2019 Can-Am Defender / Traxter HD5 Series

This manual may cover later years than listed above.

BRP often reuses sections from previous manuals when procedures do not change

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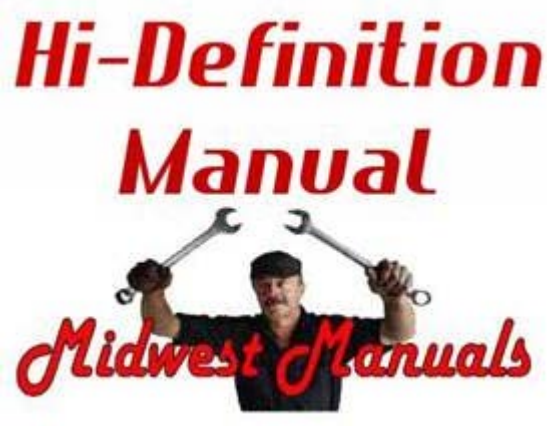

SAFETY NOTICE

This manual has been prepared as a guide to correctly service and repair the Can-Am® DEFENDER series (excluding European Union) and TRAXTER series.

This edition was primarily published to be used by mechanical technicians who are already familiar with all service procedures relating to BRP products. Mechanical technicians should attend training courses given by BRPTI.

Please note that the instructions in this manual will apply only if proper hand tools and special service tools are used.

The contents of this manual depicts parts and/or procedures applicable to a particular product at the time of writing. Service and warranty bulletins may be published to update the content of this manual. Dealer modifications that were carried out after manufacturing of the product, whether or not authorized by BRP, are not included.

In addition, the sole purpose of the illustrations throughout the manual, is to assist identification of the general configuration of the parts. They are not to be interpreted as technical drawings or exact replicas of the parts.

The use of BRP parts is most strongly recommended when considering replacement of any component. Dealer and/or distributor assistance should be sought in case of doubt.

The engines and the corresponding components identified in this document should not be utilized on product(s) other than those mentioned in this document.

It is understood that certain modifications may render use of the vehicle illegal under existing federal, provincial and state regulations.

This manual emphasizes particular information which, is denoted by the following wording and symbols:

⚠ WARNING

Indicates a potential hazard that, if not avoided, could result in serious injury or death.

⚠ CAUTION **Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

NOTICE **Indicates an instruction which, if not followed, could result in severe damage to vehicle components or other property.**

NOTE: Indicates supplementary information required to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information provided will promote its correct use.

Always observe common shop safety practice.

Unless otherwise noted, the engine must be stopped and the tether cord must be removed prior to perform any services.

Torque wrench tightening specifications must be strictly adhered to. Use the torque values and service products as in the exploded views or in the procedures when noted.

Locking devices when removed must be replaced (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pins, etc.).

Hoses, cables and locking ties removed during a procedure must be reinstalled as per factory standards.

When ordering parts always refer to the specific model *PARTS CATALOGS*.

We strongly recommend that any services be carried out and/or verified by a highly skilled professional mechanic.

It is understood that this manual may be translated into another language. In the event of any discrepancy, the English version shall prevail.

BRP disclaims liability for all damages and/or injuries resulting from the improper use of the contents of this publication.

IMPORTANT SAFETY PRECAUTIONS

We do not provide warnings about many basic shop safety practices (e.g.: Use Grinding Wheel – wear safety glasses). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in BRP shop manuals.

You should have a clear understanding of all basic shop safety practices. You should be wearing the appropriate clothing, using appropriate safety

equipment and taking all necessary safety precautions. Please be especially careful of the following:

- Read and understand all instructions before you begin a procedure or repair.
- Ensure you have the proper tools, any necessary replacement parts and the skills to perform the tasks safely and completely.
- Protect your eyes by using approved and properly fitted safety glasses.
- Use other protective wear when necessary, for example safety shoes and gloves.
- Unless the service procedure requires that the engine remain running, make sure the engine is off **before** beginning service.
- Be sure there is adequate ventilation whenever you run the engine, to avoid the risk of Carbon Monoxide poisoning.
- To avoid injury from moving parts, make sure your hands, fingers and clothing are out of the way when the engine is running.
- Gasoline vapors and hydrogen gases from batteries are explosive. Keep all cigarettes, sparks and flames away from the battery, fuel-related components and other enclosed compartments.
- Never use gasoline to clean parts, always use an approved non-flammable solvent.
- Never drain or store gasoline in an open container.

⚠ WARNING

The foregoing list represents general safety practices. For details on workplace health and safety requirements in your area, consult your local workplace health and safety agency or association.

We have provided you with some of the most important general service safety precautions, above. We cannot, however, warn you of every conceivable hazard that can arise in performing the service and repair procedures depicted in BRP manuals. Only you can decide whether or not you should perform a given task.

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INTRODUCTION

The information and component/system descriptions contained in this manual are correct at time of writing. BRP however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured.

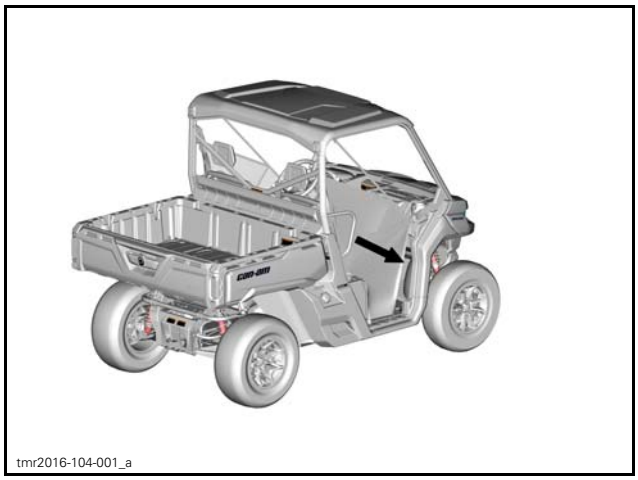
Due to late changes, there may be some differences between the manufactured product and the description and/or specifications in this document.

BRP reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

VEHICLE INFORMATION

VEHICLE IDENTIFICATION NUMBER (VIN)

The VIN (Vehicle Identification Number) decal is located under the glove box on the passenger side.

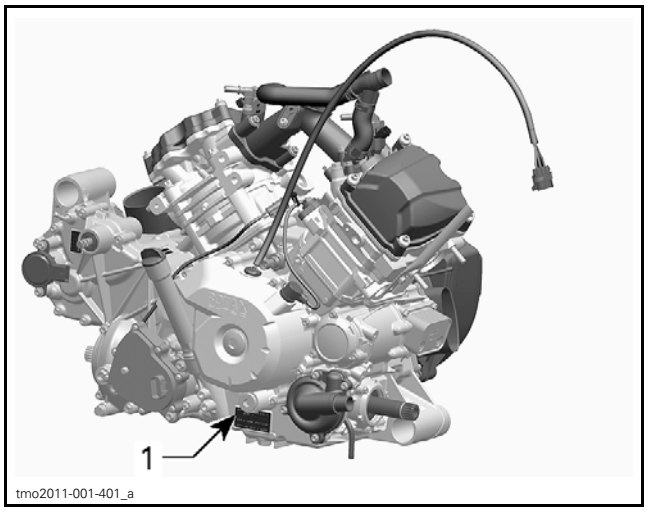


TYPICAL - VIN (VEHICLE IDENTIFICATION NUMBER) LOCATION

VIN Decal Description

TYPICAL — VEHICLE IDENTIFICATION NUMBER LABEL
1. *VIN (Vehicle Identification Number)*
2. *Model number*
3. *Manufacturing date*

ENGINE IDENTIFICATION NUMBER (EIN)

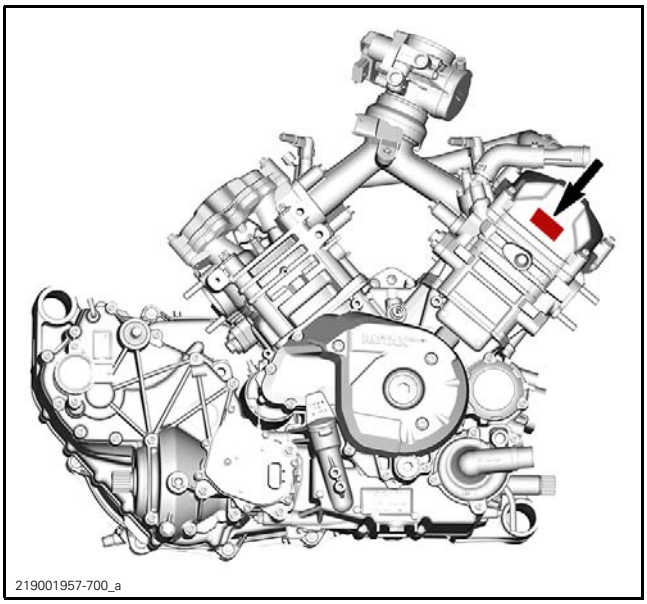


TYPICAL — ENGINE SERIAL NUMBER LABEL
1. *EIN (Engine Identification Number)*

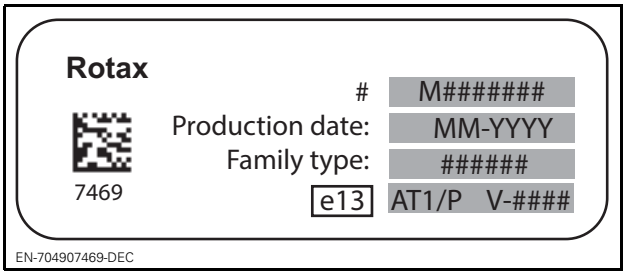
COMPLIANCE LABEL

Regulation (EU) 2016/1628 applicable for Non-Road Mobile Machineries

Vehicles who comply to Regulation (EU) 2016/1628 (NRMM) are identified on the engine valve cover.



TYPICAL



TYPICAL NRMM IDENTIFICATION

NOTE: Any tampering with the engine or its components will void the EU type-approval of the vehicle.

LIFTING AND SUPPORTING THE VEHICLE

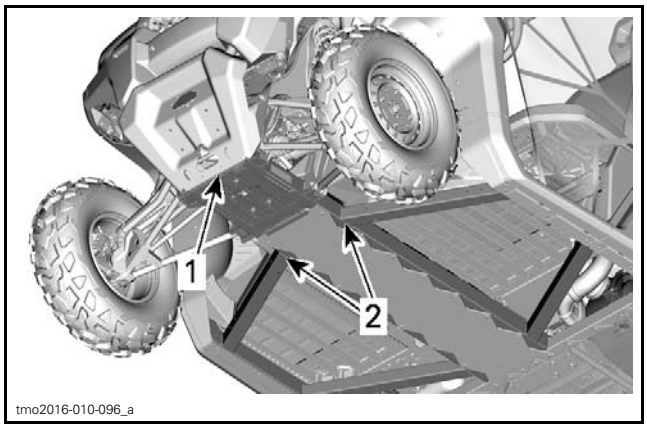
Front of Vehicle

Place vehicle on a flat non slippery ground.

Ensure vehicle shift lever is set to PARK.

Install an hydraulic jack under front skid plate.

Lift front of vehicle and install a jack stand on each side under frame section.



TYPICAL
1. Front of vehicle
2. Frame section

Lower hydraulic lift and ensure vehicle is supported safely onto both jack stands.

Rear of Vehicle

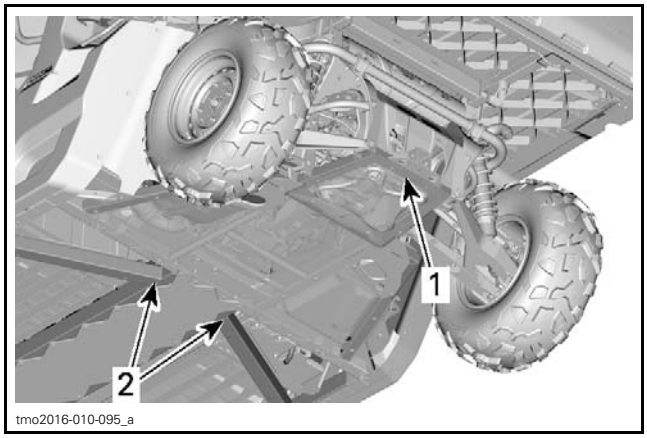
Place vehicle on a flat non slippery ground.

Activate 4WD mode.

Ensure vehicle shift lever is set to PARK.

Install an hydraulic jack under the trailer hitch.

Lift rear of vehicle and install a jack stand on each side under frame section in front of rear wheel.



TYPICAL
1. Lifting location under trailer hitch
2. Frame section to install jacks under.

Lower hydraulic lift and ensure vehicle is supported safely onto both jack stands.

LIFTING THE VEHICLE WITH A LIFTING TABLE

Roll vehicle above lifting table.

Install two 4 x 4 horizontally across vehicle as close as possible to lifting points.

NOTICE Ensure 4 x 4 are as close to lifting points as possible.

Lift vehicle using table.

NOTE: If repositioning of vehicle is needed, lift either front or rear of vehicle using the lower portion of applicable bumper.

⚠ WARNING

Do not allow anyone in the vehicle while it is being lifted.

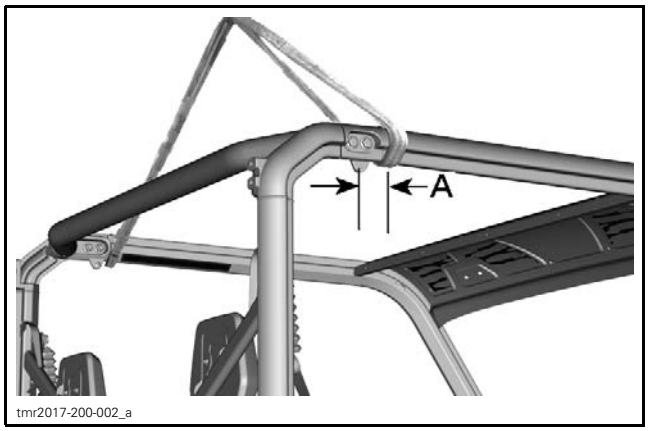
HOISTING THE VEHICLE

The vehicle may be lifted off the ground by the cage using a hoist and a lifting strap.

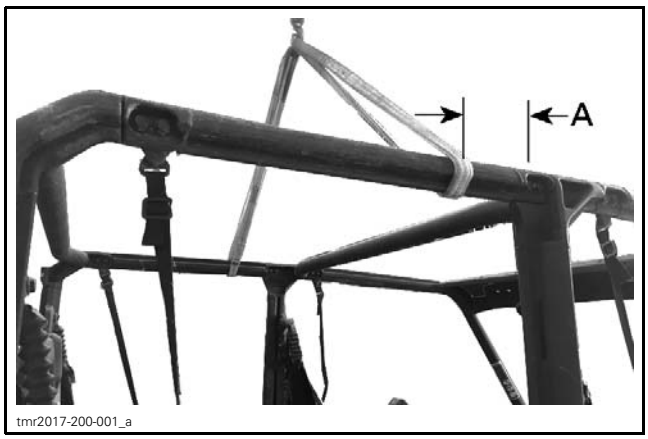
Remove the roof if equipped.

NOTICE Lifting the vehicle with the roof in place may cause irreversible damage to the roof.

Place the strap as per the following illustrations.



3-UP MODELS
A. 25 mm to 50 mm (1 in to 2 in) from the protection net anchor.



MAX MODELS
A. 125 mm to 175 mm (5 in to 7 in) from the first screw of mid pillar.

⚠ WARNING

- Ensure hoist and lifting strap are rated for lifting the total vehicle weight. Refer to applicable manufactures instructions.
- Ensure lifting strap is in good condition before lifting vehicle.
- Do not allow anyone in the vehicle or under any portion of the vehicle while it is suspended by a hoist.
- Do not perform any work on the vehicle while it is suspended by a hoist.

TRANSPORTING THE VEHICLE

If the vehicle needs to be transported, it should be properly secured on a flatbed trailer of the appropriate size and capacity.

NOTICE Do not tow this vehicle — towing can seriously damage the vehicle's drive system.

NOTICE Avoid using chains to tie the vehicle — they may damage the surface finish or plastic components.

⚠ WARNING

If the vehicle is equipped with a windshield, transport it facing forward to avoid damaging the windshield.

To load the vehicle on a platform for transport, proceed as follow:

1. Shift the vehicle into NEUTRAL (N).
2. If the vehicle is equipped with a winch, use the winch to roll the vehicle on the platform.
3. If the vehicle is not equipped with a winch, proceed as follows:
   - 3.1 Put a strap around the lower arm of each front suspension.
   - 3.2 Attach the straps to the winch cable of the towing vehicle.
   - 3.3 Pull the vehicle on the flatbed trailer with the winch.
4. Shift the vehicle into PARK (P).
5. Remove the key from the ignition switch.
6. Strap the front tires by using tire towing straps.
7. Pass a tie-down strap inside each rear wheel.
8. Firmly attach the rear wheels tie-down straps to both sides of the rear of the trailer with ratchets.

9. Ensure that both the front and rear wheels are firmly attached to the trailer.

⚠ WARNING

Make sure no loose objects are present inside vehicle during vehicle transportation.

ENGINE EMISSIONS INFORMATION

MANUFACTURER'S RESPONSIBILITY

Manufacturers of engines must determine the exhaust emission levels for each engine horsepower family and certify these engines with the United States of America Environmental Protection Agency (EPA). An emissions control information label, showing emission levels and engine specifications, must be placed on each vehicle at the time of manufacture.

DEALER RESPONSIBILITY

When servicing any vehicle that carry an emissions control information label, adjustments must be kept within published factory specifications.

Replacement or repair of any emission related component must be executed in a manner that maintains emission levels within the prescribed certification standards.

Dealers are not to modify the engine in any manner that would alter the horsepower or allow emission levels to exceed their predetermined factory specifications.

Exceptions include manufacturer's prescribed changes.

OWNER RESPONSIBILITY

The owner/operator is required to have engine maintenance performed to maintain emission levels within prescribed certification standards.

The owner/operator is not to, and should not allow anyone else to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

EMISSION REGULATIONS

The vehicle you are servicing may have been certified to applicable emission regulations in your country or state. Not as an exhaustive list; this may include standards for engine exhaust emissions, crankcase emissions, permeation emissions and evaporative emissions. Servicing procedures in this manual must be strictly followed in order to keep the vehicle within the factory specifications. Failure to follow servicing procedures in this manual may lead a vehicle to be out of compliance with applicable emission regulations.

When servicing any vehicle; adjustments must be kept within published factory specifications. Replacement or repair of any emission related component must be executed in a manner that maintains emission levels within the applicable certification standards. Nobody is allowed to modify the engine in any manner that would alter the horsepower or allow emission levels to exceed their predetermined factory specifications. Exceptions include manufacturer’s prescribed changes.

The owner/operator is required to have engine maintenance performed to maintain emission levels within the prescribed certification standards. The owner/operator is allowed and should not allow anyone else to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

MANUAL INFORMATION

MANUAL PROCEDURES

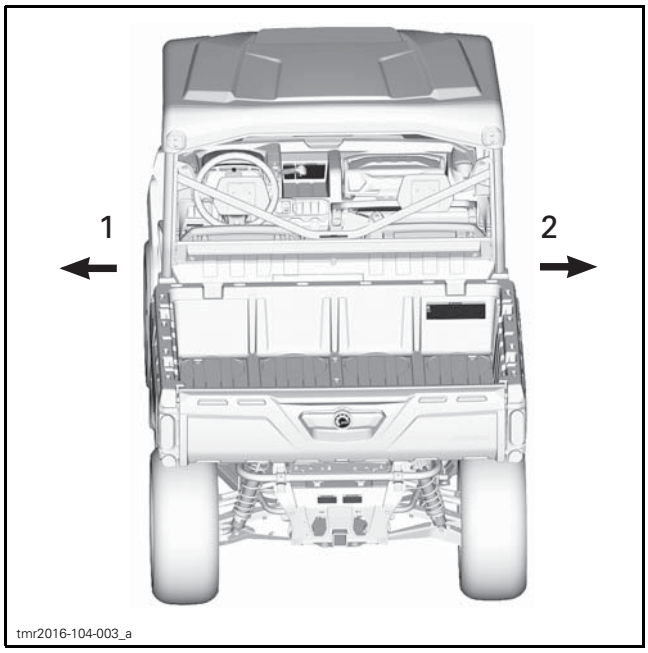
Many of the procedures in this manual are interrelated. Before undertaking any task, you should read and thoroughly understand the entire section or subsection in which the procedure is contained.

⚠ WARNING

Unless otherwise specified, the engine should be turned OFF and cold for all maintenance and repair procedures.

A number of procedures throughout the book require the use of special tools. Before starting any procedure, be sure that you have on hand all required tools, or their approved equivalents.

The use of RIGHT and LEFT indications in the text are always referenced to the driving position (sitting on the vehicle).



TYPICAL
1. Left
2. Right

This manual uses technical terms which may be different from the ones of the *PARTS CATALOGS*.

When ordering parts always refer to the specific model *PARTS CATALOGS*.

NOTICE **Most fasteners are metric, and most components are built with parts dimensioned using the metric system. Consult the appropriate *PARTS CATALOG* to obtain and use the correct parts and fasteners. Mismatched or incorrect fasteners could cause damage to the vehicle.**

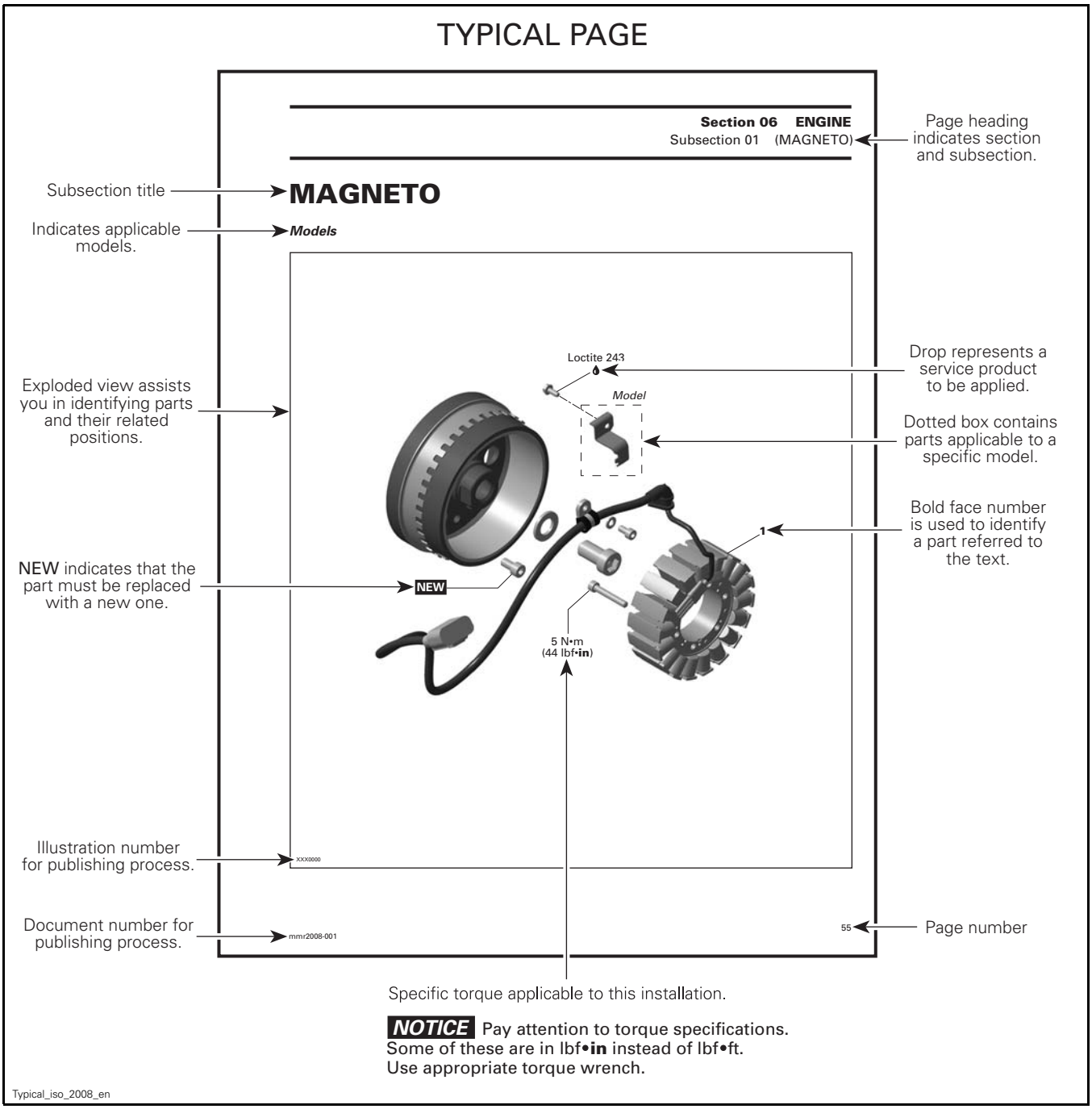
MANUAL LAYOUT

This manual is divided into many major sections as can be seen in the main table of contents at the beginning of the manual.

Each section is divided into various subsections, and again, each subsection has one or more divisions.

Illustrations and photos show the typical construction of various assemblies and, in all cases, may not reproduce the full detail or exact shape of the parts used in a particular model vehicle. However, they represent parts which have the same or a similar function.

TYPICAL PAGE



TYPICAL PAGE

Tittle in bold indicates category of information to be carried out.

GENERAL

NOTE: The following procedures can be done without removing the engine.

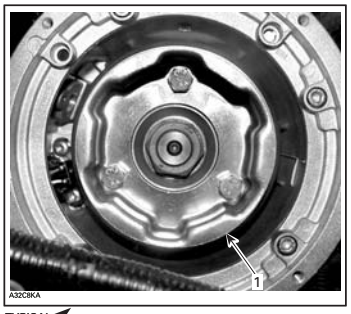
During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* sections at the beginning of this manual for complete procedure.

Reference to a specific section or subsection.

⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be replaced with new ones.



TYPICAL
1. Starting pulley

"TYPICAL" indicates a general view which may not represent exact details.

Call-outs pertaining to above illustration.

PROCEDURES

Indicates component procedures apply to.

MAGNETO FLYWHEEL

Magneto Flywheel Cleaning

Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean magneto flywheel using only a clean cloth.

Indicates specific procedure to be carried out.

Magneto Flywheel Removal

Remove muffler, refer to the *EXHAUST SYSTEM* section.

Remove acoustic panel.

Remove rewind starter.

Remove starting pulley **no. 2**.

NOTE: To remove starting pulley bolts, hold magneto flywheel with a socket as shown.

TYPICAL

Illustration always follows text to which it applies.

Models

Italic bold face typesetting indicates a procedure applicable to a specific model(s).

Remove the connecting flange retaining the rewind starter to the engine housing.

Bold face number following part name refers to exploded view at beginning of subsection.

typical_txt_2008_en

TIGHTENING TORQUE

Tighten fasteners to the torque specified in the exploded view(s) and/or in the written procedure. When a torque is not specified, refer to the following table.

⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to.
Locking devices when removed (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pins, etc.) must be replaced.

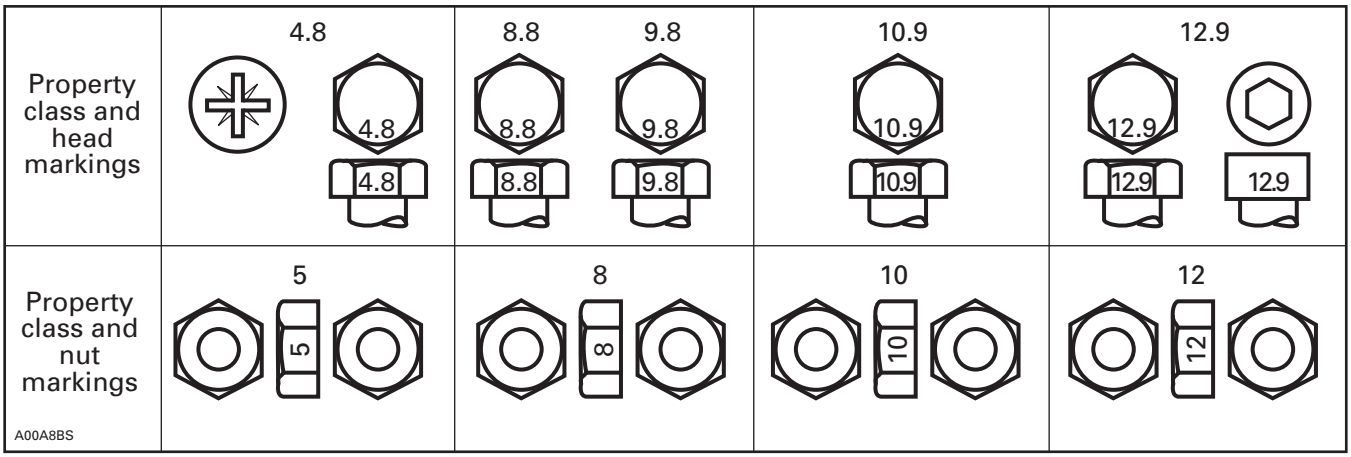
In order to avoid a poor assembly, tighten screws, bolts, or nuts in accordance with the following procedure:

1. Manually screw all screws, bolts and/or nuts.
2. Apply half the recommended torque value.
3. Tighten fastener to the recommended torque value.

NOTICE **Be sure to use the recommended tightening torque for the specified fastener used.**

NOTE: When possible, always apply torque on the nut.

NOTE: Always torque screws, bolts and/or nuts using a crisscross pattern when multiple fasteners are used to secure a part (eg. a cylinder head). Some parts must be torqued according to a specific sequence and torque pattern as detailed in the installation procedure.

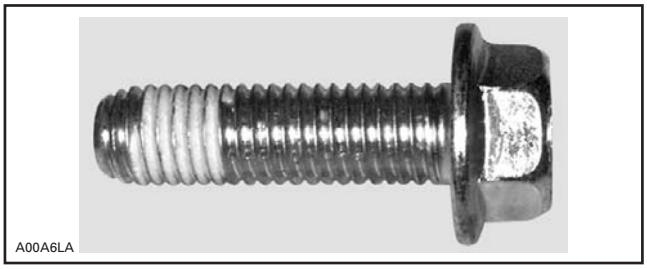


FASTENER SIZE	FASTENER GRADE/TORQUE			
	5.8 Grade	8.8 Grade	10.9 Grade	12.9 Grade
M4	1.5 – 2 N•m (13 – 18 lbf•**in**)	2.5 – 3 N•m (22 – 27 lbf•**in**)	3.5 N•m - 4 N•m (31 lbf•**in** - 35 lbf•**in**)	4 N•m - 5 N•m (35 lbf•**in** - 44 lbf•**in**)
M5	3 N•m - 3.5 N•m (27 lbf•**in** - 31 lbf•**in**)	4.5 N•m - 5.5 N•m (40 lbf•**in** - 49 lbf•**in**)	7 N•m - 8.5 N•m (62 lbf•**in** - 75 lbf•**in**)	8 N•m - 10 N•m (71 lbf•**in** - 89 lbf•**in**)
M6	6.5 N•m - 8.5 N•m (58 lbf•**in** - 75 lbf•**in**)	8 N•m - 12 N•m (71 lbf•**in** - 106 lbf•**in**)	10.5 – 15 N•m (93 – 133 lbf•**in**)	16 N•m (142 lbf•**in**)
M8	15 N•m (133 lbf•**in**)	25 N•m (18 lbf•ft)	32 N•m (24 lbf•ft)	40 N•m (30 lbf•ft)
M10	29 N•m (21 lbf•ft)	48 N•m (35 lbf•ft)	61 N•m (45 lbf•ft)	73 N•m (54 lbf•ft)
M12	52 N•m (38 lbf•ft)	85 N•m (63 lbf•ft)	105 N•m (77 lbf•ft)	128 N•m (94 lbf•ft)
M14	85 N•m (63 lbf•ft)	135 N•m (100 lbf•ft)	170 N•m (125 lbf•ft)	200 N•m (148 lbf•ft)

FASTENER INFORMATION

NOTICE Most components in the vehicles are built with parts dimensioned in the metric system. Most fasteners are metric and must not be replaced by customary fasteners or vice-versa. Mismatched or incorrect fasteners could cause damage to the vehicle or possible personal injury.

SELF-LOCKING FASTENERS PROCEDURE



TYPICAL — SELF-LOCKING FASTENER

The following describes common procedures used when working with self-locking fasteners.

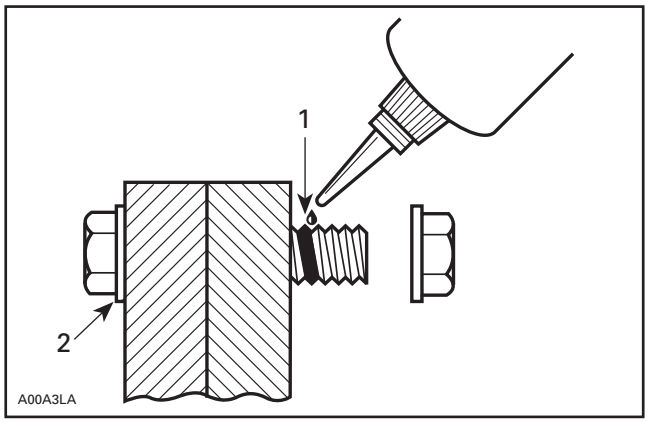
Use a metal brush or a tap to properly clean a threaded hole, then use a solvent. Allow the solvent time to act, approximately 30 minutes, then wipe off. Solvent utilization is to ensure proper adhesion of the product used for locking the fastener.

LOCTITE® APPLICATION PROCEDURE

The following describes common procedures used when working with Loctite products.

NOTE: Always use proper strength Loctite product as recommended in this shop manual.

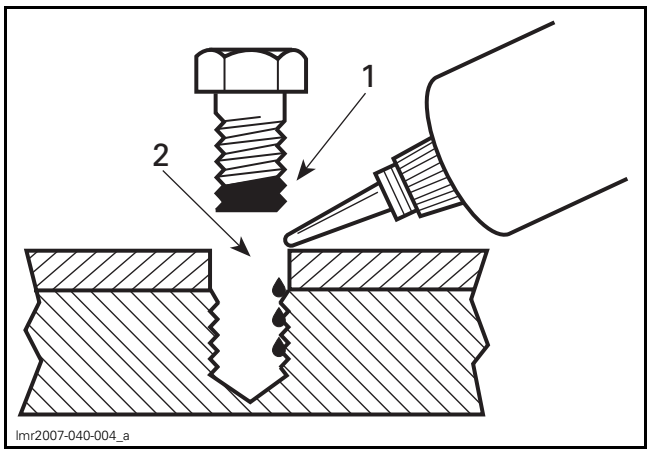
Threadlocker Application for Uncovered Holes (Bolts and Nuts)



1. Apply here
2. Do not apply

1. Clean threads (bolt and nut) with solvent.
2. Apply LOCTITE 7649 (PRIMER) (P/N 293 800 041) on threads and allow to dry.
3. Choose proper strength Loctite threadlocker.
4. Fit bolt in the hole.
5. Apply a few drops of threadlocker at proposed tightened nut engagement area.
6. Position nut and tighten as required.

Threadlocker Application for Blind Holes

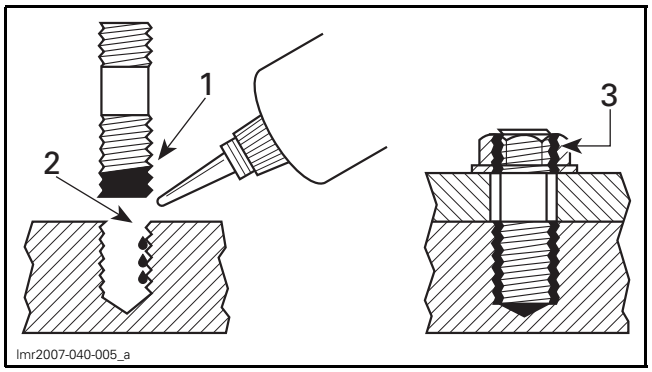


1. On fastener threads
2. On threads and at the bottom of hole

1. Clean threads (bolt and hole) with solvent.
2. Apply LOCTITE 7649 (PRIMER) (P/N 293 800 041) on threads (bolt and nut) and allow to dry for 30 seconds.
3. Choose proper strength Loctite threadlocker.

4. Apply several drops along the threaded hole and at the bottom of the hole.
5. Apply several drops on bolt threads.
6. Tighten as required.

Threadlocker Application for Stud Installation in Blind Holes



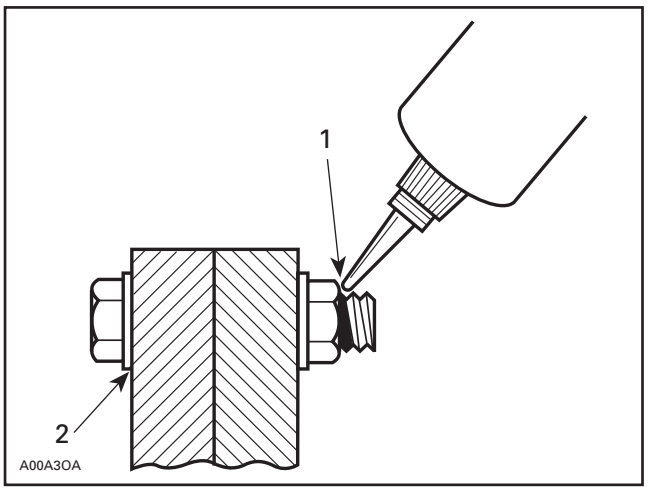
1. On stud threads
2. On threads and in the hole
3. On retaining nut threads

1. Clean threads (stud and hole) with solvent.
2. Apply LOCTITE 7649 (PRIMER) (P/N 293 800 041) on threads and allow to dry.
3. Put 2 or 3 drops of proper strength Loctite threadlocker on female threads and in hole.

NOTE: To avoid a hydro lock situation, do not apply too much Loctite.

4. Apply several drops of proper strength Loctite on stud threads.
5. Install stud.
6. Install cover, part, etc.
7. Apply a few drops of proper strength Loctite on uncovered stud threads.
8. Install and tighten retaining nut(s) as required.

Threadlocker Application for Pre-Assembled Parts

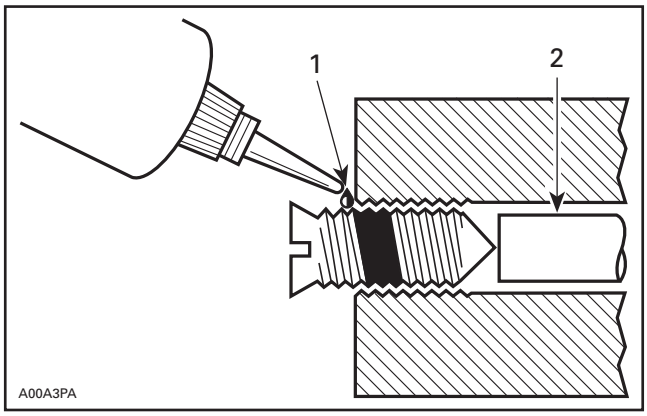


1. Apply here
2. Do not apply

1. Clean bolts and nuts with solvent.
2. Assemble components.
3. Tighten nuts.
4. Apply a few drops of proper strength Loctite on bolt/nut contact surfaces.
5. Avoid touching metal with tip of flask.

NOTE: For preventive maintenance on existing equipment, retighten nuts and apply proper strength Loctite on bolt/nut contact surfaces.

Threadlocker Application for an Adjustment Screw

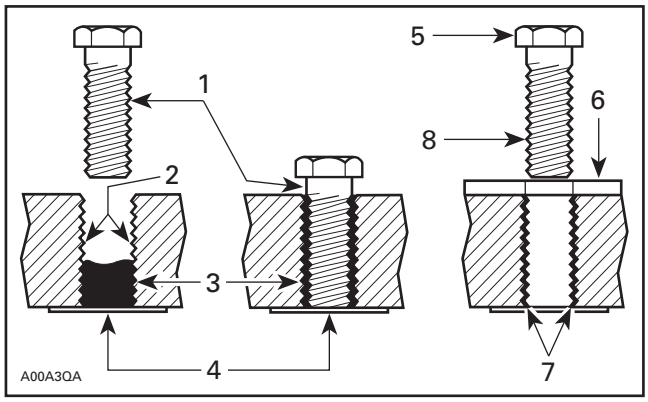


1. Apply here
2. Plunger

1. Adjust screw to proper setting.
2. Apply a few drops of proper strength Loctite threadlocker on screw/body contact surfaces.
3. Avoid touching metal with tip of flask.

NOTE: If it is difficult to readjust, heat screw with a soldering iron (232°C (450°F)).

Application for Stripped Thread Repair



1. Release agent
2. Stripped threads
3. Form-A-Thread
4. Tapes
5. Cleaned bolt
6. Plate
7. New threads
8. Threadlocker

Standard Thread Repair

Follow instructions on Loctite FORM-A-THREAD 81668 package.

If a plate is used to align bolt:

1. Apply release agent on mating surfaces.
2. Put waxed paper or similar film on the surfaces.
3. Twist bolt when inserting it to improve thread conformation.

NOTE: NOT intended for engine stud repairs.

Repair of Small Holes/Fine Threads

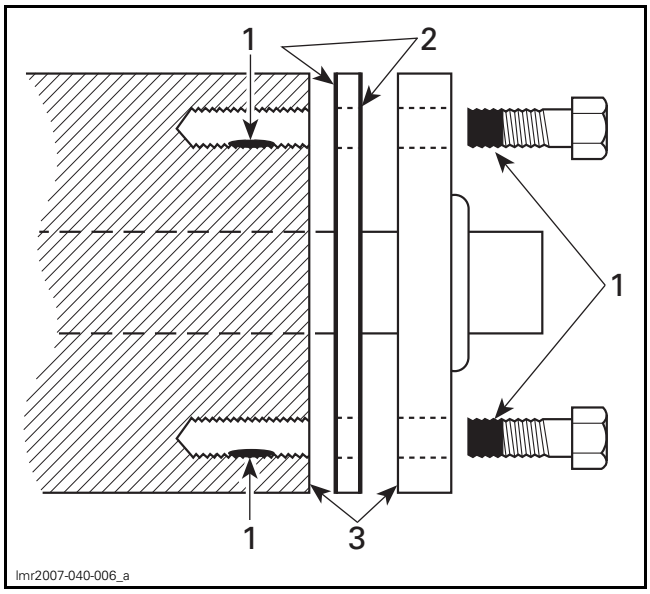
Option 1: Enlarge damaged hole, then follow *STANDARD THREAD REPAIR* procedure.

Option 2: Apply FORM-A-THREAD on the screw and insert in damaged hole.

Permanent Stud Installation (Light Duty)

1. Use a stud of the desired thread length.
2. DO NOT apply release agent on stud.
3. Follow Standard Thread Repair procedure.
4. Allow 30 minutes for Loctite FORM-A-THREAD to cure.
5. Complete part assembly.

Gasket Compound Application



1. Proper strength Loctite
2. Loctite Primer N (P/N 293 800 041) and Gasket Eliminator 518 (P/N 293 800 038) on both sides of gasket
3. Loctite Primer N only

1. Remove old gasket and other contaminants using LOCTITE CHISEL (GASKET REMOVER) (P/N 413 708 500). Use a mechanical means only if necessary.

NOTE: Avoid grinding.

2. Clean both mating surfaces with solvent.
3. Spray Loctite Primer N on both mating surfaces and on both sides of gasket and allow to dry 1 or 2 minutes.
4. Apply LOCTITE 518 (P/N 293 800 038) on both sides of gasket, using a clean applicator.
5. Place gasket on mating surfaces and assemble parts immediately.

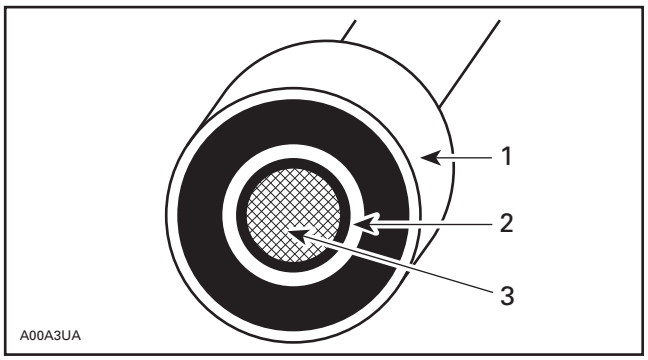
NOTE: If the cover is bolted to blind holes, apply proper strength Loctite in the hole and on threads. Tighten fastener.

If holes are sunken, apply proper strength Loctite on bolt threads.

6. Tighten as usual.

Threadlocker Application for Mounting on a Shaft

Mounting with a Press



1. Bearing
2. Proper strength Loctite
3. Shaft

1. Clean shaft external contact surface.
2. Clean internal contact surface of part to be installed on shaft.
3. Apply a strip of proper strength Loctite on circumference of shaft contact surface at insertion or engagement point.

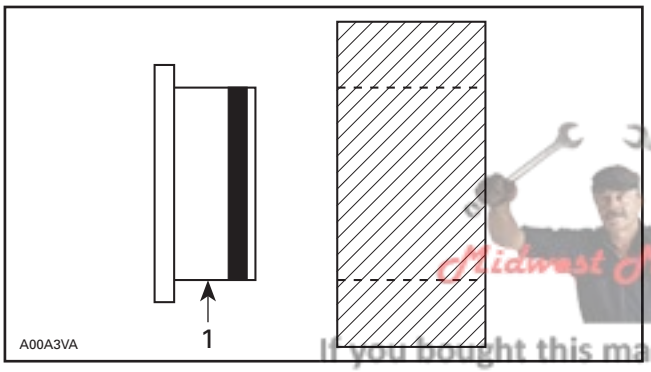
NOTE: Retaining compound is always forced out when applied on shaft.

4. DO NOT use antiseize Loctite or any similar product.
5. No curing period is required.

Mounting in Tandem

1. Apply retaining compound on internal contact surface (bore) of parts to be installed.
2. Continue parts assembly as per previous illustration.

Threadlocker Application for Case-In Components (Metallic Gaskets)



1. Proper strength Loctite

1. Clean inner housing diameter and outer gasket diameter.
2. Spray housing and gasket with LOCTITE 7649 (PRIMER) (P/N 293 800 041).
3. Apply a strip of proper strength Loctite on leading edge of outer metallic gasket diameter.

NOTE: Any Loctite product can be used here. A low strength liquid is recommended as normal strength and gap are required.

4. Install according to standard procedure.
5. Wipe off excess product.
6. Allow 30 minutes for product to cure.

NOTE: Normally used on worn-out housings to prevent leaking or sliding.

It is generally not necessary to remove gasket compound applied on outer gasket diameter.

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PERIODIC MAINTENANCE SCHEDULE

Maintenance is very important for keeping your vehicle in safe operating condition. Proper maintenance is the owner's responsibility. The vehicle should be serviced as per the maintenance schedule.

The following message appears in the gauge after every 200 hours of operation, to remind you of maintenance requirements: MAINTENANCE REQUIRED. To erase message, use BUDS2.

⚠ WARNING

Failure to properly maintain the vehicle according to the maintenance schedule and procedures can make it unsafe to operate.

Operation in trail riding conditions
Operation in severe riding conditions (dusty or muddy) or carrying heavy loads condition

EVERY YEAR OR EVERY 3 000 KM (2,000 MI) OR 200 HOURS (whichever comes first)
EVERY YEAR OR EVERY 1 500 KM (1,000 MI) OR 100 HOURS (whichever comes first)
Check fault codes
Perform all items indicated in the pre-ride inspection.
Replace engine oil and filter
Inspect gearbox oil level (HD8 and HD10 models) and look for contamination (every 3000 km)
Replace gearbox oil (HD8 and HD10 models) (Perform at the first 3000 km)
Inspect and clean engine air filter. Replace if needed
Inspect steering system for abnormal play and damages (column, rack and pinion, bellows)
Inspect the tie rod ends and ball joints for play and inspect boots condition
Inspect wheel bearings for abnormal play
Inspect suspension arm bushing and wear plates. Replace if needed.
Inspect CV joints and rubber boots condition (check for abnormal play in the joints and for cuts in the rubber boots)
Lubricate suspension arms and stabilizer bar bushings
Inspect and clean the brake system (fluid level, pads, discs, lines, calipers)
Check front differential oil level and rear drive unit (HD5 only) and, look for contamination and overall condition (vents, mount bolt torque, seals)
Inspect rear final drive oil level (HD5 models) and look for contamination and overall condition (vents, mount bolt torque, seals)
Inspect battery condition and connections
Inspect propeller shaft U-joints for abnormal play. On HD5, inspect rubber boot condition
Clean exhaust pipes and muffler area
Clean muffler spark arrester
Adjust valve clearance
Replace fuel vent breather filter
Inspect CVT drive belt and clean CVT pulleys
Inspect centrifugal levers and rollers of drive pulley
Inspect, clean and lubricate drive pulley bearing (HD5)

EVERY YEAR OR EVERY 3 000 KM (2,000 MI) OR 200 HOURS (whichever comes first)
EVERY YEAR OR EVERY 1 500 KM (1,000 MI) OR 100 HOURS (whichever comes first)
Inspect drive pulley hub needle bearing (HD8/HD10)
Inspect input and output shaft seals (engine, gearbox (HD8 and HD10 models), rear final drive (HD5 models), front differential)
Tighten cage fasteners
Inspect and clean seat belts retractors and buckles
Verify coolant level and adjust if needed
Lubricate door latches (On Cab models)

EVERY TWO YEAR OR EVERY 6 000 KM (4,000 MI) OR 400 HOURS (whichever comes first)
EVERY TWO YEAR OR EVERY 3 000 KM (2,000 MI) OR 200 HOURS (whichever comes first)
Check fault codes
Perform all items indicated in the pre-ride inspection.
Replace front differential oil
Replace gearbox oil (HD8 and HD10 models)
Replace rear final drive oil (HD5 models)
Replace brake fluid (must be performed every 2 years)
Verify cooling system
Test engine coolant strength + level
Verify fuel system for leaks (including evaporative emission system components if equipped)
Verify fuel pump pressure (idle and WOT)
Replace spark plugs
Clean vehicle speed sensor
Replace canister vent pre-filter (evaporative emission system) if equipped

EVERY 5 YEARS OR EVERY 12 000 KM (8,000 MI) (whichever comes first)
EVERY 5 YEARS OR EVERY 6 000 KM (4,000 MI) (whichever comes first)
Replace engine coolant

PERIODIC MAINTENANCE PROCEDURES (HD5)

SERVICE TOOLS

Description	Part Number	Page
TEST CAP	529 035 991	7
VACUUM/PRESSURE PUMP	529 021 800	7, 17

SERVICE PRODUCTS

Description	Part Number	Page
4T 0W40 SYNTHETIC OIL (EUR)	779286	4
4T 0W40 SYNTHETIC OIL	779139	4
4T 10W50 SYNTHETIC OIL (EUR)	779240	4
4T 10W50 SYNTHETIC OIL	779234	4
4T 5W40 SYNTHETIC BLEND OIL (EUR)	779290	4
4T 5W40 SYNTHETIC BLEND OIL	779133	4
75W90 SYNTHETIC GEAR OIL (EUR)	779212	10, 13
75W90 SYNTHETIC GEAR OIL	779158	10, 13
BRAKE AND PARTS CLEANER PRO S2	779245	11, 16
BRAKE FLUID DOT 4 (EUR)	779207	17
BRAKE FLUID DOT 4	779151	17
COSMO RUBBER GREASE	715 900 399	16
EXTENDED LIFE PRE-MIXED COOLANT (EUR)	779223	5
EXTENDED LIFE PRE-MIXED COOLANT	779150	5
LOCTITE 767 (ANTISEIZE LUBRICANT)	293 800 070	12
SYNTHETIC GREASE SUSPENSION (EUR)	779226	14–15
SYNTHETIC GREASE SUSPENSION	779163	14–15
SYNTHETIC GREASE	779162	16
XPS BRAKES AND PARTS CLEANER (USA)	219 701 705	16

GENERAL

This subsection provides:
- Fluid level verifications
- Maintenance procedures.

The following systems should be serviced according to the *PERIODIC MAINTENANCE SCHEDULE*.

PROCEDURES

AIR INTAKE SYSTEM

Replacing the Air Filter

NOTICE Never modify the air intake system. Otherwise, engine performance degradation or damage can occur. The engine is calibrated to operate specifically with these components.

Air Filter Replacement Guideline

Air filter replacement should be adjusted according to riding conditions as it is critical to ensure proper engine performance and life span.

Air filter replacement frequency must be increased for the following dusty conditions:
- Riding on dry sand
- Riding on dry dirt covered surfaces
- Riding on dry gravel roads or similar conditions.
- Riding in areas with high concentration of seeds or crop husks.
- Riding in severe snow conditions.

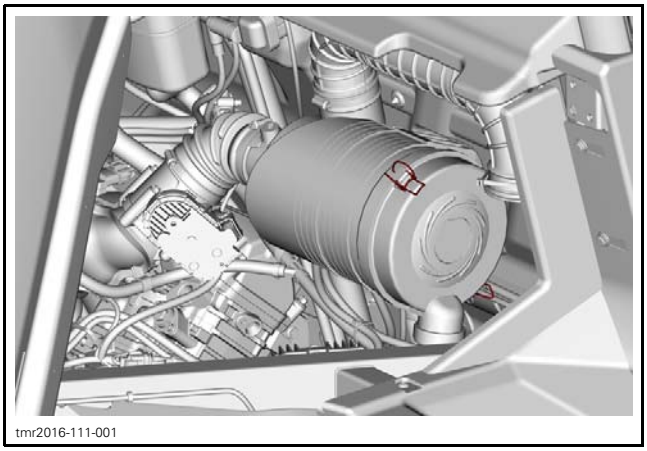
NOTICE When riding in dusty conditions or sand, the air box needs to be cleaned before every ride.

NOTE: Riding in a group in these conditions would increase even more the air filter replacement requirement.

Removing the Air Filter

Tilt cargo box.

Unlatch air filter cover and remove air filter.



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The filter fits tightly over the outlet tube and there will be some initial resistance. Gently move the end of the filter back and forth to break the seal, then rotate while pulling straight out. Avoid knocking the filter against the housing.

Replace air filter if clogged. Always use the recommended air filter or an equivalent.

Cleaning the Duckbill Valve

Visually check and physically squeeze the duckbill valve. Make sure the valve is flexible and not inverted, damaged or plugged.

Installing the Air Filter

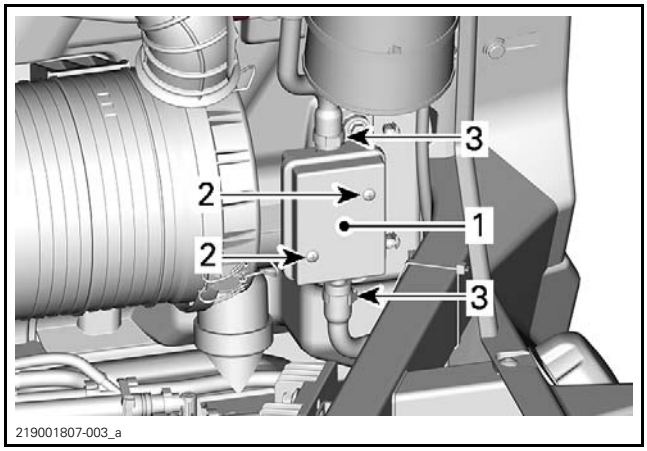
Insert the filter carefully. Seat the filter by hand, making certain it is inserted completely into the air cleaner housing. Apply pressure by hand at the outer rim of the filter, not the flexible center.

Secure air filter cover with latches.

EVAPORATIVE EMISSION SYSTEM PRE-FILTER (IF EQUIPPED)

Evaporative Emission System Pre-Filter Replacement

1. Tilt cargo box.
2. Remove the hose clamps.
3. Remove the retaining screws.
4. Remove the pre-filter assembly.



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1. Pre-Filter
2. Retaining screw
3. Clamps

5. Install a new pre-filter assembly.

TIGHTENING TORQUE	
Pre-filter retaining screw	2.5 N•m ± 0.5 N•m (22 lbf•**in** ± 4 lbf•**in**)

6. Secure hoses with clamps.

EXHAUST SYSTEM

Cleaning and Inspecting the Muffler

Purge the muffler from accumulated carbon as follows.

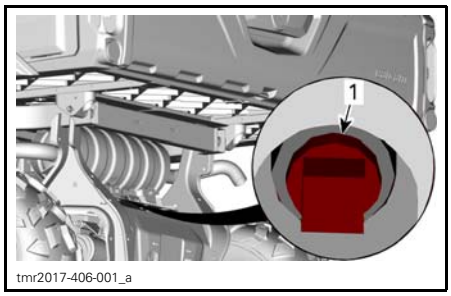
Place the vehicle in a well ventilated area.

Stop engine and let muffler cool down.

⚠ WARNING

Never run engine in an enclosed area. Never perform this operation immediately after the engine has been running because exhaust system is very hot. Make sure that there are no combustible materials in the area. Wear eye protection and gloves. Never stand behind the vehicle while purging exhaust system. Respect all applicable laws and regulations.

Remove the muffler cleanout plug.



UNDERNEATH THE MUFFLER
1. Muffler cleanout plug

Start engine (shift lever in Park).

Block the end of the mufflers with a shop rag.

Quickly increase throttle several times.

Stop engine and let muffler cool down.

Reinstall the cleanout plug.

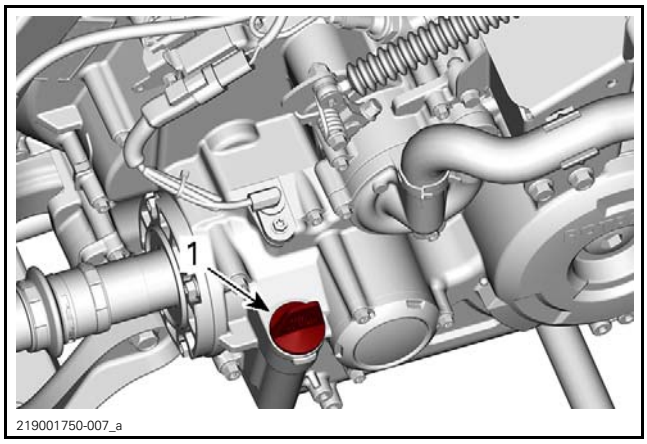
LUBRICATION SYSTEM

Verifying the Engine Oil Level

NOTICE Operating the engine with an improper level may severely damage engine.

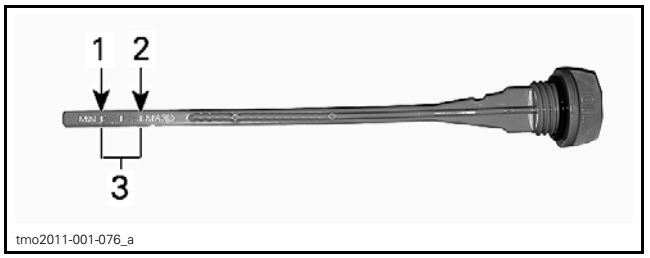
With vehicle on a level surface and engine cold, check the oil level as follows:

1. Place vehicle on a level surface.
2. Open cargo box.
3. Remove dipstick and wipe it clean.



1. Dipstick

4. Reinstall dipstick, screw in it completely.
5. Remove dipstick and check oil level. It should be near or equal to the upper mark.



TYPICAL
1. MIN.
2. MAX.
3. Operating range

To add oil, remove the dipstick. Place a funnel into the dipstick tube.

Add a small amount of recommended oil and recheck oil level.

Repeat the above procedures until oil level reaches the dipstick's upper mark.

NOTE: Do not overfill. Wipe off any spillage.

Properly tighten dipstick.

Close cargo box.

Changing the Engine Oil

NOTICE Engine oil and oil filter must be replaced at the same time.

Oil change and oil filter replacement should be done with a warm engine.

⚠ CAUTION The engine oil can be very hot. Wait until engine oil is warm.

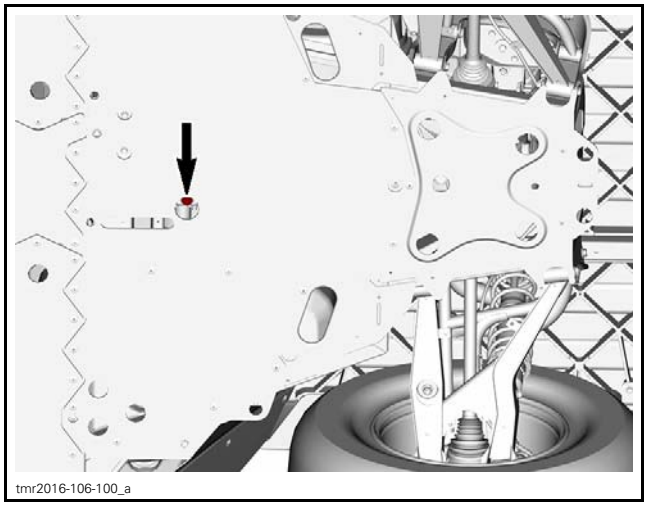
Ensure vehicle is on a level surface.

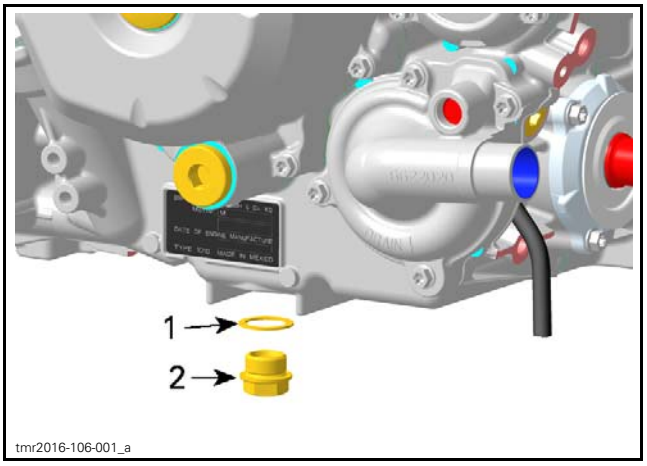
Remove dipstick.

Place a drain pan under the engine drain plug area.

Clean the drain plug area.

Unscrew magnetic drain plug and discard the gasket ring.





1. Gasket ring
2. Magnetic drain plug

Allow oil to drain completely from the crankcase.

Clean the magnetic drain plug from metal shavings and residue. Presence of debris gives an indication of internal engine damage.

Install a **NEW** gasket ring on the magnetic drain plug.

NOTICE **Never use the gasket ring a second time. Always replace by a NEW one.**

Tighten magnetic drain plug to the specification.

TIGHTENING TORQUE	
Magnetic drain plug	30 N•m ± 2 N•m (22 lbf•ft ± 1 lbf•ft)

Replace oil filter. Refer to *REPLACING THE ENGINE OIL FILTER* in this subsection.

Refill engine with recommended engine oil.

ENGINE OIL CAPACITY
2 L (2.11 qt (U.S. liq.))

RECOMMENDED ENGINE OIL (GENERAL PURPOSE)	
Scandinavia	4T 5W40 SYNTHETIC BLEND OIL (EUR) (P/N 779290)
All other countries	4T 5W40 SYNTHETIC BLEND OIL (P/N 779133)

RECOMMENDED ENGINE OIL (WARM TEMPERATURE)	
Scandinavia	4T 10W50 SYNTHETIC OIL (EUR) (P/N 779240)
All other countries	4T 10W50 SYNTHETIC OIL (P/N 779234)

RECOMMENDED ENGINE OIL (COLD TEMPERATURE)	
Scandinavia	4T 0W40 SYNTHETIC OIL (EUR) (P/N 779286)
All other countries	4T 0W40 SYNTHETIC OIL (P/N 779139)

If recommended XPS oil is not available, use a 4-stroke SAE 5W40 or 10W50 engine oil that meets or exceeds the requirements for API service classification SM, SL or SJ. Always check the API service label certification on the oil container, it must contain at least one of the above standards.

After filling, check the oil level, refer to *VERIFYING THE ENGINE OIL LEVEL* in this subsection.

Start engine and let it idle for a few minutes.

Ensure oil filter and drain plug areas are not leaking.

Stop engine.

Wait a while to allow oil to flow down to crankcase, then check oil level again.

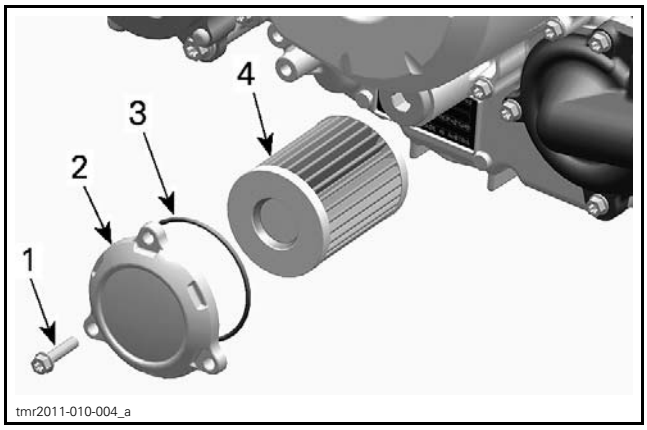
Dispose oil and filter as per your local environmental regulations.

Replacing the Engine Oil Filter

Removing the Oil Filter

Clean oil filter area.

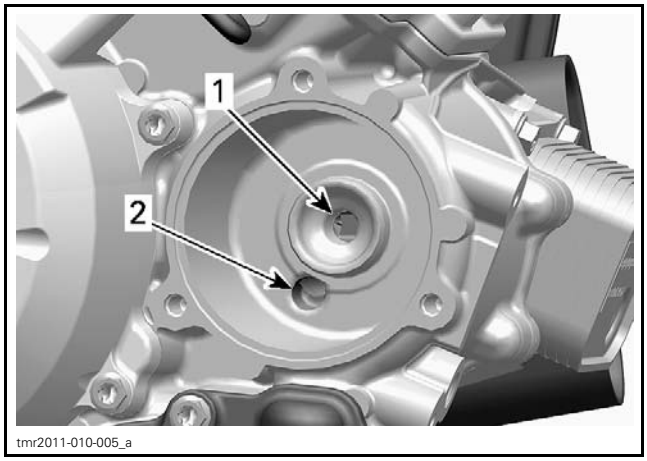
Remove:
– Oil filter cover screws
– Oil filter cover
– O-ring
– Oil filter.



1. Oil filter cover screw
2. Oil filter cover
3. O-ring
4. Oil filter

Installing the Oil Filter

Check and clean the oil filter inlet and outlet area for dirt and other contaminations.

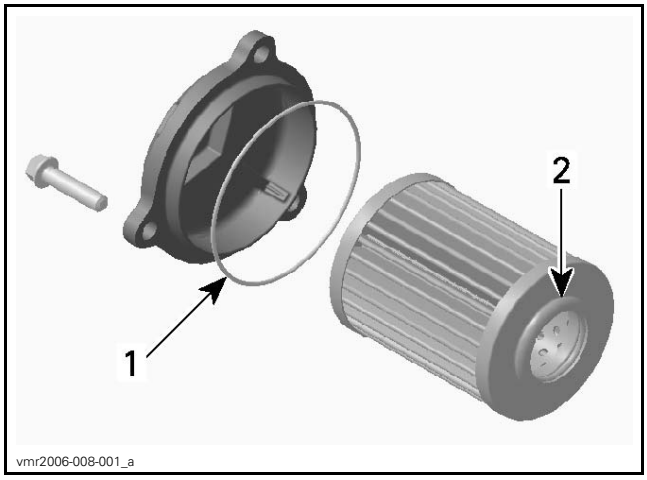


1. Outlet bore to the engine oil providing system
2. Inlet bore from the oil pump to the oil filter

Install a NEW O-ring on oil filter cover.

Install the new filter into the cover.

Apply engine oil on O-ring and oil filter seal.



1. Slightly oil
2. Slightly oil

NOTICE Pay attention to avoid pinching the O-ring during filter and cover installation.

Install the cover on the engine.

Tighten oil filter cover screws to specification.

TIGHTENING TORQUE	
Oil filter cover screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

Wipe off any oil spillage on engine.

COOLING SYSTEM

Recommended Engine Coolant

COUNTRIES	RECOMMENDED COOLANT
Scandinavia	EXTENDED LIFE PRE-MIXED COOLANT (EUR) (P/N 779223)
All other countries	EXTENDED LIFE PRE-MIXED COOLANT (P/N 779150)
Alternative, or if not available	Distilled water and antifreeze solution (50% distilled water, 50% antifreeze)

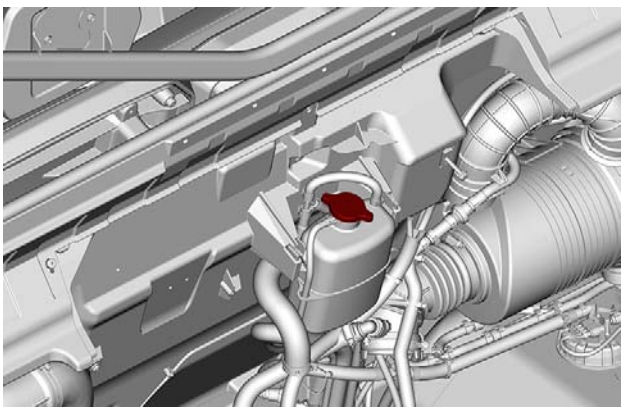
NOTICE Always use ethylene-glycol antifreeze containing corrosion inhibitors specifically formulated for internal combustion aluminum engines.

Verifying the Engine Coolant Level

⚠ WARNING

Check coolant level with engine cold.

1. Place vehicle on a level surface.
2. Tilt cargo box.

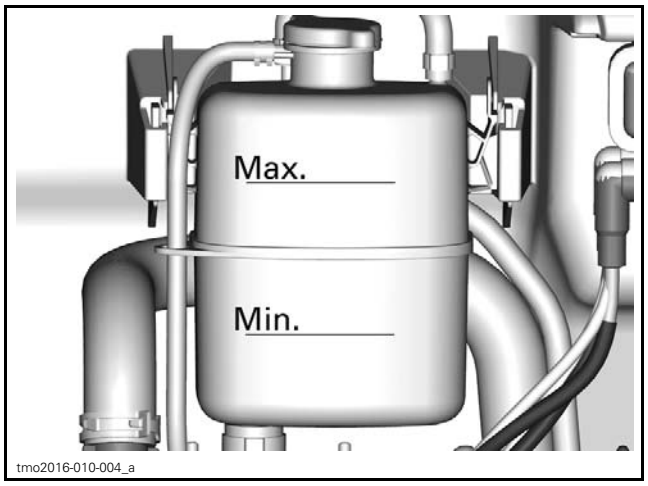


3. Remove the pressure cap.

⚠ WARNING

In order to avoid potential burns, do not remove the pressure cap if the engine is hot.

4. Ensure cooling system is full up to the MAX line.



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5. Add coolant in system as necessary. **Do not overfill**.
6. Properly reinstall pressure cap.
7. Close the cargo box.

NOTE: A cooling system that frequently requires addition of coolant is an indication of leaks or engine problems.

Checking the Engine Coolant Specific Gravity

Remove pressure cap.

Use an antifreeze tester to test coolant strength.

MINIMUM RECOMMENDED COOLANT STRENGTH
-30°C (-22°F)

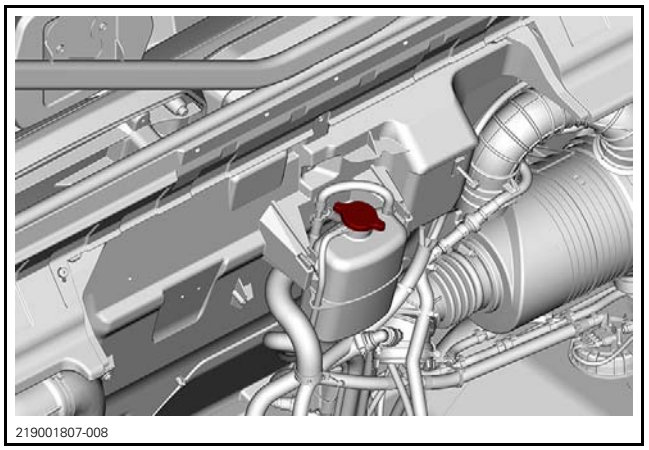
Replacing the Engine Coolant

Draining the Cooling System

⚠ WARNING

In order to avoid potential burns, do not remove the pressure cap or loosen the coolant drain plug if the engine is hot.

1. Tilt the cargo box.
2. Remove the cooling system pressure cap.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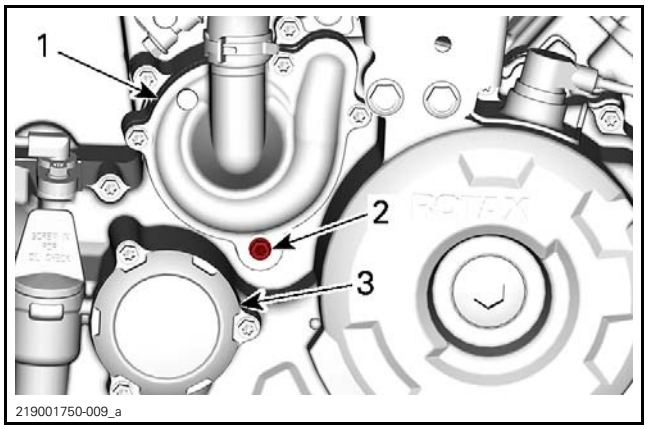
3. Place a drain pan underneath the vehicle.
4. Unscrew coolant drain plug and drain the coolant into a suitable container.

NOTE: Do not unscrew the coolant drain plug completely.



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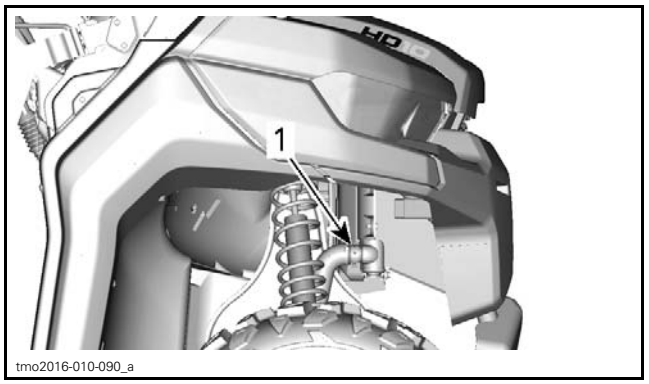
1. Water pump cover
2. Coolant drain plug
3. Oil filter cover

5. Disconnect the lower radiator hose and drain the remaining coolant into a suitable container.

NOTE: Take note of the position of the hose clamp on the lower radiator hose at the radiator.



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1. Lower radiator hose to disconnect

6. Drain cooling system completely.

7. Reinstall coolant drain plug.

TIGHTENING TORQUE	
Coolant drain plug	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

8. Reinstall radiator hose as noted prior to removal.

TIGHTENING TORQUE	
Radiator hose clamp	3 N•m ± 0.5 N•m (27 lbf•**in** ± 4 lbf•**in**)

9. Fill cooling system with coolant, refer to *BLEEDING THE COOLING SYSTEM* procedure.

Bleeding the Cooling System

1. Remove the pressure cap.
2. Fill the cooling system until coolant is full up to the MAX line of the coolant reservoir.
3. Install pressure cap.
4. Run engine at idle with the pressure cap ON until the cooling fan cycles on for a second time.
5. Stop the engine and let it cool down.

⚠ WARNING

In order to avoid potential burns, do not remove the pressure cap if the engine is hot.

6. When the engine is cool, check coolant level. Add coolant if required.
7. After the next ride following this procedure, check coolant level. Add coolant as required. Refer to *VERIFYING THE ENGINE COOLANT LEVEL* in this subsection.

Inspecting the Cooling System

1. Check general condition of hoses and clamps for tightness.
2. Carry out the *CHECKING THE ENGINE COOLANT SPECIFIC GRAVITY* as detailed in this subsection.
3. Carry out the *TESTING THE PRESSURE CAP* as detailed in this subsection.
4. Replace engine coolant if contaminated.

NOTE: Engine coolant should be replaced every 5 years or if contaminated.

Performing a Cooling System Leak Test

⚠ WARNING

To avoid potential burns, do not remove the pressure cap or loosen the cooling system drain plug if the engine is hot.

1. Tilt the cargo box
2. Replace the pressure cap by the following test cap.
3. Install the vacuum/pressure pump on the test cap.

REQUIRED TOOL	
TEST CAP (P/N 529 035 991)	
VACUUM/PRESSURE PUMP (P/N 529 021 800)	

4. Pressurize cooling system.

COOLING SYSTEM LEAK TEST
103 kPa (15 PSI)

If there is no pressure drop after 10 minutes, there is no leak in the cooling system.

If the pressure drops, check all hoses, radiator, cylinders and engine base for coolant leaks or air bubbles.

Testing the Pressure Cap

Test the pressure cap using a cooling system tester.

Replace the cap if it does not hold the pressure, or if it opens at a relief pressure that is too low or too high.

PRESSURE CAP RELIEF PRESSURE
Approximately 110 kPa (16 PSI)

TOP END

Inspecting and Adjusting the Engine Valve Clearance

NOTE: Check and adjust valve clearance only when engine is cold.

Remove valve covers, refer to *TOP END* subsection.

Turn crankshaft to TDC ignition of the respective cylinder, refer to *CAMSHAFT TIMING GEAR* in the *TIMING CHAIN* subsection.

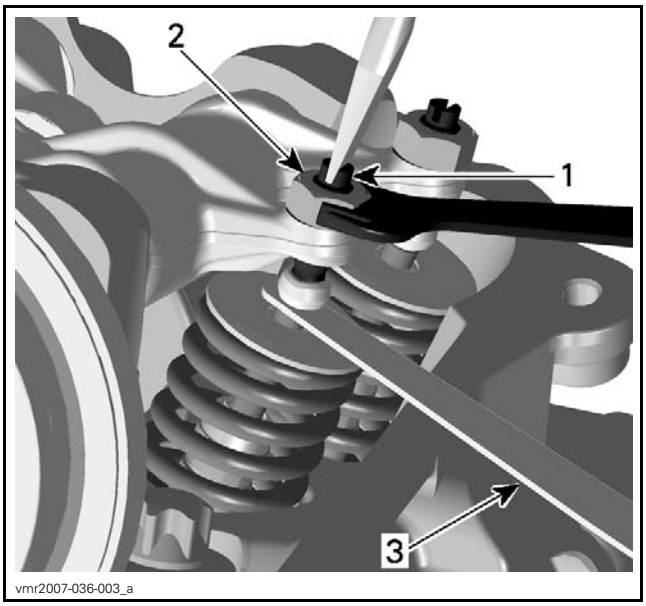
Using feeler gauge, check the valve clearance.

VALVE CLEARANCE	
EXHAUST	0.11 mm to 0.19 mm (.0043 in to .0075 in)
INTAKE	0.06 mm to 0.14 mm (.0024 in to .0055 in)

If the valve clearance is out of specification, adjust valves as follows.

NOTE: Use mean value of exhaust/intake to ensure a proper valve adjustment.

Hold the adjustment screw at the proper position and tighten the locking nut.



1. Adjustment screw
2. Locking nut
3. Feeler gauge

Repeat the procedure for each valve.

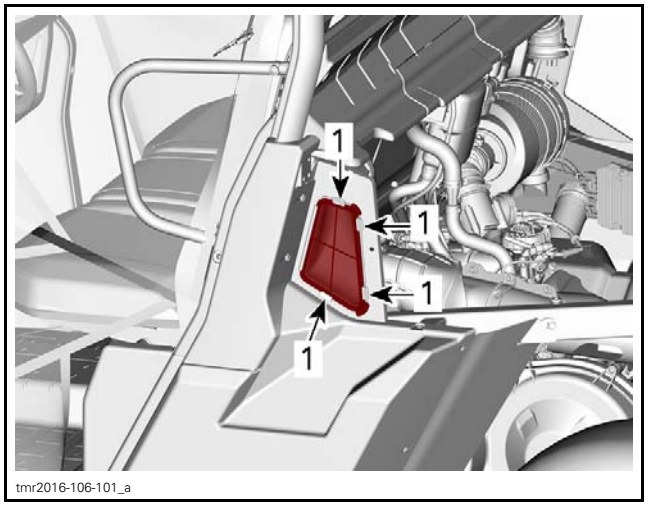
Before installing valve covers, recheck valve clearance.

CONTINUOUSLY VARIABLE TRANSMISSION (CVT)

CVT Air Filter Cleaning

Removing the CVT Air Filter

1. Tilt the cargo box.
2. Press the filter tabs to release it.



1. Press here

Cleaning the CVT Air Filter

1. Inspect filter and replace if damaged.
2. Gently clean using a solution of soft soap and water, then rinse filter.
3. Gently shake off excess water and allow filter to dry at room temperature.
4. Clean inside the CVT air inlet end.

Installing the CVT Air Filter

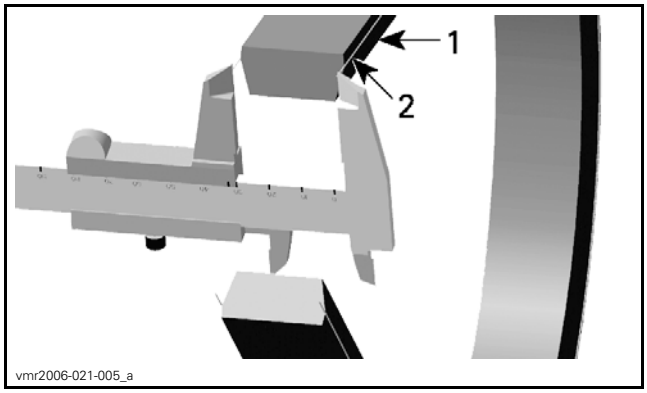
The installation is the reverse of the removal procedure.

Inspecting the Drive Belt

Inspect belt for cracks, fraying or abnormal wear. Replace if necessary.

Check drive belt width at cord level. Replace if it is out of specification (see table below).

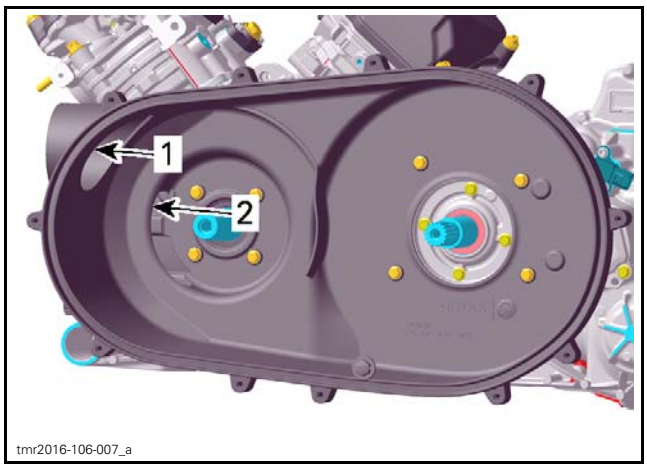
DRIVE BELT WIDTH	
Service limit	34.7 mm (1.366 in)



1. Drive belt
2. Cord in drive belt

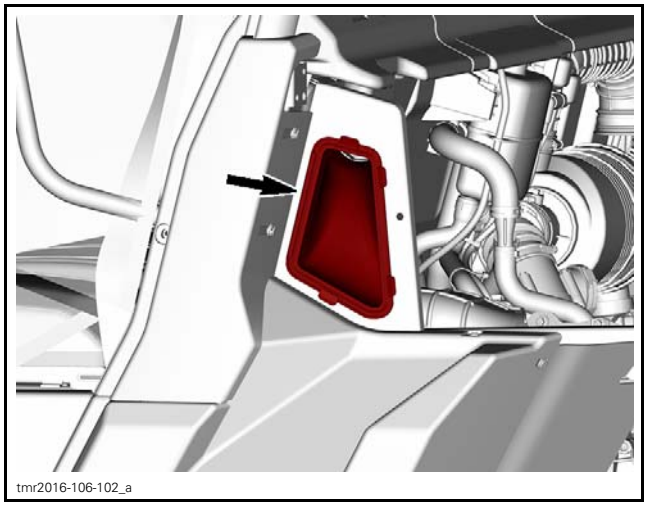
Cleaning the CVT Air Inlet/Outlet

1. Remove CVT cover, refer to *CONTINUOUSLY VARIABLE TRANSMISSION (CVT)* subsection.
2. Inspect and clean the air inlet and outlet openings from inside the CVT air guide.



1. *CVT air inlet*
2. *CVT air outlet*

3. Inspect and clean the CVT air inlet end.



NOTE: If a lot of debris or grime are found in the CVT system, it may be necessary to remove the ducts and thoroughly clean them.

4. Reinstall CVT cover.

Drive Pulley, Driven Pulley and Hub Needle Bearing Maintenance

Drive and Driven Pulley

Clean and inspect drive and drive pulley sheaves. Refer to *CONTINUOUSLY VARIABLE TRANSMISSION (CVT)* subsection.

Hub

Inspect drive pulley hub needle bearing. Refer to *CONTINUOUSLY VARIABLE TRANSMISSION (CVT)* subsection.

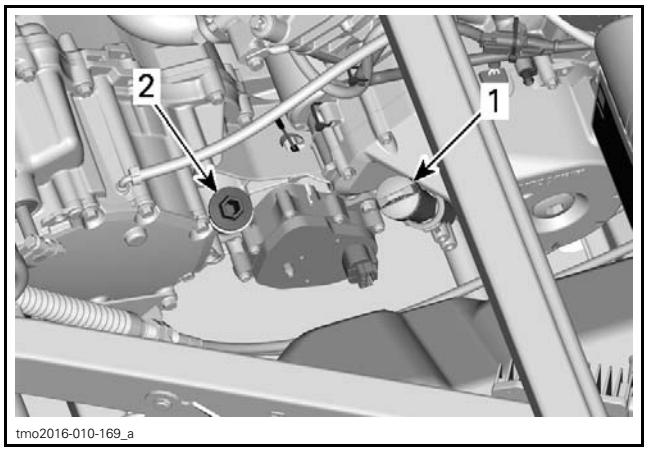
GEARBOX

Verifying the Gearbox Oil Level

Tilt the cargo box.

Unscrew and remove the gearbox oil dipstick wipe clean.

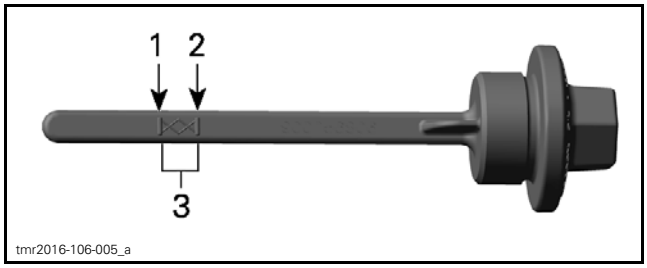
NOTICE **Pay attention not to loose O-ring on oil dipstick.**



1. *Engine oil dipstick*
2. *Gearbox oil dipstick*

Reinstall dipstick, screw in it completely.

Remove dipstick again and check oil level. It should be near or equal to the upper mark.



1. *MIN.*
2. *MAX.*
3. *Operating range*

To add oil, place a funnel into the dipstick hole.

Add a small amount of recommended oil and recheck oil level.

Repeat the above procedures until oil level reaches the dipstick's upper mark.

NOTICE **Operating the gearbox with an improper oil level may severely damage gearbox.**

NOTE: Do not overfill. Wipe off any spillage.

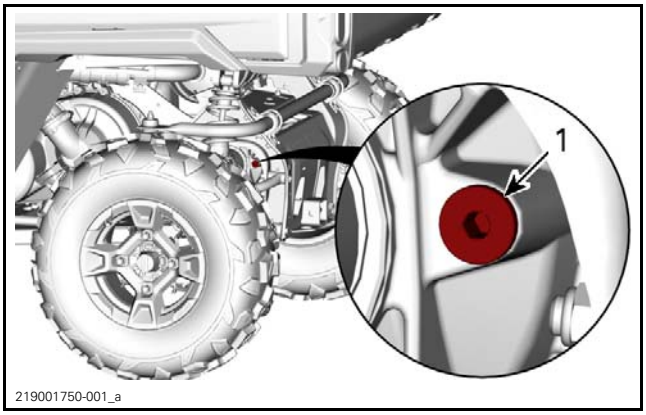
Properly tighten oil dipstick.

Rear Final Drive Oil (HD5)

Verifying Rear Final Drive Oil Level

Place the vehicle on a level surface. Select PARK position.

Check the oil level by removing the filler plug.



LH REAR SIDE OF VEHICLE
1. Filler plug

Insert a wire in the oil filler hole.

The oil level must be within the following specification.

OIL LEVEL
20 mm ± 5 mm (9/16 in ± 3/16 in) below the oil filler plug hole bottom edge

Reinstall filler plug with a NEW sealing ring.

TIGHTENING TORQUE	
Filler plug	22.5 N•m ± 2.5 N•m (17 lbf•ft ± 2 lbf•ft)

NOTICE Operating the vehicle with an improper oil level may severely damage the rear final drive.

Recommended Rear Final Drive Oil

RECOMMENDED REAR FINAL DRIVE OIL	
Scandinavia	75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212)
All other countries	75W90 SYNTHETIC GEAR OIL (P/N 779158)

NOTE: The XPS oil is specially formulated to meet the lubrication requirements of this gearbox. BRP strongly recommends the use of its XPS oil. However, if the XPS synthetic gear oil is not available, use the following lubricant:

REAR FINAL DRIVE MINIMUM OIL REQUIREMENT
75W 90 API GL-5 synthetic gear oil

NOTICE Do not use another type of oil when servicing.

Rear Final Drive Oil Change

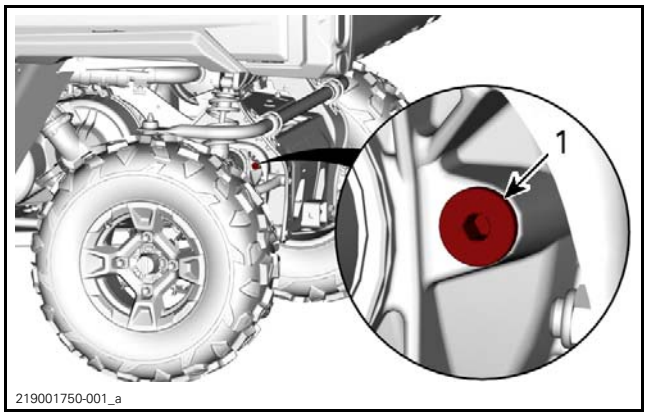
Place the vehicle on a level surface.

Clean drain plug area.

Clean the filler plug area.

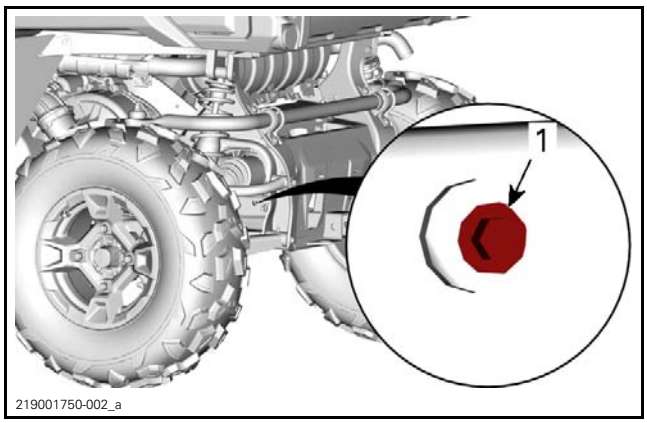
Under the vehicle, place a drain pan underneath the oil drain plug area.

Remove the filler plug.



LH REAR SIDE OF VEHICLE
1. Filler plug

Remove the drain plug.



LH REAR SIDE OF VEHICLE
1. Drain plug

Allow oil to drain completely

Clean the drain plug.

Install the drain plug.

TIGHTENING TORQUE	
Drain plug	7.5 N•m ± 0.5 N•m (66 lbf•**in** ± 4 lbf•**in**)

Fill the final drive unit to the proper level, refer to *REAR FINAL DRIVE OIL LEVEL VERIFICATION*.

For the final drive oil capacity, refer to *SPECIFICATIONS*.

NOTICE Use ONLY the recommended type of oil.

NOTICE Do not overfill.

Reinstall the filler plug with a NEW sealing ring.

TIGHTENING TORQUE	
Filler plug	7.5 N•m ± 0.5 N•m (66 lbf•**in** ± 4 lbf•**in**)

Wipe off any spillage.

Cleaning the Vehicle Speed Sensor (VSS)

Remove the VSS. Refer to *REMOVING THE VSS* in the appropriate *GEARBOX AND 4X4 COUPLING UNIT* subsection.

Remove all metal particles and oil from the VSS magnet.

NOTE: A dirty VSS will cause erratic speedometer readings.

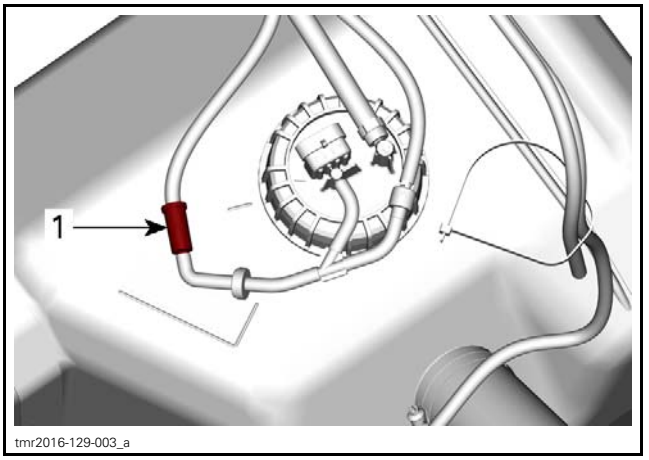
FUEL SYSTEM

Inspecting the Throttle Body

1. Visually inspect throttle plate and throttle body venturi for cleanliness.
2. Clean inside throttle body using a common throttle body cleaner if necessary.

Replacing Fuel Tank Vent Breather Filter

Ensure breather filter is installed with the flow arrow pointing towards the vent hose.



1. Fuel tank vent breather filter

Inspecting Fuel System

1. Visually inspect fuel tank for cracks, wear marks, signs of leakage or any other damages.
2. Visually inspect fuel system hoses for proper rooting, cracking, wear marks, signs of leakage or any other damages.
3. Carry out a *FUEL TANK LEAK TEST*, refer to *FUEL TANK AND FUEL PUMP* subsection.

⚠ WARNING

All fuel system leaks must be repaired. Damaged, worn or leaking fuel system components should be replaced to ensure fuel system tightness.

Fuel Pump Pressure Test

Refer to *FUEL TANK AND FUEL PUMP* subsection for procedure.

Cleaning Fuel Pump Prefilter

1. Remove fuel pump from fuel tank, refer to *FUEL PUMP REMOVAL* in *FUEL TANK AND FUEL PUMP* subsection.
2. Clean the fuel pump prefilter (strainer) using the recommended products and low pressure air.

RECOMMENDED PRODUCTS
BRAKE AND PARTS CLEANER PRO S2 (P/N 779245)

3. If the fuel pump prefilter is heavily soiled, clogged or damaged:
   - Replace it with a new one. Refer to *FUEL PUMP STRAINER REPLACEMENT* in the *FUEL TANK AND FUEL PUMP* subsection.
   - Inspect inside of fuel tank for contaminants.

– Clean fuel tank as required.
– Inspect fuel tank vent breather filter. Replace as necessary. Refer to *FUEL TANK VENT BREATHER FILTER* in *FUEL TANK AND FUEL PUMP* subsection.

ELECTRICAL SYSTEM

Inspecting the Battery

Visually inspect battery casing for cracks or other damage. If casing is damaged, replace battery and thoroughly clean battery rack with water and baking soda.

Inspect battery posts condition, battery rack mounting, straps and strap attachment points.

For battery testing, refer to *CHARGING SYSTEM* subsection.

Replacing the Spark Plug

Removing the Spark Plug

Unplug the spark plug cable.

Clean the spark plug area with pressurized air.

Unscrew spark plug using a spark plug socket.

Installing the Spark Plug

Prior to installation make sure that contact surfaces of the cylinder head and spark plug are free of grime.

1. Using a wire feeler gauge, verify the electrode gap as specified in *TECHNICAL SPECIFICATIONS*.
2. Apply antiseize lubricant over the spark plug threads to prevent possible seizure.
3. Hand screw spark plug into cylinder head, then tighten with a torque wrench and an appropriate spark plug socket.

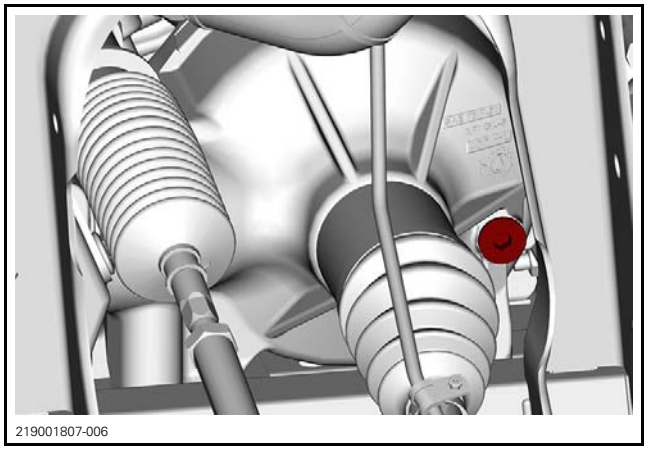
⚠ CAUTION Do not overtighen spark plugs, engine damage can occur.

TIGHTENING TORQUE	
Service product	LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070)
Spark plug	20 N•m ± 2 N•m (15 lbf•ft ± 1 lbf•ft)

DRIVE SYSTEM

Verifying the Front Differential Oil Level

Clean filler plug prior to checking oil level.



TYPICAL - FRONT RIGHT SIDE OF VEHICLE

With vehicle on a level surface, check oil level by removing filler plug. Oil level must reach the lower edge.

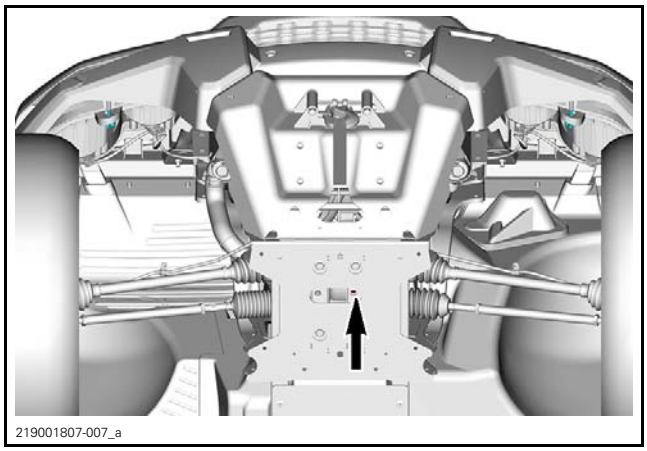
Reinstall filler plug.

TIGHTENING TORQUE	
Filler plug	16.5 N•m ± 2.5 N•m (146 lbf•**in** ± 22 lbf•**in**)

Replacing the Front Differential Oil

Place vehicle on a level surface. Set gearbox in park position.

From underneath of vehicle, clean drain plug area.

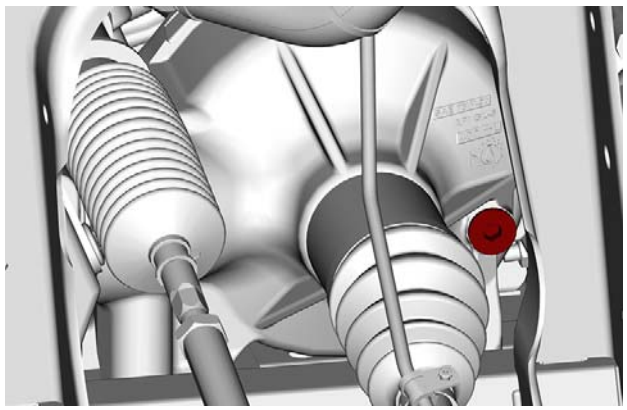


TYPICAL
1. Drain plug access hole

Place a drain pan under the front differential.

Remove drain plug.

Unscrew filler plug.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TYPICAL - FRONT RIGHT SIDE OF VEHICLE

Install drain plug.

TIGHTENING TORQUE	
Drain plug	2.7 N•m ± 0.3 N•m (24 lbf•**in** ± 3 lbf•**in**)

Refill front differential with recommended oil.

COUNTRIES	RECOMMENDED OIL
Scandinavia	75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212)
All other countries	75W90 SYNTHETIC GEAR OIL (P/N 779158)

NOTE: The XPS oil is specially formulated to meet the lubrication requirements of this gearbox. BRP strongly recommends the use of its XPS oil. However, if the XPS synthetic gear oil is not available, use the following lubricant:

FRONT DIFFERENTIAL MINIMUM OIL REQUIREMENT
75W 90 API GL-5 synthetic gear oil

CAPACITY
500 ml (17 U.S. oz)

NOTICE **Do not use another type of oil when servicing.**

Reinstall filler plug.

TIGHTENING TORQUE	
Filler plug	16.5 N•m ± 2.5 N•m (146 lbf•**in** ± 22 lbf•**in**)

Inspecting the Drive Shaft Boot and Protector

Visually inspect each drive shaft boot for grease leak, cracks or opening.

Check if the drive shaft boot protector are fixed firmly, not torn or otherwise damaged.

Replace if necessary.

Inspecting the Drive Shaft Joint

Turn and move drive shaft to detect excessive play.

Inspecting the Propeller Shaft U-Joint

Check yoke U-joints for wear, backlash or axial play, replace if necessary.

WHEELS AND TIRES

Wheel Lug Nut Torque Verification

Tighten wheel lug nuts to specification using the illustrated sequence.

TIGHTENING TORQUE	
Wheel lug nuts	100 N•m ± 10 N•m (74 lbf•ft ± 7 lbf•ft)

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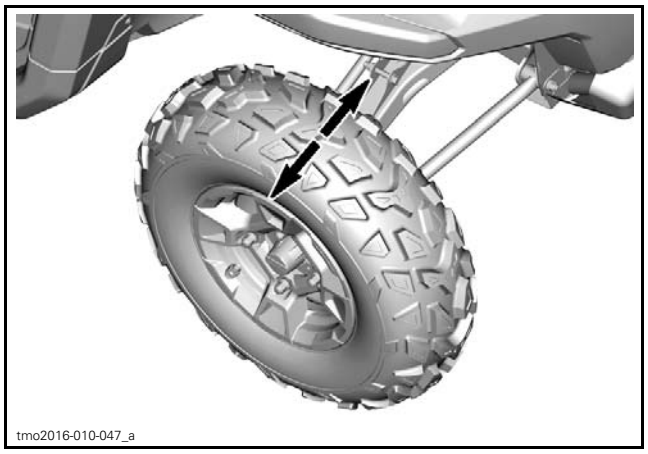
TIGHTENING SEQUENCE

STEERING SYSTEM

Inspecting the Wheel Bearing

1. Safely lift and support the front of vehicle. Refer to *INTRODUCTION* subsection.
2. Hold wheel by the top and the bottom and move it. Check for any play.



TYPICAL

3. If there is any loose, replace wheel bearing, refer to *STEERING SYSTEM* subsection.

NOTE: To properly locate play during this inspection, be sure to check other components for wear or loose (ball joints, suspension pivots, etc). If necessary repair or replace all defective parts before checking the wheel bearing condition. Be careful not to misjudge loose in the ball joint and loose in the wheel bearing.

Inspecting the Steering System

Steering Column

Turn and move steering column to detect any play.

Rack and Pinion

Check rack and pinion boots for:
– Damage
– Cracks.

Replace if necessary.

Tie-Rod End

Check tie-rod end ball joint for:
– Damage
– Pitting
– Play.

Replace if necessary.

SUSPENSION

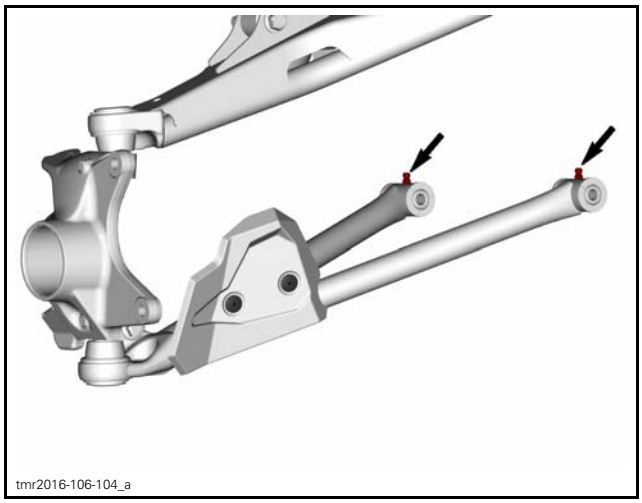
Inspecting the Shock Absorber

Check shock absorber for any leaks, replace if necessary.

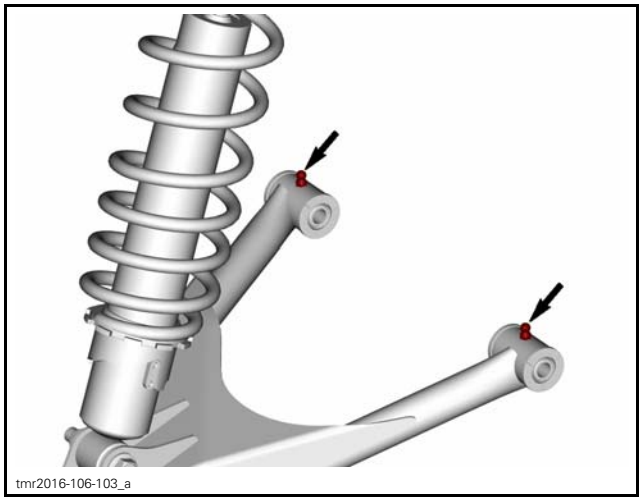
Lubricating the Suspension Arm and Stabilizer Bar Bushings (if equipped)

Lubricate suspension arm and stabilizer bar bushings (if equipped) at grease fittings.

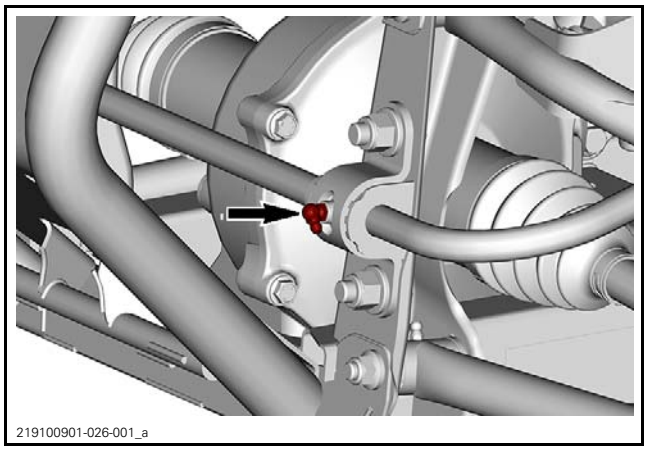
SUSPENSION GREASE	
Scandinavia	SYNTHETIC GREASE SUSPENSION (EUR) (P/N 779226)
All other countries	SYNTHETIC GREASE SUSPENSION (P/N 779163)



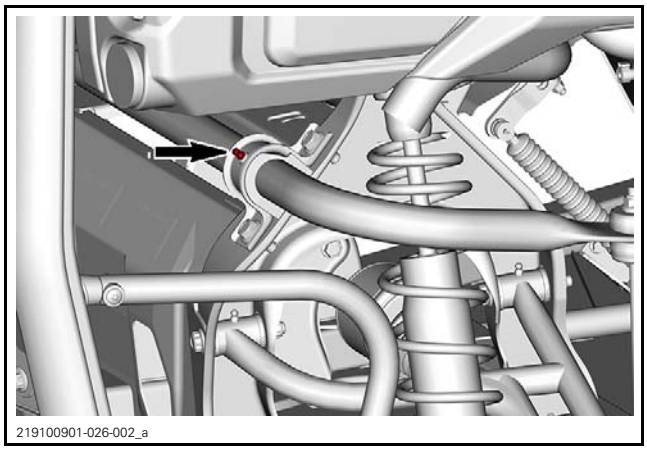
LOWER SUSPENSION ARM



UPPER SUSPENSION ARM



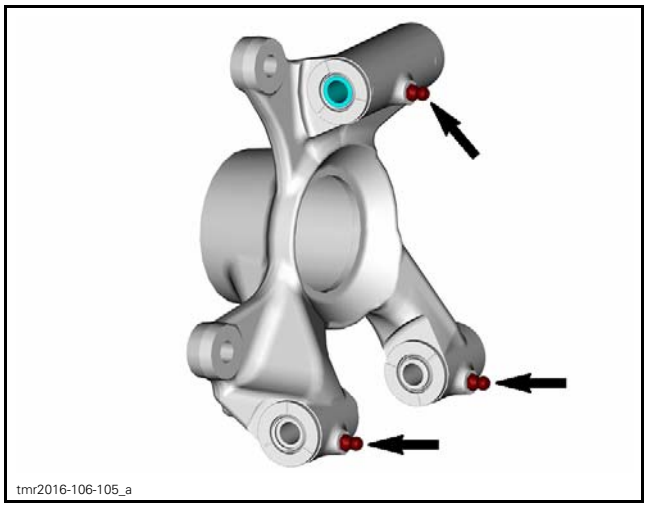
FRONT STABILIZER BAR BUSHINGS



REAR STABILIZER BAR BUSHINGS

Lubricating the Rear Knuckle

KNUCKLE LUBRICATION	
Scandinavia	SYNTHETIC GREASE SUSPENSION (EUR) (P/N 779226)
All other countries	SYNTHETIC GREASE SUSPENSION (P/N 779163)



Inspecting the Suspension Arm

Check suspension arm for:
- Cracks
- Pitting
- Bending
- Distortion.

Check suspension arm for abnormal play:
- Side to side
- Up and down.

If any play is detected, inspect:
- Bushings
- Cushions
- Wear plates.

Check ball joint for:
- Damage
- Pitting
- Play.

Check ball joint bellows for:
- Damage
- Cracks.

BRAKES

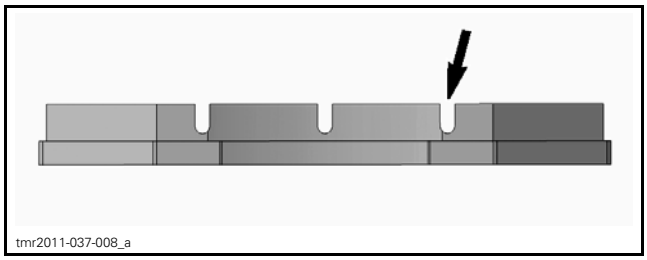
Cleaning and Inspecting the Brake System

NOTICE **Do not clean brake components in petroleum based solvent. Use brake system cleaner only. Soiled brake pads must be replaced with new ones.**

Brake Pads

1. Measure brake pad lining thickness. Refer to *TECHNICAL SPECIFICATIONS*.

NOTE: The brake pad grooves are wear indicators.



BRAKE PAD GROOVE

⚠ WARNING

Brake pads must always be replaced in pairs.

Brake Caliper

1. Remove calipers then check the following components:
   – Check brake pad pins
   – Check caliper boot for cracks
   – Check caliper movement on its support
   – Check pistons movement
   – Check pistons for scratches, rust or other damages.
2. Clean the following components using the recommended products.:
   – Brake pads
   – Caliper support and slider
   – Caliper pistons, spring and pins.

RECOMMENDED PRODUCTS
XPS BRAKES AND PARTS CLEANER (USA) (P/N 219 701 705) or BRAKE AND PARTS CLEANER PRO S2 (P/N 779245)

NOTE: Do not remove pistons from caliper for cleaning them.

3. Lubricate caliper sliders and pins using an appropriate brake caliper synthetic grease.

Brake Disc

1. Check brake disc as follows:
   – Check disc thickness
   – Check disc surfaces
   – Check disc warpage.

NOTE: Refer to *TECHNICAL SPECIFICATIONS* for details.

2. Clean brake disc using the recommended products..

RECOMMENDED PRODUCTS
XPS BRAKES AND PARTS CLEANER (USA) (P/N 219 701 705) or BRAKE AND PARTS CLEANER PRO S2 (P/N 779245)

Master Cylinder

1. Check master cylinder as follows:
   – Check cleanliness of master cylinder rod and boot.
   – Check master cylinder boot for cracks or damage.
2. If required, clean then lubricate master cylinder rod and boot using COSMO RUBBER GREASE (P/N 715 900 399).

Brake Pedal

1. Check brake pedal as follows:
   – Brake pedal pivot movement
   – Brake pedal pivot cleanliness.
2. If required, clean then lubricate brake pedal pivot using SYNTHETIC GREASE (P/N 779162).

Brake Hoses

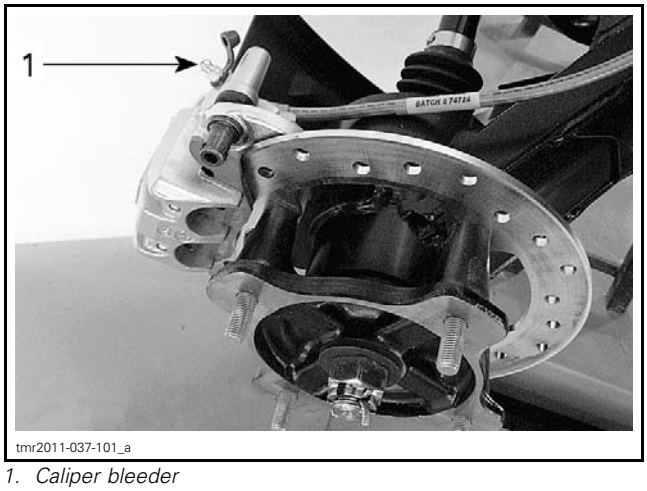
1. Check hoses for leaks, crushed, deformations, cracking or scrapes.

NOTE: Any deformation can restrict the proper flow of fluid and cause braking problems.

Replacing the Brake Fluid

Draining the Brake Fluid

1. Clean and remove reservoir cover with its diaphragm.
2. Connect a clear hose into caliper bleeder.

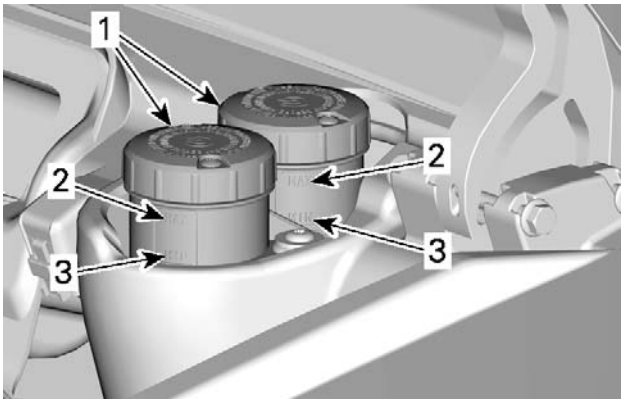


1. Caliper bleeder

3. Loosen caliper bleeder.
4. Pump brake pedal until no more fluid flows out.
5. Repeat draining procedure for the other caliper bleeders.

Filling the Brake Fluid

1. Add recommended brake fluid to MAX. mark. Do not overfill.



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1. Brake fluid reservoirs
2. MAX
3. MIN

RECOMMENDED BRAKE FLUID	
Scandinavia	BRAKE FLUID DOT 4 (EUR) (P/N 779207)
All other countries	BRAKE FLUID DOT 4 (P/N 779151)

⚠ WARNING

- **Use only DOT 4 brake fluid from a sealed container.**
- **Do not use brake fluid from an old or already opened container.**

Bleeding the Brake System (Vacuum Pump)

NOTE: Brake fluid reservoir must be kept full to prevent air from being pumped into the system.

1. On each caliper, unscrew bleeder until brake fluid comes out then close it.
2. Install the vacuum pump onto caliper bleeder.

REQUIRED TOOL	
VACUUM/PRESSURE PUMP (P/N 529 021 800)	

3. Place pump to vacuum position.
4. Pump vacuum pump a few times.
5. Loosen bleeder.
6. Continue to pump until no more air bubbles appear in clear hose.
7. Close then tighten bleeder.

TIGHTENING TORQUE	
Bleeder	5.5 N•m ± 1.5 N•m (49 lbf•**in** ± 13 lbf•**in**)

8. Add recommended brake fluid to MAX. mark. Do not overfill.
9. Perform bleeding procedure for the other caliper bleeders.
10. Check brake pedal operation:
    - If brake pedal feels spongy, bleed system again then carry out the *BRAKE SYSTEM PRESSURE VALIDATION* as detailed in *BRAKES* subsection.

Bleeding the Brake System (Manual)

NOTE: Brake fluid reservoir must be kept full to prevent air from being pumped into the system.

1. Connect a clear hose onto caliper bleeder.
2. Pump up system pressure with brake pedal until pedal resistance is felt.
3. Depress and hold brake pedal.
4. Open bleeder and then close it.
5. Release brake pedal slowly.

NOTE: Do not release brake pedal until bleeder has been closed.

6. Repeat procedure until fluid flows out without any air bubbles.
7. Tighten bleeder.

TIGHTENING TORQUE	
Bleeder	5.5 N•m ± 1.5 N•m (49 lbf•**in** ± 13 lbf•**in**)

8. Perform bleeding procedure for the other caliper bleeders.
9. Check brake pedal operation:
    - If brake pedal feels spongy, bleed system again then carry out the *BRAKE SYSTEM PRESSURE VALIDATION* as detailed in *BRAKES* subsection.

PASSENGER HANDHOLDS

Passenger Handhold Condition

Check if the passenger handholds are fixed firmly, not bent or otherwise damaged.

Replace if necessary.

TOW HITCH

Inspecting the Tow Hitch

Ensure tow hitch receptacle module is solidly mounted.

Inspect hitch for cracks and other damages.

Repair or replace as necessary.

STORAGE PROCEDURE

SERVICE PRODUCTS

Description	Part Number	Page
BRP HEAVY DUTY CLEANER	293 110 001	2
CLEANER AND DEGREASER PRO C1	779262	2
FUEL STABILIZER	779171	1
LUB. & ANTI-CORROSIVE	779168	2
OIL STORAGE (EXCEPT USA)	779173	1
OIL STORAGE (USA)	779182	1

GENERAL

If the SSV is not used or is to be stored for an extended period of time, more than 4 months, be sure to perform the storage procedures described below.

Where applicable, refer to the appropriate subsections in this manual for the required tasks outlined in these procedures.

PROCEDURES

NOTE: To facilitate the inspection and ensure adequate lubrication of components, it is recommended to clean the entire vehicle. Refer to *CLEANING THE VEHICLE* in this subsection.

FUEL SYSTEM

Fuel System Protection

With the new fuel additives, it is critical to use the FUEL STABILIZER (P/N 779171) or an equivalent to prevent fuel deterioration and fuel system gumming. Follow the manufacturer's instructions for proper use.

NOTICE **Fuel stabilizer should be added prior to engine lubrication to ensure fuel system components protection against varnish deposits.**

Pour fuel stabilizer in fuel tank. Fill up fuel tank.

ENGINE

Engine Internal Lubrication

Engine internal parts must be lubricated to protect them from rust formation during the storage period.

Proceed as follows:

1. Remove spark plug(s).
2. Spray storage oil into cylinder(s).

NOTE: Use the storage oil as per country availability.

STORAGE OIL
OIL STORAGE (EXCEPT USA) (P/N 779173)
OIL STORAGE (USA) (P/N 779182)

3. Crank the engine over, 1 or 2 seconds maximum, to lubricate cylinders.
4. Reinstall the spark plugs.

NOTE: Do not run engine during storage period.

5. Block muffler outlet, engine air inlet and CVT outlet with a rags.

NOTICE **To avoid causing damage to vehicle, use memory aid to make sure rags are removed from their installed location.**

CVT Protection

Remove drive belt. Refer to the appropriate *CONTINUOUSLY VARIABLE TRANSMISSION (CVT)* subsection.

Close CVT cover.

Block CVT outlet with a rag.

NOTE: To reach the CVT outlet, detach it from exhaust heat shield.

ELECTRICAL SYSTEM

Battery Removal

Remove the battery.

Charge and store battery.

CHASSIS

Lubrication

Lubricate front and rear suspension and rear sway bar.

Tire Pressure

Inflate tires to the recommended pressure.

Cleaning the Vehicle

Wash and dry the vehicle.

NOTICE Never use a high pressure washer to clean the vehicle. USE LOW PRESSURE ONLY (like a garden hose). The high pressure can cause electrical or mechanical damages.

Remove any dirt or rust.

To clean the vinyl or plastic parts, use only flannel clothes with CLEANER AND DEGREASER PRO C1 (P/N 779262).

NOTICE It is necessary to use flannel cloths on plastic parts to avoid damaging surfaces. Never clean plastic parts with strong detergent, degreasing agent, paint thinner, acetone, products containing chlorine, etc.

To clean the entire vehicle, including metallic parts use BRP HEAVY DUTY CLEANER (P/N 293 110 001).

Inspect the vehicle and repair any damage. Touch up all metal spots where paint has been scratched off. Spray all metal parts with LUB. & ANTI-CORROSIVE (P/N 779168).

Vehicle Protection

Protect the vehicle with a cover to prevent dust accumulation during storage.

NOTICE The vehicle has to be stored in a cool and dry place and covered with an opaque tarpaulin. This will prevent sun rays and grime from affecting plastic components and vehicle finish.

PRESEASON PREPARATION

Proper vehicle preparation is required after a storage period.

Any worn, broken or damaged parts found must be replaced.

Remove rags that were installed for storage: engine air inlet hose, CVT outlet hose and muffler.

Clean drive and driven pulleys to remove storage protective lubricant, then reinstall drive belt. Refer to *CONTINUOUSLY VARIABLE TRANSMISSION (CVT)*.

Remove parts required to allow inspection of entire engine air inlet system. Check for animal nests and other foreign material. Reinstall removed parts.

Drain fuel tank and fill with fresh fuel if a fuel stabilizer was not used for storage.

Reinstall battery. Refer to *CHARGING SYSTEM* subsection.

Inflate tires to the recommended pressure.

NOTE: Perform any due maintenance items as per the *MAINTENANCE SCHEDULE*.

Test drive vehicle.

SPECIAL PROCEDURES (HD5)

SERVICE PRODUCTS

Description	Part Number	Page
LUB. & ANTI-CORROSIVE	779168	2

GENERAL

NOTE: Component failures resulting from these events are not warrantable.

Refer to the appropriate subsections in this manual for the required tasks outlined in these procedures.

ROLLED OVER VEHICLE

In the event the vehicle was rolled over, check the following.

Inspect suspension components and steering system components.

Inspect body and chassis for damage (welded joints, bent or cracked parts).

Pay particular attention to the cage, shoulder protector, side nets, seat belts and their mechanisms.

⚠ WARNING

Do not use vehicle if any of the safety devices are damaged or inoperative.

Check all fluids level before restarting engine.

NOTICE **Check for oil accumulation in the air intake system. Check air filter.**

After restarting engine, check multifunction gauge if any malfunction is detected.

Troubleshoot and repair as required before using vehicle.

SUBMERGED VEHICLE

In the event the vehicle was submerged, proceed with the following.

NOTICE **A submerged vehicle may cause several damages (short and long term) if not serviced adequately or soon enough. Do not crank or start engine.**

Drain the entire air intake system. Inspect the throttle body. Remove parts as required.

Replace the air filter.

Drain, inspect and clean the CVT.

Empty muffler (removal required).

Unplug ECM, multifunction gauge and DPS connectors, and open fuse boxes. Check for presence of water. Dry as necessary.

Inspect all lights for water intrusion. Dry as required.

Replace the engine oil (without starting the engine).

Remove spark plugs. Crank engine in drowned mode to expel any water.

⚠ CAUTION **Keep away from spark plug holes to avoid to be splashed when cranking engine.**

Add a small quantity of engine oil in cylinders (approximately 2 teaspoonfuls).

Install spark plug(s) (replace if required).

Look for water in fuel tank, in doubt, flush fuel tank and refill with new gas.

Look for water in brake system. Replace brake fluid as required.

⚠ WARNING

Before starting engine, use the appropriate BRP diagnostic software and check for fault codes.

Start the engine and allow it to run at idle speed until the engine reaches its operating temperature.

Stop the engine.

Change engine oil and filter.

NOTE: Change oil as many times as necessary, until there is no whitish appearance in engine oil.

Change front differential oil.

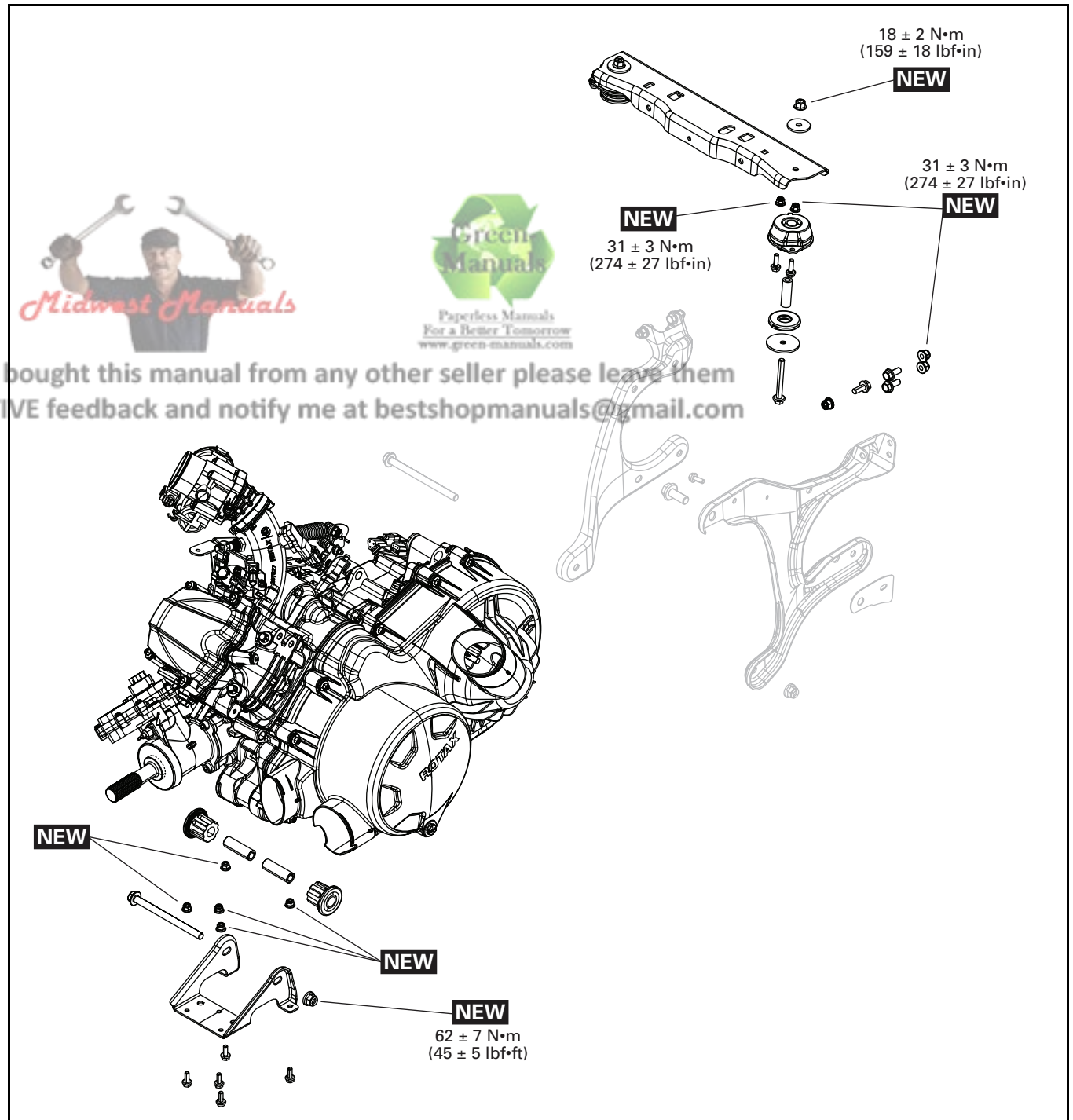
Change rear final drive oil.

Check vent tubes. Clean if required.

Lubricate front and rear suspensions. Refer to the appropriate *PERIODIC MAINTENANCE PROCEDURES* subsection.

Spray all metal parts with LUB. & ANTI-CORROSIVE (P/N 779168).
Test drive to confirm proper operation.

ENGINE REMOVAL AND INSTALLATION (HD5)



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PROCEDURES

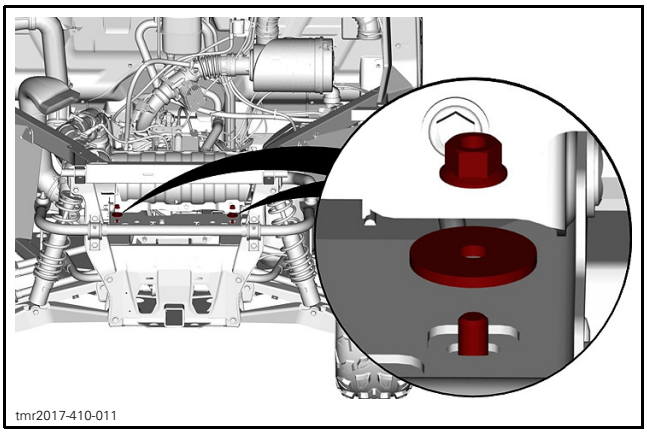
REMOVING THE ENGINE

Preparing the Vehicle and Engine

1. Place vehicle on a workstation that will have access to an engine-lifting hoist.
2. Safely lift and support the vehicle. Refer to *INTRODUCTION* subsection.
3. Disconnect the battery.

NOTICE **Always disconnect the battery cables exactly in the specified order, the BLACK (-) cable first.**

4. Remove rear drive shafts. Refer to *REAR DRIVE* subsection.
5. Remove cargo box.
6. Remove the muffler tail pipe.
7. Remove the bolts retaining the rear engine support to the chassis.

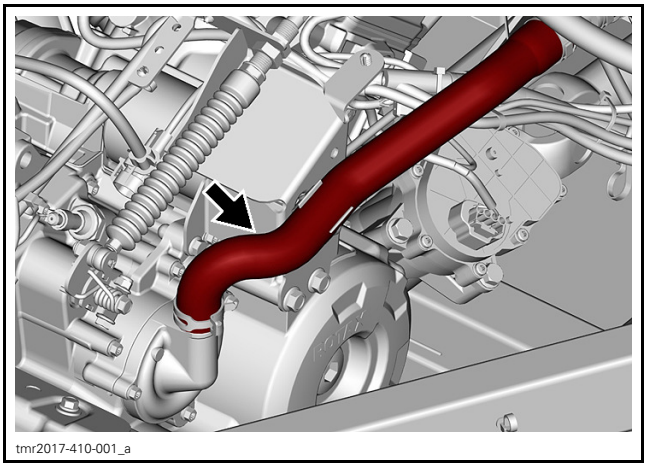


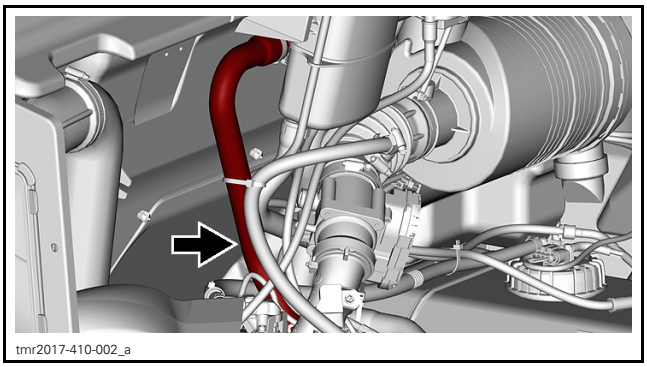
TYPICAL

8. Drain engine oil. Refer to *MAINTENANCE PROCEDURE* subsection.

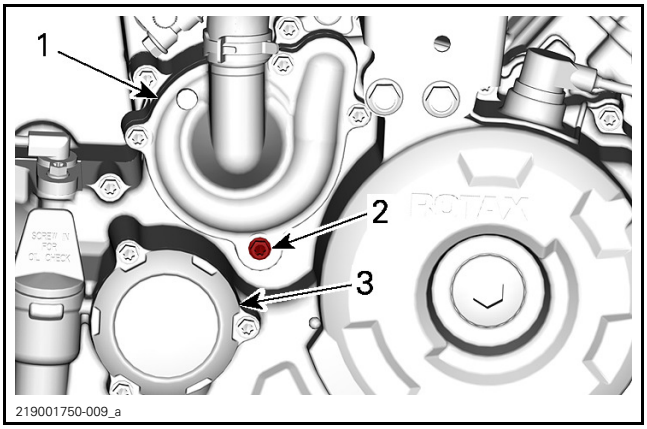
NOTE: Drain engine oil only if engine overhaul is necessary.

9. Drain the engine coolant.
   9.1 Pinch the coolant hoses near the engine using a large hose pincher.



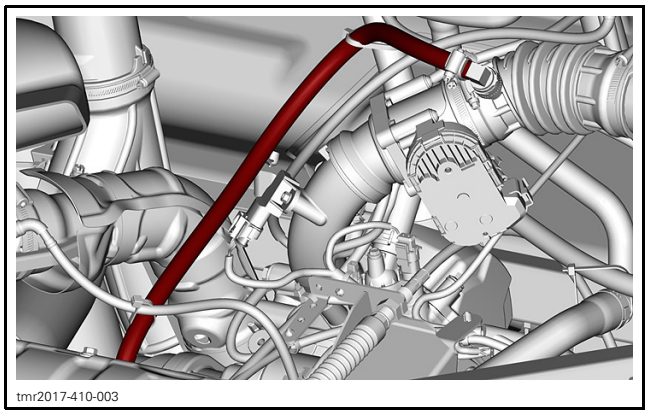


   9.2 Open coolant drain plug and drain coolant.



DRAIN PLUG LOCATION
1. *Water pump cover*
2. *Coolant drain plug*
3. *Oil filter cover*

10. Disconnect engine coolant hoses from the engine.
11. Disconnect the crankcase vent from the air intake bellows.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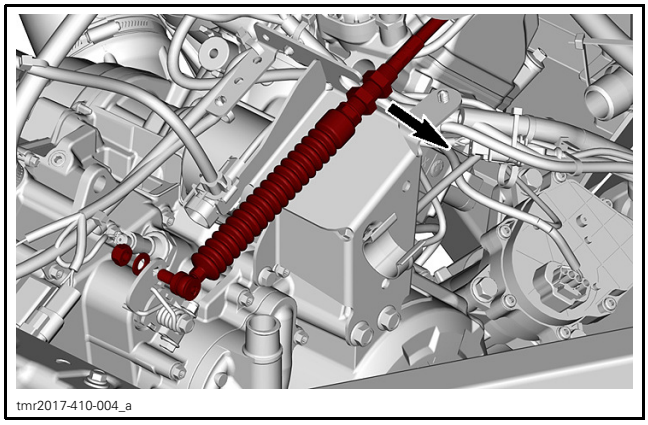
12. Disconnect the air intake bellows from the air filter housing.
13. Remove the CVT ducts.
14. Detach the shifter cable from its bracket and remove it.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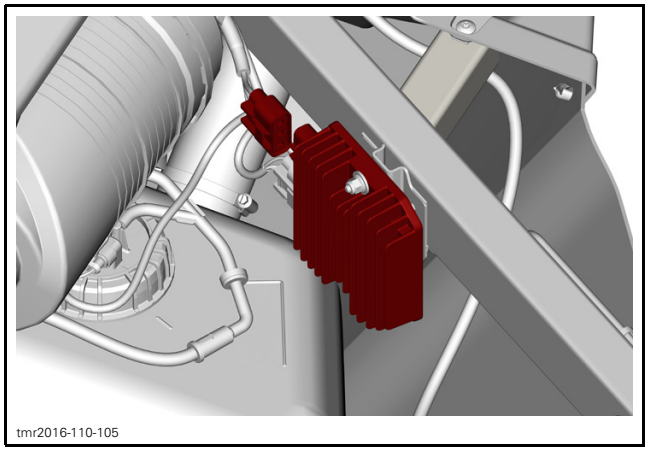
15. Remove the front engine support **nut**.
16. Remove the 4X4 coupling unit. Refer to the *GEARBOX AND 4X4 COUPLING UNIT* subsection.
17. Disconnect voltage regulator.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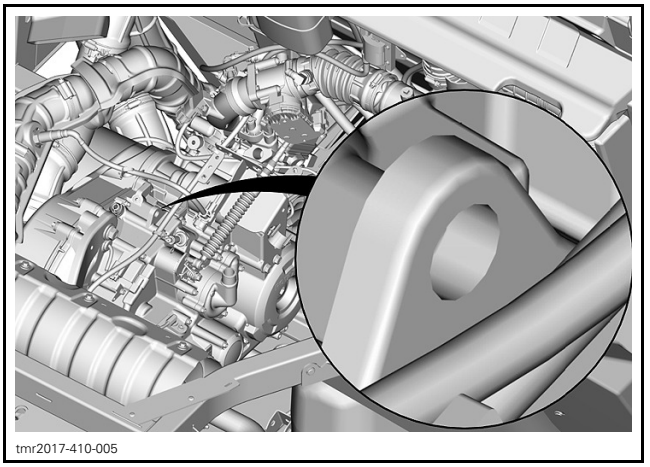
18. Disconnect the following connectors and cables from engine. Note the locking ties location for reinstallation.
    - HIC (Engine Harness Connector)
    - HO2S (Oxygen Sensor)
    - OPS (Oil Pressure Sensor)
    - VSS (Vehicle Speed Sensor)
    - GBPS (Gearbox Position Sensor)
    - CPS (Crankshaft Position Sensor)
    - Engine ground cable
    - Spark plug
    - Fuel injector
    - MAPTS (Manifold Absolute Pressure and Temperature Sensor)
    - Throttle body
    - CTS (Coolant Temperature Sensor)
    - Starter cable (retaining nut on starter motor)
    - Magneto
    - Ignition coil.

Lifting the Engine

1. Install a hook and strap through the rear engine lifting hole.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2. Slightly lift engine to ease removal of front engine support bolt.
3. Remove the front engine support bolt.
4. Remove engine from vehicle.
5. Remove the final drive unit from the engine, refer to the *REAR FINAL DRIVE* subsection.

INSTALLING THE ENGINE

The installation is the reverse of the removal procedure. However, pay attention to the following.

Prior to install engine, inspect condition of engine mounts.

Install all engine supports bolts, then tighten bolts.

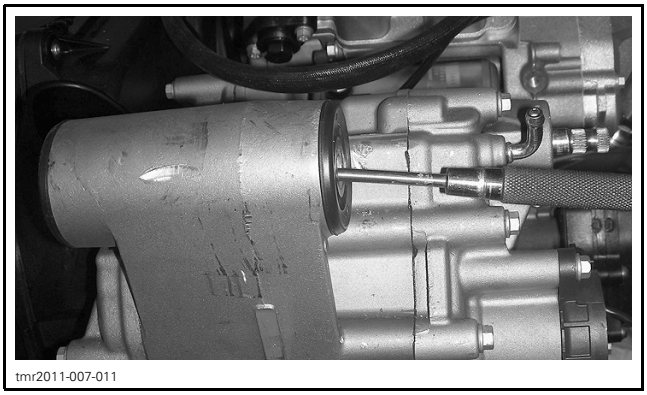
Final Assembly Procedure

1. Fill engine with the recommended oil and quantity. Refer to *LUBRICATION SYSTEM* subsection.
2. Fill and bleed cooling system. Refer to *COOLING SYSTEM* subsection.
3. Check for any leaks.
4. Test drive vehicle to confirm proper operation.

ENGINE MOUNTS

Removing the Engine Mount

Insert a punch into engine mount bushing and push the opposite engine mount out.



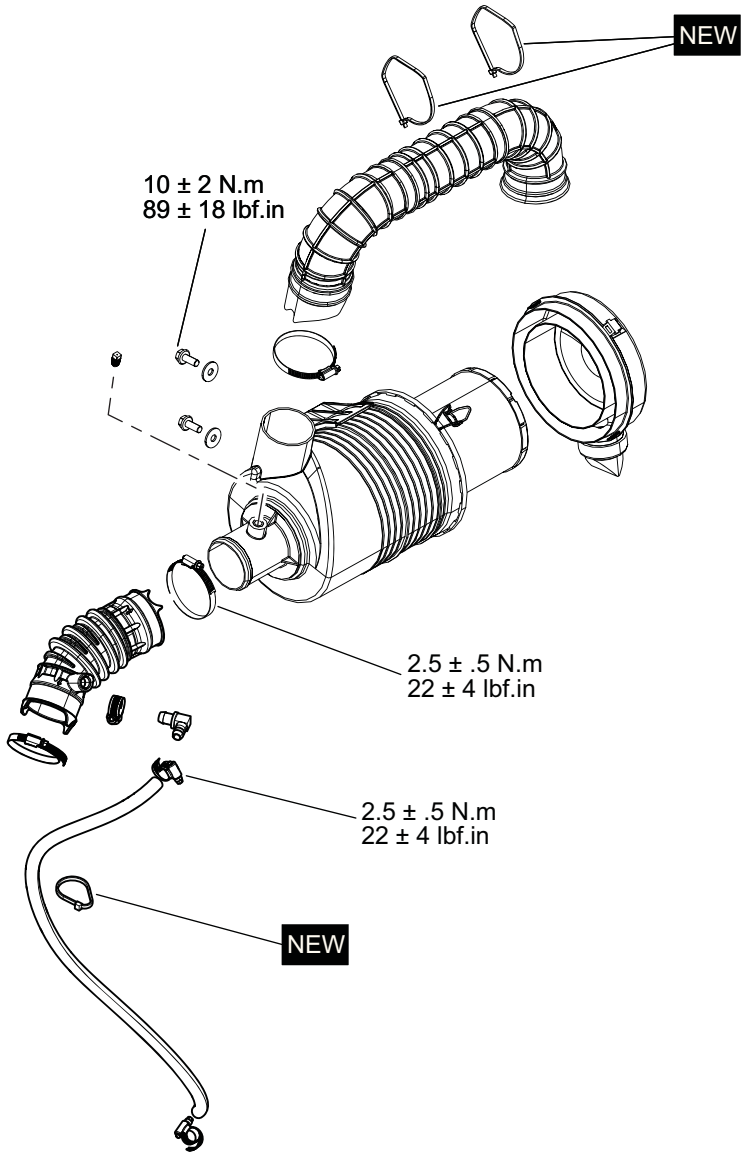
TYPICAL

Installing the Engine Mount

The installation is the reverse of the removal procedure.

AIR INTAKE SYSTEM

AIR FILTER HOUSING



NEW = Component must be replaced when removed.

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GENERAL

NOTICE Never modify the air intake system. Otherwise, engine performance degradation or damage can occur. The engine is calibrated to operate specifically with these components.

PROCEDURES

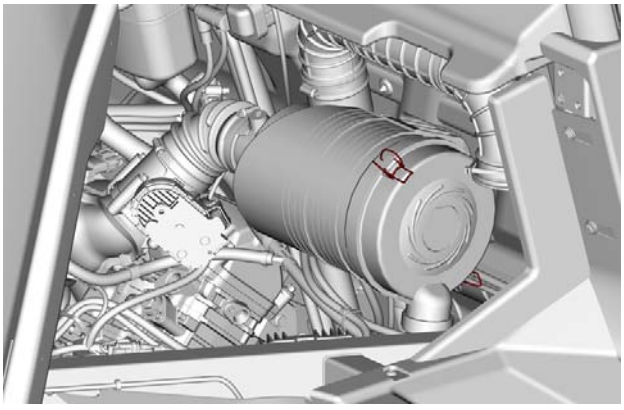
AIR FILTER

For air filter servicing, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

AIR FILTER HOUSING

Removing Air Filter Housing

Release clamps and remove air filter cover and filter.



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TYPICAL

Remove fasteners behind passenger seat.

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Installing Air Filter Housing

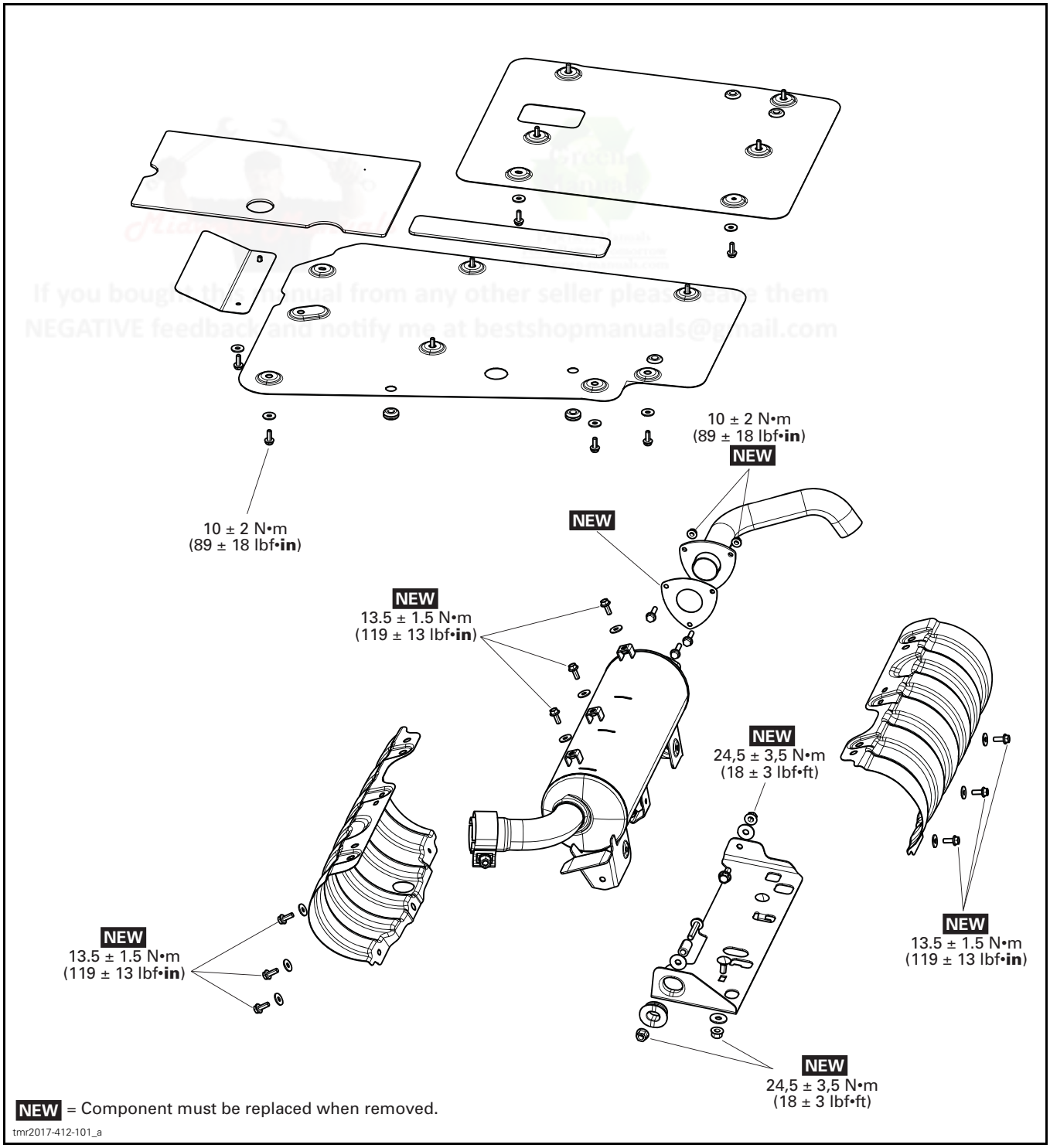
For installation, reverse the removal procedure but pay attention to the following.

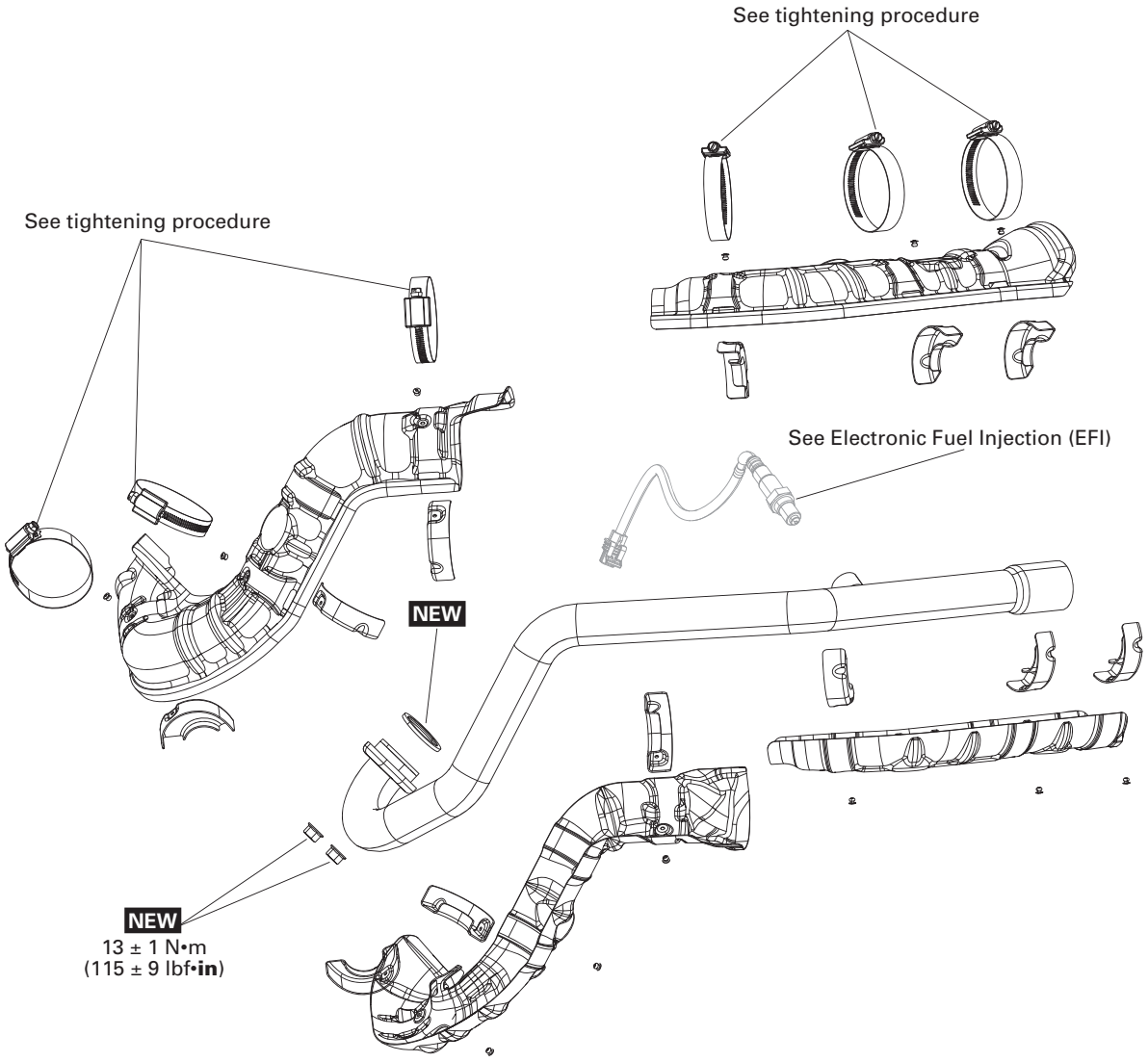
Align installation marks on throttle body, air box and housing vent hose and make sure bellow is not crushed.

Do not overtighten.

TIGHTENING TORQUE	
Air filter housing screws	10 N•m ± 2 N•m (89 lbf•**in** ± 18 lbf•**in**)

EXHAUST SYSTEM





NEW = Component must be replaced when removed.

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GENERAL

⚠ WARNING

Never touch exhaust system components immediately after the engine has been running.

PROCEDURES

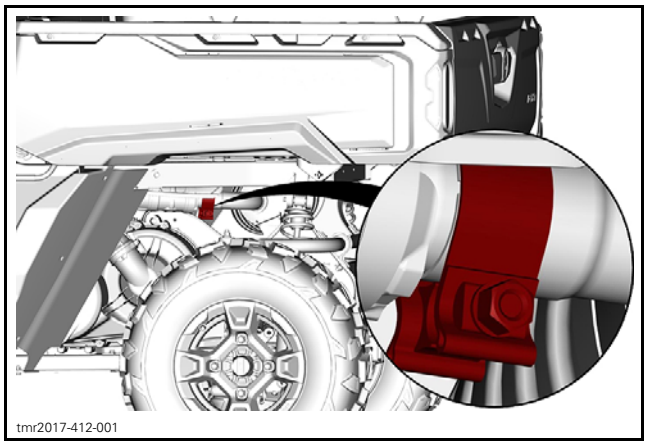
MUFFLER

Cleaning the Muffler

For muffler cleaning procedure, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Removing the Muffler

1. Loosen the muffler clamp.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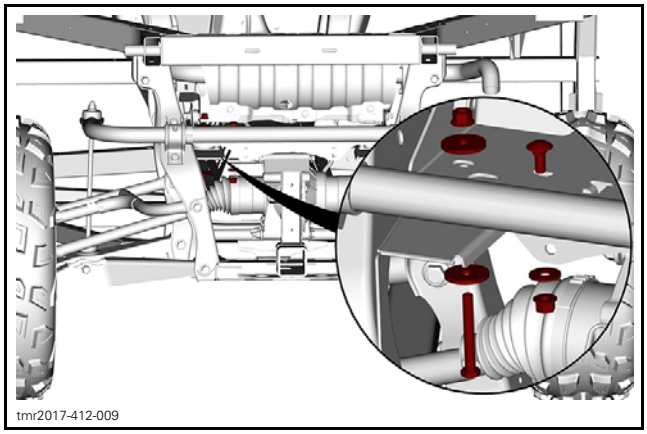
2. Remove engine support and muffler support retaining bolts and washers.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LH SHOWN - PARTS REMOVED FOR CLARITY

3. Remove the muffler support and heat shields if necessary.

Inspecting the Muffler

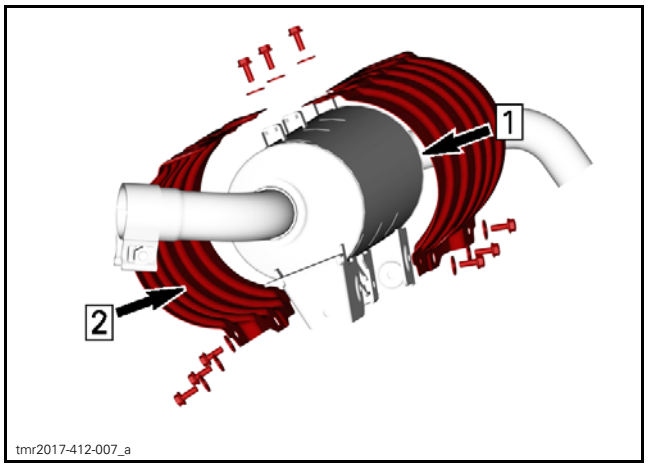
Check muffler for cracks or other damages. Replace if necessary.

Check heat shields for cracks or other damages. Replace if necessary.

Check if the rubber supports are brittle, hard or otherwise damaged. Replace if needed.

Installing the Muffler

1. Install the heat shields on the muffler.



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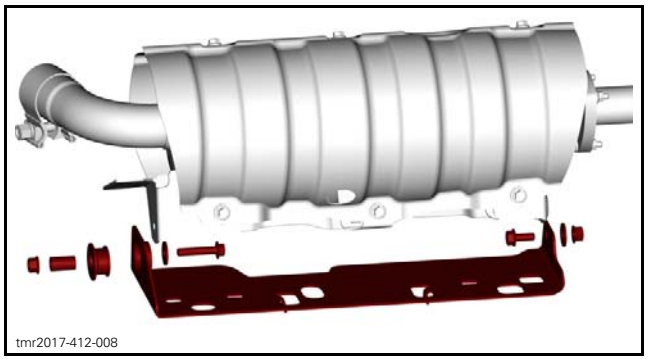
NOTE: Tighten the top screws last.

2. Install the support on the muffler. Do not tighten bolts yet.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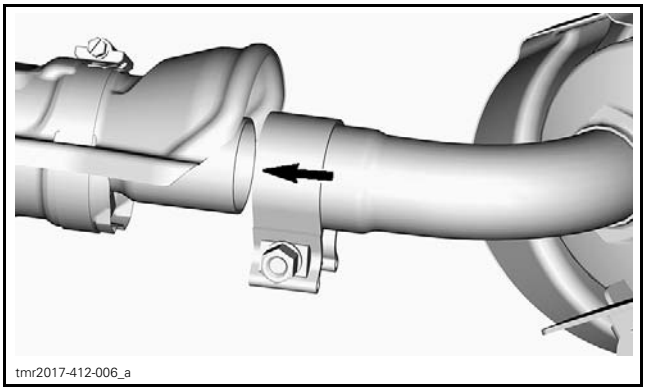
3. Install the head pipe if required, refer to *INSTALLING THE HEAD PIPE*. Do not tighten nuts yet.
4. Connect the muffler to the head pipe. Do not tighten the clamp yet.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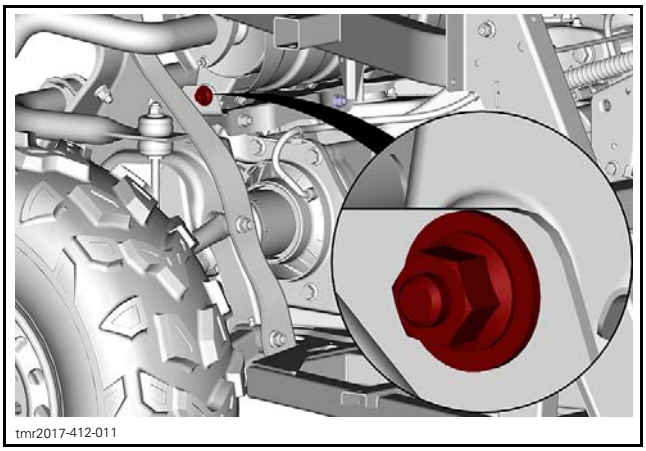
5. Tighten the RH muffler retaining bolt.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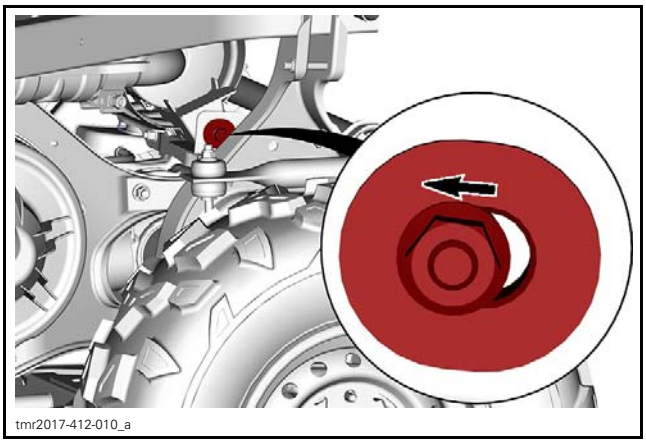
6. Push the LH side of muffler towards front while tightening the LH retaining bolt.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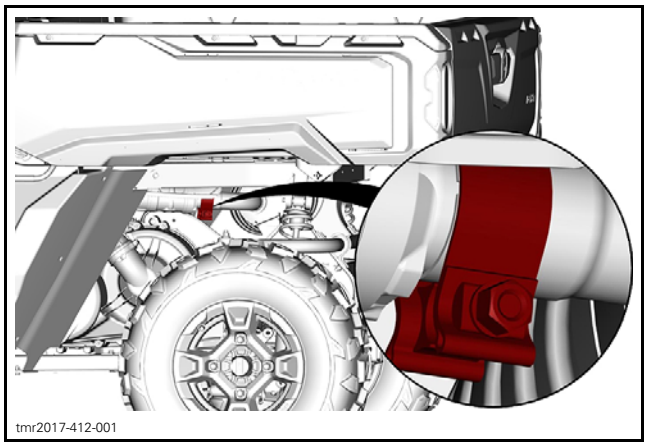
7. Tighten the remaining fasteners in this order:
   1. Head pipe nuts
   2. Muffler clamp
   3. Remaining muffler support bolts.

HEAD PIPE

Removing the Head Pipe

1. Loosen the muffler clamp.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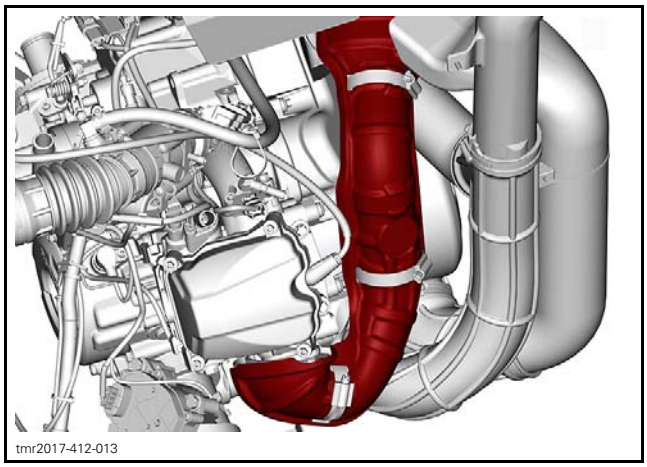
2. Remove the engine service cover. Refer to *BODY*.
3. Disconnect the oxygen sensor connector.
4. Remove the front heat shield.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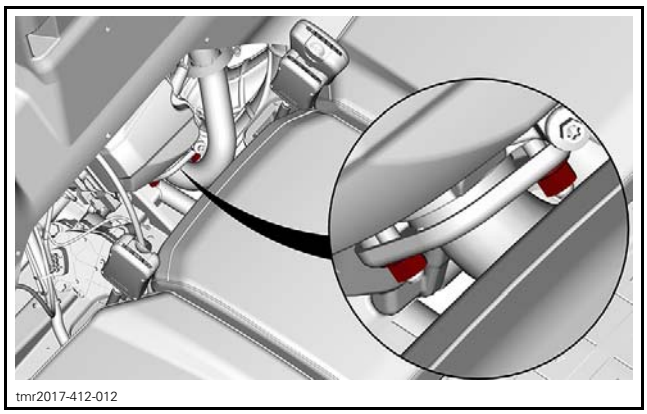
5. Remove the retaining nuts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6. Pull the head pipe out of the muffler and cylinder head, then remove it from the vehicle.
7. Remove the rear heat shields.

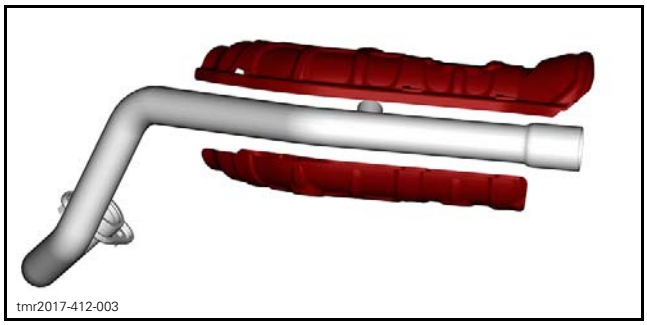
Inspecting the Head Pipe

Check head pipe for cracks, bending or other damages. Replace if need.

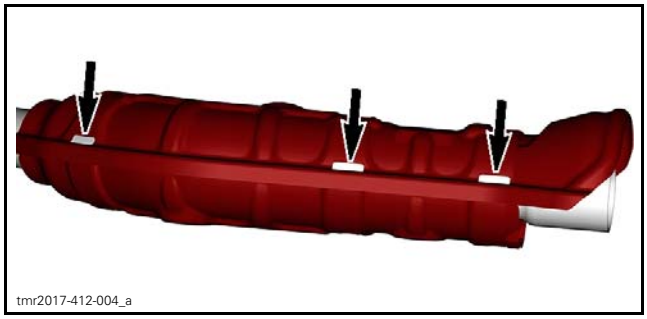
Installing the Head Pipe

1. Place the rear heat shields on the head pipe.

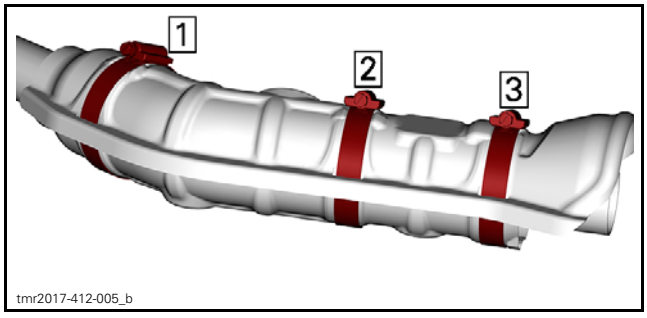
NOTE: Use the oxygen sensor opening as a guideline.



2. Pass the clamps through the openings in the upper shield and attach the shield halves together.



3. Tighten the clamps in the illustrated sequence.



CLAMPS TIGHTENING SEQUENCE - REAR OF HEAD PIPE

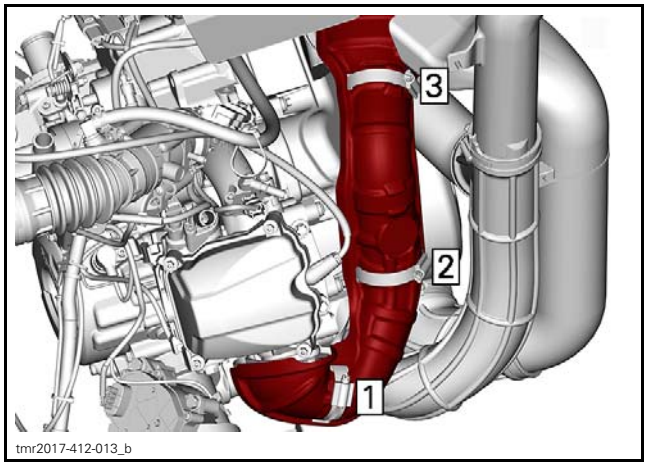
TIGHTENING TORQUE	
Heat shield clamps	4 N•m ± 0.5 N•m (35 lbf•**in** ± 4 lbf•**in**)

4. Install the head pipe with a NEW gasket.

If muffler was removed, leave the retaining nuts and muffler clamp loose. Install muffler as described in *INSTALLING THE MUFFLER*.

If muffler was not removed, tighten the retaining nuts, then the muffler clamp.

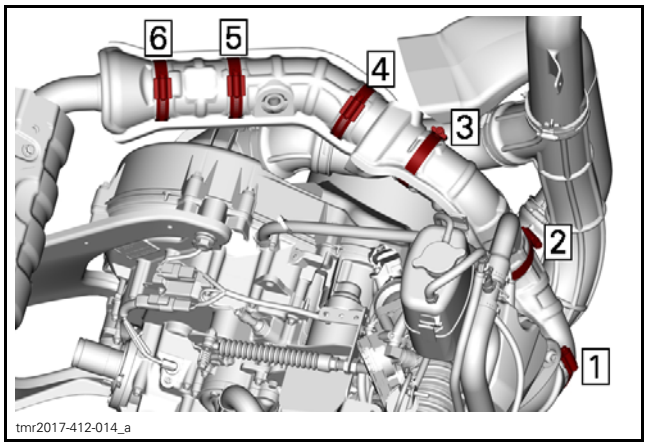
5. Install the front heat shield.
6. Tighten the clamps in the illustrated sequence.



CLAMPS TIGHTENING SEQUENCE - FRONT OF HEAD PIPE

TIGHTENING TORQUE	
Heat shield clamps	4 N•m ± 0.5 N•m (35 lbf•**in** ± 4 lbf•**in**)

Retighten all clamps in the illustrated sequence.



CLAMPS FINAL TIGHTENING SEQUENCE

TIGHTENING TORQUE	
Heat shield clamps (final torque)	8 N•m ± 0.5 N•m (71 lbf•**in** ± 4 lbf•**in**)

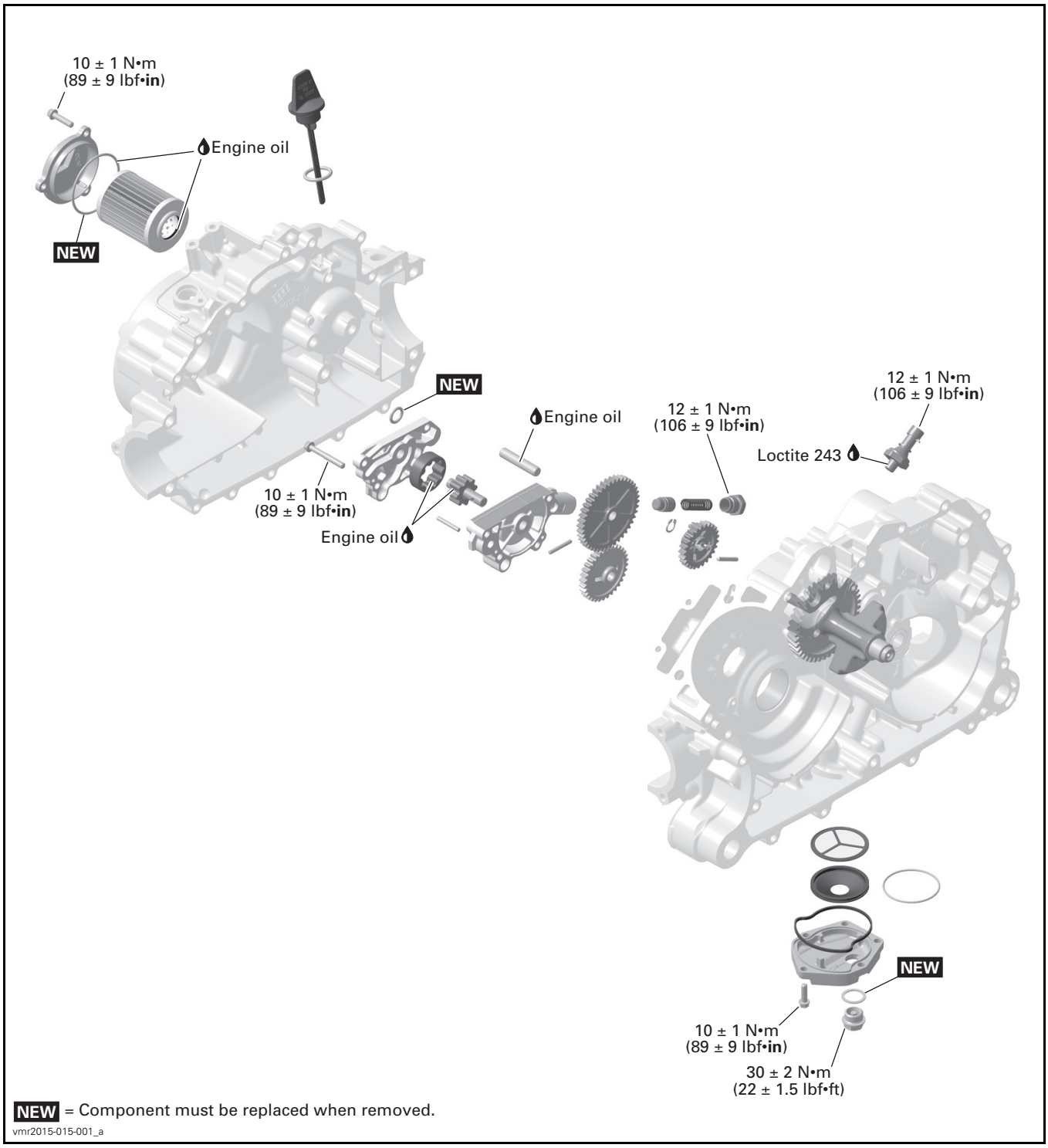
LUBRICATION SYSTEM (HD5)

SERVICE TOOLS

Description	Part Number	Page
DISCONNECT TOOL	529 035 714	3
OIL PRESSURE HOSE	529 036 394	3
PRESSURE GAUGE	529 036 395	3

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	5



NEW = Component must be replaced when removed.

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INSPECTION

ENGINE OIL PRESSURE

NOTE: The engine oil pressure test should be done with a warm engine (100°C (212°F)) and the recommended oil.

Remove the oil pressure switch, refer to *OIL PRESSURE SWITCH* in this subsection.

Install the pressure test gauge with the proper adapter hose in the oil pressure switch bore.

REQUIRED TOOL	
PRESSURE GAUGE (P/N 529 036 395)	
OIL PRESSURE HOSE (P/N 529 036 394)	

Start engine and read oil pressure.

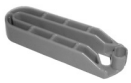
The engine oil pressure should be within the following values.

PRESSURE	1300 RPM	6000 RPM
Minimal	70 kPa (10 PSI)	350 kPa (51 PSI)
Nominal	300 kPa (44 PSI)	450 kPa (65 PSI)
Maximal	550 kPa (80 PSI)	700 kPa (102 PSI)

If the engine oil pressure is out of specifications, check the points described in *TROUBLESHOOTING* in this subsection.

Remove oil pressure gauge and adapter hose.

NOTE: To remove adapter hose from oil pressure gauge, use the disconnect tool.

REQUIRED TOOL	
DISCONNECT TOOL (P/N 529 035 714)	

Reinstall the oil pressure switch.

TROUBLESHOOTING

LOW OR NO OIL PRESSURE

1. Oil level is too low
   - *Refill engine with recommended engine oil. Refer to OIL LEVEL VERIFICATION in the appropriate PERIODIC MAINTENANCE PROCEDURES subsection.*
   - *Check for high oil consumption, refer to HIGH OIL CONSUMPTION in the TROUBLESHOOTING subsection.*
   - *Check for engine oil leaks. For leak indicator hole, refer to COOLING SYSTEM INSPECTION in the appropriate PERIODIC MAINTENANCE PROCEDURES subsection. Repair if necessary.*
2. Use of unsuitable engine oil type.
   - *Replace engine oil by the recommended engine oil.*
3. Clogged oil filter.
   - *Replace oil and oil filter at the same time.*
4. Defective oil pressure switch.
   - *Test oil pressure switch, see procedure in this subsection.*
5. Defective or worn oil pump.
   - *Check oil pump, see procedure in this subsection.*
6. Defective engine oil pressure regulator.
   - *Check engine oil pressure regulator, see procedure in this subsection.*
7. Worn plain bearings in crankcase.
   - *Check plain bearings clearance, refer to BOTTOM END subsection.*
8. Clogged engine oil strainer.
   - *Clean engine oil strainer, see procedure in this subsection.*

OIL CONTAMINATION

1. Defective water pump seal ring or rotary seal.
   - *Check for oil or coolant leak from indicator hole near water pump, refer to COOLING SYSTEM INSPECTION in the appropriate PERIODIC MAINTENANCE PROCEDURES subsection. Replace seals if necessary.*
2. Cylinder head or cylinder base gasket leak.
   - *Retighten cylinder head to specified torque, refer to TOP END subsection. Replace gasket if tightening does not solve the problem.*
3. Engine internal damage.
   - *Repair engine.*

HIGH OIL CONSUMPTION

1. Leaking breather oil seal.
   - *Check if the oil seal of the breather (underneath PTO side ball bearing of balancer shaft) is brittle, hard or damaged. Refer to BOTTOM END subsection.*
2. Valve stem seals worn or damaged.
   - *Replace valve stem seals. Refer to TOP END subsection.*
3. Worn piston rings (blue exhaust smoke).
   - *Replace piston rings. Refer to TOP END subsection.*

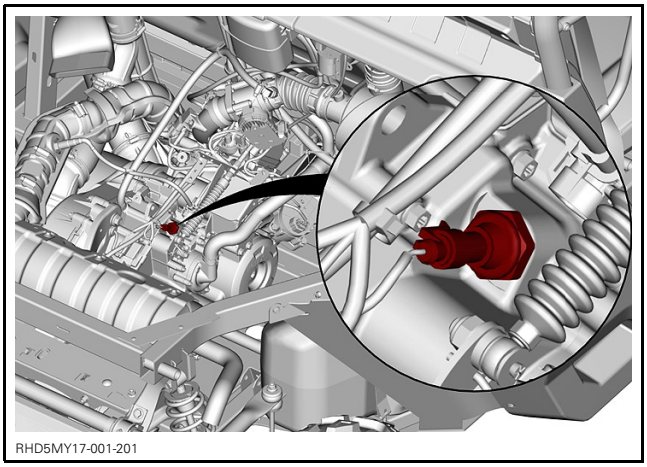
PROCEDURES

OIL PRESSURE SWITCH (OPS)

Oil Pressure Switch Access

Open cargo box.

Oil Pressure Switch Location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Oil Pressure Switch Activation

The oil pressure switch activates when the engine oil pressure is lower than following specified pressure range.

OIL PRESSURE SWITCH ACTIVATION RANGE
30 kPa ± 10 kPa (4.35 PSI ± 1.45 PSI)

To check the function of the oil pressure switch, an oil pressure test has to be performed. Refer to *ENGINE OIL PRESSURE* in this subsection.

If the engine oil pressure is good, perform the oil pressure switch resistance test.

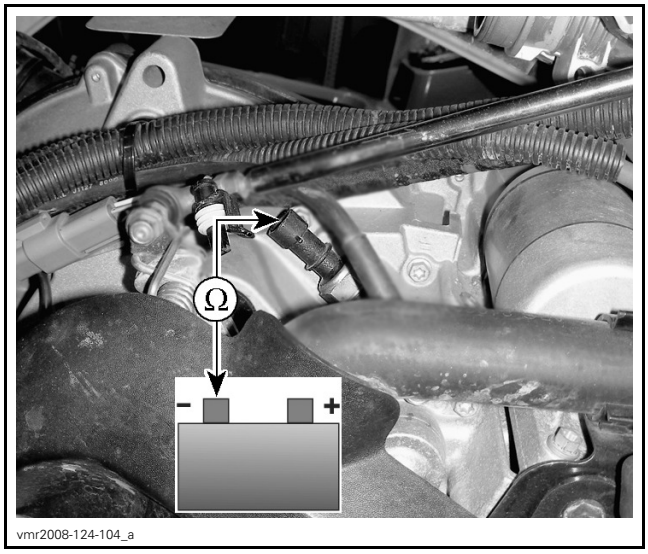
Testing the Oil Pressure Switch Resistance

Disconnect the connector from the oil pressure switch.

Using a multimeter set to Ω, check the OPS resistance as per following table.

OPS CONNECTOR		ENGINE NOT RUNNING	ENGINE NOT RUNNING
PIN		RESISTANCE (Ω)	
1	Engine ground	Close to 0 Ω (normally closed switch)	Close to 0 Ω (normal closed switch

OPS CONNECTOR		ENGINE NOT RUNNING	ENGINE RUNNING
PIN		RESISTANCE (Ω)	
1	Engine ground	Close to 0 Ω (normally closed switch)	Infinitely high when pressure reaches 30 kPa ± 10 kPa (4.35 PSI ± 1.45 PSI)



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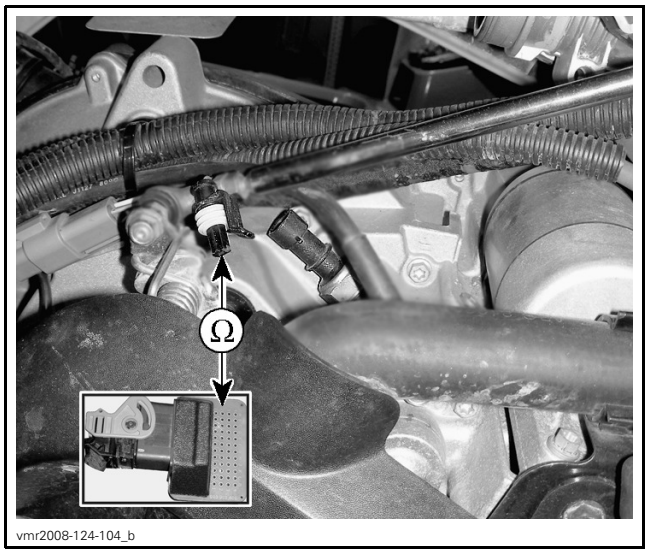
TYPICAL

If resistance values are incorrect, replace the oil pressure switch.

If the values are correct, check the continuity of the wiring harness.

Disconnect the ECM connector and check continuity of circuit between switch and ECM.

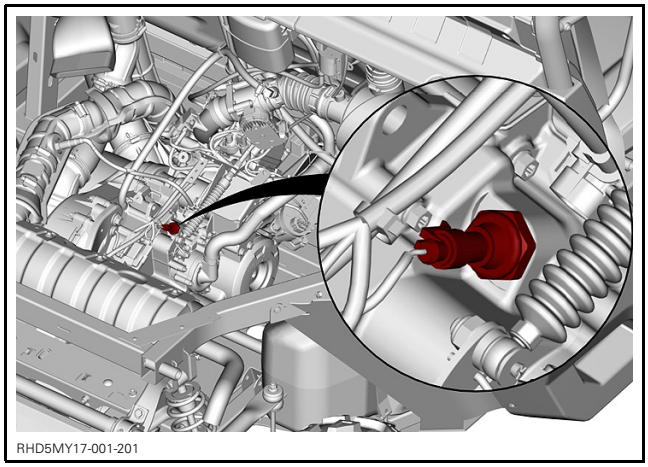
OPS CIRCUIT		**MEASUREMENT**
OPS PIN	ECM pin	Resistance (Ω) @ 20°C (68°F)
1	E3	Close to 0 Ω



TYPICAL

Removing the Oil Pressure Switch

Disconnect and unscrew oil pressure switch.



Installing the Oil Pressure Switch

Tighten oil pressure switch to specification.

TIGHTENING TORQUE	
Oil pressure switch	12 N•m ± 1 N•m (106 lbf•**in** ± 9 lbf•**in**) + LOCTITE 243 (BLUE) (P/N 293 800 060)

Plug switch connector.

OIL STRAINER

Oil Strainer Access

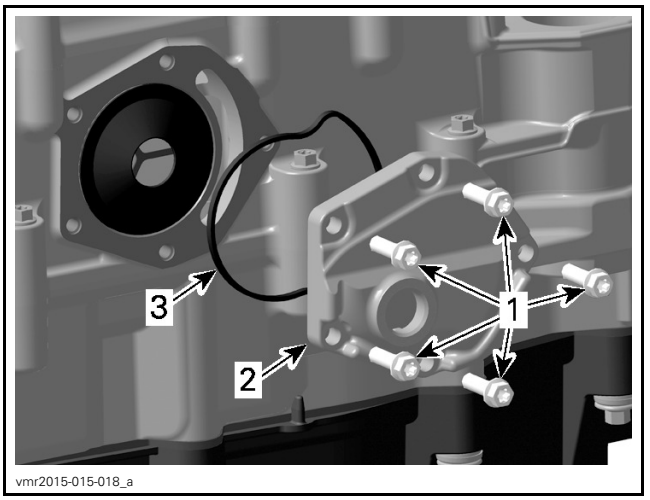
Engine must be lifted or removed to access the oil strainer. Refer to the appropriate *ENGINE REMOVAL AND INSTALLATION* subsection.

Removing the Oil Strainer

Drain engine oil, refer to *ENGINE OIL CHANGE* in the appropriate *PERIODIC MAINTENANCE PROCEDURES* subsection.

Remove:

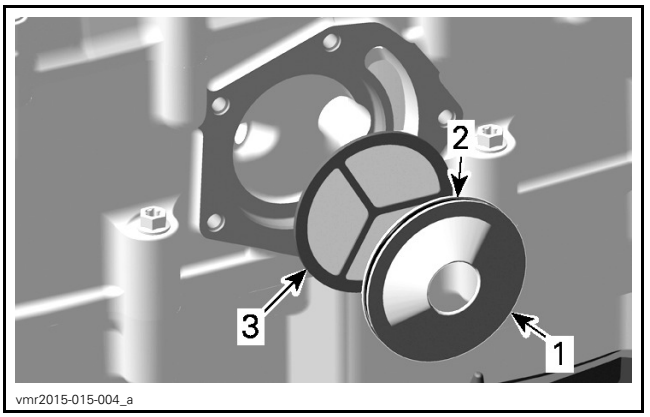
– Retaining screws
– Oil strainer cover
– Gasket.



1. *Retaining screws*
2. *Oil strainer cover*
3. *Gasket*

Remove:

– Oil collector with O-ring
– Oil strainer.



1. *Oil collector*
2. *O-ring*
3. *Oil strainer*

Cleaning and Inspecting the Oil Strainer

Clean oil strainer with a part cleaner then use an air gun to dry it.

⚠ WARNING

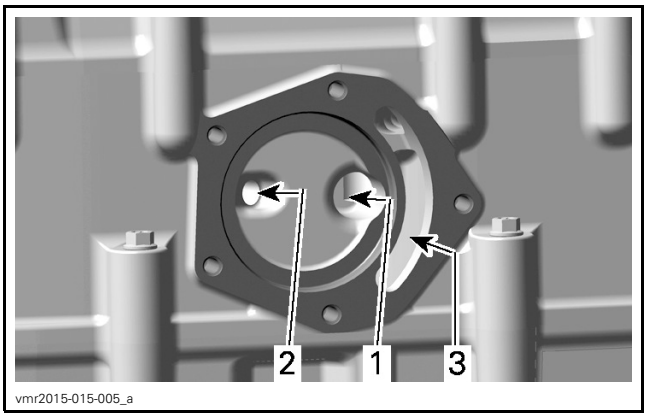
Always wear eye protector. Chemicals can cause a rash break out in and an injury to your eyes.

Check engine oil strainer for cracks or other damage. Replace if damaged.

Inspect O-ring on the oil collector and rubber ring on the oil strainer cover if brittle, cracked or hard. Replace the defective parts.

Clean both contact surfaces of oil strainer cover.

Check and clean the oil inlet and outlet area for dirt and other contaminations.



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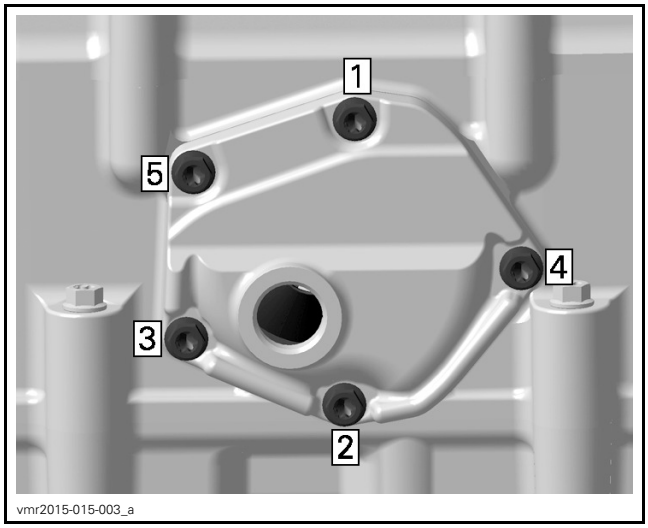
1. Oil inlet to the oil pump
2. Oil return from the oil pressure regulator system
3. Oil return from the engine oil circulation

Installing the Oil Strainer

For installation, reverse the removal procedure.

Tighten oil strainer cover screws as per following sequence.

TIGHTENING TORQUE	
Oil strainer cover screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)



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TIGHTENING SEQUENCE

Install NEW gasket ring.

Tighten magnetic drain plug to specification.

TIGHTENING TORQUE	
Magnetic drain plug	30 N•m ± 2 N•m (22 lbf•ft ± 1 lbf•ft)

Reinstall engine in vehicle, refer to the appropriate *ENGINES REMOVAL AND INSTALLATION* subsection.

Refill engine at the proper level with the recommended oil, refer to the appropriate *PERIODIC MAINTENANCE PROCEDURES* subsection.

Start engine and let idle for a few minutes.

Ensure oil filter and magnetic drain plug areas are not leaking.

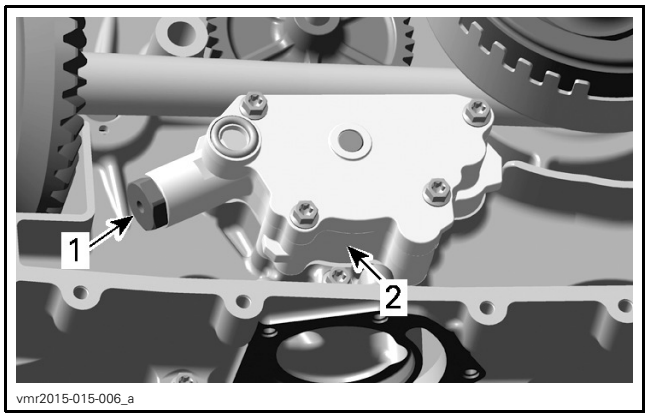
Stop engine.

Wait a while to allow oil to flow down to crankcase then check oil level. Refill as necessary.

ENGINE OIL PRESSURE REGULATOR

Oil Pressure Regulator Location

The oil pressure regulator is located in the oil pump housing (engine MAG side, behind magneto cover).



1. Oil pressure regulator plug
2. Oil pump housing

NOTE: The oil pressure regulator system works when the oil pressure exceeds 500 kPa (73 PSI).

Removing the Oil Pressure Regulator

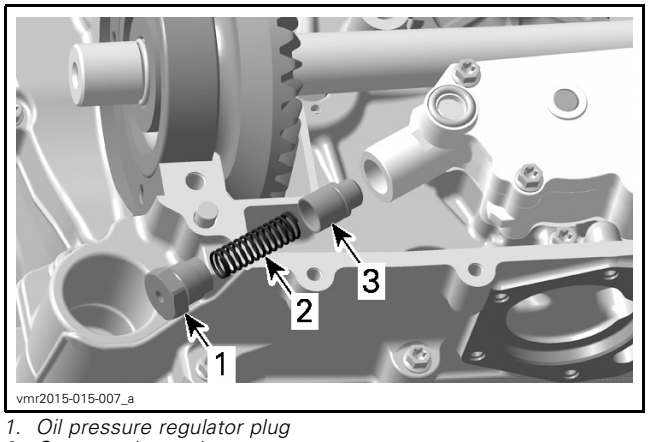
Remove:

– Engine from vehicle (refer to the appropriate *ENGINE REMOVAL/INSTALLATION* subsection)
– Water pump cover (refer to the appropriate *COOLING SYSTEM* subsection)
– Magneto cover (refer to the appropriate *MAGNETO AND STARTER* subsection).

Remove:

– Oil pressure regulator plug
– Compression spring
– Valve piston.

NOTE: Oil pressure regulator plug on oil pump housing is spring loaded.



1. Oil pressure regulator plug
2. Compression spring
3. Valve piston

Inspecting the Oil Pressure Regulator

Inspect valve piston for scoring or other damages.

Check compression spring for free length.

COMPRESSION SPRING FREE LENGTH	
NEW NOMINAL	64 mm (2.52 in)
SERVICE LIMIT	62 mm (2.441 in)

Replace both parts if important wear or damage are present.

Clean bore and threads in the oil pump housing from metal shavings and other contaminations.

Installing the Oil Pressure Regulator

For installation, reverse the removal procedure.

Tighten oil pressure regulator plug screw to specification.

TIGHTENING TORQUE	
Oil pressure regulator plug screw	12 N•m ± 1 N•m (106 lbf•**in** ± 9 lbf•**in**)

OIL PUMP

The oil pump is located on the engine MAG side (refer to *ENGINE OIL PRESSURE REGULATOR*).

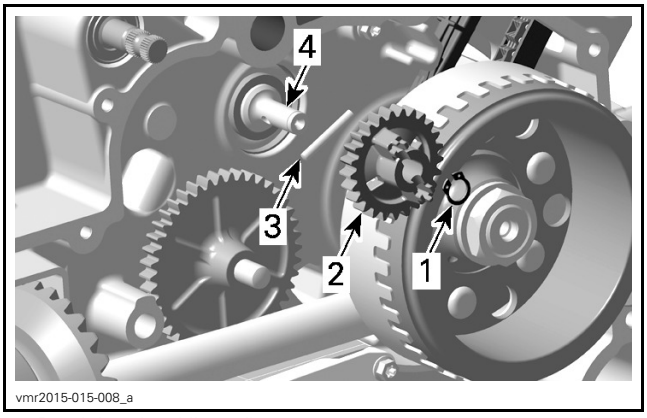
Removing the Oil Pump

Remove:

– Engine from vehicle (refer to the appropriate *ENGINE REMOVAL AND INSTALLATION* subsection)
– Water pump cover (refer to the appropriate *COOLING SYSTEM* subsection)
– Magneto cover (refer to the appropriate *MAGNETO AND STARTER* subsection).

Remove only if necessary:

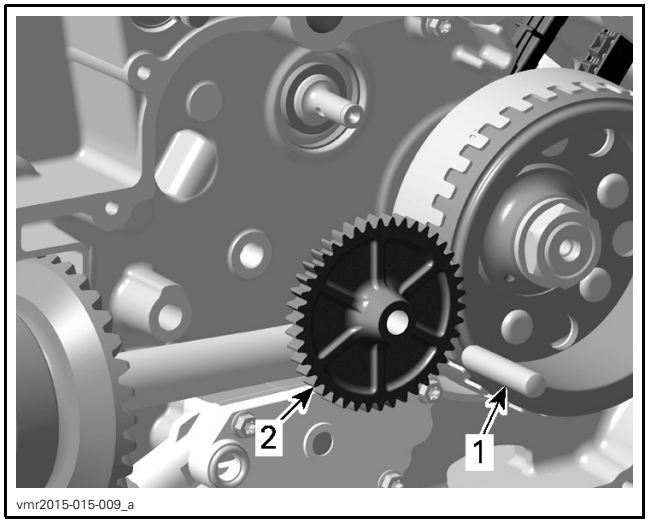
– Retaining ring (discard it)
– Drive gear
– Needle pin.



1. Retaining ring (discard)
2. Drive gear
3. Needle pin
4. Balancer shaft

NOTICE Never use the retaining ring a second time. Always replace by a NEW one.

Remove only if necessary:
– Pin
– Intermediate gear.

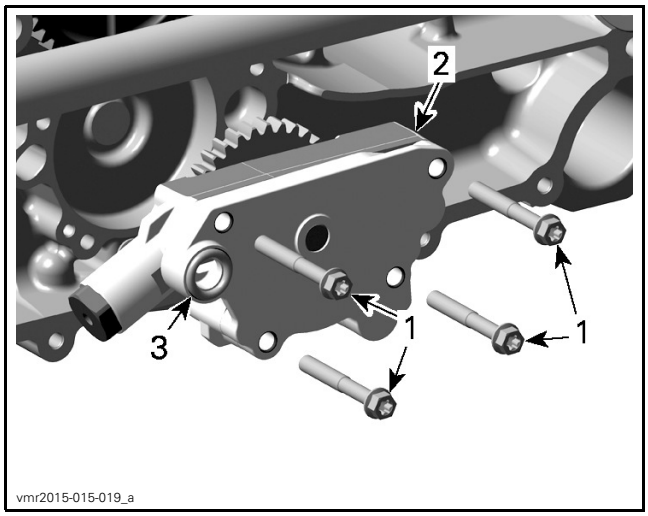


1. Pin
2. Intermediate gear

Remove:
– Oil pump cover screws
– Oil pump module with O-ring.

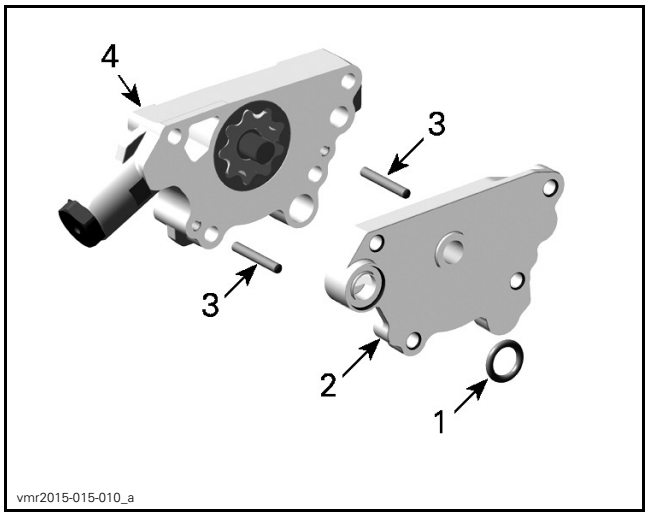
NOTICE Do not loose oil pump cover O-ring.

NOTICE Pay attention not to drop the dowel pins inside the engine.



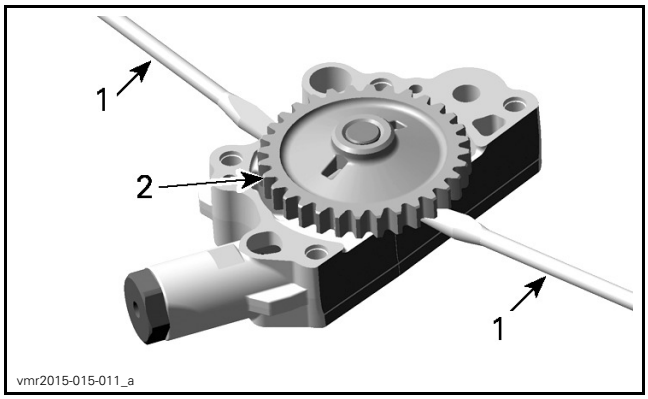
1. Oil pump cover screws
2. Oil pump module
3. O-ring, sealing to crankcase MAG side

Remove:
– O-ring
– Oil pump cover
– Dowel pins.



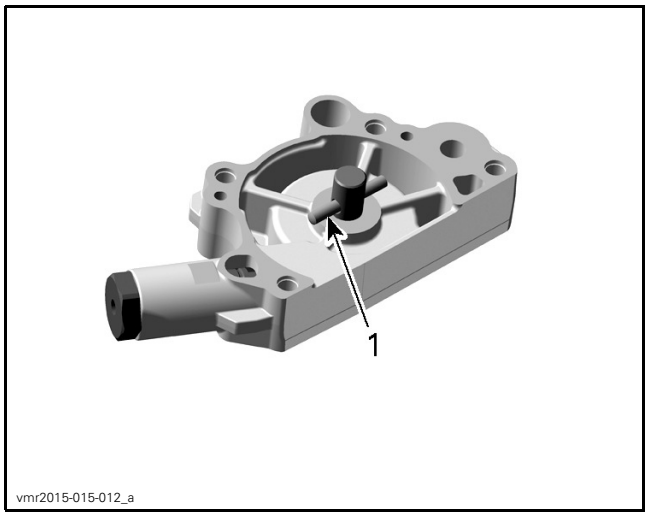
1. O-ring
2. Oil pump cover
3. Dowel pins
4. Oil pump housing

Use screwdrivers to remove oil pump gear.



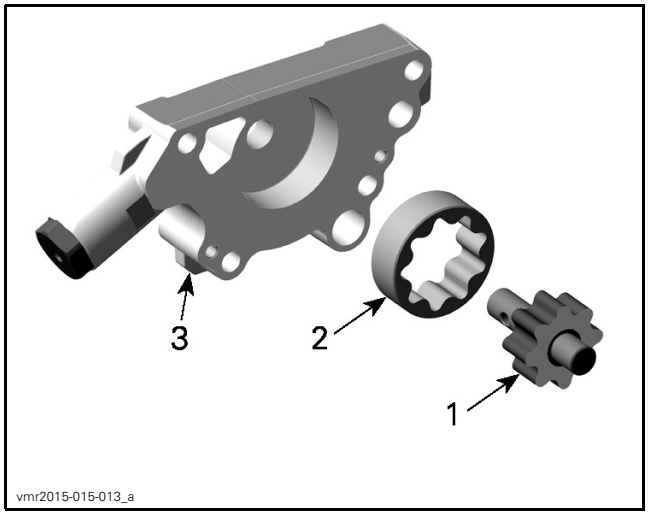
1. Flat screwdrivers
2. Oil pump gear

Remove:
– Needle pin.



1. Needle pin

Remove:
– Oil pump shaft assembly
– Outer rotor.

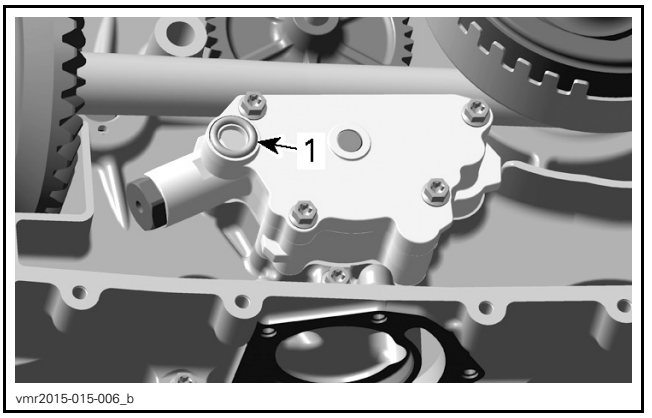


1. Oil pump shaft assembly
2. Outer rotor
3. Oil pump housing

Inspecting the Oil Pump

Inspect oil pump shaft assembly, housing and cover for marks or other damages.

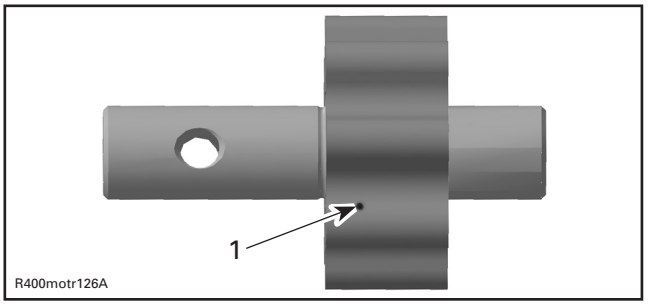
Replace O-ring if damaged, brittle or hard.



1. O-ring

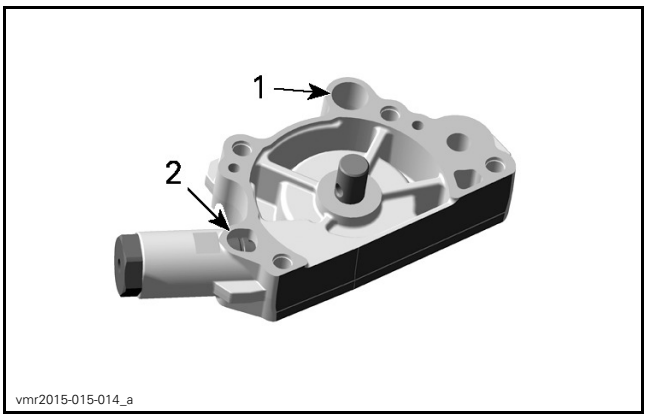
Check inner rotor for corroded pin holes or other damages. If so, replace oil pump shaft assembly.

Check the inside of oil pump housing and its cover for scoring or other damages. If so, change the complete oil pump assembly.

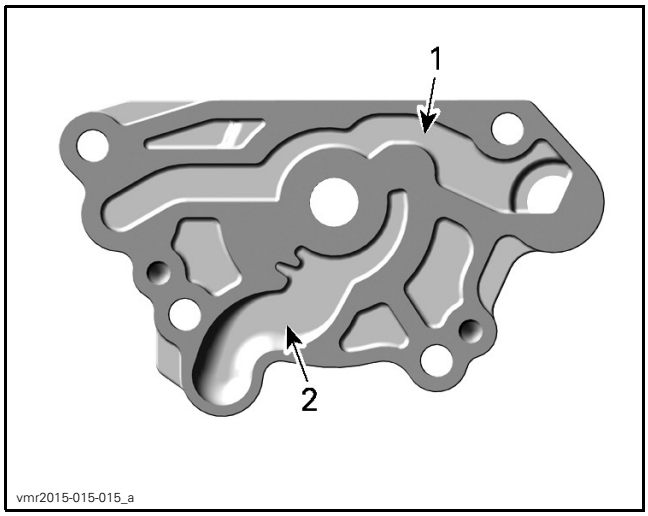


1. Pittings on the teeth

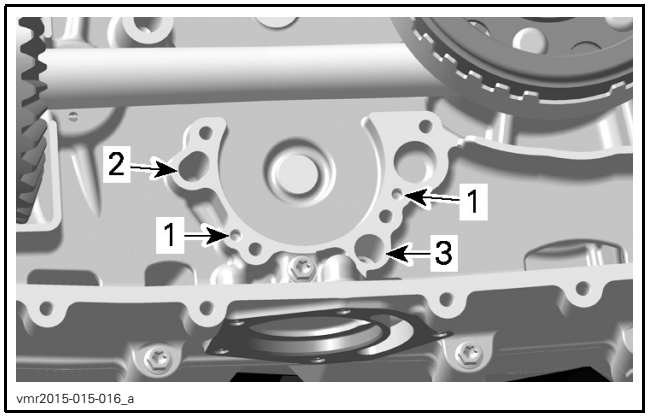
Clean oil passages and make sure they are not clogged.



OIL PUMP HOUSING
1. Suction side of the oil pump
2. Outlet from the engine oil pressure regulator valve

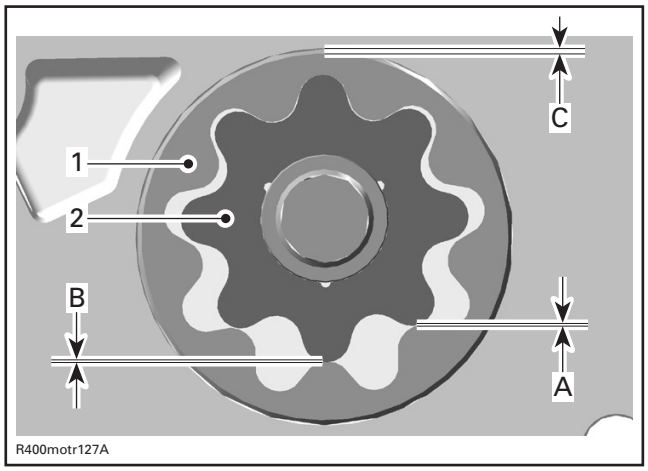


OIL PUMP COVER
1. *Oil from the pump to the oil filter in the magneto cover*
2. *Oil from the pump suction side to the oil pump*



CRANKCASE MAG SIDE
1. *Bores for dowel pins*
2. *Oil return from the oil pressure regulator system*
3. *Oil inlet to the oil pump (leads to strainer on engine bottom)*

Using a feeler gauge, measure the clearance between inner and outer rotor.



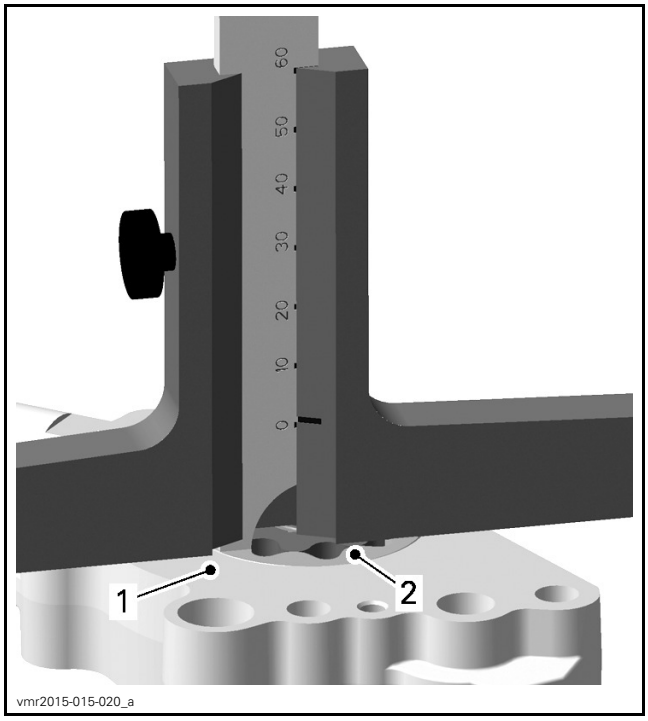
1. *Outer rotor*
2. *Inner rotor*

OUTER AND INNER ROTOR CLEARANCE	
SERVICE LIMIT	
A	0.25 mm (.0098 in)
B	
C	

If clearance between inner and outer rotor exceeds the tolerance, replace oil pump shaft assembly. Ensure to also check oil pump housing and cover. If damaged, replace the complete oil pump assembly.

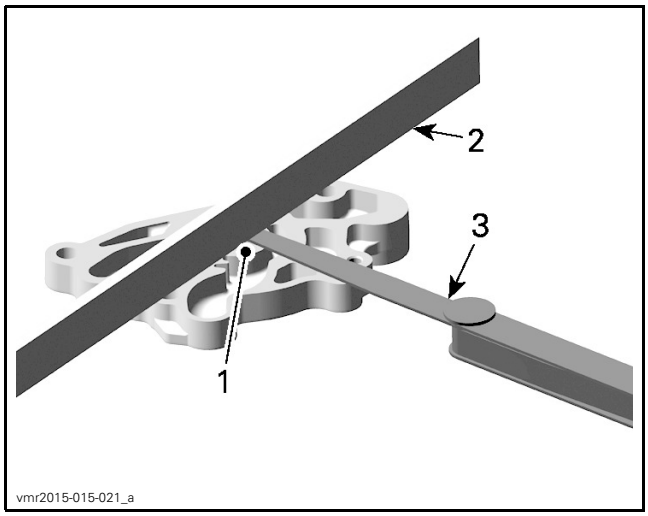
If clearance between outer rotor and its bore in oil pump exceeds the tolerance, replace the complete oil pump assembly.

Measure the axial clearance of the oil pump as shown.



MEASUREMENT "A"
1. *Oil pump housing surface*
2. *Oil pump rotor surface*

Check oil pump cover for damages and for surface straightness with a straight edge and a feeler gauge.



MEASUREMENT "B"
1. *Oil pump cover surface*
2. *Straight edge*
3. *Feeler gauge*

Add measurement A to measurement B to obtain axial clearance.

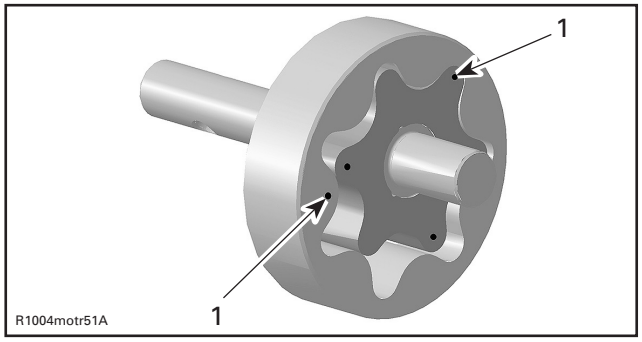
OIL PUMP AXIAL CLEARANCE	
SERVICE LIMIT	0.10 mm (.0039 in)

NOTE: When the axial clearance of the oil pump shaft assembly increases, the oil pressure decreases.

Installing the Oil Pump

For installation, reverse the removal procedure.

When installing the oil pump rotors, make sure both markings are on the same side.

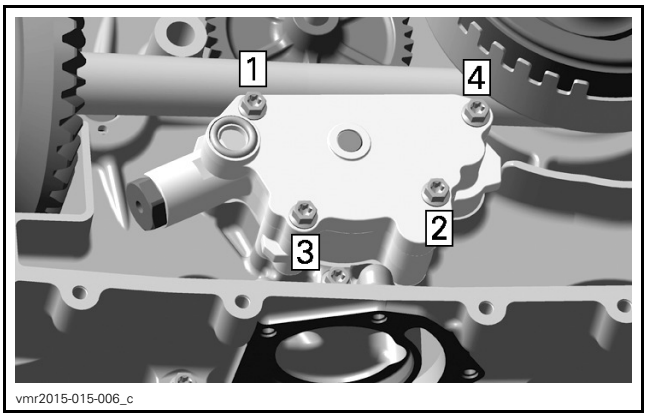


1. *Markings on inner and outer rotor*

NOTICE **Never apply any sealing compound on split surfaces of oil pump.**

Tightening oil pump cover screws as per following sequence.

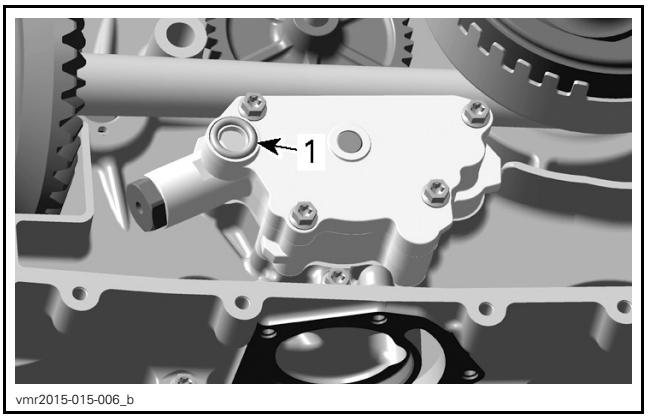
TIGHTENING TORQUE	
Oil pump cover screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)



TIGHTENING SEQUENCE

NOTE: After tightening the oil pump cover screws check for smooth operation of the oil pump assembly.

Install the O-ring on oil pump cover.



1. *O-ring*

After engine is completely reassembled, start engine and make sure oil pressure is within specifications (refer to *TESTING THE ENGINE OIL PRESSURE* in this subsection).

COOLING SYSTEM

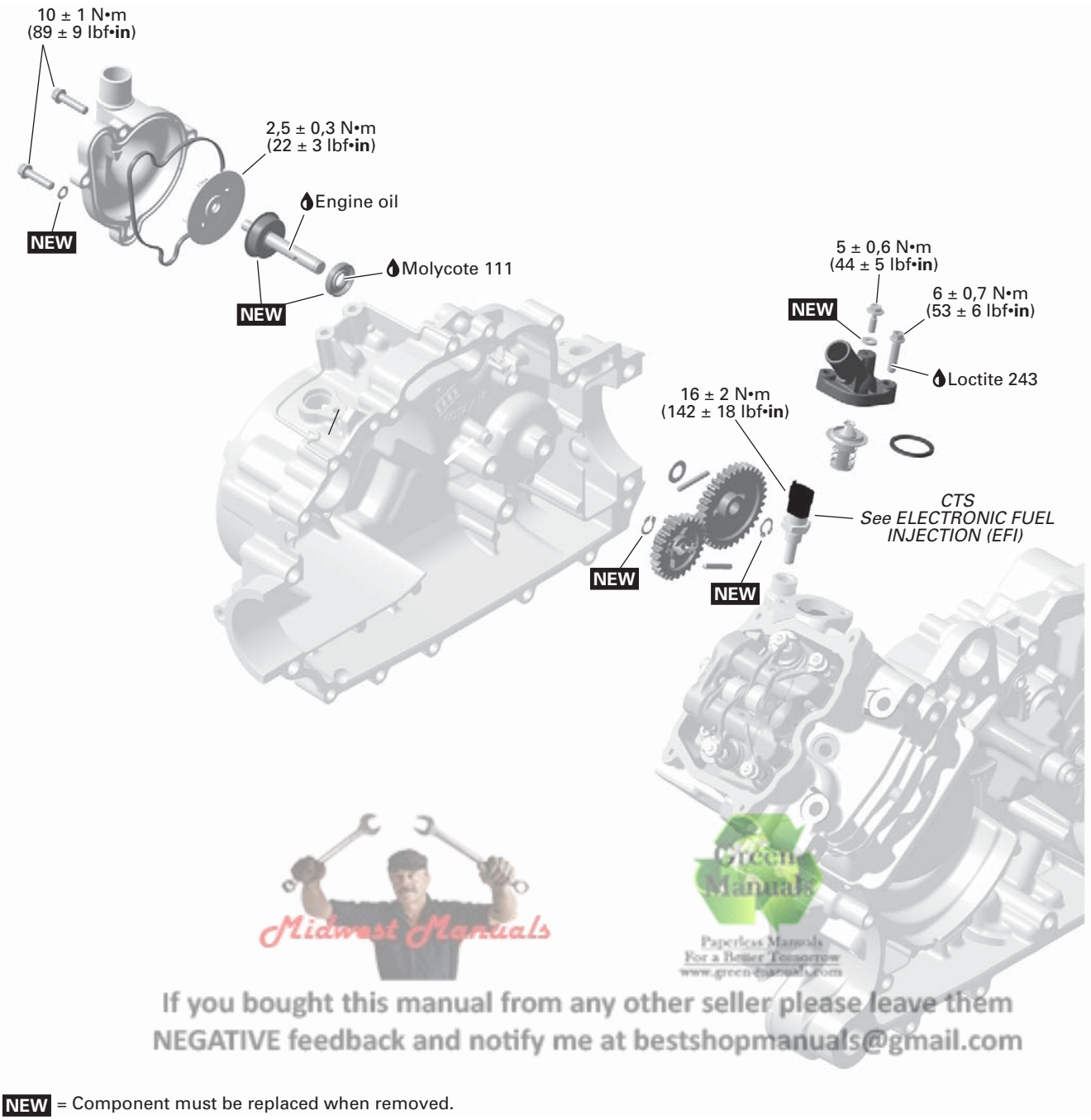
SERVICE TOOLS

Description	Part Number	Page
HANDLE	420 877 650	7
OIL SEAL PUSHER	529 035 757	7
SEAL PUSHER	529 035 766	7

SERVICE PRODUCTS

Description	Part Number	Page
DOW CORNING 111	413 707 000	7
LOCTITE 243 (BLUE)	293 800 060	4

WATER PUMP AND THERMOSTAT



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NEW = Component must be replaced when removed.

vmr2015-016-001_a

GENERAL

⚠ WARNING

Never start engine without coolant. Engine parts and ceramic seal on water pump shaft can be damaged.

During assembly/installation, use the torque values and service products as in the exploded views.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to.
Locking devices when removed (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

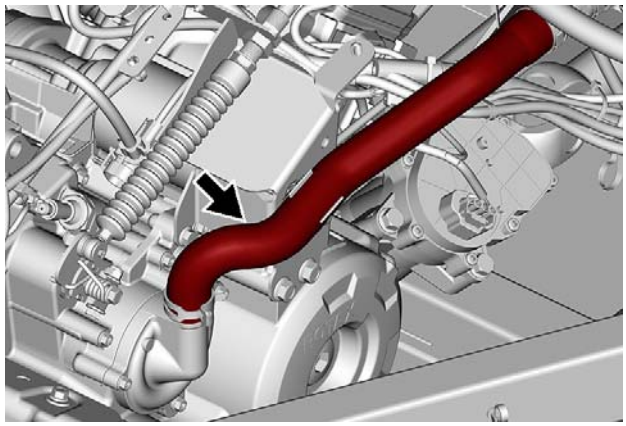
PROCEDURES

THERMOSTAT

The thermostat is a single action type, located on the RH rear side of the cylinder head.

Removing the Thermostat

Pinch the coolant hoses near the engine using a large hose pincher.



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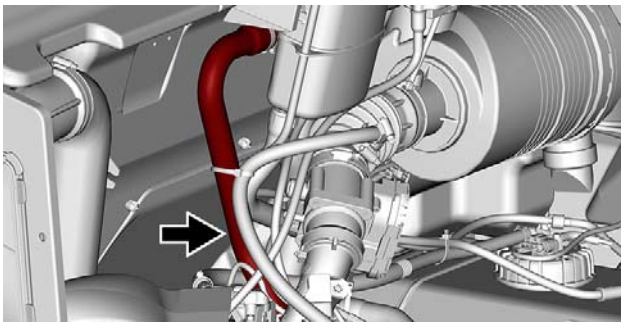

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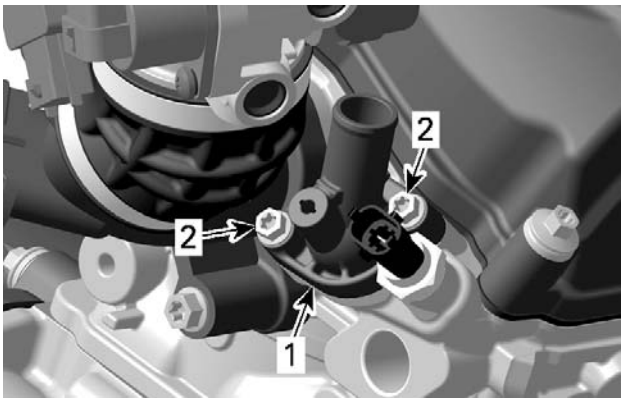
Place shop rags around the thermostat housing.

Remove thermostat housing screws and pull thermostat housing off cylinder head.



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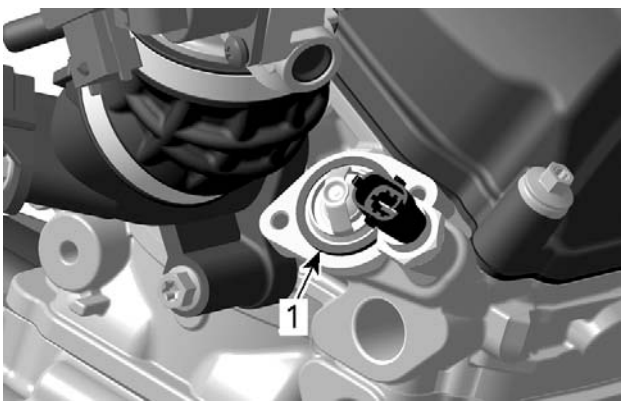
1. *Thermostat housing*
2. *Screws*

Remove thermostat with gasket.



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1. *Thermostat with gasket*

Testing the Thermostat

To test thermostat, put it in water and heat the water.

THERMOSTAT OPENING TEMPERATURE	
STARTS TO OPEN	FULLY OPEN
65°C (149°F)	75°C (167°F)

Replace thermostat if it does not begin to open at specified temperature.

Check gasket to see if it is brittle, hard or damaged. If so, replace gasket.

Installing the Thermostat

For installation, reverse the removal procedure, pay attention to the following details.

Tighten thermostat cover screws to specification.

TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Thermostat cover screws	6 N•m ± 0.7 N•m (53 lbf•**in** ± 6 lbf•**in**)

Refill and bleed cooling system, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Check cooling system for leaks.

COOLANT TEMPERATURE SENSOR (CTS)

The coolant temperature sensor is located next to the thermostat housing on the RH rear side of the cylinder head.

Refer to *ELECTRONIC FUEL INJECTION* subsection.

WATER PUMP HOUSING

Water Pump Housing Location

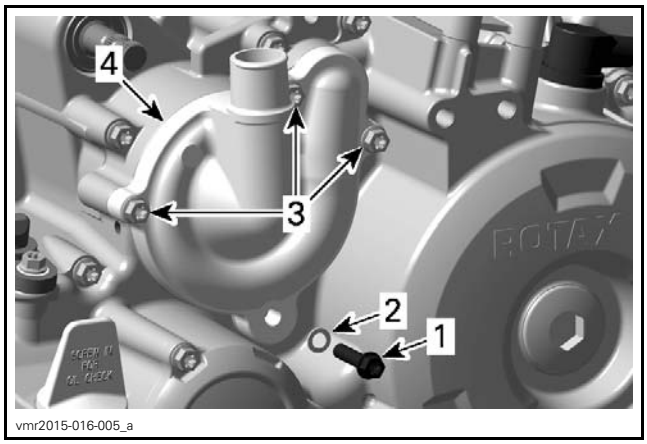
The water pump housing is located on the RH side of the engine.

Removing the Water Pump Housing

Drain cooling system, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Remove radiator outlet hose from water pump housing.

Remove screws retaining water pump housing.



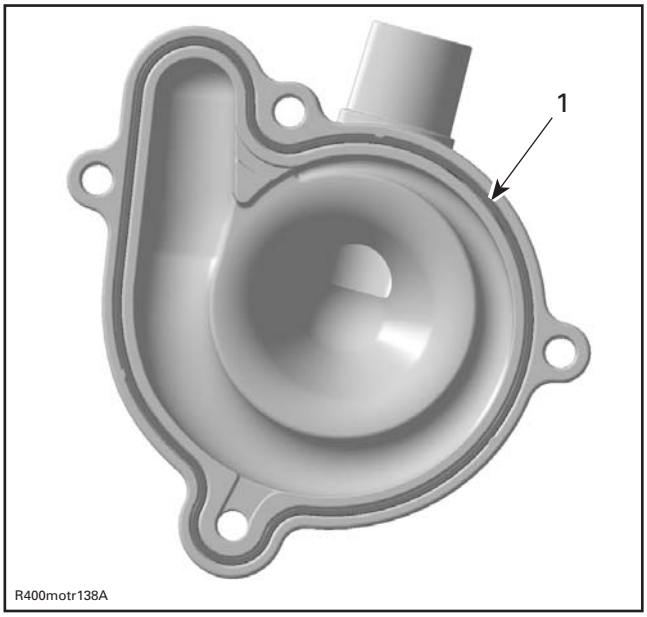
1. Coolant drain plug
2. Sealing ring
3. Screws
4. Water pump housing

Pull on water pump housing to remove it.

Inspecting the Water Pump Housing

Check if gasket is brittle, hard or damaged.

Replace as required.



WATER PUMP COVER
1. Gasket

Installing the Water Pump Housing

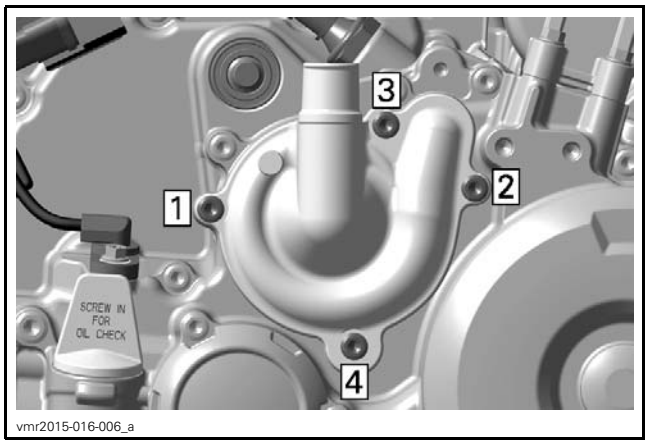
The installation is the opposite of the removal procedure.

NOTICE **To prevent leaking, make sure the gasket is properly inserted in the water pump housing groove when you reinstall the water pump cover.**

Install a NEW gasket ring on water pump housing screw.

Tightening sequence for screws on water pump cover is as per following illustration (criss-cross).

TIGHTENING TORQUE	
Water pump housing screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)



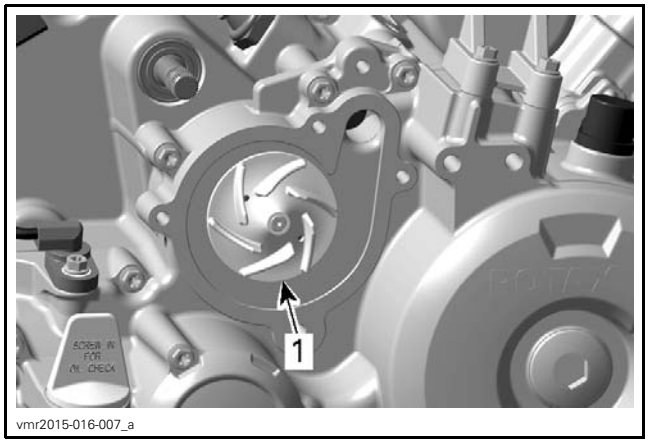
TIGHTENING SEQUENCE

WATER PUMP IMPELLER

Removing the Water Pump Impeller

Remove water pump housing, see procedure in this subsection.

Unscrew impeller from water pump shaft.



1. Impeller

Inspecting the Water Pump Impeller

Check impeller for cracks or other damages. Replace impeller if damaged.

Installing the Water Pump Impeller

The installation is the opposite of the removal procedure.

NOTE: Be careful not to damage the impeller blades during installation.

WATER PUMP SHAFT AND SEALS

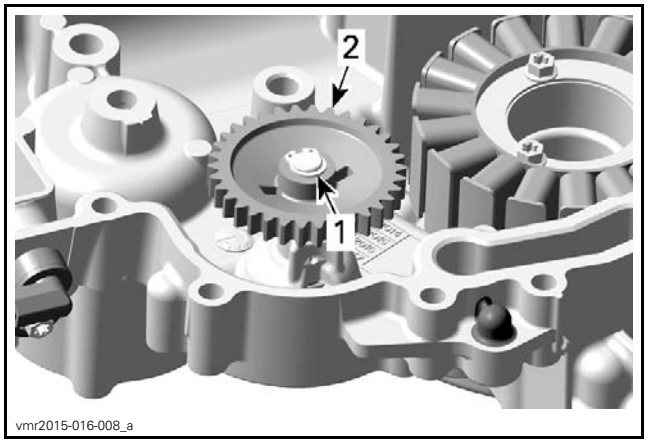
Removing the Water Pump Shaft and Seal

Remove water pump housing, refer to *WATER PUMP HOUSING* in this subsection.

Remove impeller.

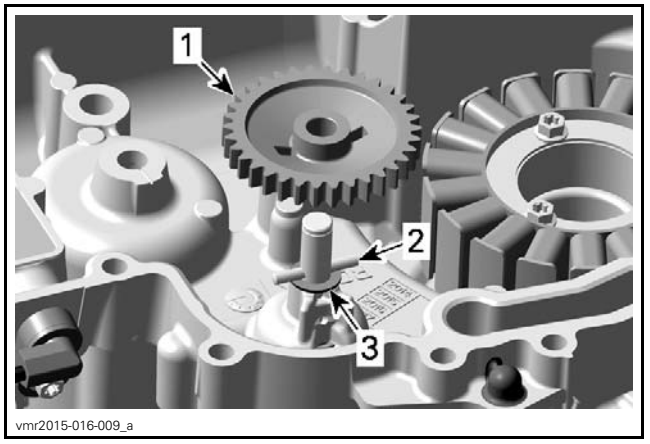
Remove magneto cover, refer to the *MAGNETO AND STARTER* subsection.

Remove circlip from the water pump gear using the appropriate pliers. Discard the circlip.



1. Circlip
2. Water pump gear

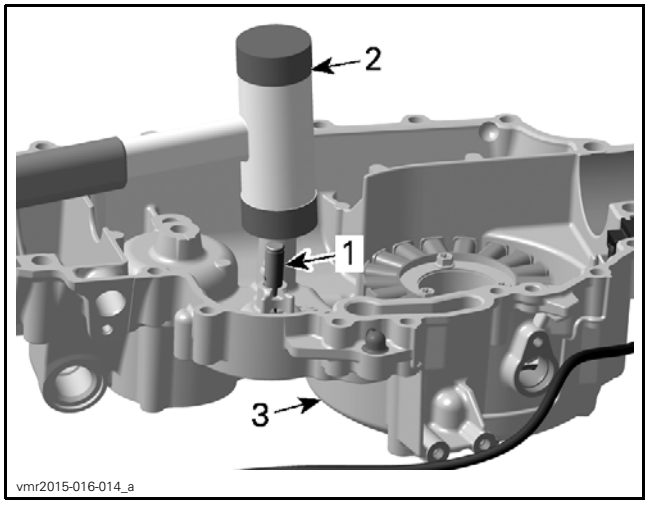
Remove:
- Water pump gear
- Needle pin
- Thrust washer.



1. Water pump gear
2. Needle pin
3. Thrust washer

Push the water pump shaft with inner portion of the rotary seal from inside of magneto cover.

REQUIRED TOOL
Soft hammer

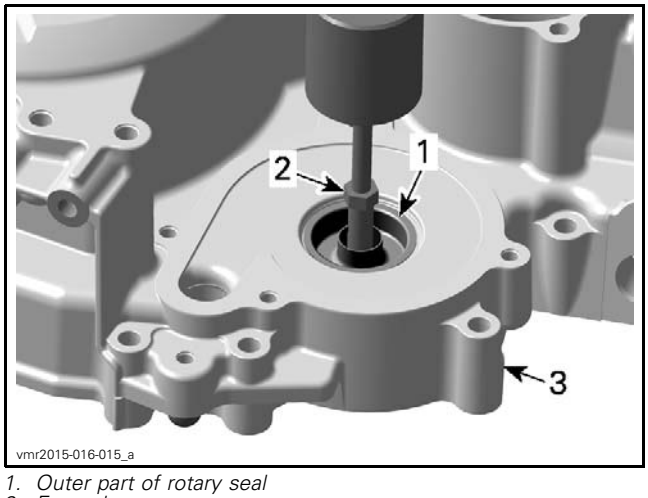


1. Water pump shaft
2. Soft hammer
3. Magneto cover

Install expander snugly against outer part of rotary seal.

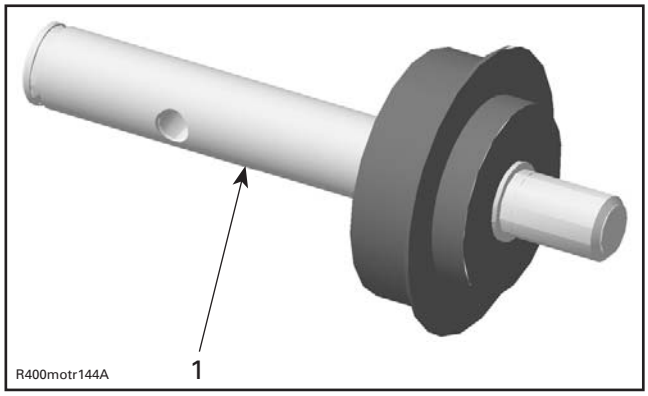
REQUIRED TOOL
Blind hole puller

Pull outer part of rotary seal out.



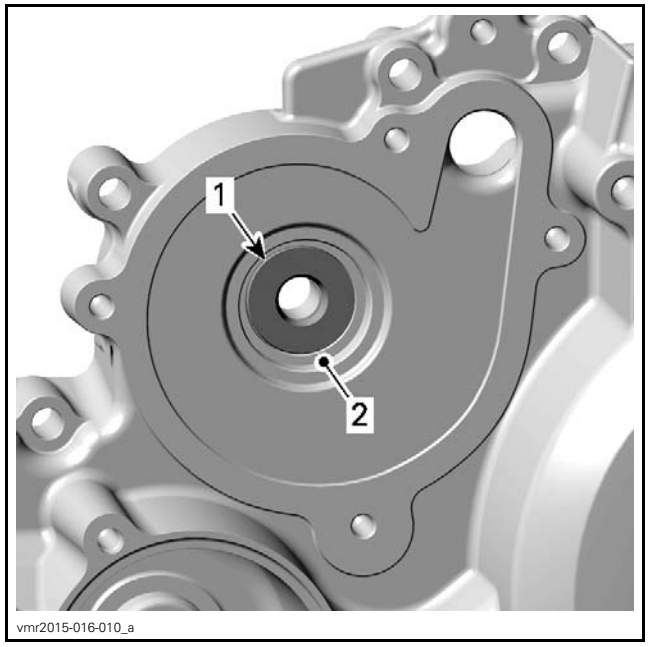
1. Outer part of rotary seal
2. Expander
3. Magneto cover

NOTICE Always replace rotary seal and water pump shaft together. Also install a NEW oil seal at the same time.



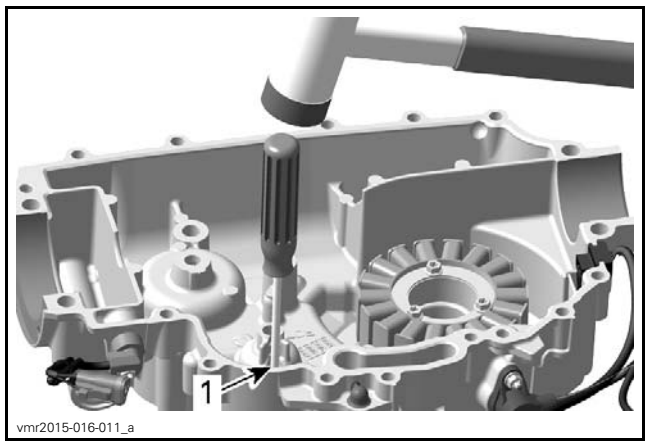
1. Water pump shaft with rotary seal

Remove oil seal from inside magneto cover using an appropriate pusher.



1. Oil seal behind the rotary seal
2. Rotary seal bore

NOTICE Be careful not to damage the surface of the rotary seal bore in magneto cover.



1. Special area for oil seal removal

Inspecting the Water Pump Shaft and Gear

Inspect water pump gear for:
- Wear
- Cracks
- Broken teeth
- Damage on snap mechanism to the needle pin.

Replace if damaged.

Inspect shaft and rotary seal for wear or damages.

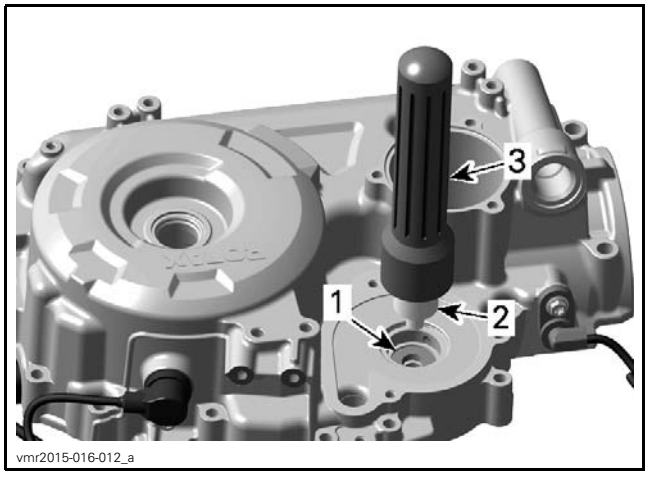
Installing the Water Pump Shaft and Seal

For installation, reverse the removal procedure. However, pay attention to the following.

NOTICE When replacing water pump shaft, always replace circlip, oil seal, water pump shaft and rotary seal with new parts.

Install the water pump shaft oil seal.

REQUIRED TOOLS	
HANDLE (P/N 420 877 650)	
OIL SEAL PUSHER (P/N 529 035 757)	



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1. *Oil seal for water pump shaft*
2. *Oil seal pusher*
3. *Handle*

Install the water pump shaft assembly.

REQUIRED TOOL	
SEAL PUSHER (P/N 529 035 766)	

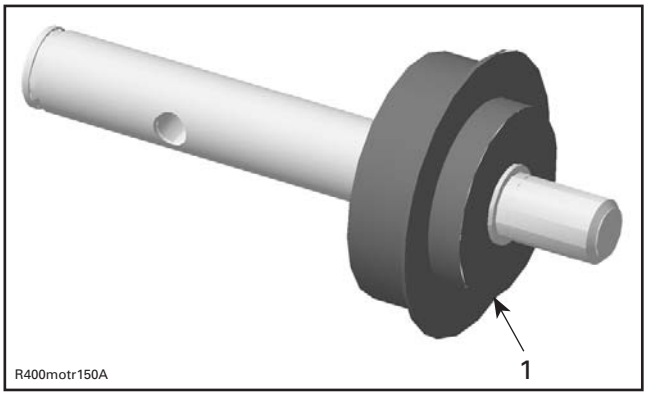
NOTE: Never use oil or grease in the press fit area of the oil seal and rotary seal bores.

Lubricate the sealing lip of the oil seal.

OIL SEAL SEALING LIP	
Service product	DOW CORNING 111 (P/N 413 707 000)

Apply a light coat of engine oil on the water pump shaft.

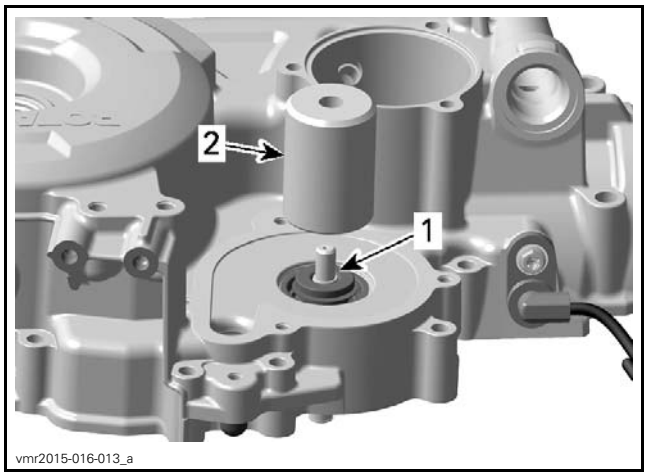
Press the water pump shaft assembly into the magneto cover using the outside area of the rotary seal.



R400motr150A

1. *Surface used to press water pump shaft assembly in place*

NOTICE Never use a hammer for rotary seal installation. To avoid damaging the ceramic component, seal must be installed using a press.



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1. *Water pump shaft with rotary seal*
2. *Water pump ceramic seal installer*

NOTE: After installation water pump shaft with rotary seal must rotate freely.

Install magneto cover, refer to *MAGNETO AND STARTER* subsection.

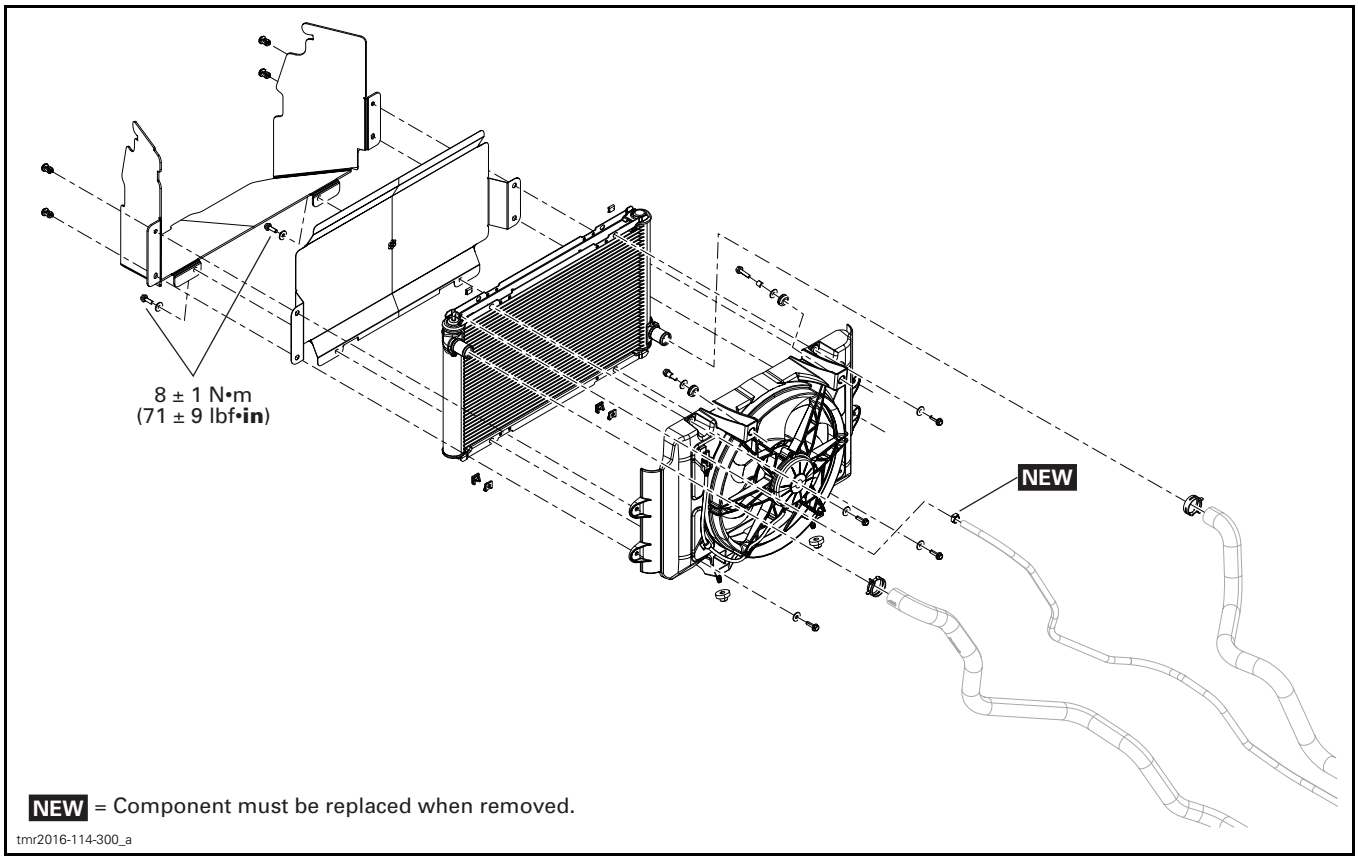
Install all other removed parts.

COOLING SYSTEM - VEHICLE

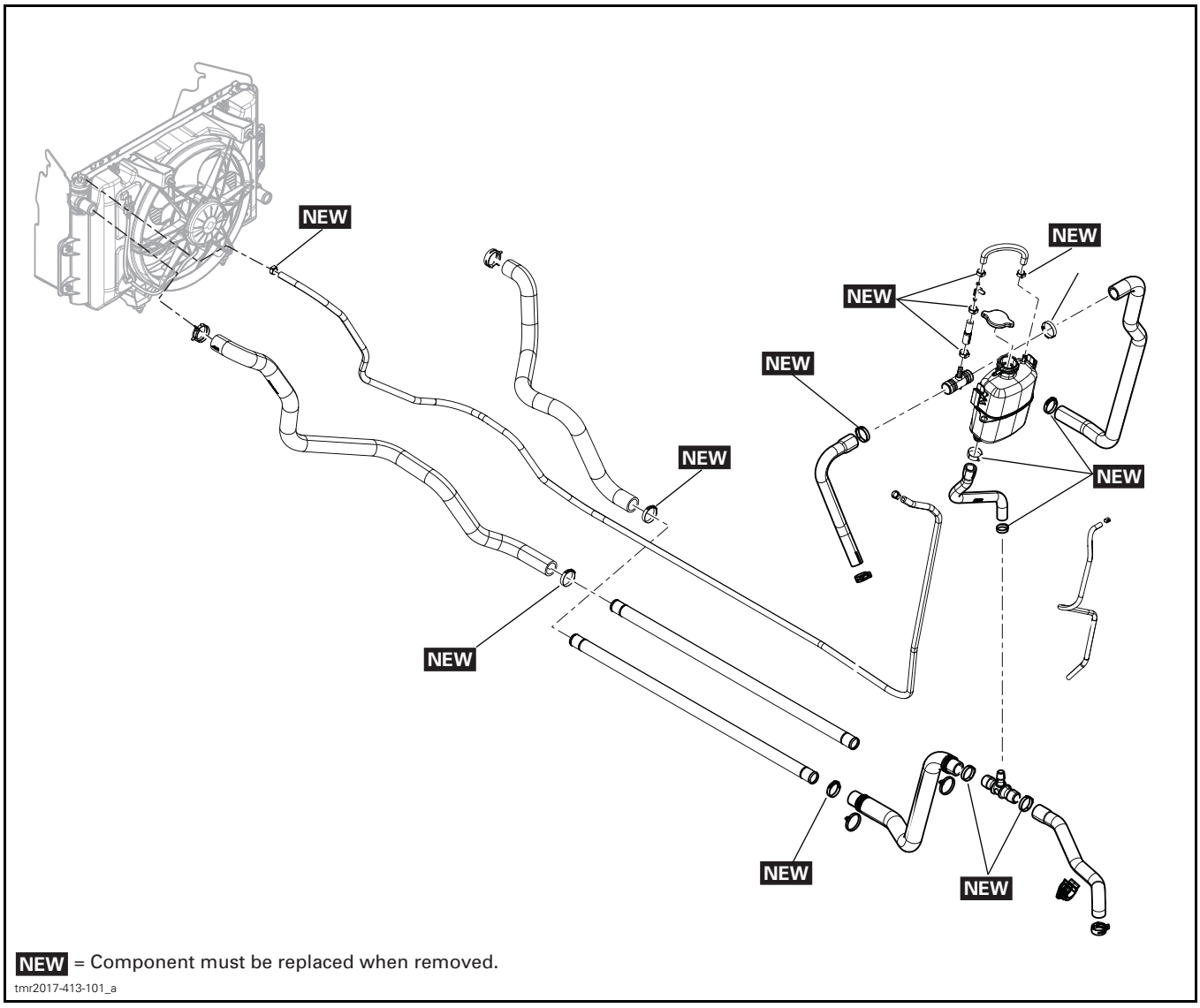
SERVICE TOOLS

Description	Part Number	Page
LARGE HOSE PINCHER	529 032 500	3

RADIATOR



COOLING HOSES



NEW = Component must be replaced when removed.

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GENERAL

NOTICE Never start engine without coolant. Some engine parts such as the rotary seal on the water pump shaft can be damaged.

PROCEDURES

RADIATOR

Inspecting the Radiator

Check radiating fins for clogging or damage.

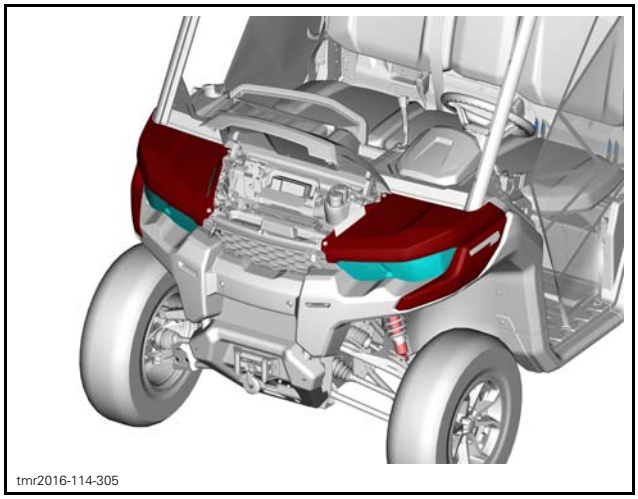
Remove insects, mud or other obstructions with compressed air or low pressure water.

Removing the Radiator

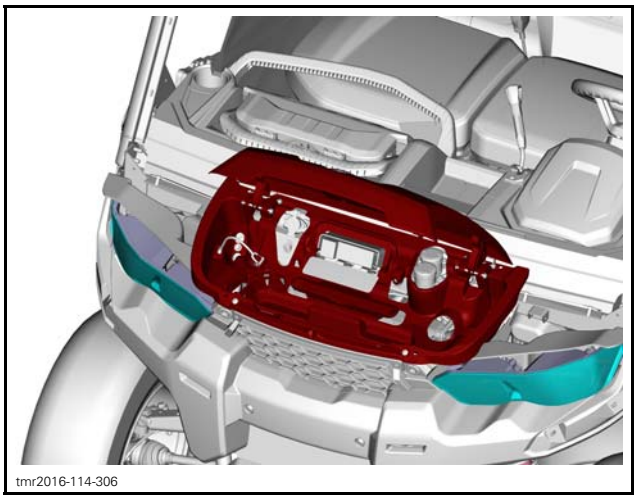
1. Install a hose pincher on both radiator hoses.

REQUIRED TOOL	
LARGE HOSE PINCHER (P/N 529 032 500)	

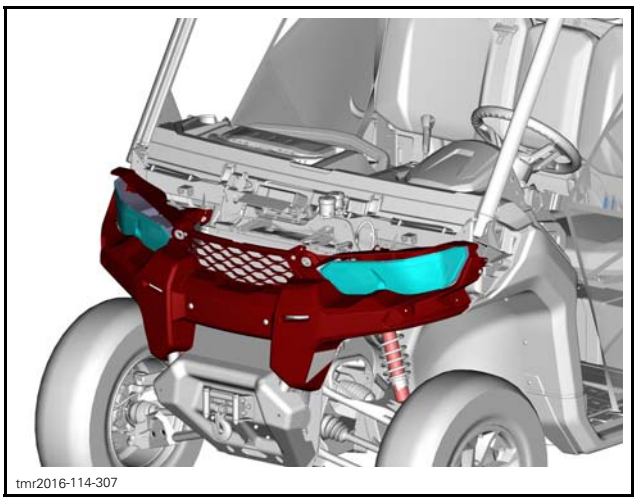
2. Remove the following parts to reach radiator:
   - Front fenders
   - Service center tray with service cover
   - Front fascia and head lights
   - Radiator deflector.



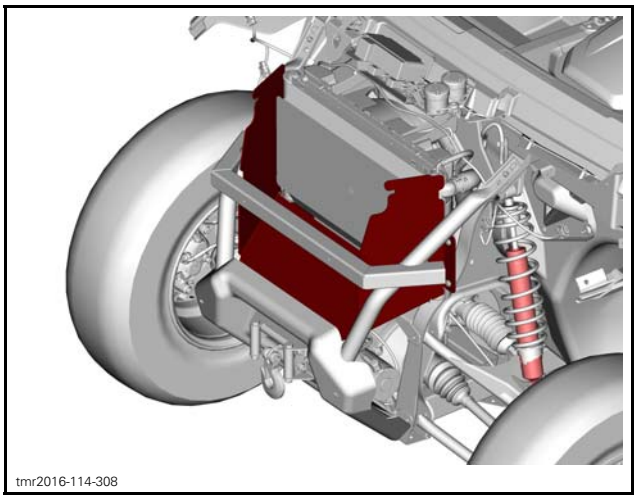
FRONT FENDERS



SERVICE CENTER TRAY WITH SERVICE COVER



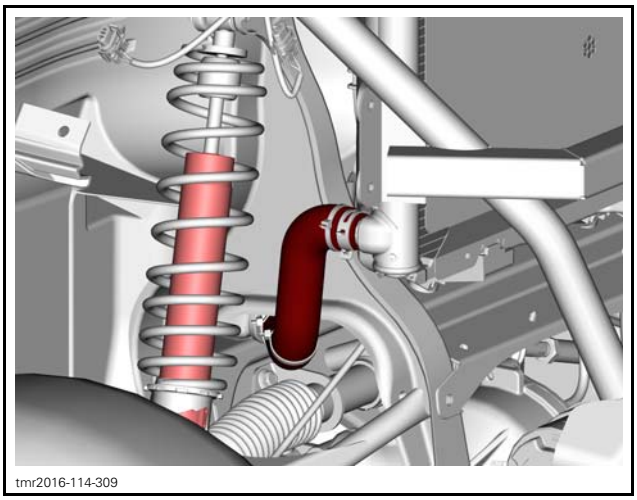
FRONT FASCIA AND HEAD LIGHTS



RADIATOR DEFLECTOR

3. Remove the following parts from the radiator:
   - Radiator outlet hose (RH lower)
   - Radiator inlet hose (LH upper)

– Coolant reservoir vent hose (LH upper)
– Radiator mounting screws (2 at top of radiator).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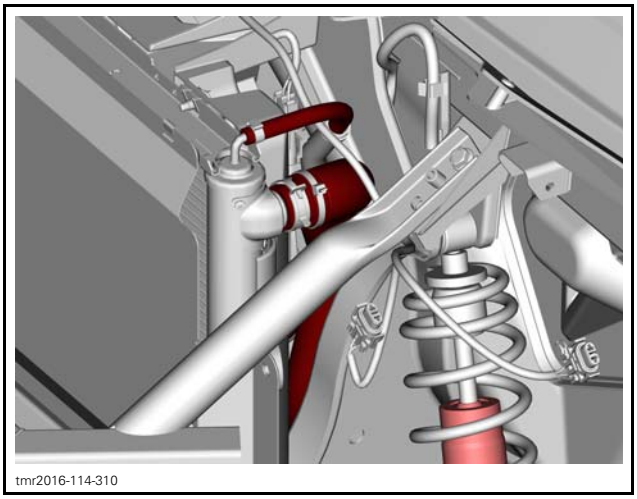
RADIATOR OUTLET HOSE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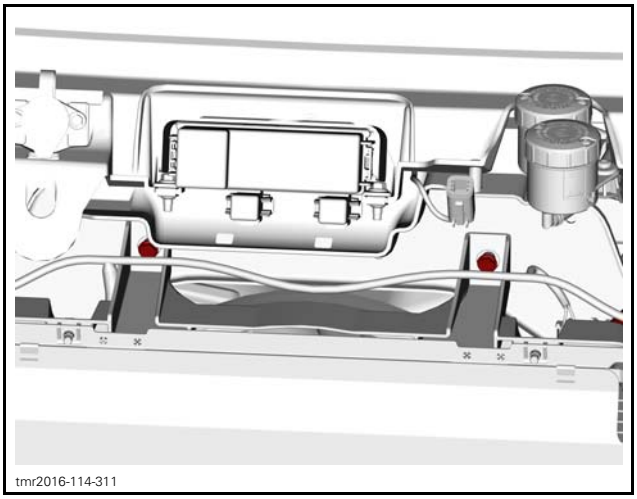
RADIATOR INLET HOSE AND RESERVOIR VENT HOSE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RADIATOR MOUNTING SCREWS

4. Disconnect cooling fan electrical connector.
5. Carefully remove radiator.

Installing the Radiator

For installation, reverse the removal procedure however, pay attention to the following details.

Fill radiator with the recommended coolant. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Bleed the cooling system, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Check for coolant leaks from radiator and hoses.

RADIATOR COOLING FAN RELAY (R1)

Installing the Relay

Relay may be inverted by 180° at installation and it will work correctly.

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1. R1: Radiator cooling fan relay

Testing the Relay Operation

The easiest way to check the relay is to remove it and temporarily substitute with a new one. If the radiator cooling fan operates, the relay is defective.

RADIATOR COOLING FAN

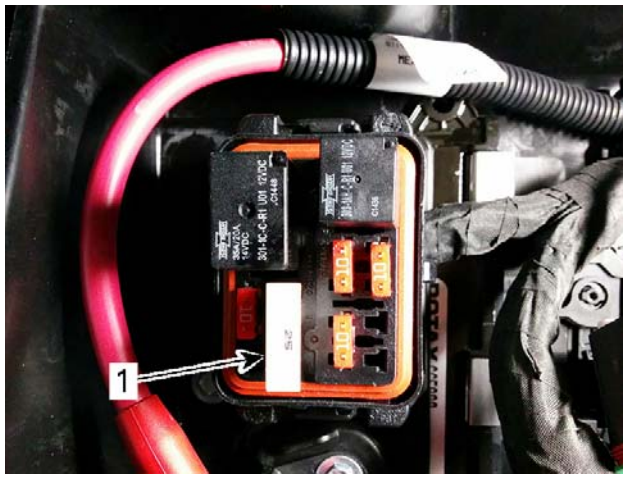
Radiator Cooling Fan Operation

The ECM controls the radiator cooling fan via the inputs of the coolant temperature sensor (CTS). Refer to the following table.

ENGINE TEMP.	96°C (205°F)	92°C (198°F)	114°C (237°F)
COOLING FAN	Turns ON	Turn OFF	ON
CHECK ENGINE LIGHT	—	—	OFF
MESSAGE IN GAUGE	—	—	- Limp Home - Hi Temp
LIMP HOME MODE	—	—	Gradual power reduction according to engine temperature.

Radiator Cooling Fan Fuse Location

The fuse (25A) is located in the fuse box underneath the passenger seat, near the battery.



1. Cooling fan fuse

Testing the Radiator Cooling Fan

1. Connect the vehicle to BUDS2, refer to *COMMUNICATION TOOLS* for procedure and connector location.
2. In BUDS2 software, select the following:
   - **Scan** button
   - **Function** tab
   - **ECM** tab
   - **Cooling Fan** button.

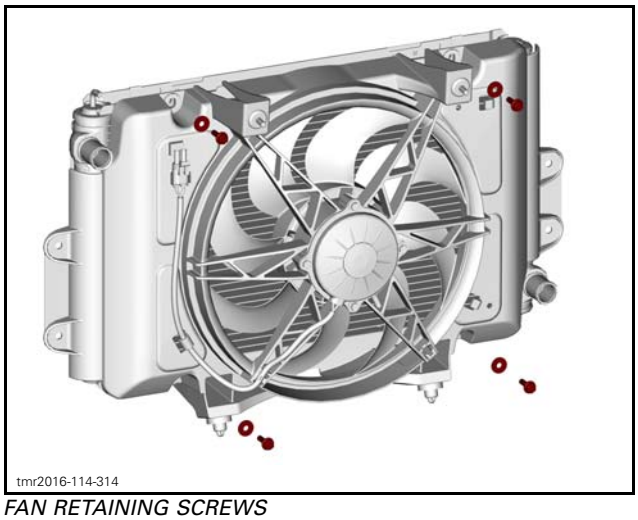
If fan turns on, check CTS, wiring harness and connectors. If all parts are good, replace the ECM.

If fan does not turn on when the **Cooling Fan** button is pressed, refer to the following troubleshooting chart.

COOLING FAN TROUBLESHOOTING CHART		
Is fan working?	YES →	Everything is OK
NO ↓		
Check fan fuse (25A). Is fuse burnt?	YES →	Replace fuse Is fan working?
NO ↓		
Bypass fan relay R1		
↓		
Fan turns?	YES →	Replace relay Is fan working?
NO ↓		
Apply 12 Vdc to fan connector		
↓		
Fan turns?	NO →	Replace fan Is fan working?
YES ↓		
Check CTS		
↓		
CTS works?	NO →	Replace CTS Is fan working?
YES ↓		
Check wiring harness and connectors		
↓		
Harness and connectors good?	NO →	Repair or replace defective part(s)
YES ↓		
Try a new ECM	→	Is fan working?

Removing the Radiator Cooling Fan

1. Remove the radiator.
2. Remove 4 fan retaining screws.
3. Remove the radiator fan.



FAN RETAINING SCREWS

Installing the Radiator Cooling Fan

For the installation, reverse the removal procedure.

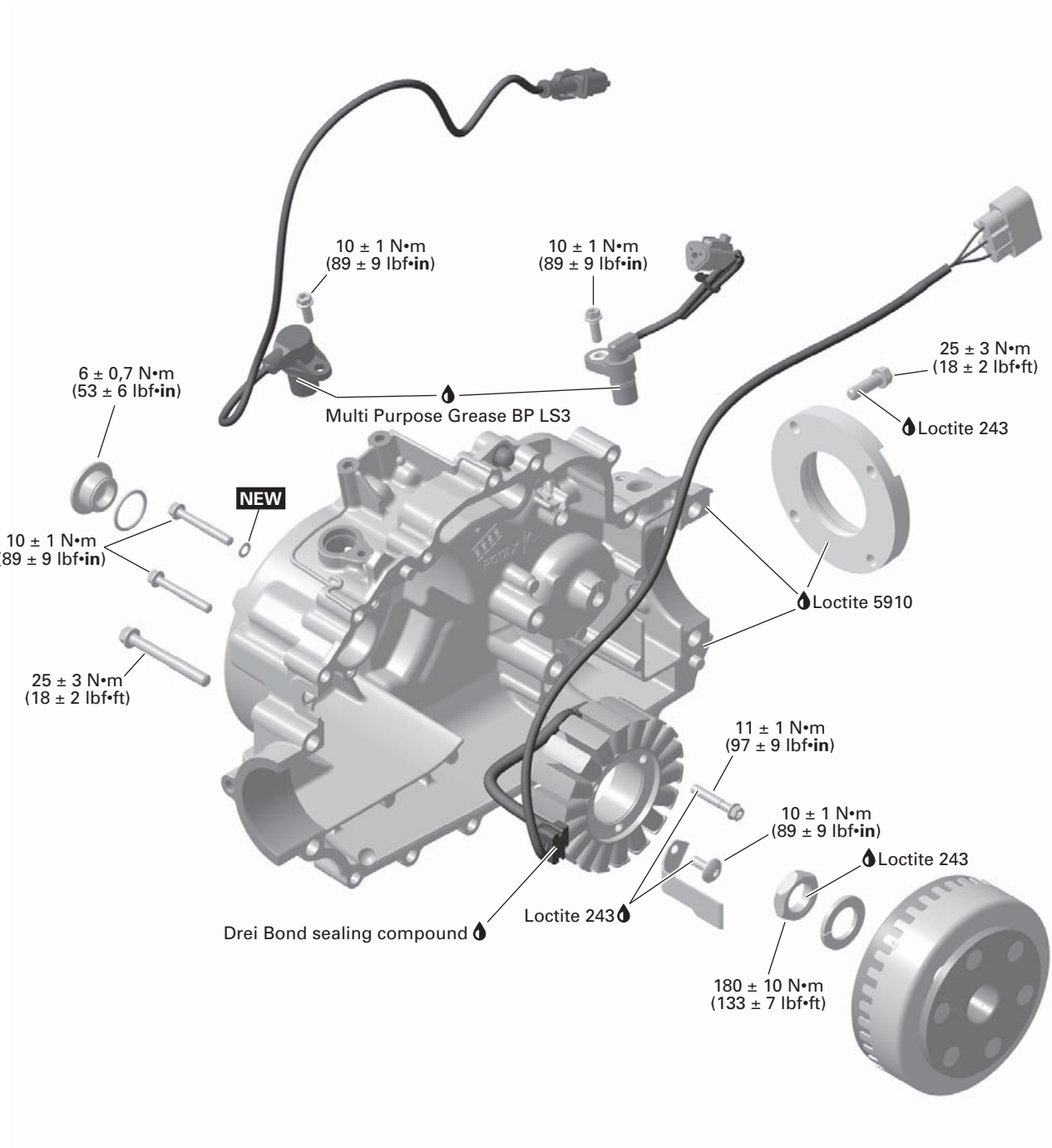
MAGNETO AND STARTER (HD5)

SERVICE TOOLS

Description	Part Number	Page
CRANKSHAFT PROTECTOR (MAG)	420 876 557	9
FLUKE 115 MULTIMETER	529 035 868	4
HANDLE	420 877 650	13
MAGNETO PULLER	529 035 748	9
STARTER DRIVE NEEDLE INSTALLER	529 035 934	13

SERVICE PRODUCTS

Description	Part Number	Page
CLUTCH AND PULLEY FLANGE CLEANER PRO S1	779244	10
DIELECTRIC GREASE	293 550 004	12
ISOFLEX GREASE TOPAS NB 52	293 550 021	15
LOCTITE 243 (BLUE)	293 800 060	7, 10
LOCTITE 5910	293 800 081	5
LOCTITE CHISEL (GASKET REMOVER)	413 708 500	5
SUPER LUBE GREASE	293 550 030	12



NEW = Component must be replaced when removed.

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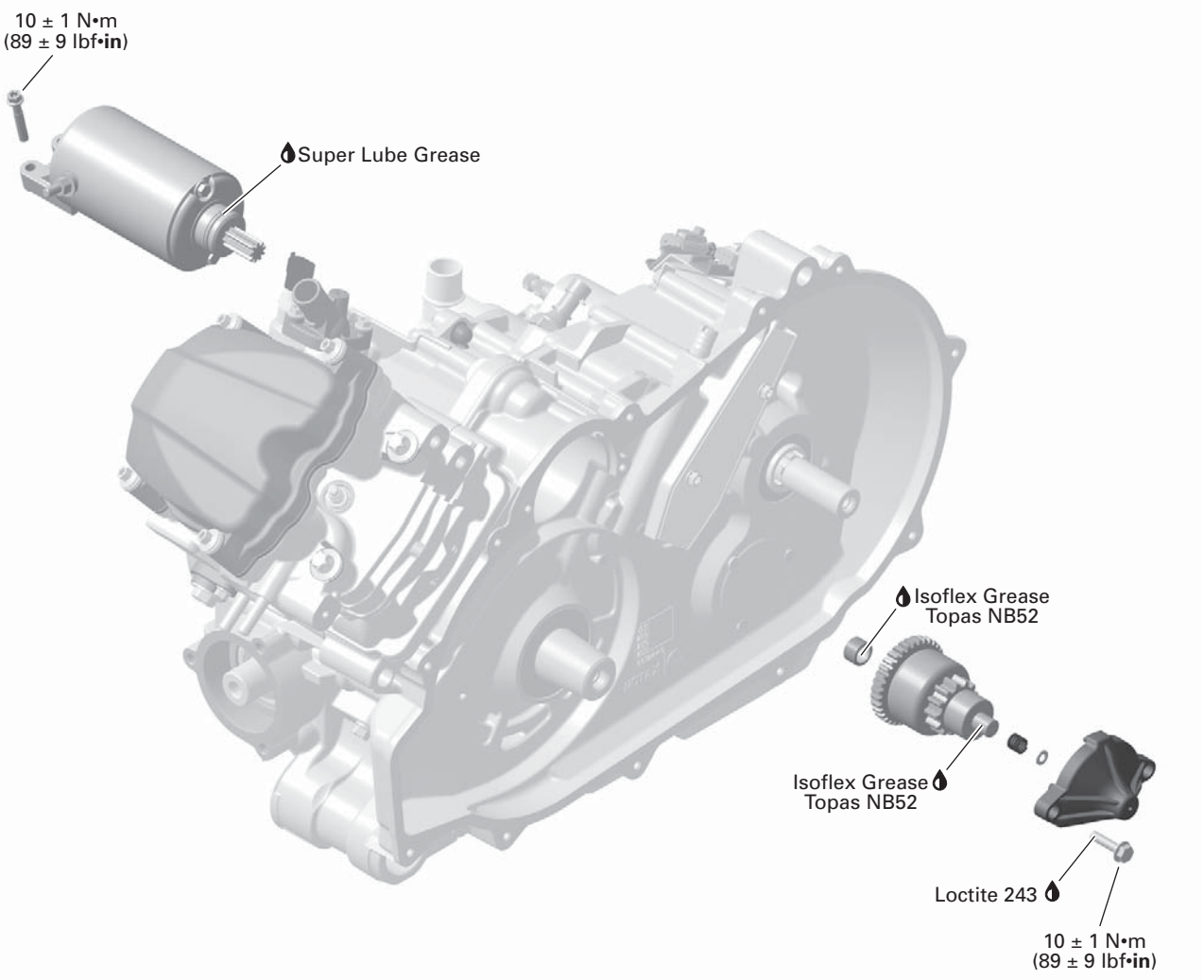

NEW = Component must be replaced when removed.

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GENERAL

The following tool is required to test most of the electrical parts.

REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	

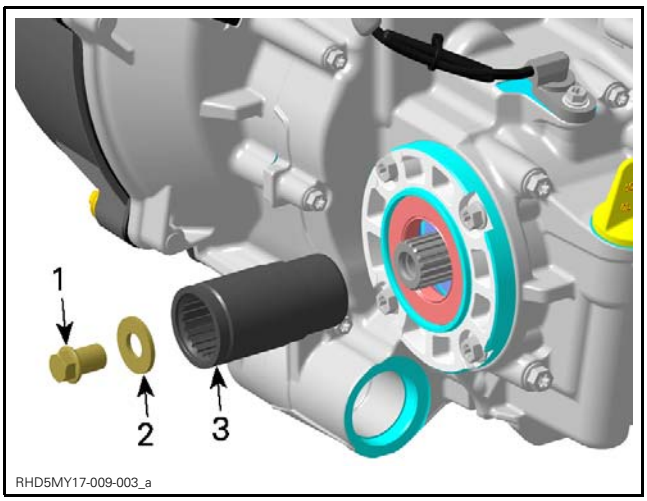
PROCEDURES

MAGNETO COVER

Removing the Magneto Cover

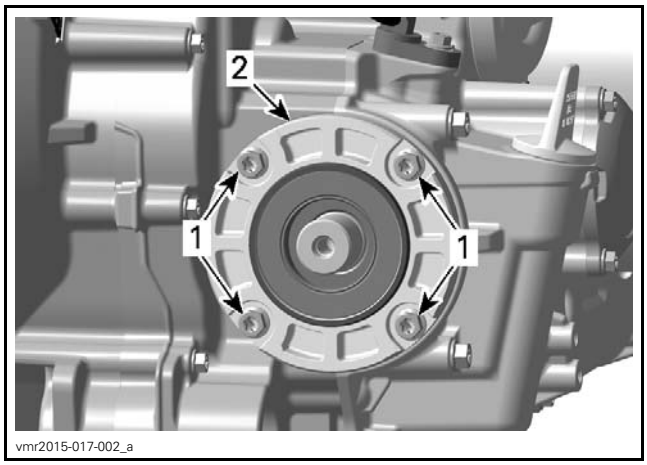
1. Remove engine from vehicle.
2. Remove 4WD coupling unit, refer to *GEARBOX AND 4X4 COUPLING UNIT* subsection.
3. Lock crankshaft at TDC, refer to *BOTTOM END* subsection.
4. Disconnect:
   - Stator
   - CPS
   - VSS.
5. Remove:
   - Water pump cover, refer to *COOLING SYSTEM* subsection
   - Starter, refer to procedure in this subsection.
6. Remove coupling sleeve.

Set gearbox to PARK position.



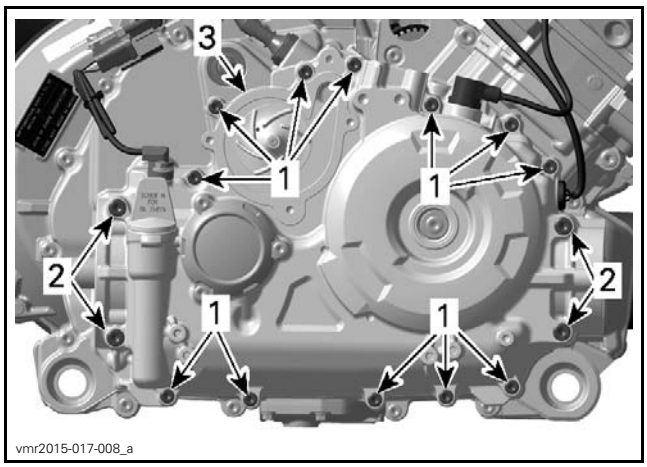
1. Retaining screw
2. Washer
3. Coupling sleeve

7. Remove bearing cover screws.
8. Remove bearing cover.



1. Screws
2. Bearing cover

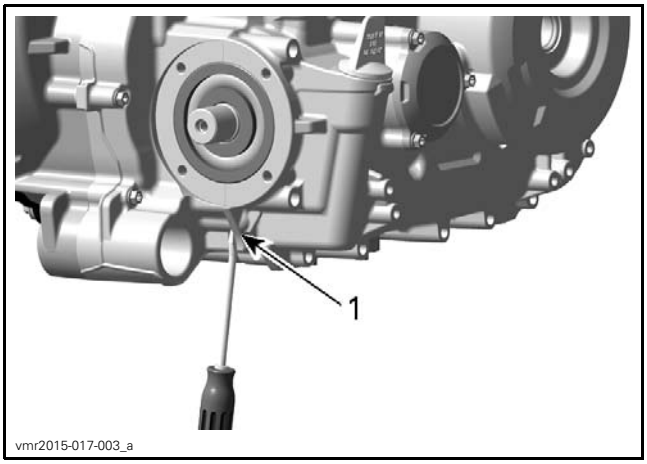
9. Remove magneto cover screws:
   - 9.1 Start removing M6 screws.
   - 9.2 Then remove the M8 screws.



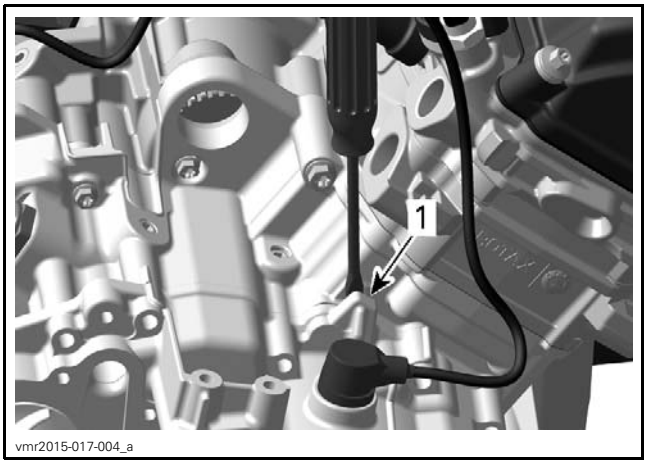
1. M6 screws
2. M8 screws
3. Magneto cover

10. Remove magneto cover.

NOTE: Lift the magneto cover from the provided area using two flat screwdrivers prying equally at the same time.

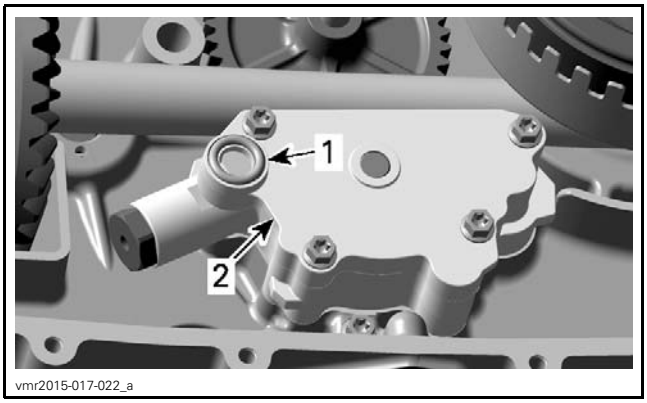


1. Special area for removal of magneto cover



1. Special area for removal of magneto cover

NOTE: Do not loose oil pump cover O-ring when removing the magneto cover.



1. O-ring
2. Oil pump cover

Cleaning and Inspecting the Magneto Cover

Check magneto cover and bearing cover for cracks or other damages. Replace if necessary.

Clean all metal component in a solvent.

Clean magneto cover, crankcase and bearing cover sealing surfaces.

SERVICE PRODUCT
LOCTITE CHISEL (GASKET REMOVER) (P/N 413 708 500)

REQUIRED TOOL
Brass brush

First, brush in one direction, then make the final brushing perpendicularly (90°) to the first pass.

NOTICE **Do not wipe with rags. Use a new clean hand towel only.**

Installing the Magneto Cover

Reverse the removal procedure. However, pay attention to the following.

Put ball bearings of output shaft exactly in place, refer to *OUTPUT SHAFT* in the *GEARBOX AND 4X4 COUPLING UNIT* subsection.

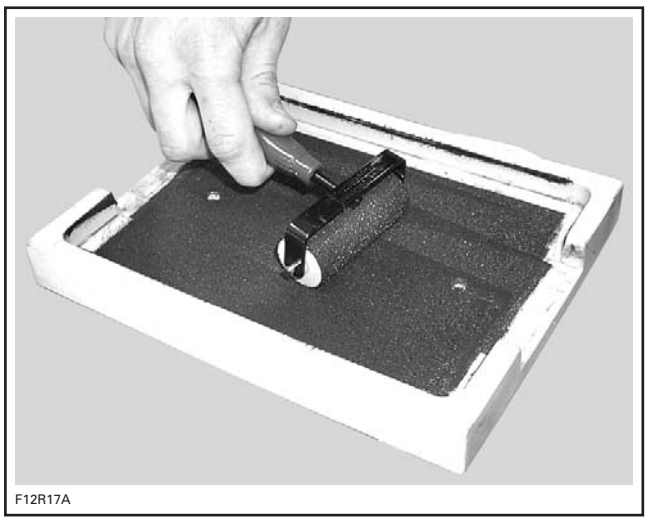
Apply sealant on mating surfaces.

SERVICE PRODUCT
LOCTITE 5910 (P/N 293 800 081)

IMPORTANT: When beginning the application of the sealant, the assembly and the first torquing should be done within 10 minutes. It is suggested to have all you need on hand to save time.

Use a plexyglass plate and apply some sealant on it. Use a soft rubber roller50 mm to 75 mm (2 in to 3 in), available in arts products suppliers for printing, and roll the sealant to get a thin uniform coat on the plate (spread as necessary). When ready, apply the sealant on magneto cover and bearing cover mating surfaces.

NOTE: It is recommended to apply this specific sealant as described here to get an uniform application without lumps. If you do not use the roller method, you may use your finger to uniformly distribute the sealant (using a finger will not affect the adhesion).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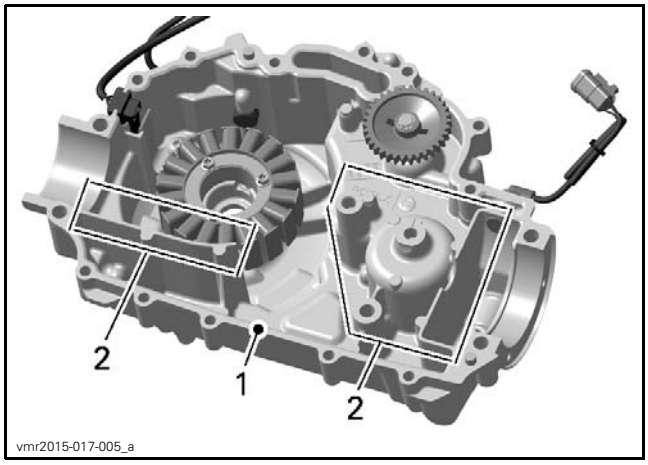
Apply sealant all around the magneto cover mating surface except the areas described below.

NOTE: Do not apply in excess as it will spread out inside cover.



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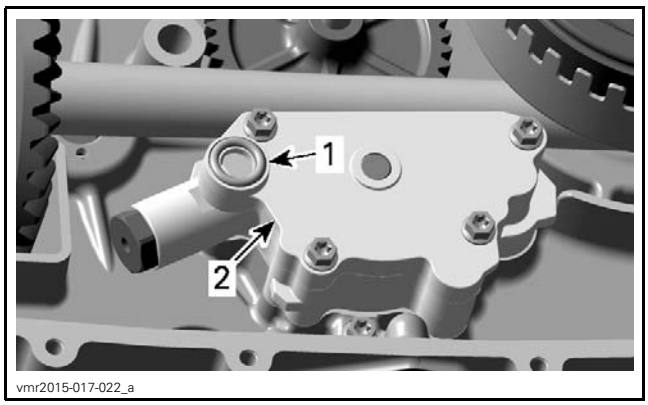
1. *Mating surface on the magneto cover*
2. *No sealant required*

NOTE: Ensure that oil pump cover O-ring is in place before installing the magneto cover.



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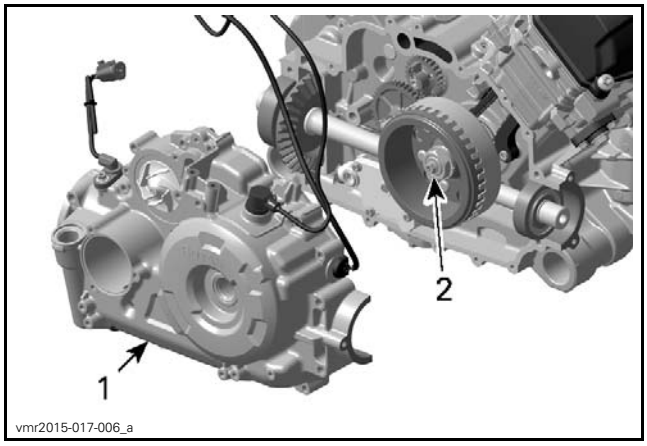
1. *O-ring*
2. *Oil pump cover*

Install the magneto cover.



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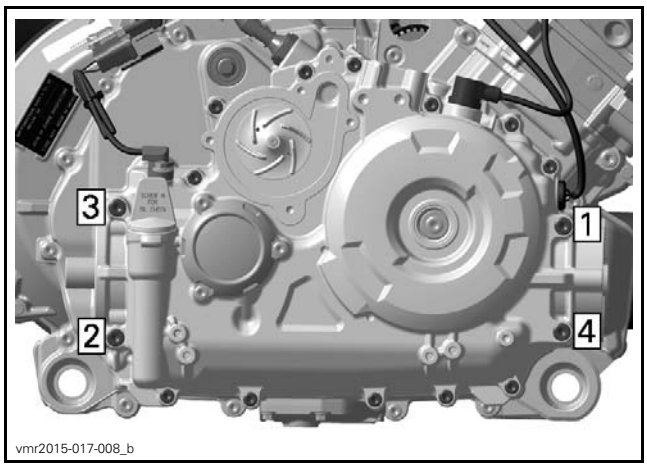
1. *Magneto cover*
2. *Crankshaft MAG side*

Tighten the M8 magneto cover screws as per following sequence.



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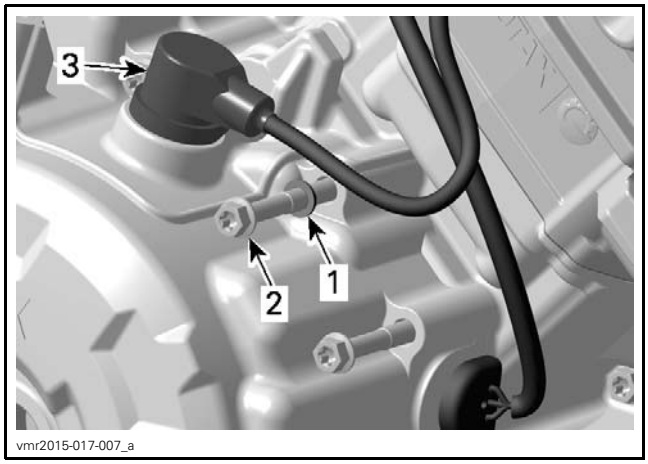
M8 SCREWS TIGHTENING SEQUENCE

TIGHTENING TORQUE	
M8 magneto cover screws	25 N•m ± 3 N•m (18 lbf•ft ± 2 lbf•ft)

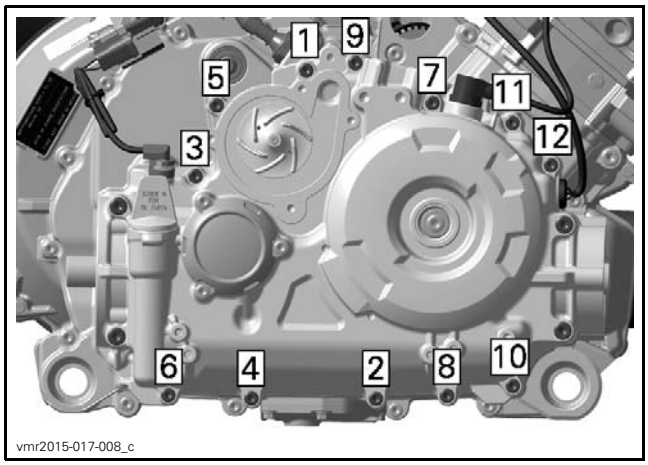
Install a NEW gasket ring on M6 magneto cover screw beside the CPS.

NOTICE Always install a new gasket ring.



1. *Gasket ring*
2. *Screw M6*
3. *CPS (Crankshaft Position Sensor)*

Tighten the M6 magneto cover screws as per following sequence.



M6 SCREWS TIGHTENING SEQUENCE

TIGHTENING TORQUE	
M6 magneto cover screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

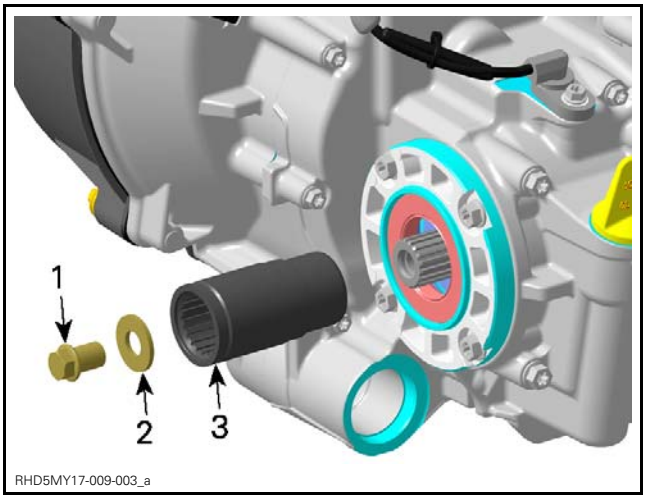
Install the bearing cover.

Tighten bearing cover screws in a criss-cross sequence to specification.

TIGHTENING TORQUE	
Bearing cover screws	25 N•m ± 3 N•m (18 lbf•ft ± 2 lbf•ft)

Let the sealant dry before starting engine. Refer to the manufacturer's label for the sealant curing time.

Install the coupling sleeve and tighten the retaining screw to specification.



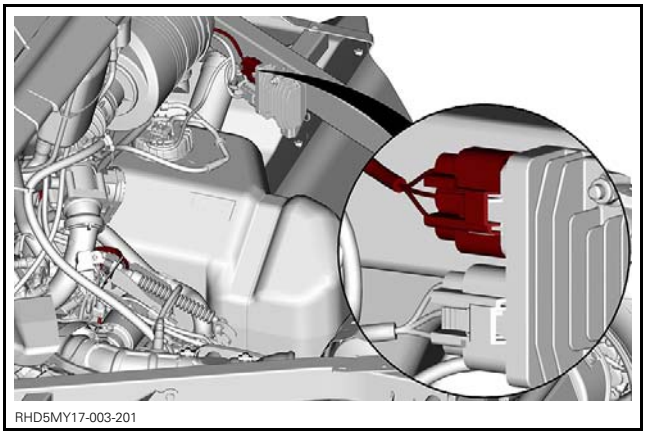
1. *Retaining screw*
2. *Washer*
3. *Coupling sleeve*

TIGHTENING TORQUE	
Coupling sleeve retaining screw	45 N•m ± 5 N•m (33 lbf•ft ± 4 lbf•ft) + LOCTITE 243 (BLUE) (P/N 293 800 060)

STATOR

Stator Connector Access

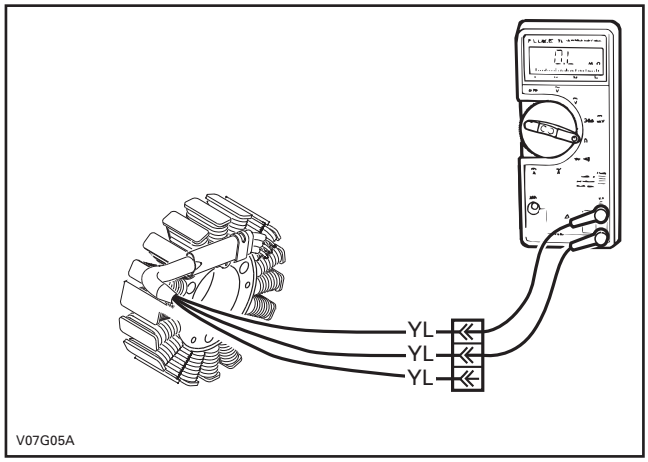
Open the cargo box to access the voltage regulator/rectifier.



Testing the Stator Continuity (Static)

1. Disconnect the stator connector on the voltage regulator/rectifier.
2. Set a multimeter to Ω and measure resistance as following.

TERMINAL	RESISTANCE @ 20°C (68°F)
1 and 2	0.15 - 0.30 Ω
1 and 3	
2 and 3	



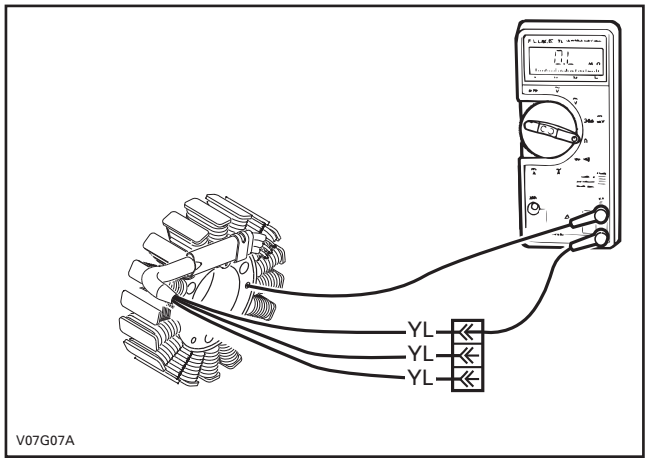
TYPICAL

3. If any reading is out of specification, replace stator.
4. Re-plug connectors properly.

Testing the Stator Insulation (Static)

1. Set multimeter to Ω.
2. Connect multimeter between any YELLOW wire (on stator connector) and engine ground.
3. Read resistance.

TEST PROBES	RESISTANCE @ 20°C (68°F)
Any YELLOW wire and engine ground	Infinite (open circuit)



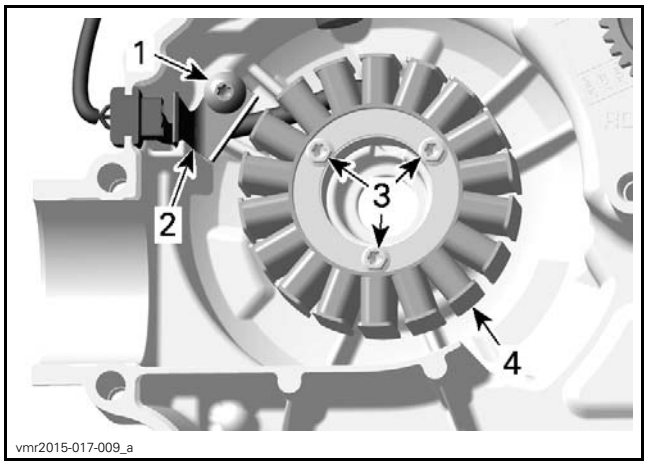
TYPICAL

4. If there is a resistance or continuity, the stator coils and/or the wiring is shorted to ground and needs to be repaired or replaced.
5. Re-plug connectors properly.

Removing the Stator

Remove magneto cover, refer to procedure in this subsection.

Remove:
- Holding strip screw
- Holding strip
- Stator screws
- Stator.



1. Holding strip screw
2. Holding strip
3. Stator screws
4. Stator

Inspecting the Stator

Check stator windings and insulation for cracks or other damages. If damaged replace it.

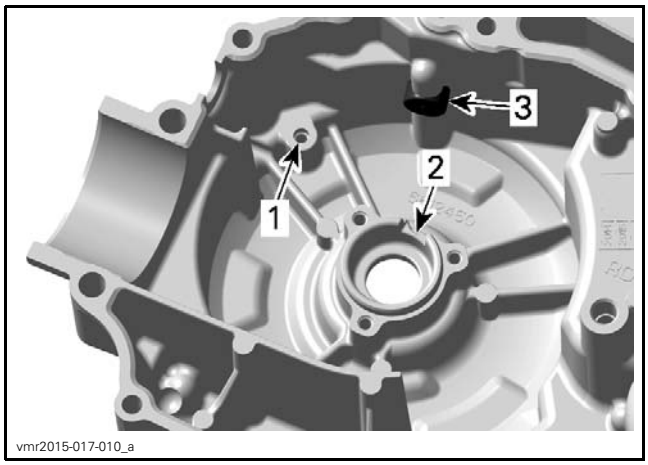
Check if stator wires are brittle, hard or otherwise damaged.

Installing the Stator

The installation is the reverse of the removal procedure. However, pay attention to the following.

NOTICE When installing the stator take care to route wires properly and install holding strip.

There is only one position for the stator (notch in the magneto cover).



1. *Thread for holding strip*
2. *Notch for stator*
3. *Crank position sensor*

ROTOR

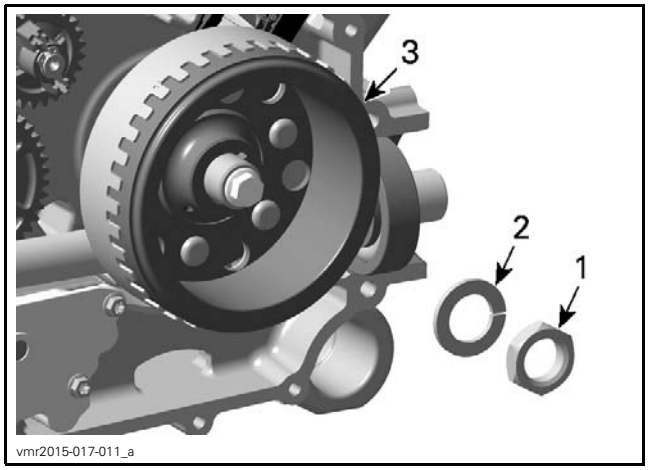
Removing the Rotor

Remove magneto cover, refer to procedure in this subsection.

Lock crankshaft. Refer to *BOTTOM END* subsection.

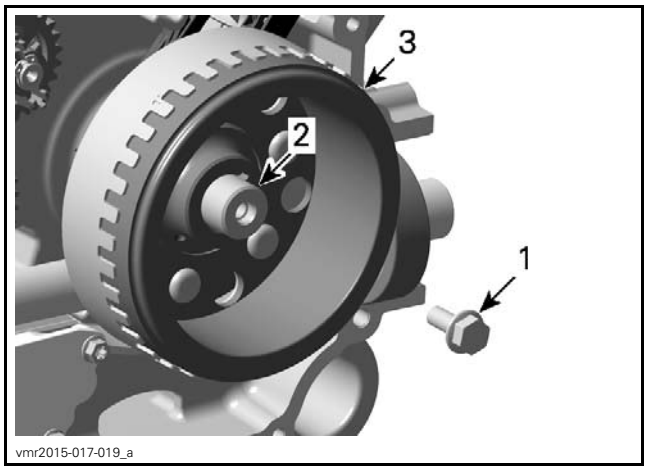
Remove:

– Nut retaining rotor
– Lock washer.



1. *Nut*
2. *Lock washer*
3. *Rotor*

Remove crankshaft plug screw.

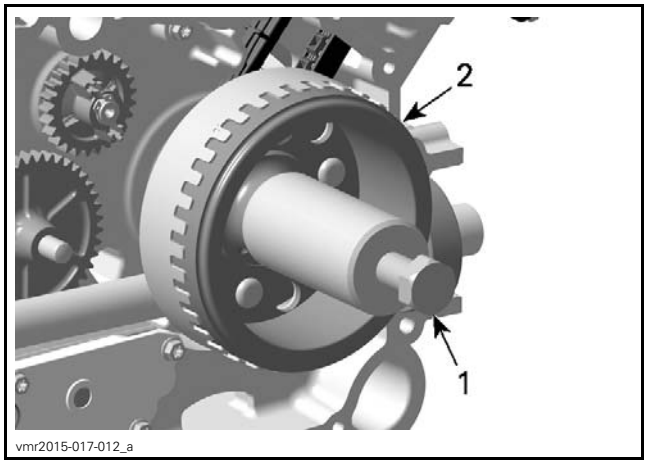


1. *Crankshaft plug screw*
2. *Crankshaft MAG side*
3. *Rotor*

Remove rotor.

REQUIRED TOOL	
CRANKSHAFT PROTECTOR (MAG) (P/N 420 876 557)	
MAGNETO PULLER (P/N 529 035 748)	

NOTE: Use grease to place protector on crankshaft end prior to screw on the magneto puller.



1. *Rotor*
2. *Magneto puller*

Screw magneto puller bolt to remove rotor.

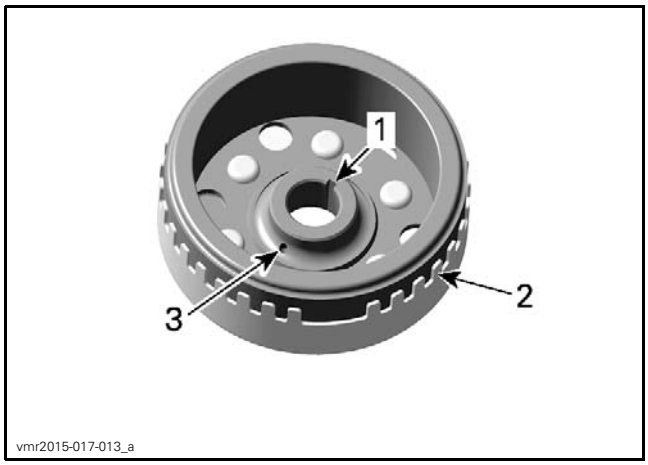
Inspecting the Rotor

Check inner side of rotor for scratches or other damage.

Blow pressurized air in the rotor oil bore and make sure it is not clogged.

Check keyway of the rotor for wear or damages.

Check if trigger wheel teeth are bent or otherwise damaged.



ROTOR
1. *Keyway*
2. *Trigger wheel*
3. *Oil bore*

Check woodruff key and keyway on the crankshaft for wear or damages.

Replace parts as necessary.

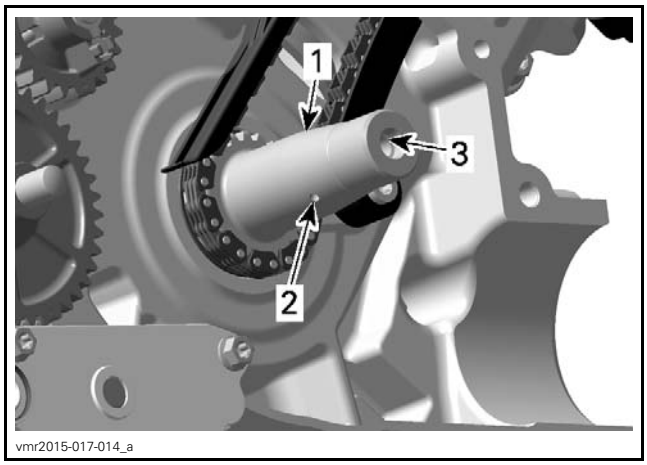
Installing the Rotor

The installation is the reverse of the removal procedure. However, pay attention to the following.

Clean the following parts:
- Crankshaft taper
- Oil passage in crankshaft taper
- Thread on crankshaft
- Oil bore in rotor
- Rotor taper.

SERVICE PRODUCT
CLUTCH AND PULLEY FLANGE CLEANER PRO S1 (P/N 779244)

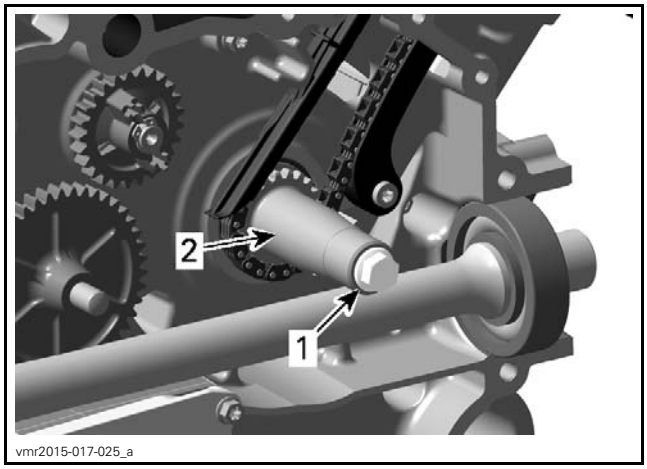
NOTICE **Taper on crankshaft and rotor must be free of grease.**



CRANKSHAFT MAG SIDE
1. *Keyway*
2. *Oil passage*
3. *Threads*

Install crankshaft plug screw.

TIGHTENING TORQUE	
Crankshaft plug screw	35 N•m ± 4 N•m (26 lbf•ft ± 3 lbf•ft) + LOCTITE 243 (BLUE) (P/N 293 800 060)



1. *Crankshaft plug screw*
2. *Crankshaft MAG side*

Slide rotor onto crankshaft. The woodruff key and the keyway must be aligned.

Tighten rotor retaining nut to specification.

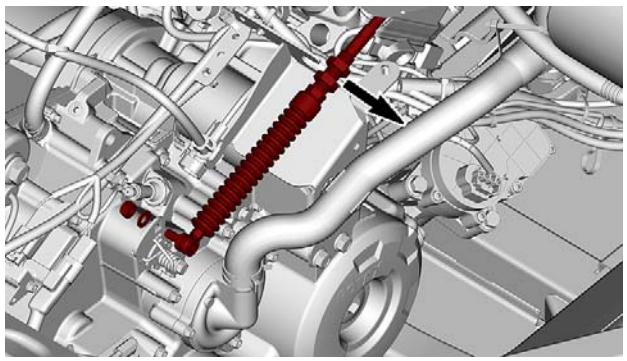
TIGHTENING TORQUE	
Rotor nut	180 N•m ± 10 N•m (133 lbf•ft ± 7 lbf•ft) + LOCTITE 243 (BLUE) (P/N 293 800 060)

STARTER

Starter Access

Open the cargo box.

Detach the shift cable from its bracket.



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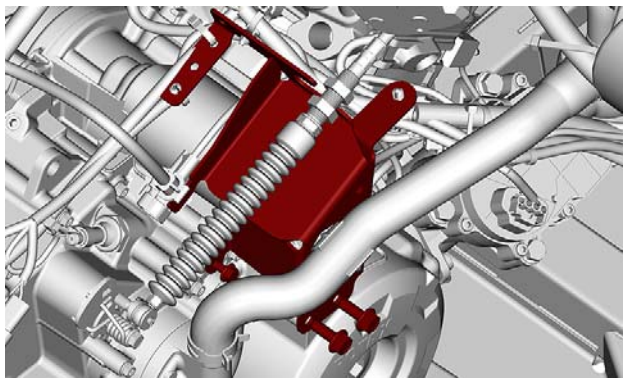
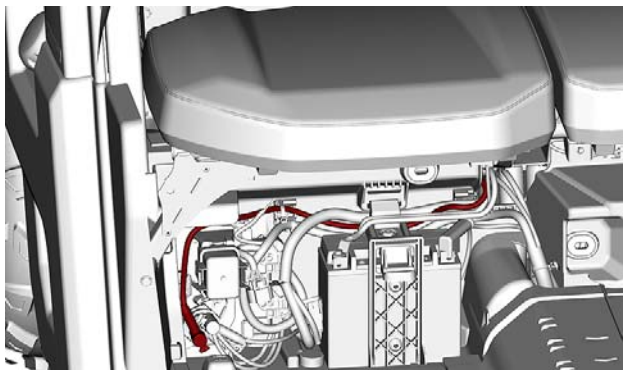
Remove the shift cable bracket.



RHD5MY17-003-203

Testing the Starter Operation

1. Disconnect the starter power cable from the solenoid.



RHD5MY17-003-204

2. Pull the starter power cable forward.
3. Using booster cables and a battery or a booster pack, carefully supply current directly to the starter power cable.

NOTICE First connect the red jumper cable from the booster battery to the starter cable. Momentarily connect the BLACK (-) cable from the booster battery to a good ground last.

If the starter turns, test other starting system components. Refer to *STARTING SYSTEM* subsection.

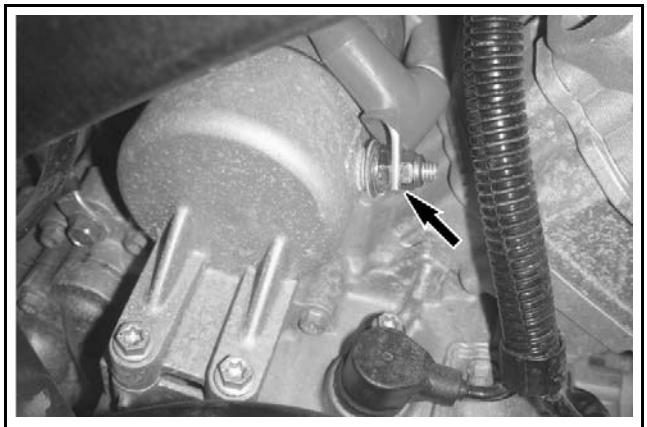
Removing the Starter

1. Disconnect the BLACK (-) battery cable from the battery.

⚠ WARNING

Always disconnect BLACK (-) battery cable first and reconnect last.

2. Disconnect the RED (+) power cable from starter.



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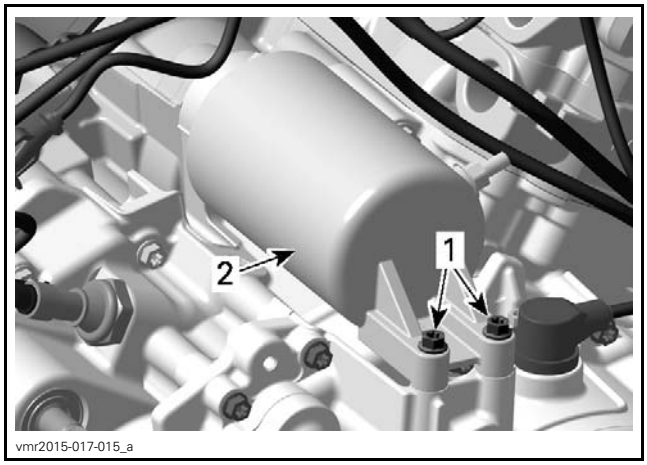
TYPICAL

3. Clean starter and surrounding area.
4. Remove starter mounting screws.



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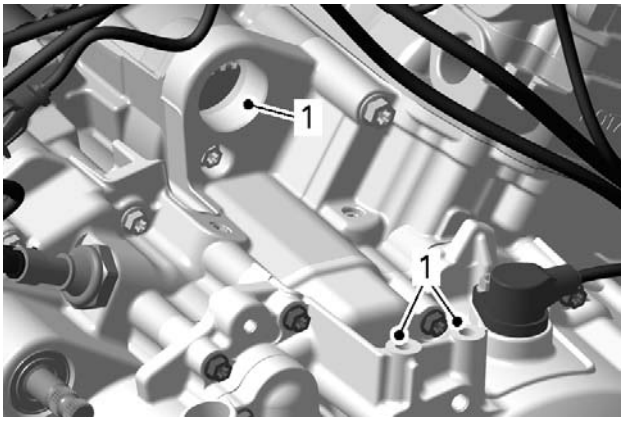
1. *Starter mounting screws*
2. *Starter*

5. Pull starter out from crankcase.

Installing the Starter

The installation is the reverse of the removal procedure. However, pay attention to the following.

Make sure the starter and engine mating surfaces are free of debris. Serious problems may arise if the starter is not properly aligned.



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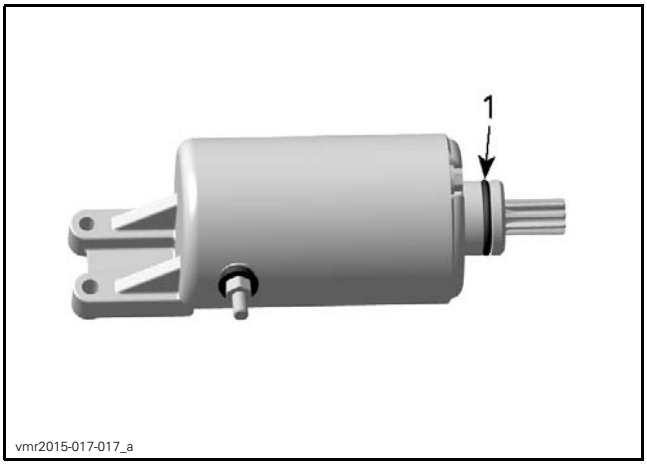
1. Clean starter mating surfaces

SERVICE PRODUCT	
Starter O-ring	SUPER LUBE GREASE (P/N 293 550 030)

Lubricate starter O-ring.



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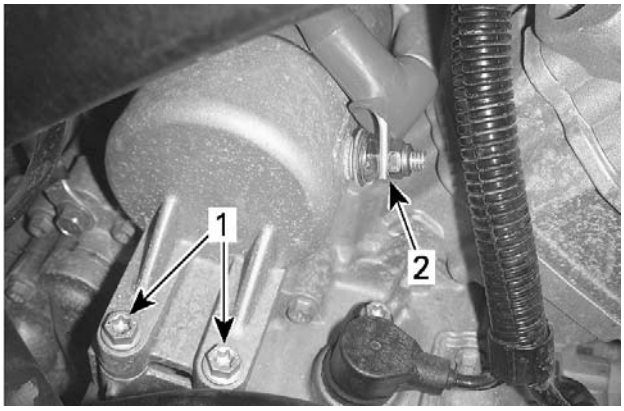
1. Lubricate starter O-ring

Install starter and tighten retaining screws to specification

TIGHTENING TORQUE	
Starter mounting screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

Connect the RED (+) cable to the starter and tighten nut to specification.

TIGHTENING TORQUE	
Starter terminal and retaining nut	6 N•m ± 0.5 N•m (53 lbf•**in** ± 4 lbf•**in**) + DIELECTRIC GREASE (P/N 293 550 004)



vmr2008-139-009_e

1. Starter mounting screws
2. Starter terminal retaining nut

Connect the BLACK (-) battery cable last.

⚠ WARNING

Always connect the RED (+) starter cable first, then the BLACK (-) battery cable last. Whenever connecting the RED (+) cable to the starter motor, always make sure the BLACK (-) battery cable is disconnected to prevent electric shock.

Test starter operation.

STARTER DRIVE

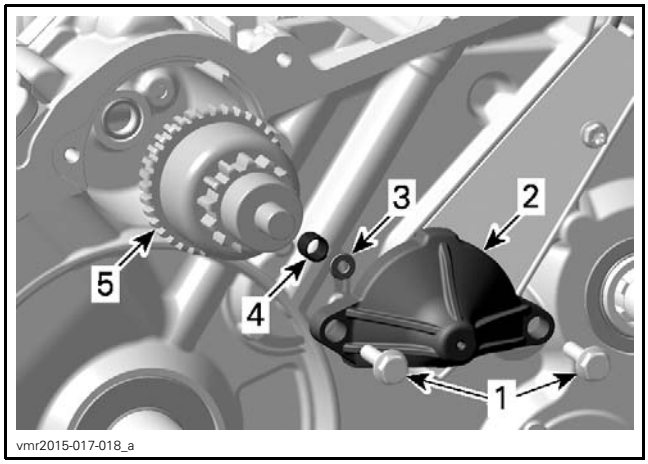
Removing the Starter

Remove drive pulley, refer to *CONTINUOUSLY VARIABLE TRANSMISSION* subsection.

Remove:
– Retaining screws
– Starter drive cover.

NOTE: Do not lose shim and/or spring during removal of starter drive cover.

Pull out starter drive.

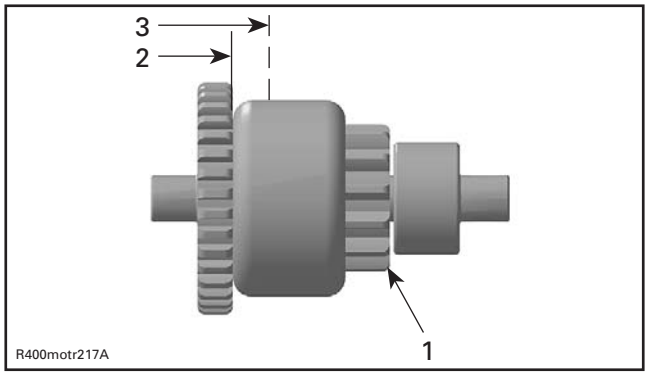


1. *Retaining screws*
2. *Starter drive cover*
3. *Shim*
4. *Spring*
5. *Starter drive*

Inspecting the Starter Drive

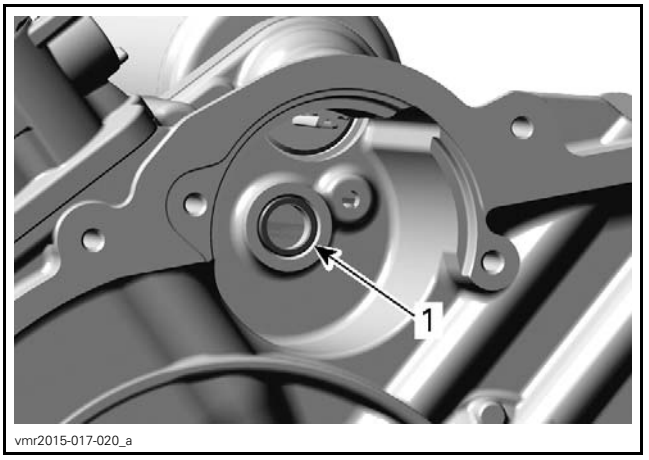
Check if starter drive pinion is free of movement.

NOTE: Centrifugal weights avoid disengaging of the pinion while starting the engine.



1. *Starter drive pinion*
2. *Starting position (spring released)*
3. *Gear is engaged drive pulley fixed half (spring loaded)*

Check needle bearing excessive play and smooth operation. If damaged see *REPLACING THE STARTER DRIVE NEEDLE BEARING* in this subsection.



1. *Starter drive needle bearing*

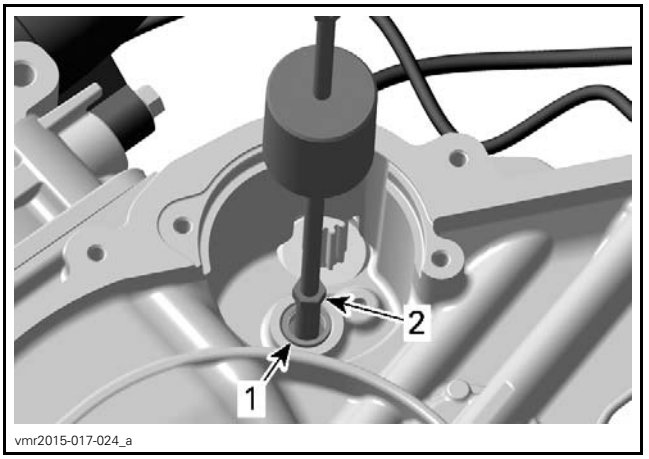
Check starter drive cover for cracks and clean it before reinstallation.

Check bore inside starter drive cover if damaged, worn or otherwise damaged. Replace as necessary.

Replacing the Starter Drive Needle Bearing

Removing the Starter Drive Needle Bearing

REQUIRED TOOL	
Blind hole puller	

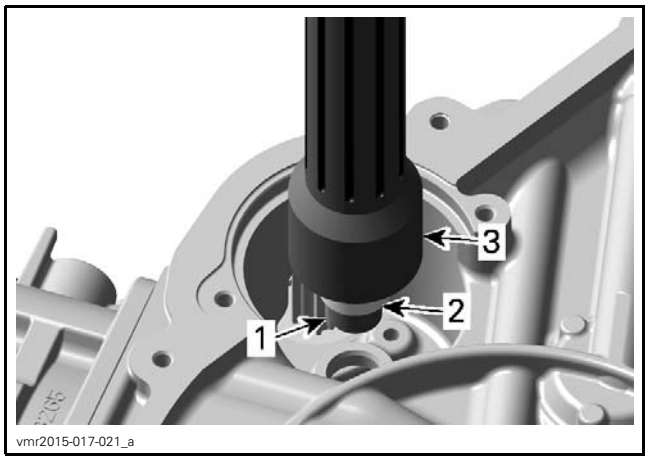


1. *Starter drive needle bearing*
2. *Blind hole bearing puller*

Installing the Starter Drive Needle Bearing

Install needle bearing.

REQUIRED TOOL	
STARTER DRIVE NEEDLE INSTALLER (P/N 529 035 934)	
HANDLE (P/N 420 877 650)	



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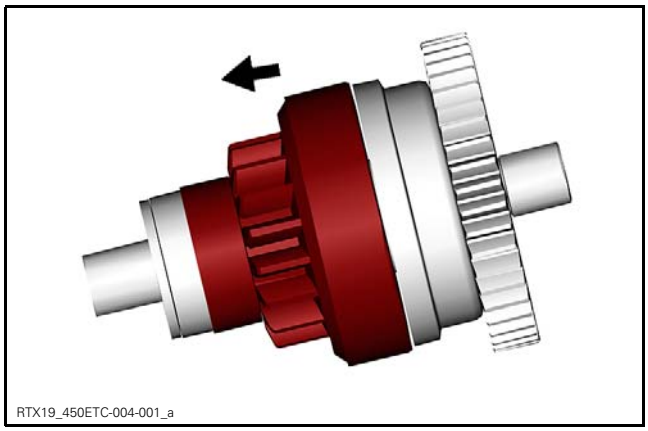
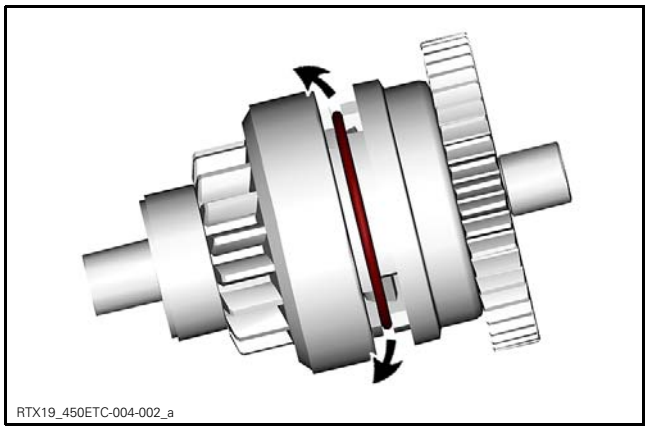
1. *Starter drive needle bearing*
2. *Starter drive needle bearing installer*
3. *Handle*

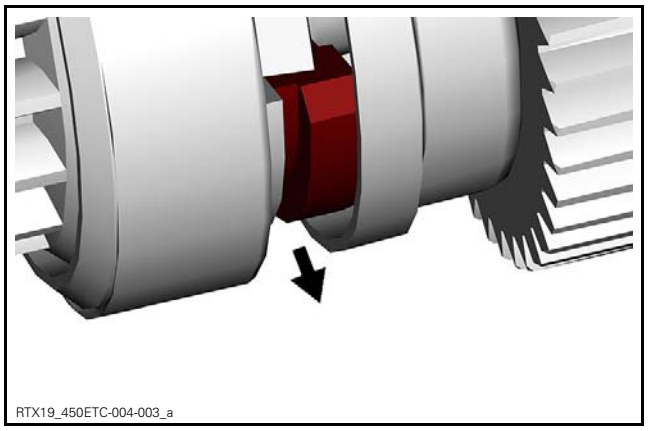
Replacing the Starter Drive Spring

Remove the starter drive. Refer to procedure in this subsection.

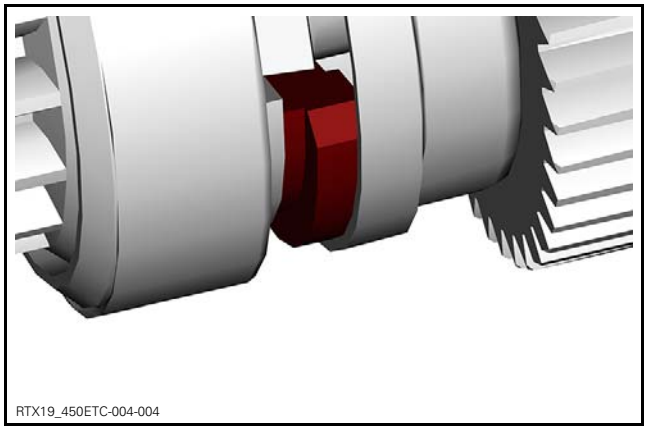
Replace the spring as per the following illustrations.


RTX19_450ETC-004-001_a

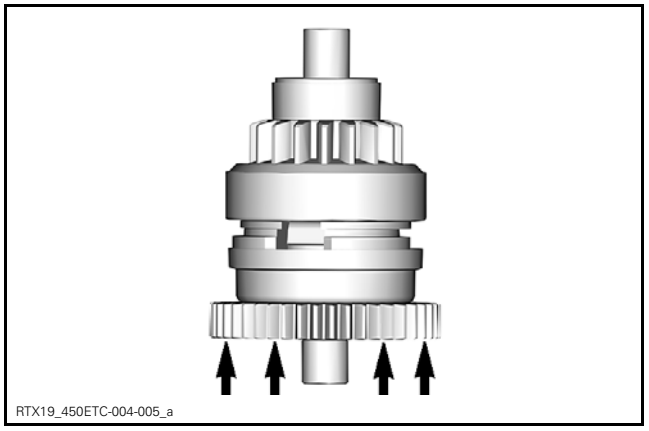

RTX19_450ETC-004-002_a


RTX19_450ETC-004-003_a

Make sure at least 1 centrifugal weight is in work position to keep the starter drive open.


RTX19_450ETC-004-004

Place the starter drive on a support.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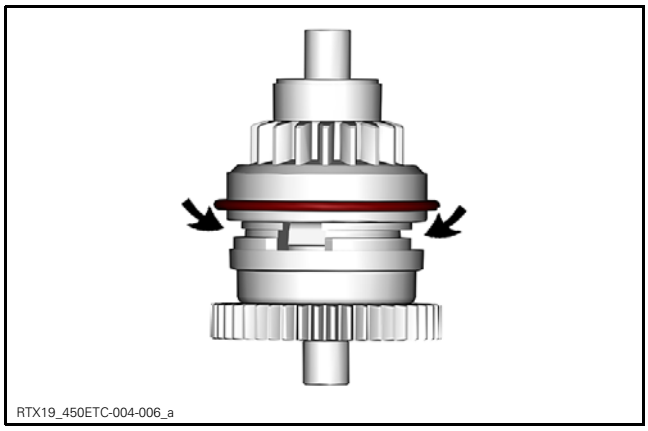
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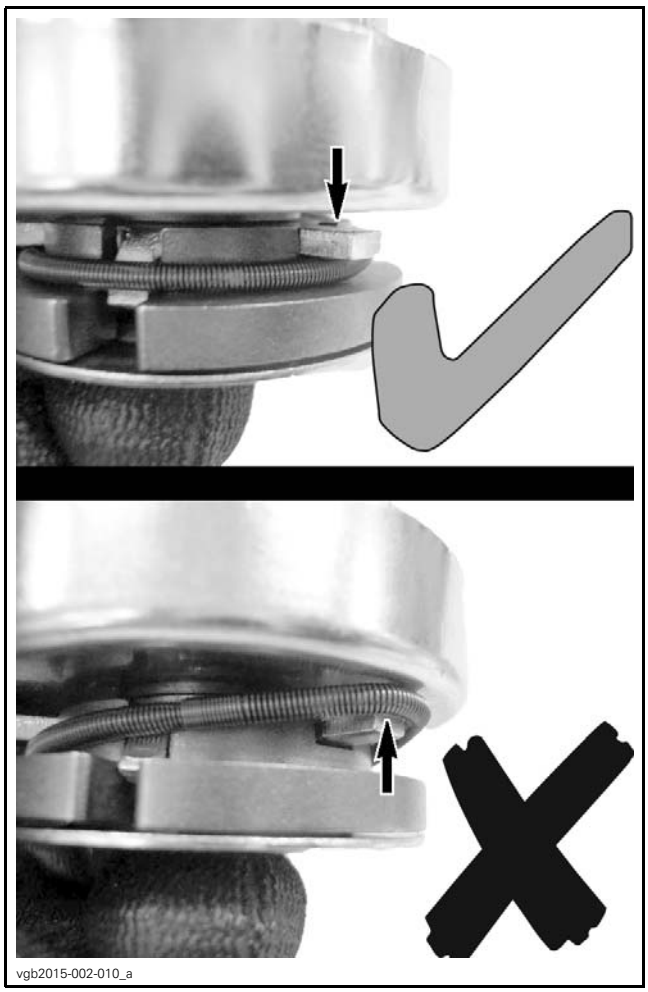
NOTICE Do not overstretch the spring during installation.

Check spring position for all centrifugal weights.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Installing the Starter Drive

The installation is the reverse of the removal procedure. However, pay attention to the following.

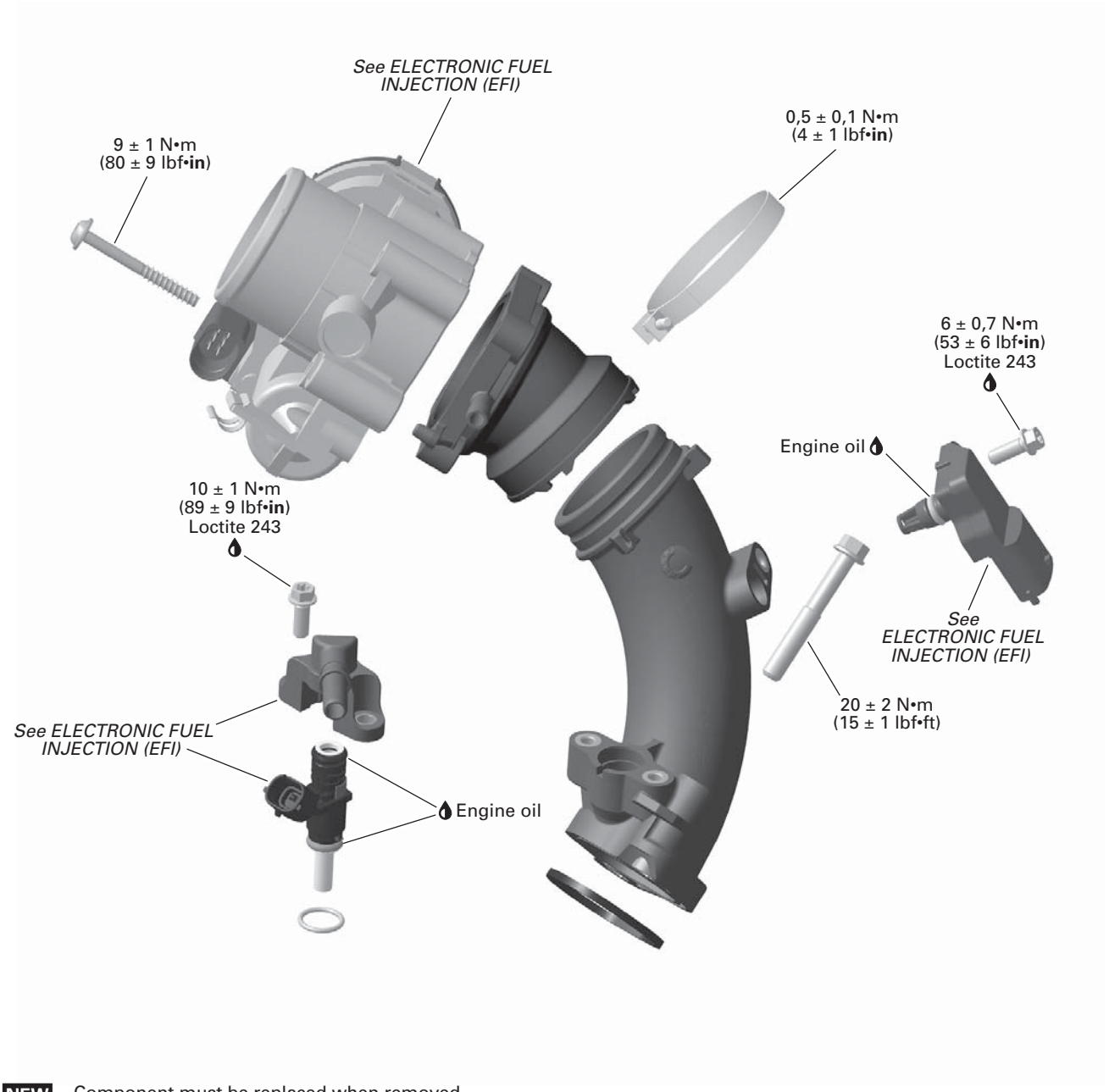
Apply multi-purpose grease inside starter drive pinion cover.

Clean out all residues of grease from:
- Needle bearing in the crankcase
- Starter drive journals
- Starter drive cover bore
- Spring.

Lubricate needle bearing and starter drive cover bore with specified service product.

SERVICE PRODUCT
ISOFLEX GREASE TOPAS NB 52 (P/N 293 550 021)

INTAKE MANIFOLD



NEW = Component must be replaced when removed.

PROCEDURES

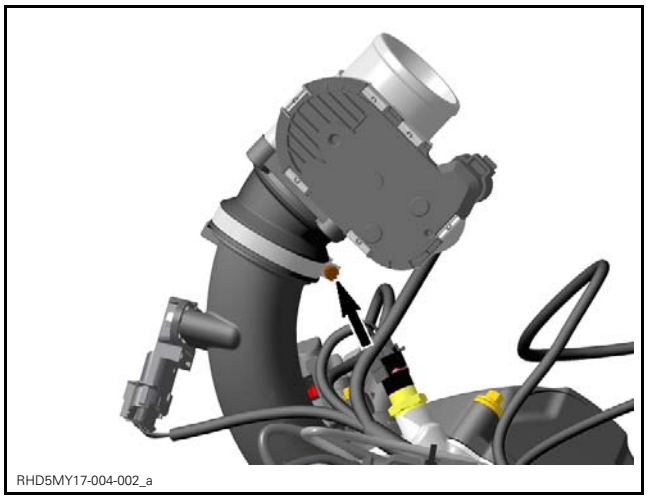
INTAKE MANIFOLD

Intake Manifold Access

Open cargo box.

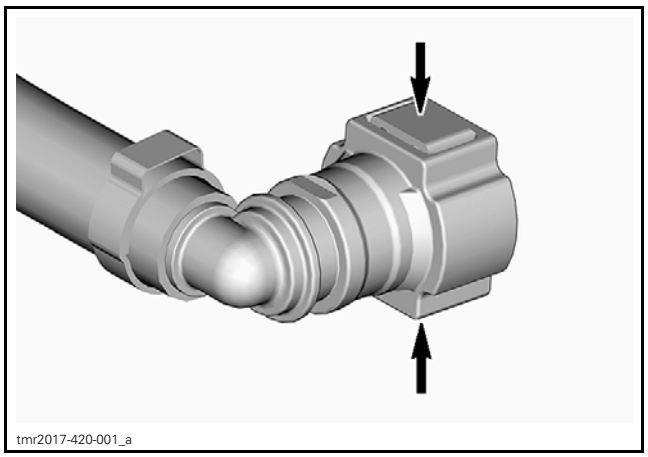
Removing the Intake Manifold

1. Release fuel pressure
   1.1 Disconnect the fuel pump connector
   1.2 Start engine and let it run out of gas.
   .
2. Loosen the lower clamp that retains the intake adapter to the intake manifold.

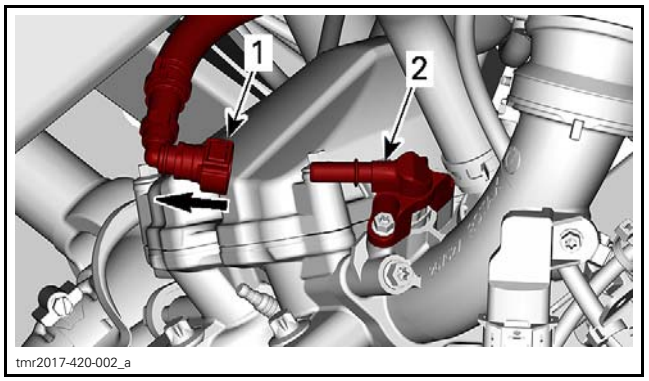


3. Disconnect the fuel hose from the fuel rail.

⚠ CAUTION The fuel hose may still be under pressure.

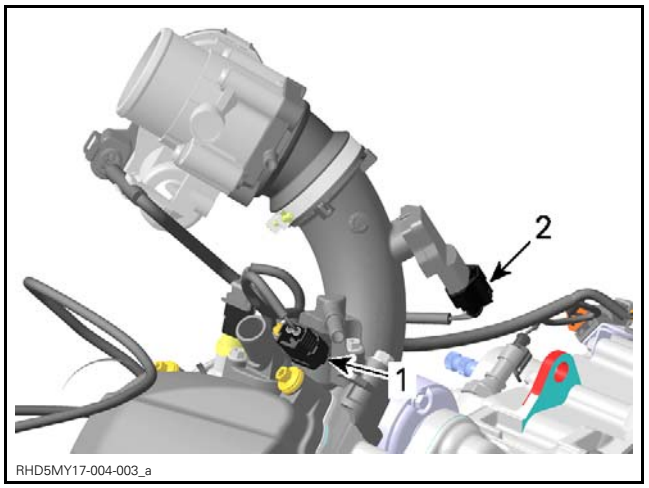


PRESS BUTTONS



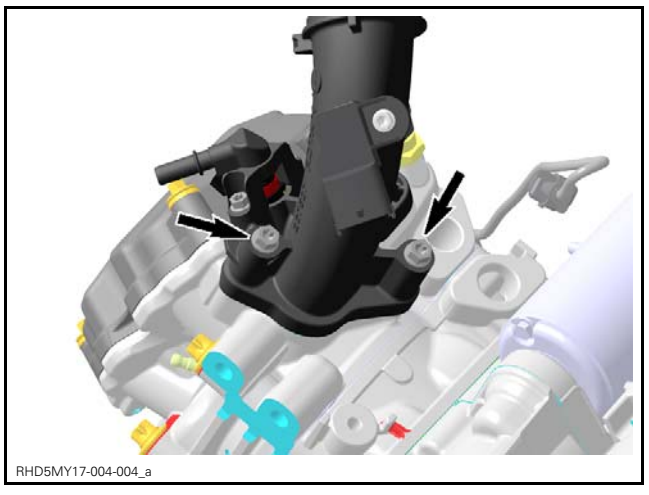
PULL OFF
1. Fuel pressure hose fitting
2. Fuel rail

4. Disconnect:
   – Fuel injector electrical connector
   – MAPTS connector.



1. Fuel injector connector
2. MAPTS connector

5. Remove intake manifold from engine and intake adapter.



Inspecting the Intake Manifold

Check intake manifold for cracks, warping at flanges or any other damage. Replace if necessary.

Installing the Intake Manifold

The installation is the reverse of the removal procedure. However, pay attention to the following.

Tighten intake manifold retaining screws to specified torque.

TIGHTENING TORQUE	
Intake manifold retaining screws	20 N•m ± 2 N•m (15 lbf•ft ± 1 lbf•ft)

TOP END

SERVICE TOOLS

Description	Part Number	Page
DIAL INDICATOR ADAPTER	529 036 159	5
ENGINE LEAK DOWN TEST KIT	529 035 661	5
PISTON CIRCLIP INSTALLER	529 036 083	22
TDC DIAL INDICATOR	414 104 700	5
VALVE GUIDE INSTALLER	529 036 269	17
VALVE GUIDE REMOVER (6 MM)	529 036 074	16
VALVE SPRING COMPRESSOR CUP	529 036 270	13
VALVE SPRING COMPRESSOR	529 035 724	13

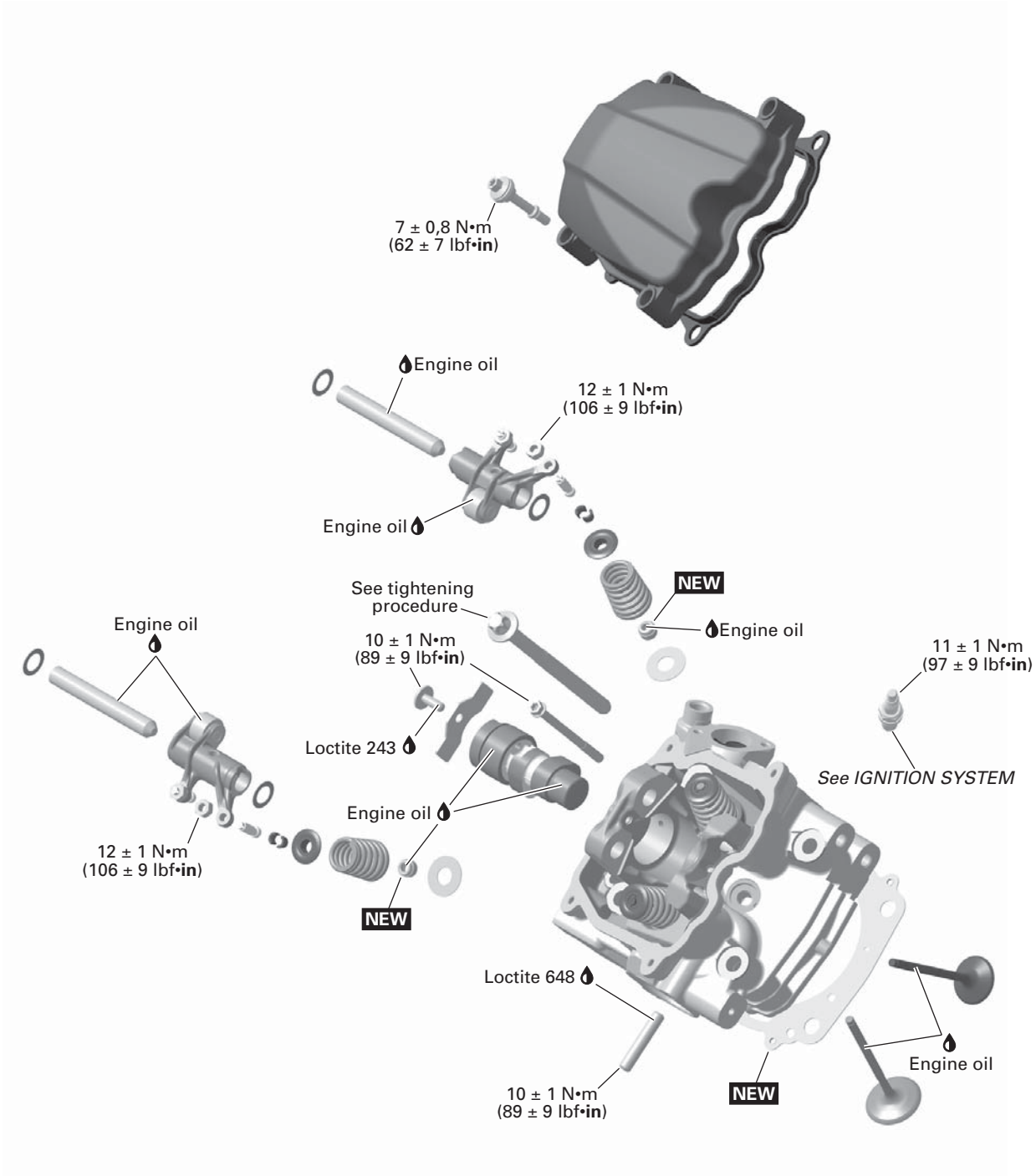
SERVICE TOOLS – OTHER SUPPLIER

Description	Part Number	Page
SNAP-ON PLIERS	YA 8230	14

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 767 (ANTISEIZE LUBRICANT)	293 800 070	17

CYLINDER HEAD



NEW = Component must be replaced when removed.

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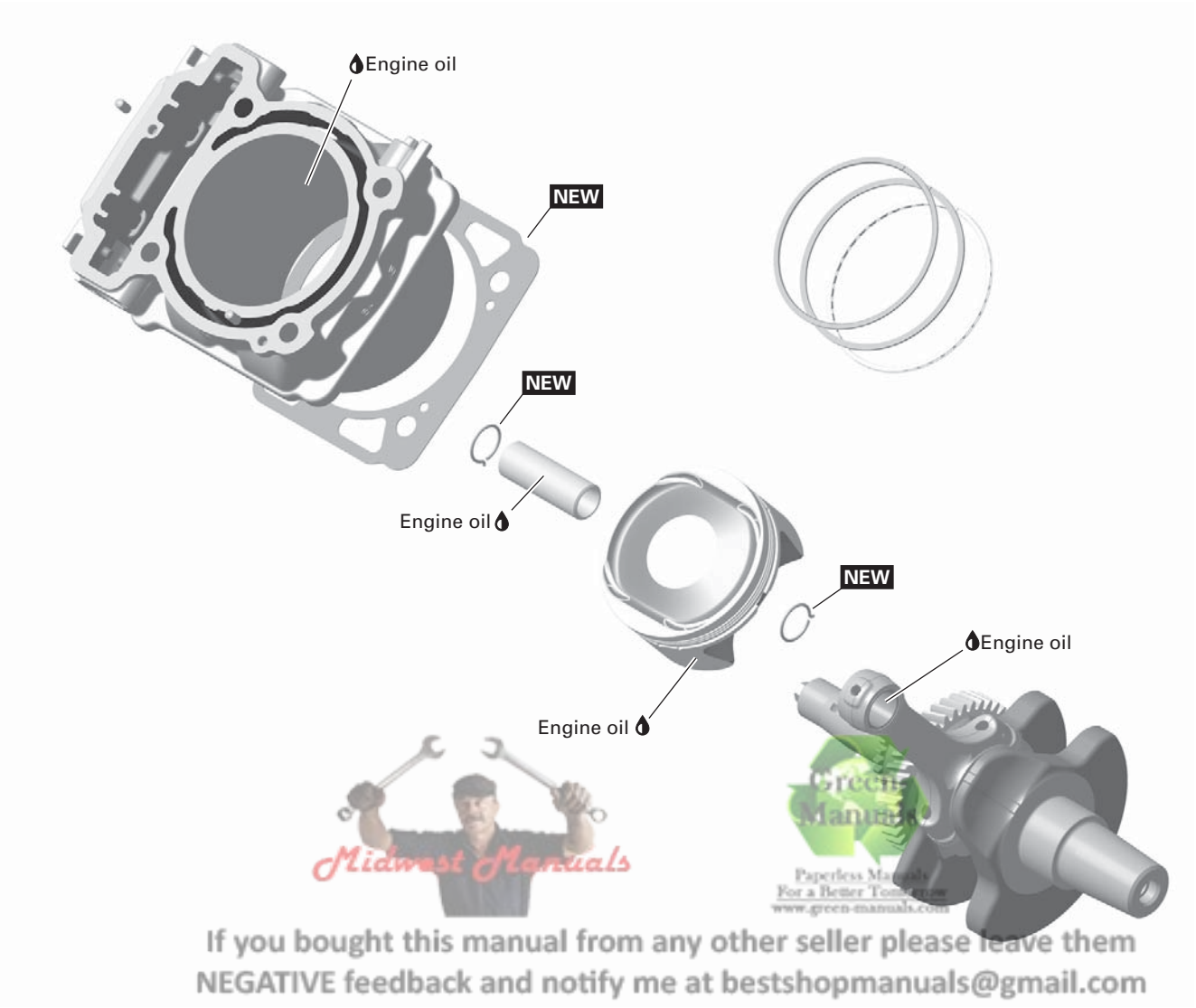
CYLINDER AND PISTON



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NEW = Component must be replaced when removed.

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GENERAL

When diagnosing an engine problem, always perform a cylinder leak test.

NOTE: Even though the following procedures do not require the engine removal, many illustrations show the engine out of the vehicle for more clarity.

IMPORTANT: Note position of parts on disassembly. This may help to find the root cause of a problem. A component that is not replaced should be reinstalled in the same position as originally mounted.

INSPECTION

LEAK TEST

Before performing the cylinder leak test, verify the following:

– Clamp(s) tightness
– Radiator and hoses.

NOTE: For best accuracy, the leak test should be done with the engine at normal operating temperature.

⚠ WARNING

Prevent burning yourself on hot engine parts.

Preparation

Disconnect battery.

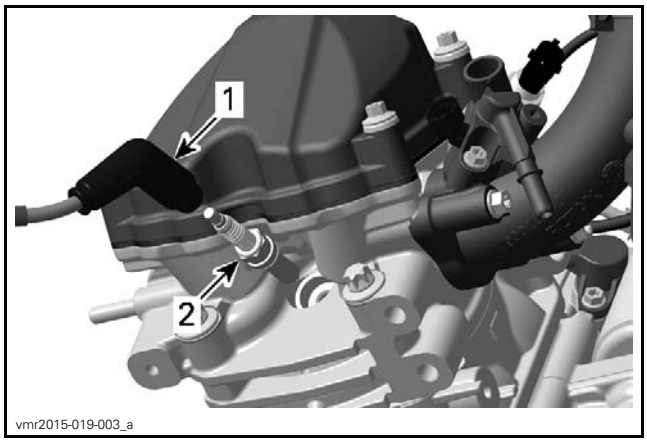
⚠ WARNING

Always respect this order for disassembly; disconnect BLACK (-) cable first.

Remove radiator cap.

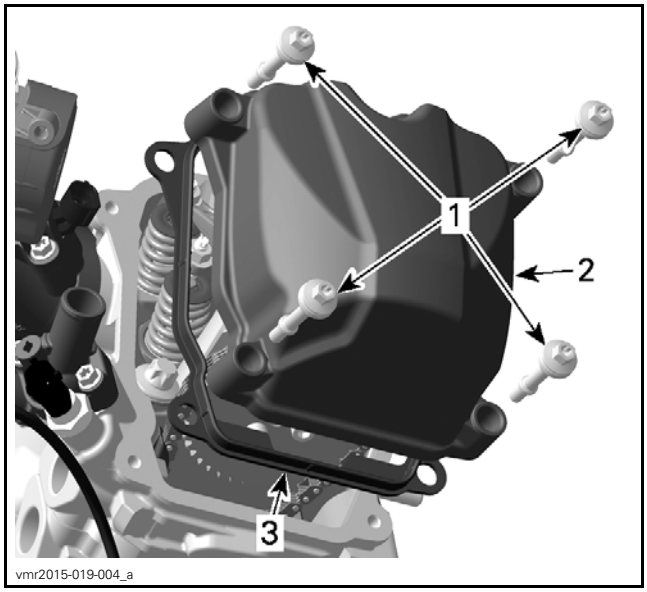
Unplug spark plug cable.

Clean spark plug area and remove spark plug from cylinder head.



1. Spark plug cable
2. Spark plug

Remove valve cover. Refer to procedure in this subsection.



1. Valve cover screws
2. Valve cover

Rotate crankshaft until piston is at TDC ignition.

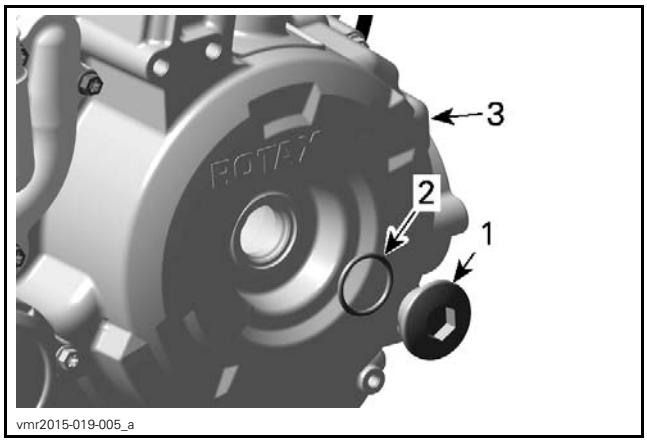
To turn crankshaft, there are two possible procedures.

First Procedure

Turn the drive pulley.

Second Procedure

1. Remove plug screw with O-ring from magneto cover.



1. Plug screw
2. O-ring
3. Magneto cover

2. Turn crankshaft.

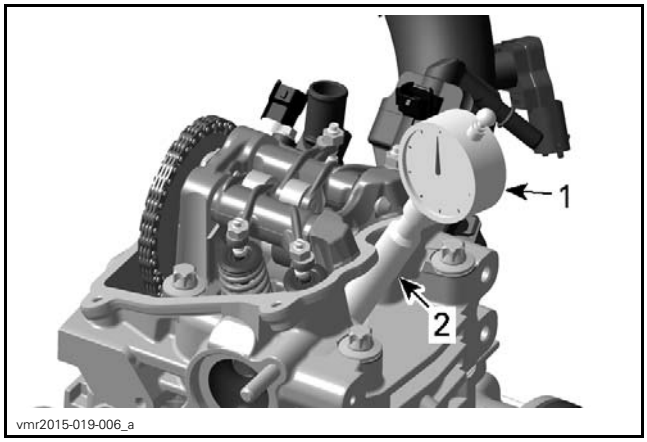
REQUIRED TOOL
13 mm socket

NOTICE Turn only clockwise to avoid loosening of the MAG side screw of the crankshaft.

Set the piston to precisely TDC ignition. For proper procedure refer to *CRANKSHAFT LOCKING PROCEDURE* in the *BOTTOM END* subsection.

NOTE: If engine is removed from vehicle a dial indicator can be used.

REQUIRED TOOL	
TDC DIAL INDICATOR (P/N 414 104 700)	
DIAL INDICATOR ADAPTER (P/N 529 036 159)	

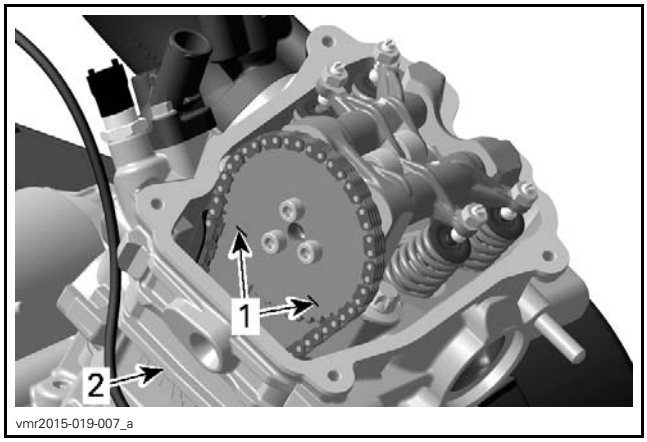


1. TDC dial indicator
2. Dial indicator adapter

NOTE: If a dial indicator is not available, use a screwdriver or another similarly suitable tool.

NOTICE Do not scratch or damage piston/cylinder surface.

NOTE: At TDC ignition the marks on the camshaft timing gear have to be parallel to cylinder head base as per following illustration.



1. Marks on camshaft timing gear
2. Cylinder head base

Leak Test

REQUIRED TOOL	
ENGINE LEAK DOWN TEST KIT (P/N 529 035 661)	

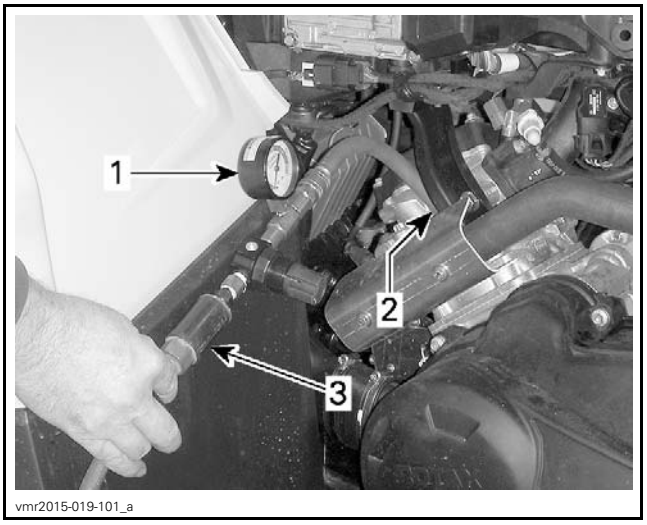
Connect leak tester to adequate air supply.

Set needle of measuring gauge to zero.

NOTE: All testers have specific instructions on gauge operation and required pressure.

Install gauge adapter into previously cleaned spark plug hole.

Supply combustion chamber with air pressure.



TYPICAL
1. *Leak tester*
2. *Leak tester installed in spark plug bore*
3. *Air supply hose*

Note the amount or percentage of leakage (depending on tester).

LEAKAGE PERCENTAGE	ENGINE CONDITION
0% to 15%	Excellent condition
16% to 25%	Good condition
26% to 40%	Fair condition; reduced engine performance
41% and higher	Poor condition, diagnose and repair engine

NOTE: To make sure there is no false reading due to a valves not perfectly seated, tap each valve adjustment screw (on the rocker) using a soft hammer.

Diagnosis

Listen for air leaks.
- Air escaping in intake port/throttle body means leaking intake valve(s).
- Air escaping in exhaust port means leaking exhaust valve(s).
- Air bubbles in the coolant (radiator) means leaking cylinder head gasket.
- Air/coolant escaping from cylinder/head means damaged gasket(s) and/or loosened screws.
- Air escaping into crankcase area means excessively worn cylinder and/or broken piston rings.
- Air/oil escaping from crankcase means damaged gasket and/or loosened screws (refer to *BOTTOM END* subsection).

NOTE: For all the checkpoints mentioned above, see the appropriate engine section to diagnose and repair the engine.

Reassembly

Reverse the preparation procedure. Ensure to respect torque values and use of appropriate products/lubricants. Refer to exploded views in other subsections of this manual as required.

PROCEDURES

VALVE COVER

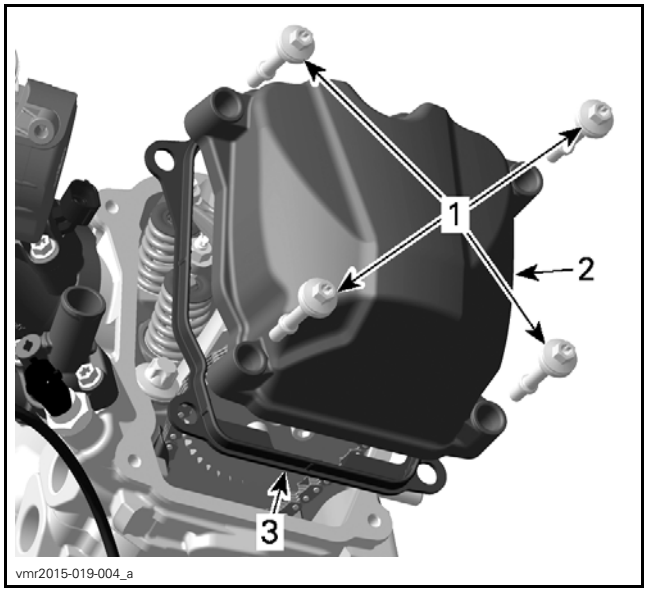
Valve Cover Access

Open cargo box.

Refer to *BODY* subsection and remove the engine service cover.

Removing the Valve Cover

Remove:
- Valve cover screws
- Valve cover
- Gasket.



1. *Valve cover screws*
2. *Valve cover*
3. *Gasket*

Inspecting the Valve Cover

Check the gasket on the valve cover if it is brittle, cracked or hard. If so, replace the gasket.

Installing the Valve Cover

The installation is the reverse of the removal procedure.

Tighten valve cover retaining screws to specified torque in a criss-cross sequence.

TIGHTENING TORQUE	
Valve cover retaining screws	7 N•m ± 0.8 N•m (62 lbf•**in** ± 7 lbf•**in**)

ROCKER ARM

Removing the Rocker Arm

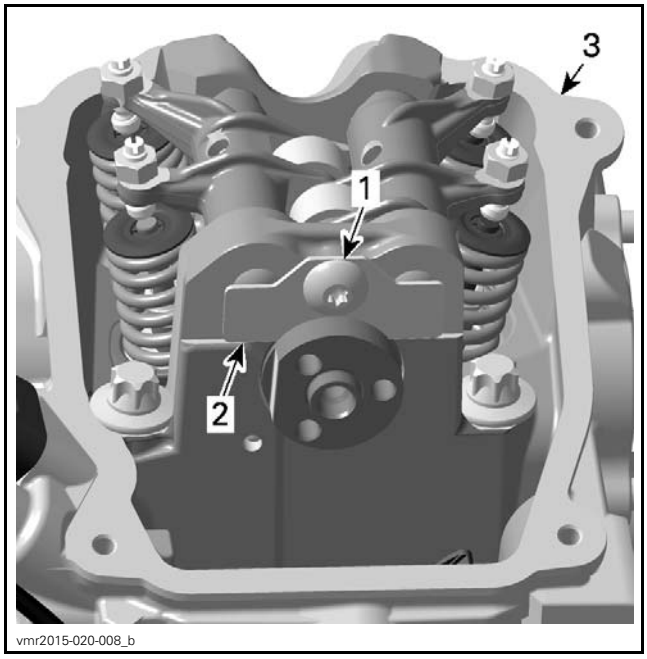
Remove valve cover.

Refer to *TIMING CHAIN* subsection and remove the following parts:

– Timing chain tensioner
– Camshaft timing gear.

Remove:

– Pan head screw
– Camshaft retaining plate.



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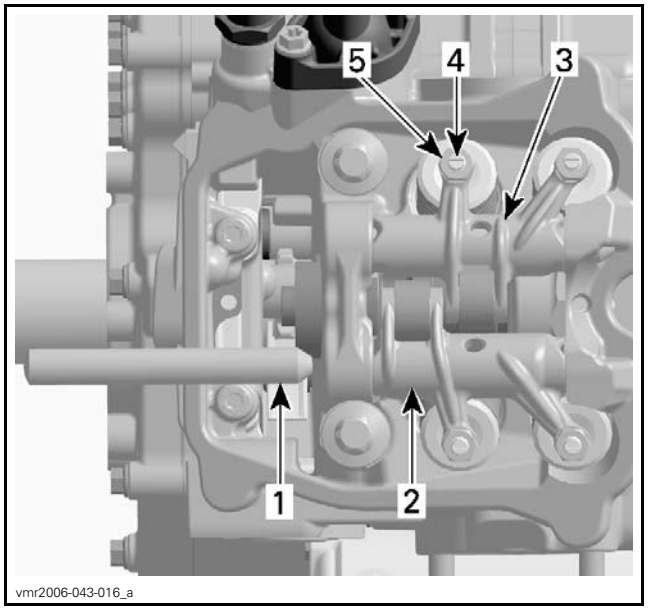
1. Pan head screw
2. Camshaft retaining plate
3. Cylinder head

Remove rocker arm shafts.



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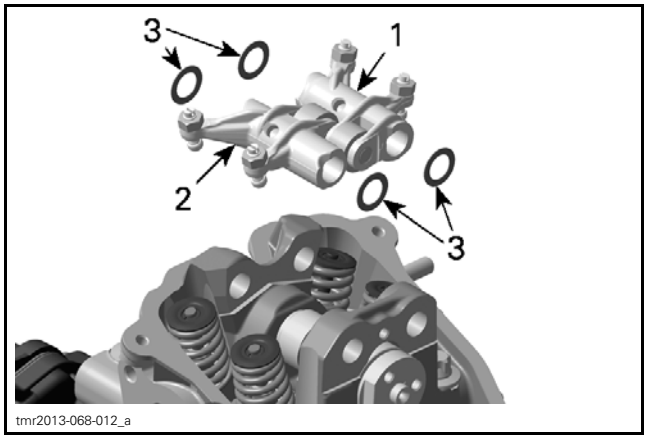
1. Rocker arm shaft
2. Rocker arm (exhaust side)
3. Rocker arm (intake side)
4. Adjustment screw
5. Lock nut

Remove:

– Rocker arm assembly (exhaust side and intake side) with adjustment screws and lock nuts
– Thrust washers.



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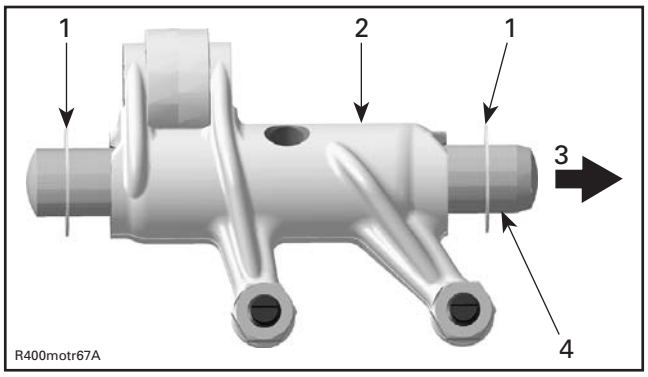
1. Rocker arm (exhaust side)
2. Rocker arm (intake side)
3. Thrust washers

NOTICE **Pay attention not to lose thrust washers or drop them into the timing chain compartment.**

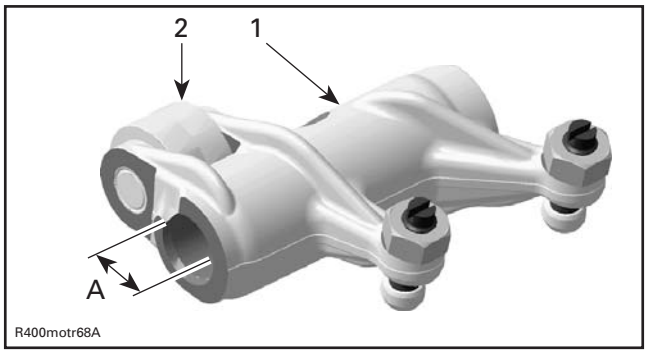


1. 2 thrust washers
2. Rocker arm (exhaust side)
3. Cylinder head (spark plug side)
4. Big taper to spark plug side

Inspecting the Rocker Arm

Inspect each rocker arm for cracks and scored friction surfaces. If so, replace rocker arm assembly.

Check the rocker arm rollers for free movement, wear and excessive radial play. Replace rocker arm assembly if necessary.

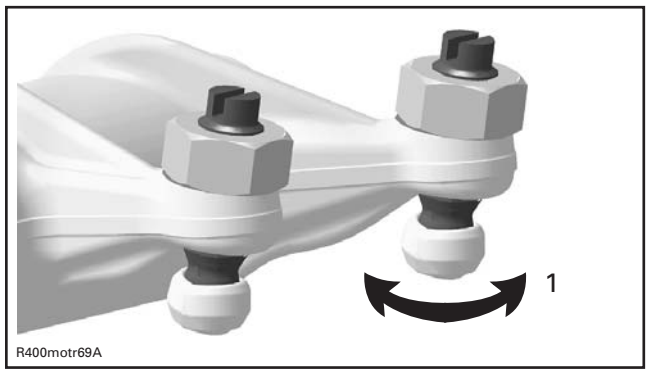


1. Rocker arm (exhaust side)
2. Roller
A. Bore for rocker arm shaft

Measure rocker arm bore diameter. If diameter is out of specification, change the rocker arm assembly.

ROCKER ARM BORE DIAMETER	
NEW	12.036 mm to 12.050 mm (.4739 in to .4744 in)
SERVICE LIMIT	12.060 mm (.4748 in)

Check adjustment screws for free movement, cracks and/or excessive play.

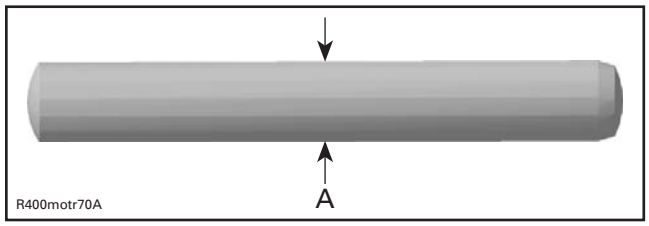


1. Free movement of adjustment screw top

Inspecting the Rocker Arm Shaft

Check for scored friction surfaces; if so, replace parts.

Measure rocker arm shaft diameter.



A. Measure rocker arm shaft diameter here

ROCKER ARM SHAFT DIAMETER	
NEW	12.00 mm to 12.018 mm (.4724 in to .4731 in)
SERVICE LIMIT	11.990 mm (.472 in)

Any area worn excessively will require parts replacement.

Installing the Rocker Arm

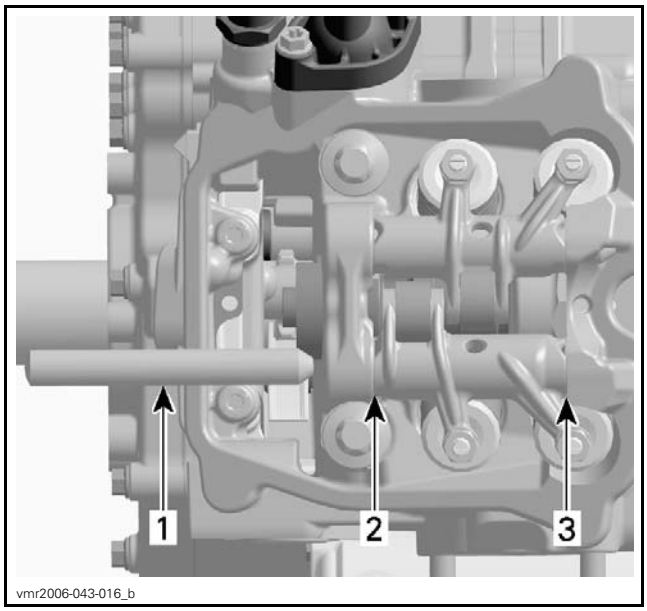
NOTE: Use the same procedure for exhaust and intake rocker arm.

Apply engine oil on rocker arm shaft.

Insert a rocker arm shaft with the chamfered edge first through rocker arm pin bore.

Install a thrust washer at timing chain side, then the proper rocker arm (exhaust side or intake side).

Push in rocker arm shaft until its chamfer reaches the end of rocker arm bore.



1. Rocker arm shaft
2. Thrust washer (timing chain side)
3. Thrust washer (spark plug side)

Place the other thrust washer and push rocker arm shaft to end position.

Install the camshaft retaining plate.

Tighten pan head screw to specification.

TIGHTENING TORQUE	
Pan head screw	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

Adjust valve clearance, refer to *PERIODIC MAINTENANCE PROCEDURE*.

CAMSHAFT

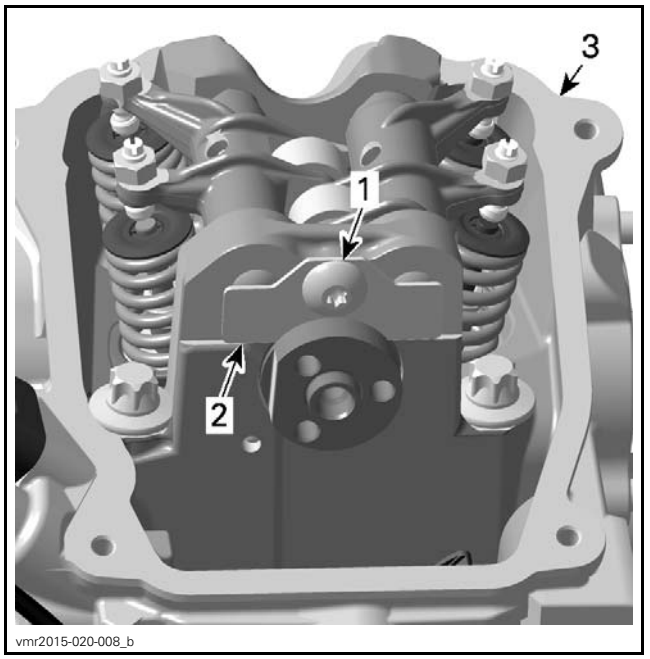
Removing the Camshaft

Remove valve cover (see *VALVE COVER* in this subsection).

Refer to *TIMING CHAIN* subsection and remove the following parts:

– Timing chain tensioner
– Camshaft timing gear.

Remove the camshaft retaining plate.

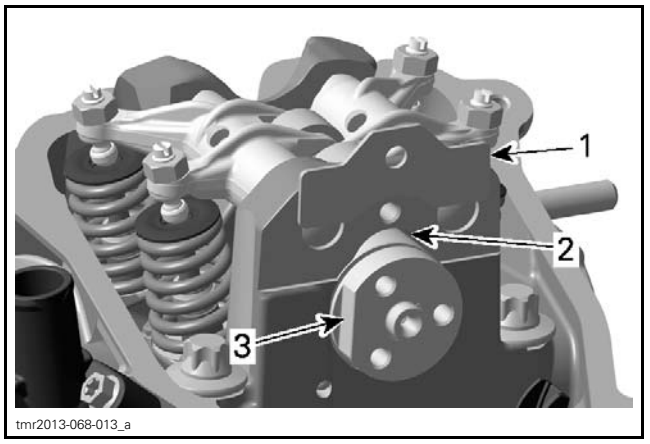


1. Camshaft retaining plate
2. Pan head screw
3. Cylinder head

Remove rocker arms (see *ROCKER ARM* in this subsection).

Remove the camshaft.

NOTE: For removal rotate camshaft so that intake/exhaust lobe shows to upper side of cylinder head.



1. Camshaft retaining plate
2. Area for camshaft lobes
3. Camshaft

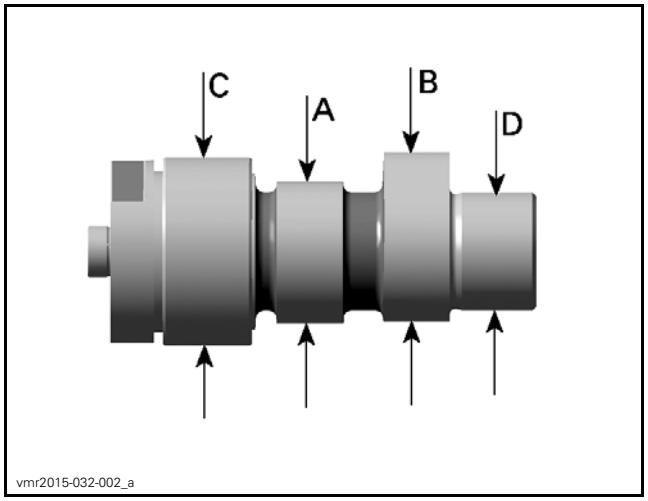
Inspecting the Camshaft

Inspecting the Camshaft Lobe

Check each lobe and bearing journal for:

– scoring
– scuffing
– cracks
– signs of wear.

Using a micrometer to measure:
– camshaft lobe height
– camshaft journal.



A. Camshaft lobe (exhaust valves)
B. Camshaft lobe (intake valves)
C. Camshaft journal (timing chain side)
D. Camshaft journal (spark plug side)

CAMSHAFT LOBE (EXHAUST)	
NEW	32.890 mm to 33.090 mm (1.295 in to 1.303 in)
SERVICE LIMIT	32.840 mm (1.293 in)

CAMSHAFT LOBE (INTAKE)	
NEW	32.950 mm to 33.150 mm (1.297 in to 1.305 in)
SERVICE LIMIT	32.900 mm (1.295 in)

Inspecting the Camshaft Journals

CAMSHAFT JOURNAL (TIMING CHAIN SIDE)	
NEW	34.959 mm to 34.975 mm (1.3763 in to 1.377 in)
SERVICE LIMIT	34.950 mm (1.376 in)

CAMSHAFT JOURNAL (SPARK PLUG SIDE)	
NEW	21.959 mm to 21.980 mm (.8645 in to .8654 in)
SERVICE LIMIT	21.950 mm (.8642 in)

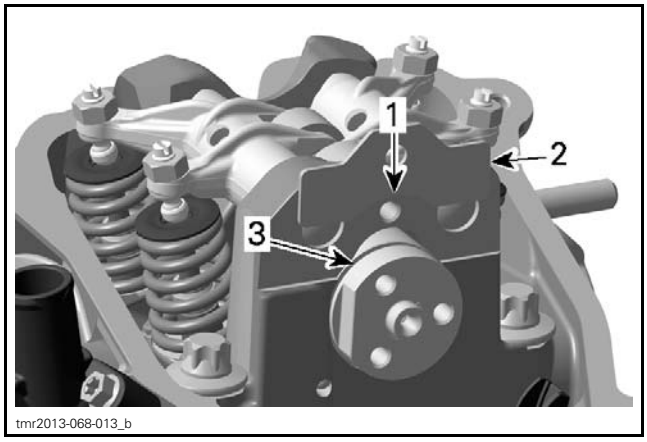
Measure camshaft bearing in cylinder head. Refer to *INSPECTING THE CYLINDER HEAD* in this subsection.

Installing the Camshaft

The installation is the reverse of the removal procedure. However, pay attention to the following.

NOTICE **The camshafts are not identical in design. Do not invert the camshafts during assembly. Any mix-up of the components will lead to engine damage.**

Place the camshaft retaining plate in the slot of the camshaft.



1. Direction of movement
2. Camshaft retaining plate
3. Slot retaining camshaft

Tighten pan head screw to specification.

TIGHTENING TORQUE	
Pan head screw	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

For other parts, refer to proper installation procedure.

CYLINDER HEAD

Cylinder Head Access

Open cargo box.

Refer to *BODY* subsection and remove the engine service cover.

Removing the Cylinder Head

Drain engine coolant. Refer to the *PERIODIC MAINTENANCE PROCEDURES* subsection.

Disconnect the coolant hose from the thermostat housing.

Before removing cylinder head, blow out remaining coolant using air pressure. During cylinder head removal, the remaining coolant in cylinder head could overflow into the engine and the engine oil will be contaminated.

Refer to *EXHAUST SYSTEM* subsection and remove the head pipe.

Refer to *INTAKE MANIFOLD* and disconnect the intake manifold from the cylinder head.

Disconnect spark plug wire.

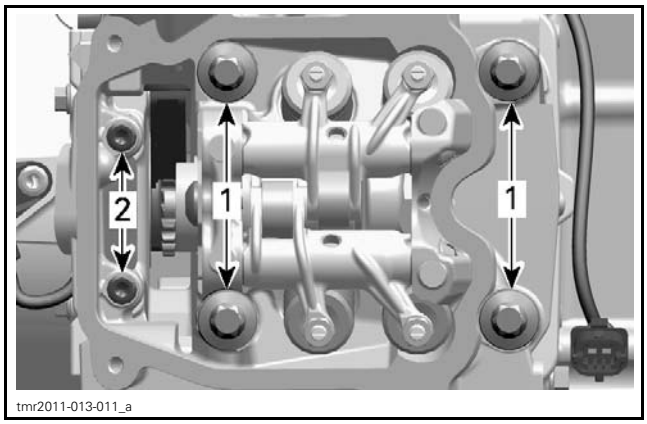
Disconnect CTS connector, located at the cylinder head.

Remove the valve cover and its gasket (see *VALVE COVER* in this subsection).

Refer to *TIMING CHAIN* subsection and remove the following parts:

– Timing chain tensioner
– Camshaft timing gear.

First remove the M6 cylinder head screws, then the M10 cylinder head screws.

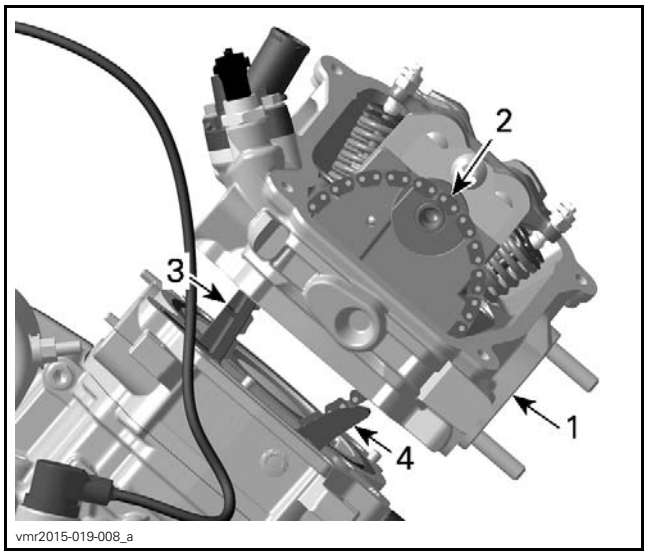


1. Cylinder head screws M10
2. Cylinder head screws M6

Pull up cylinder head.

Remove timing chain guide (fixed).

Remove and discard the cylinder head gasket.



1. Cylinder head
2. Timing chain
3. Chain guide (fixed)
4. Cylinder head gasket

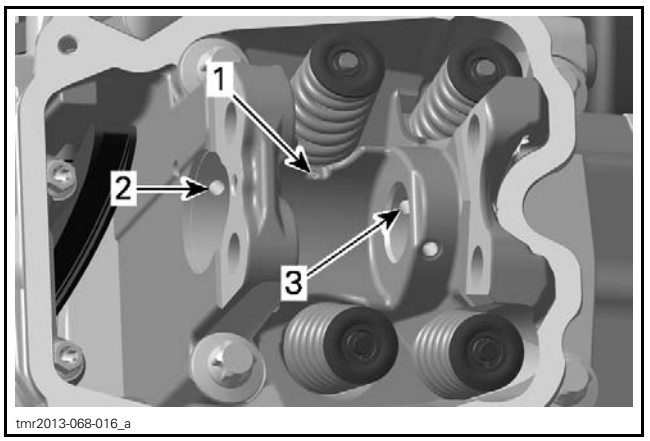
Inspecting the Cylinder Head

Inspect timing chain guide (fixed) for wear, cracks or other damages. Replace if necessary.

Check for cracks between valve seats, if so, replace cylinder head.

Check mating surface between cylinder and cylinder head for contamination. If so, clean both surfaces.

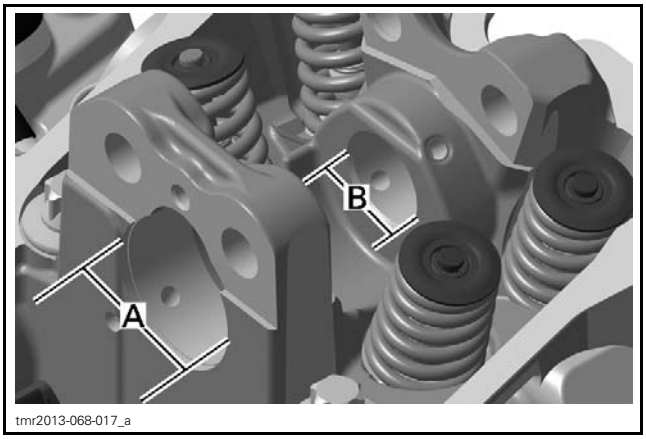
Clean oil support through the cylinder head from contamination.



1. Oil port to lubricate camshaft lobes intake/exhaust
2. Oil supply to camshaft bearing journal (timing chain side)
3. Oil supply to camshaft bearing journal (spark plug side)

Inspecting the Cylinder Head Camshaft Bearing

Measure camshaft bearing in cylinder head.



A. Camshaft bearing (timing chain side)
B. Camshaft bearing (spark plug side)

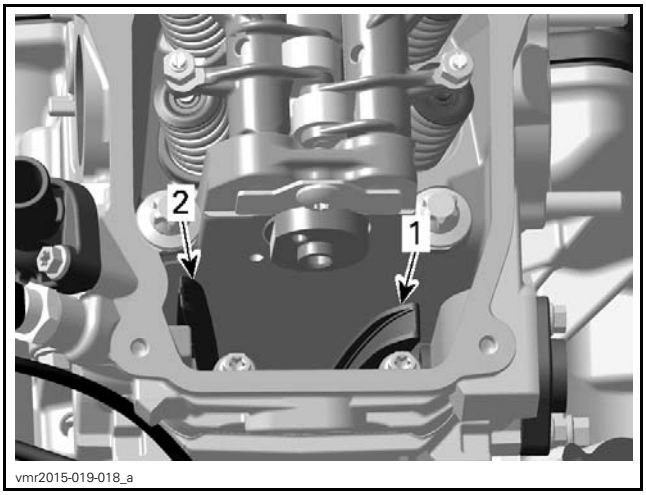
CAMSHAFT BEARING (TIMING CHAIN SIDE)	
NEW	35.000 mm to 35.025 mm (1.378 in to 1.3789 in)
SERVICE LIMIT	35.040 mm (1.3795 in)
CAMSHAFT BEARING (SPARK PLUG SIDE)	
NEW	22.000 mm to 22.021 mm (.8661 in to .867 in)
SERVICE LIMIT	22.040 mm (.8677 in)

Installing the Cylinder Head

The installation is the reverse of the removal procedure. However, pay attention to the following.

Ensure dowel pins are in place.

NOTICE Timing chain guide (fixed) has to be fixed between cylinder and cylinder head.

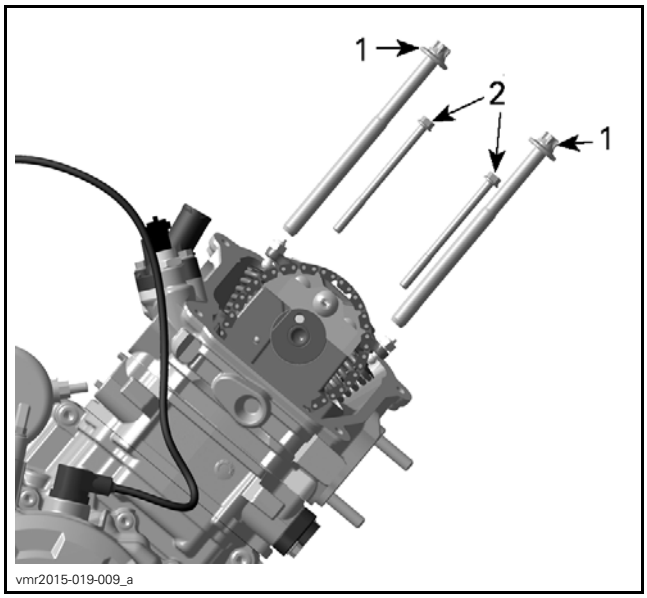


1. Timing chain guide (tensioner side) mounted in crankcase
2. Timing chain guide (fixed) between cylinder and cylinder head

Install a NEW cylinder head gasket.

Install cylinder head screws.

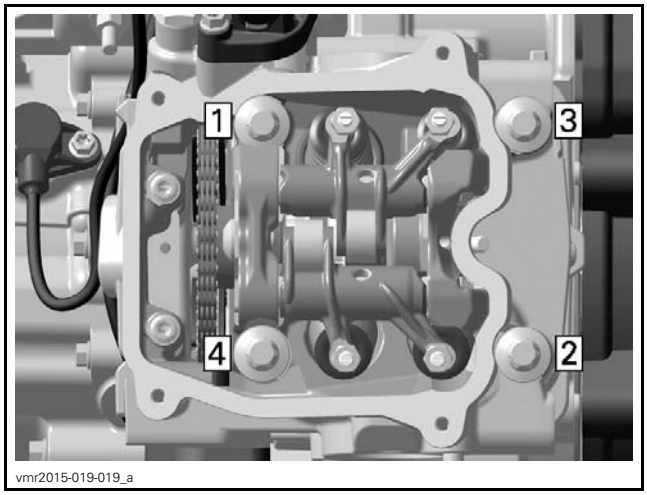
NOTICE Check for proper lengths of the cylinder head screws.



1. Location no. 1
2. Location no. 2

CYLINDER HEAD SCREW IDENTIFICATION	
Location no. 1	M10 x 140
Location no. 2	M6 x 85

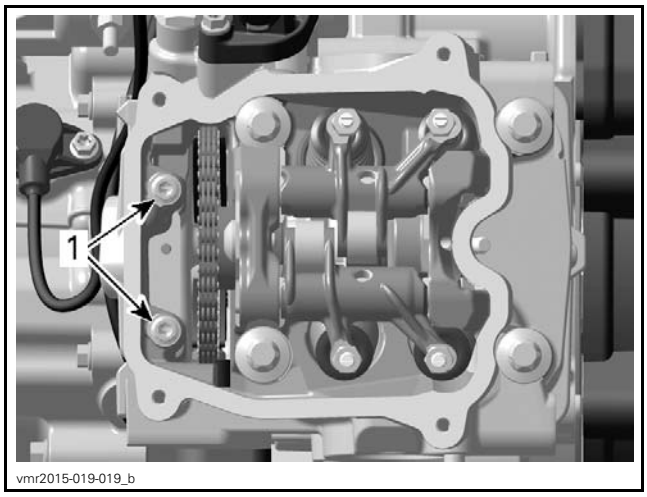
Tighten M10 cylinder head screws FIRST as per following specifications.



TIGHTENING SEQUENCE - M10 CYLINDER HEAD SCREWS

TIGHTENING PROCEDURE		
M10 cylinder head screws	step 1	20 N•m ± 1 N•m (15 lbf•ft ± 1 lbf•ft)
	step 2	180° ± 5°

Tighten M6 cylinder head screws as per following specification.



1. M6 Screws

TIGHTENING TORQUE	
M6 cylinder head screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

Check timing chain guide (tensioner side) for movement.

Refer to applicable subsection for installation details of remaining removed parts.

VALVE SPRINGS

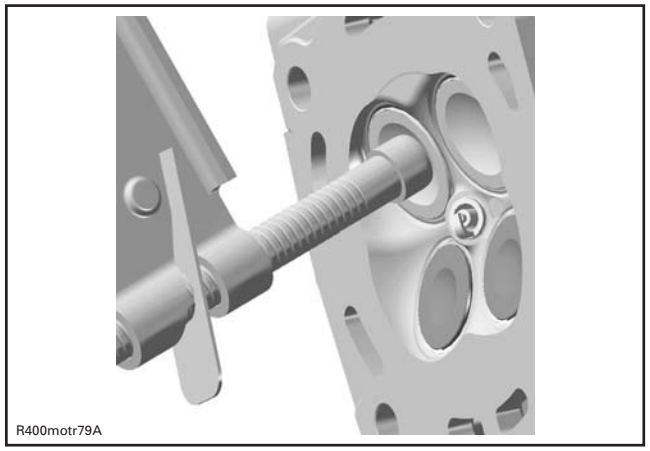
Removing the Valve Spring

Refer to following procedures in this subsection to remove:

– *CAMSHAFT*
– *CYLINDER HEAD*.

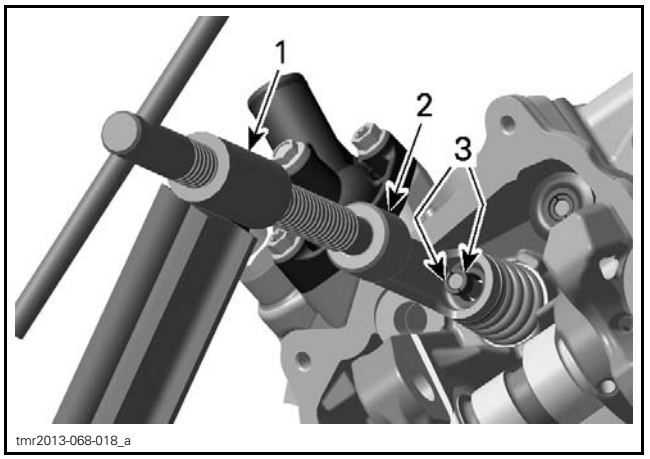
Compress valve spring.

REQUIRED TOOL	
VALVE SPRING COMPRESSOR (P/N 529 035 724)	
VALVE SPRING COMPRESSOR CUP (P/N 529 036 270)	



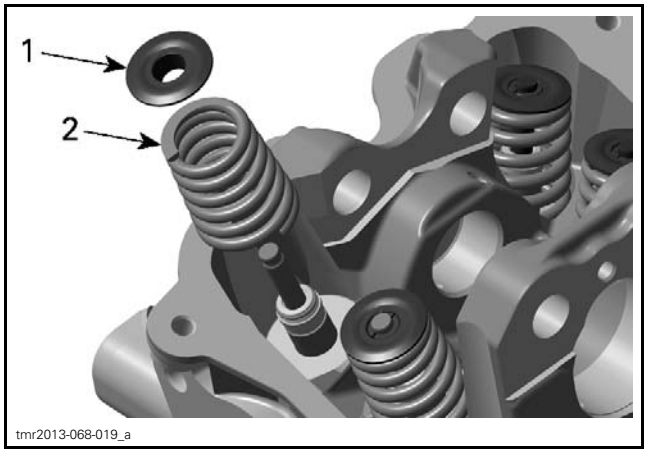
LOCATE VALVE SPRING COMPRESSOR IN CENTER OF THE VALVE

Remove valve cotters.



1. Valve spring compressor
2. Valve spring compressor cup
3. Valve cotter

Remove tools and withdraw valve spring retainer and valve spring.

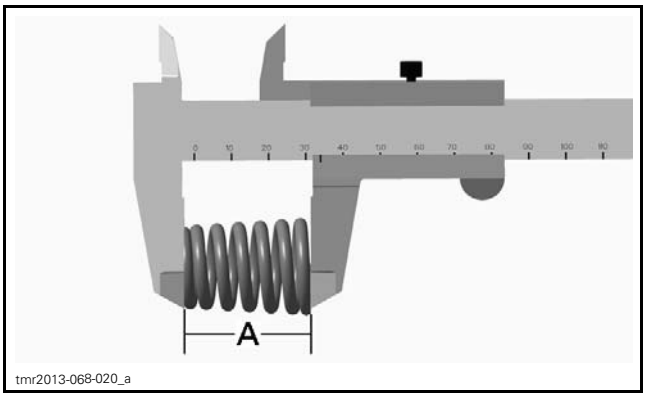


1. Valve spring retainer
2. Valve spring

Inspecting the Valve Spring

Check valve spring for visible damage. If so, replace valve spring.

Check valve spring for free length and straightness.



A. Valve spring length

VALVE SPRING FREE LENGTH	
NEW	40.41 mm (1.591 in)
SERVICE LIMIT	39.00 mm (1.535 in)

Replace valve springs if not within specifications.

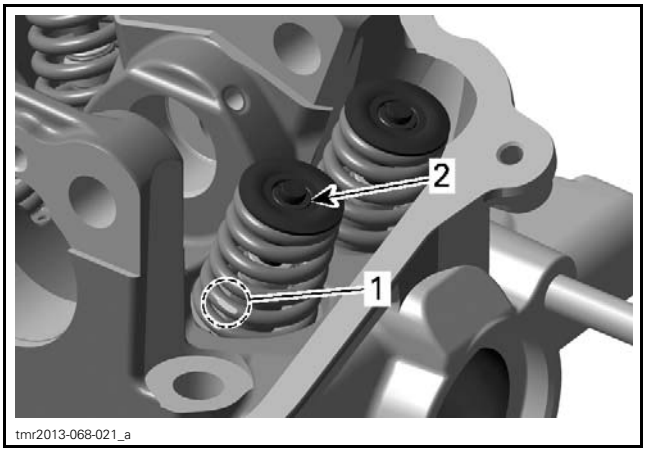
Installing the Valve Spring

The installation is the reverse of the removal procedure. However, pay attention to the following.

Colored area of the valve spring must be placed on bottom side.

To ease installation of cotters, apply oil or grease on them so that they remain in place while releasing the spring.

NOTE: Valve cotter must be properly engaged in valve stem grooves.



1. Colored area position of the valve spring
2. Valve cotter

After spring is installed, ensure it is properly locked by tapping on valve stem end with a soft hammer so that valve opens and closes a few times.

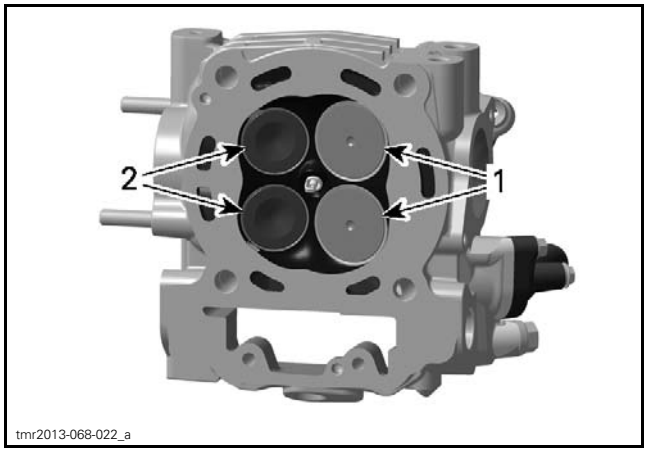
NOTICE **An improperly locked valve spring will cause engine damage.**

VALVES

Removing the Valve

Remove valve spring, see *VALVE SPRING* in this subsection.

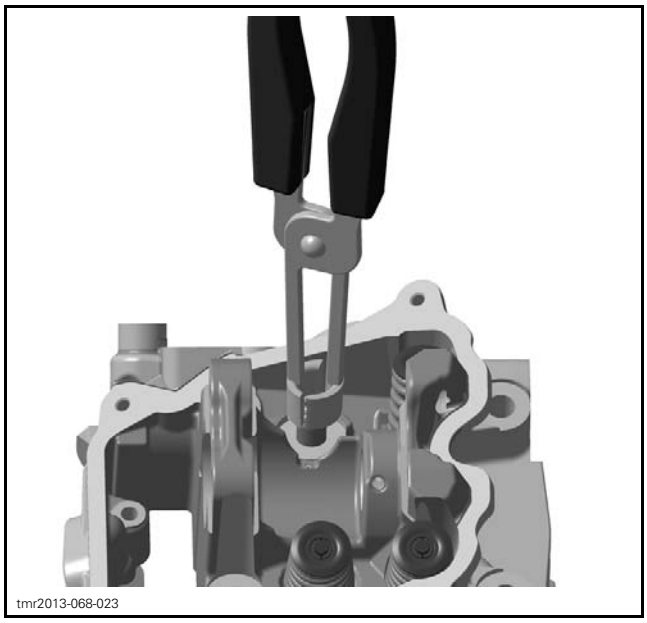
Push valve stem, then pull valves (intake and exhaust) out of valve guide.



1. Intake valves 36.5 mm (1.437 in)
2. Exhaust valves 31 mm (1.22 in)

Remove valve stem seal and discard it.

REQUIRED TOOL	
SNAP-ON PLIERS (P/N YA 8230)	


tmr2013-068-023

Inspecting the Valve

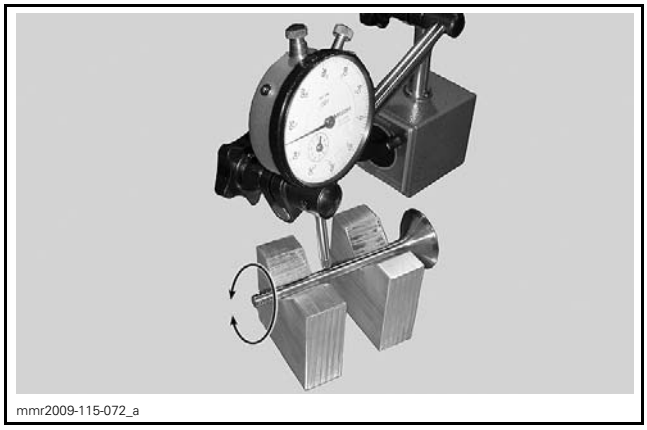
Whenever valves are removed always inspect valve guides. Refer to *VALVE GUIDES* in this subsection.

Valve Stem Seal

Always install NEW seals whenever valves are removed.

Valve

Inspect valve surface, check for abnormal stem wear and bending. If out of specification, replace by a new one.

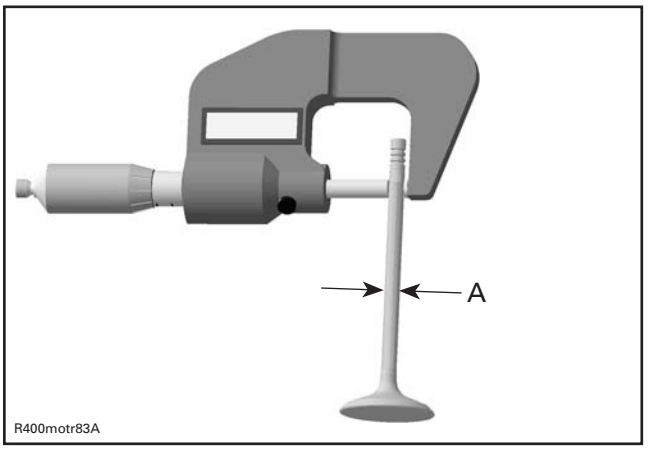

mmr2009-115-072_a

VALVE OUT OF ROUND (INTAKE AND EXHAUST VALVES)	
NEW	0.005 mm (.0002 in)
SERVICE LIMIT	0.060 mm (.0024 in)

Valve Stem

Measure valve stem in three places using a micrometer.

Replace valve if valve stem is out of specification or has other damages such as wear or friction surface.

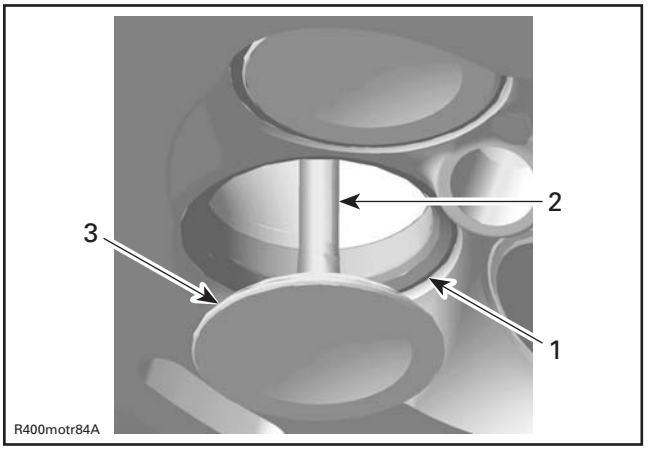


R400motr83A

A. Valve stem diameter

VALVE STEM DIAMETER	
EXHAUST VALVE	
NEW	5.461 mm to 5.476 mm (.215 in to .2156 in)
SERVICE LIMIT	5.440 mm (.2142 in)
INTAKE VALVE	
NEW	5.472 mm to 5.486 mm (.2154 in to .216 in)
SERVICE LIMIT	5.450 mm (.2146 in)

Valve Face and Seat



R400motr84A

1. *Valve seat*
2. *Exhaust valve contaminated area*
3. *Valve face (contact surface to valve seat)*

Check valve face and seat for burning or pittings and replace valve or cylinder head if there are signs of damage.

Ensure to seat valves properly. Apply some lapping compound to valve face and work valve on its seat with a lapping tool (see *VALVE GUIDES* in this subsection).

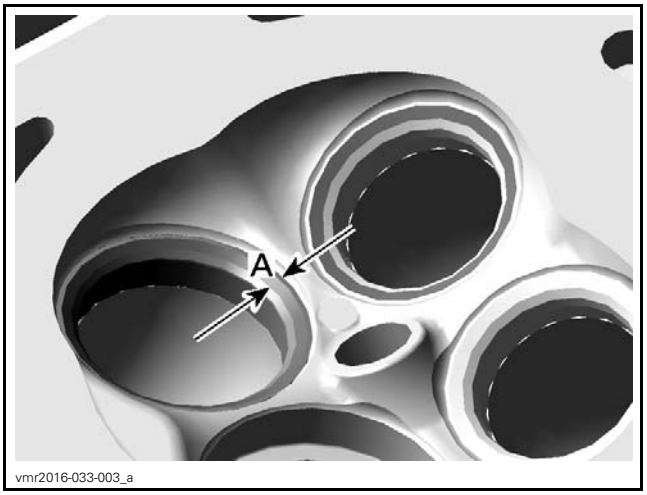
Measure valve face contact width.

NOTE: The location of contact area should be in center of valve seat.

Measure valve seat width using a caliper.

VALVE SEAT CONTACT WIDTH	
EXHAUST VALVE	
NEW	1.25 mm to 1.55 mm (.049 in to .061 in)
SERVICE LIMIT	2.00 mm (.079 in)
INTAKE VALVE	
NEW	1.05 mm to 1.35 mm (.041 in to .053 in)
SERVICE LIMIT	1.80 mm (.071 in)

If valve seat contact width is too wide or has dark spots, replace the cylinder head.



A. Valve seat contact width

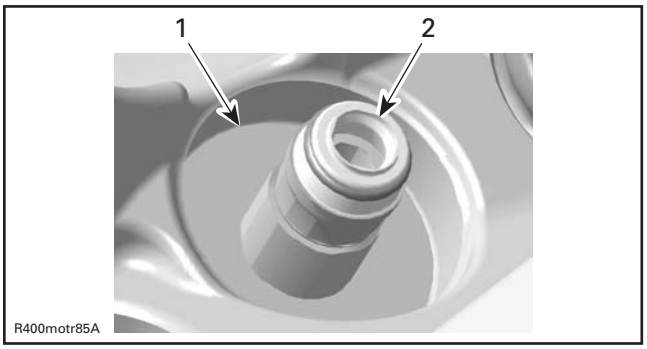
Installing the Valve

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install a NEW valve stem seal. Make sure thrust washer is installed before installing seal.

Apply engine oil on valve stem and install it.

NOTICE **Be careful when valve stem is passed through sealing lips of valve stem seal.**



1. Thrust washer
2. Sealing lips of valve stem seal

For proper valve spring installation refer to *VALVE SPRINGS* in this subsection.

VALVE GUIDES

Inspecting the Valve Guide

Always replace valve stem seals whenever valve guides are removed.

Measure valve guide in three places using a small bore gauge.

NOTE: Clean valve guide to remove carbon deposits before measuring.

Replace valve guide if it is out of specification or has other damages such as wear or friction surface.

VALVE GUIDE DIAMETER (INTAKE AND EXHAUST VALVES)	
NEW	5.506 mm to 5.518 mm (.2168 in to .2172 in)
SERVICE LIMIT	5.568 mm (.2192 in)

Removing the Valve Guide

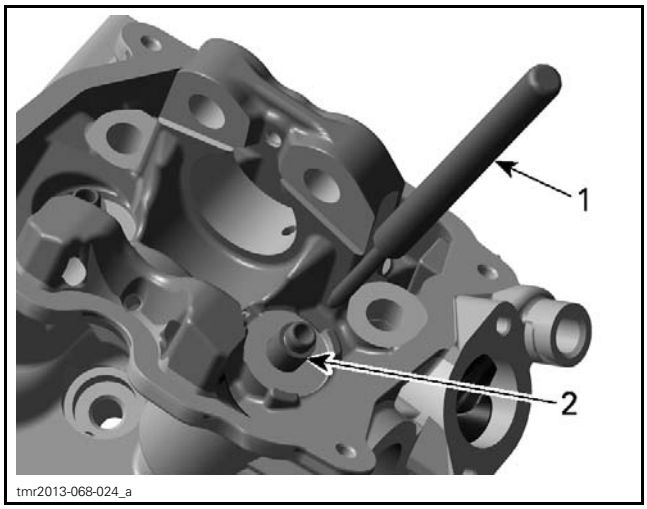
Refer to following procedures in this subsection to remove:

– Cylinder head
– Valve springs
– Valves
– Valve stem seals
– Thrust washers.

NOTE: Clean valve guide area from contamination before removal.

Drive the valve guide out of cylinder head.

REQUIRED TOOL	
Hammer	
VALVE GUIDE REMOVER (6 MM) (P/N 529 036 074)	



1. *Valve guide remover*
2. *Valve guide*

Installing the Valve Guide

The installation is the reverse of the removal procedure. However, pay attention to the following.

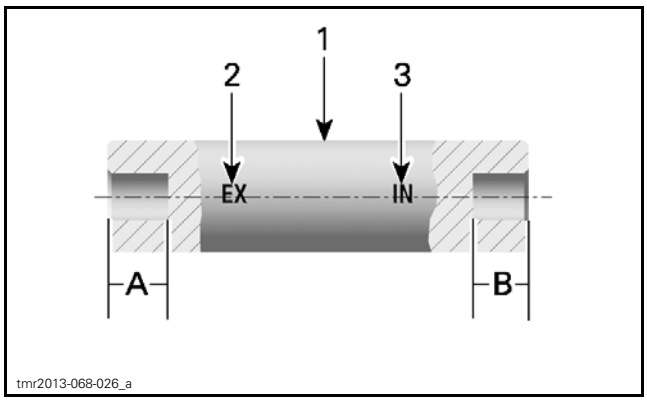
Clean the valve guide bore before reinstalling the valve guide into cylinder head.

NOTE: Apply LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070) on valve guide prior to install it into the cylinder head.

Install valve guide.

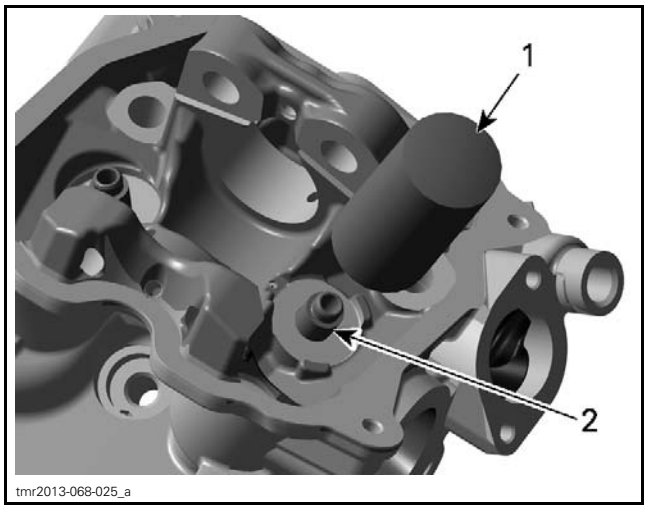
REQUIRED TOOL	
VALVE GUIDE INSTALLER (P/N 529 036 269)	

NOTICE Valve guide installer is used for intake and exhaust valve guides. Choose proper side for installation.



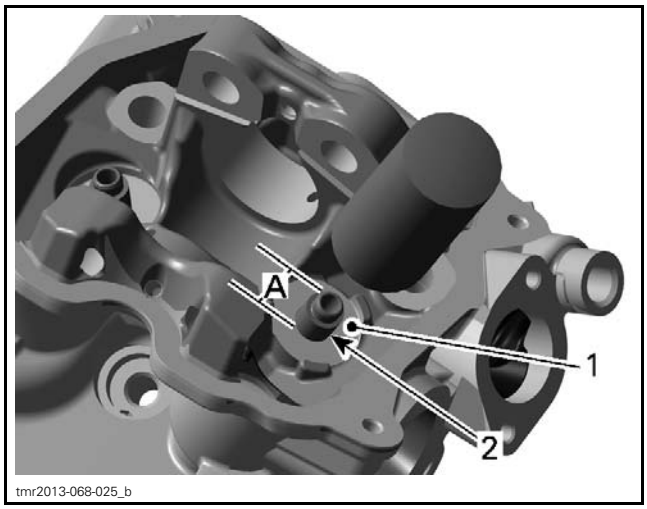
1. *Valve guide installer*
2. *Mark "EX" - exhaust valve guide installer*
3. *Mark "IN" - intake valve guide installer*

A. 14.5 mm (.571 in)
B. 13.3 mm (.524 in)



1. *Valve guide installer*
2. *Valve guide*

NOTICE Push valve guide in the cold cylinder head as per following illustration.

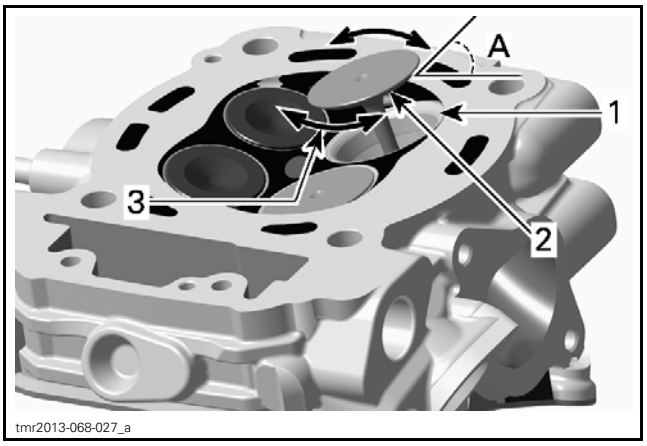


1. *Thrust surface of cylinder head*
2. *Valve guide*

A. Measurement from thrust surface to valve guide top

VALVE GUIDE (MEASUREMENT "A")	
INTAKE	13.1 mm to 13.5 mm (.5157 in to .5315 in)
EXHAUST	14.3 mm to 14.7 mm (.563 in to .579 in)

Apply some lapping compound to valve face and work valve on its seat with a lapping tool.



tmr2013-068-027_a

1. Valve seat
2. Valve face (contact surface to valve seat)
3. Turn valve while pushing against cylinder head

A. Valve seat angle 45°

NOTE: Ensure to seat valves properly. Apply marking paste to ease checking contact pattern.

Repeat procedure until valve seat/valve face fits together.

CYLINDER

Removing the Cylinder

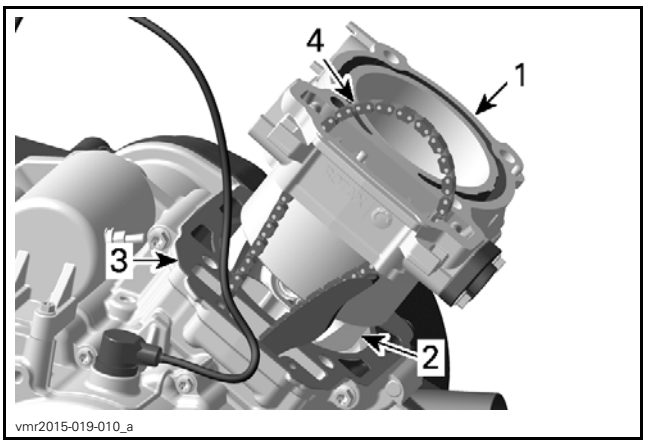
Refer to *TIMING CHAIN* subsection and remove the following parts:

– Timing chain tensioner
– Camshaft timing gear.

Remove the cylinder head (see *CYLINDER HEAD* in this subsection).

Pull cylinder.

Discard cylinder base gaskets.



vmr2015-019-010_a

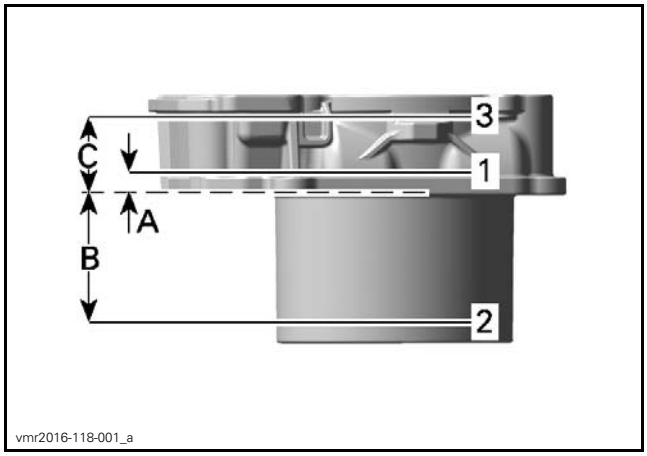
1. Cylinder
2. Piston assembly
3. Cylinder base gasket
4. Camshaft timing chain

Inspecting the Cylinder

Check cylinder for cracks, scoring and wear ridges on the top and bottom of the cylinder. If so, replace cylinder.

Cylinder Taper

Measure cylinder bore at 3 recommended positions.



vmr2016-118-001_a

1. First measure
2. Second measure
3. Third measure

A. 5 mm (.197 in)
B. 58 mm (2.283 in)
C. 37 mm (1.457 in)

CYLINDER TAPER SPECIFICATION	
NEW (MAXIMUM)	0.038 mm (.0015 in)
SERVICE LIMIT	0.090 mm (.0035 in)

Distance between measurements should not exceed the service limit mentioned above. Otherwise, replace cylinder and piston rings.

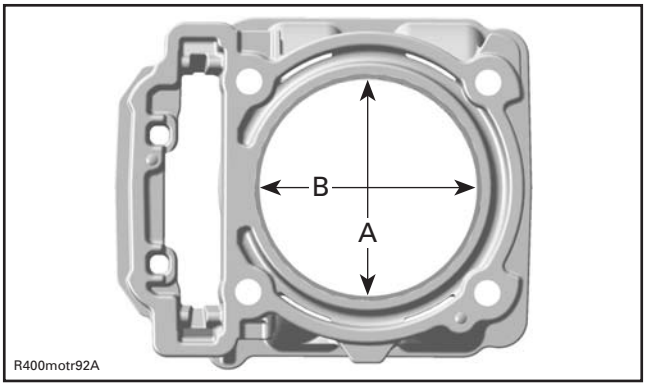
Cylinder Out of Round

Measure cylinder diameter:

– in piston pin axis
– perpendicular to piston pin axis.

direction from top of cylinder. Take another measurement 90° from first one and compare.

NOTE: Use the same measuring points as described in *CYLINDER TAPER*.



A. Perpendicular to crankshaft axis
B. Parallel to crankshaft axis

CYLINDER OUT OF ROUND	
NEW (MAXIMUM)	0.015 mm (.0006 in)
SERVICE LIMIT	0.020 mm (.0008 in)

Installing the Cylinder

the installation is the reverse of the removal procedure. However, pay attention to the following.

NOTICE Always replace cylinder base gasket before installing the cylinder.

NOTE: Make sure piston rings are properly spaced, refer to *PISTON RINGS* in this subsection.

Apply engine oil:
– In the bottom area of the cylinder bore
– On the piston rings
– On the piston ring compressor.

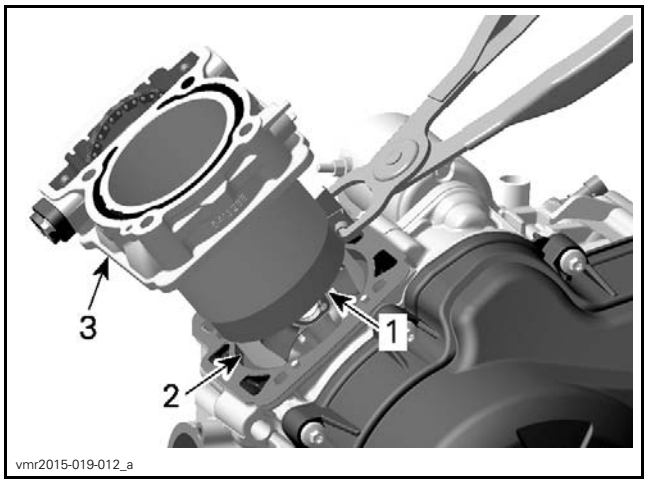
Compress piston rings.

Apply engine oil on the band of the tool.

REQUIRED TOOL
Piston ring compressor with band width of 15 mm to 20 mm (.59 in to .79 in)

NOTE: The cylinder can not be pushed fully over the piston unless the piston is located at TDC.

Put timing chain through the chain pit then put the cylinder in place.



1. Piston ring compressor
2. Piston
3. Cylinder

NOTICE Chain guide has to be fixed between cylinder and cylinder head.

Install cylinder head and the other parts in accordance with the proper installation procedures.

PISTON

Removing the Piston

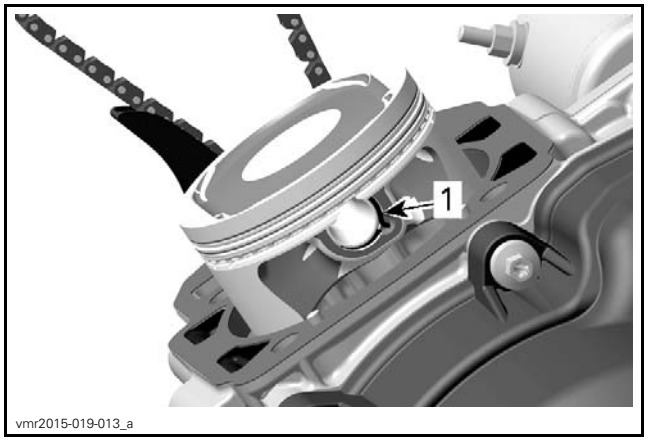
Refer to following procedures in this subsection to remove:
– Cylinder head
– Cylinder.

Place a rag under piston and in the area of timing chain compartment.

⚠ WARNING

Piston circlips are spring loaded.

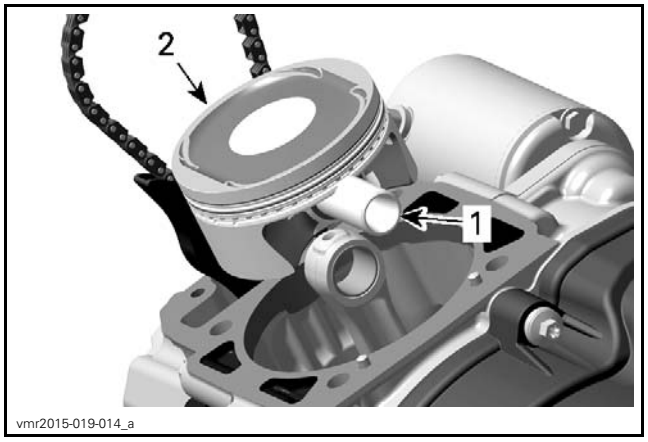
Remove one piston circlip and discard it.



1. Piston circlip

NOTE: The removal of both piston circlips is not necessary to remove piston pin.

Push piston pin out of piston.



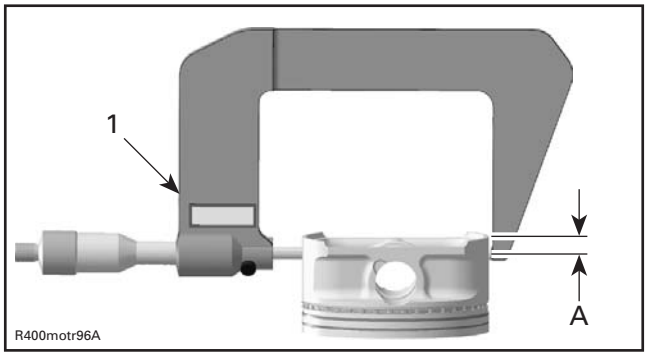
1. *Piston pin*
2. *Piston*

Detach piston from connecting rod.

Inspecting the Piston

Inspect piston for scoring, cracking or other damages. Replace piston and piston rings if necessary.

Using a micrometer, measure piston at 8 mm (.315 in) perpendicularly (90°) to piston pin.



1. *Measuring perpendicularly (90°) to piston pin*

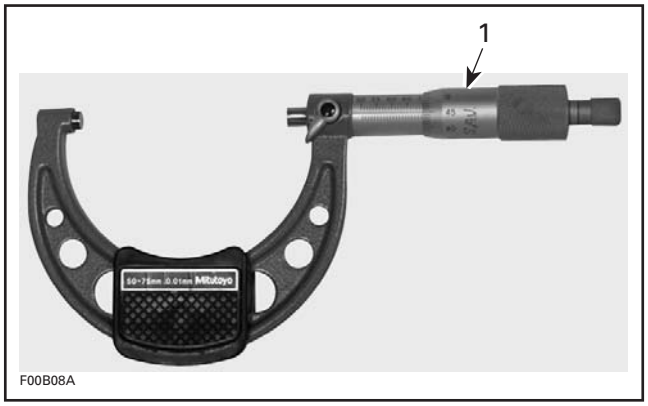
A. *8 mm (.315 in)*

The measured dimension should be as described in the following tables. If not, replace piston.

PISTON MEASUREMENT	
NEW	93.950 mm to 93.966 mm (3.6988 in to 3.6994 in)
SERVICE LIMIT	93.900 mm (3.6969 in)

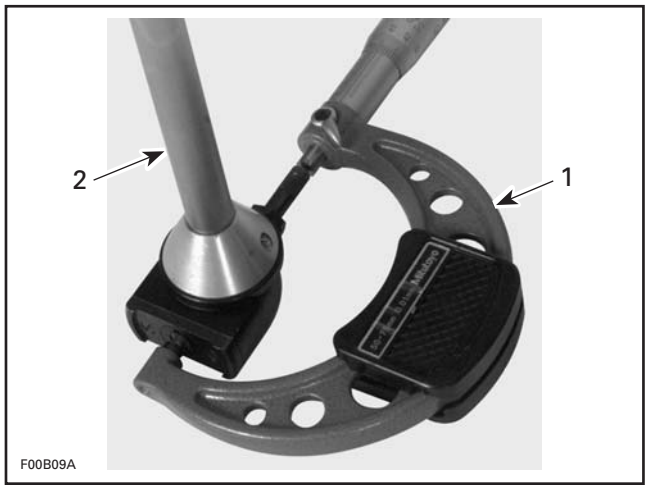
Piston/Cylinder Clearance

Adjust and lock a micrometer to the piston dimension.

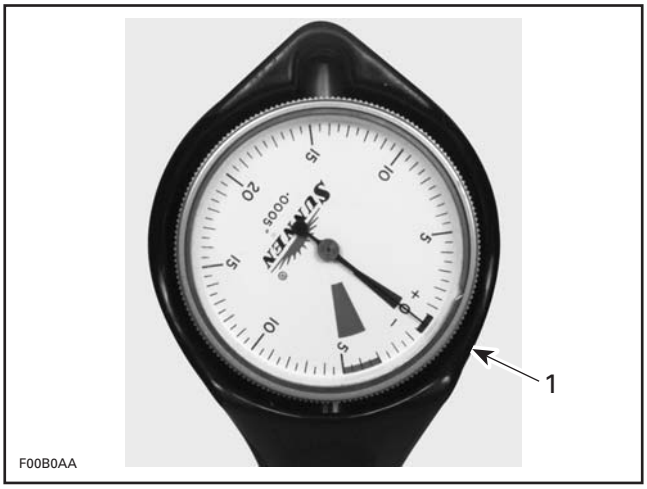


1. *Micrometer set to the piston dimension*

With the micrometer set to the dimension, adjust a cylinder bore gauge to the micrometer dimension and set the indicator to 0 (zero).



1. *Use the micrometer to set the cylinder bore gauge*
2. *Dial bore gauge*



TYPICAL

1. *Indicator set to 0 (zero)*

Position the dial bore gauge 20 mm (.787 in) above cylinder base, measuring perpendicularly (90°) to piston pin axis.

Read the measurement on the cylinder bore gauge. The result is the exact piston/cylinder wall clearance.

PISTON/CYLINDER CLEARANCE	
NEW	0.027 mm to 0.057 mm (.0011 in to .0022 in)
SERVICE LIMIT	0.100 mm (.0039 in)

NOTE: Make sure used piston is not worn.

If clearance exceeds specified tolerance, replace piston by a new one and measure piston/cylinder clearance again.

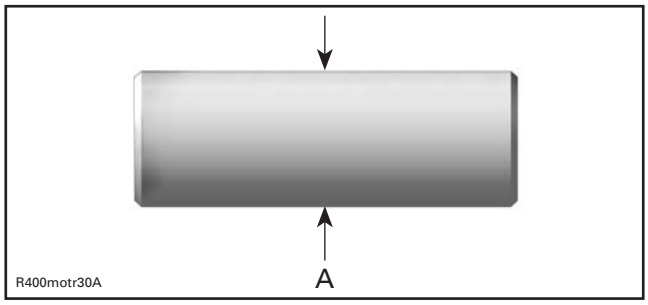
NOTE: Make sure the cylinder bore gauge indicator is set exactly at the same position as with the micrometer, otherwise the reading will be false.

Connecting Rod/Piston Pin Clearance

Using synthetic abrasive woven, clean piston pin from deposits.

Inspect piston pin for scoring, cracking or other damages.

Measure piston pin. See the following illustration for the proper measurement positions.

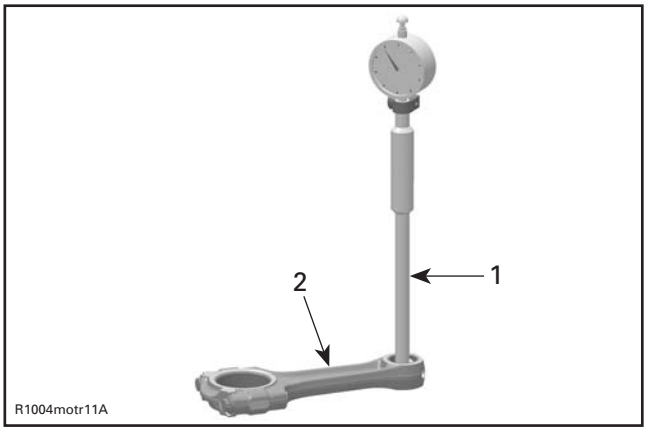


A. Piston pin diameter

PISTON PIN DIAMETER	
NEW	19.996 mm to 20.000 mm (.7872 in to .7874 in)
SERVICE LIMIT	19.980 mm (.7866 in)

Replace piston pin if diameter is out of specifications.

Measure inside diameter of connecting rod small end bushing.



1. Bore gauge
2. Connecting rod

CONNECTING ROD SMALL END DIAMETER	
NEW	20.010 mm to 20.020 mm (.7878 in to .7882 in)
SERVICE LIMIT	20.060 mm (.7898 in)

Replace connecting rod if diameter of connecting rod small end is out of specifications. Refer to *BOTTOM END* subsection for removal procedure.

Compare measurements to obtain the connecting rod/piston pin clearance.

CONNECTING ROD/ PISTON PIN CLEARANCE	
SERVICE LIMIT	0.080 mm (.0031 in)

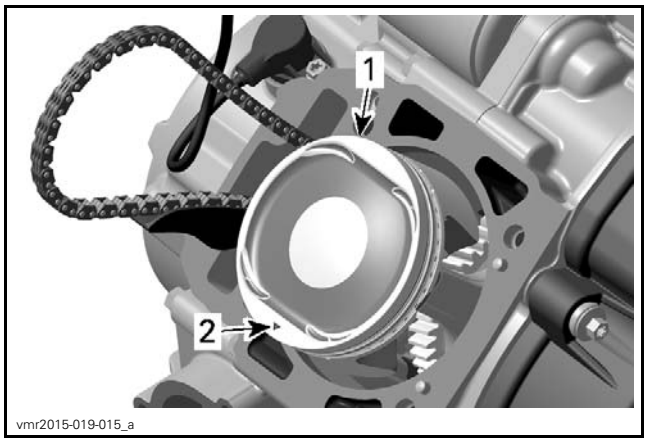
Installing the Piston

The installation is the reverse of the removal procedure. However, pay attention to the following.

Apply engine oil on the piston pin.

Insert piston pin into piston and connecting rod.

Install piston with the punched arrow on piston dome must point towards exhaust side of the engine.



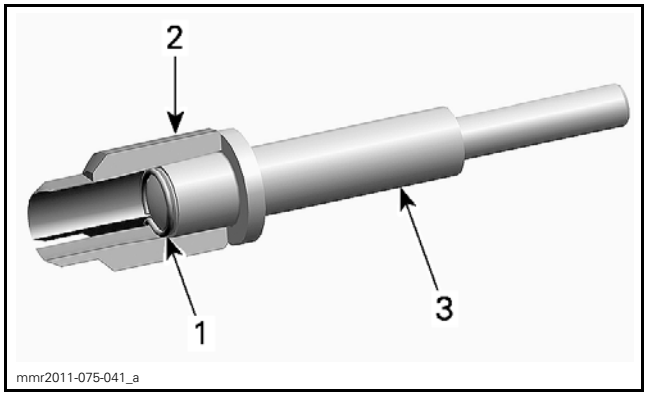
1. Piston
2. Mark on piston must show to exhaust side

Install NEW piston circlip as per following procedure:

REQUIRED TOOL	
PISTON CIRCLIP INSTALLER (P/N 529 036 083)	

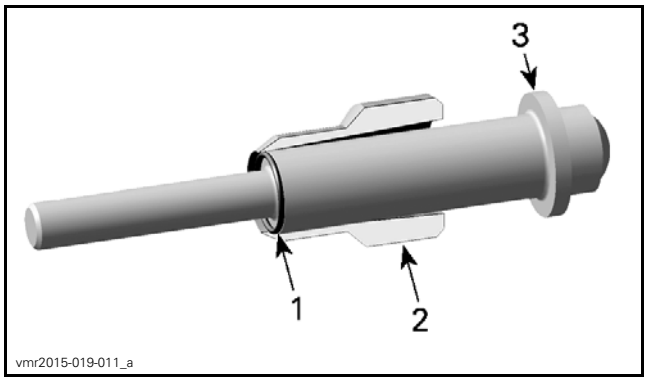
NOTICE **Always replace disassembled piston circlip(s) by NEW ones. Place a rag on cylinder base to avoid dropping the circlip inside the engine.**

1. Place circlip in sleeve and push piston circlip installer handle until circlip reaches the mid position in the sleeve.



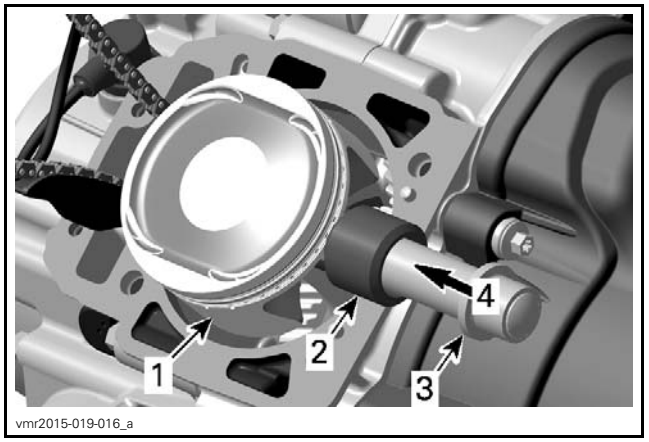
TYPICAL
1. Circlip
2. Sleeve
3. Installer handle

2. Push piston circlip installer handle until circlip reaches end position in the sleeve.



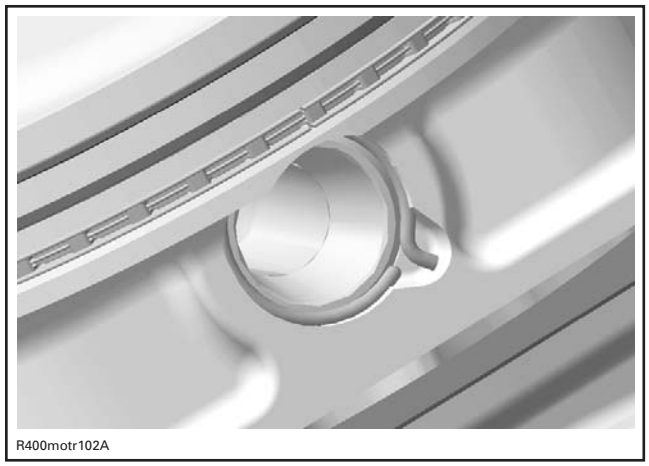
TYPICAL
1. Circlip
2. Sleeve
3. Installer handle

3. Align sleeve with piston pin axis and push installer handle until circlip engages in piston.



1. Hold piston while pushing circlip in place
2. Sleeve
3. Installer handle
4. Direction to push circlip

NOTE: Take care that the hook of the piston circlip is positioned properly.



CORRECT POSITION OF THE PISTON CIRCLIP

PISTON RINGS

Removing the Ring

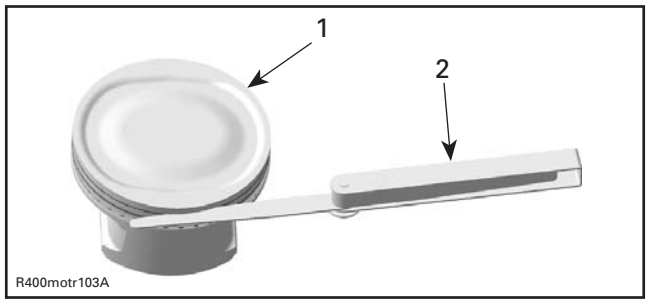
Remove the piston (see *PISTON* in this subsection).

Inspecting the Ring

Ring/Piston Groove Clearance

Using a feeler gauge measure each ring/piston groove clearance. If the clearance is too large, the piston and the piston rings should be replaced.

RING/PISTON GROOVE CLEARANCE	
UPPER COMPRESSION RING	
NEW	0.03 mm to 0.07 mm (.0012 in to .0028 in)
SERVICE LIMIT	0.150 mm (.0059 in)
LOWER COMPRESSION RING	
NEW	0.02 mm to 0.06 mm (.0008 in to .0024 in)
SERVICE LIMIT	0.150 mm (.0059 in)
OIL SCRAPER RING	
NEW	0.01 mm to 0.18 mm (.0004 in to .0071 in)
SERVICE LIMIT	0.250 mm (.0098 in)



1. Piston
2. Feeler gauge

Ring End Gap

RING END GAP	
UPPER COMPRESSION RING	
NEW	0.20 mm to 0.35 mm (.008 in to .014 in)
SERVICE LIMIT	0.60 mm (.024 in)
LOWER COMPRESSION RING	
NEW	0.35 mm to 0.55 mm (.014 in to .022 in)
SERVICE LIMIT	0.85 mm (.033 in)
OIL SCRAPER RING	
NEW	0.20 mm to 0.70 mm (.008 in to .028 in)
SERVICE LIMIT	1.00 mm (.039 in)

To measure the ring end gap place the ring in the cylinder in the area of 8 mm to 16 mm (5/16 in to 5/8 in) from top of cylinder.

NOTE: In order to correctly position the ring in the cylinder, use piston as a pusher.

Using a feeler gauge, check ring end gap. Replace ring if gap exceeds above described specified tolerance.

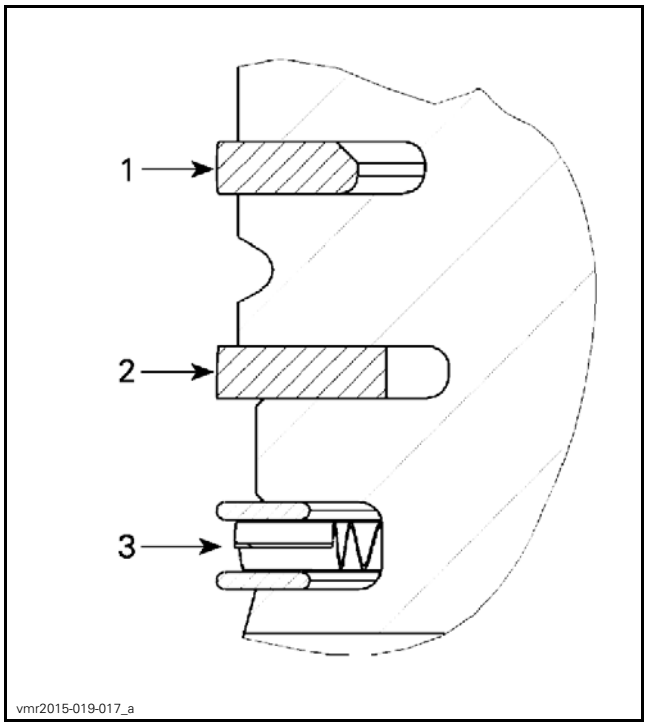
Installing the Ring

The installation is the reverse the removal procedure. However, pay attention to the following.

NOTE: Use a ring expander to prevent breakage during installation. The oil ring must be installed by hand.

NOTE: First install spring and then rings of oil scraper ring.

Install the oil scraper ring first, then the lower compression ring with the word "N and TOP " facing up, then the upper compression ring with the word "N and TOP" facing up.

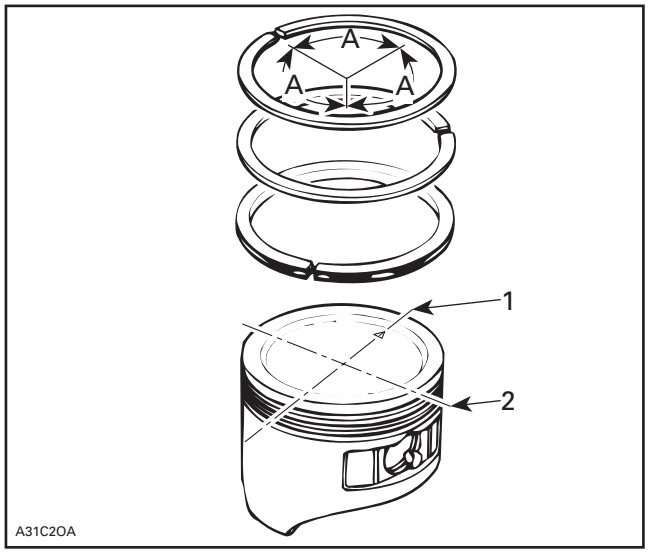


1. Upper compression ring
2. Lower compression ring
3. Oil scraper ring

NOTICE Ensure that top and second rings are not interchanged.

Check that rings rotate smoothly after installation.

Space the piston ring end gaps 120° apart and do not align the gaps with the piston pin bore or the thrust side axis.



1. DO NOT align ring gap with piston thrust side axis
2. DO NOT align ring gap with piston pin bore axis
A. 120°

TIMING CHAIN

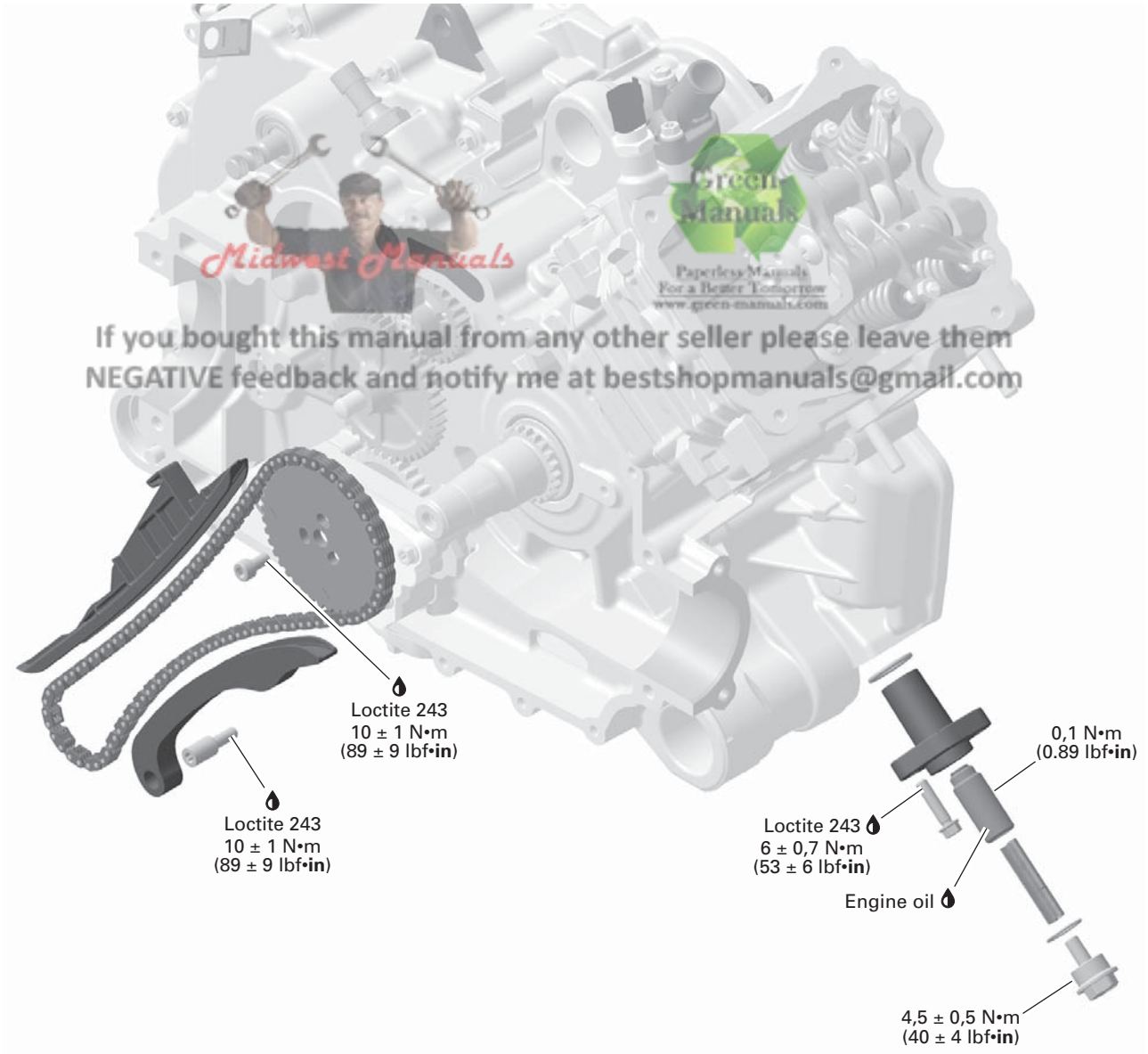
SERVICE TOOLS

Description	Part Number	Page
CAMSHAFT TIMING TOOL	529 036 268	6–7

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	7, 9

TIMING CHAIN



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NEW = Component must be replaced when removed.

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GENERAL

IMPORTANT: Note position of parts on disassembly. This may help to find the root cause of a problem. A component that is not replaced should be reinstalled in the same position as originally mounted.

TROUBLESHOOTING

UNUSUAL ENGINE NOISE OR VIBRATION

1. IMPROPER VALVE CLEARANCE ADJUSTMENT AND/OR WORN OUT ROCKER ARM(S)
   - *Readjust valve clearance and/or replace defective part(s), refer to TOP END subsection.*
2. DEFECTIVE CHAIN TENSIONER
   - *Replace chain tensioner.*
3. WORN OUT TIMING CHAIN GUIDE(S)
   - *Replace timing chain guide(s).*
4. STRETCHED TIMING CHAIN OR WORN OUT TIMING GEARS
   - *Replace timing chain and timing gears.*
5. LOOSE TIMING GEAR RETAINING SCREWS
   - *Retighten screws to recommended torque.*
6. INCORRECT CAMSHAFT TIMING
   - *Replace damaged components and readjust camshaft timing.*

ENGINE LACKS ACCELERATION OR POWER

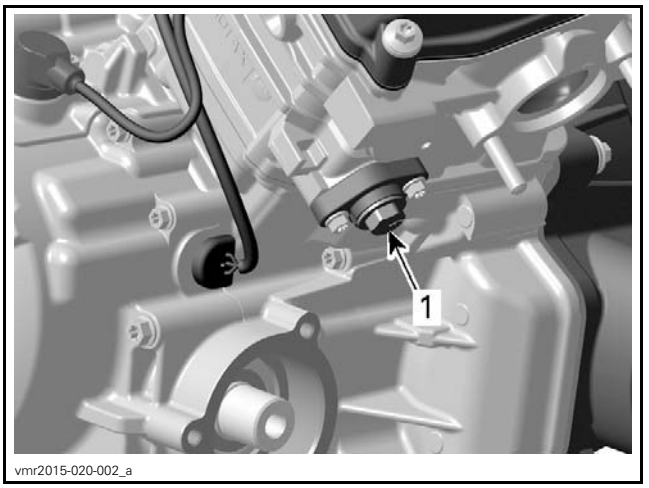
1. INCORRECT CAMSHAFT TIMING
   - *Replace damaged components and readjust camshaft timing.*

PROCEDURES

TIMING CHAIN TENSIONER

Timing Chain Tensioner Location

The timing chain tensioner is located in the cylinder.



1. Timing chain tensioner

Timing Chain Tensioner Access

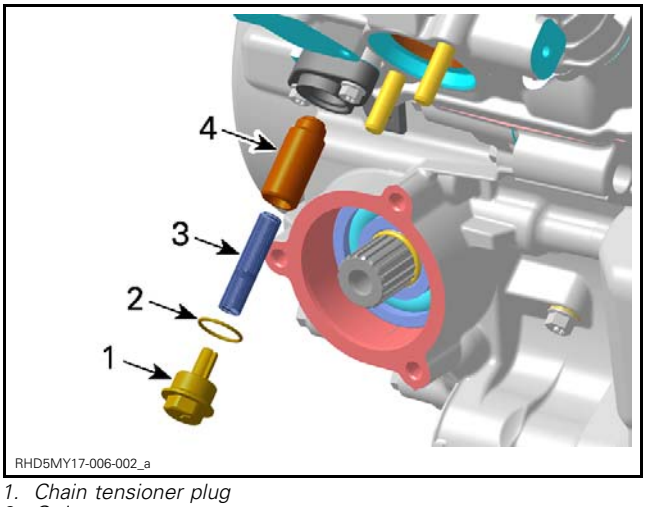
Refer to *BODY* subsection and remove the engine service cover.

Removing the Timing Chain Tensioner

1. Make sure the piston is set to TDC ignition. Refer to *CRANKSHAFT LOCKING PROCEDURE* in the *BOTTOM END* subsection.
2. Carefully unscrew chain tensioner plug and release spring tension.

⚠ CAUTION Tensioner is spring loaded.

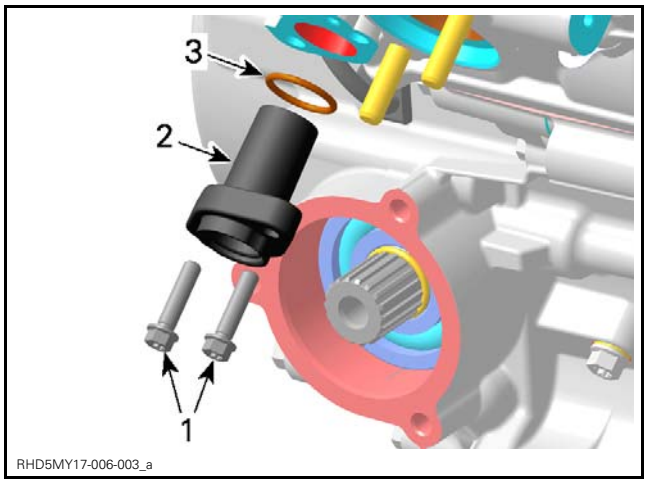
3. Remove:
   – O-ring
   – Spring
   – Chain tensioner plunger.



1. Chain tensioner plug
2. O-ring
3. Spring
4. Chain tensioner plunger

4. Remove:
   – Chain tensioner housing retaining screws

– Chain tensioner housing
– O-ring.



1. Screws
2. Chain tensioner housing
3. O-ring

Inspecting the Timing Chain Tensioner

Check the chain tensioner housing and plug for cracks or other damages. Replace if necessary.

Check chain tensioner plunger for free movement and/or scoring.

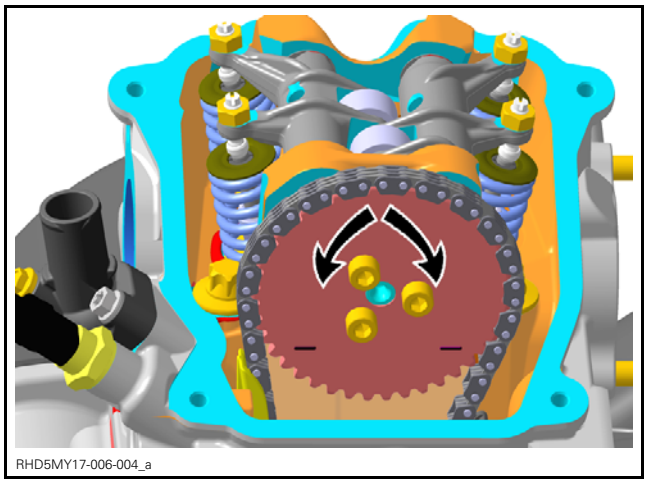
Check if O-rings are brittle, cracked or hard. Replace if necessary.

Check spring condition. Replace if bent, broken or worn.

Installing the Timing Chain Tensioner

The installation is the reverse of the removal procedure. However, pay attention to the following.

NOTE: Before installing the chain tensioner make sure, that the camshaft timing gear can be moved back and forth.



MOVE GEAR BACK AND FORTH

1. Lubricate plunger before installation.

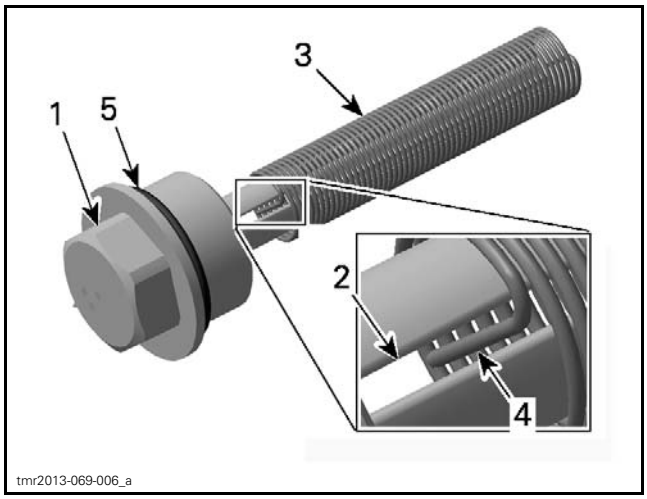
PLUNGER LUBRICATION	
Service product	Engine oil

2. Slightly turn the camshaft timing gear in order to get the timing chain play on the tensioner side.
3. Slightly screw the plunger in until the timing chain allows no more back and forth movement of the camshaft timing gear.
4. Screw the plunger in an additional 1/8 turn to reach the required specified torque.

TIMING CHAIN TENSIONER ADJUSTMENT (TORQUE)
0.1 N•m (.9 lbf•**in**)

NOTICE **Improper adjustment of the timing chain will lead to severe engine damage.**

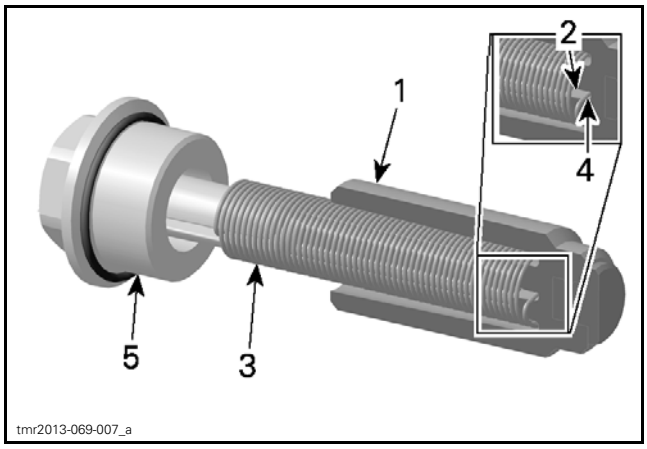
5. Place the O-ring on plug.
6. Fit the spring on one side into the slot of the plug.



1. Plug
2. Slot
3. Spring
4. Spring end
5. O-Ring

Fit the spring on the other side into the plunger.

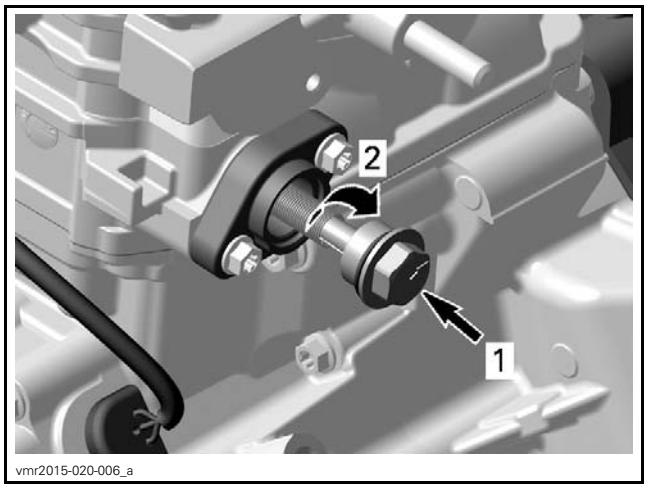
NOTE: Turn spring only clockwise in order to fit the spring end into the notch of the plunger to avoid loosening the plunger during spring installation. Do not preload the spring.



FOR CLARITY PARTS ARE REMOVED FROM CYLINDER
1. Plunger
2. Notch
3. Spring
4. Spring end
5. Plug with O-ring

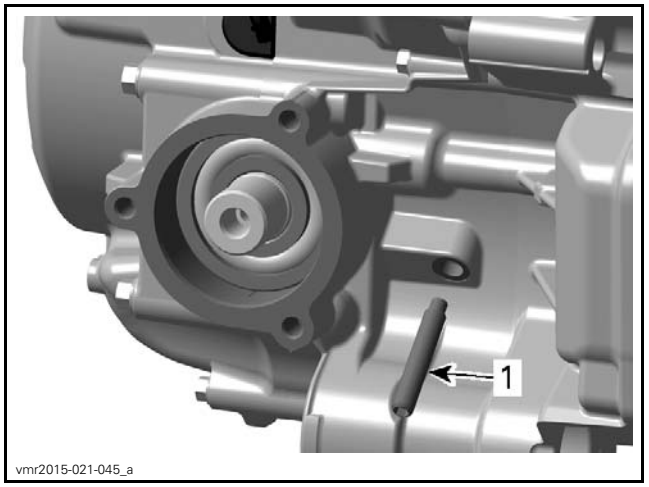
7. Then compress the spring and screw the plug in.

NOTE: To avoid overstressed timing chain, the plug must engage into threads within the first full turn.



Step 1: Compress spring
Step 2: Screw in plug

8. Remove the crankshaft locking bolt and install all other removed parts.



1. Crankshaft locking bolt

9. Finally, tighten the chain tensioner plug to specification.

TIGHTENING TORQUE	
chain tensioner plug	4.5 N•m ± 0.5 N•m (40 lbf•**in** ± 4 lbf•**in**)

CAMSHAFT TIMING GEAR

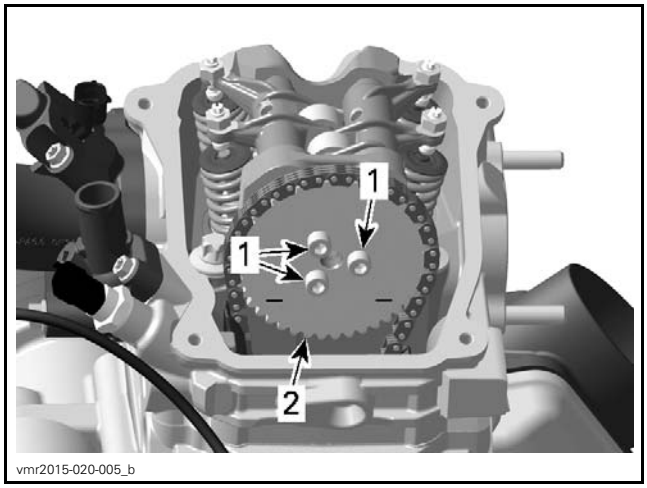
Removing the Camshaft Timing Gear

Remove the valve cover, refer to *TOP END* subsection.

Turn crankshaft to TDC ignition and lock crankshaft, refer to *CRANKSHAFT LOCKING PROCEDURE* in the *BOTTOM END* subsection.

Unscrew timing chain tensioner. Refer to *TIMING CHAIN TENSIONER* in this subsection.

Remove:
– Camshaft timing gear retaining screws
– Camshaft timing gear.



1. Camshaft timing gear retaining screws
2. Camshaft timing gear

NOTE: Secure timing chain with a piece of wire.

Inspecting the Camshaft Timing Gear

Check camshaft timing gear for wear or deterioration.

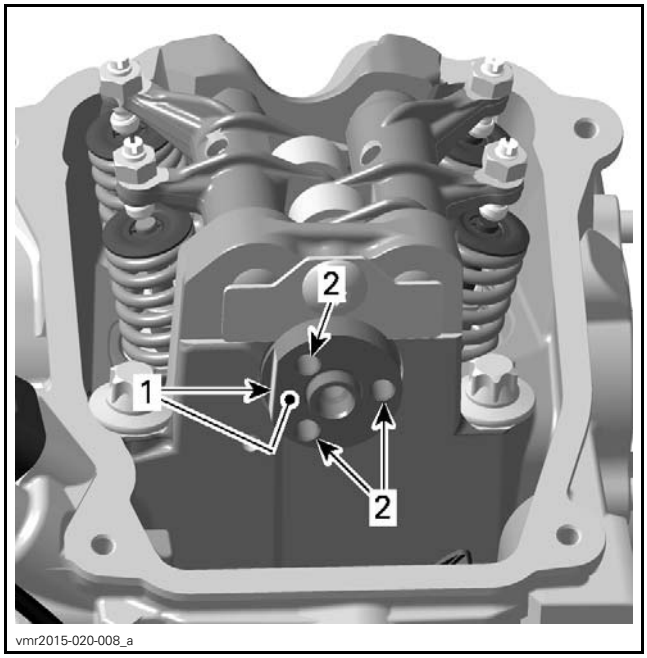
If gear is worn or damaged, replace it as a set with the timing chain.

For crankshaft gear, refer to *BOTTOM END* subsection, see *CRANKSHAFT*.

Installing the Camshaft Timing Gear

The installation is the reverse of the removal procedure. However, pay attention to the following.

1. Clean mating surface and threads of camshaft prior installing camshaft timing gear.

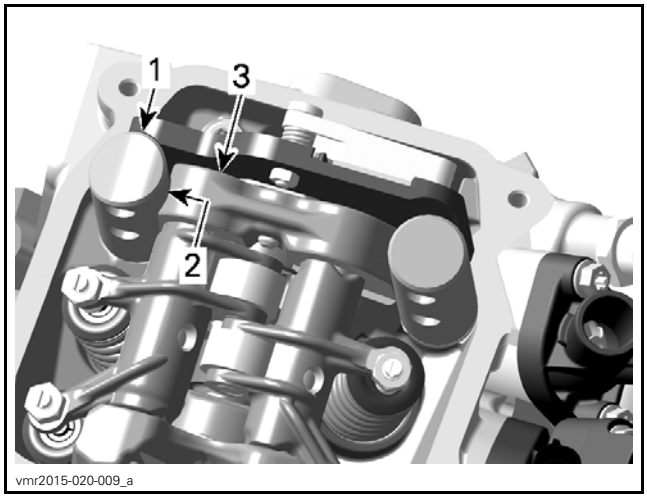


1. Mating surface on camshaft
2. Threads for camshaft screws

2. Crankshaft must be locked at TDC position before installing the timing chain, refer to *CRANKSHAFT LOCKING PROCEDURE* in the *BOTTOM END* subsection.
3. Install the camshaft timing tool on the cylinder head.

REQUIRED TOOL	
CAMSHAFT TIMING TOOL (P/N 529 036 268)	

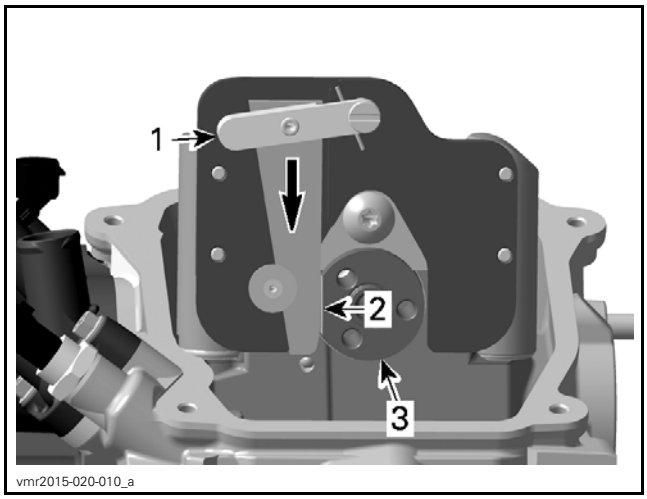
NOTE: Align tube of camshaft adjustment tool properly with machined radius on cylinder head.



CAMSHAFT TIMING TOOL INSTALLED
1. Tube (camshaft adjustment tool)
2. Machined radius (camshaft adjustment tool)
3. Cylinder head

4. Set camshaft to TDC ignition position by aligning the camshaft flange flat spot with the tool lever.

NOTE: In addition, to ensure proper camshaft timing, press camshaft adjustment tool lever downwards.

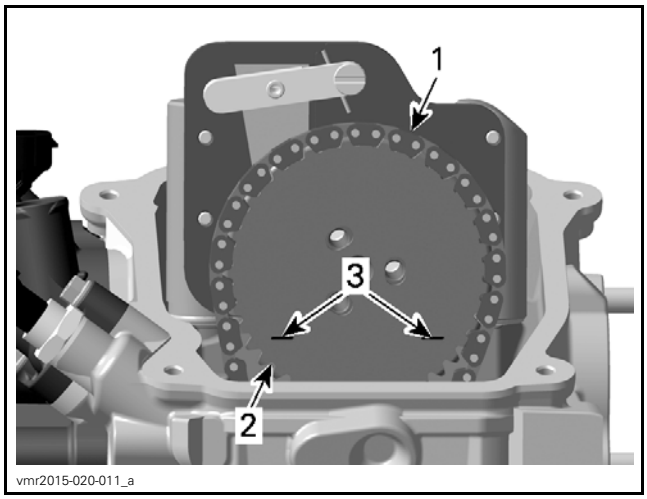


PRESS TOOL LEVER DOWN
1. *Lever*
2. *Flat spot*
3. *Camshaft*

NOTICE Crankshaft and camshaft must be locked at TDC ignition position to place camshaft timing gear and timing chain in the proper position.

5. Place camshaft timing gear along with the timing chain on the camshaft.

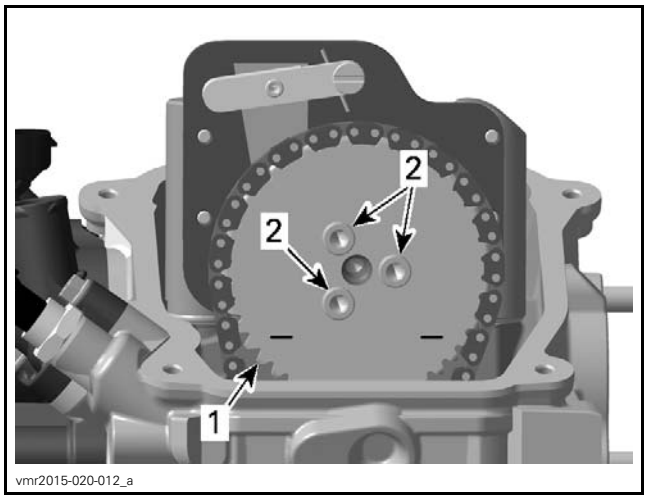
NOTE: The printed marks on the camshaft timing gear must be parallel to the cylinder head base.



1. *Timing chain*
2. *Camshaft timing gear*
3. *Printed marks on camshaft timing gear*

6. Install and adjust timing chain tensioner, refer to *TIMING CHAIN TENSIONER* in this subsection.

7. Install and tighten camshaft timing gear retaining screws to specified torque.



1. *Camshaft timing gear*
2. *Timing gear retaining screws*

TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Camshaft timing gear retaining screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

8. Remove the CAMSHAFT TIMING TOOL (P/N 529 036 268).

TIMING CHAIN

Removing the Timing Chain

Remove engine from vehicle, refer to *ENGINE REMOVAL/INSTALLATION* subsection.

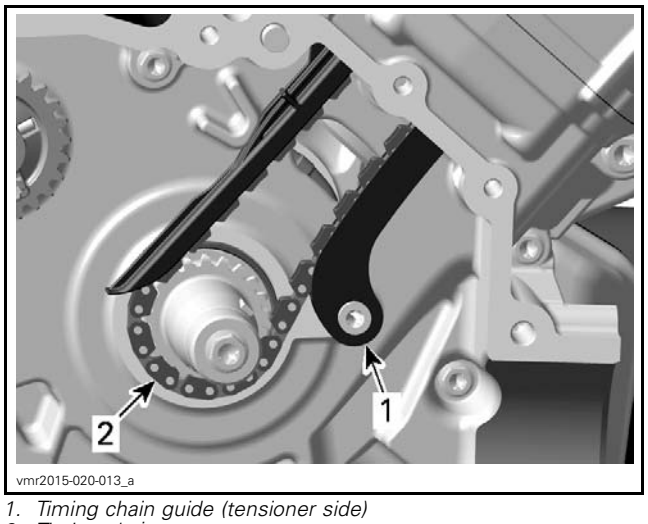
Refer to *MAGNETO AND STARTER* subsection and remove following parts:
– Magneto cover
– Rotor.

Refer to *TOP END* subsection and remove the valve cover.

Refer to *GEARBOX AND 4X4 COUPLING UNIT* subsection and remove the output shaft.

NOTE: Mark the operating direction of the timing chain and check for excessive radial play before removal. Refer to *TIMING CHAIN INSPECTION*.

Refer to following procedures in this subsection and remove following parts:
– Chain tensioner
– Camshaft timing gear.

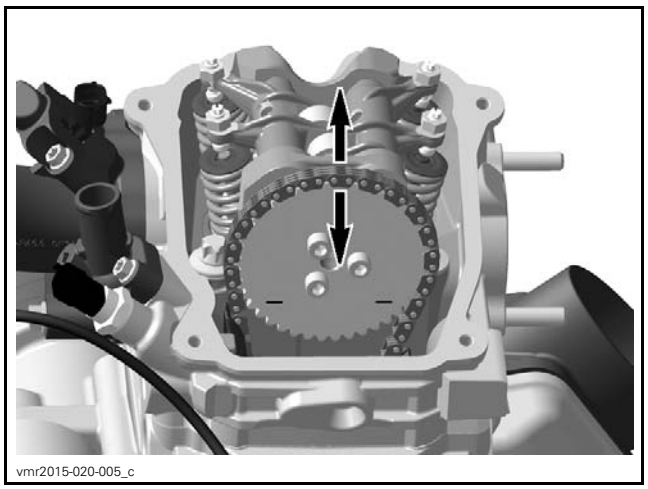


1. Timing chain guide (tensioner side)
2. Timing chain

Carefully pull the timing chain downwards and sideways, then out of the crankcase.

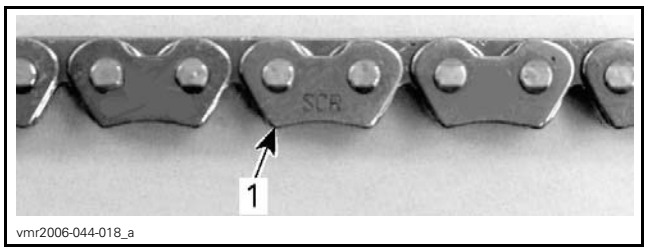
Inspecting the Timing Chain

Check timing chain on camshaft timing gear for excessive radial play.



CHECKING TIMING CHAIN RADIAL PLAY

Check chain condition for wear and teeth condition.



1. Timing chain

If chain is excessively worn or damaged, replace it as a set (camshaft timing gear and timing chain).

Check timing chain guides for wear, cracks or deforming. Replace as required.

NOTE: Check also the timing chain guide (tensioner side).

Installing the Timing Chain

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install timing chain with camshaft timing gear.

NOTE: Ensure to carry out proper valve timing, refer to *CAMSHAFT TIMING GEAR* in this subsection.

NOTICE **Improper valve timing will damage engine components.**

TIMING CHAIN GUIDE (TENSIONER SIDE)

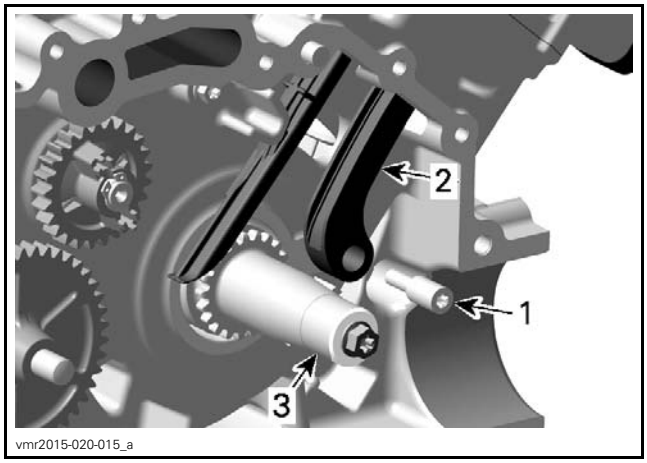
Removing the Timing Chain Guide (Tensioner Side)

Refer to procedures in this subsection and remove:

– Camshaft timing gear
– Timing chain.

Remove:

– Bearing screw
– Timing chain guide (tensioner side).



1. Bearing screw
2. Timing chain guide (tensioner side)
3. Crankshaft MAG side

Inspecting the Timing Chain Guide (Tensioner Side)

Check timing chain guide for wear, cracks or deforming. Replace if necessary.

Installing the Timing Chain Guide (Tensioner Side)

The installation is the reverse of the removal procedure.

TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Timing chain guide bearing screw	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

BOTTOM END

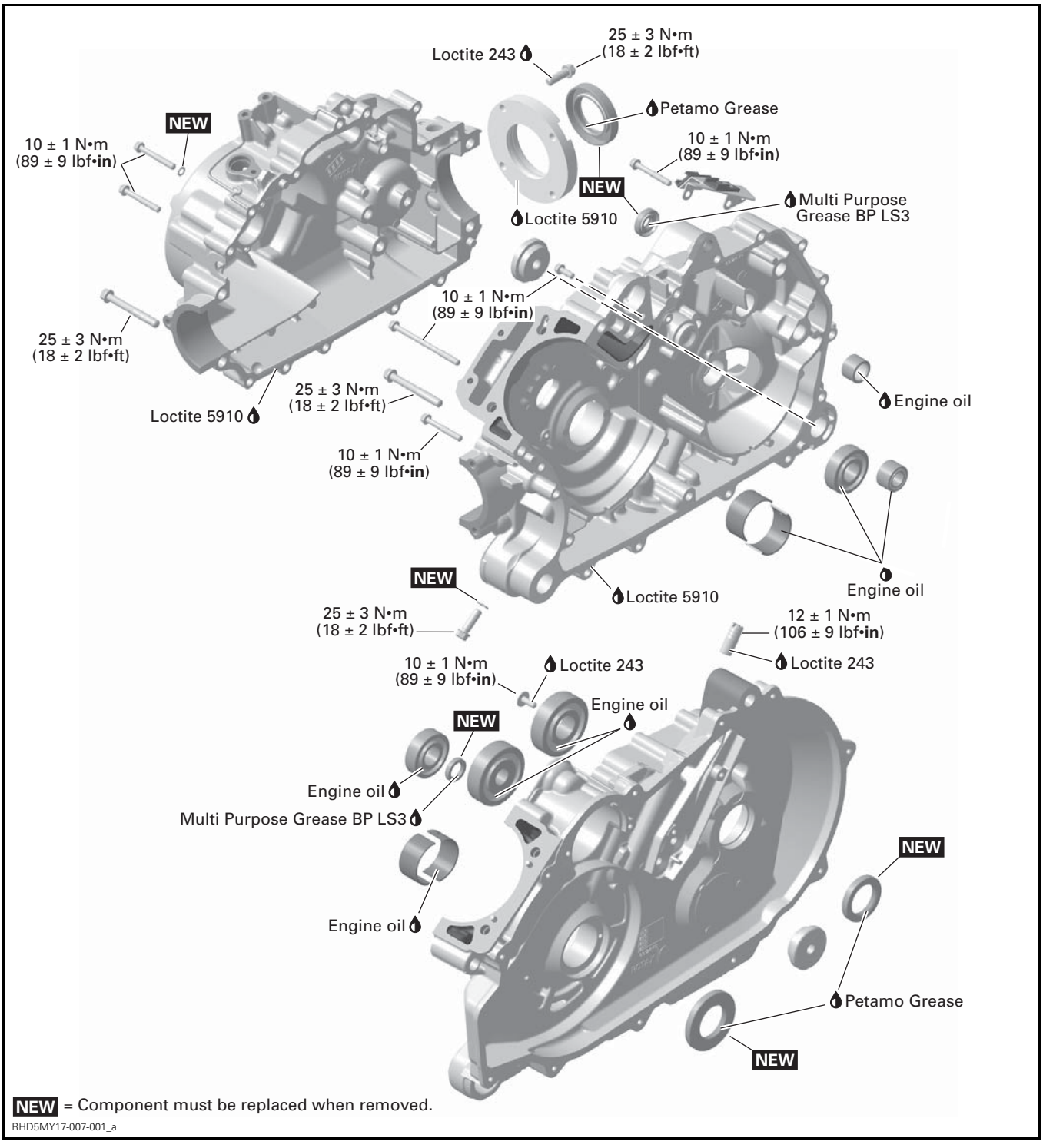
SERVICE TOOLS

Description	Part Number	Page
BEARING INSTALLER (GEARBOX)	529 035 762	14
BEARING INSTALLER (GEARBOX)	529 035 763	13
CRANKCASE SUPPORT (MAG SIDE)	529 035 916	11–12
CRANKCASE SUPPORT PTO	529 035 754	11–12
CRANKSHAFT LOCKING BOLT	529 035 617	18, 22
DIAL INDICATOR ADAPTER	529 036 159	17
HANDLE	420 877 650	5, 11, 13–14
OIL SEAL INSTALLER	529 036 069	11
OUTPUT SHAFT SEAL INSTALLER	529 035 941	5
PLAIN BEARING REMOVER/INSTALLER	529 035 917	11–12
TDC DIAL INDICATOR	414 104 700	17

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	5
LOCTITE 5910	293 800 081	15
LOCTITE CHISEL (GASKET REMOVER)	413 708 500	9

CRANKCASE



NEW = Component must be replaced when removed.

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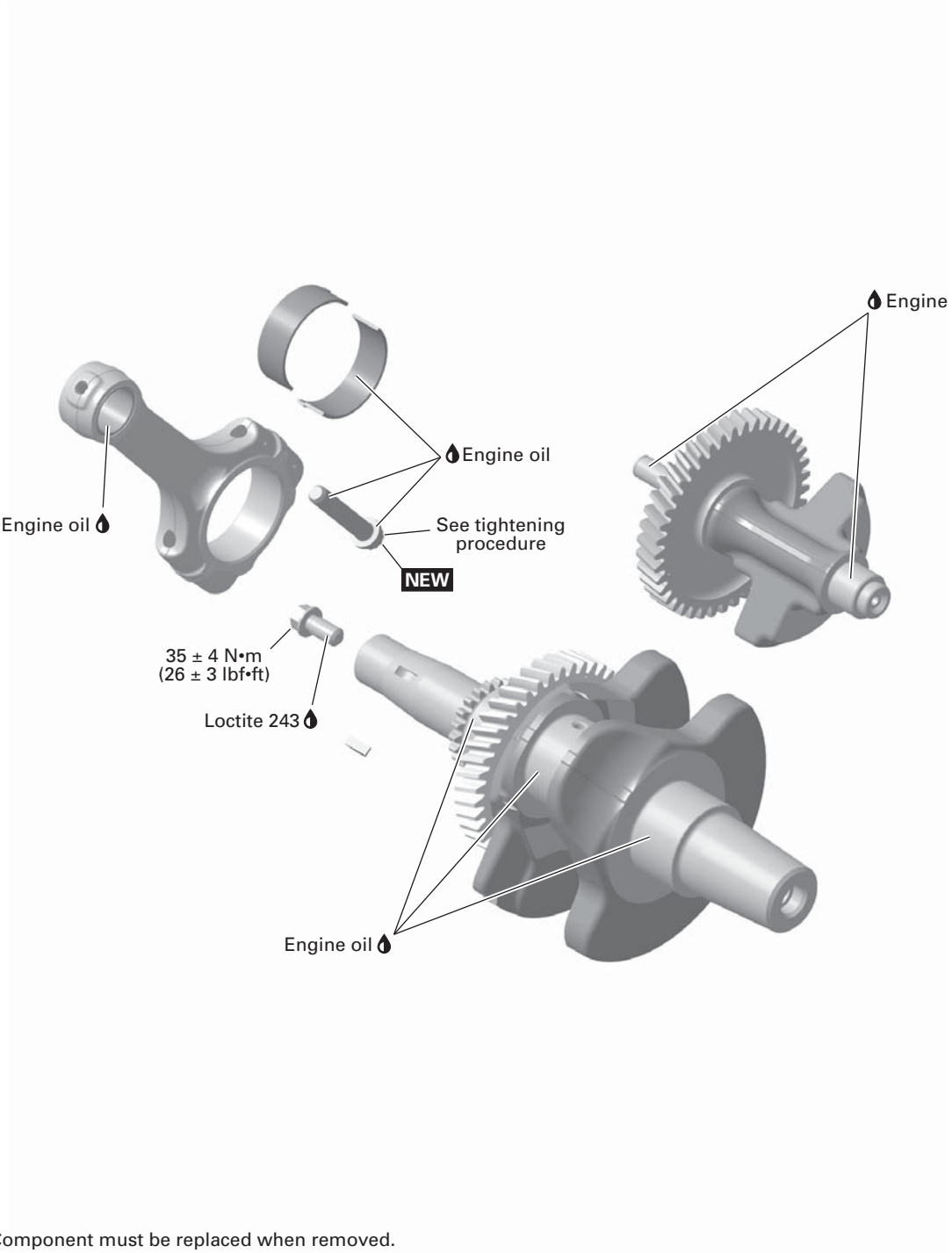
CRANKSHAFT/BALANCER SHAFT



NEW = Component must be replaced when removed.

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GENERAL

This section includes the procedures pertaining to the crankcase, crankshaft and balancer shaft. For the gearbox, follow the procedure for the *CRANKCASE* then refer to *GEARBOX AND 4X4 COUPLING UNIT* subsection.

During assembly / installation, use the torque values and service products as in the exploded views.

Clean threads before applying a thread locker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.
Locking devices when removed (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

PROCEDURES

IMPORTANT: Note position of parts on disassembly. This may help to find the root cause of a problem. A component that is not replaced should be reinstalled in the same position as originally mounted.

OUTPUT SHAFT OIL SEAL

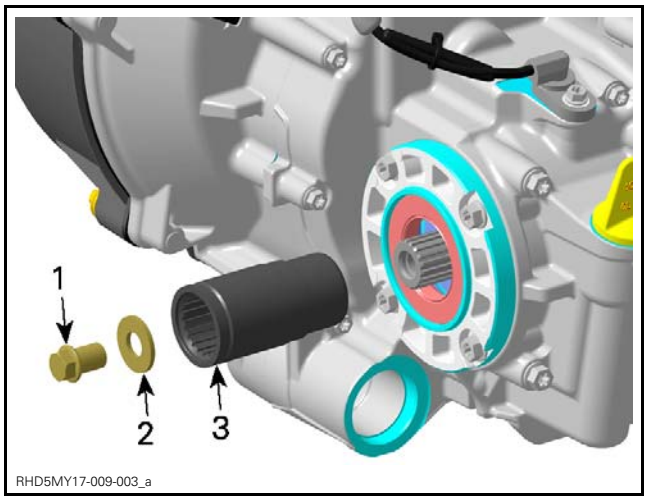
Removing the Output Shaft Oil Seal

NOTE: The output shaft oil seal can be removed and installed without removing the engine from vehicle.

Remove the final drive unit. Refer to *REAR DRIVE*.

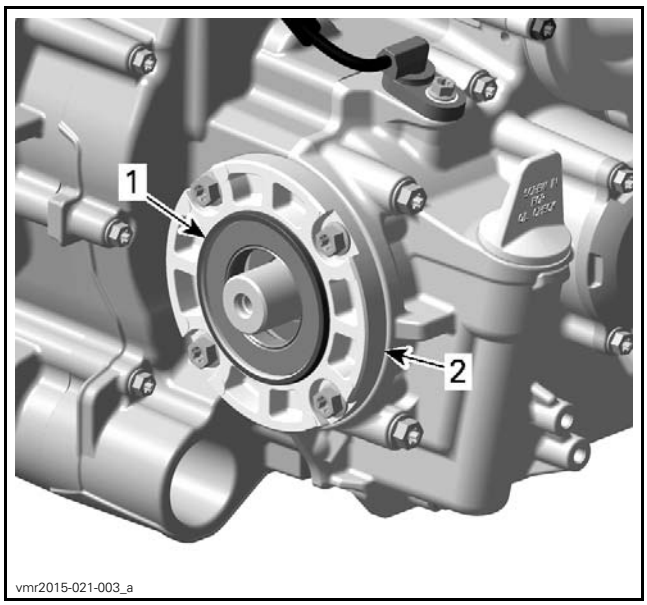
Set gearbox to PARK position.

Remove coupling sleeve.



1. *Retaining screw*
2. *Washer*
3. *Coupling sleeve*

Replace oil seal if brittle, hard or otherwise damaged.



1. *Output shaft oil seal*
2. *Bearing flange*

Drain engine oil, refer to *ENGINE OIL CHANGE* in the *PERIODIC MAINTENANCE PROCEDURES* subsection.

Using a small screwdriver, remove the output shaft oil seal from bearing flange.

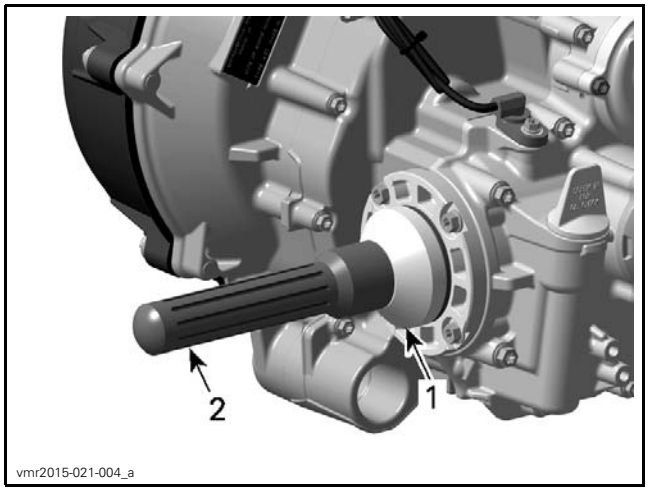
NOTICE Avoid scratching the bearing flange or output shaft during oil seal removal.

Check oil seal seating surface for grooves. Replace bearing flange if necessary.

Check bearing behind oil seal for contamination and/or metal shavings. Replace if necessary.

Installing the Output Shaft Oil Seal

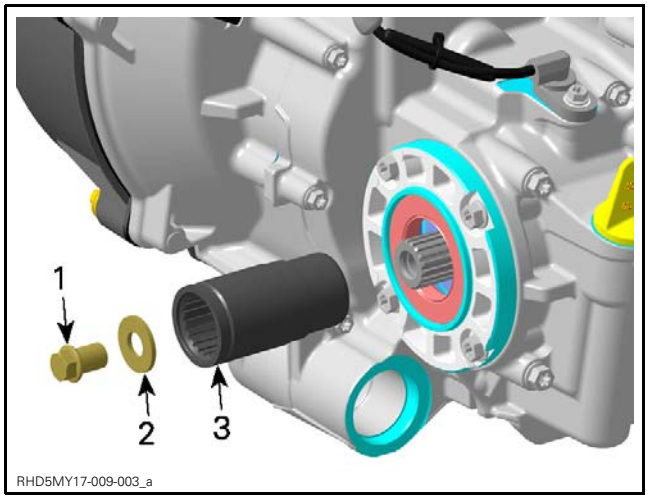
REQUIRED TOOL	
OUTPUT SHAFT SEAL INSTALLER (P/N 529 035 941)	
HANDLE (P/N 420 877 650)	



1. *Outputshaftseal installer*
2. *Handle*

Set gearbox to PARK position.

Tighten coupling sleeve retaining screw to specification.



1. *Retaining screw*
2. *Washer*
3. *Coupling sleeve*

TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Coupling sleeve retaining screw	45 N•m ± 5 N•m (33 lbf•ft ± 4 lbf•ft)

Install all remaining removed parts. Refer to applicable subsections.

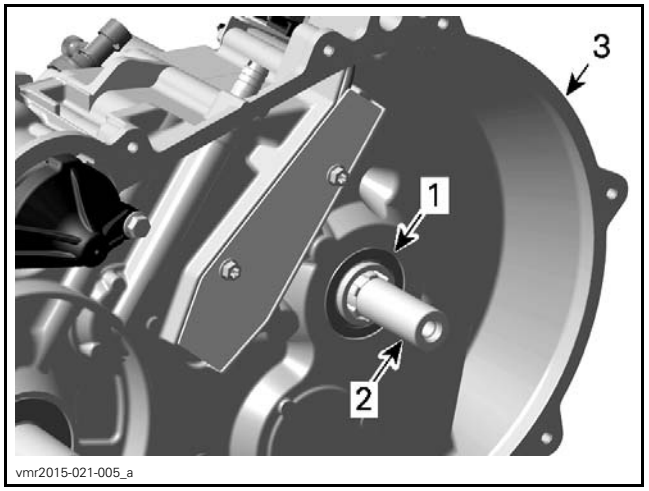
COUNTER SHAFT OIL SEAL

Removing the Counter Shaft Oil Seal

Replace oil seal if brittle, hard or otherwise damaged.

NOTE: The counter shaft oil seal can be removed without removing the engine from vehicle.

Remove the driven pulley. Refer to *CONTINUOUSLY VARIABLE TRANSMISSION* subsection.



1. *Counter shaft oil seal*
2. *Counter shaft*
3. *Crankcase, PTO side*

Using a small screwdriver, remove the counter shaft oil seal.

NOTICE **Avoid scratching the crankcase or counter shaft during oil seal removal.**

Installing the Counter Shaft Oil Seal

Using a suitable tube with the proper diameter to install the oil seal.

Install all removed parts.

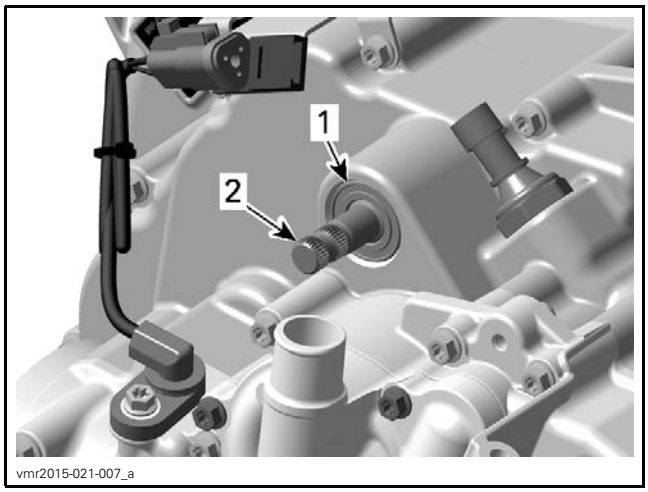
SHIFT SHAFT OIL SEAL

Removing the Shift Shaft Oil Seal

Remove the shift plate from the shift shaft. Refer to the *SHIFTER* subsection.

Replace oil seal if brittle, hard or otherwise damaged.

NOTE: The shift shaft oil seal can be removed without removing the engine from vehicle.



1. Shift shaft oil seal
2. Shift shaft

Using a small screwdriver, remove the shift shaft oil seal.

NOTICE **Avoid scratching the crankcase or shift shaft during oil seal removal.**

Installing the Shift Shaft Oil Seal

Using a suitable tube, with the proper diameter, install the seal.

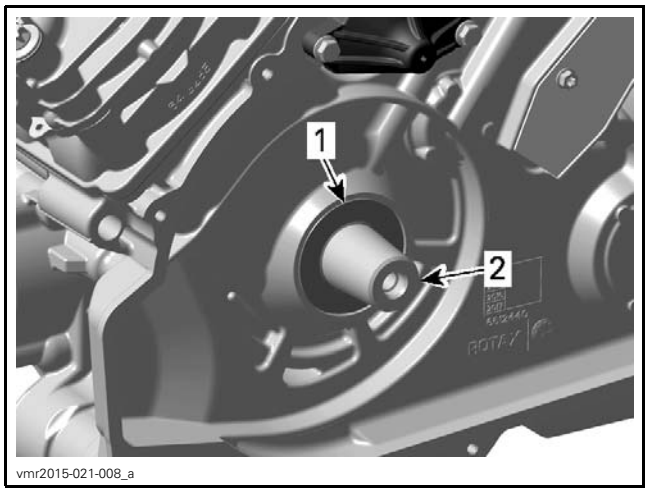
Refer to the *SHIFTER* subsection and reinstall the shift plate and cable.

CRANKSHAFT OIL SEAL

Removing the Crankshaft Oil Seal

Replace oil seal if brittle, hard or otherwise damaged.

NOTE: The crankshaft oil seal can be removed without removing the engine from vehicle.



1. Crankshaft oil seal
2. Crankshaft, PTO side

Remove the drive pulley. Refer to *CONTINUOUSLY VARIABLE TRANSMISSION* subsection.

Using a small screwdriver, remove the crankshaft oil seal.

NOTICE **Avoid scratching the crankcase or crankshaft during oil seal removal.**

Installing the Crankshaft Oil Seal

Using a suitable tube with the proper diameter to install the seal.

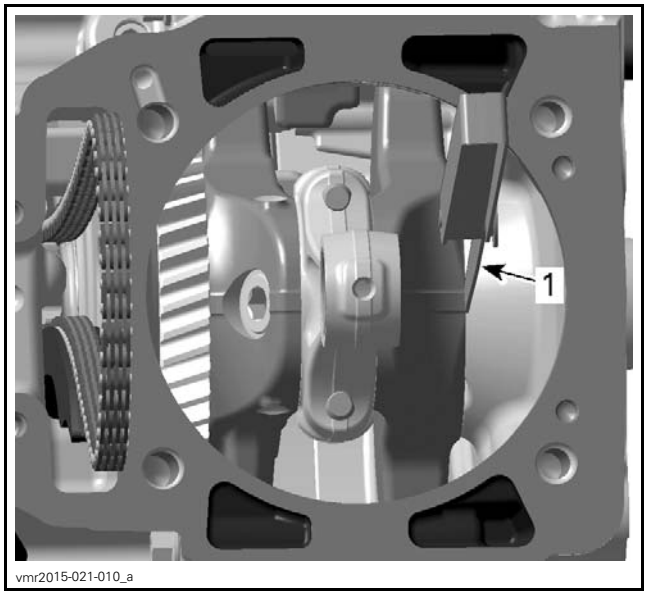
CRANKCASE

Disassembling the Crankcase

NOTE: Oil pump removal from crankcase MAG side is not necessary, but recommended to see condition of oil pump, refer to *LUBRICATION SYSTEM* subsection.

Remove:
- Engine from vehicle, refer to *ENGINE REMOVAL AND INSTALLATION* subsection
- Magneto cover and rotor, refer to *MAGNETO AND STARTER* subsection
- Output shaft, refer to *GEARBOX AND 4X4 UNIT* subsection
- Cylinder head and cylinder, refer to *TOP END* subsection
- Drive and driven pulley, refer to *CONTINUOUSLY VARIABLE TRANSMISSION* subsection
- Oil pressure switch, refer to *LUBRICATION SYSTEM* subsection.

Measure axial clearance between the crankshaft and crankcase PTO with a feeler gauge.

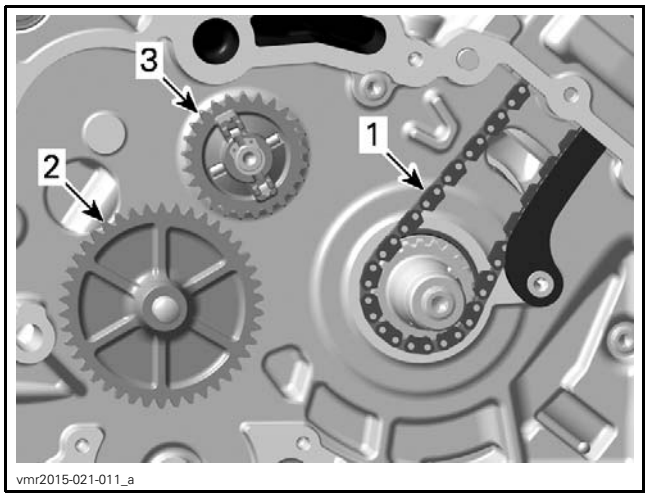


1. Feeler gauge

CRANKSHAFT AXIAL CLEARANCE	
NEW	0.1 mm to 0.4 mm (.004 in to .016 in)
SERVICE LIMIT	0.5 mm (.02 in)

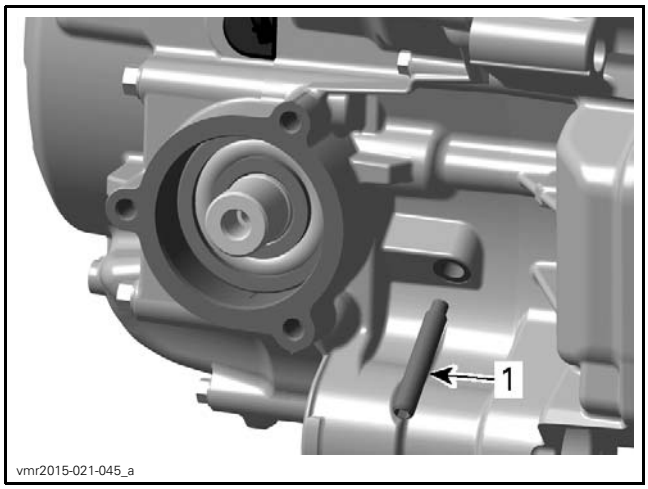
If measurement is out of specification, inspect butting faces of crankshaft and crankcase (MAG/PTO side) for excessive wear.

Remove:
– Timing chain
– Intermediate gear of oil pump
– Drive gear of water pump.



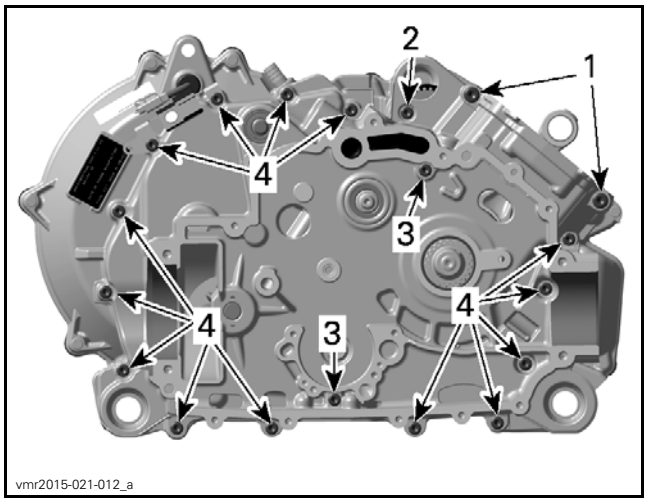
1. Timing chain
2. Intermediate gear, oil pump
3. Drive gear, water pump

Remove crankshaft locking bolt.



1. Crankshaft locking bolt

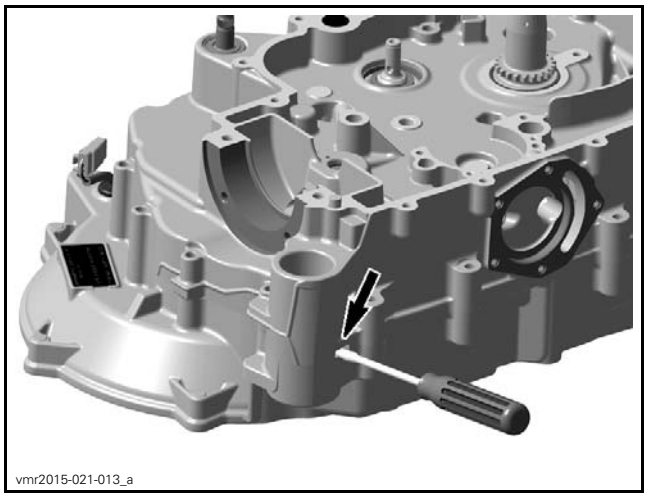
Remove crankcase retaining screws:
1. Start removing the M6 screws
2. Then remove the M8 screws.



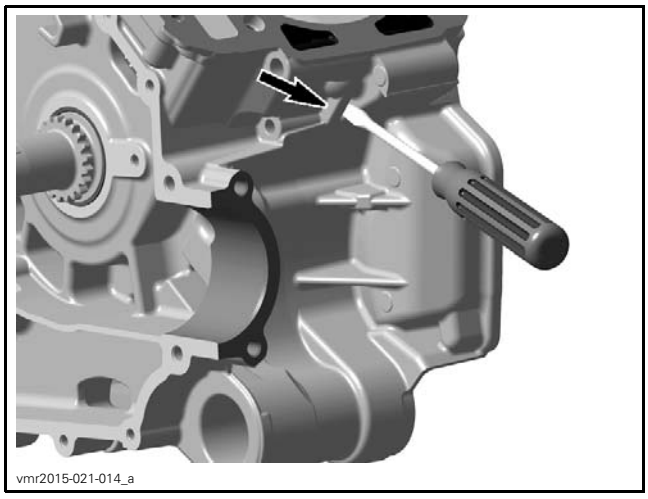
1. 2x screws M8 x 85
2. 1x screw M6 x 16
3. 2x screws M6 x 85
4. 14x screws M6 x 45

Place the crankcase on a wood stand, MAG side upwards.

Split crankcase with 2 screwdrivers.



POSITION FOR BIG FLAT SCREWDRIVER

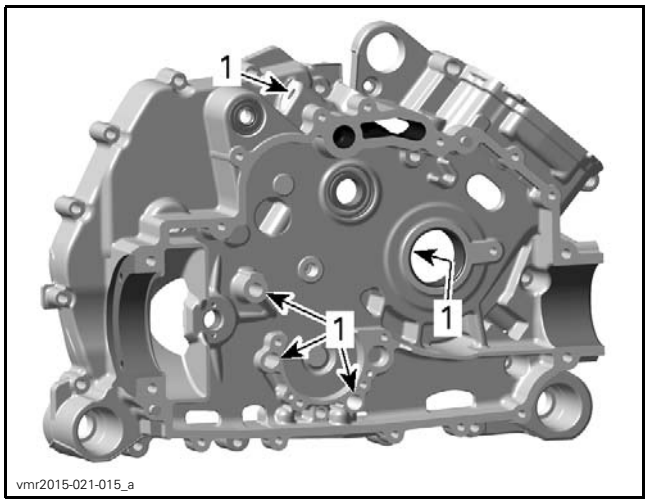


POSITION FOR BIG FLAT SCREWDRIVER

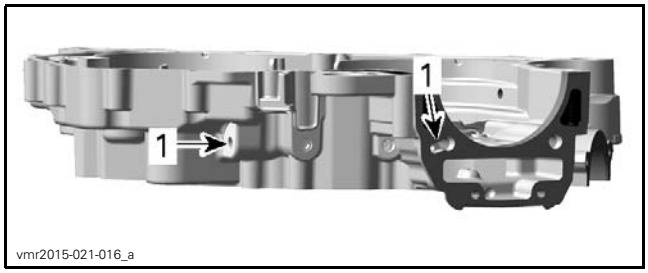
Cleaning the Crankcase

Clean all metal components in a solvent.

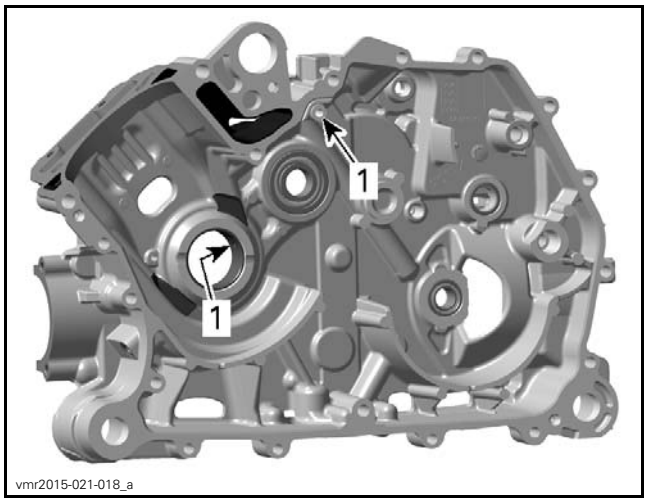
Clean oil passages and make sure they are not clogged.



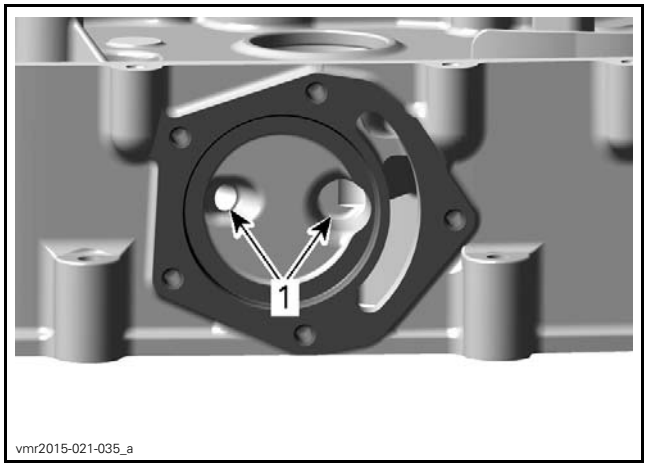
CRANKCASE MAG SIDE
1. Oil orifices



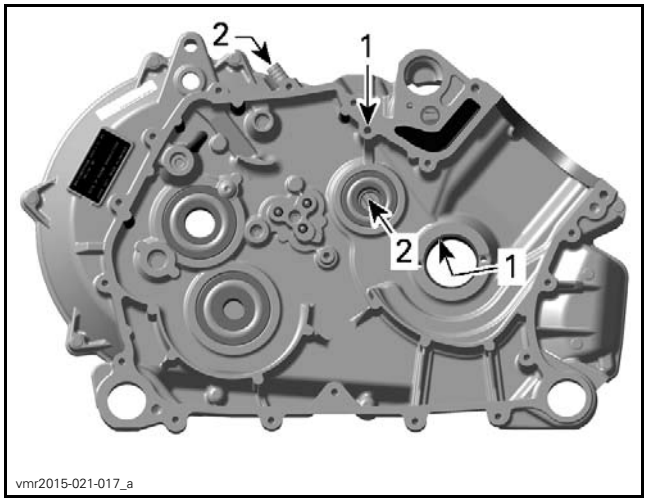
CRANKCASE MAG SIDE
1. Oil orifices



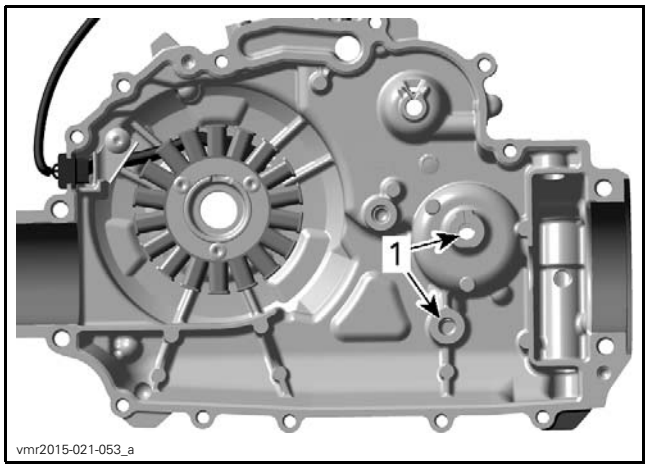
CRANKCASE MAG SIDE
1. Oil orifices



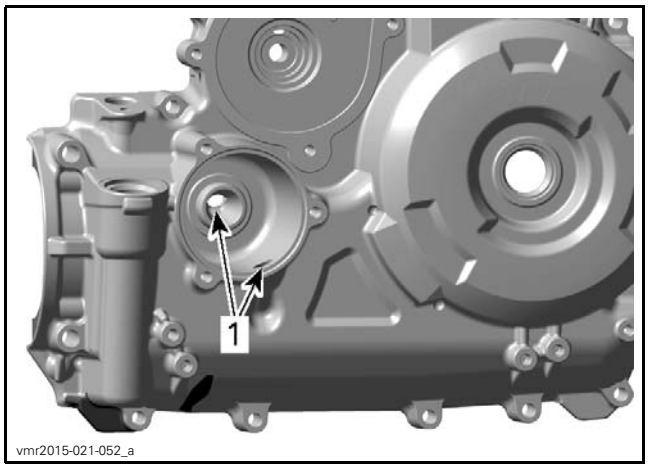
CRANKCASE MAG SIDE
1. Oil orifices



CRANKCASE PTO SIDE
1. Oil orifices
2. Engine blow by bore



MAGNETO COVER
1. Oil orifices



MAGNETO COVER
1. Oil orifices

Clean crankcase mating surfaces using a combination of LOCTITE CHISEL (GASKET REMOVER) (P/N 413 708 500) and a brass brush. First brush in one direction then make the final brushing perpendicularly (90°) to the first pass.

NOTICE **Do not wipe with rags. Use a new clean hand towel only.**

Inspecting the Crankcase

NOTE: To check some parts, it is recommended to remove all components from crankcase.

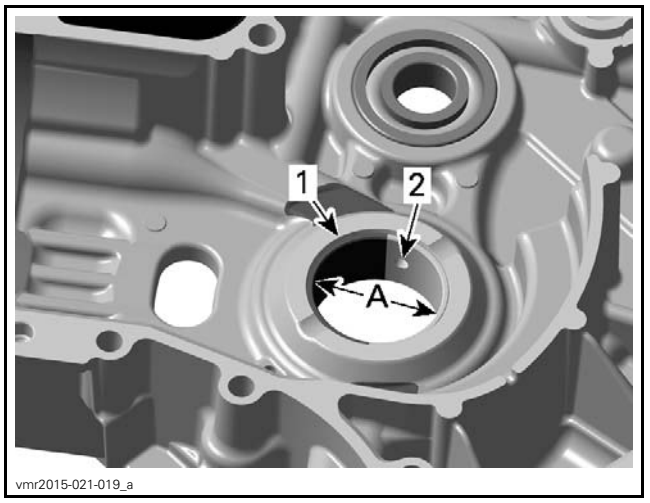
Crankshaft Plain Bearing

Check MAG and PTO plain bearings for scoring or other damages.

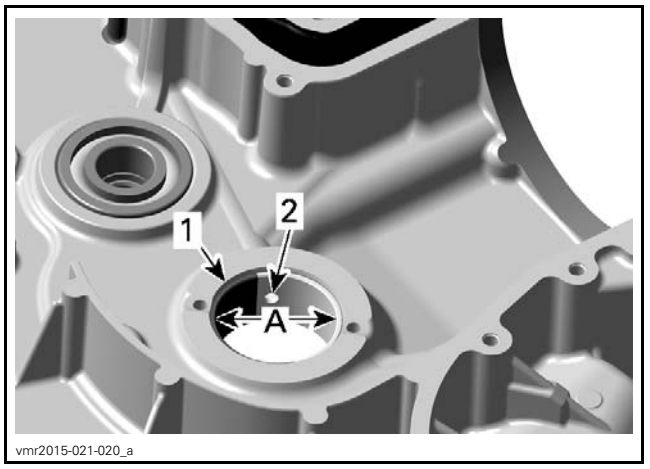
Measure plain bearing inside diameter.

Compare measurements to MAG/PTO main journal diameters of crankshaft, refer to *CRANKSHAFT* in this subsection.

Replace if the measurement is out of specification.



MAG PLAIN BEARING
1. Plain bearing
2. Oil bore
A. Plain bearing inside diameter

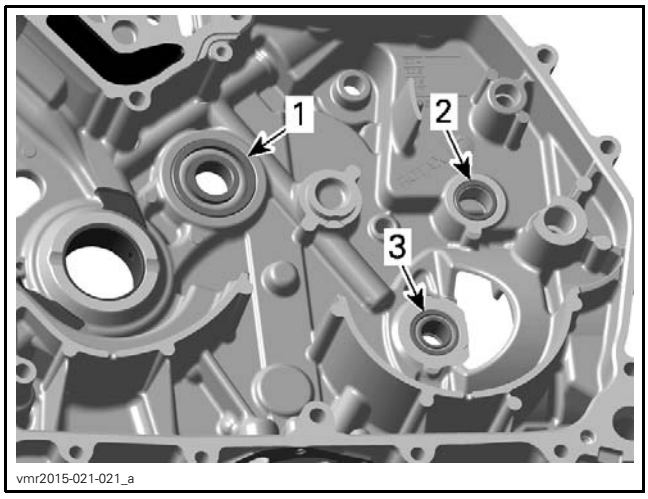


PTO PLAIN BEARING
1. Plain bearing
2. Oil bore
A. Plain bearing inside diameter

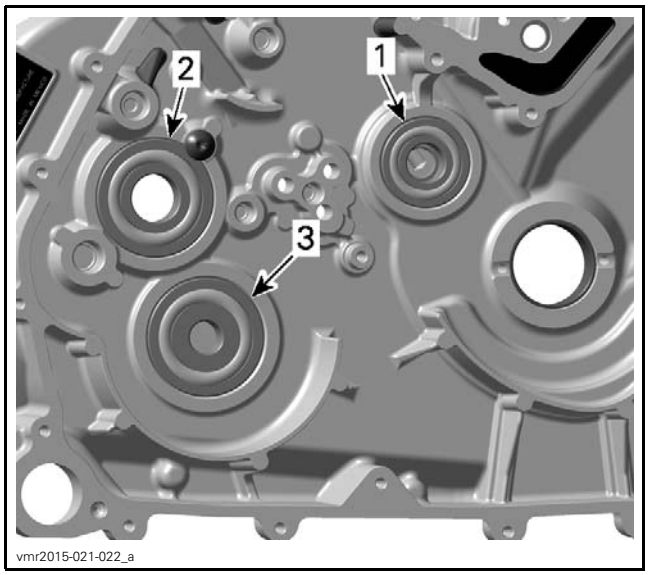
PLAIN BEARING INSIDE DIAMETER (MAG/PTO)	
SERVICE LIMIT	42.100 mm (1.6575 in)

Ball and Needle Bearings

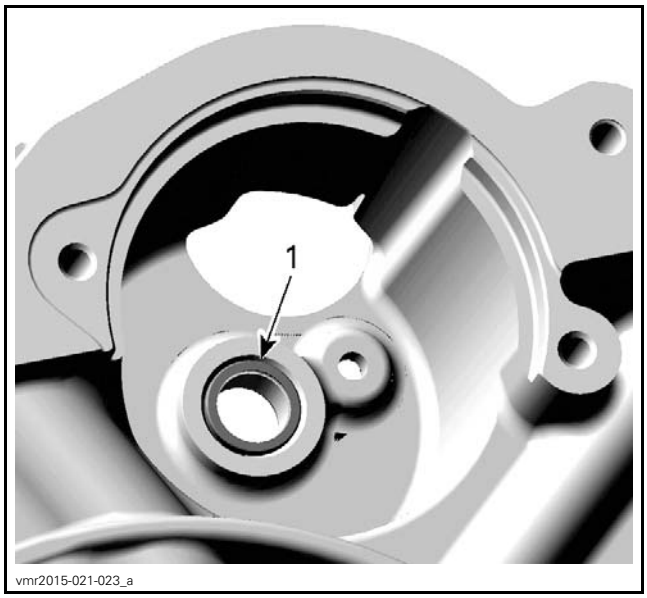
Check ball bearings and needle bearings for excessive play and smooth operation. Replace if necessary.



CRANKCASE MAG
1. *Balancer shaft ball bearing*
2. *Counter shaft needle bearing*
3. *Bevel gear needle bearing*



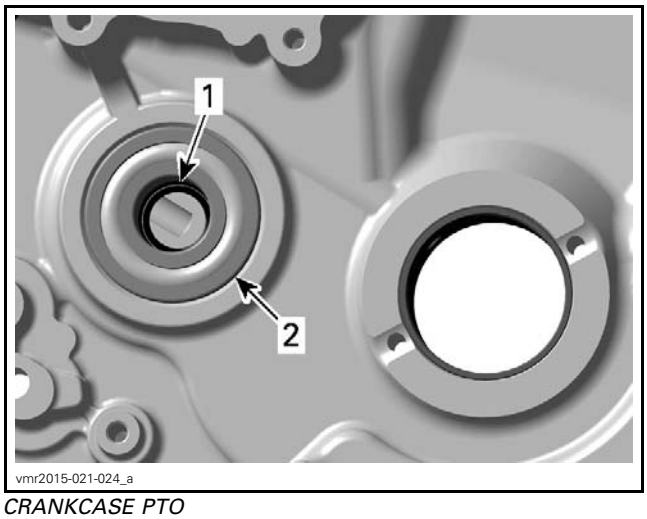
CRANKCASE PTO
1. *Balancer shaft ball bearing*
2. *Counter shaft ball bearing*
3. *Bevel gear ball bearing*



CRANKCASE PTO
1. *Starter drive needle bearing*

Balancer Shaft Oil Seal

Replace oil seal if brittle, hard or otherwise damaged.



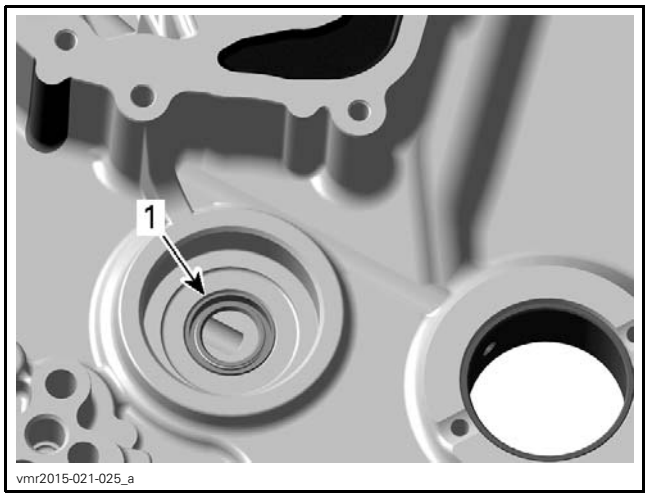
CRANKCASE PTO
1. *Balancer shaft oil seal*
2. *Balancer shaft ball bearing*

Balancer Shaft Oil Seal Replacement Procedure

Removing the Balancer Shaft Oil Seal

Remove balancer shaft ball bearing, refer to *BEARING REPLACEMENT PROCEDURE* in this subsection.

The oil seal is removed easily with a flat screwdriver.



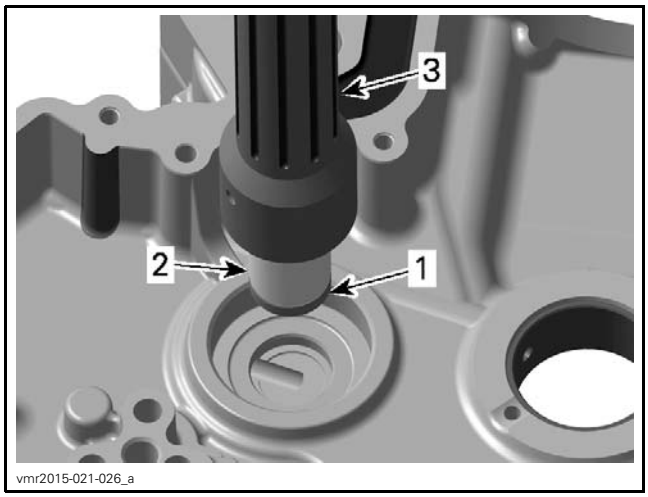
CRANKCASE PTO
1. Balancer shaft oil seal

NOTICE Avoid scoring bearing seat or oil seal bore in crankcase.

Installing the Balancer Shaft Oil Seal

NOTICE Oil seal must be installed with sealing lip towards balancer shaft.

REQUIRED TOOL	
OIL SEAL INSTALLER (P/N 529 036 069)	
HANDLE (P/N 420 877 650)	



CRANKCASE, PTO SIDE
1. Balancer shaft oil seal
2. Oil seal installer
3. Handle

Bearing Replacement Procedure

NOTICE Clean oil, outside and inside, from crankcase.

NOTICE Always support crankcase properly when ball bearings, needle bearings or plain bearings are removed or installed; otherwise, crankcase could be damaged.

Unless otherwise instructed, never use hammer to install ball bearings, needle bearings or plain bearings. Use press machine only.

NOTICE Ball bearings have to be installed with closed bearing cage to the engine outside.

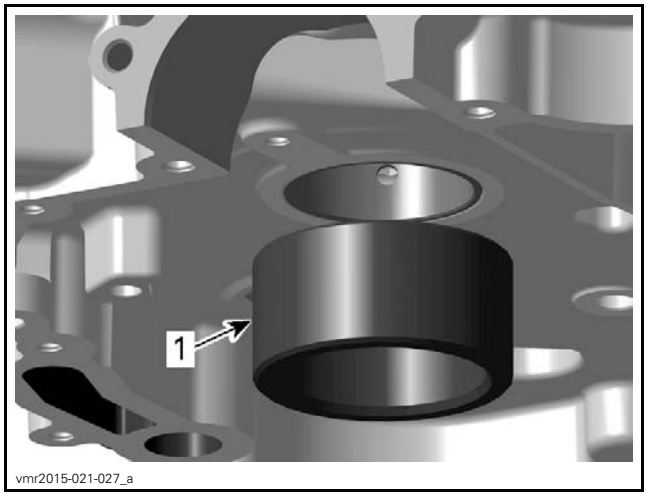
Removing the Crankshaft Plain Bearing

NOTE: Always use a press for removal or installation of plain bearing halves.

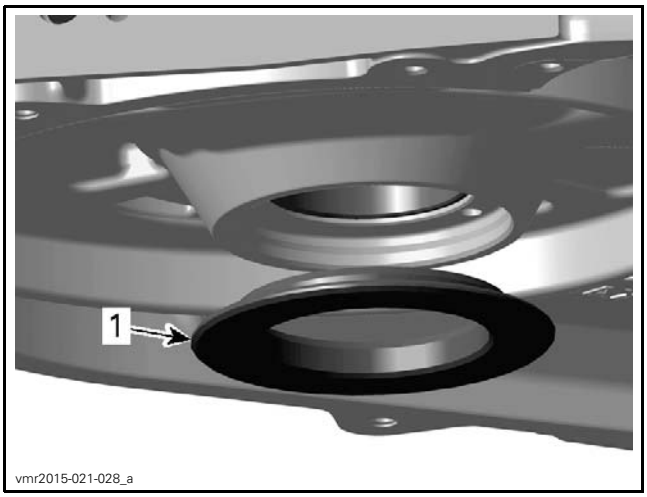
Carefully press the plain bearings out from the crankcase half from inside towards the outside.

NOTE: Use proper crankcase support when removing plain bearings.

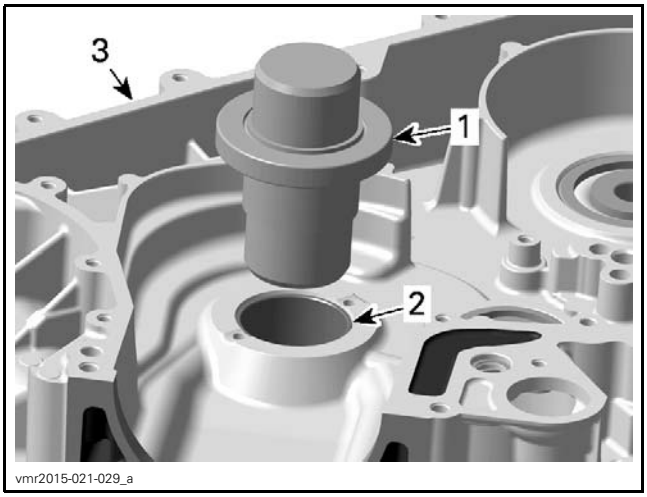
REQUIRED TOOL	
PLAIN BEARING REMOVER/INSTALLER (P/N 529 035 917)	
CRANKCASE SUPPORT (MAG SIDE) (P/N 529 035 916)	
CRANKCASE SUPPORT PTO (P/N 529 035 754)	



CRANKCASE MAG SIDE
1. Crankcase support MAG



CRANKCASE PTO SIDE
1. Crankcase support PTO



PRESS PLAIN BEARINGS OUTSIDE
1. Plain bearing remover/installer
2. Plain bearing
3. Crankcase (PTO side shown)

Installing the Crankshaft Plain Bearing

NOTICE Unless otherwise instructed, never use hammer to install plain bearings. Use press only.

NOTE: Use proper crankcase support when installing plain bearings. Damage to crankcase may occur if this procedure is not performed correctly.

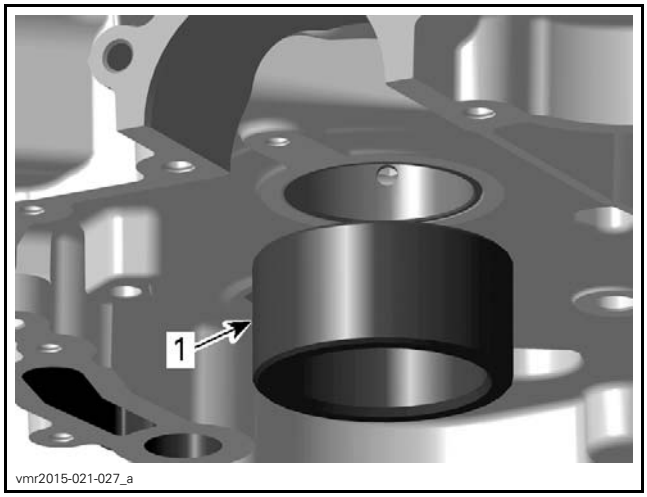
Carefully press in the plain bearings in the same direction as during disassembly, from the crankcase inside towards the outside.

Install plain bearings in a cold crankcase.

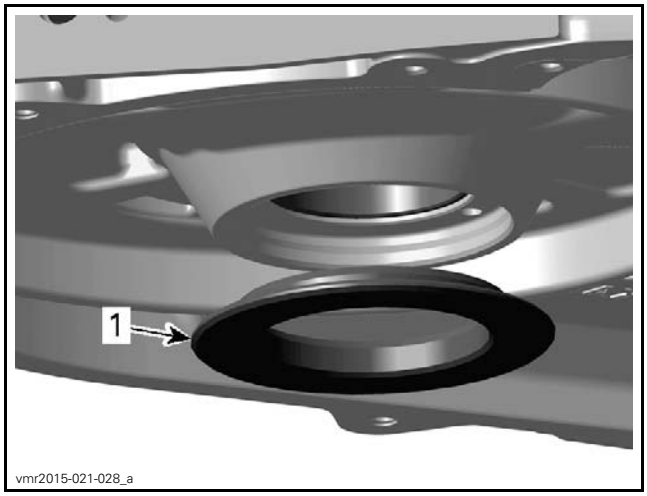
NOTE: Do not lubricate plain bearings and/or crankcase for installation.

REQUIRED TOOL	
PLAIN BEARING REMOVER/INSTALLER (P/N 529 035 917)	
CRANKCASE SUPPORT (MAG SIDE) (P/N 529 035 916)	
CRANKCASE SUPPORT PTO (P/N 529 035 754)	

Use an O-ring (Ø 42 mm (1.65 in) x 1 mm to 1.5 mm (.04 in to .06 in) thickness) to hold plain bearings in place during installation. The O-ring will disappear in the groove of the plain bearing remover/installer.



CRANKCASE MAG SIDE
1. Crankcase support MAG

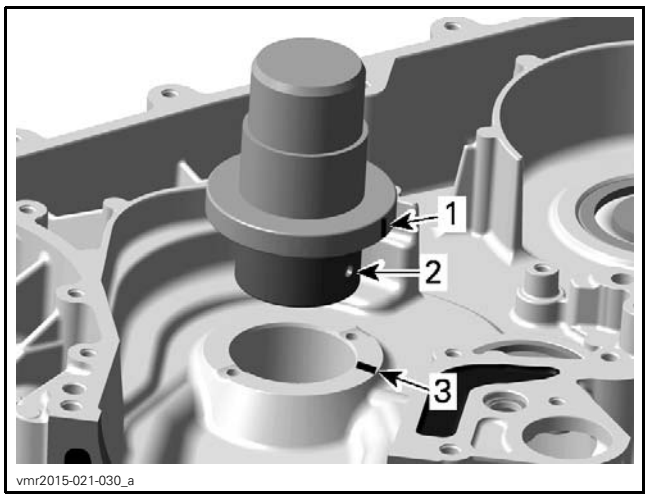


CRANKCASE PTO SIDE
1. Crankcase support PTO

Mark position of plain bearing oil bore on plain bearing remover/installer.

Mark position of oil bore on crankcase half.

Align mark on plain bearing remover/installer with mark on crankcase half.

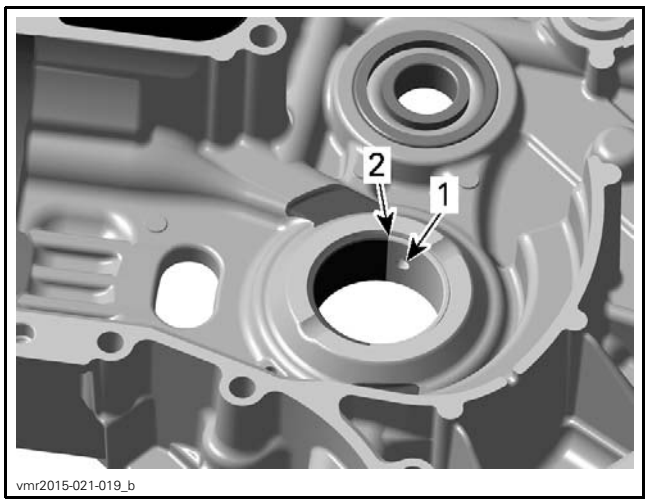


PRESS PLAIN BEARINGS INSIDE
1. *Oil bore position marked on plain bearing remover/installer*
2. *Plain bearing oil bore*
3. *Oil bore position marked on crankcase*

NOTICE Misalignment of the plain bearing and crankcase oil bores will prevent proper oil supply to plain bearings.

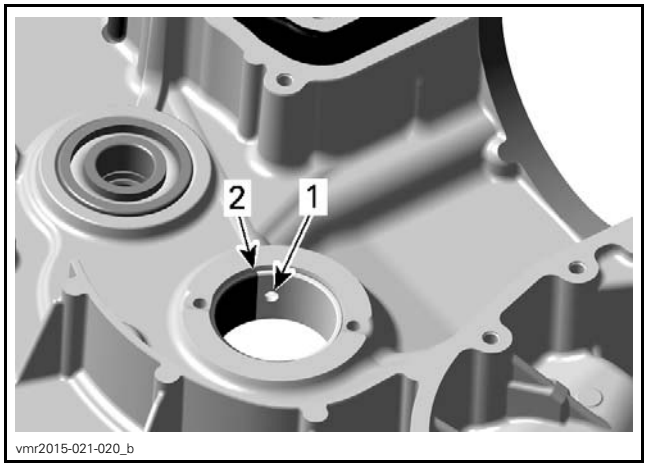
Carefully press in the plain bearings from inside the crankcase towards the outside.

NOTICE The partition of the plain bearings in crankcase half MAG side must be positioned near to oil bore in counterclockwise direction.



CRANKCASE MAG
1. *Oil bore*
2. *Partition*

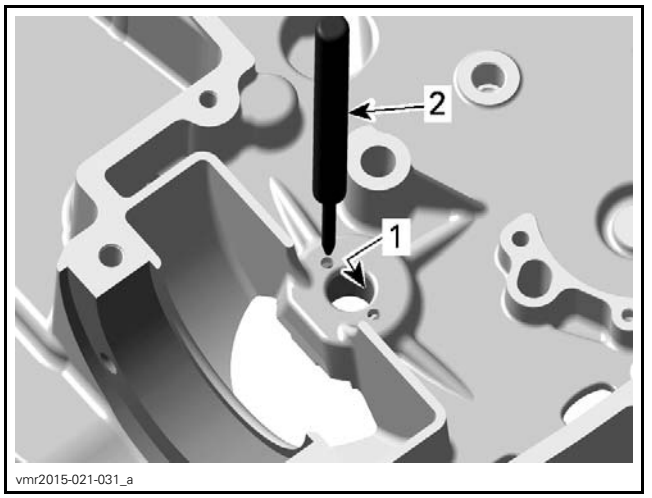
NOTICE The partition of the plain bearings in crankcase half PTO side must be positioned near to oil bore in counterclockwise direction.



CRANKCASE PTO
1. *Oil bore*
2. *Partition*

Removing the Bevel Gear Needle Bearing

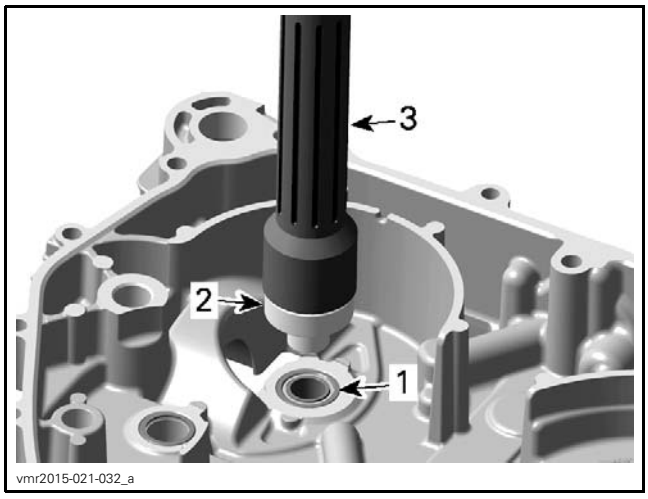
Remove bevel gear needle bearing using a punch.



1. *Bevel gear needle bearing*
2. *Punch*

Installing the Bevel Gear Needle Bearing

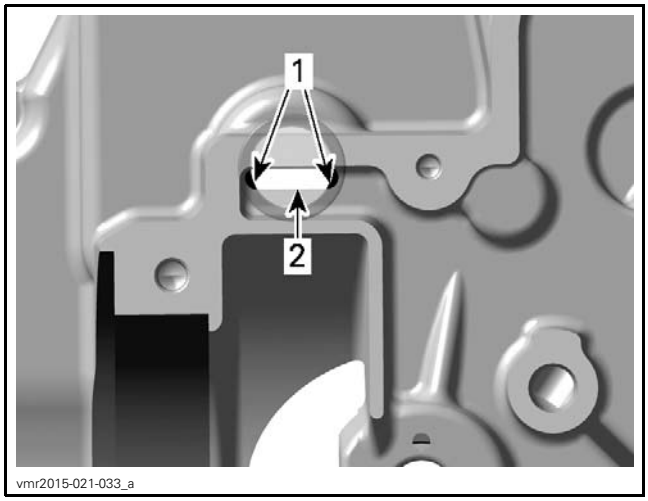
REQUIRED TOOL	
BEARING INSTALLER (GEARBOX) (P/N 529 035 763)	
HANDLE (P/N 420 877 650)	



1. Bevel gear needle bearing
2. Needle bearing installer
3. Handle

Removing the Counter Shaft Needle Bearing

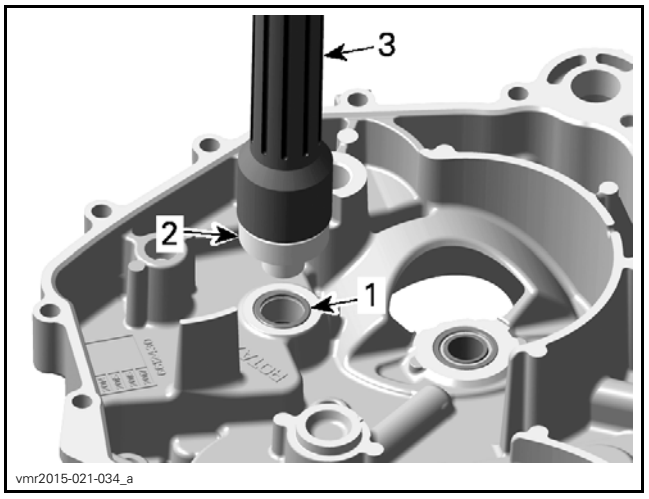
Remove counter shaft needle bearing, using a punch.



1. Counter shaft needle bearing
2. Hole in crankcase MAG side

Installing the Counter Shaft Needle Bearing

REQUIRED TOOL	
BEARING INSTALLER (GEARBOX) (P/N 529 035 762)	
HANDLE (P/N 420 877 650)	



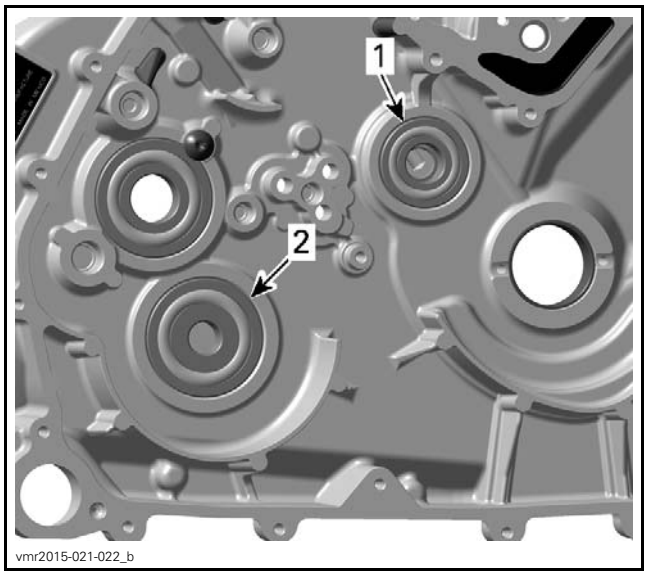
1. Counter shaft needle bearing
2. Needle bearing installer
3. Handle

Starter Drive Needle Bearing Replacement

For starter drive needle bearing replacement refer to *MAGNETO AND STARTER* subsection.

Removing the Balancer Shaft (PTO side) and Bevel Gear Ball Bearing

To remove ball bearings use a blind hole bearing puller.

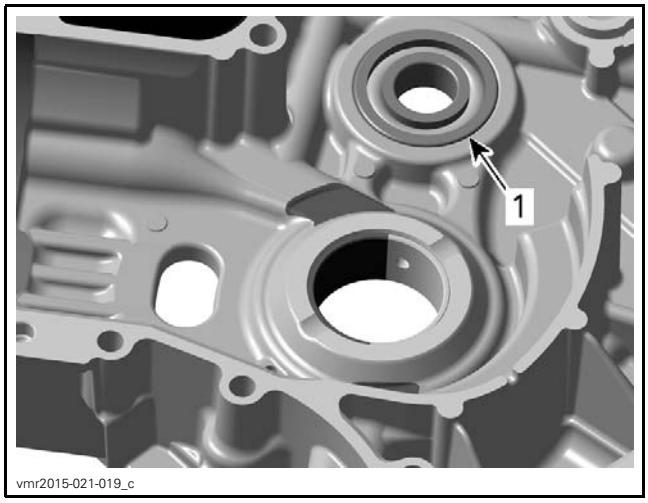


CRANKCASE PTO
1. Balancer shaft ball bearing
2. Bevel gear ball bearing

Installing the Balancer Shaft (PTO side) and Bevel Gear Ball Bearing

Use a suitable installer for installing ball bearings.

Removing the Balancer Shaft (MAG side) Ball Bearing



CRANKCASE MAG
1. Balancer shaft ball bearing

Removed ball bearing with a suitable pusher from outside in.

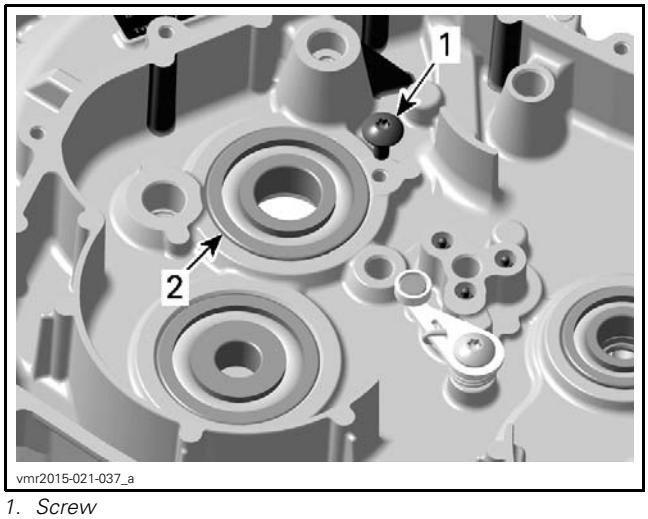
Installing the Balancer Shaft (MAG side) Ball Bearing

Use a suitable installer.

Removing the Counter Shaft (PTO side) Ball Bearing

Remove screw.

Push ball bearing from outside in with a punch.



1. Screw
2. Counter shaft ball bearing

Installing the Counter Shaft (PTO side) Ball Bearing

Use a suitable installer.

NOTE: Install ball bearing with closed bearing cage towards outside of engine.

Assembling the Crankcase

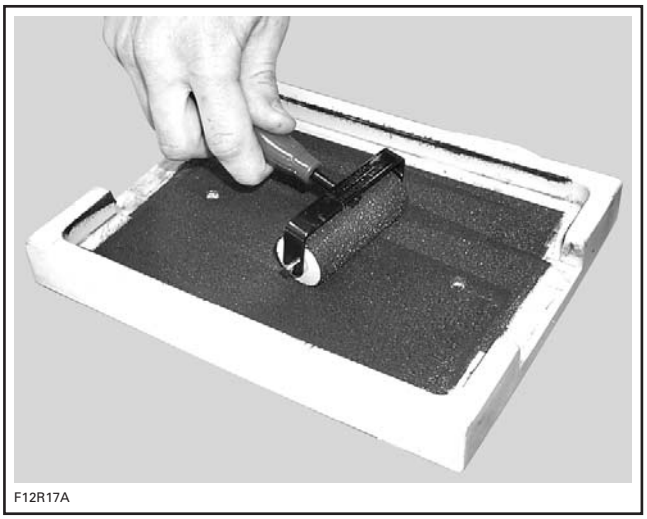
The assembly is the reverse of the disassembly procedure. However, pay attention to the following.

Use LOCTITE 5910 (P/N 293 800 081) on mating surfaces.

IMPORTANT: When beginning the application of the crankcase sealant, the assembly and the first torquing should be done within 10 minutes. It is suggested to have all you need on hand to save time.

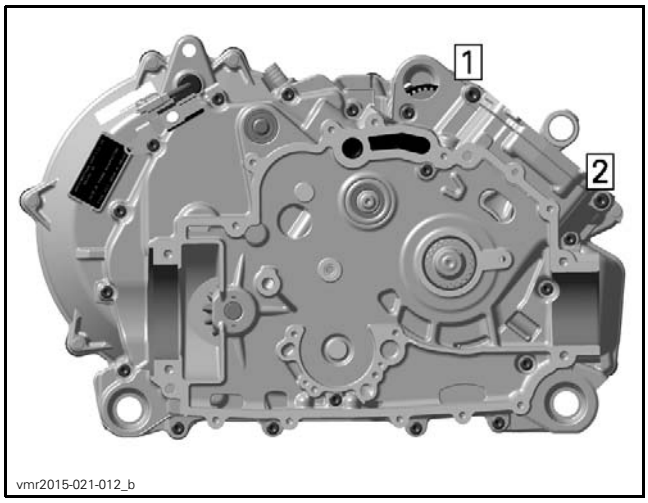
Use a polycarbonate plate and apply some sealant on it. Use a soft rubber roller 50 mm to 75 mm (2 in to 3 in) available in arts products suppliers for printing and roll the sealant to get a thin uniform coat on the plate (spread as necessary). When ready, apply the sealant on crankcase mating surfaces.

NOTE: It is recommended to apply this specific sealant as described here to get a uniform application without lumps. If you do not use the roller method, you may use your finger to uniformly distribute the sealant (using a finger will not affect the adhesion). Do not apply in excess as it will spread out inside crankcase.



First tighten crankcase M8 retaining screws as per following sequence:

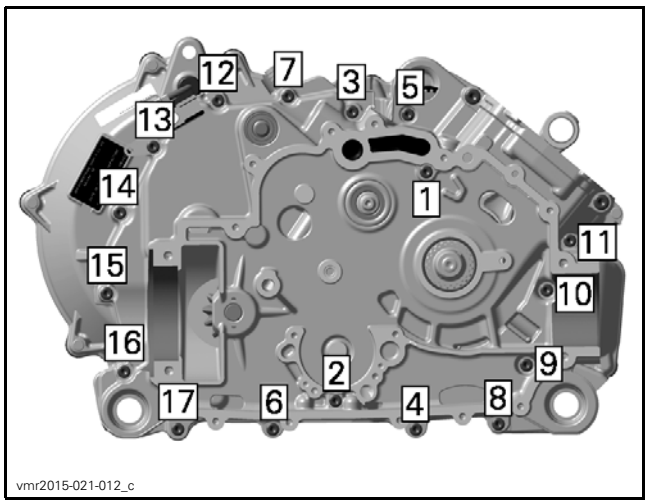
TIGHTENING TORQUE	
Crankcase M8 retaining screws	25 N•m ± 3 N•m (18 lbf•ft ± 2 lbf•ft)



M8 SCREWS TIGHTENING SEQUENCE

Then tighten crankcase M6 retaining screws as per following sequence.

TIGHTENING TORQUE	
Crankcase M6 retaining screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)



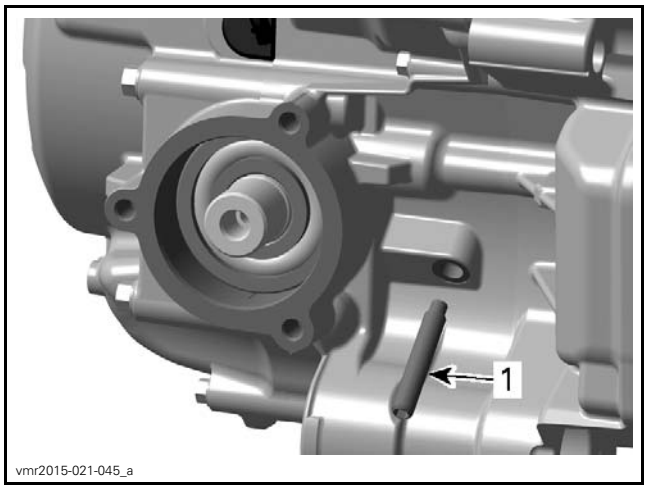
M6 SCREWS TIGHTENING SEQUENCE

BALANCER SHAFT

Removing the Balancer Shaft

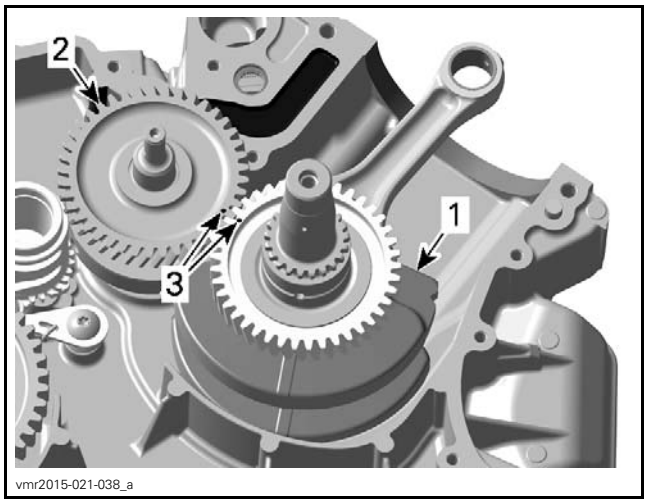
Split crankcase, refer to *CRANKCASE* in this subsection.

Remove the crankshaft locking bolt.



1. Crankshaft locking bolt

Align the dot of crankshaft gear with the balancer shaft gear dot then remove balancer shaft.



1. Crankshaft
2. Balancer shaft
3. Dots on crankshaft gear and balancer shaft gear

Inspecting the Balancer Shaft

Check balancer shaft and replace if damaged.

Check ball bearings on MAG and PTO side for excessive play and smooth operation. Replace if necessary.

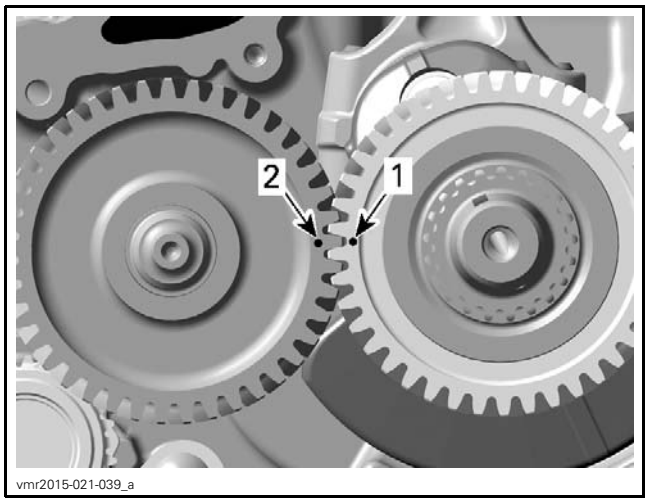
Inspect the balancer shaft gear for chipped, worn or broken teeth. Replace balancer shaft if necessary.

NOTE: If any imperfection is detected, check also the crankshaft gear, refer to *CRANKSHAFT* in this subsection.

Installing the Balancer Shaft

The installation is the reverse of the removal procedure. However, pay attention to the following.

Align the dot on crankshaft gear with the balancer shaft gear dot.



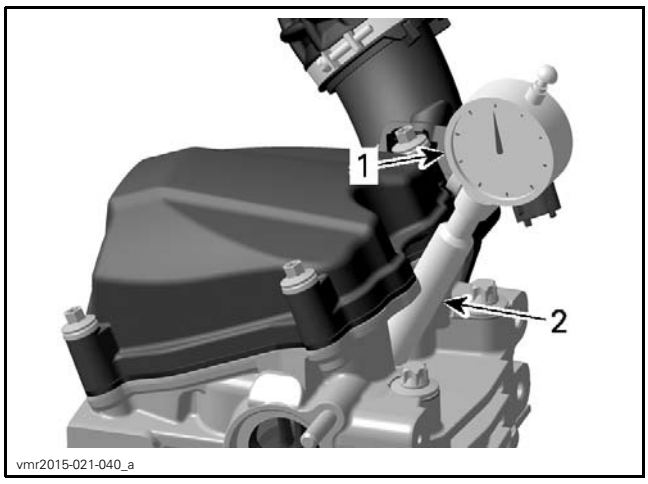
1. *Mark on crankshaft gear*
2. *Mark on balancer shaft gear*

CRANKSHAFT

Crankshaft Locking Procedure

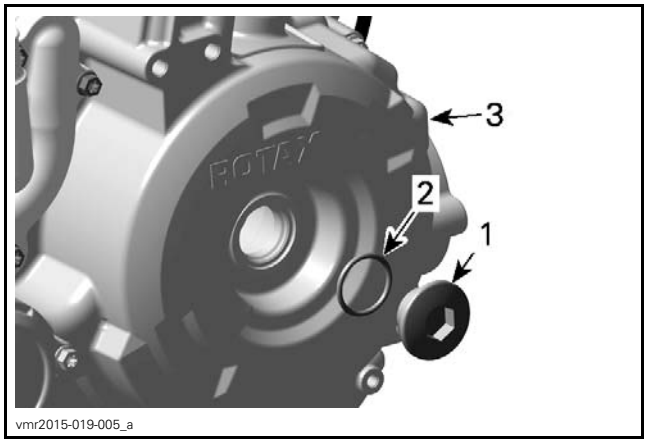
Disconnect spark plug cable and remove the spark plug.

REQUIRED TOOL	
TDC DIAL INDICATOR (P/N 414 104 700)	
DIAL INDICATOR ADAPTER (P/N 529 036 159)	



1. *Dial gauge*
2. *Dial indicator adapter*

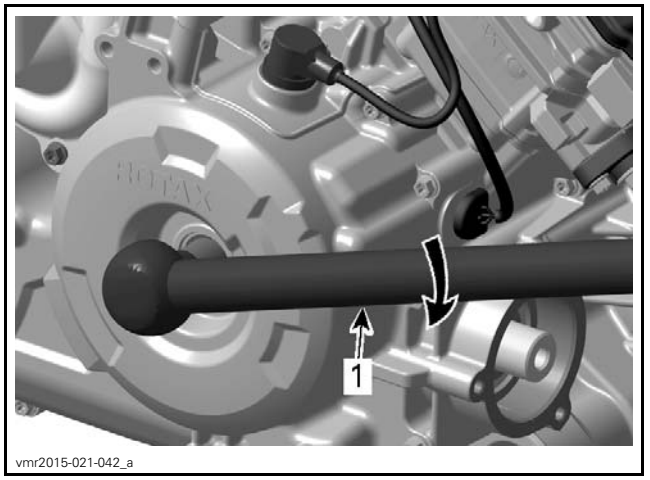
Remove the plug screw and O-ring from magneto cover.



1. *Plug screw*
2. *O-ring*
3. *Magneto cover*

Set piston to TDC ignition by turning the crankshaft.

REQUIRED TOOL
13 mm socket



1. *Wrench with 13 mm socket*

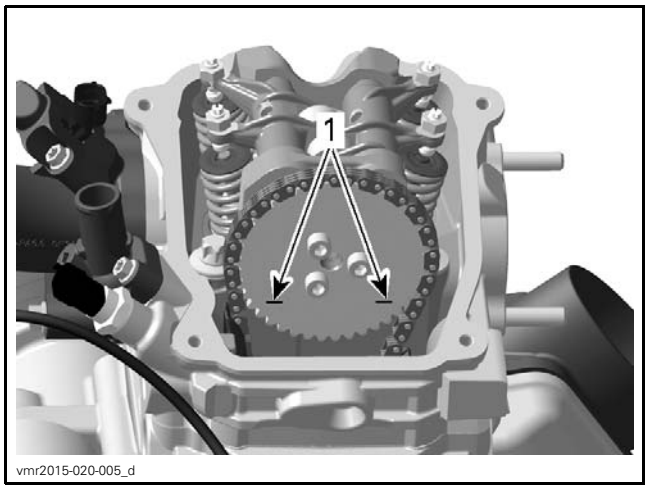
TDC ignition

NOTICE **Never use the mark on the magneto to find the TDC. Only use the crankshaft locking tool to locate the TDC.**

Remove valve cover and verify if the printed marks on the camshaft timing gear are parallel with the cylinder head edge. If so, the engine is at TDC ignition position.

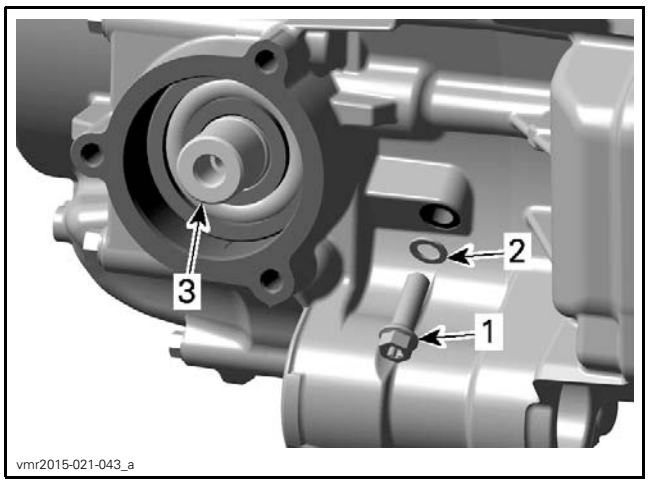
NOTE: If printed marks on camshaft timing gear are not as specified, turn crankshaft 360°.

NOTE: In this position the piston is set to TDC ignition.



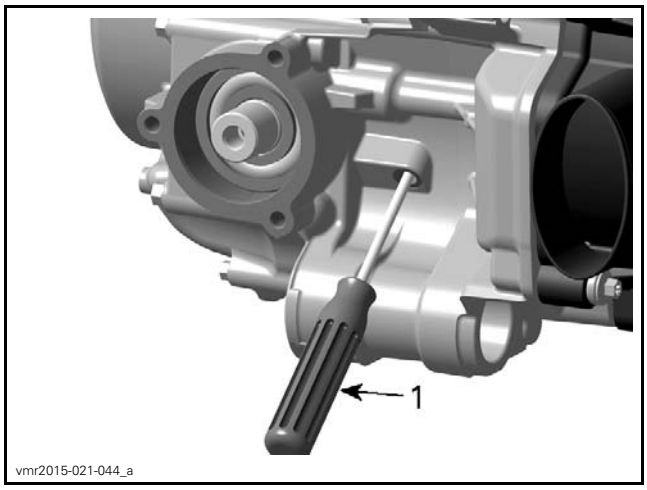
TYPICAL - PISTON AT TDC IGNITION
1. *Printed marks on camshaft timing gear*
2. *Cylinder head base*

Remove:
- Screw
- Sealing ring.



1. *Screw*
2. *Sealing ring*
3. *Output shaft on front side of vehicle*

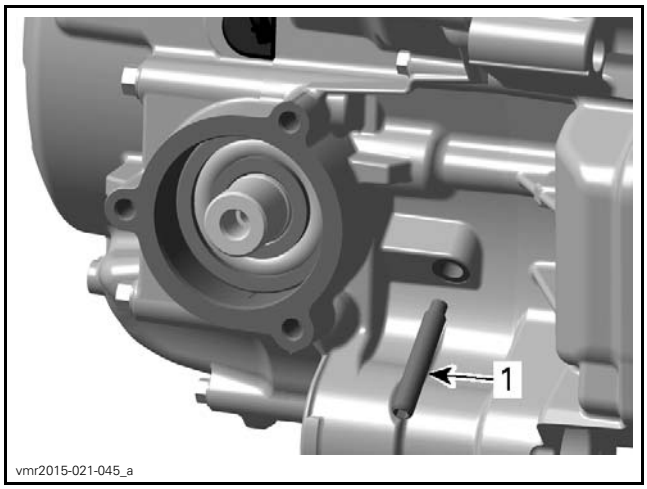
Use a screwdriver to check if groove in crankshaft is aligned with the hole.



1. *Screwdriver*

Lock crankshaft.

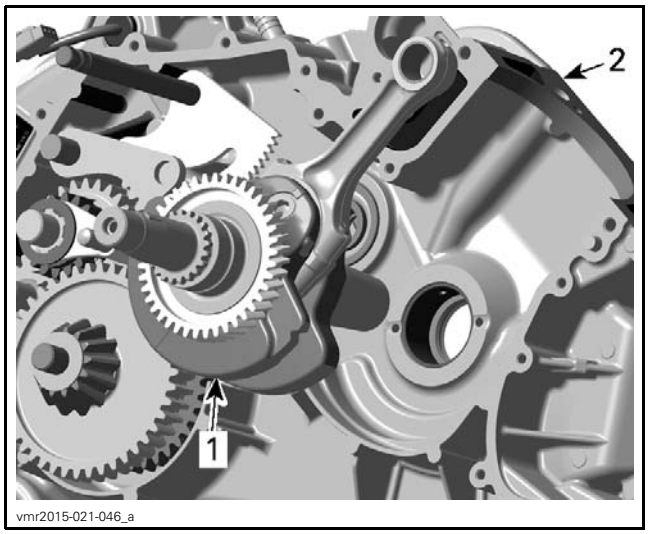
REQUIRED TOOL	
CRANKSHAFT LOCKING BOLT (P/N 529 035 617)	



1. *Crankshaft locking bolt*

Removing the Crankshaft

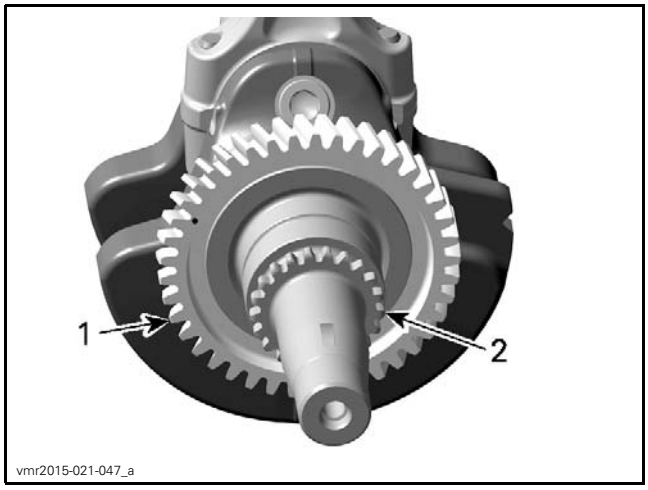
Remove:
- Balancer shaft, see *BALANCER SHAFT* in this subsection
- Crankshaft.



1. Crankshaft
2. Crankcase PTO

Inspecting the Crankshaft

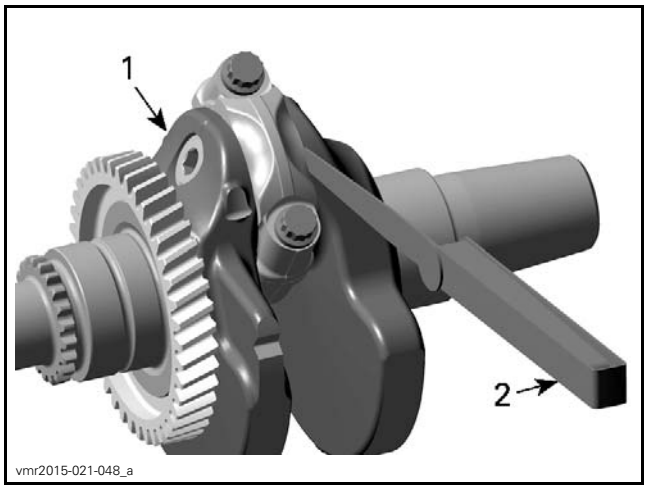
Replace crankshaft if the gears are worn or otherwise damaged.



1. Balancer gear
2. Crankshaft timing gear

Connecting Rod Big End Axial Play

Using a feeler gauge, measure distance between butting face of connecting rod and crankshaft counterweight. If the distance exceeds specified tolerance, replace the crankshaft.



1. Crankshaft
2. Feeler gauge

CONNECTING ROD BIG END AXIAL PLAY	
NEW	0.100 mm to 0.452 mm (.004 in to .018 in)
SERVICE LIMIT	0.500 mm (.02 in)

Connecting Rod/Piston Pin Clearance

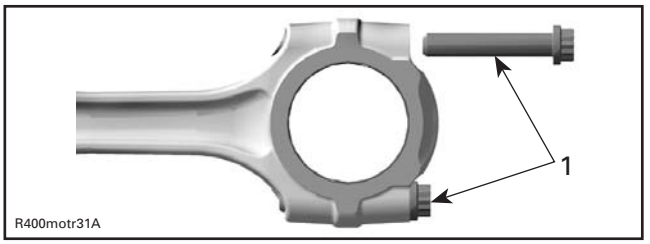
Refer to *TOP END* subsection.

Connecting Rod Big End Radial Play

NOTE: Prior to remove connecting rod from the crankshaft, mark big end halves together to ensure a correct reinstallation (cracked surface fits in only one position).

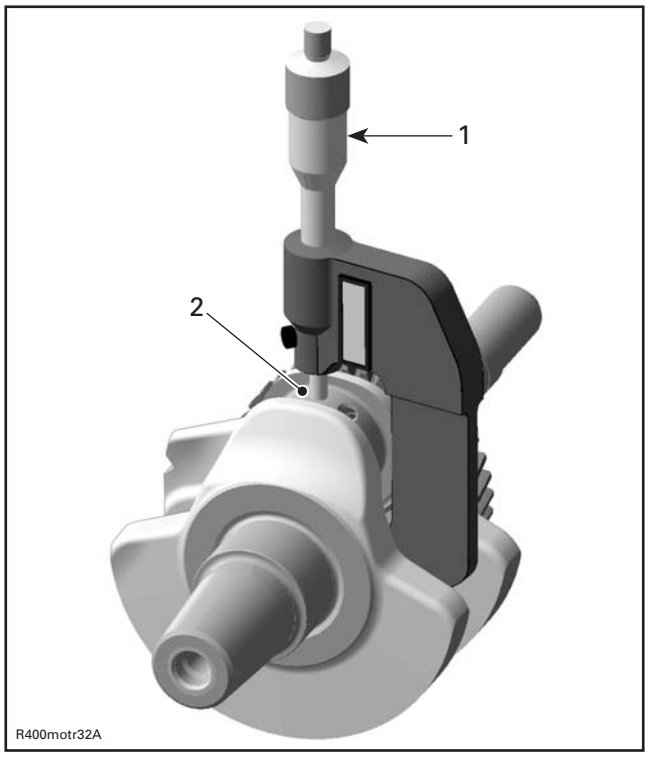
Remove connecting rod from crankshaft.

NOTICE **Connecting rod screws are not reusable. Always discard screws and replace by NEW ones. It is recommended to install new plain bearings when reinstalling connecting rods.**



1. Connecting rod screw

Measure crankpin. Compare to inside diameter of connecting rod big end.



1. Micrometer
2. Crankpin area for plain bearings

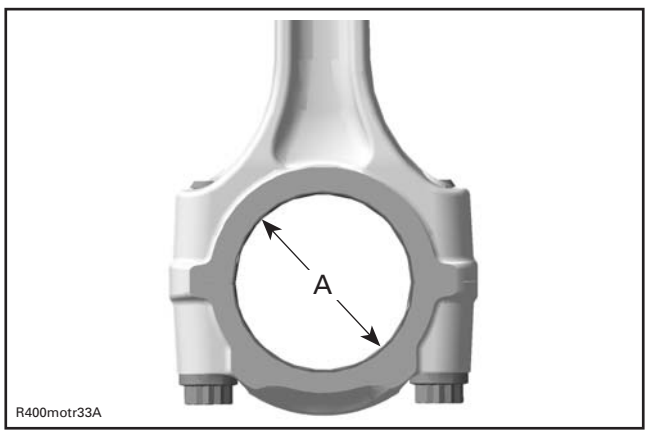
CRANK PIN DIAMETER	
NEW	40.001 mm to 40.025 mm (1.5748 in to 1.5758 in)
SERVICE LIMIT	39.980 mm (1.574 in)

If the crank pin diameter is out of specification, replace crankshaft.

To measure the connecting rod big end diameter, use the OLD screws.

Install the OLD plain bearings as they were mounted initially.

Carry out the tightening procedure described in *CRANKSHAFT ASSEMBLY* in this subsection.



A. Connecting rod big end plain bearing

If the crank pin diameter is out of specification, replace crankshaft.

CONNECTING ROD BIG END DIAMETER	
SERVICE LIMIT	40.100 mm (1.579 in)

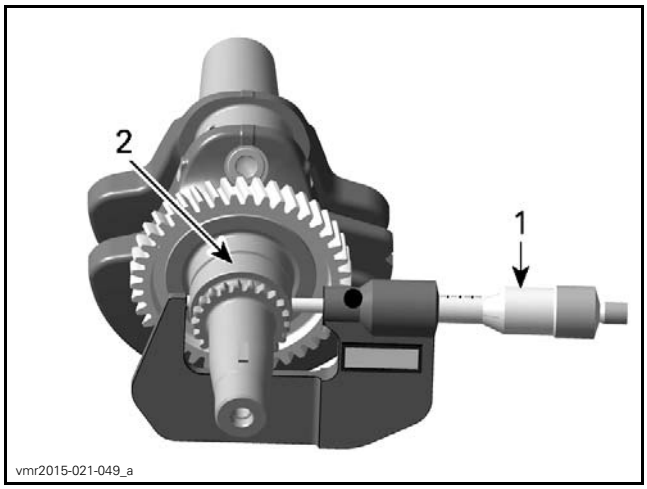
If connecting rod big end diameter is out of specification, replace plain bearings and recheck.

CONNECTING ROD BIG END RADIAL PLAY	
SERVICE LIMIT	0.09 mm (.0035 in)

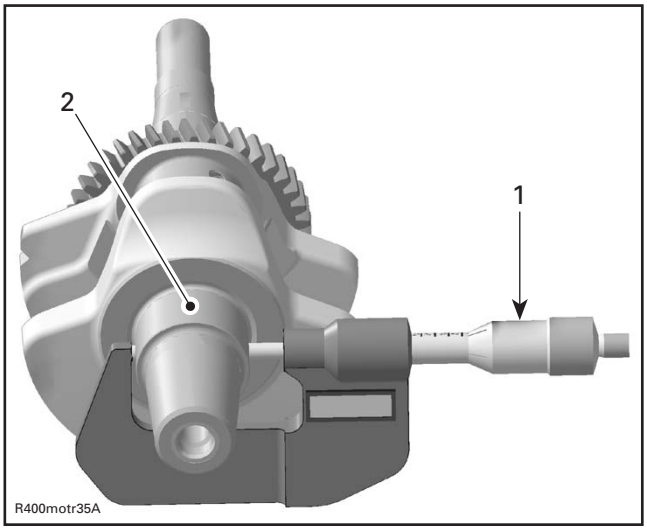
If connecting rod big end radial clearance is out of specification, replace plain bearings and recheck.

Crankshaft Radial Play MAG/PTO Side

Measure crankshaft MAG/PTO side. Compare to inside diameter of MAG/PTO plain bearings, refer to *CRANKCASE* in this subsection.



1. Micrometer
2. Crankshaft, MAG side main bearing journal



1. Micrometer
2. Crankshaft area for PTO plain bearing

CRANKSHAFT MAG/PTO DIAMETER	
NEW	42.016 mm to 42.040 mm (1.6542 in to 1.6551 in)
SERVICE LIMIT	42.000 mm (1.6535 in)

CRANKSHAFT MAG RADIAL PLAY	
SERVICE LIMIT	0.07 mm (.0028 in)

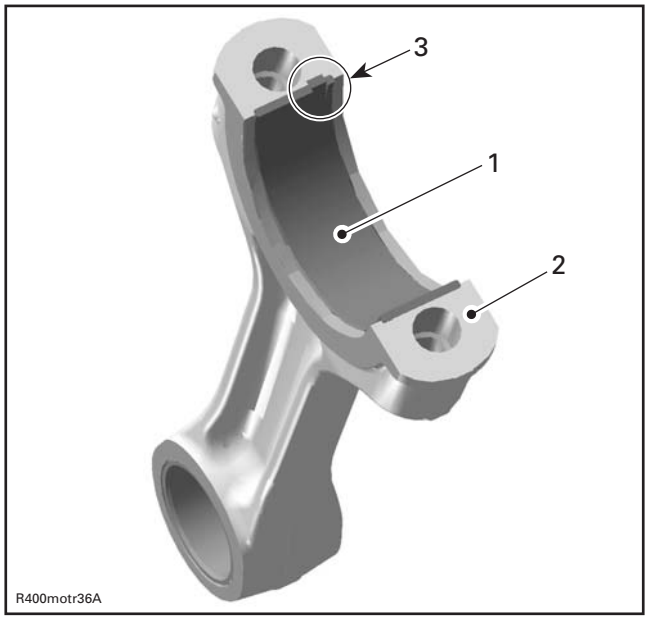
Assembling the Crankshaft

The assembly is the reverse of the disassembly procedure. However, pay attention to the following.

Clean the split surface on both sides (cracked area) carefully with compressed air.

Use NEW bearings, when connecting rod big end diameter is out of specification.

Put plain bearings correctly in place.



1. *Half plain bearing of connecting rod big end*
2. *Split surface of the connecting rod*
3. *Nose of bearing in line with connecting rod groove*

Oil the plain bearing surface of the connecting rod and crank pin before installation.

NOTICE Lower cap and rod must match together since there is a cracked surface.

Oil NEW connecting rod screws.

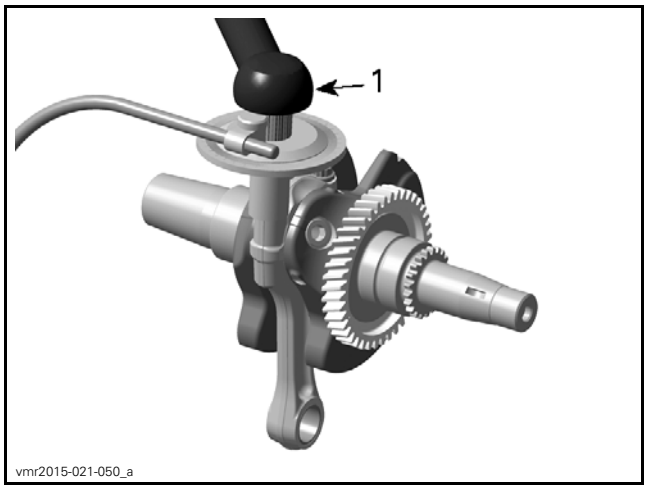
NOTICE Always use NEW connecting rod screws for the final assembly. They are not reusable.

Thread screws in connecting rod, then tighten as per following procedure.

NOTICE Strictly adhere following instructions:

- Do not apply any thread locker.
- The running direction of the big end bearings and of the piston pins must not change.
- Always perform each step on both connecting rod screws before going to the next step.
- Failure to strictly follow procedure may cause connecting rod screws to loosen and lead to severe engine damage.

REQUIRED TOOL
Torque wrench
Angle torque wrench



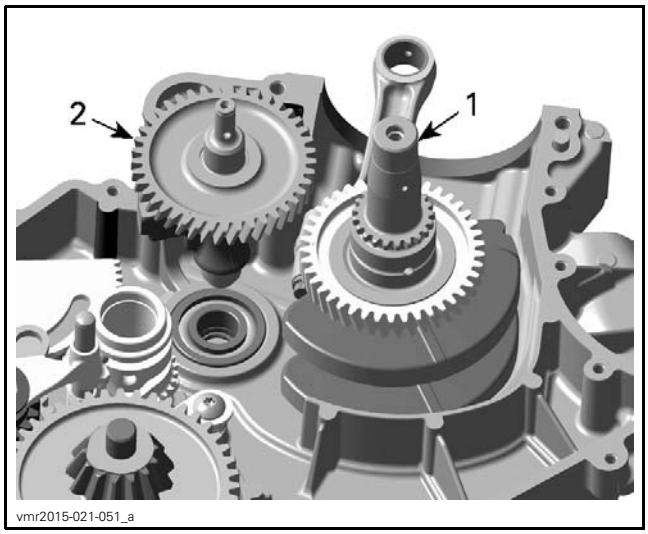
1. *Angle torque wrench*

CONNECTING RODS SCREWS TIGHTENING SEQUENCE	
Step 1	Tighten to 1/2 of specified torque
Step 2	Tighten to 20 N•m ± 2 N•m (15 lbf•ft ± 1 lbf•ft)
Step 3	Torque by an additional 60 ± 5° turn using an angle torque wrench

Installing the Crankshaft

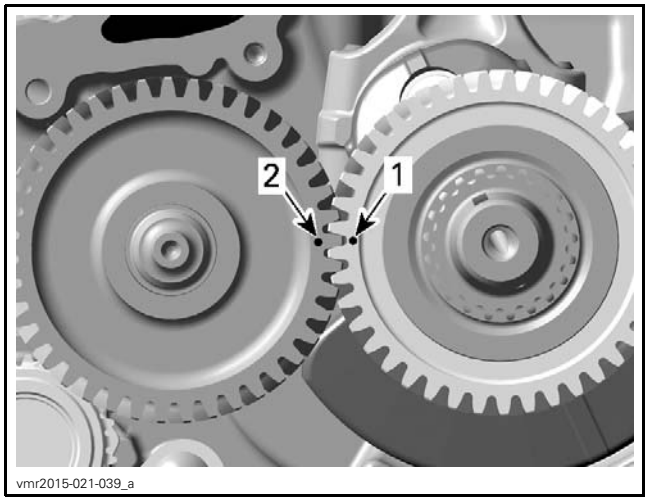
The installation is the reverse of the removal procedure. However, pay attention to following.

Install crankshaft first then balancer shaft.



1. Crankshaft
2. Balancer shaft

Align the marks of crankshaft and balancer shaft.



1. Mark on crankshaft gear
2. Mark on balancer shaft gear

After reinstalling of crankcase MAG, measure axial clearance of crankshaft with a feeler gauge between PTO crankcase and crankshaft thrust surface.

Install the CRANKSHAFT LOCKING BOLT (P/N 529 035 617) to keep the crankshaft in TDC position before installing the camshaft timing chain (refer to *CRANKSHAFT LOCKING PROCEDURE* in this subsection).

NOTICE **Make sure the woodruff key on crankshaft MAG is present and correctly in place.**

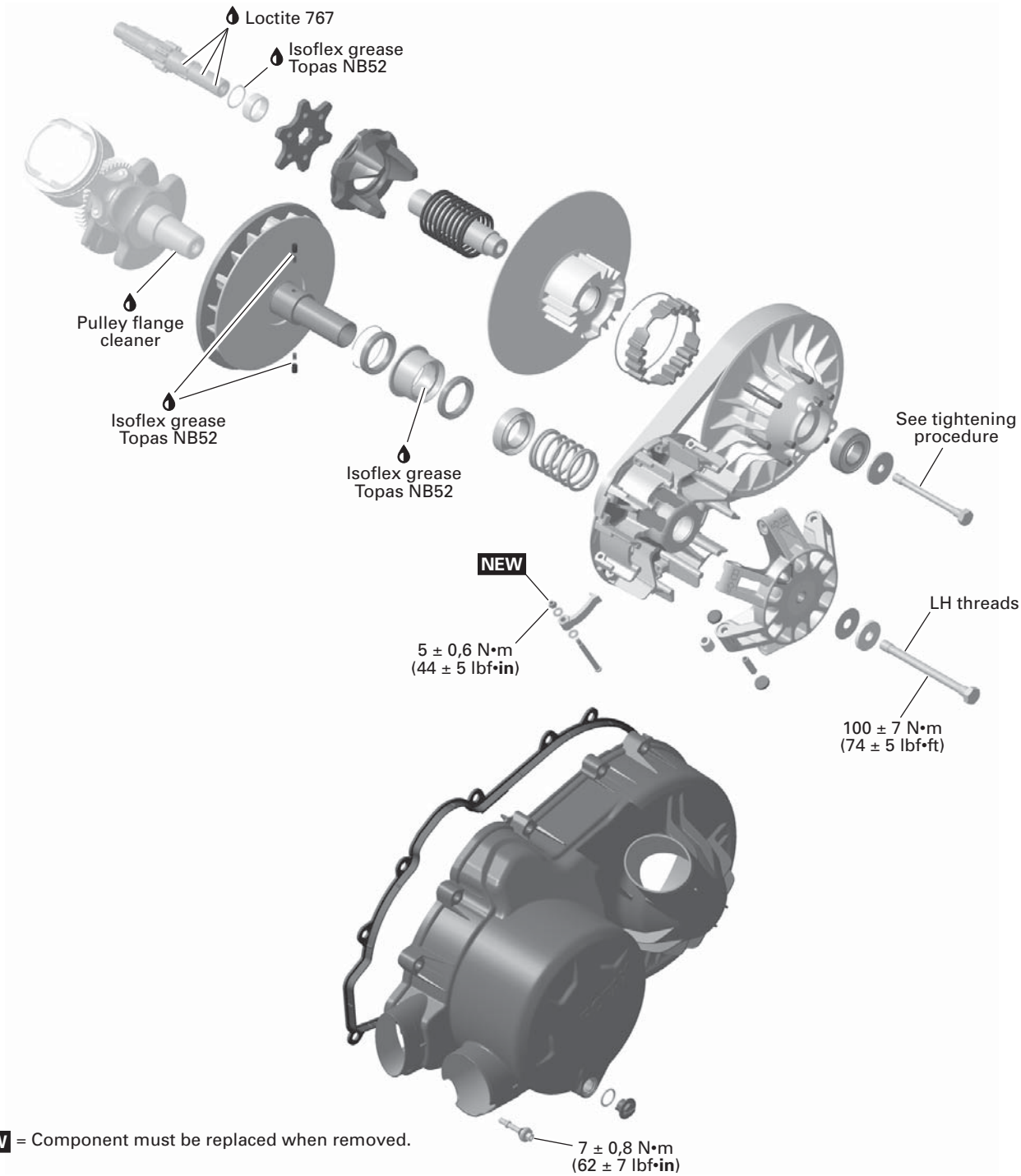
CONTINUOUSLY VARIABLE TRANSMISSION (CVT) (HD5)

SERVICE TOOLS

Description	Part Number	Page
CLUTCH PULLER	529 035 746	7
DRIVE PULLEY HOLDER (CVT)	529 006 400	6
DRIVEN CLUTCH HOLDER	529 035 771	16
PULLER/LOCKING TOOL	529 036 098	5, 22

SERVICE PRODUCTS

Description	Part Number	Page
CLUTCH AND PULLEY FLANGE CLEANER PRO S1	779244	9, 17, 21
ISOFLEX GREASE TOPAS NB 52	293 550 021	14


Loctite 767
Isoflex grease
Topas NB52
Pulley flange
cleaner
Isoflex grease
Topas NB52
Isoflex grease
Topas NB52
See tightening
procedure
NEW
5 ± 0,6 N•m
(44 ± 5 lbf•in)
LH threads
100 ± 7 N•m
(74 ± 5 lbf•ft)
7 ± 0,8 N•m
(62 ± 7 lbf•in)
NEW = Component must be replaced when removed.
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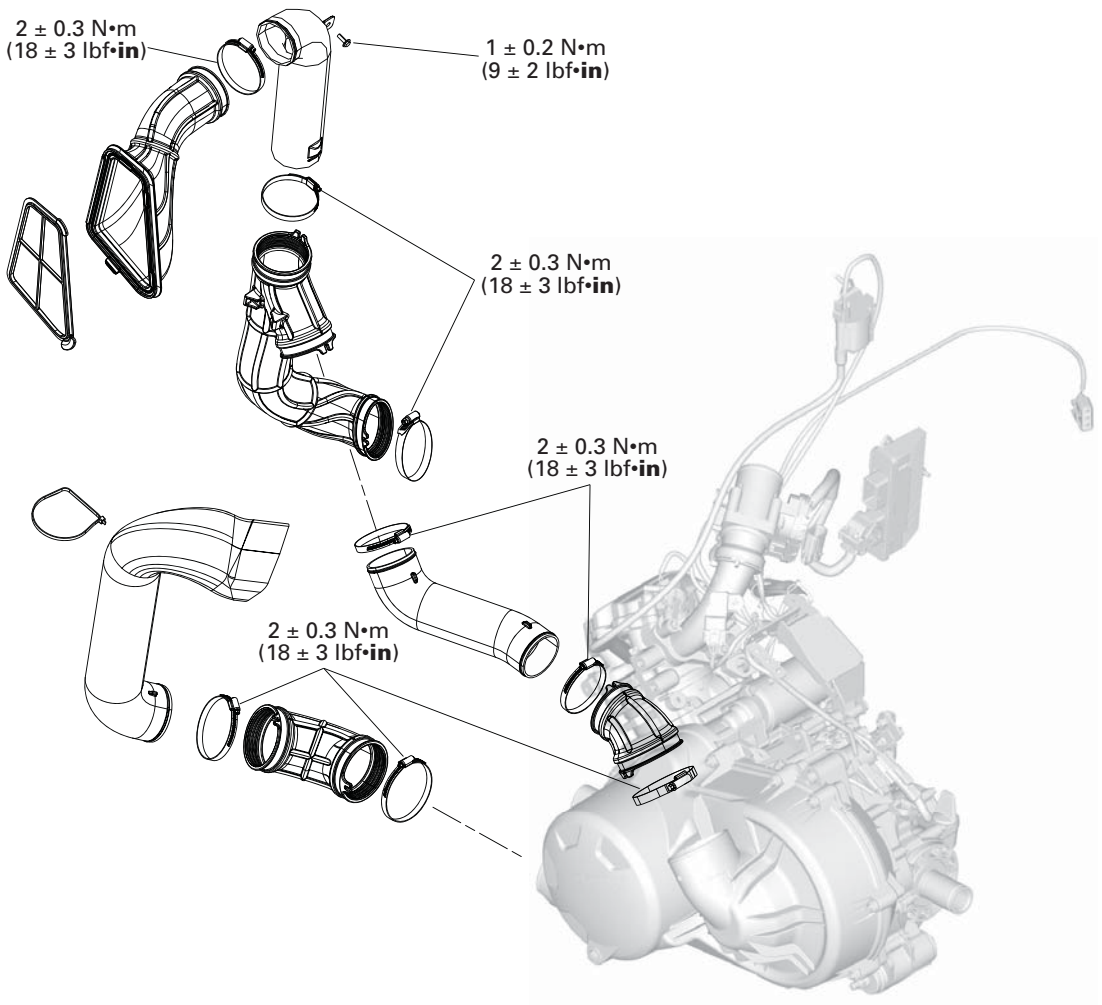

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GENERAL

NOTE: For a better understanding, some illustrations are taken with engine out of vehicle. To perform the following instructions, it is not necessary to remove engine from vehicle.

This CVT is lubrication free. Never lubricate any components except drive pulley one-way clutch.

⚠ WARNING

Never touch CVT while engine is running. Never drive vehicle when CVT cover is removed.

⚠ WARNING

Any drive pulley repairs must be performed by an authorized Can-Am dealer. Subcomponent installation and assembly tolerances require strict adherence to procedures detailed.

NOTICE Never use any type of impact wrench at drive pulley removal and installation.

⚠ WARNING

The clutch assembly is a precisely balanced unit. Never replace parts with used parts from another clutch assembly.

NOTICE These pulleys have metric threads. Do not use imperial thread puller. Always tighten puller by hand to ensure that the drive pulley has the same type of threads (metric vs imperial) before tightening completely.

PROCEDURES

CVT COVER

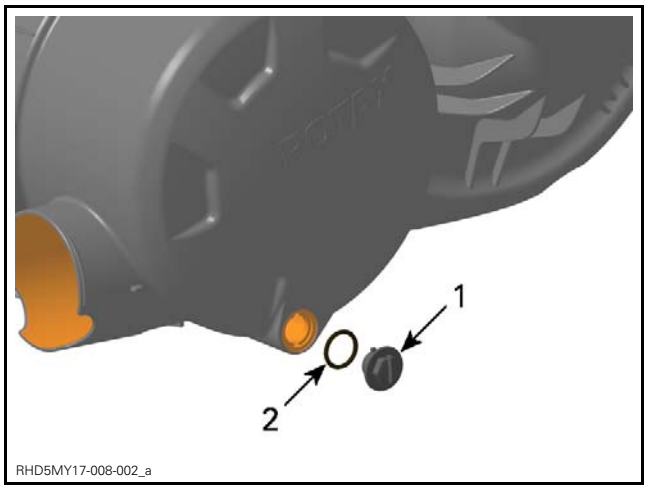
CVT Cover Access

Tilt cargo box.

Draining the CVT Cover

Turn bayonet cap 90° counterclockwise to open it.

Remove bayonet cap with O-ring.



1. Bayonet cap
2. O-ring

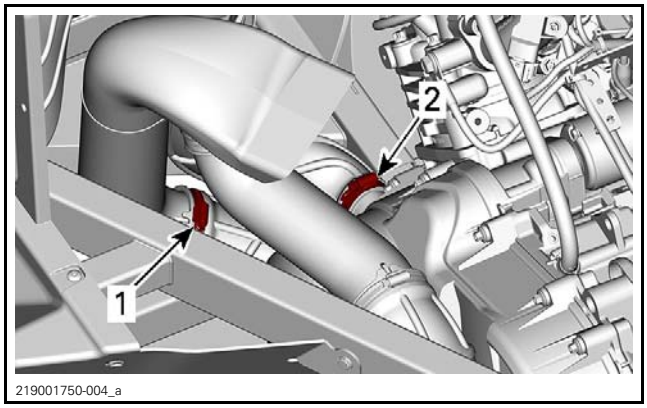
Let water drain from CVT cover.

NOTICE If an appreciable amount of water or any debris entered the CVT cover, CVT must be cleaned and inspected.

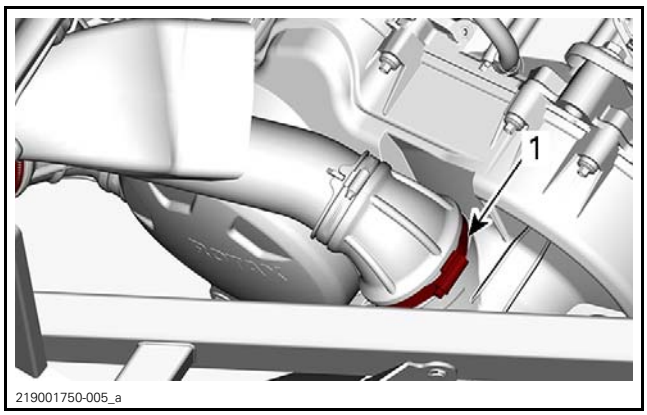
Reinstall bayonet cap with O-ring.

Removing the CVT Cover

Disconnect CVT cooling air ducts.



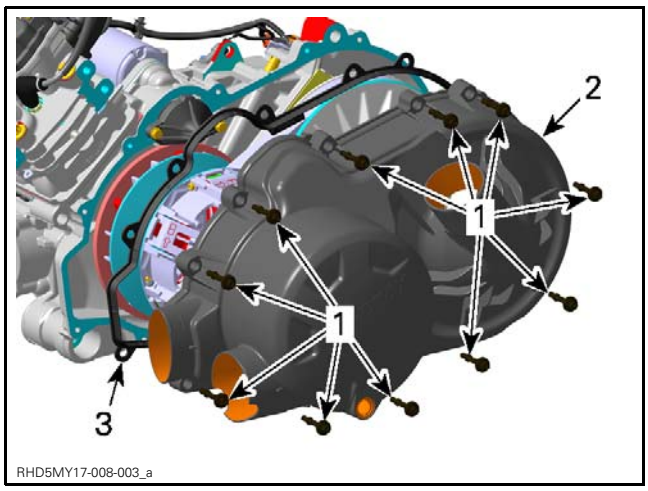
1. Outlet duct clamp
2. Front inlet duct clamp



1. Rear inlet duct clamp

Remove:
– Retaining screws
– CVT cover
– Gasket.

NOTE: Do not use and impact tool to remove CVT cover screws.



1. *Retaining screws*
2. *CVT cover*
3. *Gasket*

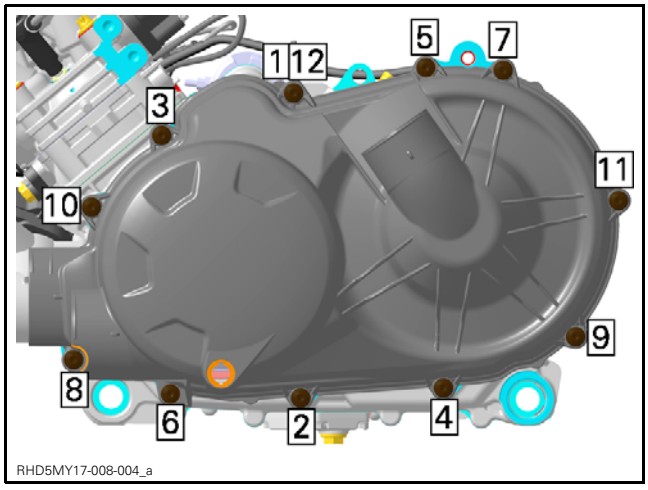
NOTE: To support the cover remove the center top screw last.

Installing the CVT Cover

Install the center top screw of cover in first.

Install the other screws then torque them in a crisscross sequence.

Tighten the CVT cover screws as per following sequence.



CVT COVER TIGHTENING SEQUENCE

TIGHTENING TORQUE	
CVT cover retaining screws	7 N•m ± 0.8 N•m (62 lbf•**in** ± 7 lbf•**in**)

Reinstall the CVT cooling ducts.

DRIVE BELT

Removing the Drive Belt

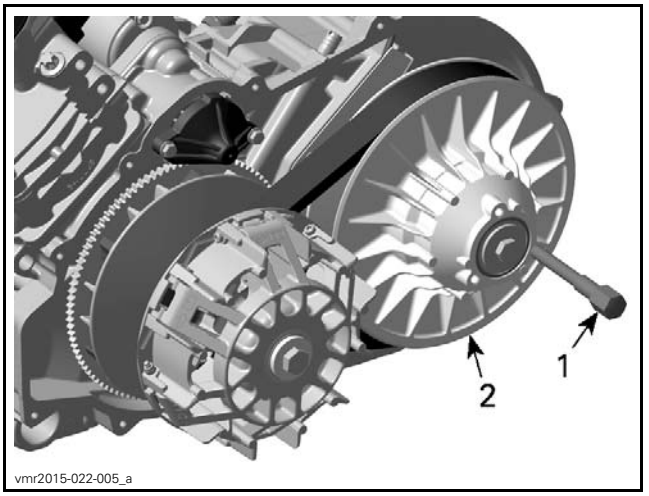
NOTICE **In case of a drive belt failure, the CVT cover, air inlet and air outlet must be cleaned and inspected for obstruction.**

Remove CVT cover, refer to procedure in this subsection.

Open driven pulley.

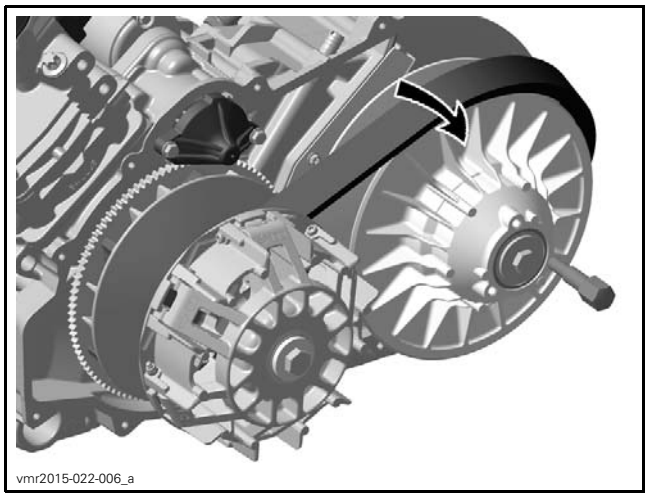
REQUIRED TOOL	
PULLER/LOCKING TOOL (P/N 529 036 098)	

Screw tool in the threaded hole of driven pulley and tighten to open the pulley.



1. *Puller/locking tool*
2. *Fixed sheave of driven pulley*

Slide belt over the top edge of fixed sheave.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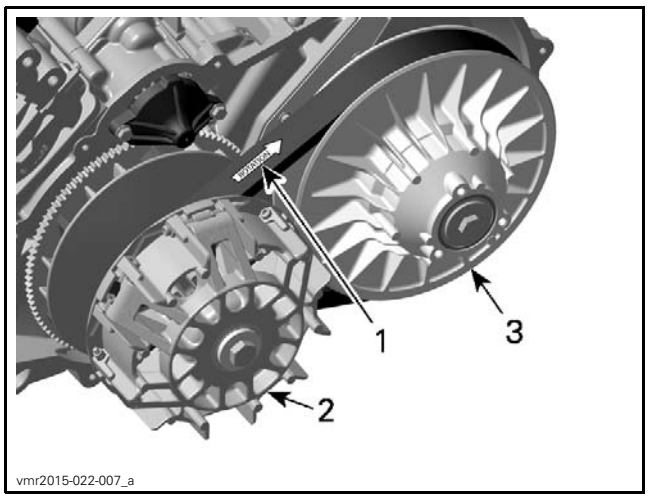
Inspecting the Drive Belt

For drive belt inspection, refer to the *PERIODIC MAINTENANCE PROCEDURES (HD5)* subsection.

Installing the Drive Belt

For installation, reverse the removal procedure. Pay attention to following details.

The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so that the arrow printed on belt is pointing towards the back of the vehicle.



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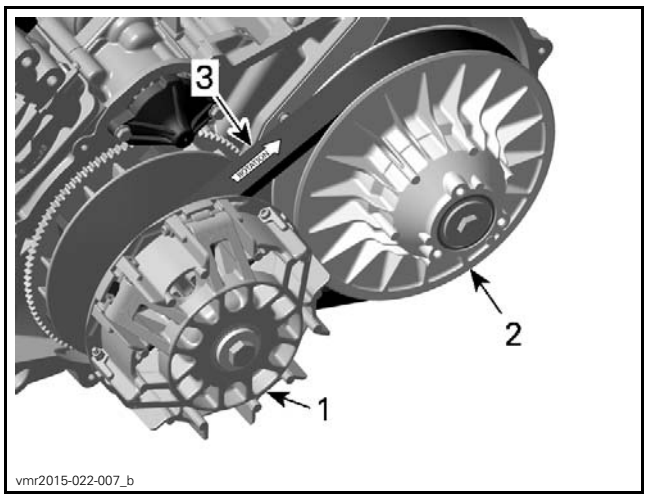
1. *Arrow towards the back of the vehicle*
2. *Drive pulley (front)*
3. *Driven pulley (rear)*

DRIVE PULLEY



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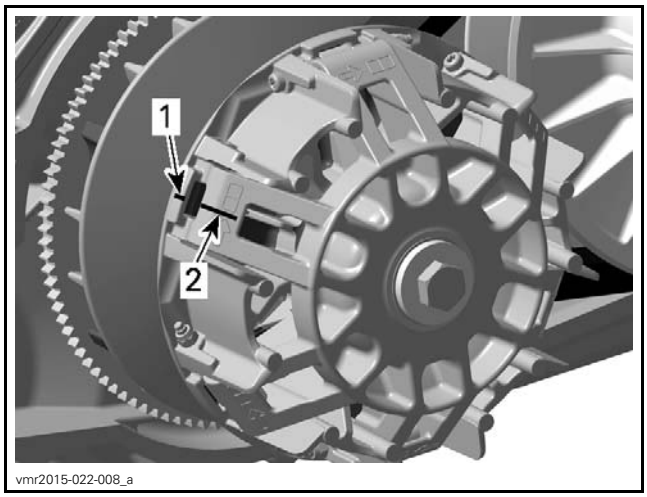
1. *Drive pulley*
2. *Driven pulley*
3. *Belt*

Removing the Drive Pulley

Remove drive belt, refer to procedure in this subsection.

Prior to removing the drive pulley, mark sliding sheave and governor cup together to ensure correct reinstallation. There are 4 levers mounted out of 6 possible positions.



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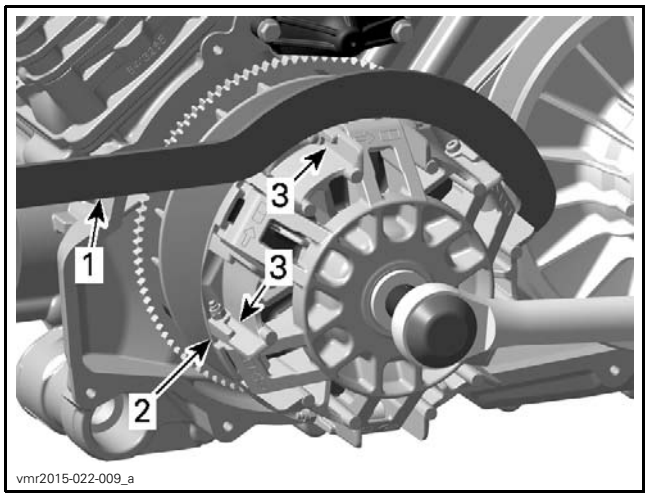
1. *Mark on drive pulley sliding sheave*
2. *Mark on governor cup*

To block drive pulley, two methods can be used:

– Lock crankshaft. Refer to the *BOTTOM END* subsection.
– Block drive pulley.

REQUIRED TOOL	
DRIVE PULLEY HOLDER (CVT) (P/N 529 006 400)	



1. Drive pulley holder
2. Drive pulley sliding sheave
3. Area to place holding tool hook

Loosen drive pulley screw clockwise.

NOTICE **Drive pulley screw has LH threads.**

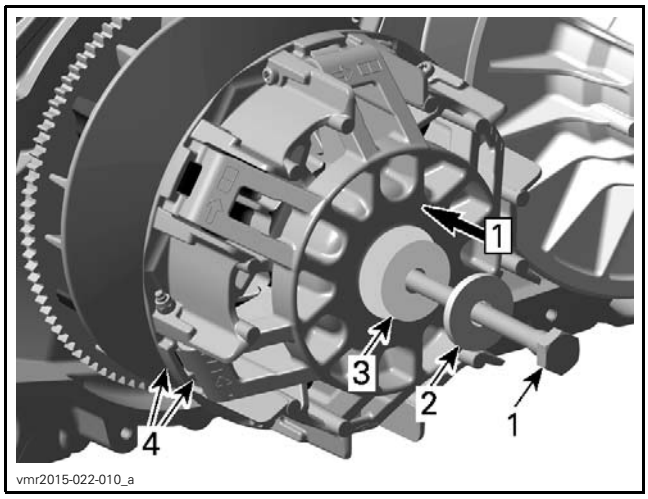
NOTE: Do not unscrew the drive pulley screw completely. If governor cup is stuck, hit it using a soft hammer.

Remove service tool.

Apply axial pressure with your hand on the sliding sheave and governor cup.

Remove:
– Screw
– Spring washer
– Thrust washer.

⚠ CAUTION **Sliding sheave of drive pulley is spring loaded.**



Step 1: Push

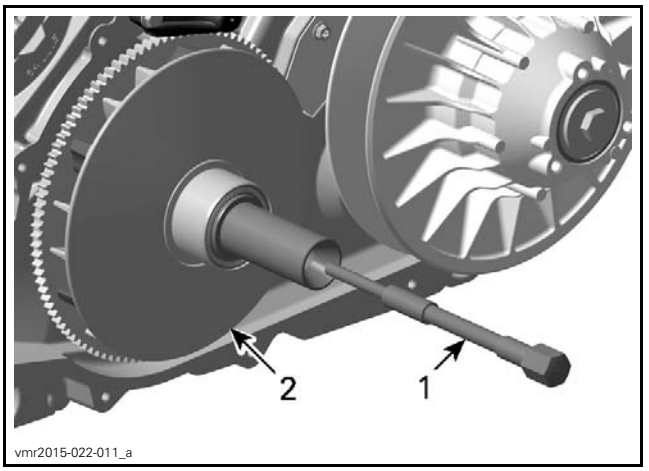
1. Drive pulley screw
2. Spring washer
3. Thrust washer
4. Sliding sheave with governor cup

Slowly release spring pressure and remove sliding sheave.

Slowly release sliding sheave.

Remove fixed sheave.

REQUIRED TOOL	
CLUTCH PULLER (P/N 529 035 746)	

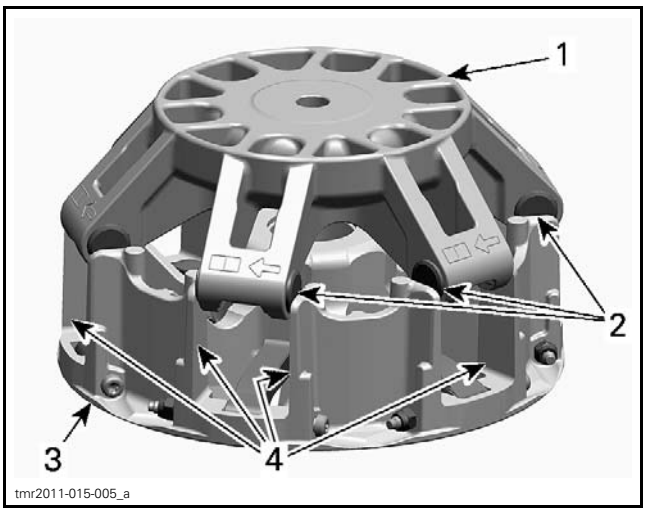


1. Drive pulley puller
2. Fixed sheave

Disassembling the Drive Pulley

Governor Cup

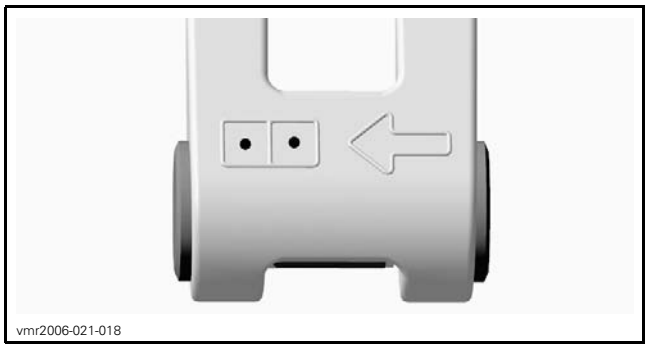
Carefully lift governor cup until slider shoes come at their highest position into guides.



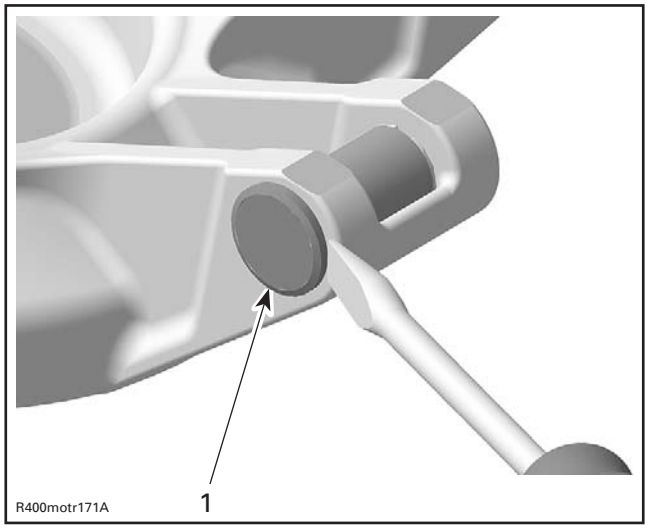
1. Governor cup
2. Slider shoes
3. Sliding sheave
4. Guides

NOTE: The following procedure is not necessary except if roller must be removed. Refer to *INSPECTING THE DRIVE PULLEY* subsection before proceeding.

NOTE: Whenever removing a governor cup that has the 2 boxes marked (punch marks), replace it with a new one.



Remove slider shoes



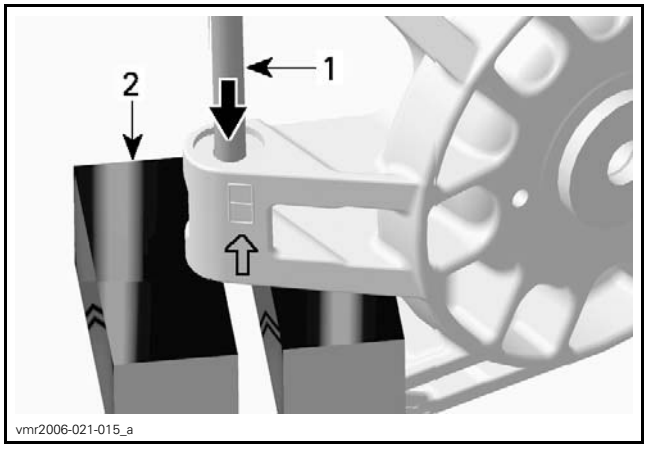
1. Slider shoe

Put governor cup on a vise. Use protection plates on the vise jaws to avoid marks and/or damages to the governor cup.

Push out roller sleeve with an appropriate punch in the direction illustrated (against insertion arrow marked on governor cup arm).

NOTE: Use a punch with a smaller diameter than the roller sleeve.

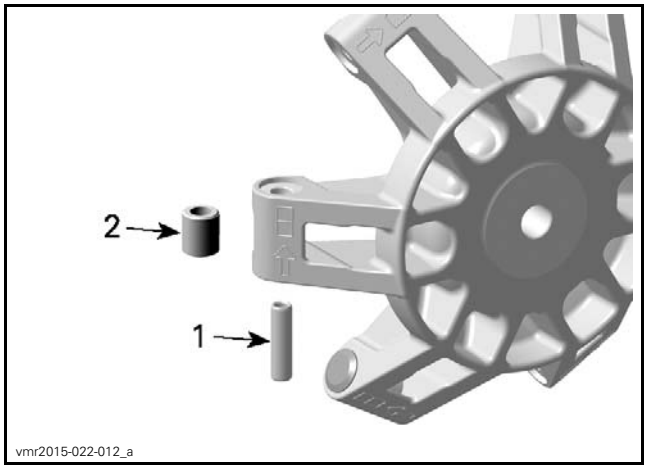
NOTICE Do not clamp the governor cup in the vise to push out bearing sleeve. Governor cup will be damaged.



PUSHING OUT ROLLER SLEEVE
1. Punch
2. Vise

NOTICE Always replace all rollers at the same time. Partially worn rollers may cause damage to the CVT system.

Remove roller sleeve and roller.



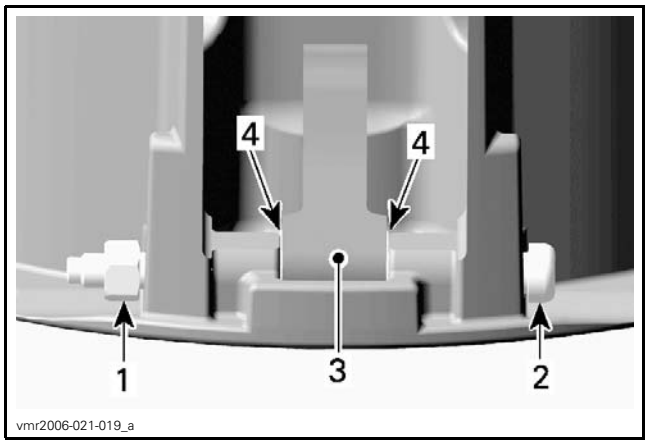
1. Roller sleeve
2. Roller

Sliding Sheave

NOTE: This drive pulley is equipped with 4 levers.

Unscrew lock nut and remove centrifugal lever pivot bolt.

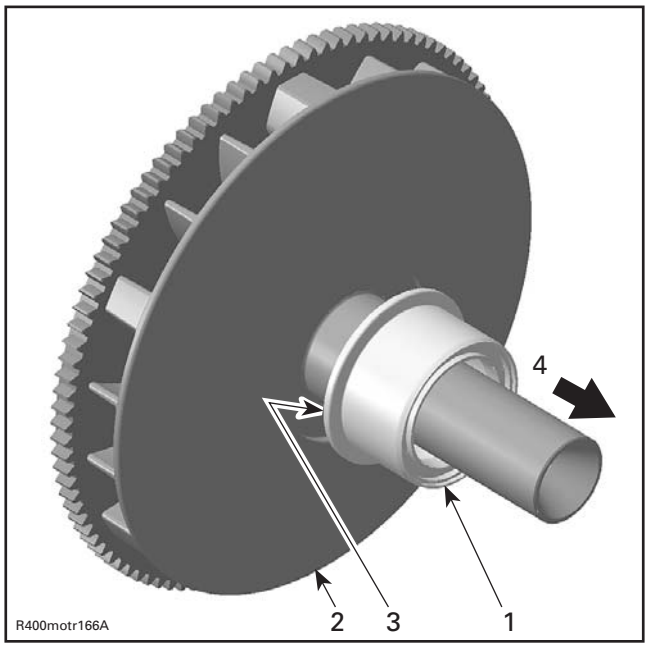
Remove centrifugal lever and both thrust washers.



1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Thrust washers*

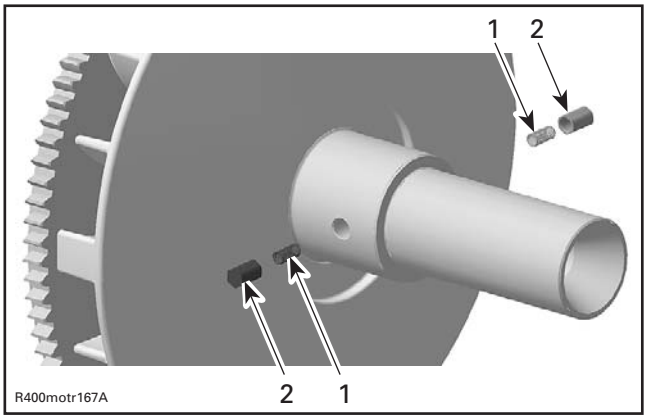
Fixed Sheave

Pull and rotate one-way clutch slowly until the half of spring sleeves are visible.



1. *One-way clutch*
2. *Fixed sheave*
3. *Spring sleeve area*
4. *Direction of removal*

Hold both spring sleeves with fingers and carefully remove them when the one-way clutch is disengaged.



1. *Spring*
2. *Spring sleeves*

Cleaning the Drive Pulley

Clean pulley faces and shaft with fine steel wool and dry cloth.

Using a paper towel with the recommended cleaning solvent, clean:

– Crankshaft tapered end
– Crankshaft threads
– Taper inside of the fixed sheave of the drive pulley
– Drive pulley screw threads.

SERVICE PRODUCT
CLUTCH AND PULLEY FLANGE CLEANER PRO S1 (P/N 779244)

NOTICE **To avoid damage, make sure cleaner does not contact the crankshaft seal.**

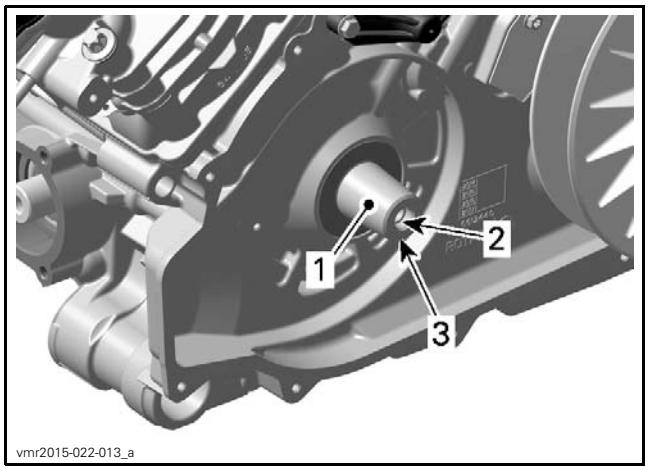
Remove all hardened oil deposits that have baked on crankshaft and pulley tapered surfaces with coarse or medium steel wool and/or sand paper no. 600.

NOTICE **Do not use any other type of abrasive.**

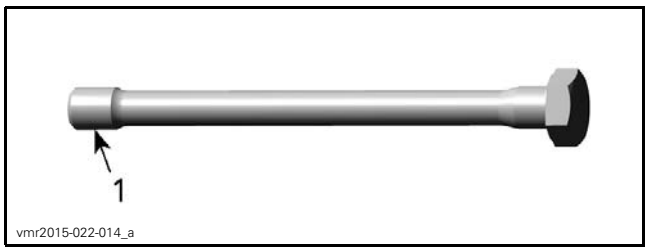
Reclean mounting surfaces with paper towel and cleaning solvent.

Wipe off the mounting surfaces with a clean, dry paper towel.

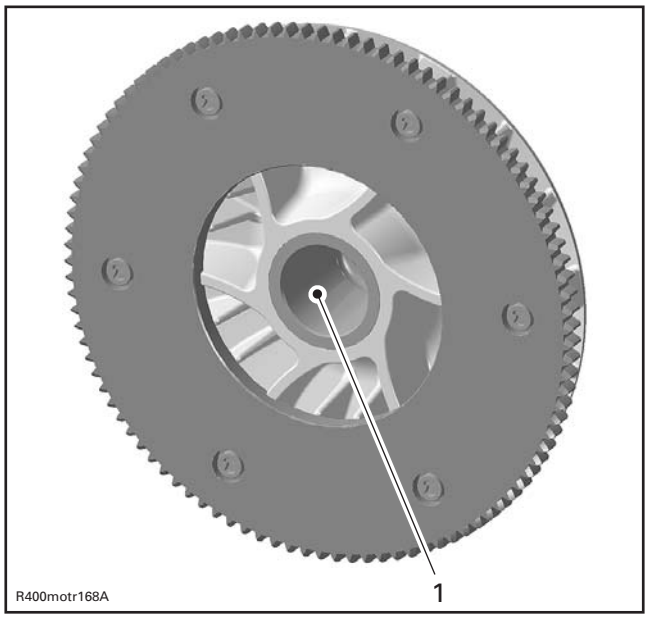
NOTICE **Mounting surfaces must be free of any oil, cleaner or towel residue.**



1. *Taper*
2. *Threads*
3. *Crankshaft*

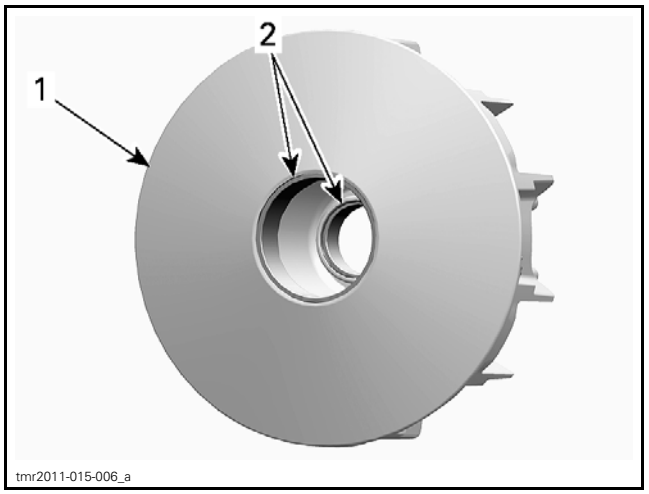


1. *Drive pulley screw threads*



1. *Taper of fixed sheave*

Only use petrol base cleaner when cleaning bushings.



1. *Sliding sheave*
2. *Bushings*

NOTICE Do not use acetone to clean bushing.

Inspecting the Drive Pulley

Governor Cup

Check governor cup for cracks or other visible damages. Replace if necessary.

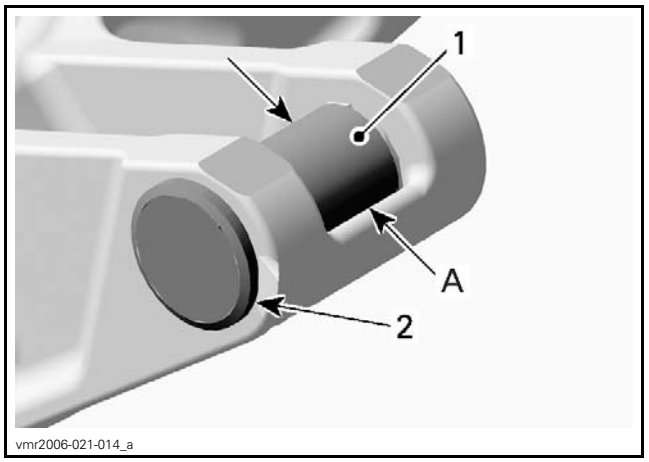
Roller and Slider Shoe

Check each roller for roundness of external diameter.

NOTE: Whenever replacing rollers and slider shoes, always replace all rollers and slider shoes as a set.

Check slider shoes for visible wear and replace if damaged.

Measure the roller diameter. If one roller is out of specification, replace all rollers.



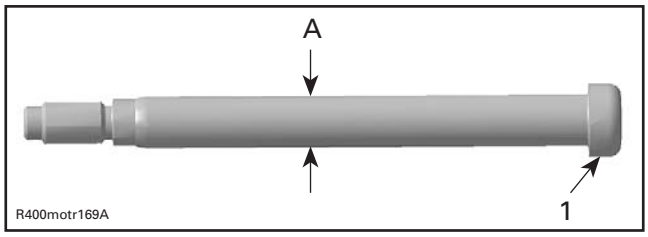
1. *Roller*
2. *Slider shoe*

A. *Roller outer diameter*

ROLLER OUTER DIAMETER	
NEW	13.80 mm to 14.00 mm (.543 in to .551 in)
SERVICE LIMIT	13.20 mm (.52 in)
ROLLER INNER DIAMETER	
NEW	8.025 mm to 8.175 mm (.316 in to .322 in)
SERVICE LIMIT	9.00 mm (.354 in)

Centrifugal Lever Pivot Bolt

Measure diameter of centrifugal lever pivot bolt, replace if it is out of specification.

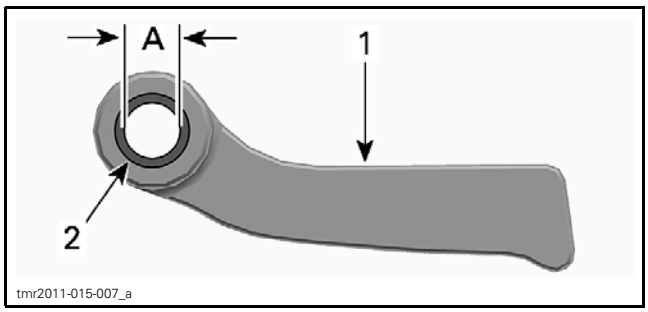


1. Centrifugal lever pivot bolt
A. Measure diameter here

CENTRIFUGAL LEVER PIVOT BOLT DIAMETER	
SERVICE LIMIT	6.000 mm (.236 in)

Centrifugal Lever

Check bushing diameter in the centrifugal lever for wear. If a centrifugal lever must be replaced, replace all levers at the same time.

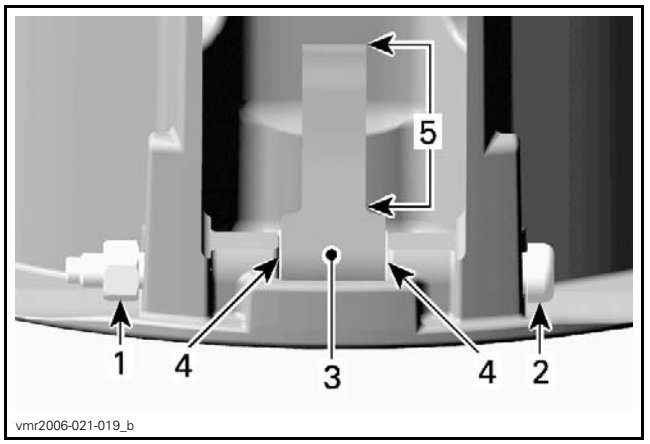


1. Centrifugal lever
2. Bushing
A. Bushing inner diameter

CENTRIFUGAL LEVER BORE DIAMETER	
SERVICE LIMIT	6.200 mm (.244 in)

Inspect and replace as necessary the following items if their contact surfaces are heavy worn:

– Centrifugal lever
– Thrust washers
– Centrifugal lever pivot bolts
– Lock nuts.



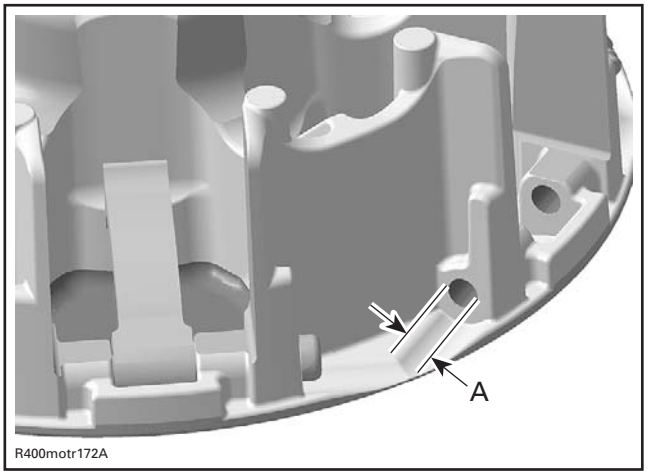
1. Lock nut
2. Centrifugal lever pivot bolt
3. Centrifugal lever
4. Thrust washers
5. Contact surface to the roller

NOTICE **Whenever replacing centrifugal levers, always replace all levers at the same time. Otherwise, the drive pulley will be unbalanced (because of lever differences).**

Sliding Sheave

Check sliding sheave for cracks and sliding contact surface for excessive wear. Replace sliding sheave if necessary.

Measure centrifugal lever pivot bolt bores. Replace sliding sheave if bores are out of specification or damaged.



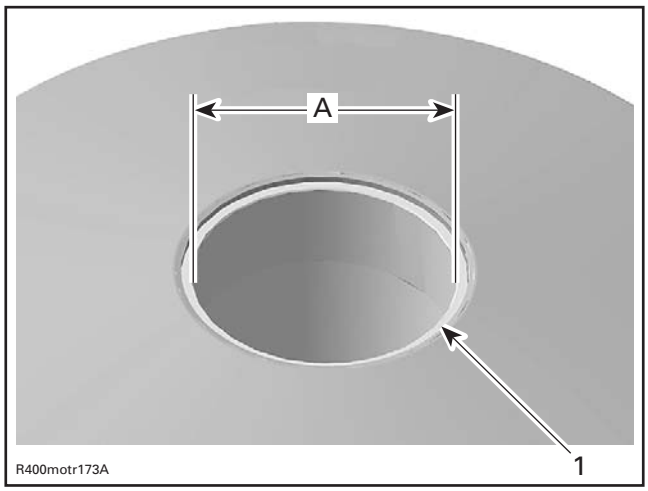
A. Centrifugal lever pivot bolt bore diameter

CENTRIFUGAL LEVER PIVOT BOLT BORE DIAMETER	
NEW	6.113 mm to 6.171 mm (.241 in to .243 in)
SERVICE LIMIT	6.300 mm (.248 in)

Measure bushing diameters of sliding sheave.

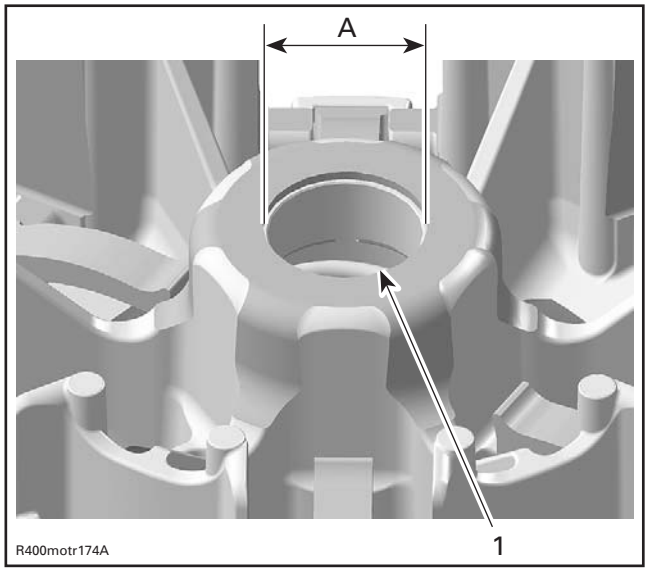
REQUIRED TOOL
Dial bore gauge

MEASURING POINT
At least 5 mm (1/4 in) from bushing edge



1. Bushing on fixed sheave side
A. Bore diameter of bushing

SLIDING SHEAVE LARGE BUSHING	
NEW	55.000 mm to 55.040 mm (2.165 in to 2.167 in)
SERVICE LIMIT	55.200 mm (2.173 in)



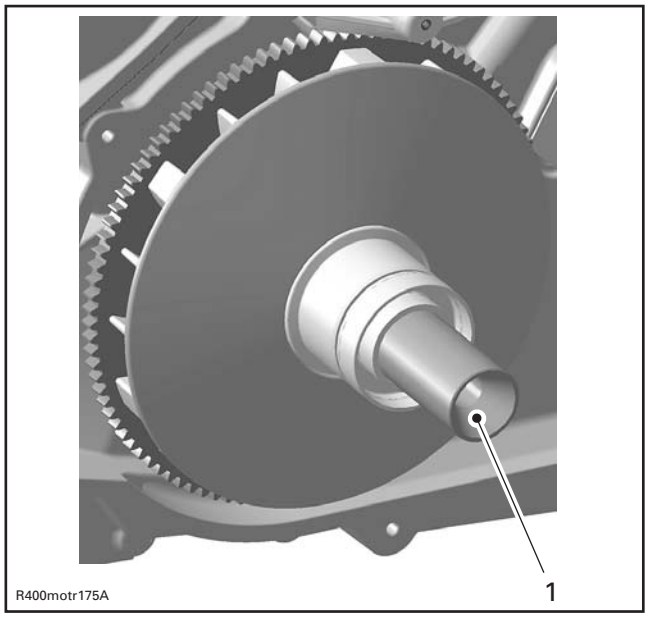
1. Bushing on governor cup side
A. Bore diameter of bushing

SLIDING SHEAVE SMALL BUSHING	
NEW	30.000 mm to 30.040 mm (1.181 in to 1.183 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Replace sliding sheave if one of the bushings is out of specification. Visually inspect coatings.

Fixed Sheave

Check fixed sheave contact surface to the governor cup for scoring and other damages. If so, replace fixed sheave.



1. Visually check here

Check for any marks on fixed sheave plate. Replace if necessary.

Check ring gear teeth for excessive wear or other damage. Replace fixed sheave if necessary.

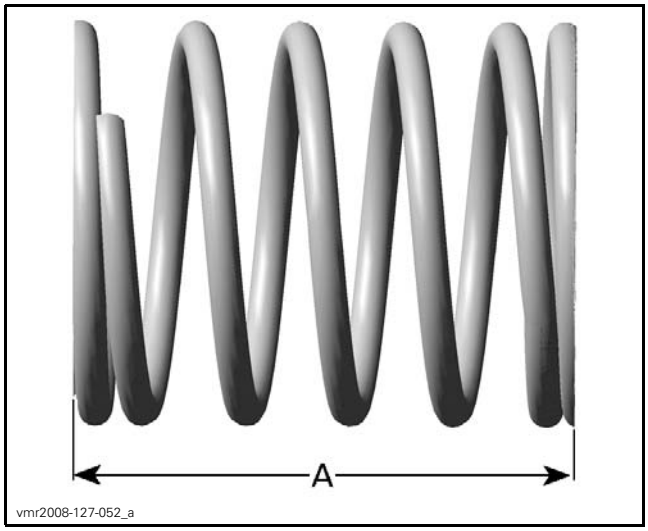
⚠ WARNING

Fixed sheave and ring gear are balanced together. Always replace both parts together otherwise severe injury and/or damages may occur.

Spring

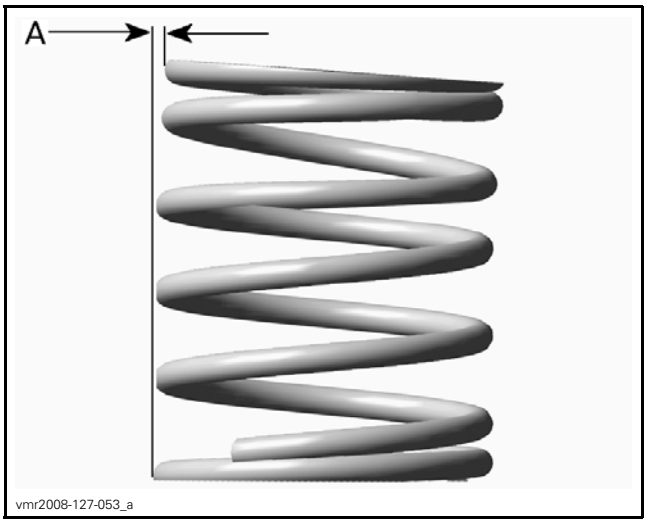
Measure spring free length and squareness. If spring is out of specification, replace by a new one.

SPRING FREE LENGTH	
SERVICE LIMIT	75 mm (2.953 in)



A. Free length

CLUTCH SPRING SQUARENESS	
SERVICE LIMIT	4 mm (.157 in)

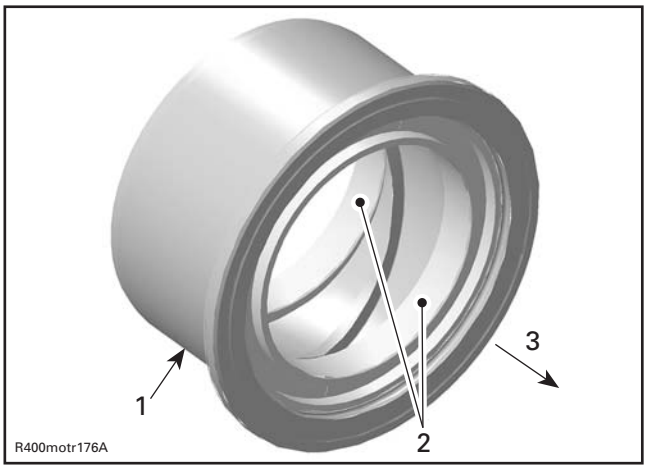


A. Squareness

One-Way Clutch

Check bearings for excessive play and smooth operation. Replace one-way clutch if necessary.

NOTICE Be careful not to damage the inside of one-way clutch during bearing removal.



1. One-way clutch
2. Bearings
3. Drive pulley sliding sheave side

Measure length of spring sleeve and check if edges on top of the spring sleeve are excessively worn. If out of specifications, replace both spring sleeves and springs at the same time.

SPRING SLEEVE LENGTH	
NEW	9.2 mm to 9.4 mm (.362 in to .37 in)
SERVICE LIMIT	9.0 mm (.354 in)

Drive Pulley Assembly

For assembly, reverse the disassembly procedure. Pay attention to following details.

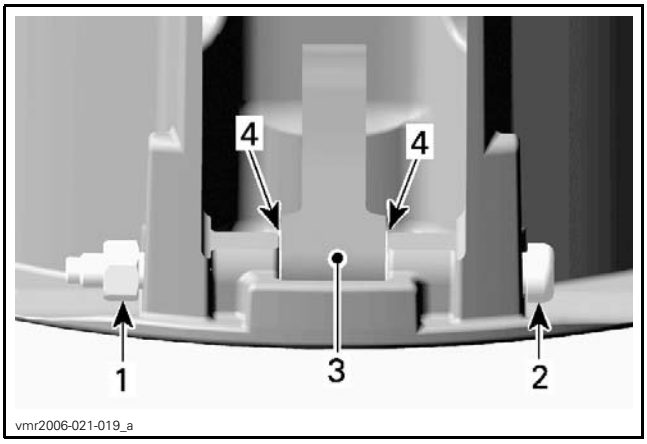
One-Way Clutch

Lubricate spring sleeves, springs and between one-way clutch bearings using recommended product.

SERVICE PRODUCT
ISOFLEX GREASE TOPAS NB 52 (P/N 293 550 021)

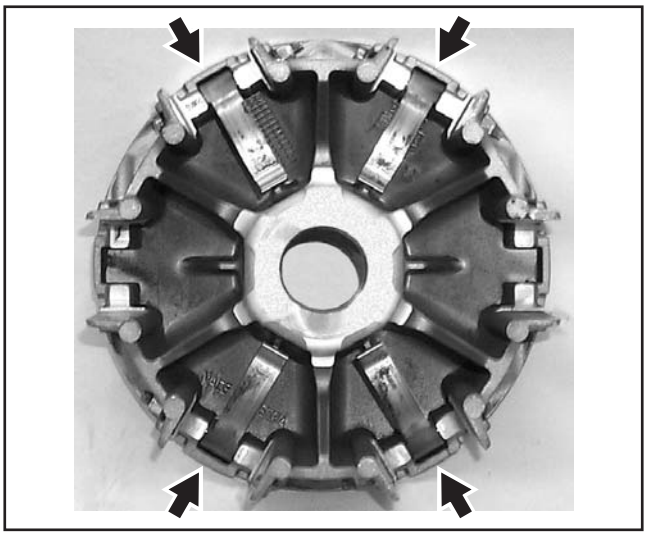
Sliding Sheave

Install centrifugal lever and both thrust washers.



vmr2006-021-019_a

1. *Lock nut*
2. *Centrifugal lever pivot bolt*
3. *Centrifugal lever*
4. *Thrust washers*



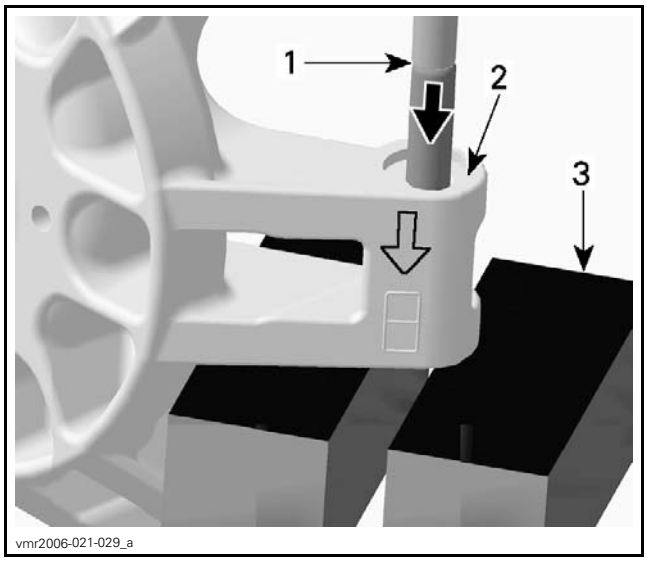
NOTICE Centrifugal lever must move easily after installation.

Governor Cup

Rebuild governor cup with **NEW** roller sleeves, thrust washers, rollers and slider shoes.

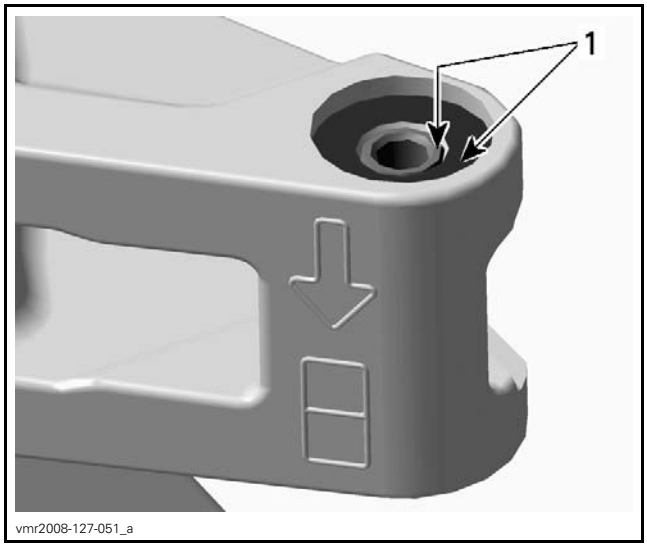
Push in roller sleeve with an appropriate punch in the direction of the protruding arrow. Push until roller sleeve aligns with the contact surface of the slider shoe.

NOTICE Final position of roller sleeve has to be flush with the contact surface of the slider shoes (no protrusion).



vmr2006-021-029_a

1. *Top edge of roller sleeve*
2. *Mating surface of slider shoes*
3. *Vise*

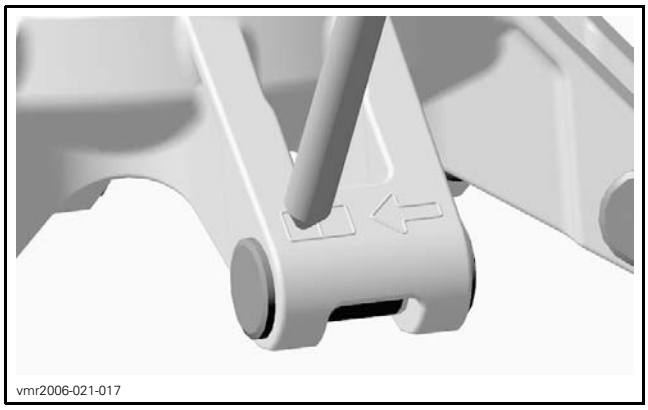


vmr2008-127-051_a

1. *Flush surfaces*

Whenever replacing roller sleeves, punch a mark in an empty telltale box. If each box is already marked, replace governor cup with a new one.

NOTICE Do not tap too hard. Severe damage to the governor cup may appear.

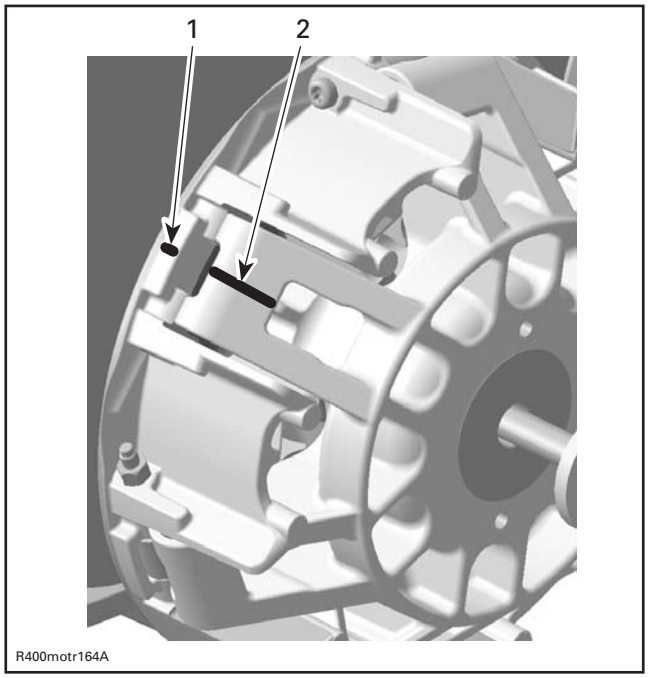

vmr2006-021-017

NOTICE Rollers must move easily after installation.

Carefully press slider shoes in the governor cup arm so they **bottom out evenly** in the machined portion of the governor cup arm.

NOTICE Slider shoes must be pressed in evenly to ensure they are centered in the arm and slide properly in the guides.

Align governor cup with sliding sheave using the marks traced at disassembly.



R400motr164A

1. Mark on drive pulley sliding sheave
2. Mark on governor cup

Installing the Drive Pulley

For installation, reverse the removal procedure. Pay attention to the following details.

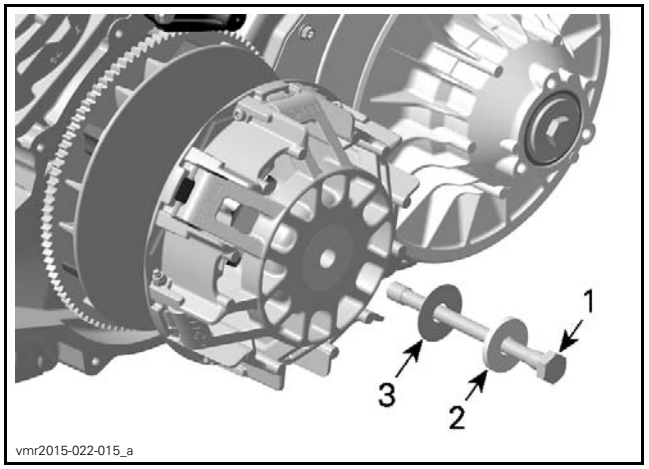
NOTICE Do not apply antiseize or any lubricant on crankshaft and drive pulley tapers.

NOTICE Never use any type of impact wrench at drive pulley removal and installation.

Clean mounting surfaces. Refer to *CLEANING THE DRIVE PULLEY* procedure in this subsection.

Install drive pulley on crankshaft extension.

Install:
- Thrust washer
- Spring washer with its concave side towards drive pulley
- Drive pulley screw.



vmr2015-022-015_a

1. Drive pulley screw
2. Spring washer
3. Thrust washer

⚠ WARNING

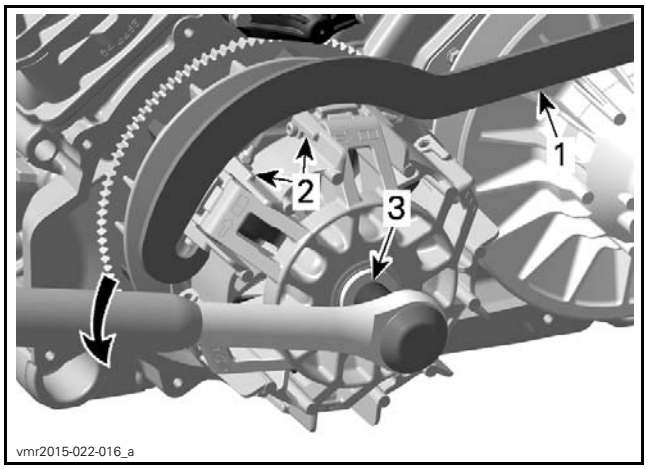
Never substitute spring washer and/or screw with aftermarket parts. Always use BRP genuine parts.

Lock the drive pulley as per removal procedure.

Tighten drive pulley screw counterclockwise to specification.

TIGHTENING TORQUE	
Drive pulley screw	100 N•m ± 7 N•m (74 lbf•ft ± 5 lbf•ft)

NOTE: Drive pulley screw has LH threads.



1. Drive pulley holder
2. Drive pulley removal/installation area
3. Drive pulley screw

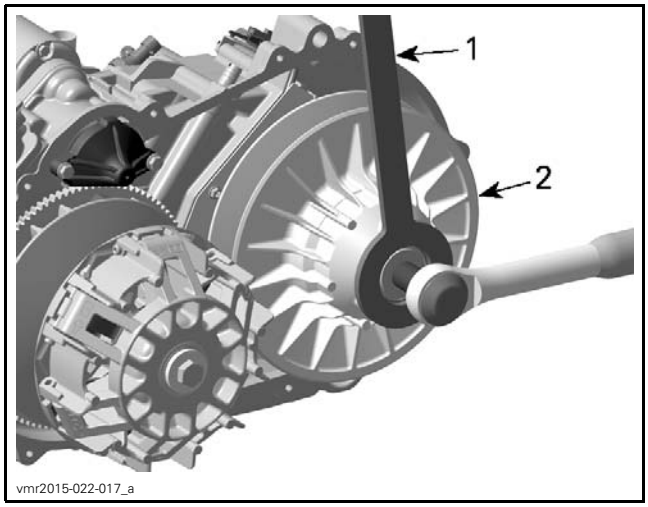
DRIVEN PULLEY

Removing the Driven Pulley

Remove . Refer to *DRIVE BELT* in this subsection.

Block driven pulley fixed sheave.

REQUIRED TOOL	
DRIVEN CLUTCH HOLDER (P/N 529 035 771)	



1. Driven clutch holder
2. Driven pulley fixed sheave

Unscrew the driven pulley screw.

NOTE: Do not remove screw completely.

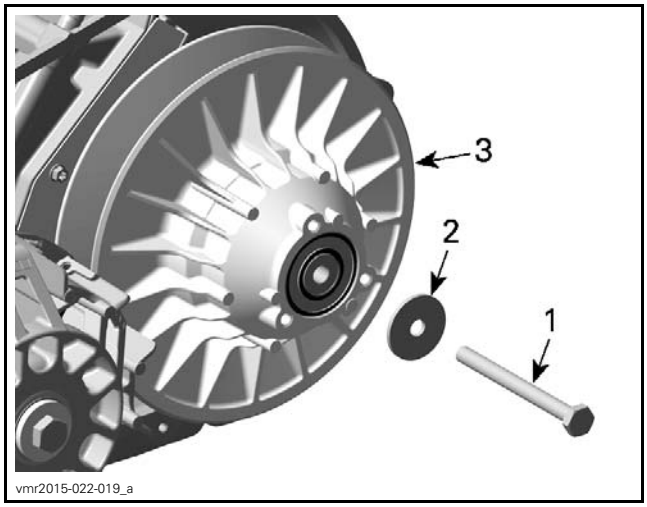
Apply axial pressure with your hand on driven pulley and maintain during screw removal.

Remove:

– Driven pulley screw
– Washer.

⚠ WARNING

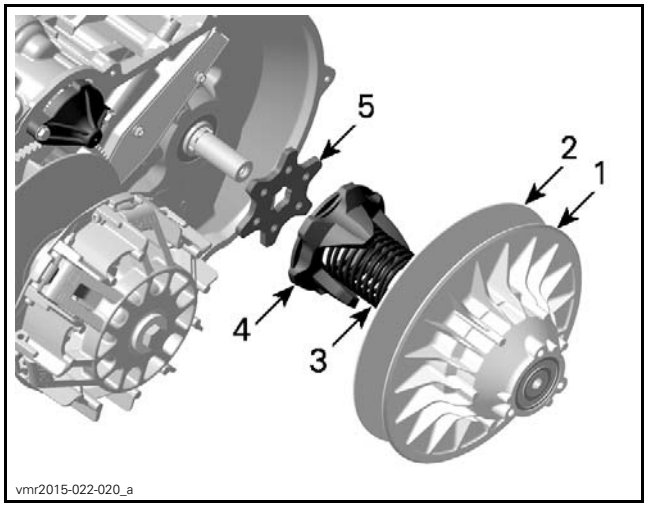
Driven pulley is spring loaded. Hold driven clutch pulley tight and slowly remove the driven pulley screw to release spring tension.



1. Driven pulley screw
2. Washer
3. Driven pulley fixed sheave

Remove:

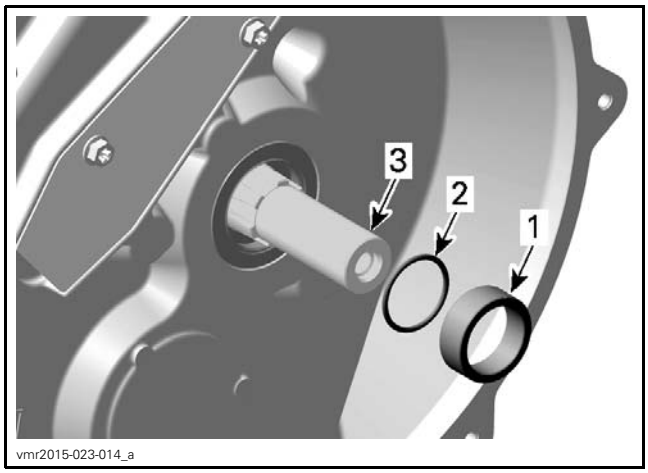
– Driven pulley
– Spring
– Cam
– Plate.



1. Fixed sheave of driven pulley
2. Sliding sheave of driven pulley
3. Spring
4. Cam
5. Plate

Remove distance sleeve including O-ring from counter shaft on engine PTO side.

Replace O-ring if brittle, hard or damaged.

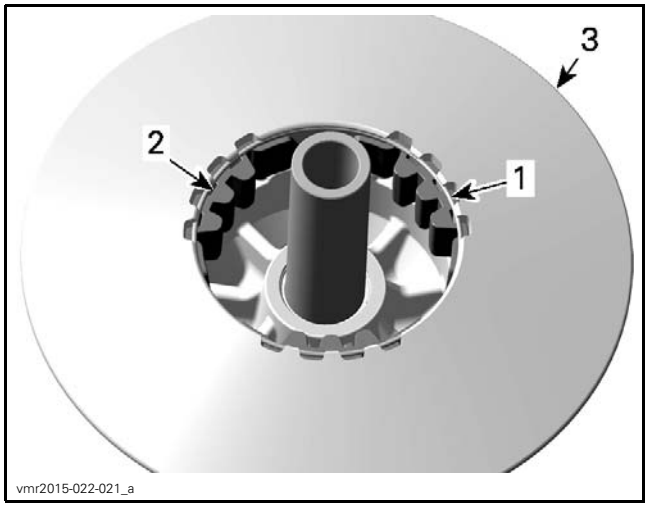


1. Distance sleeve
2. O-ring
3. Counter shaft

Disassembling the Driven Pulley

Fixed Sheave

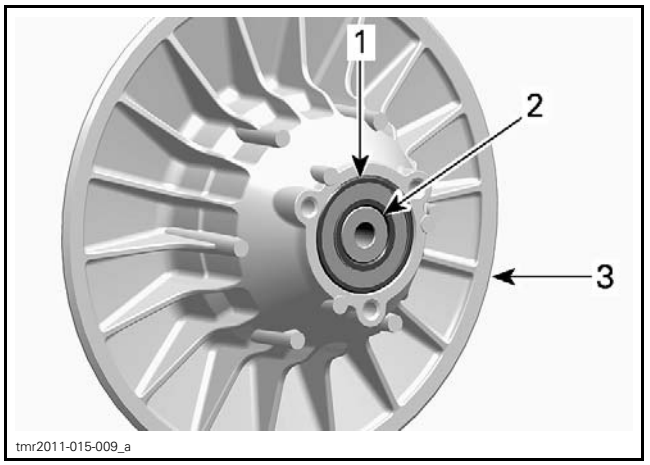
Remove retaining ring and lift torque gear.



1. Retaining ring
2. Torque gear
3. Fixed sheave of driven pulley

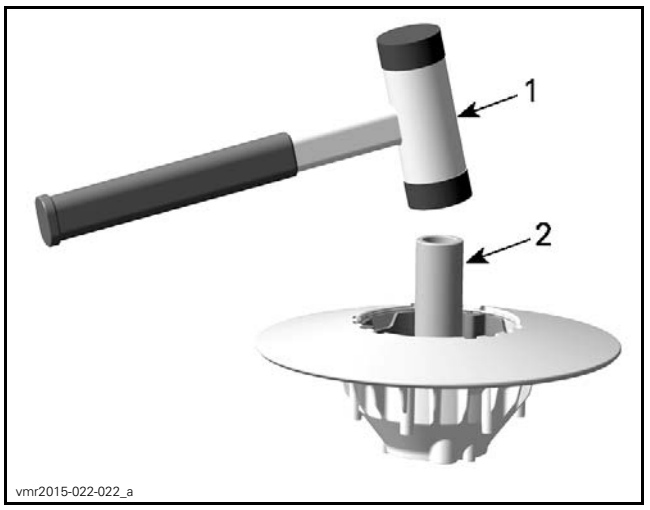
NOTE: The following procedure is not necessary except if ball bearing or shaft must be removed. Refer to *INSPECTING THE DRIVEN PULLEY* before proceeding.

Heat ball bearing area up to 100°C (212°F) before removing ball bearing.



1. Ball bearing
2. Shaft
3. Fixed sheave of driven pulley

Use a soft hammer to push shaft with bearing out of fixed sheave.



1. Soft hammer
2. Shaft

Remove shaft from ball bearing.

Cleaning the Driven Pulley

To remove a dust deposit from cam or shaft, use a dry cloth.

Clean pulley faces and shaft with fine steel wool and dry cloth.

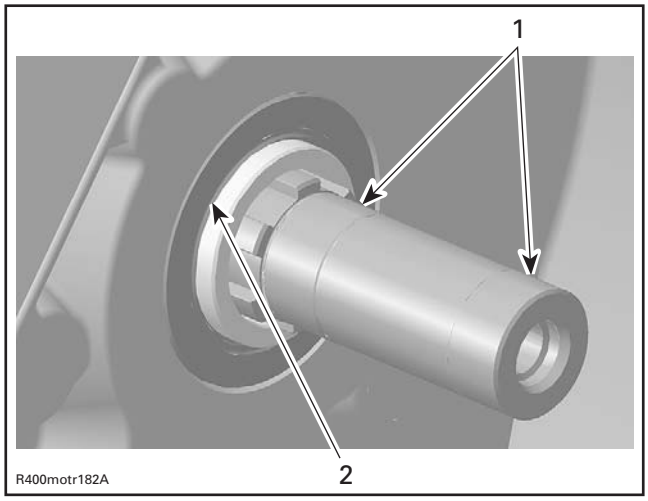
Clean driven pulley using the recommended product

SERVICE PRODUCT
CLUTCH AND PULLEY FLANGE CLEANER PRO S1 (P/N 779244)

Clean the CVT crankcase area from contamination.

Using a paper towel with cleaning solvent to clean counter shaft end and the inside of the shaft.

NOTICE To avoid damage, make sure cleaner does not contact the counter oil shaft seal.



1. Counter shaft supports
2. Sealing lip of counter shaft oil seal

Inspecting the Driven Pulley

Sliding Sheave

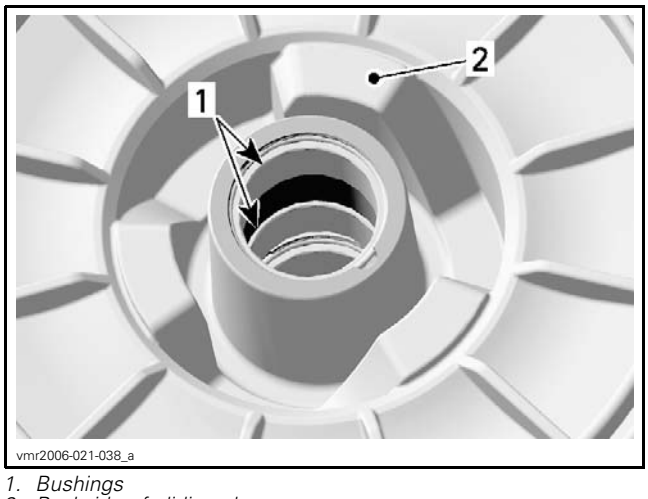
Check sliding sheave for cracks and sliding contact surface for excessive wear. Replace sliding sheave if necessary.

Check bushings for cracks, scratch and for free movement when assembled to sliding sheave.

Using a dial bore gauge, measure bushing diameters. Measuring point must be at least 5 mm (1/4 in) from bushing edges.

Measure bushing inner diameter.

NOTE: Bushings cannot be replaced. Replace sliding sheave if bushings are out of specification. Visually inspect coatings.



1. Bushings
2. Backside of sliding sheave

REQUIRED TOOL
Dial bore gauge

MEASURING POINT
At least 5 mm (1/4 in) from bushing edge

BUSHINGS INNER DIAMETER	
NEW	30.060 mm to 30.100 mm (1.183 in to 1.185 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Fixed Sheave

Check fixed sheave for cracks and excessive wear. Replace fixed sheave if necessary.

Check ball bearing for free play and smooth operation. Replace if necessary.

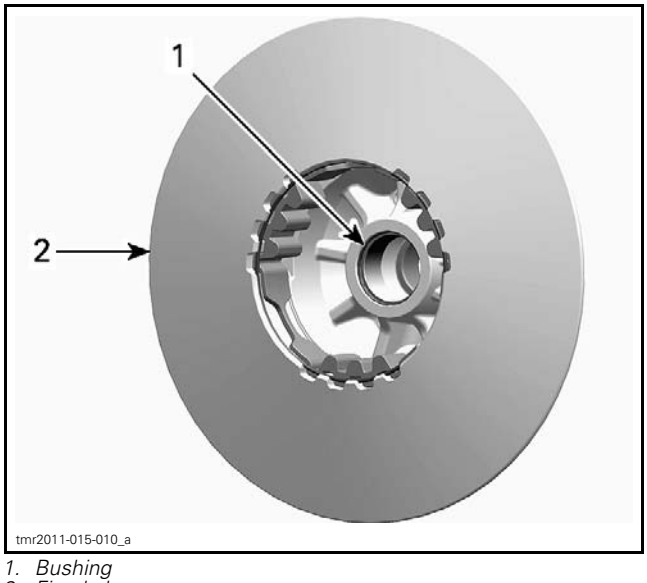
Check shaft for heavy wear or visible damage. Replace if necessary.

If the shaft is removed, measure bushing inner diameter

NOTE: This bushing cannot be replaced. Replace fixed sheave if bushing is out of specification. Visually inspect coatings.

REQUIRED TOOL
Dial bore gauge

MEASURING POINT
At least 5 mm (1/4 in) from bushing edge

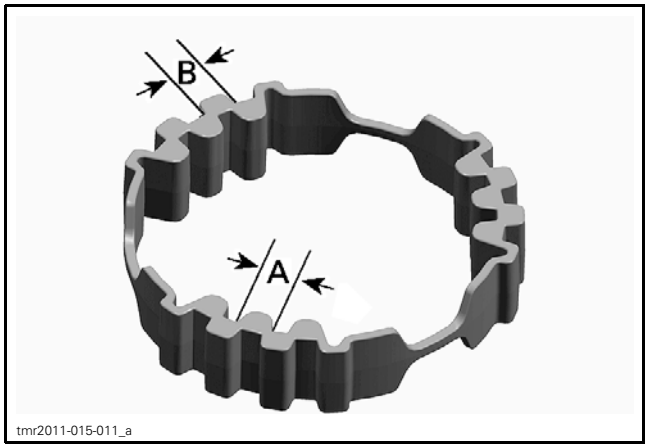


1. Bushing
2. Fixed sheave

BUSHING INNER DIAMETER	
NEW	30.060 mm to 30.100 mm (1.183 in to 1.185 in)
SERVICE LIMIT	30.200 mm (1.189 in)

Check torque gear for visible damage and cracks.

Measure for wear limit using a caliper.

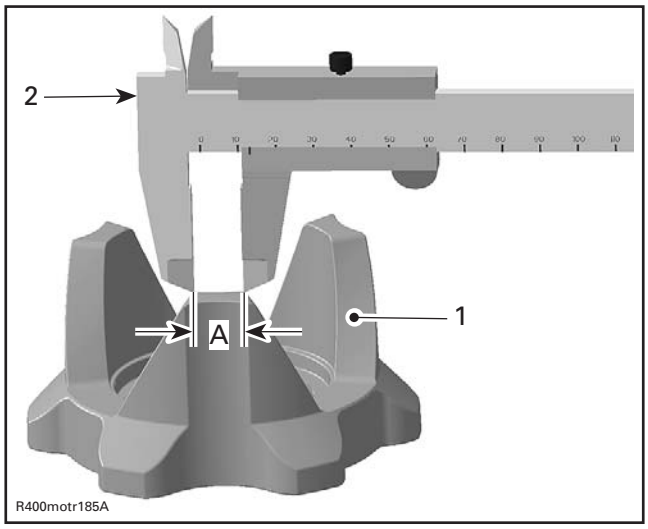


A. Measurement inside
B. Measurement outside

WEAR ON TEETH (BOTH SIDES)	
SERVICE LIMIT	7.500 mm (.295 in)

Cam

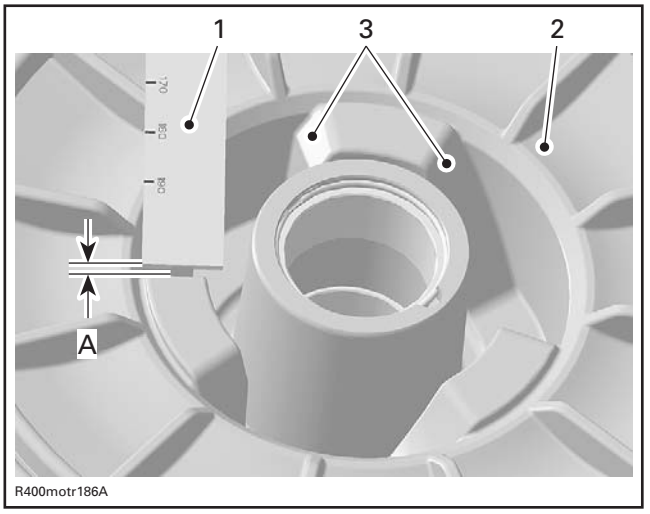
Check cam for visible damage and measure for wear using a caliper.



1. Contact surfaces for power train
2. Caliper

A. Width to be measured due to wear on contact surface

WIDTH ON TOP SURFACE	
SERVICE LIMIT	6.000 mm (.236 in)



1. Caliper
2. Sliding sheave
3. Contact surface

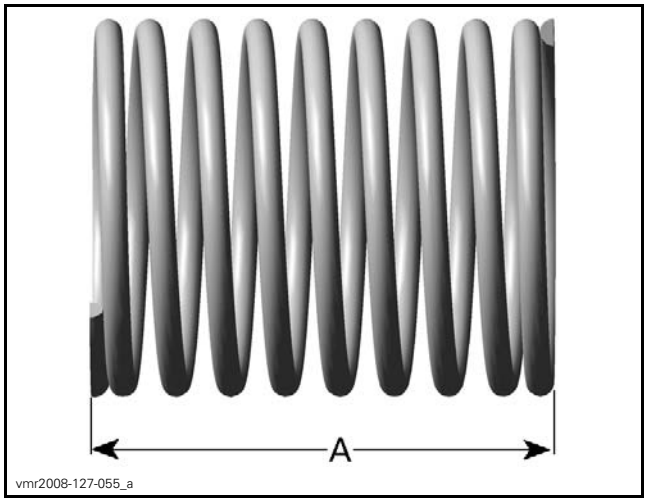
A. Wear to be measured

WEAR ON CONTACT SURFACE	
SERVICE LIMIT	1.000 mm (.039 in)

Spring

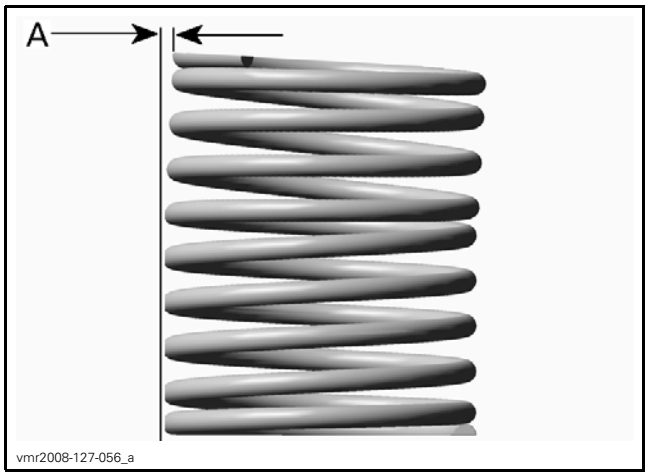
Measure spring free length and squareness. If spring is out of specification, replace by a new one.

SPRING FREE LENGTH	
SERVICE LIMIT	164 mm (6.457 in)



A. Free length

CLUTCH SPRING SQUARENESS	
SERVICE LIMIT	3.8 mm (.15 in)



A. Squareness

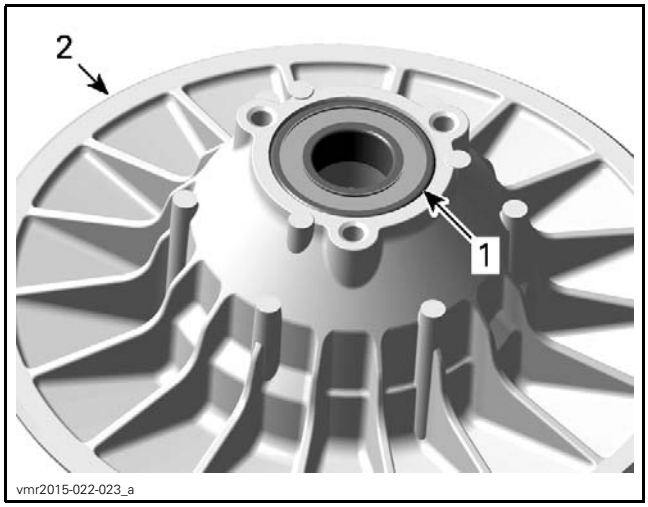
Assembling the Driven Pulley

For installation, reverse the removal procedure. Pay attention to following details.

Heat ball bearing area up to 100°C (212°F) before ball bearing installation.

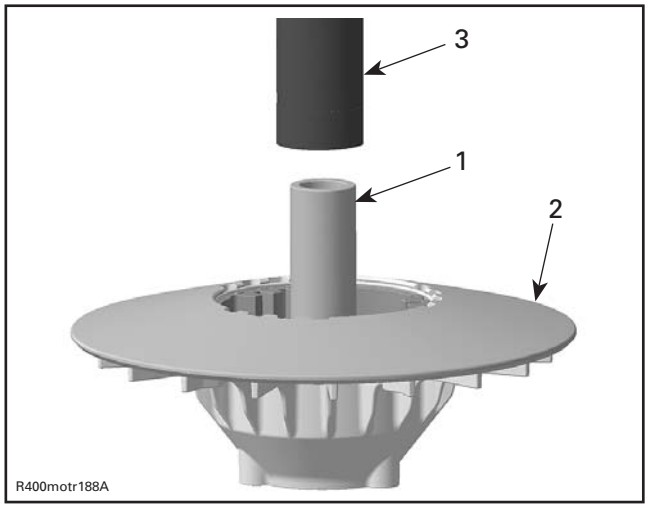
NOTE: Place new ball bearing in a freezer for 10 minutes before installation.

Install ball bearing with the writing on top and push only on the outer ring.



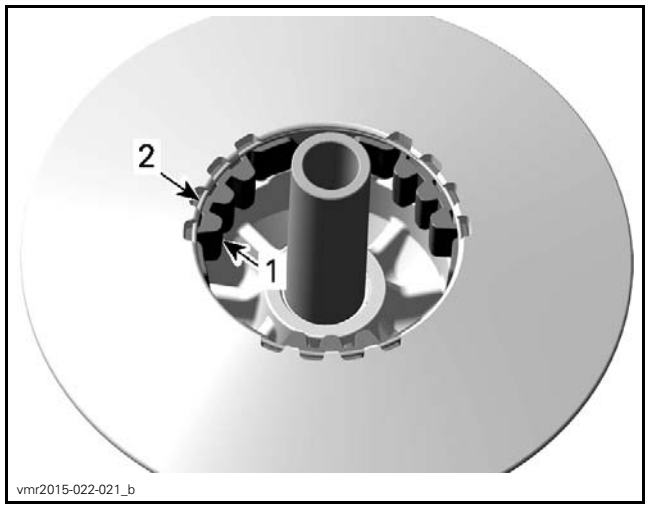
1. Ball bearing

NOTICE Do not use a hammer, use a press only.



1. Shaft
2. Fixed sheave
3. Press machine

Install torque gear then secure it with retaining ring.



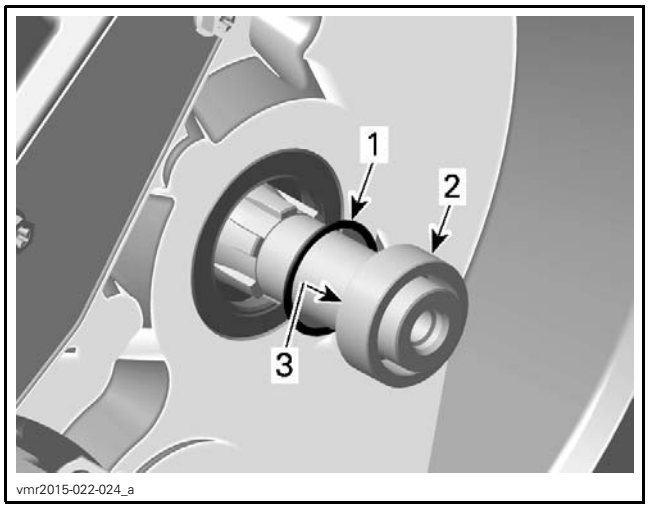
1. Torque gear
2. Retaining ring

Installing the Driven Pulley

For installation, reverse the removal procedure. Pay attention to the following details.

Place O-ring on counter shaft splines and move it with spacer in end position.

NOTICE Chamfer on inside diameter of the spacer must face engine side.



1. O-ring
2. Distance sleeve
3. Chamfered area of distance sleeve

Clean:

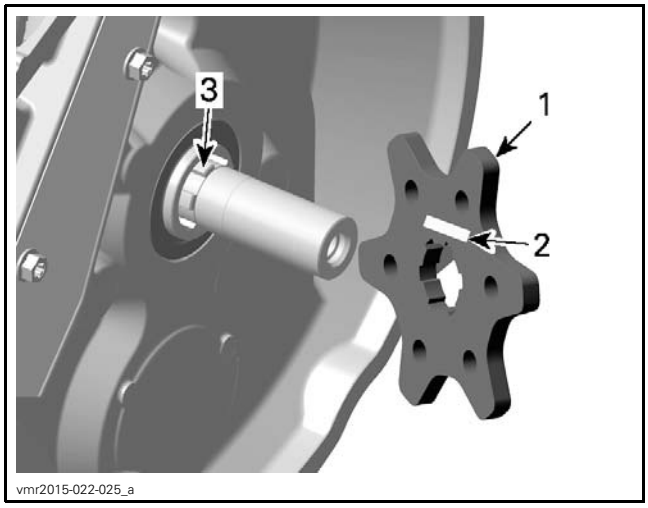
– Threads of gearbox counter shaft
– Driven pulley screw threads.

SERVICE PRODUCT
CLUTCH AND PULLEY FLANGE CLEANER PRO S1 (P/N 779244)

NOTICE **Threads of gearbox counter shaft and driven pulley screw must be free of oil and grease. Lubricants in threads will create too high preload to tightened driven pulley screw.**

Install cam retainer on counter shaft spline the right way then install cam.

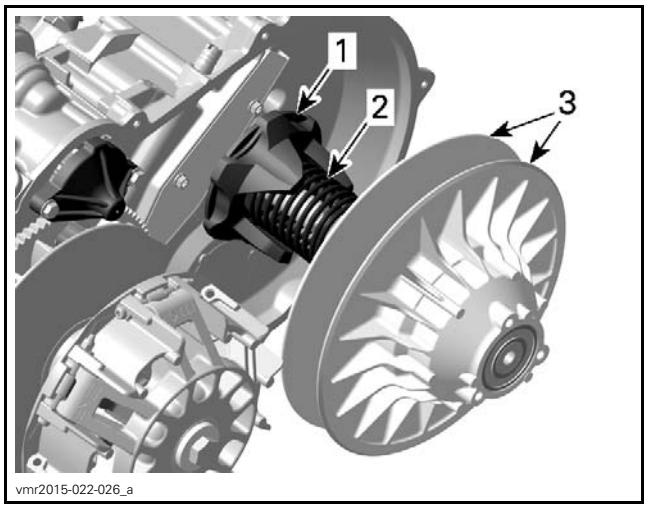
NOTE: Place cam retainer with printed mark "ENGINE SIDE" towards the engine.



1. Cam retainer
2. Printed mark "ENGINE SIDE"
3. Counter shaft spline

Insert sliding sheave into fixed sheave.

Place spring behind sliding sheave then align driven pulley with cam.



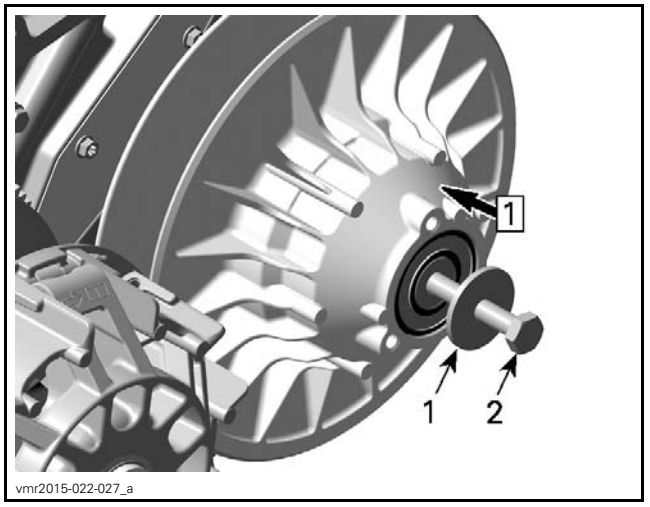
1. Cam
2. Spring
3. Driven pulley

With your hand, push the driven pulley onto the shaft to compress the spring.

NOTICE **A cam not correctly engaged will cause damage to the driven pulley and cam.**

Install the driven pulley screw and its washer.

NOTE: Tighten the screw with your hand sufficiently for the cam to remain engaged.

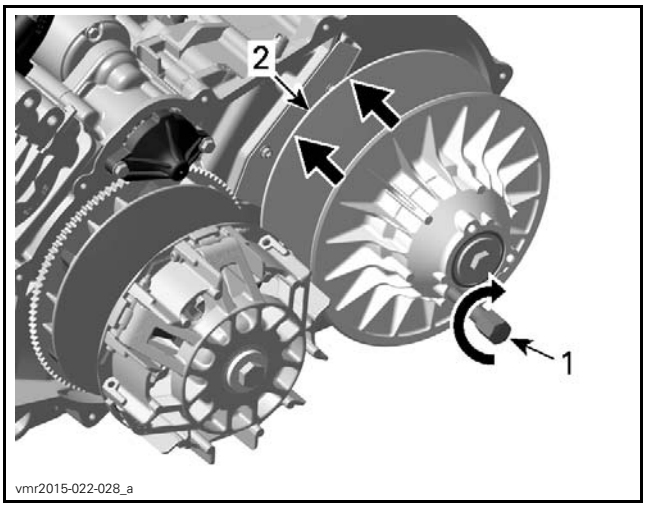


Step 1: Push

1. Washer
2. Driven pulley screw

Install drive belt. Refer to *DRIVE BELT* in this subsection.

REQUIRED TOOL	
PULLER/LOCKING TOOL (P/N 529 036 098)	



1. Puller/locking tool
2. Sliding sheave

NOTE: If driven pulley sheaves cannot be opened when the service tool is screwed in, the cam is not correctly engaged in the sliding sheave.

Torque driven pulley screw to specification.

TIGHTENING PROCEDURE		
Driven pulley screw	Step 1	20 N•m ± 1 N•m (15 lbf•ft ± 1 lbf•ft)
	Step 2	180° ± 5°

Check driven pulley end play.

SPECIFICATION	
Driven pulley end play	0 mm (0 in)

GEARBOX AND 4X4 COUPLING UNIT (with external switches)

SERVICE TOOLS

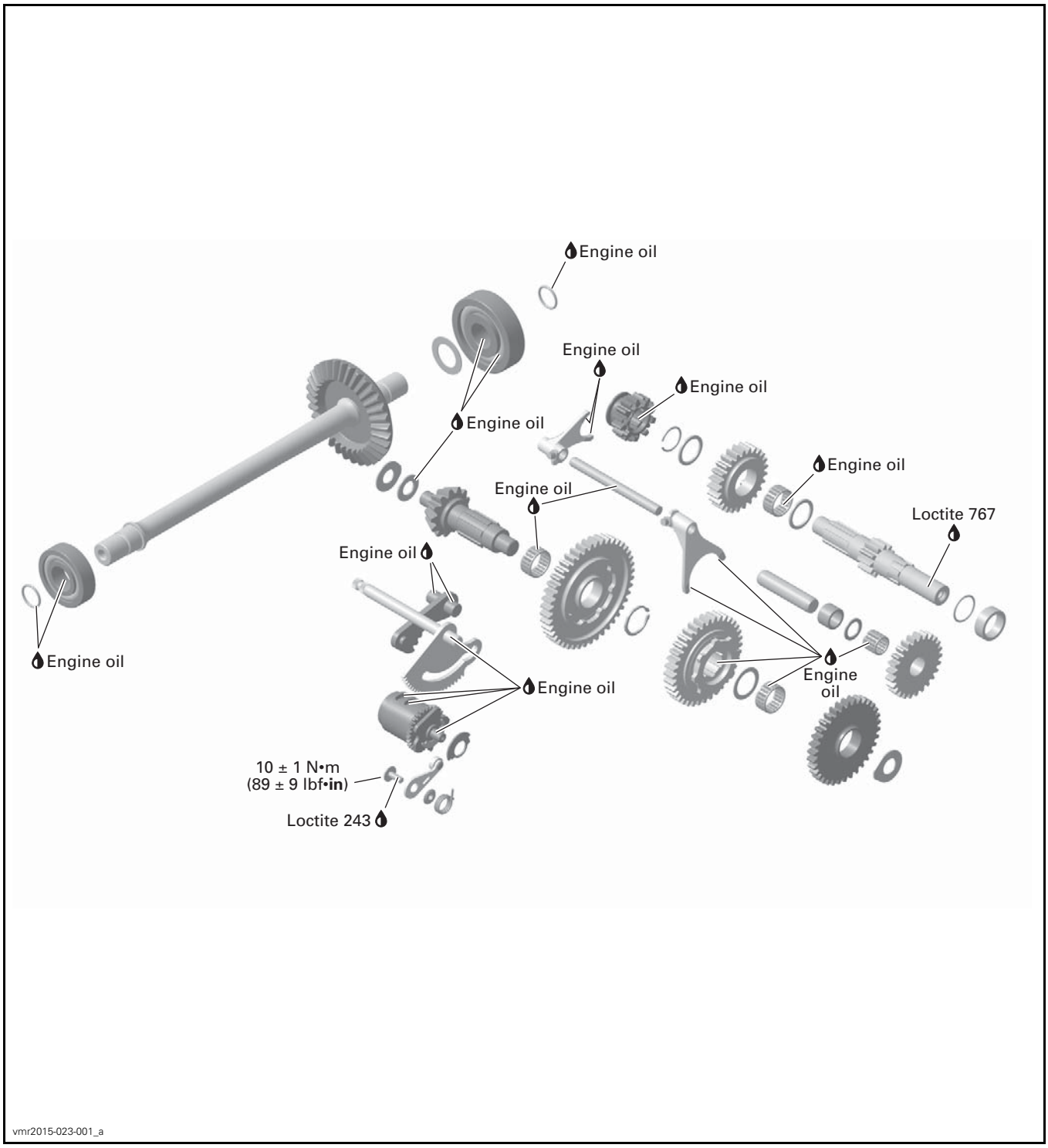
Description	Part Number	Page
FLUKE 115 MULTIMETER	529 035 868	6, 21

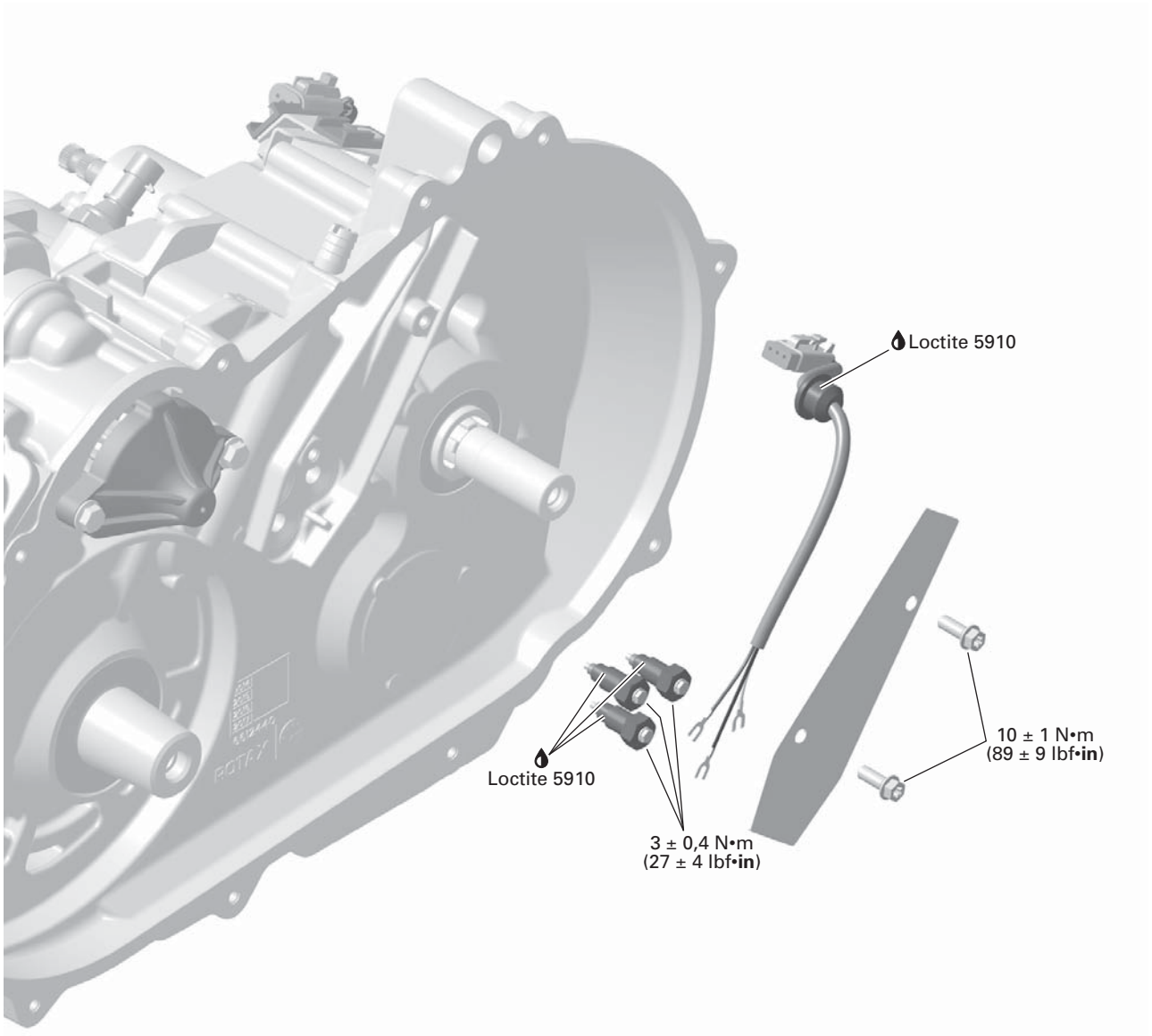
SERVICE TOOLS – OTHER SUPPLIER

Description	Part Number	Page
FLUKE RIGID BACK-PROBE	TP88	6

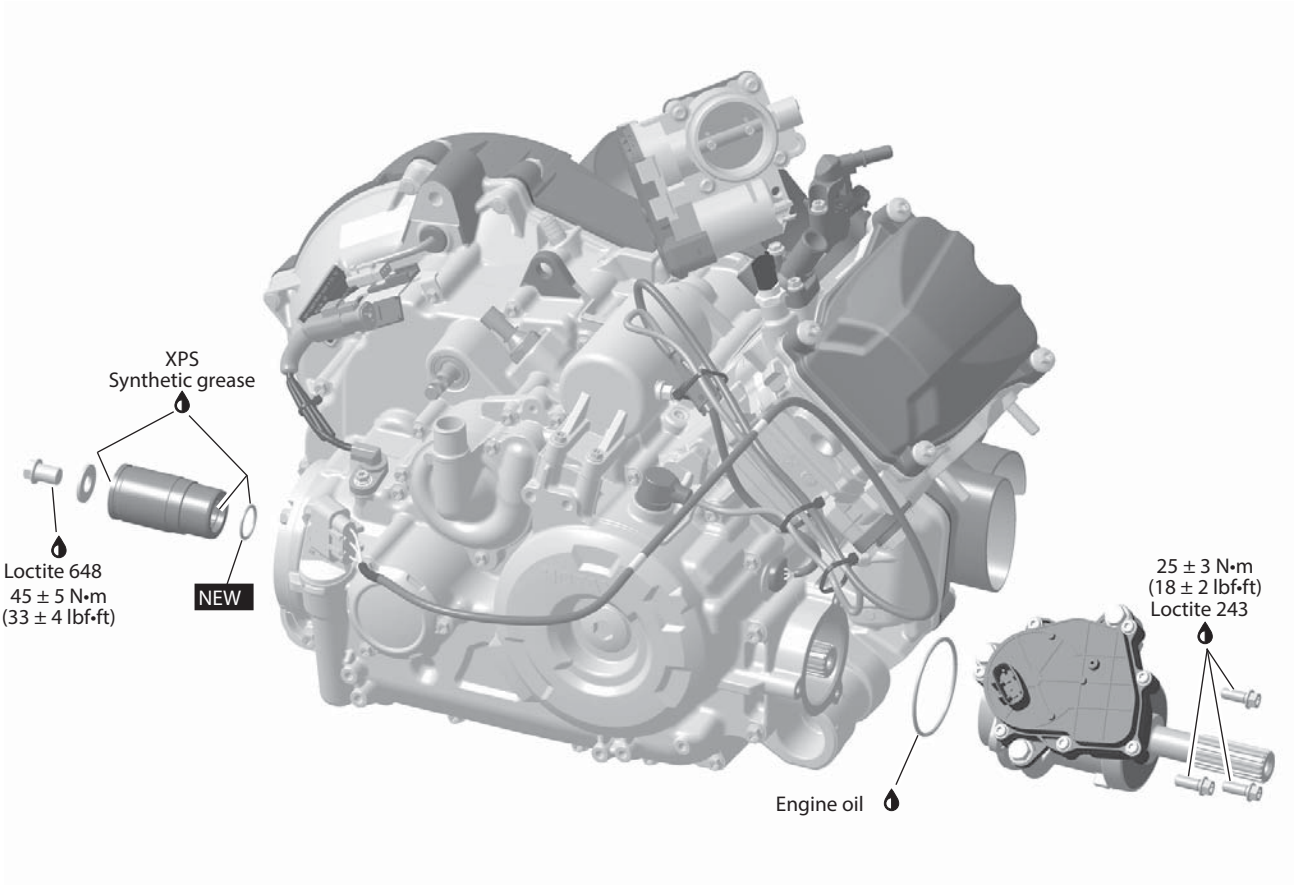
SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	25, 29–30
LOCTITE 5910	293 800 081	22
LOCTITE 648 (GREEN)	413 711 400	11
SUPER LUBE GREASE	293 550 030	7


Engine oil
Engine oil
Engine oil
Engine oil
Engine oil
Engine oil
Loctite 767
Engine oil
Engine oil
Engine oil
Engine oil
10 ± 1 N•m
(89 ± 9 lbf•in)
Loctite 243
vmr2015-023-001_a



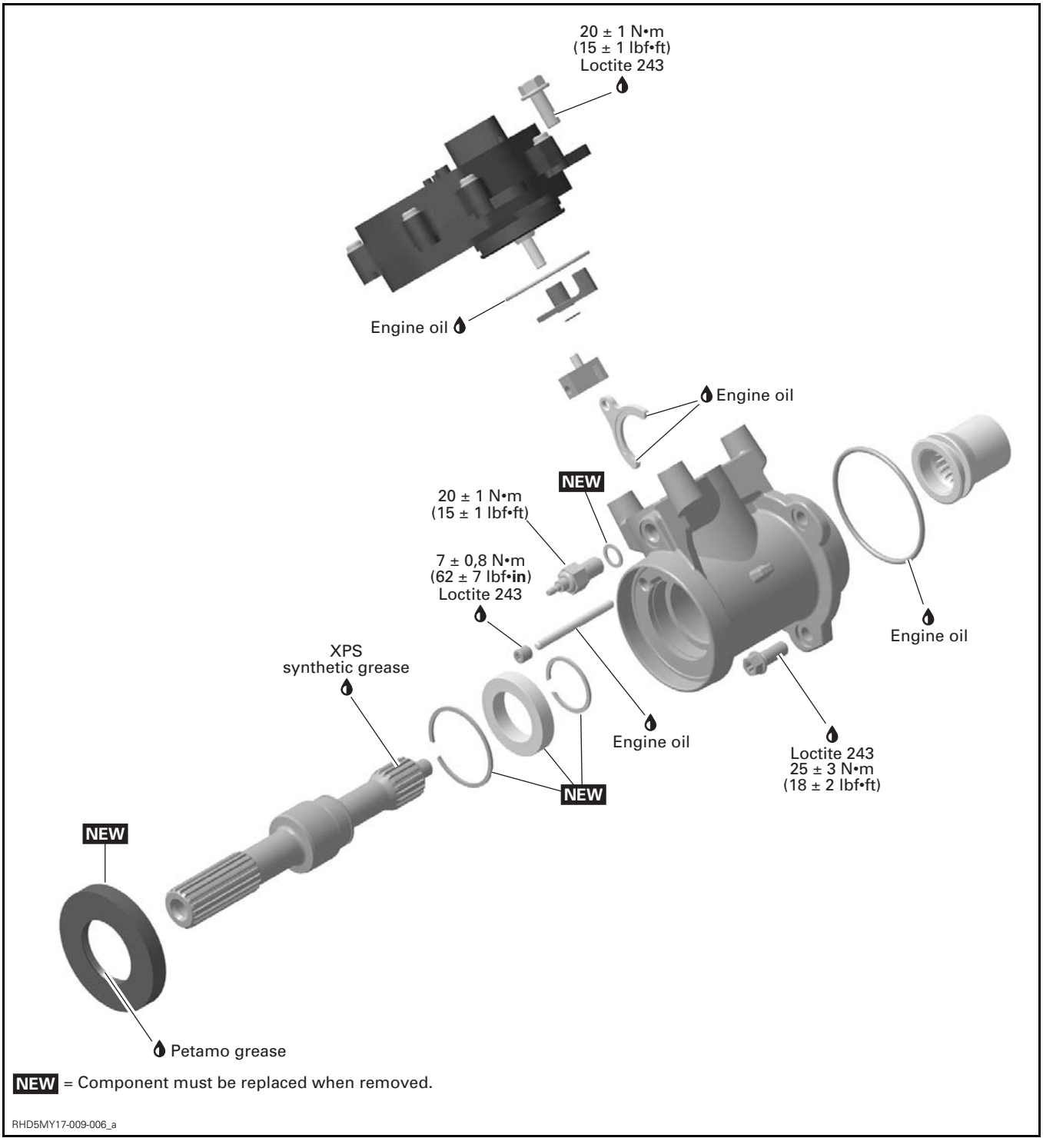
vmr2015-023-002_a



NEW = Component must be replaced when removed.

219100901-017-100_a

4X4 COUPLING UNIT



NEW = Component must be replaced when removed.

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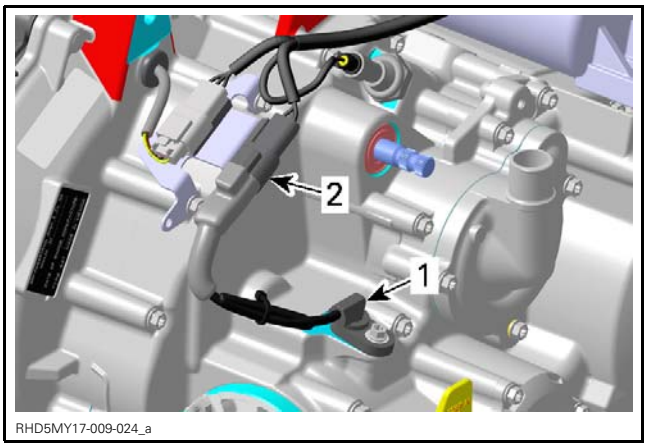
PROCEDURES

VEHICLE SPEED SENSOR (VSS)

VSS Location

The vehicle speed sensor is located on the magneto cover on the rear side of the engine.



RHD5MY17-009-024_a

1. VSS (Vehicle Speed Sensor)
2. VSS connector

Accessing the VSS

To reach the VSS, tilt the cargo box.

VSS Wire Identification

FUNCTION	PIN	COLOR - SENSOR CONNECTOR	COLOR - WIRING HARNESS CONNECTOR
12-volt input from fuse F9	A	RED	VIOLET/BLUE
Speed signal (to ECM E1)	B	WHITE	WHITE
Ground (to ECM D4)	C	BLACK	BLACK/GREEN

VSS Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with main relay activated	Fuse 9 of fuse block 2 (from main relay R2)

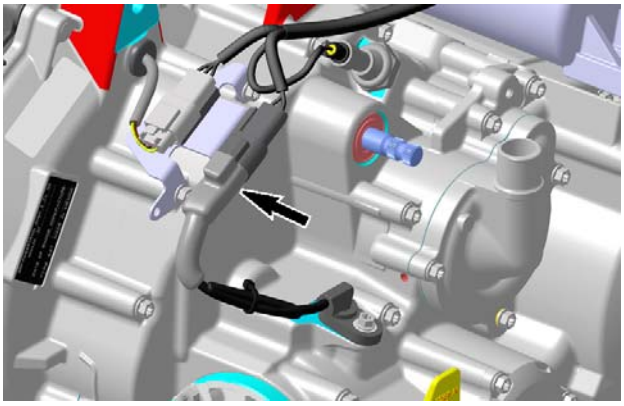
Testing the VSS Input Voltage

1. Remove VSS connector cover.
2. Set multimeter to Vdc.

REQUIRED TOOL
FLUKE 115 MULTIMETER (P/N 529 035 868)

3. Turn ignition switch ON.
4. Back-probe the VSS connector.

REQUIRED TOOL
FLUKE RIGID BACK-PROBE (P/N TP88)



RHD5MY17-009-024_b

VSS CONNECTOR

5. Measure voltage as per following table.

VEHICLE SPEED SENSOR INPUT VOLTAGE TEST		
TEST PROBES		RESULT (KEY ON)
PIN A VIOLET/BLUE wire	PIN C BLACK/GREEN wire	Battery voltage

If voltage is not as specified, test positive and ground circuits separately.

Testing the VSS Signal

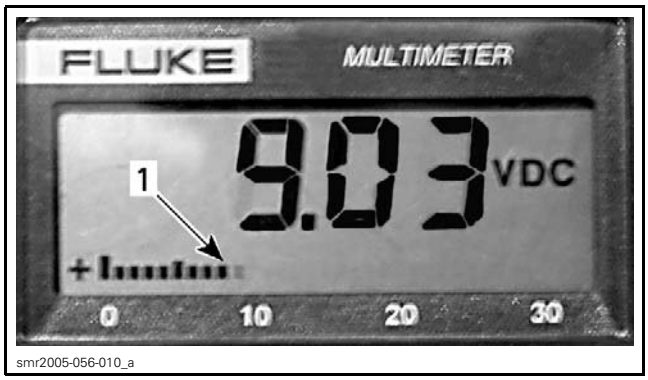
1. Lift rear of vehicle so that rear wheels are off the ground.
2. Set transmission to 2WD and to NEUTRAL.
3. Back-probe the VSS connector.

REQUIRED TOOL
FLUKE RIGID BACK-PROBE (P/N TP88)

4. Turn ignition switch ON.
5. Set multimeter to Vdc.
6. Measure voltage while slowly rotating rear wheels by hand.

VEHICLE SPEED SENSOR SIGNAL TEST		
TEST PROBES		RESULT (WHILE ROTATING WHEELS)
PIN B WHITE wire	PIN C BLACK/GREEN wire	Alternate reading between battery voltage and 0 Vdc

NOTE: Since we measure pulsating voltage, the numeric display will continuously change. The analog display may be easier to follow.

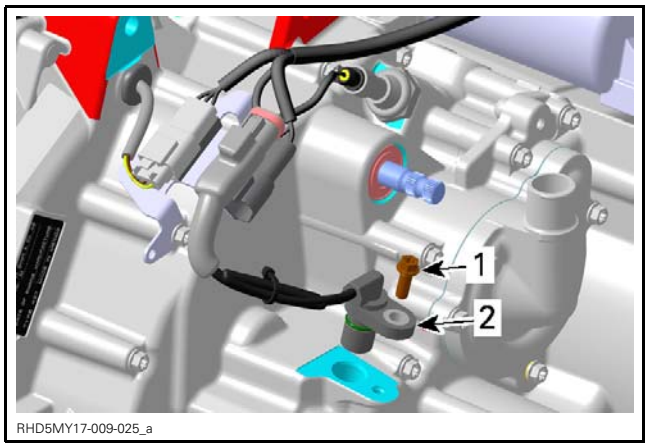


1. Analog display

Removing the VSS

Remove:

– Retaining screw
– VSS.



1. Screw
2. VSS

Installing the VSS

For installation, reverse the removal procedure. Pay attention to the following.

Lubricate VSS O-ring.

VSS O-RING	
Service product	SUPER LUBE GREASE (P/N 293 550 030)

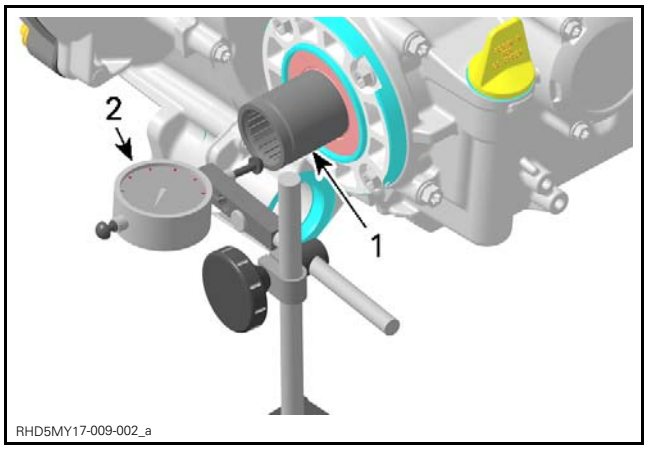
Tighten VSS retaining screw to specification.

TIGHTENING TORQUE	
VSS retaining screw	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

OUTPUT SHAFT AND COUPLING SLEEVE

Removing the Output Shaft and Coupling Sleeve

1. Remove engine from the vehicle. Refer to *ENGINE REMOVAL AND INSTALLATION* subsection.
2. Measure output shaft axial clearance prior to remove it.



1. Coupling sleeve
2. Dial indicator

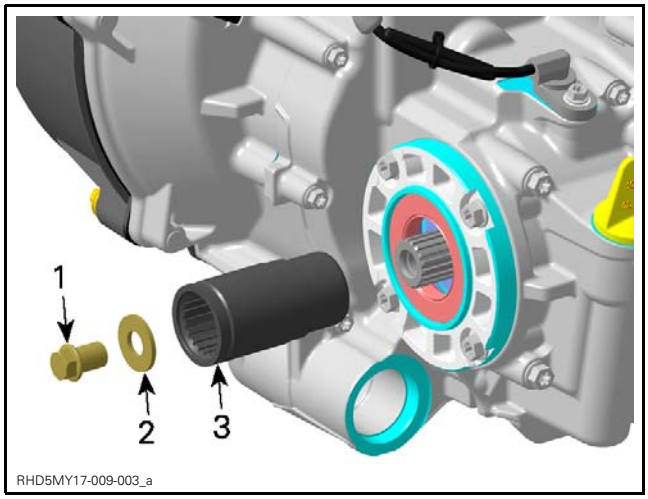
OUTPUT SHAFT AXIAL CLEARANCE	
NEW	0.09 mm to 0.18 mm (.004 in to .007 in)
SERVICE LIMIT	0.30 mm (.012 in)

If the output shaft axial clearance is out of specification, crankcase must be split and the bevel gear must be adjusted. See *GEARBOX ADJUSTMENT* in this subsection.

NOTICE If the output shaft must be replaced, always replace the bevel gear shaft at the same time.

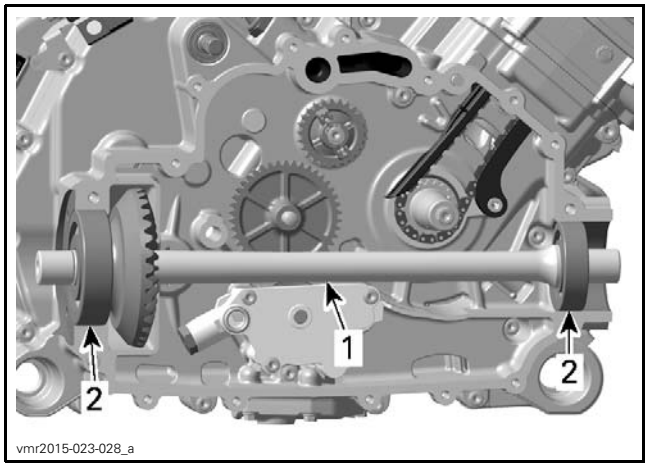
3. Remove *4X4 COUPLING UNIT*, refer to procedure in this subsection.
4. Remove coupling sleeve.

Set gearbox to PARK position.



1. *Retaining screw*
2. *Washer*
3. *Coupling sleeve*

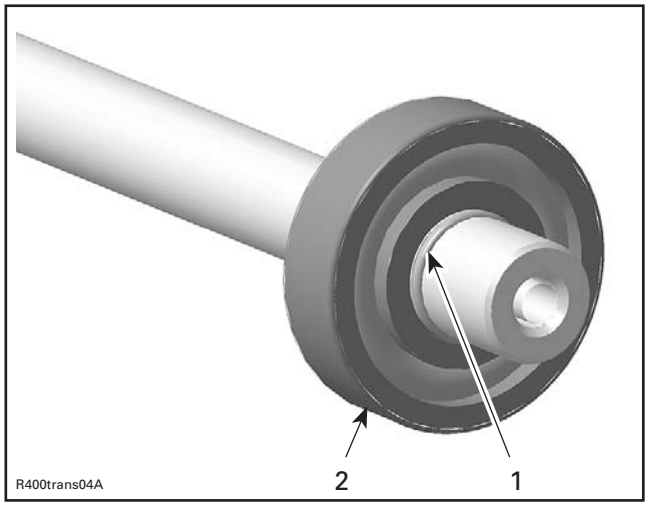
5. Refer to *MAGNETO AND STARTER* subsection to remove:
   - Output shaft bearing cover
   - Magneto cover
   - Rotor.
6. Use a soft hammer to remove output shaft with its bearings from housing.



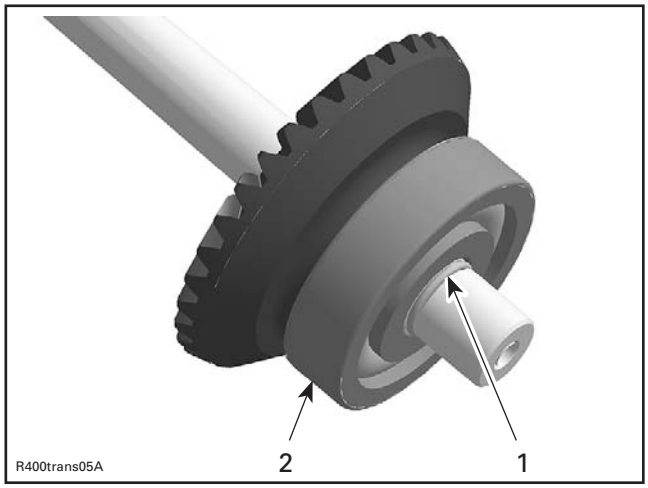
1. *Output shaft*
2. *Ball bearings*

7. Remove both O-rings and both bearings from output shaft.

NOTE: Both bearings on output shaft have a transition fit.

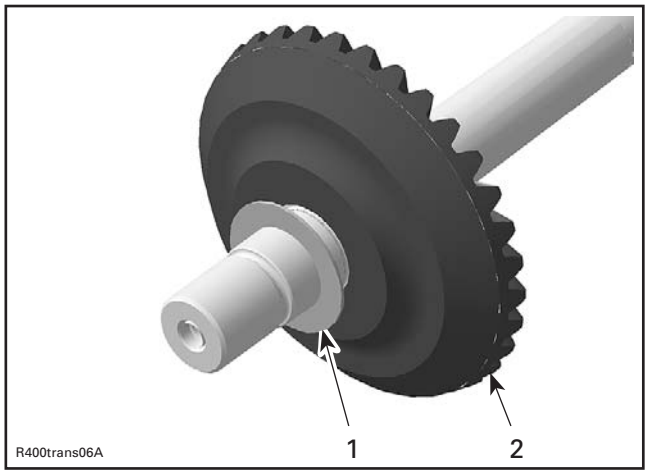


1. *O-ring*
2. *Bearing on front side*



1. *O-ring*
2. *Bearing on rear side*

8. Withdraw adjustment shim.



1. *Adjustment shim*
2. *Output shaft bevel gear*

Inspecting the Output Shaft and Coupling Sleeve

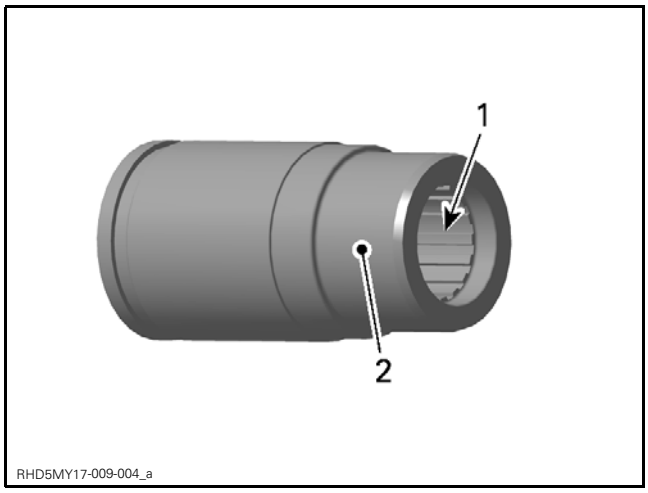
Check output shaft for bending, cracks and other visible damages.

NOTICE **Always replace output shaft and bevel gear shaft at the same time.**

Check output shaft bevel gear for wear and teeth damages.

Check splines of coupling sleeve for wear or other damages. Replace if splines are damaged.

Check oil seal running surface of coupling sleeve for scratches or grooves. Replace if necessary.



1. Splines
2. Oil seal running surface

Check if output shaft bearings turn freely and smoothly. Replace if necessary.

Replace output shaft oil seal if brittle, hard or damaged. Refer to *BOTTOM END* subsection for replacement procedure.

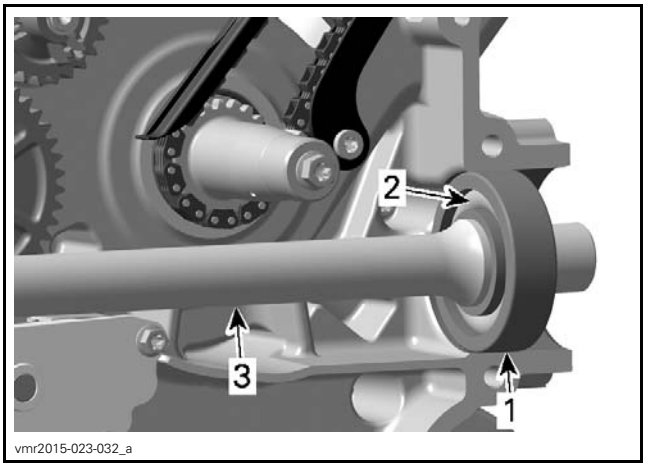
Replace O-rings of output shaft if brittle, hard or damaged.

Clean crankcase and magneto cover mating surface and especially the bearing areas from metal particles or other contamination.

Installing the Output Shaft and Coupling Sleeve

Reverse the removal procedure. However, pay attention to following details.

Install front ball bearing with open side of plastic-cage facing to the inside of the engine.



1. Ball bearing (front side)
2. Open side of plastic cage
3. Output shaft

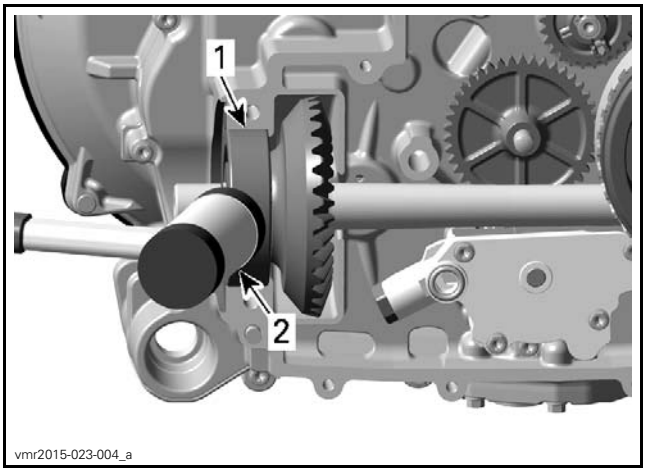
Adjust axial play as per following procedure:

Install output shaft in crankcase.

NOTICE **Do not install thrust washer on output shaft ring gear side yet.**

Put bearings exactly in place against crankcase.

REQUIRED TOOL
Soft hammer

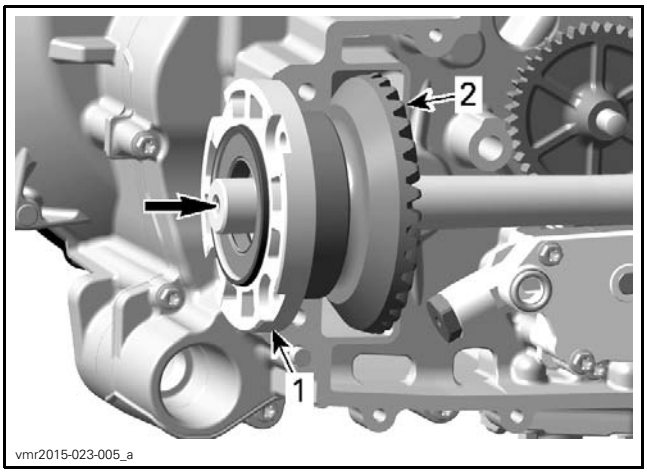


1. Output shaft ball bearing
2. Soft hammer

Install output shaft bearing cover.

NOTE: Do not apply sealant on bearing cover yet.

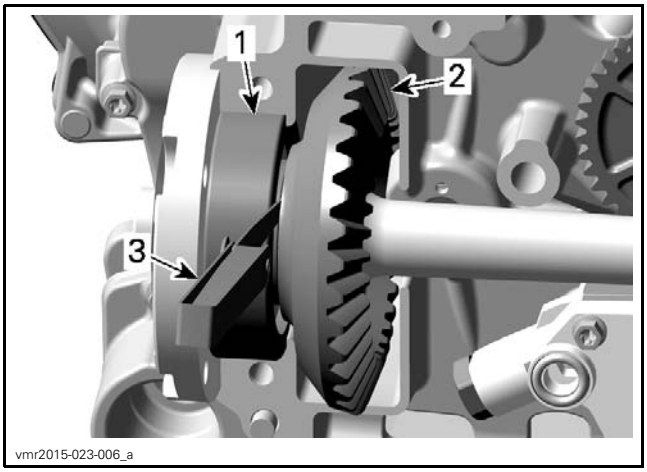
Push output shaft as per following illustration.



WAY TO PUSH THE BEVEL GEARS TOGETHER
1. *Bearing cover*
2. *Output shaft bevel gear*

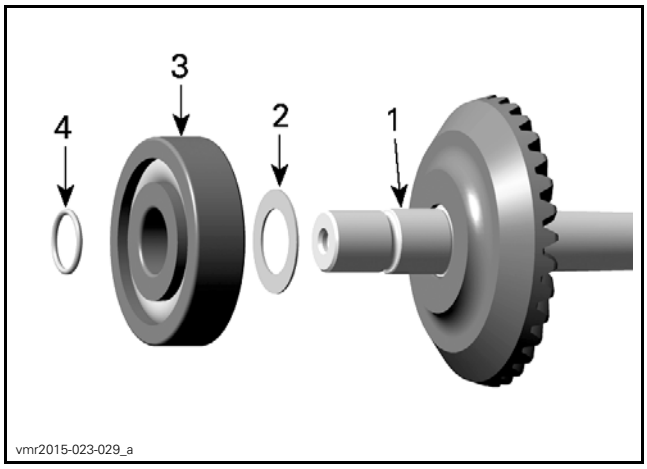
Measure axial gap between bearing and output shaft bevel gear.

REQUIRED TOOL
Feeler gauge



1. *Output shaft ball bearing*
2. *Output shaft bevel gear*
3. *Feeler gauge*

Remove output shaft again and rebuild it with proper adjustment shim.



1. *Output shaft*
2. *Adjustment shim*
3. *Ball bearing*
4. *O-ring*

Use the measured thickness to choose the required adjustment shim as per the following table.

MEASURED THICKNESS	ADJUSTMENT SHIM THICKNESS
0.79 mm to 0.88 mm (.0311 in to .0346 in)	0.70 mm (.0276 in)
0.89 mm to 0.98 mm (.035 in to .0386 in)	0.80 mm (.0315 in)
0.99 mm to 1.08 mm (.039 in to .0425 in)	0.90 mm (.0354 in)
1.08 mm to 1.18 mm (.0425 in to .0465 in)	1.00 mm (.0394 in)
1.19 mm to 1.28 mm (.0469 in to .0504 in)	1.10 mm (.0433 in)
1.29 mm to 1.38 mm (.0508 in to .0543 in)	1.20 mm (.0472 in)
1.39 mm to 1.48 mm (.0547 in to .0583 in)	1.30 mm (.0512 in)
1.49 mm to 1.58 mm (.0587 in to .0622 in)	1.40 mm (.0551 in)

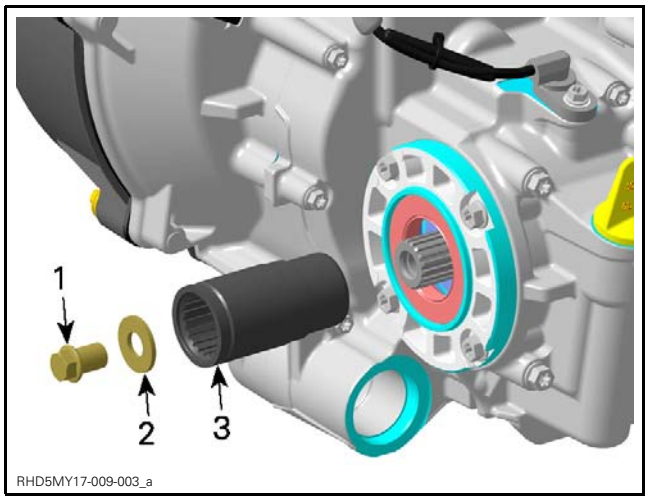
NOTE: Output shaft axial clearance of 0.09 mm to 0.18 mm (.004 in to .007 in) is included in the above table.

Install output shaft.

Install magneto cover and bearing cover. Refer to *MAGNETO AND STARTER* subsection.

Set gearbox to PARK position.

Tighten coupling sleeve retaining screw to specification.



1. *Retaining screw*
2. *Washer*
3. *Coupling sleeve*

TIGHTENING TORQUE	
Service product	LOCTITE 648 (GREEN) (P/N 413 711 400)
Coupling sleeve retaining screw	45 N•m ± 5 N•m (33 lbf•ft ± 4 lbf•ft)

GEARBOX

Disassembling the Gearbox

1. Remove engine from vehicle, refer to *ENGINE REMOVAL AND INSTALLATION* subsection.

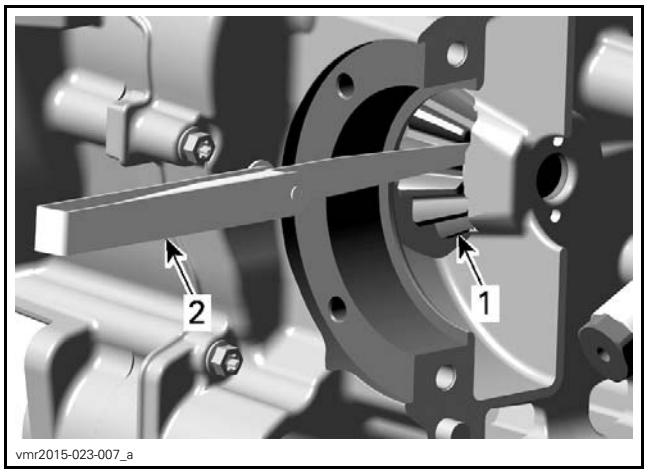
NOTE: During gearbox disassembly, inspect the condition of each part closely.

2. Remove magneto cover and rotor, refer to *MAGNETO AND STARTER* subsection.
3. Remove output shaft.
4. Measure the axial clearance of bevel gear.

NOTE: Bevel gear axial clearance should be measured before crankcase separation.

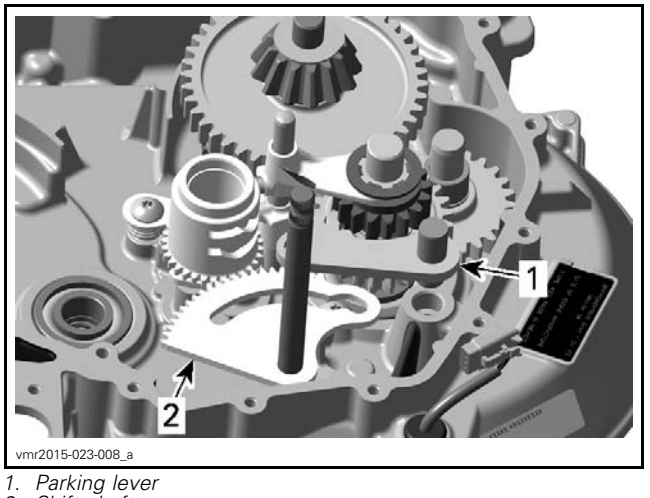
REQUIRED TOOL
Feeler gauge

BEVEL GEAR AXIAL CLEARANCE	
NEW	0.02 mm to 0.11 mm (.0008 in to .0043 in)
SERVICE LIMIT	0.15 mm (.006 in)



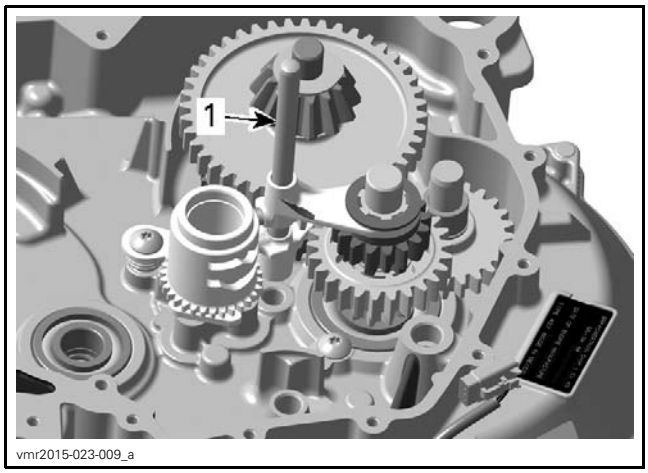
MEASURE AXIAL CLEARANCE
1. *Bevel gear*
2. *Feeler gauge*

5. Separate crankcase, refer to *BOTTOM END* subsection.
6. Remove balancer shaft, refer to *BOTTOM END* subsection.
7. Remove:
   - Parking lever
   - Shift shaft.



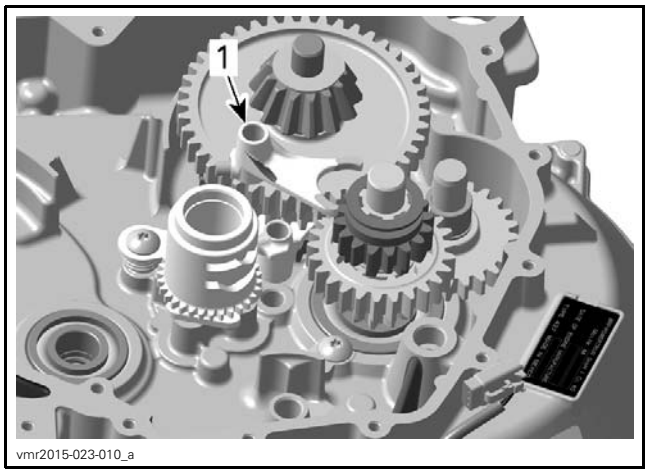
1. *Parking lever*
2. *Shift shaft*

8. Remove shift fork shaft.



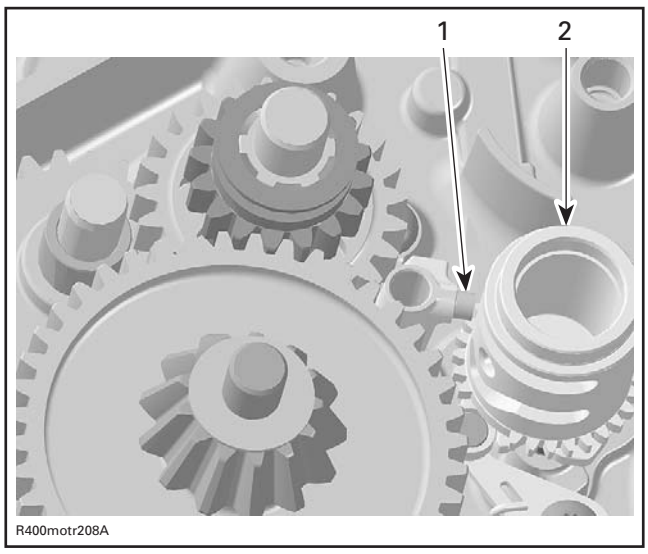
1. Shift fork shaft

9. Remove shift fork.



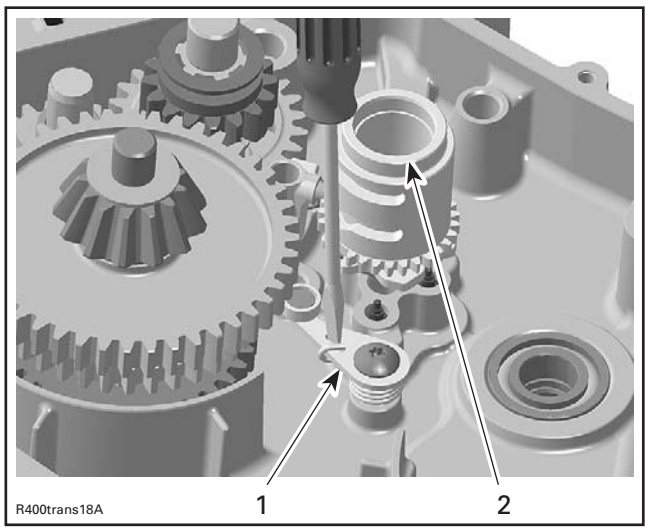
1. Shift fork (engaged in counter shaft gear)

10. Disengage shift fork from shift drum.



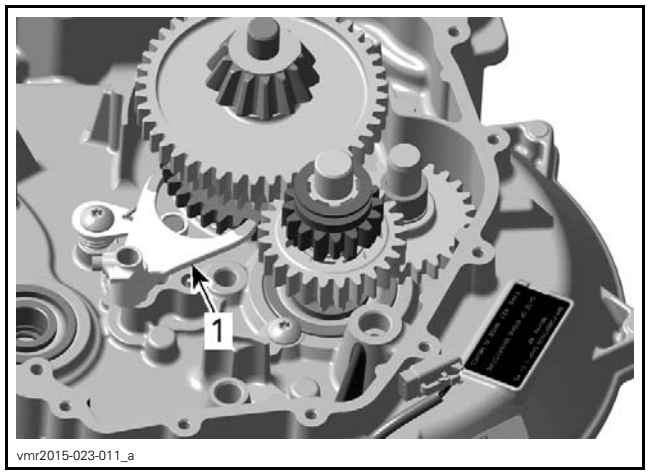
1. Shift fork engagement pin
2. Shift drum

11. Insert a flat screwdriver in the slot of index lever. Turn screwdriver counterclockwise and remove shift drum.



1. Index lever
2. Shift drum

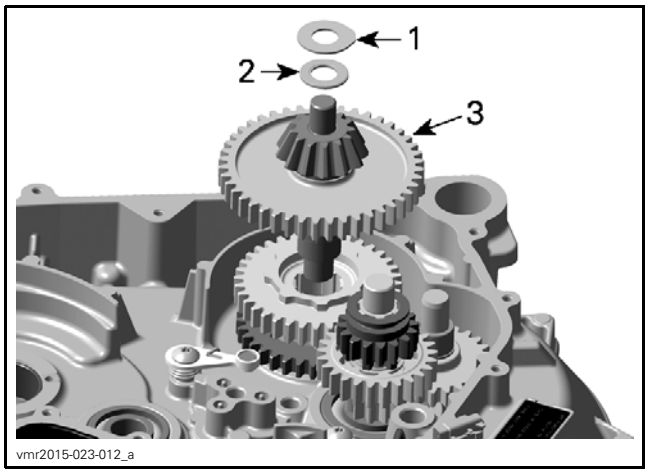
12. Remove shift fork.



1. Shift fork

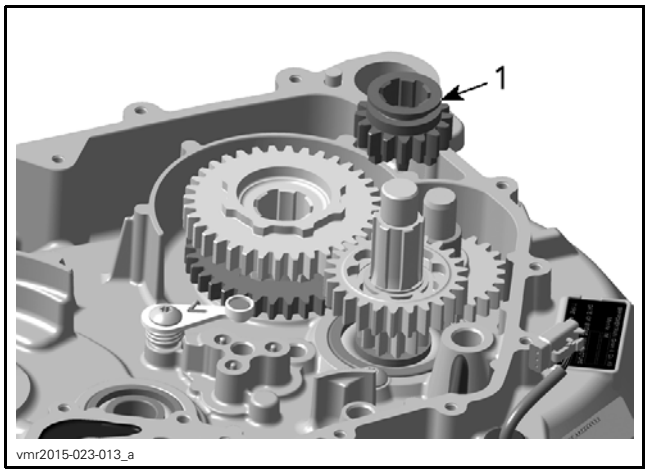
13. Remove:
- Thrust washer
- Axial needle bearing
- Bevel gear shaft with low range gear assembly.

.



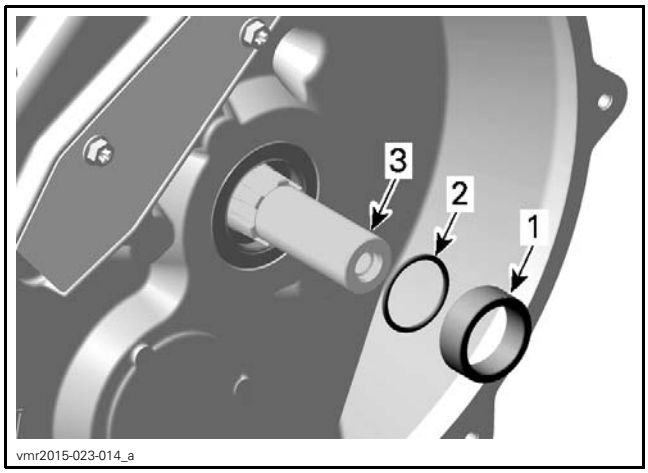
1. Thrust washer
2. Axial needle bearing
3. Bevel gear shaft with low range gear assembly

14. Remove main gear from counter shaft.



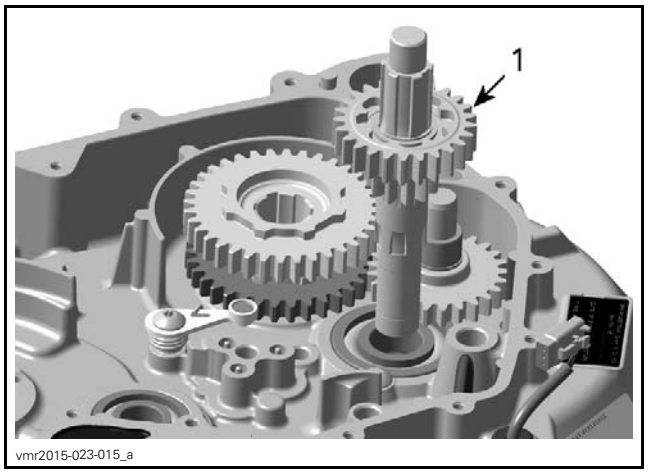
1. Main gear

15. Remove distance sleeve including O-ring from counter shaft on engine PTO side.



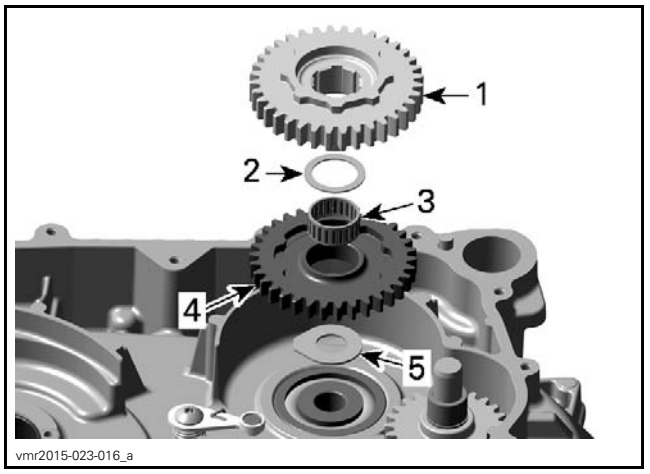
1. Distance sleeve
2. O-ring
3. Counter shaft

16. Remove counter shaft with high range gear assembly.



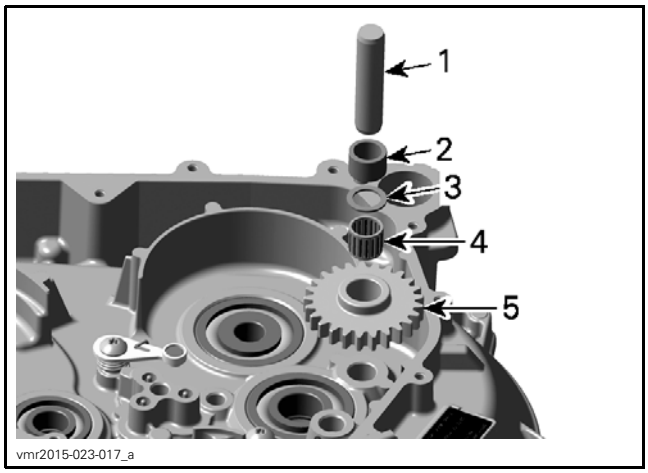
1. Counter shaft with high range gear assembly

17. Remove:
- Sliding gear
- Needle bearing
- Thrust washer
- Reverse gear
- Thrust washer.



1. Sliding gear
2. Needle bearing
3. Thrust washer
4. Reverse gear
5. Thrust washer

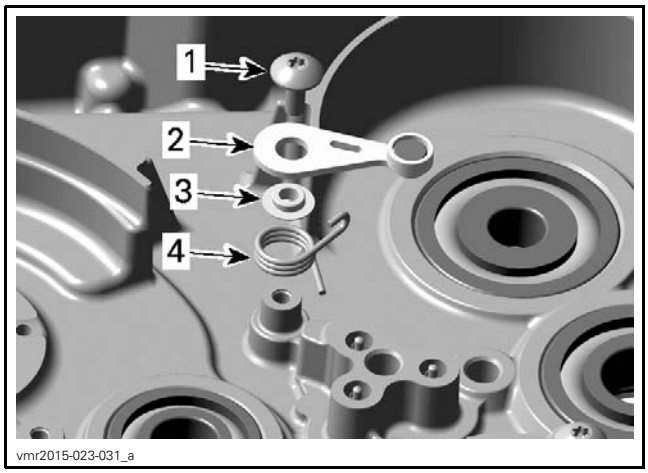
18. Remove:
- Intermediate gear shaft
- Distance sleeve
- Thrust washer
- Needle bearing
- Intermediate gear.



1. Intermediate gear shaft
2. Distance sleeve
3. Thrust washer
4. Needle bearing
5. Intermediate gear

Remove index lever only if necessary.

NOTE: Check index lever for visible damage and if it moves freely. Replace if necessary.



1. Screw
2. Index lever
3. Step ring
4. Index spring

Inspecting the Gearbox

Always verify for the following when inspecting gearbox components:

– Gear teeth damage
– Worn or scored bearing surfaces
– Bent, worn or scored shift fork
– Worn shift fork engagement pins
– Bent, worn or scored shift fork shaft
– Rounded engagement dogs and slots of gears
– Worn grooves on shift drum
– Worn gear engagement groove
– Worn splines on shafts and gears.

Bearings

Check all ball bearings and needle bearings turn freely and smoothly. If rough or any excessive play is detected, replace bearing.

Gears

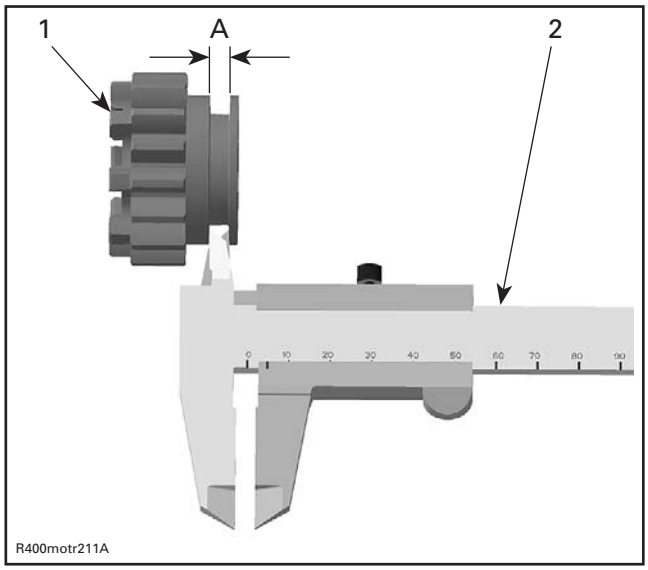
Check tooth flanks of gears.

Replace gears only together with the corresponding meshing gears.

NOTE: Always replace circlips and use special pliers to install them.

Measure the engagement groove width of sliding gears.

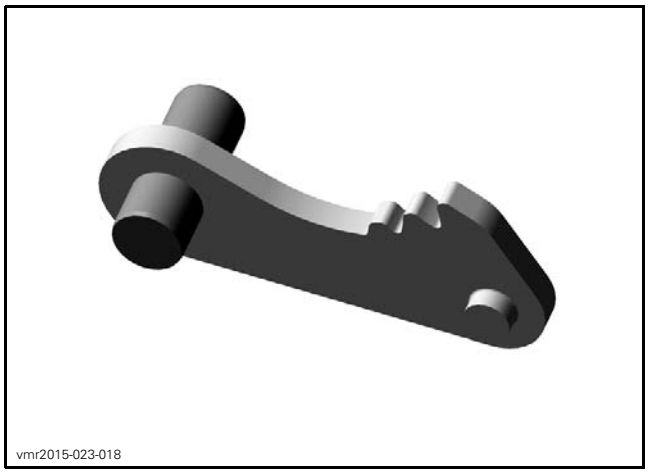
ENGAGEMENT GROOVE WIDTH	
NEW	5.00 mm to 5.10 mm (.197 in to .201 in)
SERVICE LIMIT	5.20 mm (.205 in)



TYPICAL
1. Main gear
2. Caliper
A. Engagement groove width

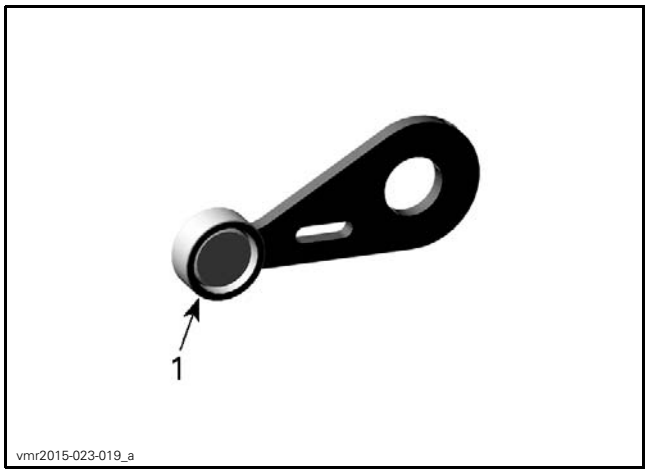
Levers

Parking lever for cracks or other damages.



PARKING LEVER

Roller of index lever must have free movement.



INDEX LEVER
1. Roller

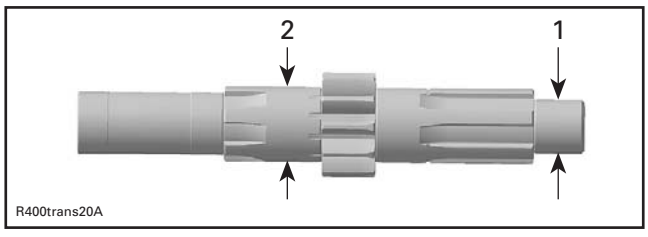
Shafts

Check taper grooves and annular grooves of shafts. Annular grooves must have sharp edges.

Check shift shaft for worn splines and gears.

Check counter shaft for wear.

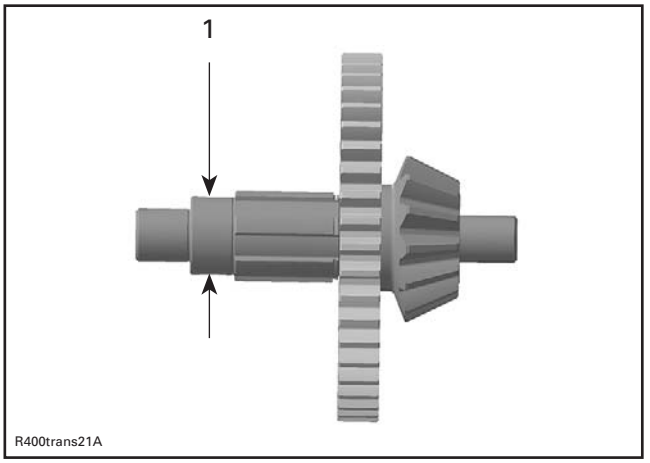
COUNTER SHAFT SERVICE LIMIT	
MAG side	17.990 mm (.708 in)
PTO side	24.950 mm (.982 in)



1. Mag side
2. PTO side

Check bevel gear shaft.

BEVEL GEAR SHAFT SERVICE LIMIT	
PTO side	24.990 mm (.984 in)



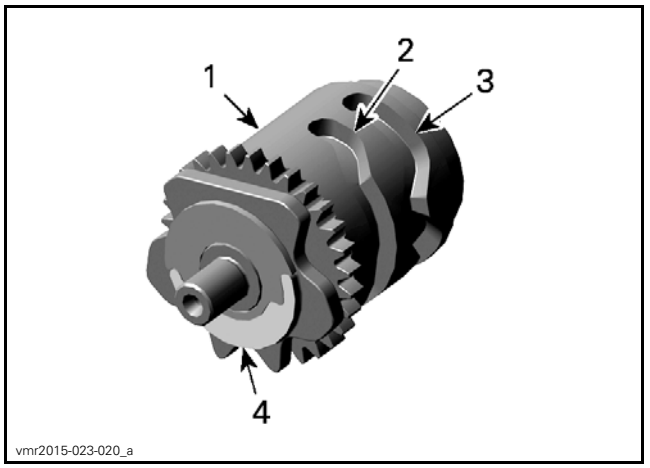
1. PTO side

Shift Drum

Check tracks of shift drum for scoring or heavy wear like rounded engagement slots.

Check index washer on shift drum for scoring or visible damages.

Replace isolating washer if there are signs of wear or visible damages.



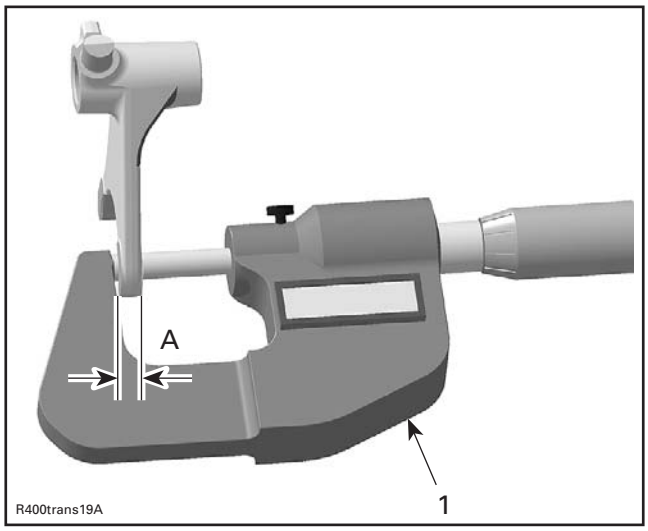
1. Shift drum
2. Track for the low/reverse gear shift fork
3. Track for the high gear shift fork
4. Isolating washer

Shift Forks

Check both shift forks for visible damage, wear or bent shift fork claws.

Measure the shift fork claw thickness.

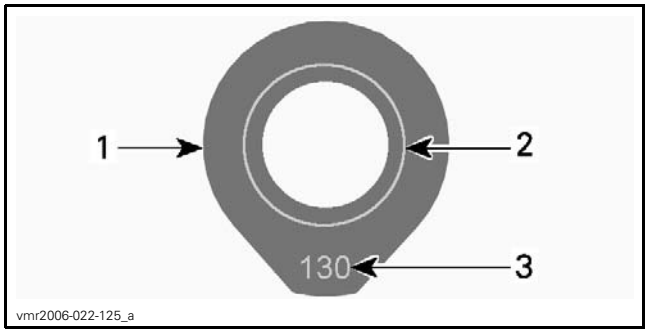
SHIFT FORK CLAW THICKNESS	
NEW	4.800 mm to 4.860 mm (.189 in to .191 in)
SERVICE LIMIT	4.750 mm (.187 in)



1. Micrometer
A. Shift fork claw thickness

Thrust Washers

Check thrust washers for wear. Always replace thrust washer by a new one with the same thickness, when reassembling the gearbox with existing output shaft and bevel gear.



1. Thrust washer for adjusting the bevel gear axial clearance on PTO side
2. Area where wear signs appear
3. Adjustment thickness of the washer

Adjusting the Gearbox

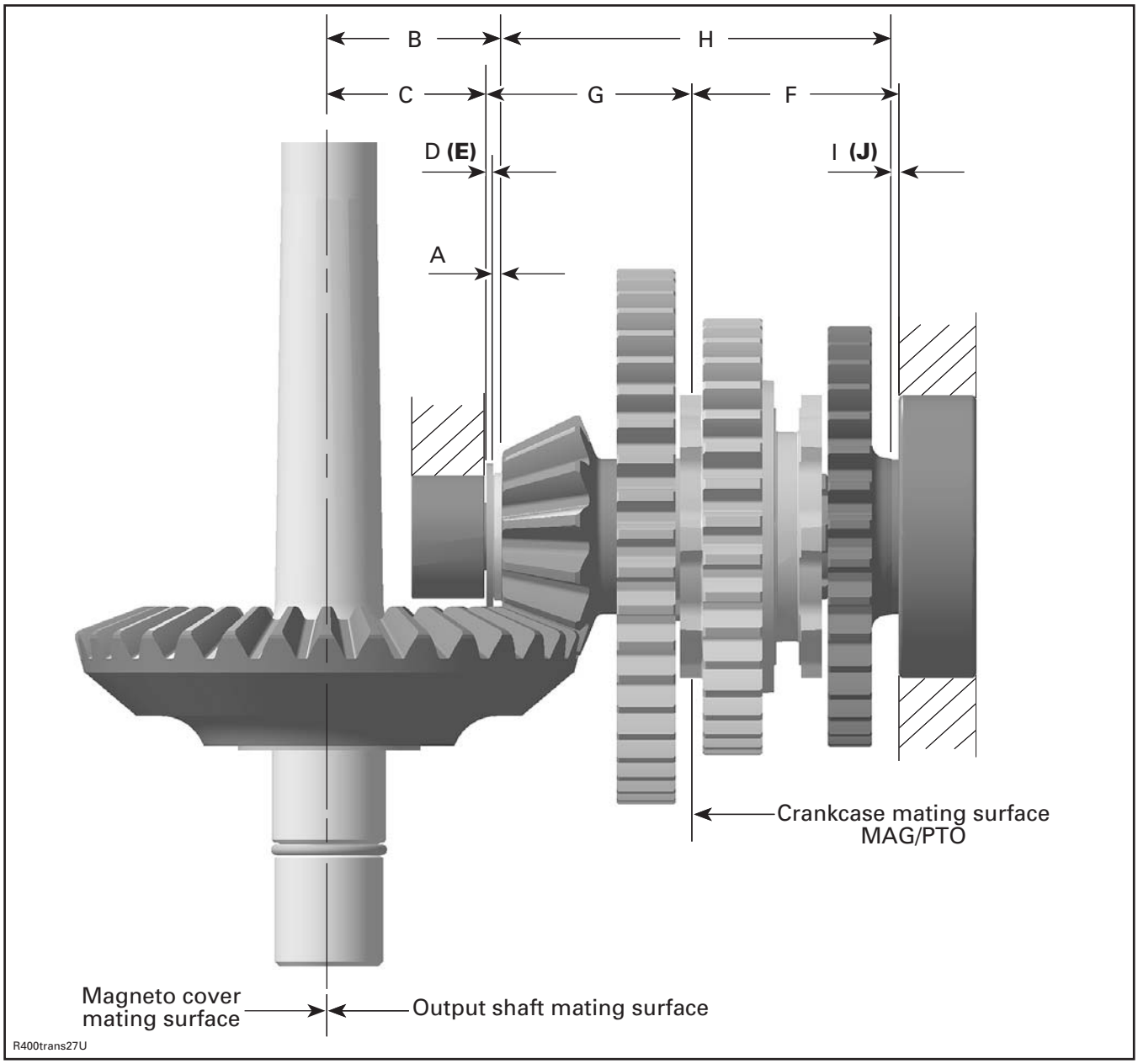
NOTE: Only necessary if the bevel gear backlash and the axial clearance is out of specification or if parts are changed (output shaft, bevel gear or crankcase).

The bevel gear adjustment includes:
– Bevel gear backlash on MAG side crankcase
– Bevel gear axial clearance on PTO side crankcase.

The bevel gear backlash is adjusted by finding the proper thrust washer thickness E as per following illustration.

The bevel gear axial clearance is adjusted by finding the proper thrust washer thickness J as per following illustration.

NOTE: Clean mating surface of crankcase before taking measurements. Refer to *BOTTOM END* subsection.



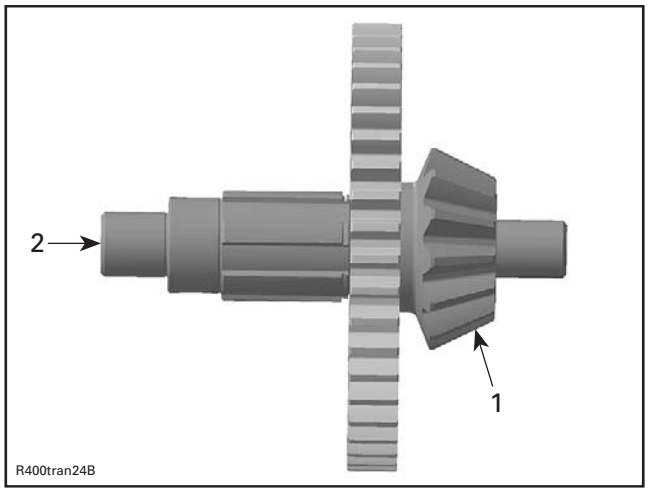
Bevel Gear Backlash Procedure (MAG Side Crankcase)

Use the following course of calculation to determine the theoretical thrust washer thickness D:

D = B - C - A

B = Distance between the thrust surface of bevel gear and the theoretical center of its taper. This is defined by manufacturer and written on the bevel gear shaft.

NOTE: Bevel gear reference number is a value between - 10 and + 10.



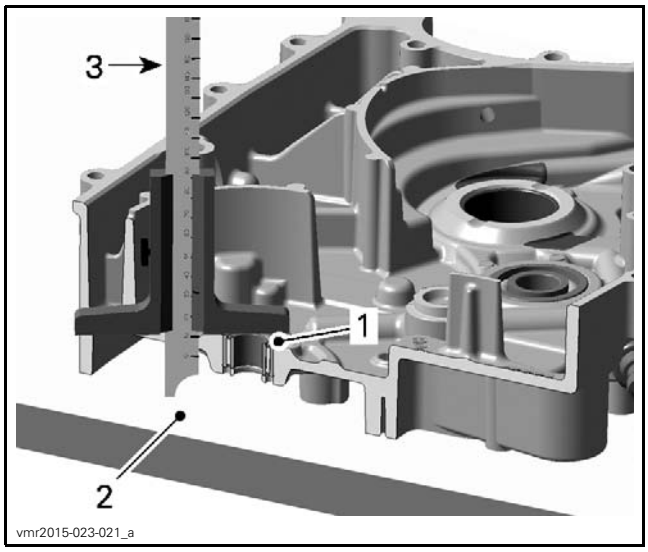
1. Bevel gear
2. Bevel gear reference number location

Use following course of calculation to find out value B.

$$B = \left(\frac{\text{bevel gear reference number}}{100}\right) + 37.8$$

C = Distance between the washer thrust surface in the MAG side and the mating surface of crankcase magneto cover.

NOTE: For a better understanding following illustration is made as a cutaway.



MEASUREMENT C
1. Washer thrust surface
2. Mating surface of crankcase to the magneto cover
3. Depth gauge

A = 2 mm (.0787 in) nominal thickness of axial needle bearing.

When all the measurements are taken, calculate the theoretical thickness D of thrust washer using the formula (D = B - C - A).

Take the obtained theoretical thrust washer thickness D and choose the proper thrust washer number E according to the following table.

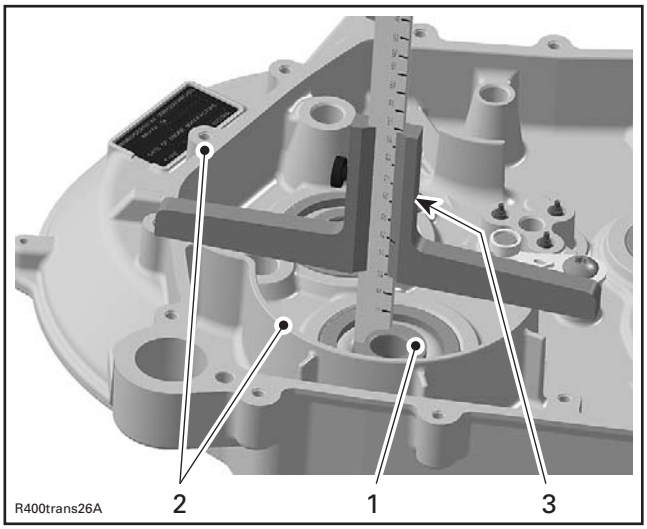
THEORETICAL THRUST WASHER THICKNESS D	THRUST WASHER NUMBER E
1.20 mm to 1.29 mm (.0472 in to .0508 in)	120
1.30 mm to 1.39 mm (.0512 in to .0547 in)	130
1.40 mm to 1.49 mm (.0551 in to .0587 in)	140
1.50 mm to 1.59 mm (.0591 in to .0626 in)	150
1.60 mm to 1.69 mm (.063 in to .0665 in)	160
1.70 mm to 1.79 mm (.0669 in to .0705 in)	170
1.80 mm to 1.89 mm (.0709 in to .0744 in)	180

Bevel Gear Axial Clearance Procedure (PTO Side Crankcase)

Use the following course of calculation to determine the theoretical thrust washer thickness I:

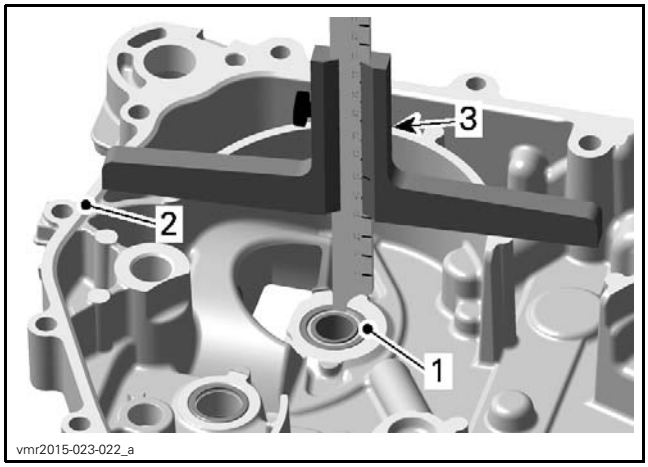
I = F + G - H - A - E

F = Distance between mating surface (crankcase PTO) to ball bearing inner race.



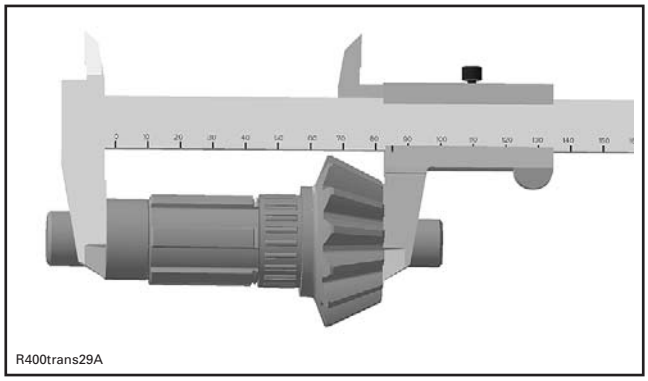
1. Ball bearing inner race
2. Mating surface of crankcase PTO
3. Depth gauge

G = Distance between mating surface of crankcase MAG and outer race of needle bearing.



1. *Needle bearing inner race*
2. *Mating surface of crankcase MAG*
3. *Depth gauge*

H = Distance between thrust surfaces of bevel gear shaft.



A = 2.00 mm (.0787 in) nominal thickness of needle bearing.

E = The thrust washer number nominal value as found in the *BEVEL GEAR BACKLASH PROCEDURE*. For example, thrust washer number 170 represents a value of 1.70 mm (.0669 in).

When all the measurements are taken, calculate the theoretical thrust washer thickness I using the formula (I = F + G - H - A - E).

Take the obtained theoretical thrust washer thickness I and choose the proper thrust washer number J according to the following table.

THEORETICAL THRUST WASHER THICKNESS I	THRUST WASHER NUMBER J
1.22 mm to 1.31 mm (.048 in to .0516 in)	120
1.32 mm to 1.41 mm (.052 in to .0555 in)	130
1.42 mm to 1.51 mm (.0559 in to .0594 in)	140
1.52 mm to 1.61 mm (.0598 in to .0634 in)	150
1.62 mm to 1.71 mm (.0638 in to .0673 in)	160
1.72 mm to 1.81 mm (.0677 in to .0713 in)	170
1.82 mm to 1.91 mm (.0717 in to .0752 in)	180

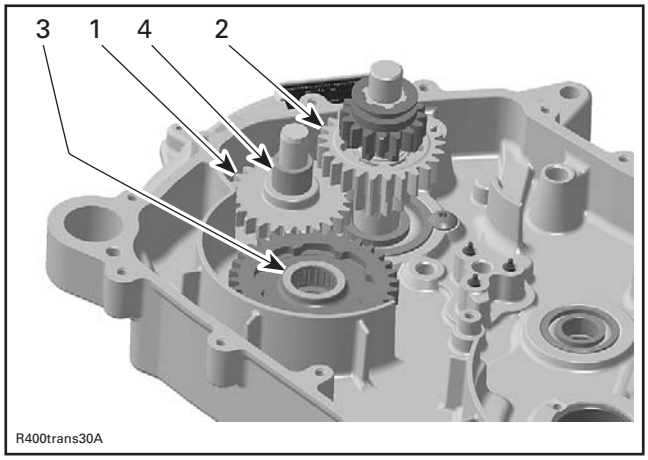
NOTE: Bevel gear axial clearance of 0.02 mm to 0.11 mm (.0008 in to .0043 in) is included in the above table.

Assembling the Gearbox

Reverse the disassembly procedure. However, pay attention to the following.

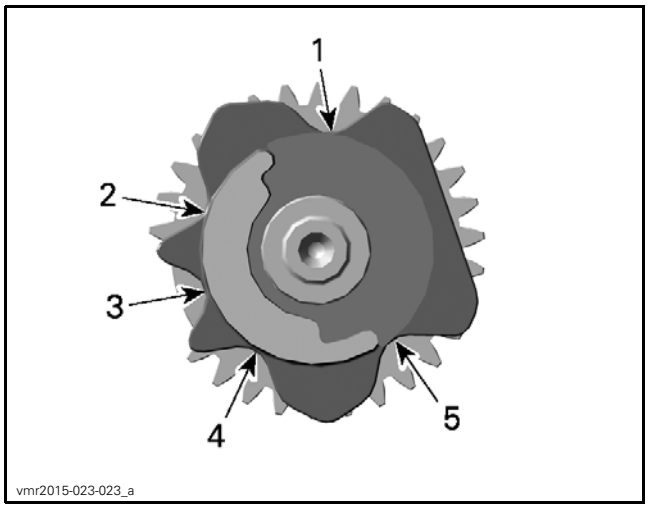
1. Install:
   - Intermediate gear shaft , needle bearing, intermediate gear, thrust washer and distance sleeve
   - Thrust washer, needle bearing, reverse gear, thrust washer and sliding gear
   - Counter shaft with high range gear assembly.
2. Main gear.
3. Bevel gear shaft with low range gear assembly.

NOTE: If a new bevel gear is used, it is necessary to perform the bevel gear adjustments, refer to *GEARBOX ADJUSTMENT* in this subsection. If the existing bevel gear is used, it is mandatory to use new thrust washers with the same thickness and also a new axial needle bearing.



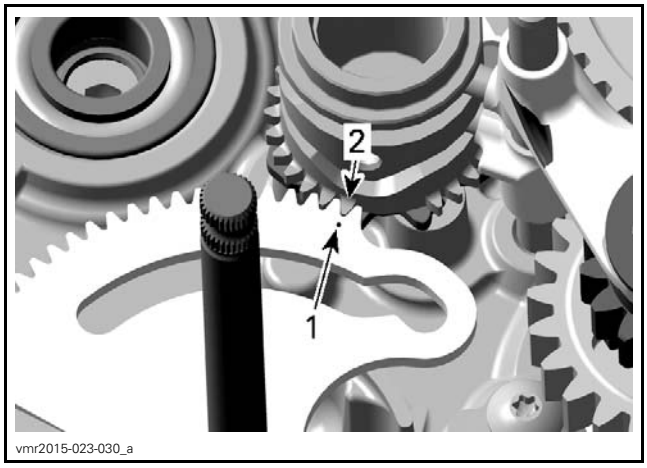
1. Intermediate gear
2. Counter shaft
3. Thrust washer after sliding gear on bevel gear
4. Thrust washer between distance sleeve and reverse gear

4. Install shift forks.
5. Put shift forks in place and afterward insert pin with the chamfer on top for a better installation of crankcase MAG side.
6. Insert a flat screwdriver in the slot of index lever. Turn screwdriver counterclockwise and install shift drum on park position as per the following illustration.



1. Parking stop location
2. Reverse stop location
3. Neutral stop location
4. High gear stop location
5. Low gear stop location

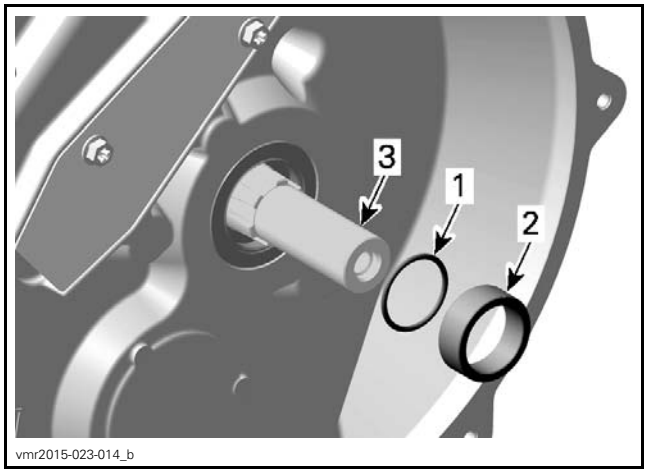
7. Insert shift shaft with mark in line to first tooth on shift drum.



1. Mark on shift shaft
2. First tooth on shift drum

8. Install parking lever.
9. Run all gears as a final function check.
10. Install balancer shaft then close crankcase housings. Refer to *BOTTOM END* subsection.
11. Install O-ring including distance sleeve on counter shaft end PTO side.

NOTICE **Place O-ring including distance sleeve right away. Chamfered bore of distance sleeve has to face the engine.**



1. O-ring
2. Distance sleeve
3. Main shaft end PTO side

12. Install output shaft and measure axial clearance, refer to *OUTPUT SHAFT* in this subsection.
13. Install all other removed parts.

GEARBOX POSITION INDICATOR SWITCHES

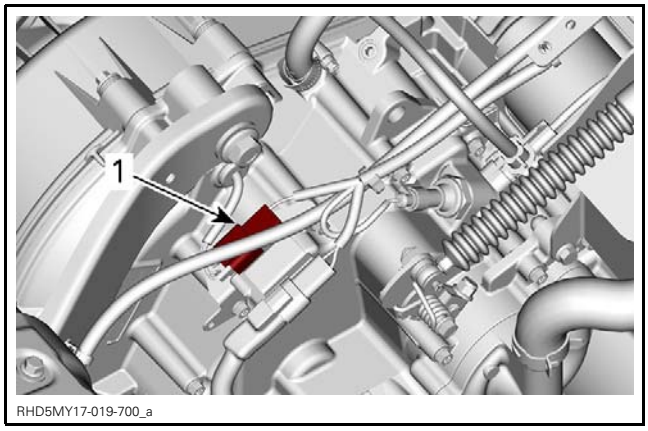
NOTE: First ensure shifter link rod is properly adjusted, Refer to *SHIFTER* subsection.

The multifunction gauge uses one switch state (open or closed) for each P, N and R switch to determine the gearbox position.

Gearbox Position Indicator Switch Access

The switches are located in the crankcase, behind the CVT cover.

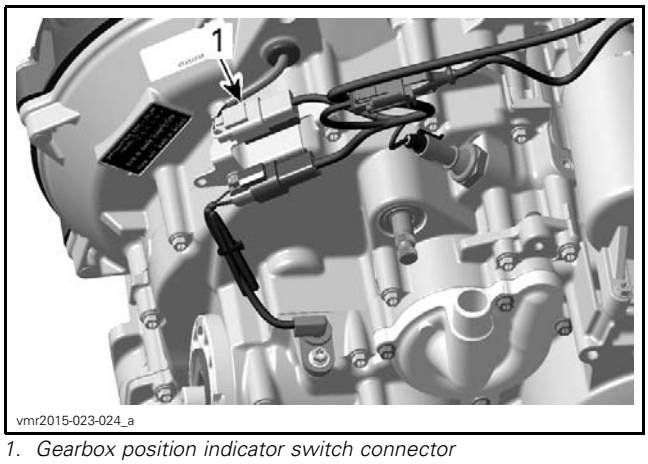
A common connector for the gearbox position indicator switches is easily accessible by tilting the cargo box.



1. Gearbox position indicator switch connector

Testing the Gearbox Position Indicator Switch Continuity

1. Tilt the cargo box.
2. Disconnect gearbox position indicator switch connector.



1. Gearbox position indicator switch connector

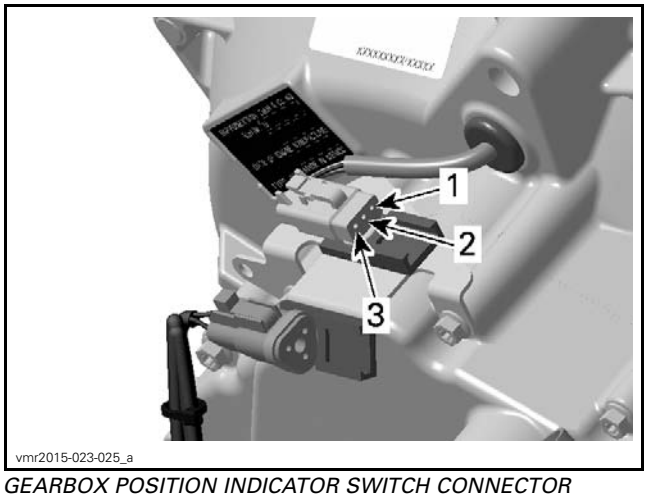
REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	

3. Using a multimeter, measure resistance of the position switch while selecting the gearbox to each position. Compare results with following table.

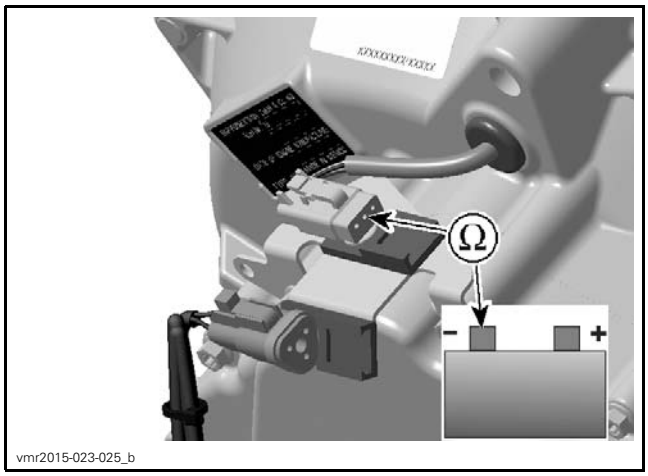
SHIFTER POSITION	CORRESPONDING SWITCH		
	YELLOW/ GREEN	BLUE	BROWN
	Position 3	Position 1	Position 2
L		X	X
H			X
N	X		X
R	X		
P	X	X	

An "X" indicates switch is making ground contact, thus there should be continuity (R is close to 0 Ohms).

A blank space indicates switch is not making contact, there should be no continuity (R = infinite).



GEARBOX POSITION INDICATOR SWITCH CONNECTOR
1. Blue wire
2. Brown wire
3. Yellow/green wire



vmr2015-023-025_b

If the indicator switch is good, check the vehicle harness and/or indicator lights.

Removing the Gearbox Position Indicator Switch

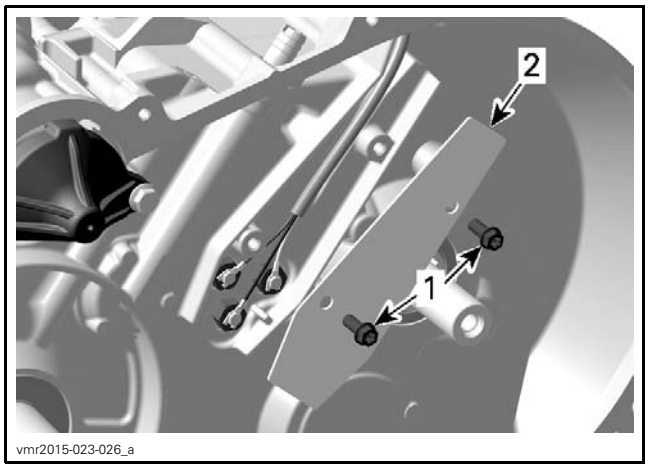
NOTE: Engine removal is not necessary.

Refer to *CONTINUOUSLY VARIABLE TRANSMISSION (CVT)* subsection and remove:

– CVT cover
– Driven pulley.

Remove:

– Retaining screws
– Switch protection plate.

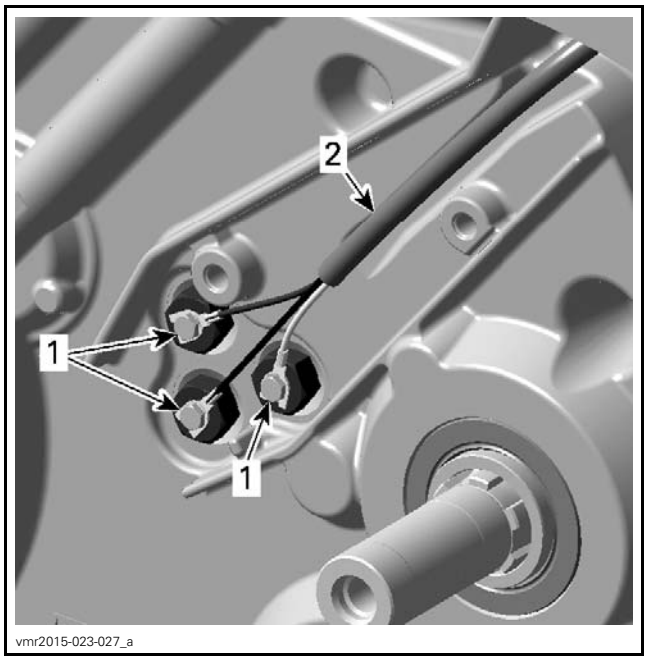


vmr2015-023-026_a

1. Retaining screws
2. Switch protection plate

NOTE: Clean area from dirt and belt dust before removing gearbox position indicator switch(es). Take note of corresponding switch position and wire color.

Remove screw retaining terminals of intermediate wiring harness to gearbox position indicator switch.



vmr2015-023-027_a

1. Retaining screws
2. Intermediate wiring harness

Unscrew gearbox position indicator switch.

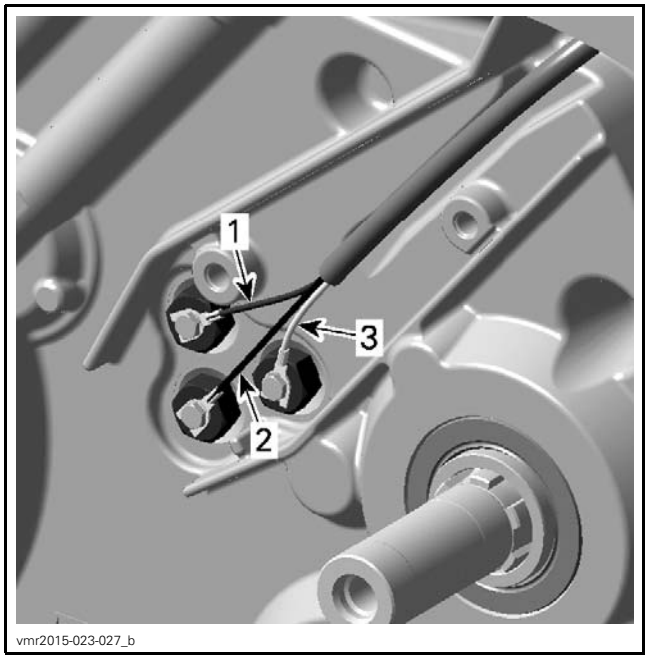
Installing the Gearbox Position Indicator Switch

1. Reverse the removal procedure. However, pay attention to the following.
2. Take care to avoid damaging threads in switch bores during installation.

TIGHTENING TORQUE	
Service product	LOCTITE 5910 (P/N 293 800 081)
Gearbox position Indicator switch	3 N•m ± 0.4 N•m (27 lbf•**in** ± 4 lbf•**in**)

NOTICE **Do not apply thread locker on switch plunger as it will lead to switch malfunction.**

3. If all terminals were removed, put them back in the proper location as noted prior to removal.



1. Gearbox position switch position 1 — BLUE wire
2. Gearbox position switch position 2 — BROWN wire
3. Gearbox position switch position 3 — GREEN/YELLOW wire

4. Install protection plate and tighten screws to specification.

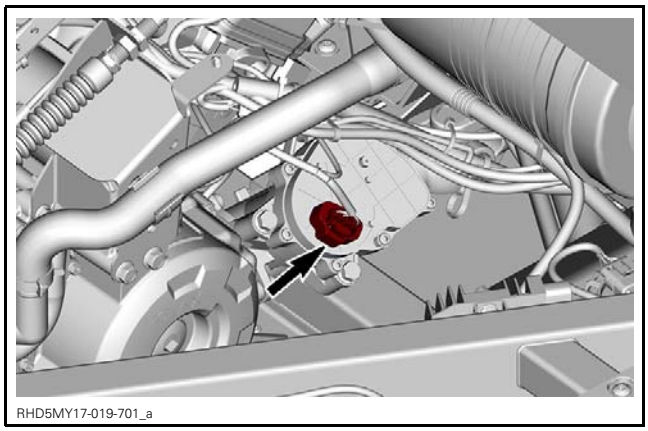
TIGHTENING TORQUE	
Protection plate retaining screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

4WD SWITCH

Testing the 4WD Switch

Tilt cargo box.

Unplug actuator connector from coupling unit.



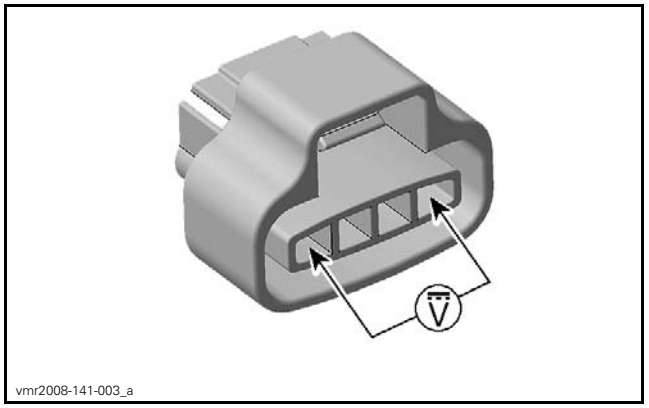
Using a multimeter, check if the 4WD switch works properly.

Turn ignition key ON.

Select 2WD position.

Install the RED probe to the WHITE wire connector and the BLACK probe to the WHITE/BLACK wire connector.

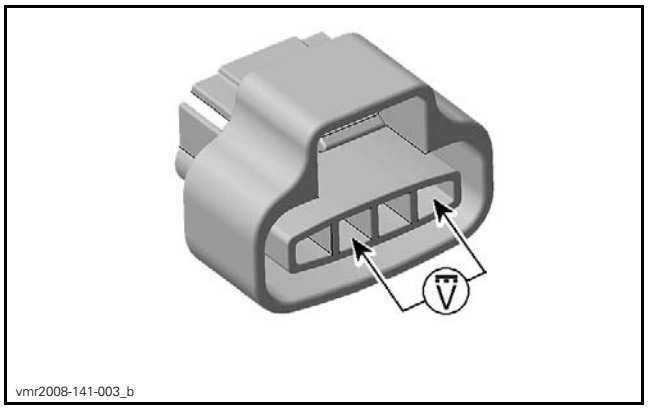
The obtained value should be 12 Vdc.



Select 4WD position.

Install the RED probe to the WHITE/BLUE wire connector and the BLACK probe to the WHITE wire connector.

The obtained value should be 12 Vdc.

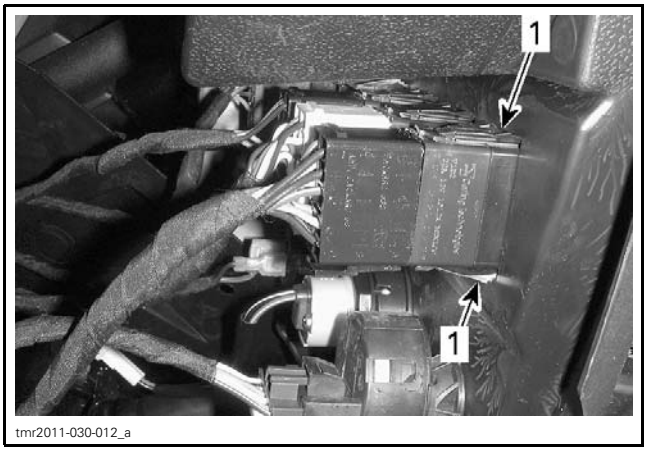


If voltage is not as specified, check wires and connectors. If good, replace the 4WD switch.

Replacing the 4WD Switch

To replace the 4WD switch, reach under the dashboard and release retaining clips, then push switch out of the console.

Disconnect electrical connector.



tmr2011-030-012_a

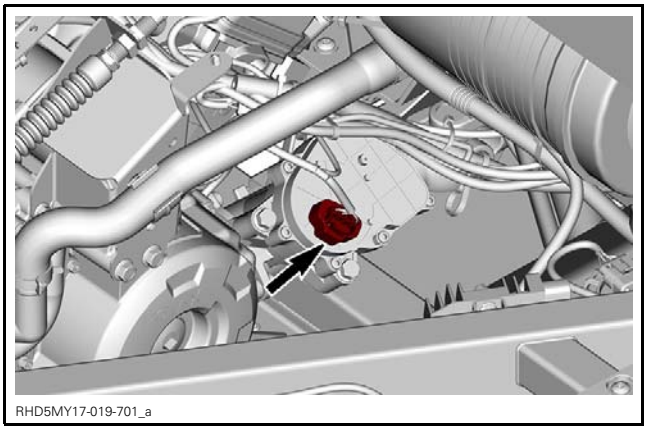
1. Retaining clips

4WD ACTUATOR

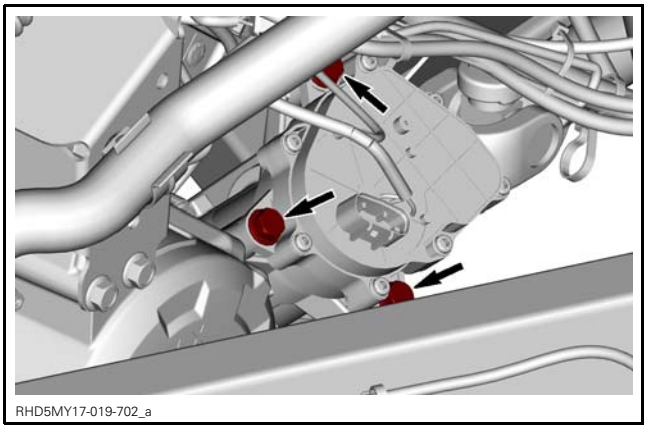
Removing the 4WD Actuator

Tilt cargo box.

Unplug actuator connector.


RHD5MY17-019-701_a

Remove actuator screws.

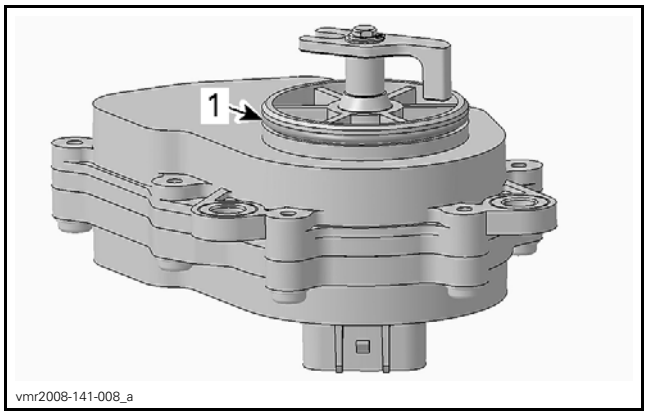

RHD5MY17-019-702_a

Pull the actuator out of the housing.

Installing the 4WD Actuator

Lubricate actuator O-ring.

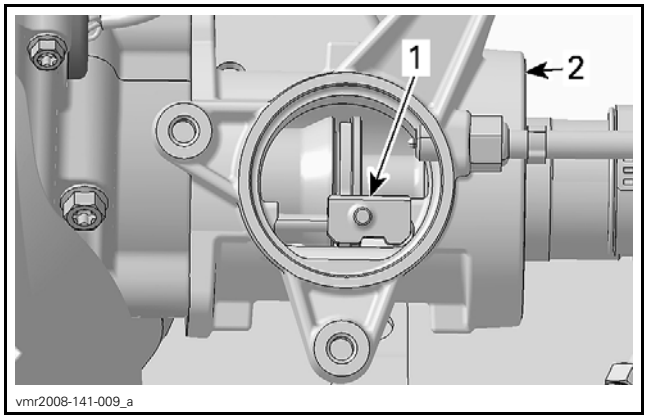
SERVICE PRODUCT	
Actuator O-ring	Engine oil



vmr2008-141-008_a

1. Actuator O-ring

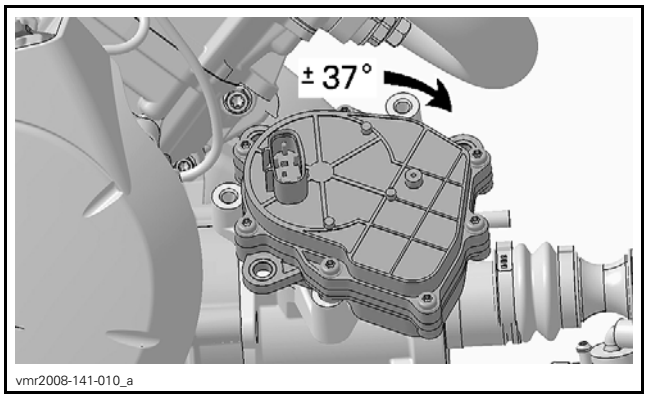
Verify if sliding sleeve is in 2WD position. The sliding sleeve should be pointed toward the front of vehicle.



vmr2008-141-009_a

1. Sliding sleeve
2. Coupling unit housing

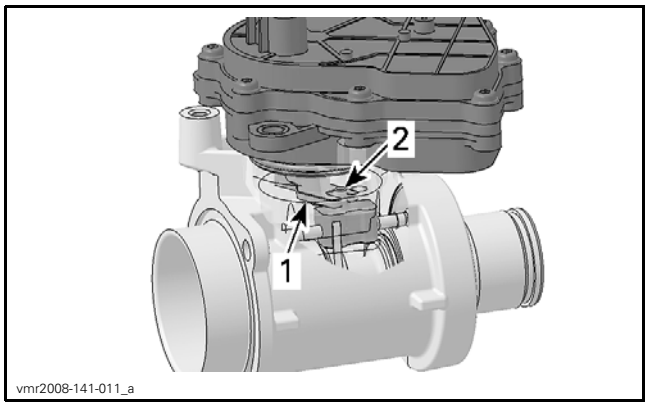
Turn the actuator 37 degrees clockwise from the mounting position.



vmr2008-141-010_a

FROM RH SIDE — ACTUATOR POSITIONS AT 37 DEGREES

Align the actuator fork with the dog on sliding sleeve then push the actuator in the housing.



1. *Actuator fork*
2. *Sliding sleeve dog*

Rotate the actuator counterclockwise until it orients itself to mounting position.

⚠ CAUTION Do not cut or break the actuator O-ring.

Tighten actuator screws to specification.

TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Actuator screws	20 N•m ± 2 N•m (15 lbf•ft ± 1 lbf•ft)

Connect actuator.

Lift the front of vehicle until front wheels turn freely.

Try to turn the front propeller shaft. The shaft should turn easily.

Place ignition switch to ON position and select the 4WD position.

The front propeller shaft should not turn (the PARK position must be selected).

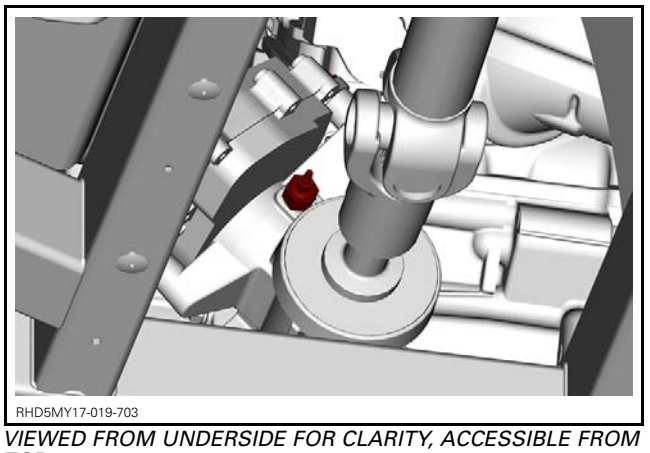
If the front propeller shaft turns, the actuator is not installed correctly. Remove actuator and reinstall it.

4WD INDICATOR SWITCH

Removing the 4WD Indicator Switch

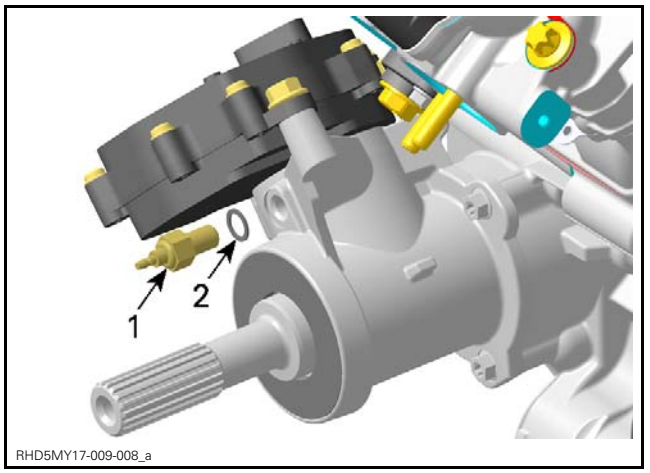
Tilt cargo box.

Unplug the 4WD indicator switch connector.



VIEWED FROM UNDERSIDE FOR CLARITY, ACCESSIBLE FROM TOP

Remove:
- 4WD indicator switch
- Sealing washer (discard it)

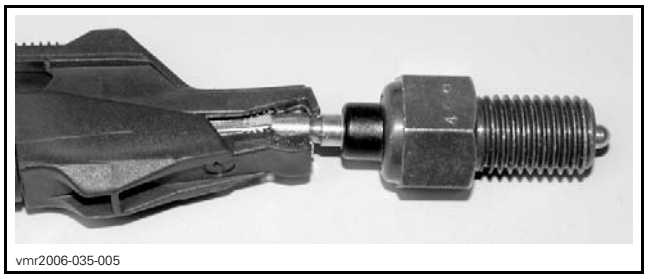


1. *4WD indicator switch*
2. *Sealing washer (discard it)*

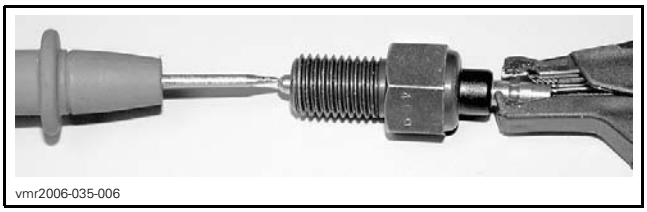
Testing the 4WD Indicator Switch

Using a multimeter, do the following to check the switch.

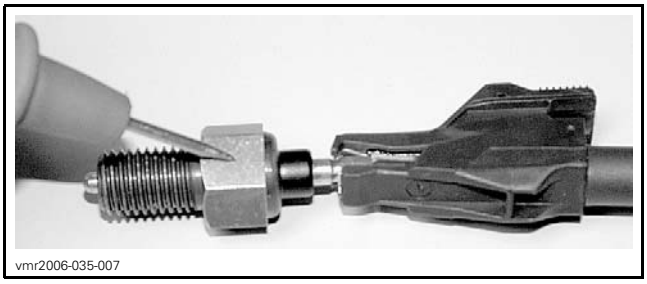
Using an alligator clip, place the BLACK probe on the external pin.



Touch the contact pin with the RED probe. The multimeter should indicate ± 1 Ω.


vmr2006-035-006

Apply the RED probe on switch body. The measure should be OL.


vmr2006-035-007

If switch is out of specifications, replace it.

Installing the 4WD Indicator Switch

The installation is the reverse of the removal procedure. However, pay attention to the following details.

Install a **NEW** sealing washer and tighten 4WD indicator switch to specification.

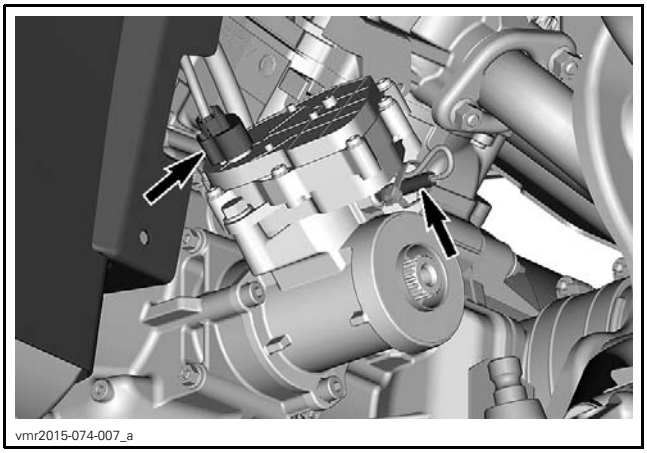
TIGHTENING TORQUE	
4WD indicator switch	20 N•m ± 1.5 N•m (15 lbf•ft ± 1 lbf•ft)

4X4 COUPLING UNIT

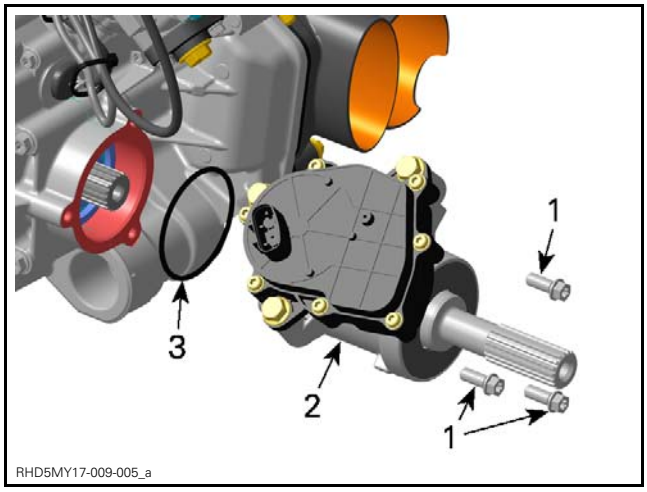
Removing the 4x4 Coupling Unit

Remove front propeller shaft. Refer to *FRONT DRIVE* subsection.

Unplug:
– Coupling unit connector
– 4WD switch connector.


vmr2015-074-007_a

Remove:
– Retaining screws
– 4x4 coupling unit
– O-ring.

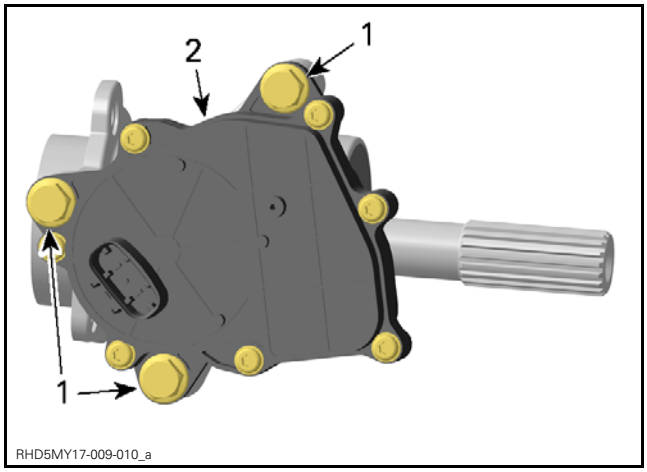


RHD5MY17-009-005_a

1. *Retaining screws*
2. *4x4 coupling unit*
3. *O-ring*

Disassembling the 4x4 Coupling Unit

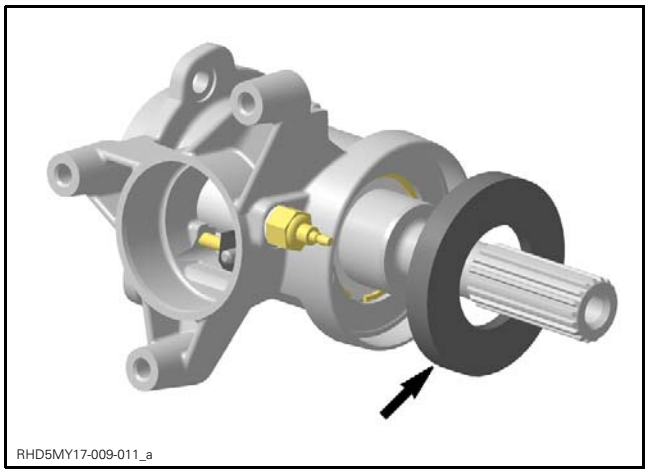
Remove:
– Retaining screws
– Actuator.



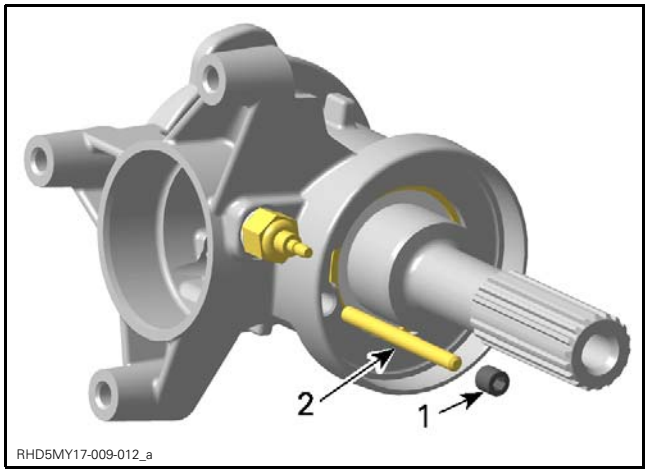
RHD5MY17-009-010_a

1. *Retaining screws*
2. *Actuator*

Remove and discard the oil seal.

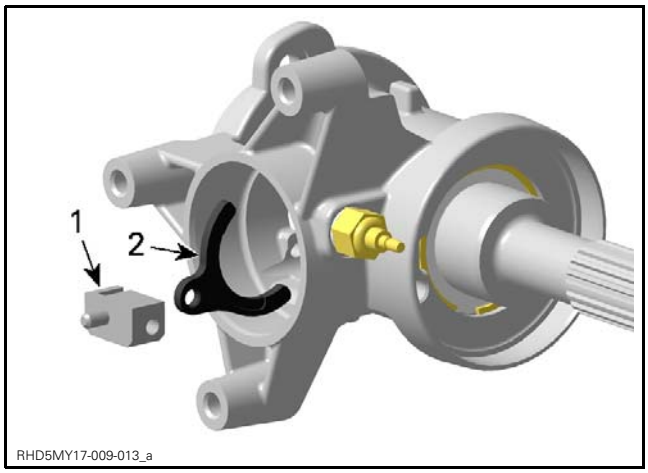


Remove:
- Allen set screw
- Sliding sleeve pin.



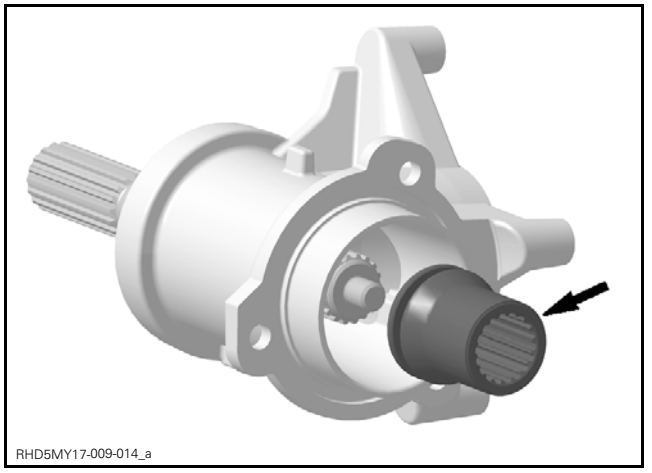
1. Allen set screw
2. Sliding sleeve pin

Remove:
- Sliding sleeve
- Shifter fork.

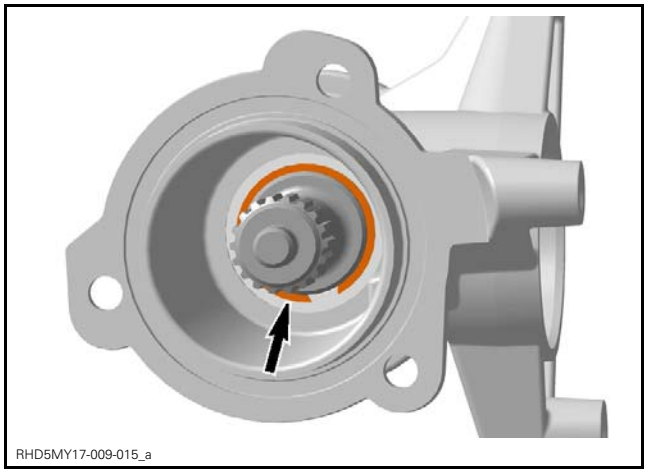


1. Sliding sleeve
2. Shifter fork

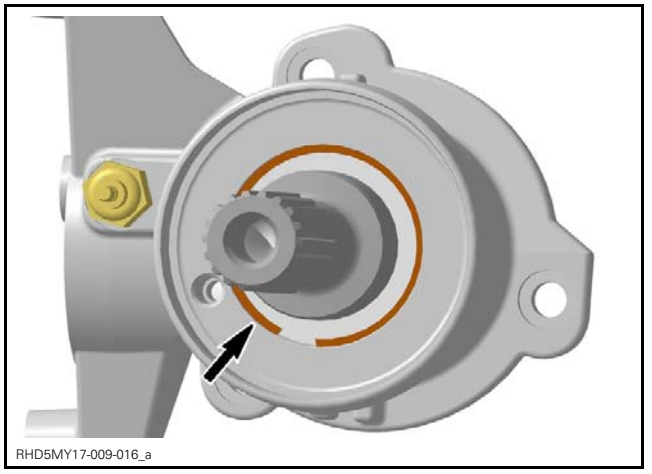
Pull out the coupling sleeve.



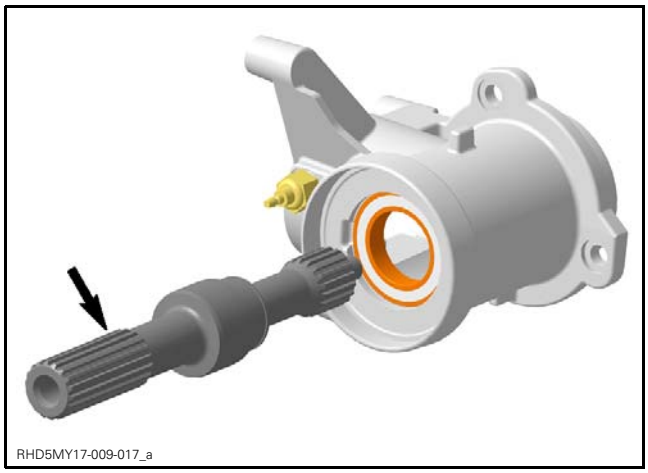
Remove the inner circlip.



Remove the outer circlip.



Remove coupling unit shaft.



Remove the ball bearing.

NOTE: Remove the ball bearing only if it does not turn freely and smoothly.

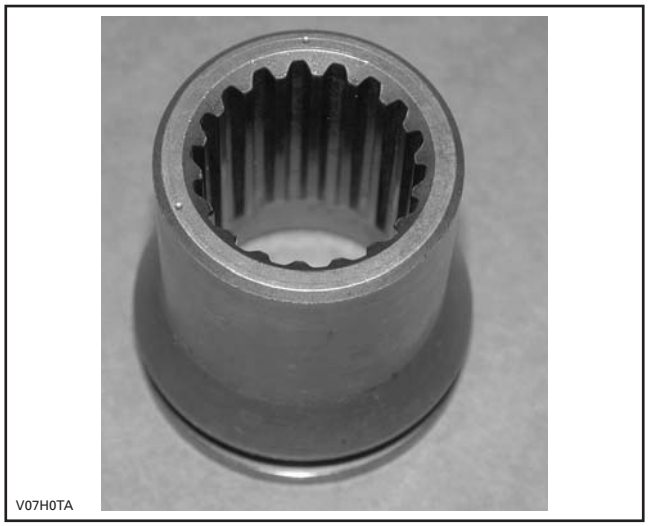
REQUIRED TOOL
Blind hole bearing puller

Inspecting the 4x4 Coupling Unit

Check disconnect unit housing and actuator for cracks or other damages. Replace defective part(s) if necessary.

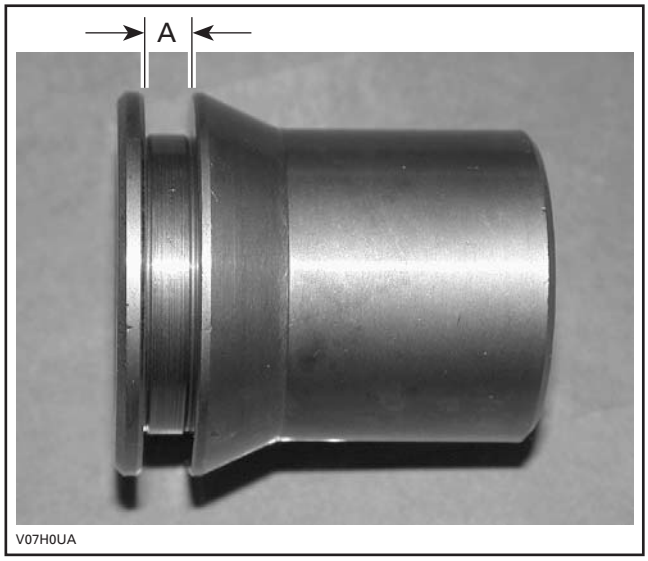
Check if the actuator O-ring and the coupling unit housing O-ring are brittle, hard or damaged.

Check splines of coupling sleeve for wear or other damages. Replace if splines are damaged.



Measure the coupling sleeve groove. If the width of groove is out of specification replace the coupling sleeve.

COUPLING SLEEVE GROOVE WIDTH	
Service limit	5.00 mm (.197 in)



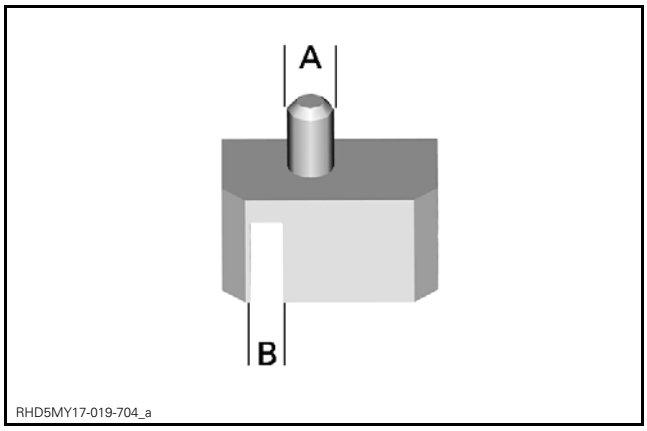
A. Groove width

Check sliding sleeve dog for bend and measure it.

SLIDING SLEEVE DOG THICKNESS	
Service limit	4.80 mm (.189 in)

Measure the sliding sleeve groove.

SLIDING SLEEVE GROOVE WIDTH	
Service limit	3.60 mm (.142 in)

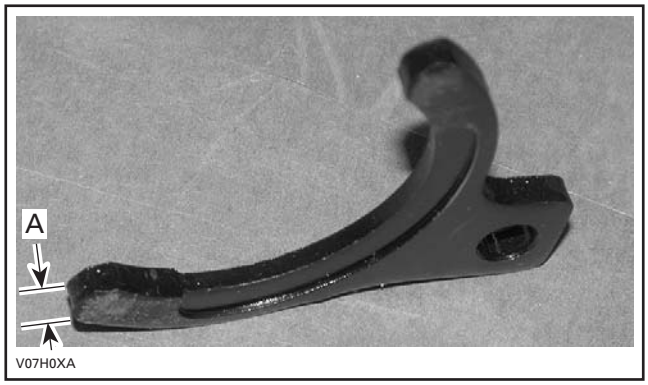


A. Sliding sleeve dog thickness
B. Sliding sleeve groove width

Check shifter fork for visible damage, wear or bent claws.

Measure the shifter fork claw thicknesses.

SHIFTER FORK CLAWS THICKNESS	
Service limit	2.93 mm (.115 in)

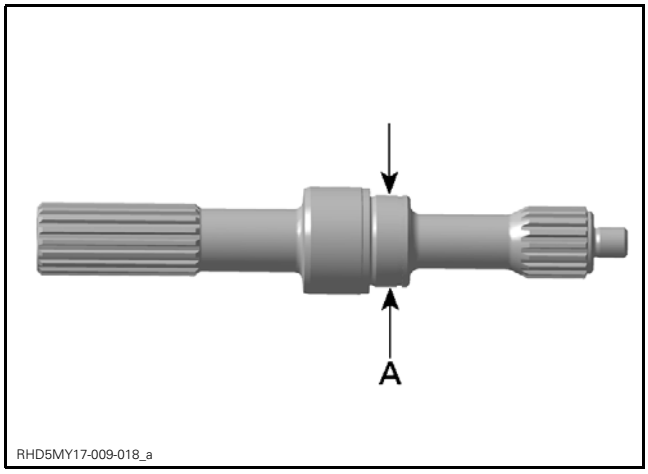


A. Shifter fork claw thickness

Check inner and outer shaft splines for wear or other damages. Replace shaft if necessary.

Measure the coupling unit shaft for wear limit.

COUPLING UNIT SHAFT	
Service limit	29.995 mm (1.181 in)



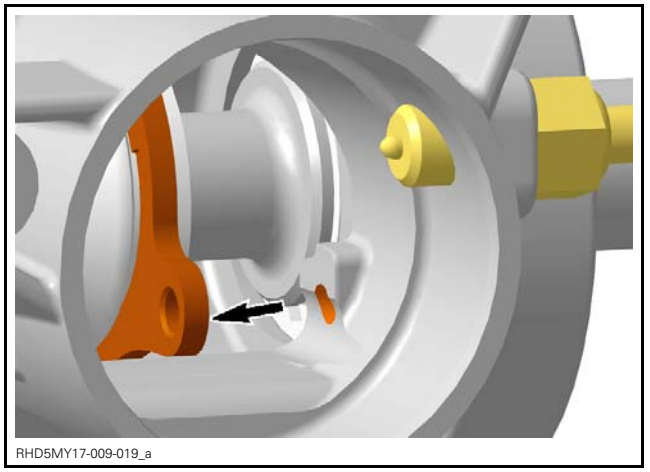
A. Shaft diameter in the area of bearing

Assembling the 4x4 Coupling Unit

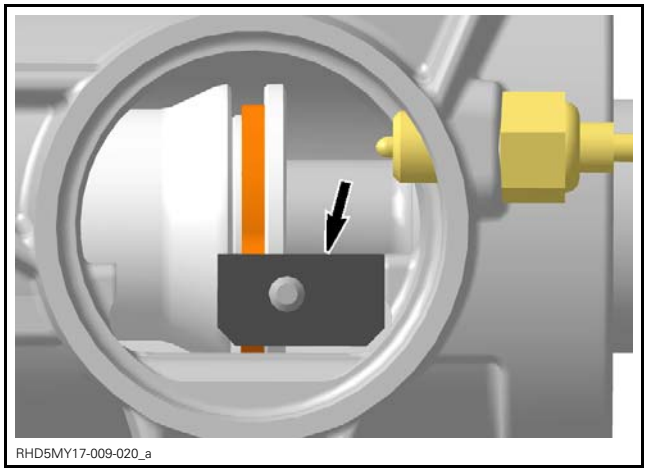
The installation is the reverse of removal procedure. However, pay attention to the following:

Apply engine oil on moving parts.

Install the shifter fork.



Install sliding sleeve.

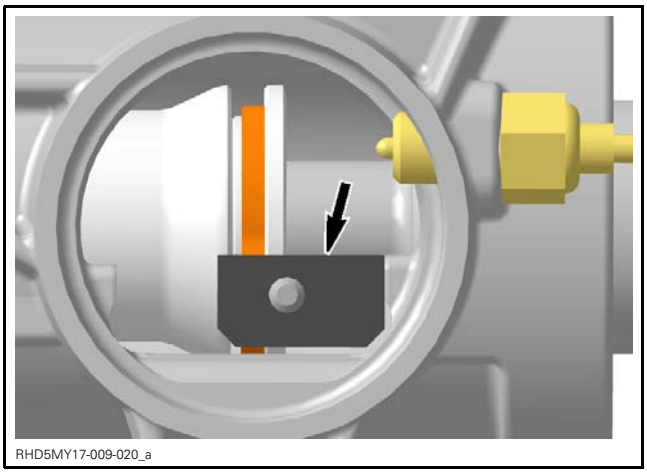


Insert pin and tighten Allen set screw to specification.

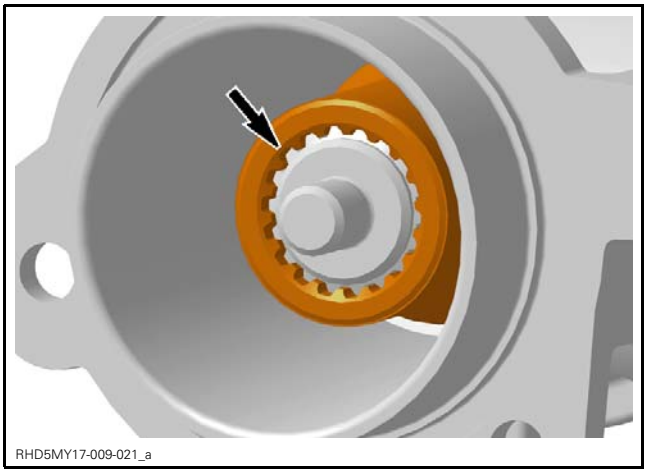
TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Allen set screw	7 N•m ± 1 N•m (62 lbf•**in** ± 9 lbf•**in**)

Check if the shifter fork and the coupling sleeve are installed properly.

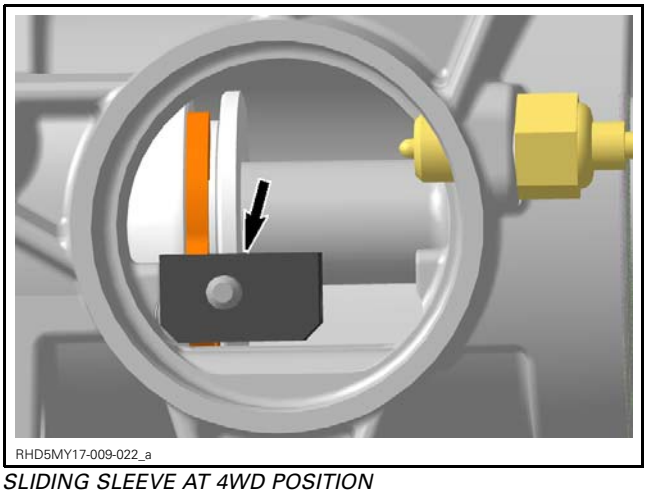
– When moving the sliding sleeve to 2WD position , the coupling sleeve is equal with the end of the shaft splines.



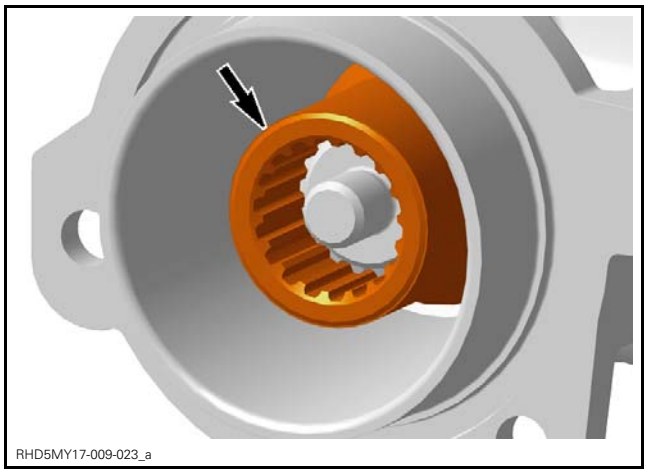
SLIDING SLEEVE AT 2WD POSITION



– When moving the sliding sleeve to 4WD position , the coupling sleeve is flush with the end of shaft.



SLIDING SLEEVE AT 4WD POSITION



Install the actuator onto the 4x4 coupling unit. Refer to *INSTALLING THE 4WD ACTUATOR* in this subsection.

Installing the 4x4 Coupling Unit

The installation is the reverse of removal procedure. However, pay attention to the following:

Lubricate coupling unit housing O-ring.

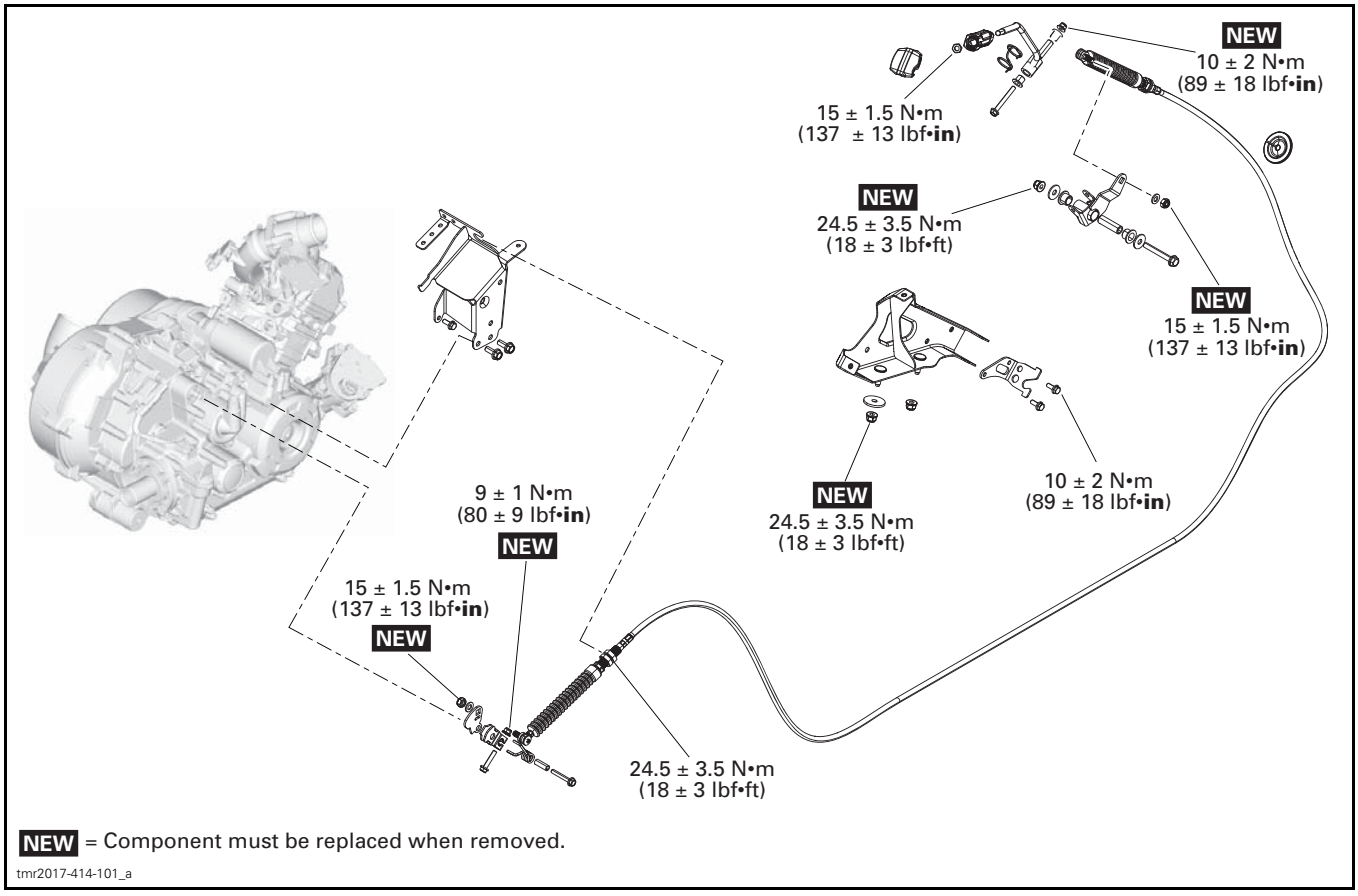
COUPLING UNIT HOUSING O-RING	
Service product	Engine oil

Tighten coupling unit screws to specification.

TIGHTENING TORQUE	
Service product	LOCTITE 243 (BLUE) (P/N 293 800 060)
Coupling unit screws	25 N•m ± 3.5 N•m (18 lbf•ft ± 3 lbf•ft)

Install all other removed parts and check if the actuator is operational. See the procedure in *INSTALLING THE ACTUATOR* in this subsection.

SHIFTER



NEW = Component must be replaced when removed.

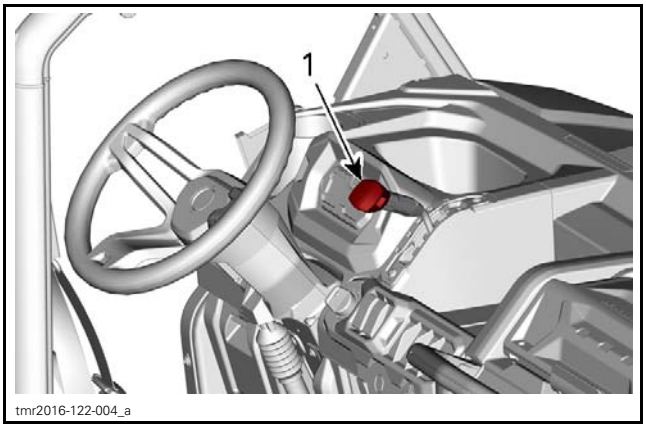
tmr2017-414-101_a

PROCEDURES

SHIFT LEVER

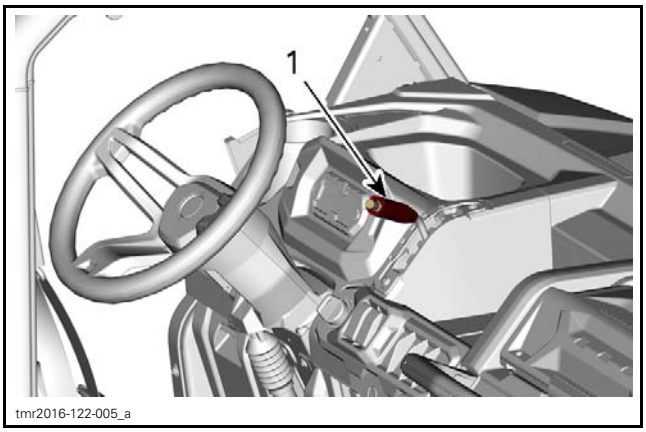
Removing the Shift Lever

1. Place shift lever in NEUTRAL position.
2. Secure vehicle using wheel blocks.
3. Hold the jam nut located underneath the shift lever knob and unscrew the knob.



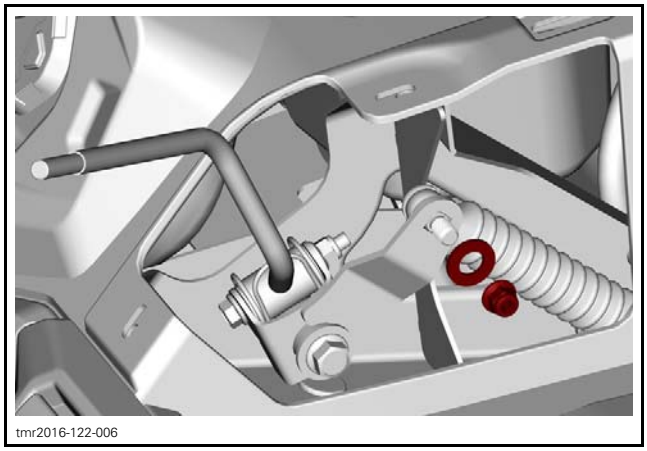
1. Knob

4. Remove the jam nut.
5. Remove shift lever trim.

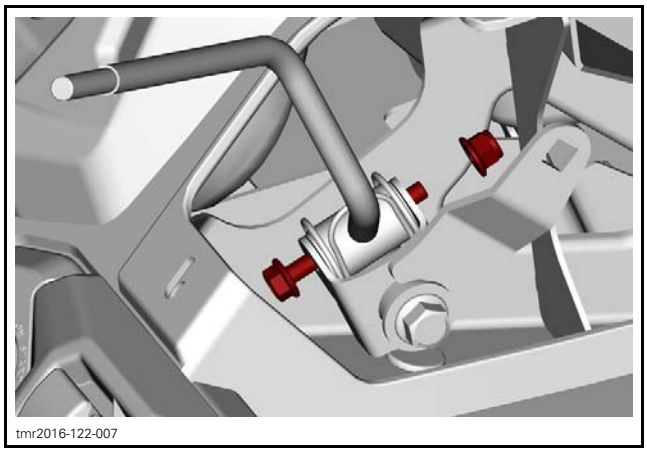


1. Trim

6. Detach shifter cable from shift lever by removing nut and washer.



7. Remove shift lever pivot bolt and nut.



8. Remove shift lever.

Inspecting the Shift Lever

Check shift lever for bending or cracks.

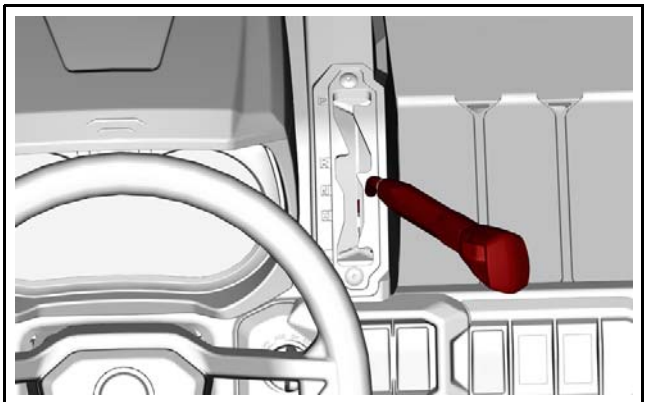
Check spring and bushing condition.

Replace all damaged parts.

Installing the Shift Lever

The installation is the reverse of the removal procedure. However, pay attention to the following.

Ensure shift lever is tilting toward the center of vehicle


tmr2017-203-005

TYPICAL

Screw the jam nut all the way down the threads.

Screw the knob on the shift lever until it reaches the jam nut.

Place it at the right position.

Lock the knob in place using the jam nut.

TIGHTENING TORQUE	
Shift lever knob jam nut	15.5 N•m ± 1.5 N•m (137 lbf•**in** ± 13 lbf•**in**)

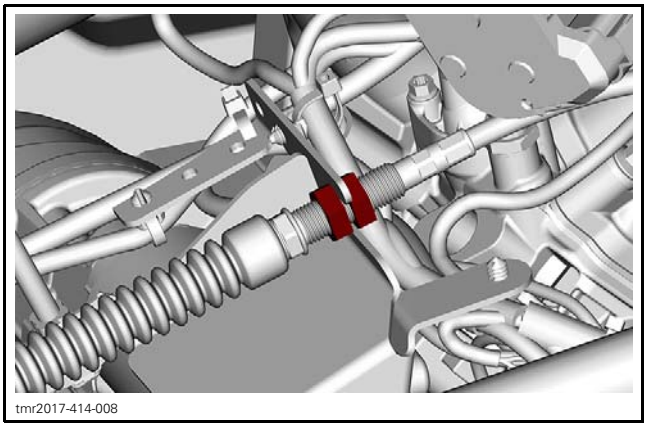
Adjust shifter cable, refer to *ADJUSTING THE SHIFTER CABLE* in this subsection.

Check if shift lever works properly in all positions.

SHIFTER CABLE

Adjusting the Shifter Cable

1. Place shift lever in NEUTRAL position.
2. Move the vehicle forward and backward to ensure that the gearbox is engaged in neutral.
3. Secure vehicle using wheel blocks.
4. Loosen cable adjustment nuts (engine side).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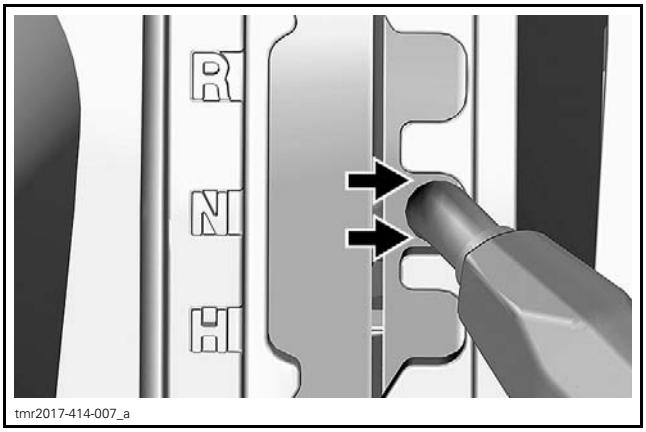
5. Adjust cable nuts until the shift lever is **well centred** in the neutral notch.



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SHIFT LEVER WELL CENTERED

NOTE: The free play must be equal before and behind the lever.

6. Tighten cable adjustment nuts to specification.

TIGHTENING TORQUE	
Cable adjustment nuts	24.5 N•m ± 3.5 N•m (18 lbf•ft ± 3 lbf•ft)

7. Move shift lever in R position then in H position.
8. Place shift lever in NEUTRAL position.
9. Check if shift lever is properly centered with neutral notch. Readjust if required.
10. Test the shifter to confirm that the system works properly in all positions.

⚠ WARNING

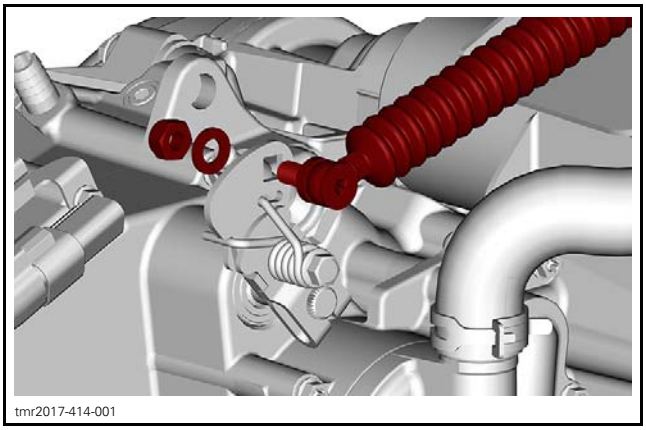
After adjustment, make sure that PARK position works properly.

SHIFT PLATE

Removing the Shift Plate

Do not remove shift plate needlessly.

1. Remove shifter cable from shift plate.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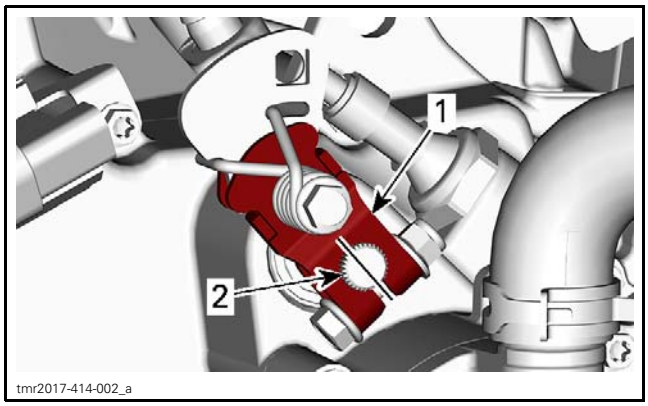
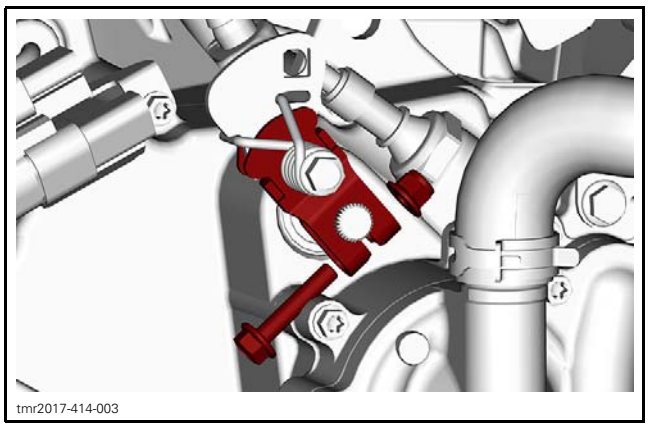
2. Mark the indexation between the main shift plate and the shift shaft.



1. Main shift plate
2. Shift shaft

3. Remove shift plate pinch bolt.

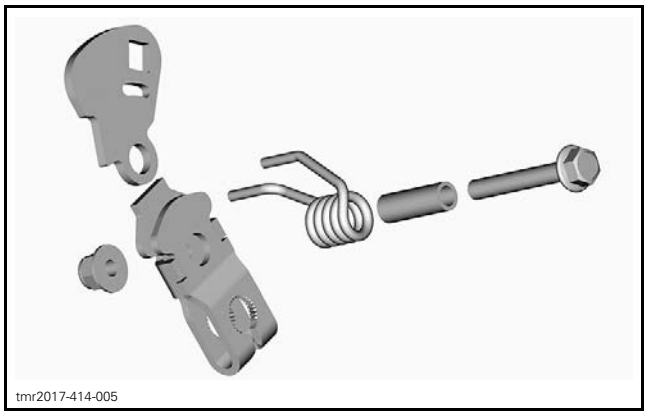


4. Remove shift plate.

Inspecting the Shift Plate

Check shift plate components for:
– Excessive play between parts
– Cracks
– Bending
– Splines condition.

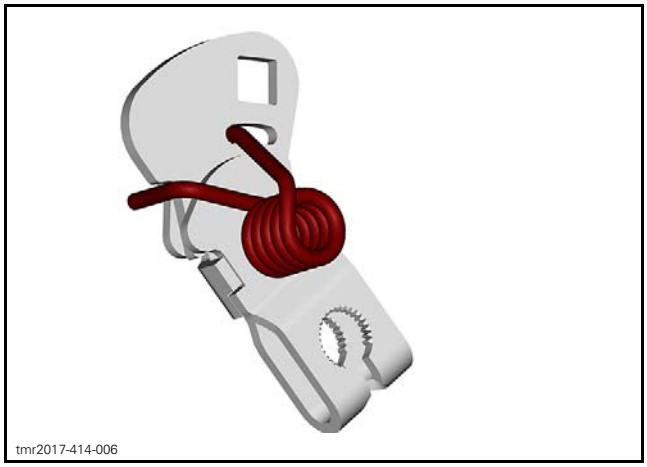
Disassembling the Shift Plate



Assembling the Shift Plate

The assembling is the reverse of the disassembling procedure. However, pay attention to the following.

Index the plates and spring as shown.



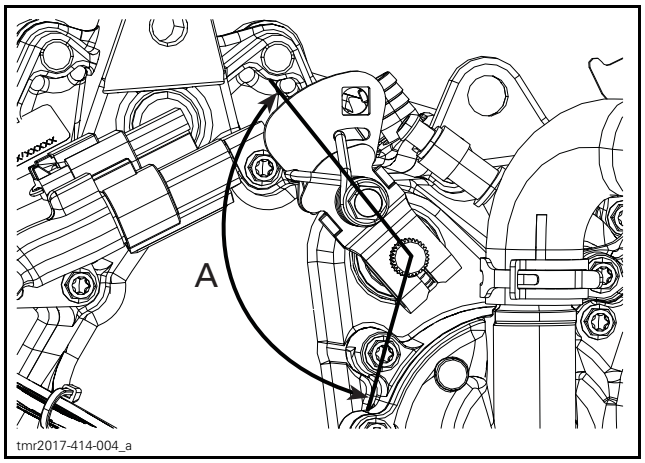
Installing the Shift Plate

The installation is the reverse of the removal procedure. However, pay attention to the following.

Place the gearbox in NEUTRAL before shift plate installation.

Install and align shift plate using marks previously traced.

If shift plate is installed on a new engine, install it in the indicated angle.



CORRECT ANGLE IN NEUTRAL
A. 120°

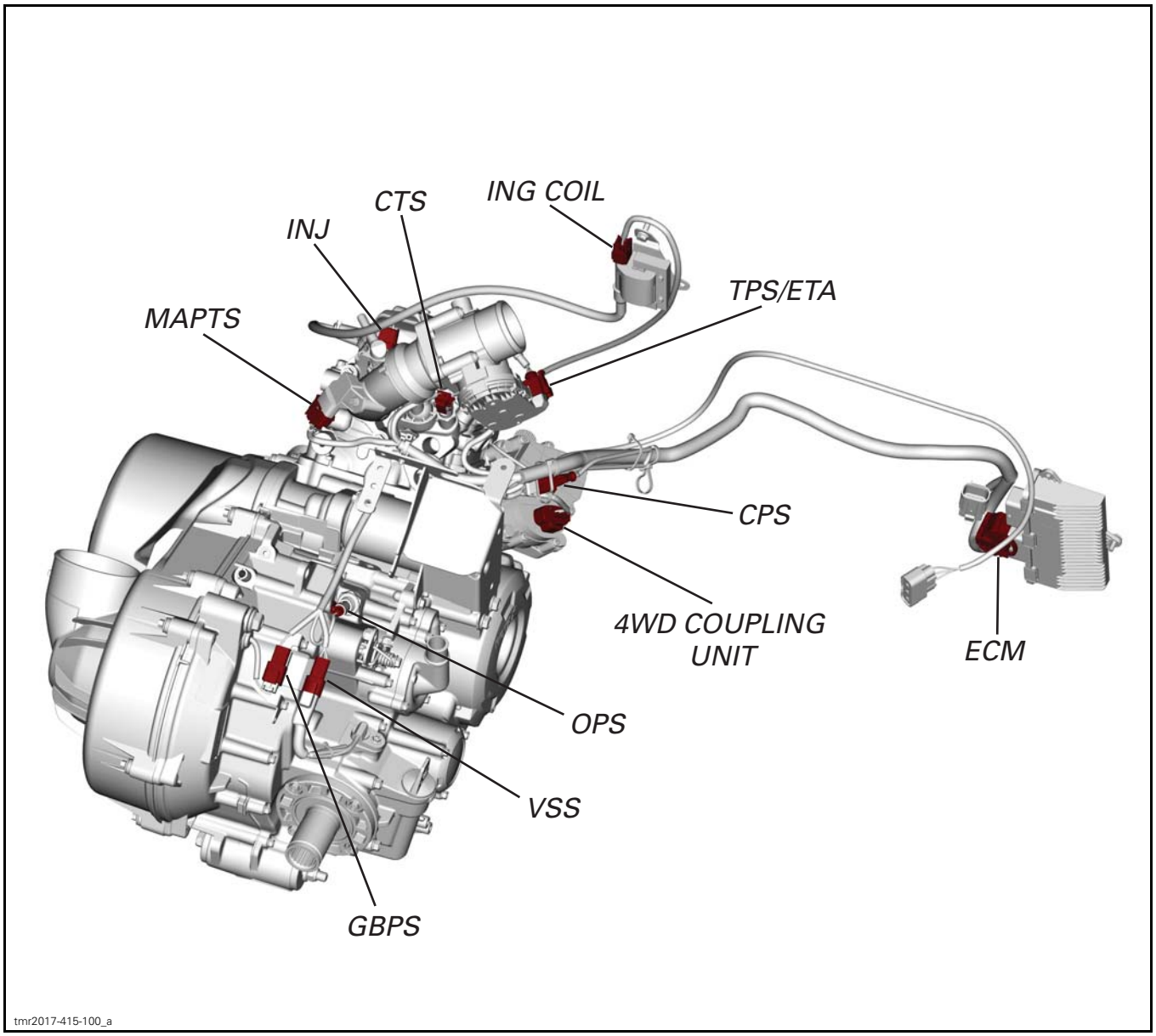
NOTE: When correctly installed, the upper shift plate is square with the shifter cable.

Tighten shift plate nut to specification.

TIGHTENING TORQUE	
Shift plate nut	9 N•m ± 1 N•m (80 lbf•**in** ± 9 lbf•**in**)

Install and adjust shifter cable, refer to *ADJUSTING THE SHIFTER CABLE* in this subsection.

ENGINE MANAGEMENT SYSTEM (EMS)



4WD Actuator
CPS = Crankshaft Position Sensor
CTS = Cooling Temperature Sensor
ECM = Engine Control Module
ETA = Electric Throttle Actuator
GBPS = Gearbox Position Sensor
IGN COIL = Ignition coil
INJ= Fuel Injector
MAPTS = Manifold Air Pressure/Temperature Tensor
OPS = Oil Pressure Switch
TPS = Throttle Position Sensor
VSS = Vehicle Speed Sensor

GENERAL

SYSTEM DESCRIPTION

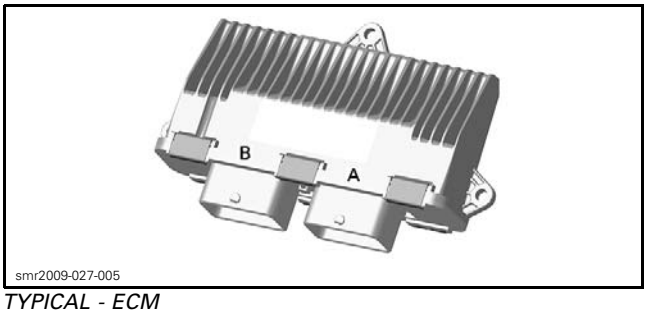
The ECM ensures a high power output with clean combustion.

There are 7 main systems that are controlled by the ECM:

1. Electronic Fuel Injection (EFI)
2. Intelligent throttle control
3. Cooling system (cooling fan)
4. Ignition system
5. Starting system
6. Fuel system

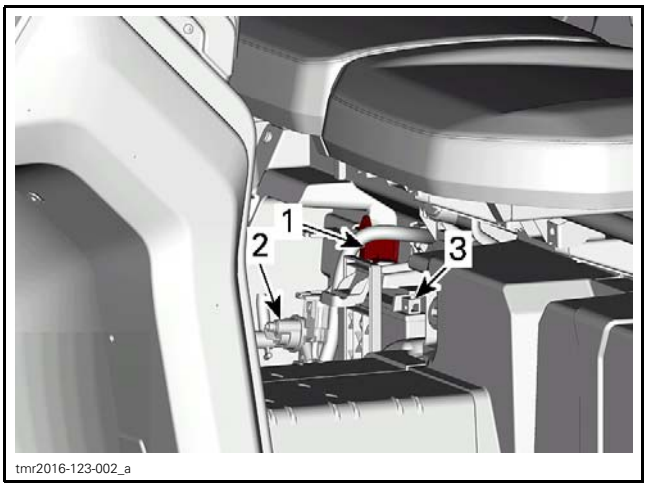
NOTE: For further information related to these systems, refer to the applicable subsection.

The ECM is the central point of the engine management system.



TYPICAL - ECM

The ECM is located under the right passenger's seat, to the right of the fuse box and behind the starter solenoid.



ECM LOCATION
1. ECM
2. Starter solenoid
3. Battery

The ECM reads input signals from various switches, controls, and sensors, that it compares to predetermined parameters, makes computations, and provides control signal outputs required for proper engine management.

The ECM also interacts through CAN bus with the gauge module for various functions, information exchange and display of messages. Refer to *CONTROLLER AREA NETWORK (CAN)* and *LIGHTS, GAUGE AND ACCESSORIES* subsections.

The ECM also features a permanent memory that will store the information on the various ignition keys programmed to the vehicle, fault codes, customer information, and other engine information, even when the battery is removed from the vehicle.

Diagnostic Mode

The ECM features a self-diagnostic mode that is activated on system power up (ignition key ON) for certain systems and components, and when the engine is running for others. Refer to *DIAGNOSTIC AND FAULT CODES* subsection for more information.

Monitoring System

The MONITORING SYSTEM monitors various electrical and electronic components of the engine control systems such as the:

– ETA (Electric Throttle Actuator)
– TPS (Throttle Position Sensor)
– TAS (Throttle Accelerator Sensor)
– ECM (Engine Control Module).

The engine management system provides for redundancies in these components should a failure or partial failure occur to which it will adjust system operation to protect the vehicle and most of importantly, the driver.

Should the engine management system not respond (or not respond correctly) to a failure, then the monitoring system will react to ensure vehicle and driver safety.

The monitoring system therefore ensures the engine management system is functioning correctly.

Limp Home Mode

When a major component of the EMS is not operating properly, limp home mode will be set.

Engine RPM will be limited and/or engine behavior and control may be modified depending on the cause of the failure.

LIMP HOME will be displayed in the multifunction gauge and the CHECK ENGINE light symbol will be on in the gauge.

A failure of any of the following major components will force the vehicle into LIMP HOME MODE:

– TPS / ETC / TAS
– Injectors
– Low oil pressure
– High engine coolant temp
– MAPTS signal fault.

CONTROLLER AREA NETWORK (CAN)

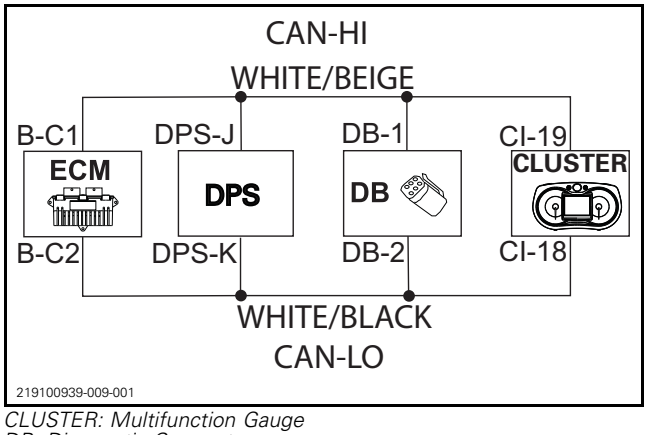
GENERAL

SYSTEM DESCRIPTION

The CAN (Controller Area Network) protocol is an ISO standard for serial data communication.

The CAN bus links the ECM and multifunction gauge together so that they communicate to interact as required. The components are connected together by 2 wires and they are in constant communication with each other at a rate of about every 20 milliseconds. CAN lines consist of a pair of twisted wires (WHITE/BEIGE and WHITE/BLACK).

If a component or system malfunction is detected, a module may generate a fault code, which it transmits through the CAN bus as a signal. The fault signal may be used for various functions such as triggering the display of an error message in the multifunction gauge display, turning on a fault indicator light, limiting or inhibiting vehicle or engine operation, or viewed using the BRP diagnostic software BUDS2 for troubleshooting.



CLUSTER: Multifunction Gauge
DB: Diagnostic Connector
DPS: Dynamic Power Steering
ECM: Engine Control Module

COMMUNICATION TOOLS AND B.U.D.S.

SERVICE TOOLS

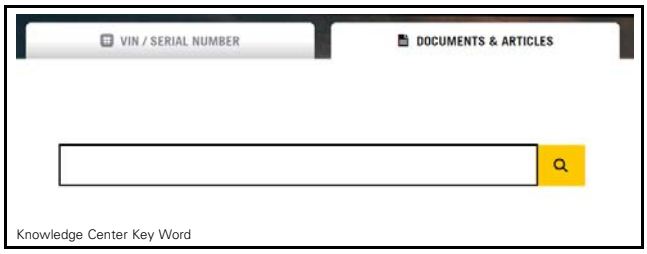
Description	Part Number	Page
12 V BATTERY SUPPLY CABLE	529 035 997	1
DIAGNOSTIC CABLE	710 000 851	1
MPI-2 INTERFACE CARD	529 036 018	1
MPI-3 INTERFACE CARD	529 036 353	1
POWER INTERFACE	515 177 223	1

GENERAL

Refer to the **B.U.D.S. directory** on *KNOWLEDGE CENTER* for all BUDS related information, including:

- Download link
- User manual (programming keys, reading fault codes, navigation through menus, writing data to modules etc.)
- Installation instructions.

Search keyword: "BUDS".



Download and install the software on a PC.

Connect the vehicle to the BRP diagnostic software (BUDS2).

REQUIRED TOOLS

MANDATORY TOOLS	
A personal computer (laptop or desktop)	
MPI-2 INTERFACE CARD (P/N 529 036 018)	
OR	
MPI-3 INTERFACE CARD (P/N 529 036 353)	
DIAGNOSTIC CABLE (P/N 710 000 851)	
POWER INTERFACE (P/N 515 177 223)	
12 V BATTERY SUPPLY CABLE (P/N 529 035 997)	
OPTIONAL TOOL	
Extension cable available at electronic retail outlets. Do not exceed 7.5 m (25 ft)	

Multi-Purpose Interface Card (MPI-2 or MPI-3)

The Multi-Purpose Interface (MPI) in conjunction with the diagnostic cable is used with BUDS2 to communicate with the engine control module (ECM) and other modules.

The MPI card uses the power from the PC computer's USB port.

Power Interface

The power interface and power supply cable allows the connection of a fully charged external battery to provide stable voltage to the unit and BUDS2.

Stable voltage is essential to prevent update crashes.

Do not use a charger on the battery (unit or external) during software updates.

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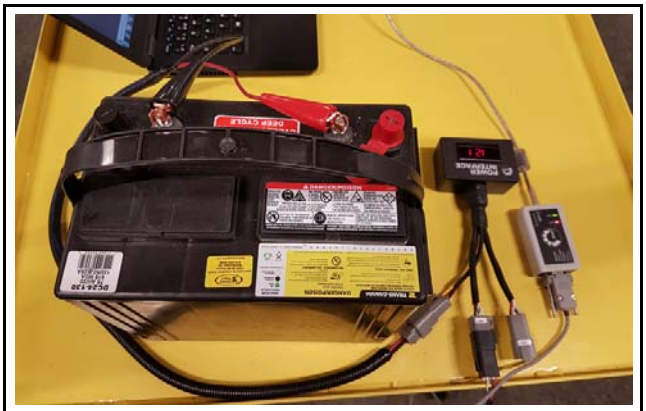
The power interface and power supply cable connected to external battery can be used for extended diagnostic time.



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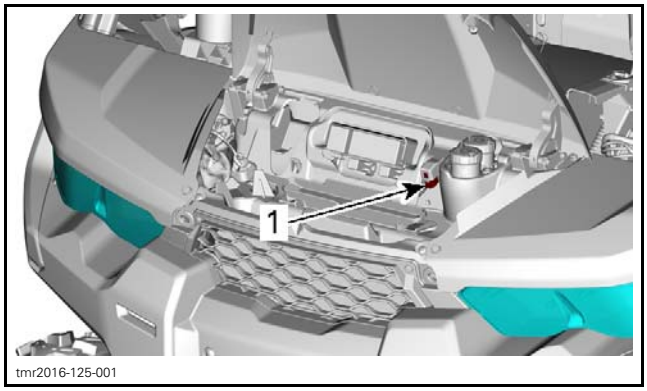
TYPICAL

The power interface with or without the power supply cable will keep the unit powered even if the ignition switch is turned off or the D.E.S.S. key is removed.

The power interface has a fuse protected voltmeter included and an extra fuse to protect from polarity inversion of the power supply cable.

DIAGNOSTIC CONNECTOR LOCATION

The diagnostic connector is located under the hood, stored in it's protective cap.



tmr2016-125-001

1. Diagnostic connector

TROUBLESHOOTING

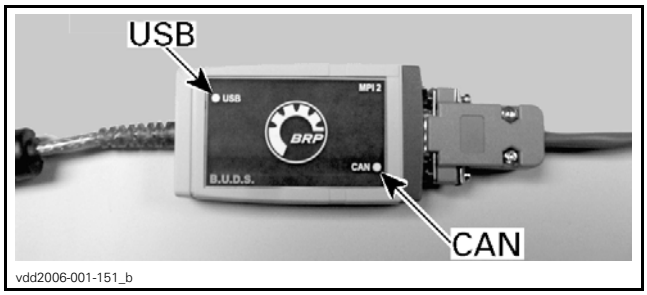
DIAGNOSTIC TIPS

IMPORTANT: Make sure all connections are made and vehicle is powered up **before starting the BRP diagnostic software (BUDS2)** to allow proper communication between the vehicle and BUDS2.

Multi-Purpose Interface Card Connection Troubleshooting

MPI Status Lights

The MPI card includes 2 status lights that indicate the connection condition: USB and CAN. **Both lights must be GREEN** to function properly. Otherwise, refer to the following charts.



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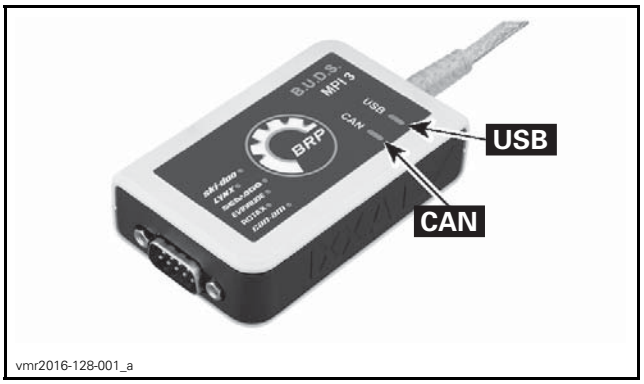
MPI-2 CARD



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MPI-3 CARD

Prerequisite for USB Communication:

– Computer turned on.
– MPI card connected to computer.

COMMUNICATION PROBLEM (USB)	
STATUS	WHAT TO DO
Light is OFF	Check USB connection between MPI card and computer. Check USB operation on computer (hardware or USB drivers)
Light is GREEN	Connections are GOOD. Communication can take place on USB side

Prerequisite for CAN Communication:

– MPI card connected to diagnostic connector on vehicle.
– Computer turned ON
– The D.E.S.S. key installed on the engine D.E.S.S. post (if applicable).
– ECM is powered.
– Ignition key installed and turned to ON (electrical system powered up without engine started).
– BUDS2 started and logged on.

COMMUNICATION PROBLEM (CAN)	
STATUS	WHAT TO DO
CAN Light is OFF	– BUDS2 does not communicate with the vehicle. – Check if ignition key is in *ON* position. – Check connections from computer to vehicle. – Check if BUDS2. is started. – Check if vehicle is powered: is cluster turned ON?
CAN Light is RED	This occurs when BUDS2 looses communication with vehicle. – Check if ignition key is in *ON* position. – Check connections from computer to vehicle. – Check if vehicle is powered: is cluster turned ON?
CAN Light is GREEN	– Connections are GOOD. BUDS2 communicates normally with the vehicle.

DIAGNOSTIC AND FAULT CODES

GENERAL

MONITORING SYSTEM

The Engine Management System (EMS) features a monitoring system that self-diagnoses various electrical and electronic components. This mode becomes active when the ignition key is turned ON.

NOTE: Some components require the engine to be running to be monitored (fuel injectors for example).

The monitoring system continuously validates that the components (control modules, sensors and actuators) are not faulty or defective. When a malfunction is detected, the related electronic module(s):

– Sets an active fault code.
– Adapts the proper protection strategy according to the failure.
– Sends out signals to the multifunction gauge to inform the rider of a particular condition.

A fault code is an indication that a glitch or malfunction is detected by the monitoring system of the vehicle.

If a minor fault occurs, the engine and vehicle will continue to operate without noticeable loss of performance.

If a more important fault occurs, engine RPM may be limited. The engine/vehicle will continue to operate with reduced performance.

If a major component of the EMS fails, engine RPM will be limited as well as vehicle speed.

These strategies are used to protect engine and electrical system from damage and to maintain safe operation of the vehicle. In extreme cases, the engine may also be completely shut down.

Message in Gauge for Problematic Conditions

If an abnormal condition occurs, the gauge will display one of the following messages. It can be combined with a pilot lamp.

MESSAGE	DESCRIPTION
D.E.S.S. KEY NOT RECOGNIZED	Optionnal D.E.S.S. key installed: D.E.S.S. key requires cleaning.
BAD KEY	Optionnal D.E.S.S. key installed:Wrong key used in the ignition switch. Use the right key for the vehicle.
CHECK ENGINE	All active or previously activated faults that require attention. No engine limitation engaged.
LIMP HOME	Critical faults requiring diagnostic as soon as possible. An engine limitation is engaged and/or the engine behavior is modified.
ECM CRC ERROR	Error message from ECM.
TPS FAULT	Throttle body fault, generally followed by a Limp Home message.
BRAKE SWITCH FAULT	Brake signal fault.
ECM NOT RECOGNIZED	Message displayed when the gauge is unable to identify the ECM.
CHECK DPS (models with DPS)	Check engine pilot light on. Indicates that the DPS (Dynamic Power Steering) does not work properly.
PPS FAULT	Faulty Pedal Position Sensor(s) (PPS).
FUEL SENDER RANGE PERFORMANCE	When the fuel sender resistor value is out of range the multifunction gauge (analog/digital) will detect it and display the message.

Limp Home Mode

When a major component of the EMS is not operating properly, limp home mode will be set.

Engine RPM will be limited and/or engine behavior and control may be modified depending on the cause of the failure.

This mode allows the rider to return home, which would otherwise not be possible without this advanced system.

LIMP HOME will be displayed in the multifunction gauge and the CHECK ENGINE light symbol will be on in the gauge.

FAULT CODES

Fault Code Categories

A fault code consists of an alphanumeric designator followed by a hexadecimal number of 3 digits. The alphanumeric designator defines the category of the fault code while the hexadecimal number refers to a unique fault.

FAULT CODE CATEGORIES		
ALPHANUMERIC DESIGNATOR	MODULE/ SYSTEM	EXAMPLE OF FAULT CODE
From P0 to P3	Power train, TCM and DPS	P0116
From U0 to U3	Communication between module and sensors	U0073

RELATED MODULE AND FAULTS	
MODULE	FAULT CODE CATEGORY
ECM	P and U
DPS	P and U
Cluster	P and U

Fault Code States

Fault codes have 3 possible states:
- Active
- Occurred
- Inactive.

Active Fault Codes

An active fault code is an indication of a fault that is **currently triggered**.

The active fault may or may not compromise normal operation of the system(s). Service action should be taken to correct the problem that caused the fault code.

Once the fault condition(s) of the active fault is no longer present, its state will change to "occurred".

Occurred Fault Codes

An occurred fault code indicates a fault that was active, but **no longer** is.

The occurred fault does not presently affect system or component operation but is retained as a history of the faults that were detected.

The fault may have been generated due to a system or component that was momentarily operating outside normal parameters. Repeated occurred faults of this type should be considered when troubleshooting a problem, and may require that maintenance action be taken.

An occurred fault may also be generated when disconnecting and reconnecting a component, replacing a burnt fuse, when the software update of an electronic module has been carried out, or may be due to a momentary high or low voltage.

Inactive Fault Codes

An inactive fault code represents a fault code that is neither active, nor occurred. It is simply part of a list of all possible faults that can be monitored by the ECM and multifunction gauge, which may become active or occurred if the monitoring system detects an applicable fault. These codes can be viewed in the BRP diagnostic software (BUDS2).

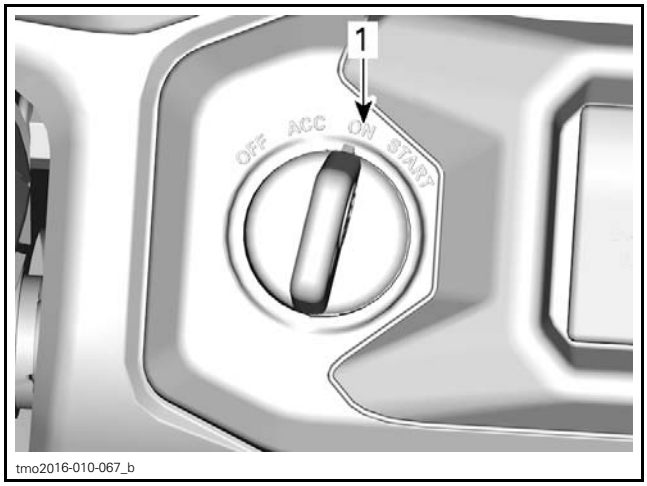
How to Read Fault Codes Using the Multifunction Gauge

NOTE: A fault code must be in an "Active" state to be displayed in the multifunction gauge. The BRP diagnostic software (BUDS2) must be used to read all fault codes states.

Analog/Digital Gauge

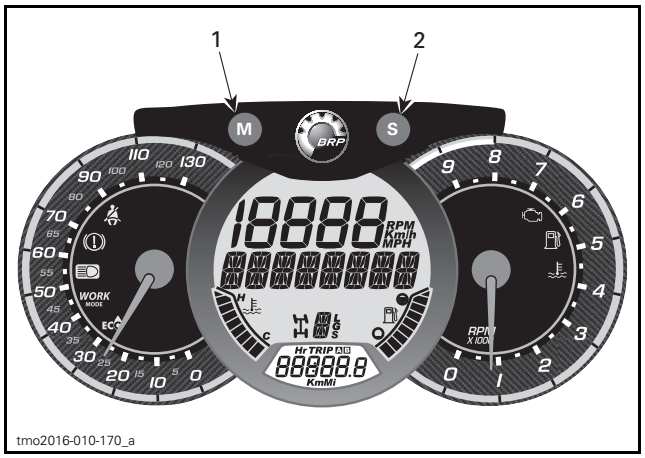
Proceed as follows to view the active fault codes:

1. Turn ignition key to ON position.



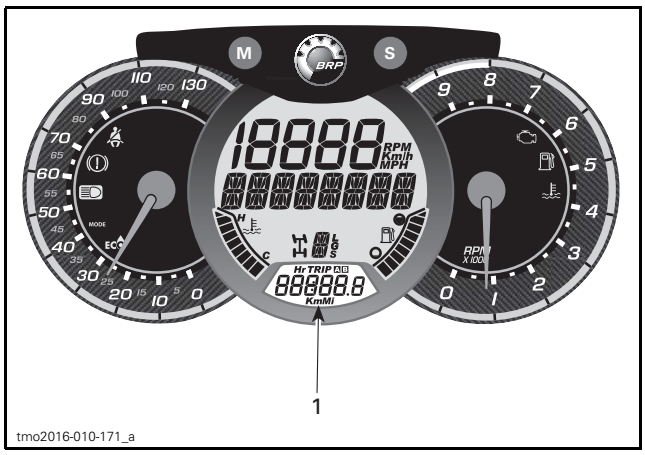
1. Key ON

2. Wait for the multifunction gauge to complete its self test function.
3. Press the S (set) button repeatedly until Hr (hour) is displayed in the secondary digital display.



tmo2016-010-170_a

1. *M (mode) button*
2. *S (set) button (pressed repeatedly to toggle secondary display)*

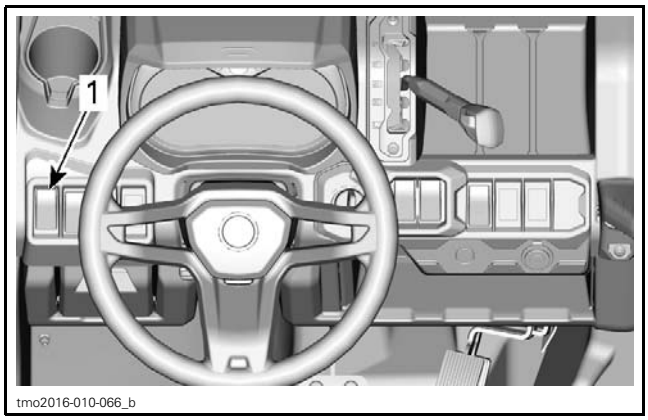


tmo2016-010-171_a

1. *Toggle this digital display to Hr*

4. Press and hold the M (mode) button while quickly toggling the HI - LO beam switch to enter the fault code display function.

NOTE: A minimum of 3 HI - LO toggles must be completed within 2 seconds.



tmo2016-010-066_b

1. *OFF/Low/High beam headlight switch*

If a fault code is active, it will be displayed in the main digital display.

If no fault code is active, a scrolling NO ACTIVE FAULT CODE message will be displayed.

If there are multiple fault codes, the display will cycle through each fault code repeatedly. A maximum of 10 fault codes may be displayed.

If the fault code display function has been interrupted by another message, a fault code(s) may not have been displayed. Repeat the fault code display procedure to view all active fault codes.

To exit the fault code display function, press both the M and S buttons simultaneously.

How to Read Fault Codes Using BUDS2

1. Connect the vehicle to the BRP diagnostic software (BUDS2).
2. In BUDS2, go to:
   - **Faults** page
   - **Vehicle** button
   - **Active/Occurred** tab.

Only active or occurred faults are displayed in this tab. The areas stay empty if there is no detected faults.

FAULT NOMENCLATURE	
COLUMN	INFORMATION
Code	Fault code number. When 2 stars (**) precedes the code, detailed conditions when the fault occurred, can be displayed by clicking the "More details" button
State	Display the fault state (active, occurred, inactive)
Module	Displays the module that reports the fault code. This is the module that detects or has received a message of an anomaly and reports it. List of modules: - Cluster (multifunction gauge) - DPS (dynamic power steering) - ECM (engine control module)
Description	Provides a short description of the fault

How to Clear Fault Codes Using BUDS2

1. Connect the vehicle to the BRP diagnostic software (BUDS2).
2. In BUDS2, go to:
   - **Faults** page
   - **Vehicle** button
   - **Active/Occurred** tab.

By selecting the refresh or the clear button on the top right of the Active/Occurred Tab, the faults are reloaded from the vehicle, or cleared.

How to Find Fault Code Descriptions

Connect the vehicle to the BRP diagnostic software (BUDS2) and go to **Faults** page.

In the list, select the related fault code.

Check in the **Possible Causes** tab of the bottom table for the problem description.

DIAGNOSTIC AND FAULT CODES

GENERAL

FAULT CODE TABLE

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
C0051	DPS GLOBE	ROTOR ENCODER SPI COM FAIL	internal comm fail error or damaged DPS	change dps if condition still active after key-on cycle
C0052	DPS GLOBE	ROTOR INCODER VARIANCE	internal INCODER fail or damaged DPS	change dps if condition still active after key-on cycle
C1203	DPS GLOBE	TORQUE SENSOR OUT OF RANGE	internal error or damaged DPS	change dps if condition still active after key-on cycle
C1304	DPS GLOBE	TORQUE SENSOR LINEARITY CHECK FAIL	internal error or damaged DPS	change dps if condition still active after key-on cycle
C1309	DPS GLOBE	TEMPERATURE HIGH	DPS temp upper range due to excessive use of DPS	verify with customer condition when dps ovr show-up
C1310	DPS GLOBE	TEMPERATURE OVER	DPS temp exceed due to excessive use of DPS	verify with customer condition when dps ovr show-up
C1318	DPS GLOBE	SEPIC LOW	internal error or damaged DPS	change DPS
C1319	DPS GLOBE	SEPIC HIGH	internal error or damaged DPS	change DPS
C2109	SCM	Release Valve Activation delay Exceed	If pressure threshold not reach after calibrated time delay (When release valve activated)	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C210A	SCM	Suspension Valve Activation time Exceed	If the suspension valve maximum allowed activation time in a specific time window is exceeded for (counter > CntExceed).	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C210B	SCM	Outlet Valve Activation time Exceed	If the suspension valve maximum allowed activation time in a specific time window is exceeded for (counter > CntExceed).	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C2111	SCM	Pressure sensor signal Invalid	Sensor input voltage < 0.5V for hardcoded debounce time	Open SCM Activation page in BUDS, performe a pressure sensor test in System self test sequence section

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
C21D0	SCM	Pressure threshold not Reach outlet adjustment	If pressure threshold not reach after calibrated time delay (threshold change in function of compressor temperature) (When outlet pressure adjustment activated)	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C21D2	SCM	Compressor over temperature condition	If over temp threshold reach for time delay	Open SCM Activation page in BUDS, performe a pressure test in System self test sequence section
C21D3	SCM	Over pressure detected	If pressure > 350PSI	Open SCM Activation page in BUDS, performe a pressure sensor test in System self test sequence section
C21E0	SCM	Pressure threshold not reach Rear suspension adjustment	If pressure threshold not reach after calibrated time delay (threshold change in function of compressor temperature) (When Rear suspension adjustment activated)	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C21E1	SCM	Air Leak Plausibility check Rear suspension	If maximum number of readjustment for rear suspension is reach	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C21F0	SCM	Pressure threshold not reach Front suspension adjustment	If pressure threshold not reach after calibrated time delay (threshold change in function of compressor temperature) (When front suspension adjustment activated)	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C21F3	SCM	Air Leak Plausibility check Front Right suspension	If maximum number of readjustment for front right suspension is reach	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section
C21F4	SCM	Air Leak Plausibility check Front left suspension	If maximum number of readjustment for front left suspension is reach	Open SCM Activation page in BUDS, performe a combined test in System self test sequence section

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0030	ECM	Internal fault path number for Signal error : power stage of heater of Sensor upstream catalyst	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0031	ECM	Internal fault path number for Min error : power stage of heater of Sensor upstream catalyst	Damaged O2 sensor, damaged circuit wires,damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

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PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0032	ECM	Internal fault path number for Max error: power stage of heater of Sensor upstream catalyst	Damaged O2 sensor, damaged circuit wires,damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0037	ECM	Internal fault path number for Min error : power stage of heater of Sensor upstream catalyst, LSU 2	Blown fuse, damaged or disconnected O2 sensor, damaged or disconnected circuit wires, damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0038	ECM	Internal fault path number for Max error: power stage of heater of Sensor upstream catalyst, LSU 2	Blown fuse, damaged or disconnected O2 sensor, damaged or disconnected circuit wires, damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0106	ECM	Manifold Absolute Pressure circuit range/performance	Damaged sensor, damaged circuit wires, damaged connector or damaged ECM pins, ECM voltage supply	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0107	ECM	Manifold Air Pressure Sensor voltage too Low	Damaged sensor, damaged circuit wires, damaged connector or damaged ECM pins, ECM voltage supply Low	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0108	ECM	Manifold Air Pressure Sensor voltage too High	Damaged sensor, wires shorted to battery +, ECM voltage supply too High.	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0112	ECM	Intake Air Temperature Sensor 1 circuit Low	Damaged sensor, damaged circuit wires, damaged connector or damaged ECM pins, ECM voltage supply Low	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0113	ECM	Intake Air Temperature Sensor 1 circuit High	Damaged sensor, wires shorted to battery +, ECM voltage supply too High.	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0116	ECM	Engine Coolant Temperature Sensor 1 circuit range/performance	Damaged sensor, wires shorted to battery +, ECM voltage supply.	Disconnect the sensor and check for a change in the fault code. If the fault code stays the same, look for a short circuit on the harness. If the fault code is different, replace the sensor Measure the sensor resistance (Expected value: 2280 to 2736 Ohms at 19 to 21°C (66 to 70°F)) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0117	ECM	Engine Coolant Temperature Sensor 1 circuit Low	Engine temperature sensor or circuit wires shorted to ground.	Disconnect the sensor and check for a change in the fault code. If the fault code stays the same, look for a short circuit on the harness. If the fault code is different, replace the sensor Measure the sensor resistance (Expected value: 2280 to 2736 Ohms at 19 to 21°C (66 to 70°F)) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0118	ECM	Engine Coolant Temperature Sensor 1 circuit High	Disconnected sensor, or sensor resistance too High.	Make sure sensor connector is well inserted Measure the sensor resistance (Expected value: 2280 to 2736 Ohms at 19 to 21°C (66 to 70°F)) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0122	ECM	First Throttle Accelerator Sensor (TAS) Short circuit to GND	Damaged circuit wires, damaged sensor or damaged ECM pins.	Make sure sensor connector is well inserted Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0123	ECM	First Throttle Accelerator Sensor (TAS) shorted to battery +	Damaged circuit wires, damaged sensor or damaged ECM pins.	Make sure sensor connector is well inserted Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0127	ECM	Intake Air Temperature too High	Air Temperature in intake High	
P0130	ECM	ECU int. fault path no.: electrical diagnosis for lambda sensor upstream catalyst. npl-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0131	ECM	ECU int. fault path no.: electrical diagnosis for lambda sensor upstream cat. min-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0132	ECM	ECU int. fault path no.: electrical diagnosis for lambda sensor upstream cat. max-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0133	ECM	ECU int. fault path no.: diagnosis lambda sensor upstream catalyst	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0135	ECM	ECU int. fault path no.: lambda sensor heating upstream cat.	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0136	ECM	ECU int. fault path no.: electrical diagnosis for second lambda sensor upstream cat. npl-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0137	ECM	ECU int. fault path no.: electrical diagnosis for second lambda sensor upstream cat. min-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0138	ECM	ECU int. fault path no.: electrical diagnosis for second lambda sensor upstream cat. max-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0139	ECM	ECU int. fault path no.: diagnosis lambda sensor upstream catalyst (exhaust bank2)	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0141	ECM	ECU int. fault path no.: lambda sensor heating upstream cat.	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0201	ECM	Power stage sig error injector 2	ECM injector power stage error	Open ECM ACTIVATION page in BUDS. Activate injector and check if injector is reacting as expected
P0202	ECM	Power stage sig error injector 1	ECM injector power stage error	Open ECM ACTIVATION page in BUDS. Activate injector and check if injector is reacting as expected
P0217	ECM	Engine Coolant over temperature condition	Coolant fluid temperature too high	Check for coolant fluid leak and coolant fluid level Check radiator condition Check for other fault, Check thermostat
P0222	ECM	2nd Throttle Accelerator Sensor (TAS) shorted to GND	Damaged circuit wires, damaged sensor, or damaged ECM pins.	Make sure sensor connector is well inserted Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

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PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0223	ECM	2nd Throttle Accelerator Sensor (TAS) shorted to battery +	Damaged circuit wires, damaged sensor, or damaged ECM pins.	Make sure sensor connector is well inserted Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0231	ECM	Fuel Pump circuit shorted to ground, or open circuit	Blown fuse, damaged or disconnected fuel pump, damaged circuit wires, damaged connectors or damaged ECM output pins.	Check related fuse(s) Disconnect the fuel pump and measure his winding resistance (Expected value < 2 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wire, between the ECM and fuel pump connectors (Expected value < 2 Ohms)
P0232	ECM	Fuel Pump circuit shorted to battery +	Damaged fuel pump, damaged circuit wires, damaged connectors or damaged ECM output pins.	Check related fuse(s) Disconnect the fuel pump and measure his winding resistance (Expected value < 2 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wire, between the ECM and fuel pump connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0261	ECM	Cylinder 1 injector open circuit or shorted to ground	Blown fuse, damaged or disconnected injector, damaged or disconnected circuit wires, damaged ECM output pins.	Check related fuse(s) Disconnect injector 1 and measure his resistance (Expected value: 14 to 15 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wire, between the ECM and injector 1 connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness
P0262	ECM	Cylinder 1 injector shorted to battery +	Damaged injector, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect injector 1 and measure his resistance (Expected value: 14 to 15 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Verify the isolation between harness injectors signals (Expected value: open) Measure the resistance of the harness wire, between the ECM and injector 1 connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0264	ECM	Cylinder 2 injector open circuit or shorted to ground	Blown fuse, damaged or disconnected injector, damaged or disconnected circuit wires, damaged ECM output pins.	Check related fuse(s) Disconnect injector 2 and measure his resistance (Expected value: 14 to 15 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wire, between the ECM and injector 2 connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness
P0265	ECM	Cylinder 2 injector shorted to battery +	Damaged injector, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect injector 2 and measure his resistance (Expected value: 14 to 15 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Verify the isolation between harness injectors signals (Expected value: open) Measure the resistance of the harness wire, between the ECM and injector 2 connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness
P0324	ECM	Diagnostic Fault Code for min error of knock sensor	Damaged knock sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is fully inserted and check knock system.

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P032A	ECM	Diagnostic Fault Code for min error of knock sensor	Damaged knock sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is fully inserted and check knock system.
P0335	ECM	Crankshaft Position Sensor	Damaged CPS, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is well inserted Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0359	ECM	Ignition coil	Damaged ignition coil, damaged circuit wires, damaged connector or damaged ECM output pins.	Open the ECM Activation page in BUDS Perform an ignition coil activation and check if ignition coil is reacting as expected Check related fuse(s) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness Refer to the service manual for detailed ignition coil testing procedure

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0360	ECM	Ignition coil	Damaged ignition coil, damaged circuit wires, damaged connector or damaged ECM output pins.	Open the ECM Activation page in BUDS Perform an ignition coil activation and check if ignition coil is reacting as expected Check related fuse(s) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness Refer to the service manual for detailed ignition coil testing procedure
P0361	ECM	Ignition coil range/performance	Damaged ignition coil, damaged circuit wires, damaged connector or damaged ECM output pins.	Open the ECM Activation page in BUDS Perform an ignition coil activation and check if ignition coil is reacting as expected Check related fuse(s) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness Refer to the service manual for detailed ignition coil testing procedure

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0362	ECM	Ignition coil range/performance	Damaged ignition coil, damaged circuit wires, damaged connector or damaged ECM output pins.	Open the ECM Activation page in BUDS Perform an ignition coil activation and check if ignition coil is reacting as expected Check related fuse(s) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms) Check if HIC connector is connecting the engine harness to the vehicle harness Refer to the service manual for detailed ignition coil testing procedure
P0480	ECM	Radiator cooling fan relay	Blown fuse, damaged or disconnected relay, damaged circuit wires or connectors, damaged ECM output pins, damaged Relay.	Check related fuse(s) Disconnect relay and measure his coil resistance (Expected value: 70 to 90 Ohms) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wire, between the ECM and tested device connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0500	DPS	Invalid or missing vehicle speed	No vehicle speed available & Vehicle is in (H or L Gear) with Engine RPM over 4000RPM. Damaged Vehicle Speed sensor circuit, Damaged sensor, Wrong mounting position of speed sensor.	Check if vehicle speed is available in BUDS Monitoring page Check related fuse(s) Disconnect the sensor, measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 5 Ohms)
P0501	ECM	Vehicle speed not plausible	Vehicle speed correlation check failed	Check if vehicle speed is available in Monitoring page in BUDS Check related fuse(s) Disconnect the sensor, measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 5 Ohms)
P0504	ECM	Brake signal not plausible	Brake signal correlation check failed	Open the ECM Monitoring page in BUDS. Check fuse Press on brake pedal. Ensure that brake switch light comes on ECM Monitoring page
P0512	ECM	Starter control circuit	Damaged or disconnected relay, damaged circuit wires, damaged connectors or damaged ECM output pins.	Measure voltage between harness connector SS1 and ground (Expected value: 11 to 13 volts) Measure resistance from connector: ECMB-L4 to SS2 (Expected value: < 2 ohms)
P0513	ECM	Invalid Access Key Detected	A non stored access key was detected when key switch was turned to ON.	Use a stored access key to turn key switch. If no stored access keys are available program one and try again

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0520	ECM	Engine oil pressure sensor circuit malfunction	Damaged switch, damaged circuit wires, damaged connector, damaged ECM pins.	Measure resistance between harness connector EOP and ground When engine stopped. (Expected value < 2 Ohms) Measure resistance between harness connector EOP and ground When engine running. (Expected value = open) Measure resistance from harness connector: EOP to ECMA-E3 (Expected value: < 2 Ohms) Check if HIC connector is properly connected (engine harness to the vehicle harness).
P0523	ECM	Engine oil pressure sensor sticking	Damaged switch, damaged circuit wires, damaged connector, damaged ECM pins.	Measure resistance between harness connector EOP and ground When engine stopped. (Expected value < 2 Ohms) Measure resistance between harness connector EOP and ground When engine running. (Expected value = open) Measure resistance from harness connector: EOP to ECMA-E3 (Expected value: < 2 Ohms) Check if HIC connector is properly connected (engine harness to the vehicle harness).

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0524	ECM	Engine oil pressure too Low	Damaged switch, damaged circuit wires, damaged connector, damaged ECM pins.	Measure resistance between harness connector EOP and ground When engine stopped. (Expected value < 2 Ohms) Measure resistance between harness connector EOP and ground When engine running. (Expected value = open) Measure resistance from harness connector: EOP to ECMA-E3 (Expected value: < 2 Ohms) Check if HIC connector is properly connected (engine harness to the vehicle harness)
P0551	DPS	TORQUE_SENSOR_ OPEN	Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0552	DPS	TORQUE_SENSOR_ SHORT_GND	Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0553	DPS	TORQUE_SENSOR_ SHORT_5V	Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0560	ECM	Non-plausibility error on system voltage	Battery failure, voltage regulator failure, damaged circuit wires or connection, damaged magneto generator. An external battery charger may have been used.	Measure battery voltage with engine stopped. (Expected value: 11 to 13 volts) Measure battery voltage with engine running. (Expected value: 13 to 14.7 volts) Check connections on voltage regulator. Check ground and positive connections on battery. Check ground on vehicle frame

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0562	DPS	System voltage low	Blown fuse, battery low (damaged magneto/regulator), damaged circuit wires or connection, Intense usage of WINCH	Check related fuse(s) Measure battery voltage with engine stopped (Expected value: 11 to 13 Volts) Check ground and positive connections on battery Validate that all the DPS connectors are secured On the DPS power connector, measure the voltage between the two harness wires (Expected value: Battery voltage)
P0562	DPS GLOBE	BATTERY LOW	Battery low (damaged magneto/regulator), damaged circuit wires or connection. Intense usage of WINCH	Measure battery voltage with engine stopped (Expected value: 11 to 13 Volts) Check ground and positive connections on battery Validate that all the DPS connectors are secured On the DPS power connector pins, measure the voltage between the two harness power wires (Expected value: Battery voltage) Measure the resistance of the harness wire, between the DPS power connector and ground (Expected value < 2 Ohms)
P0562	ECM	System voltage low	Blown fuse FC, battery failure, voltage regulator failure, damaged circuit wires or connection, damaged magneto generator. An external battery charger may have been used. Intense usage of WINCH	Measure battery voltage with engine stopped. (Expected value: 11 to 13 volts) Measure battery voltage with engine running. (Expected value: 13 to 14.7 volts) Check connections on voltage regulator. Check ground and positive connections on battery. Check ground on vehicle frame

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0563	DPS	system voltage high	Rectifier failure, damaged circuit wires or connection.	Measure battery voltage with engine stopped. (Expected value: 11 to 13 volts) Measure battery voltage with engine Running at 3500RPM. (Expected value: 13 to 14.7 volts) Check connections on voltage regulator. Check ground and positive connections on battery.
P0563	DPS GLOBE	BATTERY HIGH	Rectifier failure, damaged circuit wires or connection./ Improper battery charger could raise that fault	Measure battery voltage with engine stopped. (Expected value: 11 to 13 volts) Measure battery voltage with engine Running at 3500RPM. (Expected value: 13 to 14.7 volts) Check connections on voltage regulator. Check ground and positive connections on battery.
P0563	ECM	System voltage high	Damaged regulator. An external battery charger may have been used.	Measure battery voltage with engine stopped. (Expected value: 11 to 13 volts) Measure battery voltage with engine running. (Expected value: 13 to 14.7 volts) Check connections on voltage regulator. Check ground and positive connections on battery. Check ground on vehicle frame
P0601	DPS	CALIBRATION FAULT	DPS not calibrated or damage DPS	Try updating the DPS
P0601	SCM	SCM calibration fault	Calibration Checksum err	Update SCM
P0602	DPS GLOBE	Manufacturing CRC Programming Error	Internal error or damaged DPS	change dps if condition always active
P0605	SCM	EEPROM COMMUNICATION FAULT	Last minute memory or last modes memory check	External troubleshooting is not possible Check for communication fault using BUDS
P0606	DPS GLOBE	Application CRC(boot)	Application CRC(boot)	reflash DPS

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0606	ECM	Control Module Processor	Faulty calibration Faulty programming Damaged ECM	Try updating the ECM calibration If the problem persists, reflash ECM If the problem persists, replace the ECM.
P0607	DPS GLOBE	Boot Count(boot)	Battery low (damaged magneto/regulator), damaged circuit wires or connection. Intense usage of WINCH	Measure battery voltage with engine stopped (Expected value: 11 to 13 Volts) Check ground and positive connections on battery Validate that all the DPS connectors are secured On the DPS power connector, measure the voltage between the two harness power wires (Expected value: Battery voltage)
P060D	ECM	Throttle Accelerator Sensor (TAS) synchronistic error between sensor 1 and 2	Throttle Accelerator Sensors (TAS) plausibility check error	Make sure sensor connector is well inserted Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P060E	ECM	Throttle position performance	TPS plausibility check error	Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P0610	ECM	Variant Coding error	Faulty variant coding Faulty programming Wrong ECM after replacement	Try updating the ECM variant or calibration If the problem persists, reflash ECM If the problem persists, replace ECM.
P062F	DPS GLOBE	EEPROM SPI	internal error or damaged DPS, EEPROM SPI	change dps if condition still active after key-on cycle external troobleshooting not possible

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P062F	ECM	Internal control module EEPROM error	Faulty calibration or variant Faulty programming Damaged ECM	Try updating the ECM variant or calibration If the problem persists, reflash ECM If the problem persists, replace ECM.
P0635	DPS GLOBE	EXCESSIVE ERROR CURRENT	internal error or damaged DPS	change DPS
P0636	DPS	MOTOR LOW CURRENT FAULT	Internal error or damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0637	DPS	MOTOR HIGH CURRENT FAULT	Internal error or damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0637	DPS GLOBE	OVER CURRENT	short-circuit in motor/ internal error	change DPS
P0658	DPS	PHASE A_LOW	DPS motor supply Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0659	DPS	PHASE A_HIGH	DPS motor supply Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P0666	DPS	HIGH TEMPERATURE	High temperature of the DPS. Extreme usage of the unit.	Let the unit cool down.
P0685	ECM	Accessory relay circuit	Blown fuse, damaged or disconnected relay, damaged circuit wires, damaged connectors or damaged ECM output pins	Check related fuse(s) Disconnect Accessories and Lights relays, turn key switch (on w/lights) Measure coil resistance of both relays (Expected value: 70 to 90 Ohms) Measure the voltage of the harness power wires of both relays relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and both relays (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0686	ECM	Accessory relay circuit shorted to ground or open circuit	Blown fuse, damaged or disconnected relay, damaged circuit wires, damaged connectors or damaged ECM output pins	Check related fuse(s) Disconnect Accessories and Lights relays, turn key switch (on w/lights) Measure coil resistance of both relays (Expected value: 70 to 90 Ohms) Measure the voltage of the harness power wires of both relays relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and both relays (Expected value < 2 Ohms)
P0687	ECM	Accessory relay circuit shorted to battery +	Damaged relay, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect Accessories and Lights relays, turn key switch (on w/lights) Measure coil resistance of both relays (Expected value: 70 to 90 Ohms) Measure the voltage of the harness power wires of both relays relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wires, between the ECM and both relays (Expected value < 2 Ohms)
P0691	ECM	Radiator fan circuit shorted to ground or open circuit	Blown fuse, damaged or disconnected fan relay, damaged circuit wires, damaged connectors or damaged ECM output pins.	Check related fuse(s) Disconnect radiator fan relay and measure his coil resistance (Expected value: 70 to 90 Ohms) Measure the voltage of the harness power wire of relay relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wire, between the ECM and relay (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P0692	ECM	Radiator fan circuit shorted to battery +	Damaged fan relay, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect radiator fan relay and measure his coil resistance (Expected value: 70 to 90 Ohms) Measure the voltage of the harness power wire of relay relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector Measure the resistance of the harness wire, between the ECM and relay (Expected value < 2 Ohms)
P0790	ECM	Check of Override Button	Damaged switch, damaged circuit wires, damaged connector, damaged ECM pins.	Open the ECM Monitoring page in BUDS. Press on Override button. Ensure that the 2 switch light change of state.
P0811	ECM	Clutch slippage detected	Excessive clutch slippage	Check clutch for proper clutch behavior
P1036	ECM	Internal fault path number for Signal error : power stage of heater of Sensor upstream catalyst, LSU 2	Blown fuse, damaged or disconnected O2 sensor, damaged or disconnected circuit wires, damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P1120	ECM	Wrong Throttle Accelerator Sensor (TPS) position	Wrong TPS sensor position. Both TPS position failed test.	Check TAS adjustment.

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P1130	ECM	ECU int. fault path no.: electrical diagnosis for lambda sensor upstream cat. Sig-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 1st oxygen sensor (FRONT cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P1136	ECM	ECU int. fault path no.: electrical diagnosis for second lambda sensor upstream cat. Sig-error	Damaged O2 sensor, damaged circuit wires, damaged connector or damaged ECM output pins.	Check related fuse(s) Disconnect the 2nd oxygen sensor (REAR cylinder) and measure his resistance (Expected value: 7 to 12 Ohms) Measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Disconnect the associated ECM connector and measure resistance between harness wires and ground (Expected value: open) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P1171	ECM	Diagnostic Fault code for Fuel Supply System (ORA Max Fault) Exhaust Bank1	Injection and fuel supply system. Adaptation of the air charge reaching the limits (min and max) based on the lambda sensors feedback. Too much variation in the engine itself in reference to a nominal engine. It can be cause by an engine that has been modified or out of spec (airbox, air filter, injectors, exhaust system, valve clearance, etc.) or any other components that can influence the engine performance.	Check injector and fuel supply system.
P1172	ECM	Diagnostic Fault code for Fuel Supply System (ORA Min Fault) Exhaust Bank1	Injection and fuel supply system. Adaptation of the air charge reaching the limits (min and max) based on the lambda sensors feedback. Too much variation in the engine itself in reference to a nominal engine. It can be cause by an engine that has been modified or out of spec (airbox, air filter, injectors, exhaust system, valve clearance, etc.) or any other components that can influence the engine performance.	Check injector and fuel supply system.
P1174	ECM	Diagnostic Fault code for Fuel Supply System (ORA Max Fault) Exhaust Bank2	Injection and fuel supply system. Adaptation of the air charge reaching the limits (min and max) based on the lambda sensors feedback. Too much variation in the engine itself in reference to a nominal engine. It can be cause by an engine that has been modified or out of spec (airbox, air filter, injectors, exhaust system, valve clearance, etc.) or any other components that can influence the engine performance.	Check injector and fuel supply system.

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P1175	ECM	Diagnostic Fault code for Fuel Supply System (ORA Min Fault) Exhaust Bank2	Injection and fuel supply system. Adaptation of the air charge reaching the limits (min and max) based on the lambda sensors feedback. Too much variation in the engine itself in reference to a nominal engine. It can be cause by an engine that has been modified or out of spec (airbox, air filter, injectors, exhaust system, valve clearance, etc.) or any other components that can influence the engine performance.	Check injector and fuel supply system.
P1339	ECM	Signal fault at phase determination	backup phase detection strategies not able to find the correct phase	
P1606	ECM	Control Module Processor	Internal ECM problem	Check for ECM fault External troubleshooting not possible
P160E	ECM	Electrical Throttle Actuator (ETA) control fault	Damaged ETC, damaged circuit wires, damaged connector or damaged ECM output pins.	Disconnect ETC Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms)
P1610	ECM	Electrical Throttle Actuator (ETA) shorted to V +	Damaged ETC, damaged circuit wires, damaged connector or damaged ECM output pins.	Disconnect ETC Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms)
P1611	ECM	Electrical Throttle Actuator (ETA) shorted to ground	Damaged ETC, damaged circuit wires, damaged connector or damaged ECM output pins.	Disconnect ETC Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms)
P1612	ECM	Electrical Throttle Actuator (ETA) signal not plausible	Damaged ETC, damaged circuit wires, damaged connector or damaged ECM output pins.	Disconnect ETC Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P1613	ECM	Electrical Throttle Actuator (ETA)	Damaged ETC, damaged circuit wires, damaged connector or damaged ECM output pins.	Disconnect ETC Measure the resistance of the harness wires, between the ECM and tested device connectors (Expected value < 2 Ohms)
P1614	ECM	Throttle idle position failure on throttle release	Throttle mechanical adjustment No initialization after throttle body/ ECM replacement	Check throttle mechanical adjustment. Check idle stop for wear. Ensure throttle plate is against throttle stop. Check throttle angle at idle. Perform THROTTLE POSITION SENSOR RESET in BUDS with throttle completely OFF. Refer to the service manual for more details.
P1615	ECM	TPS position deviation fault	Throttle mechanical adjustment No initialization after throttle body/ ECM replacement	Check throttle mechanical adjustment. Check idle stop for wear. Ensure throttle plate is against throttle stop. Check throttle angle at idle. Perform THROTTLE POSITION SENSOR INITIALIZATION in BUDS with throttle completely OFF. Refer to the service manual for more details.
P1616	ECM	Throttle limp-home-position failed	Throttle mechanical stop No initialization after throttle body/ ECM replacement	Check throttle mechanical adjustment. Check idle stop for wear. Ensure throttle plate is against throttle stop. Check throttle angle at idle. Perform THROTTLE POSITION SENSOR INITIALIZATION in BUDS with throttle completely OFF.. Refer to the service manual for more details.

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P1619	ECM	TPS adaptation failure	Wrong throttle body mechanical position during reset of closed TPS or no initialization after ECM replacement.	Check THROTTLE cable adjustment. Check idle stop for wear. Ensure throttle plate is against throttle stop. Perform THROTTLE POSITION SENSOR INITIALIZATION in BUDS with throttle completely OFF.FF.
P1620	ECM	TPS adaptation failure	Wrong throttle body mechanical position during reset of closed TPS or no initialization after ECM replacement.	Check cable adjustment. Check idle stop for wear. Make sure throttle plate is against throttle stop. Perform THROTTLE POSITION SENSOR INITIALIZATION in BUDS with throttle completely OFF.
P1621	ECM	TPS adaptation cancelled lower mechanical stop failed	Throttle mechanical stop No initialization after throttle body/ ECM replacement	Check cable adjustment. Check idle stop for wear. Ensure throttle plate is against throttle stop. Check throttle angle at idle. Perform THROTTLE POSITION SENSOR INITIALIZATION in BUDS with throttle completely OFF. Refer to the service manual for more details.
P1622	ECM	TPS adaptation failed	Throttle mechanical stop No initialization after throttle body/ ECM replacement	Check cable adjustment. Check idle stop for wear. Ensure throttle plate is against throttle stop.. Check throttle angle at idle. Perform THROTTLE POSITION SENSOR INITIALIZATION in BUDS with throttle completely OFF. Refer to the service manual for more details.
P16C0	ECM	ECU ADC plausibility check	Monitoring plausibility check failed	Check for ECM fault
P16C1	ECM	ECU ADC test failed	Monitoring plausibility check failed	Check for ECM fault
P16C2	ECM	ECU monitoring error	Monitoring plausibility check failed	Check for ECM fault
P16C3	ECM	Throttle Accelerator Sensors (TAS) monitoring check fault	Monitoring plausibility check failed	Check for ECM fault

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P16C4	ECM	Engine speed monitoring check fault	Monitoring plausibility check failed	Check for ECM fault
P16C5	ECM	Safety fuel cut-off activated monitoring check level 1	Monitoring plausibility check failed	Check for ECM fault
P16C6	ECM	Safety fuel cut-off activated monitoring check level 2	Monitoring plausibility check failed	Check for ECM fault
P16C7	ECM	Throttle valve plausibility check failed	Monitoring plausibility check failed	Check for ECM fault
P16C8	ECM	Permitted throttle valve position monitoring check exceeded	Monitoring plausibility check failed	Check for ECM fault
P1F01	DPS	Power output overload	Motor short circuit or power output failed	Reset fault, If fault re-occur, replace DPS unit
P1F02	DPS	Power output overload (18V).	High voltage at the unit input.	Measure battery voltage with engine stopped. (Expected value: 11 to 13 volts) Measure battery voltage with engine running. (Expected value: 13 to 14.7 volts) test charging system as per shop manual
P1F03	DPS	Electronic Circuit Overheat	Hi temperature detected by on board temperature sensor.	Fault may become Active in extreme use situations. Reset fault and let DPS cool down. If fault re-occur in normal riding conditions, replace DPS unit
P1F05	DPS	Motor current sensor range/performance	Motor input vs output Current correlation check failed	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P20EB	ECM	Main relay de-energized too late or sticking	Damaged circuit wires, damaged connectors or damaged ECM output pins. Damaged relay	Disconnect main relay and measure his coil resistance (Expected value: 70 to 90 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P212C	ECM	2nd Throttle Accelerator Sensors (TPS) low	Damaged TPS, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is well inserted Disconnect the sensor and associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P212D	ECM	2nd Throttle Accelerator Sensors (TPS) high	Damaged TPS, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is well inserted Disconnect the sensor and associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P2228	ECM	Ambient pressure sensor shorted to ground	Damaged sensor, damaged circuit wires, damaged connector or damaged ECM pins, ECM voltage supply low	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P2229	ECM	Ambient pressure sensor short to V +	Damaged sensor, wires shorted to battery +, ECM voltage supply too high.	Make sure sensor connector is well inserted Disconnect the sensor, measure the voltage of the harness power wires (Expected value: 4.8 to 5.1 Volts) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P2279	ECM	Intake Air System leak	Check for cracked plenum	Intake or throttle body air leak

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P2299	ECM	Throttle and break pedal are used at the same time	If the accelerator pedal and the brake are activated simultaneously for a delay time and the vehicle is moving faster than Speed-threshold	
P2416	ECM	exchanged lambda sensors upstream catalyst	Wrong O2 sensor position after O2 replacement or wire replacement.	Swap O2 sensor wires.
P2530	ECM	Ignition switch state not plausible	Ignition key switch connection or internal switch fault	Check ignition key contacts and wire connections
P2620	ECM	Throttle Accelerator Sensors (TPS) position	Wrong TPS sensor position.	Check TAS adjustment.
P2621	ECM	First Throttle Accelerator Sensor (TPS) low	Damaged TPS, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is well inserted Disconnect the sensor and associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P2622	ECM	First Throttle Accelerator Sensors (TPS) high	Damaged TPS, damaged circuit wires, damaged connector or damaged ECM output pins.	Make sure sensor connector is well inserted Disconnect the sensor and associated ECM connector Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 2 Ohms)
P2670	DPS	PHASE B_LOW	DPS motor supply Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS
P2671	DPS	PHASE B_HIGH	DPS motor supply Damaged DPS	External troubleshooting is not possible Clear the Fault. If Fault becomes Active Replace the DPS

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
P2801	ECM	Gear position sensor invalid range	Damaged circuit wires, damaged gear position sensor, damaged ECM pins or damaged transmission.	Open ECM Monitoring page in BUDS, Verify that gear position information changes with gear selection changes on vehicle. Disconnect GBPS Measure voltage between harness connector 5-GBPS-1 and 5-GBPS-3. (Expected value: 4.8 to 5.1 Volts) Measure resistance from connector: 5-ECM-B13 to 5-GBPS-2 (Expected value: < 2 Ohms) Measure resistance from connector: 5-ECM-B22 to 5-GBPS-3 (Expected value: < 2 Ohms)
P2806	ECM	Gear position sensor angle defined area vs position not plausible	Damaged circuit wires, damaged gear position sensor, damaged ECM pins or damaged transmission.	Open ECM Monitoring page in BUDS, Verify that gear position information changes with gear selection changes on vehicle. Disconnect GBPS Measure voltage between harness connector 5-GBPS-1 and 5-GBPS-3. (Expected value: 4.8 to 5.1 Volts) Measure resistance from connector: 5-ECM-B13 to 5-GBPS-2 (Expected value: < 2 Ohms) Measure resistance from connector: 5-ECM-B22 to 5-GBPS-3 (Expected value: < 2 Ohms)
U0073	DPS	CAN bus off, no messages	Damaged circuit wires or damaged DPS pins.	On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and DPS connectors (Expected value < 5 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
U0073	DPS GLOBE	CAN LOSS/CANBUS FAILURE/CANBUSS OFF	Damaged CAN Bus wires to Network, damaged DPS pins or wires.	On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and DPS connectors (Expected value < 5 Ohms)
U0073	SCM	CAN-Bus failure, CAN-Bus OFF	Damaged circuit wires or damaged SCM pins.	On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and SCM connectors (Expected value < 2 Ohms)
U0100	DPS	Lost communication with ECM (lost of CAN ID's)	Damaged CAN Bus wires to ECM, damaged DPS/ECM pins.	On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and ECM connectors (Expected value < 5 Ohms)
U0100	DPS GLOBE	ECM CAN COMMUNICATION OFF	Damaged CAN Bus wires to Network, damaged DPS pins or wires.	On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and DPS connectors (Expected value < 5 Ohms)
U0100	SCM	Lost Communication With ECM (lost of CAN ID's)	Missing CAN ID from ECM Internal module error Damaged circuit wires or damaged module pins.	On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and ECM connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
U0155	DPS	Lost communication with CLUSTER	Damage CAN Bus wires to cluster Damaged circuit wires or damaged Cluster module pins.	On the Cluster power connector, measure the voltage between the two harness power wires (Expected value: Battery voltage) On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and Cluster connectors (Expected value < 2 Ohms)
U0155	ECM	Lost communication with CLUSTER (lost of CAN ID's)	Missing CAN ID Module internal error Damaged circuit wires or damaged module pins.	With vehicle connected to BUDS with MPI2, check for CLUSTER fault or ECM fault Disconnect the cluster connector Measure the voltage of the harness power wires relative to ground (Expected value: Battery voltage) Disconnect MPI2 from DB connector Measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Disconnect the ECM connector Measure the resistance of each CAN wire in the harness, between the Diagnostic and ECM connectors (Expected value < 2 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and Cluster connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
U0155	ECM	Lost communication with CLUSTER (lost of CAN ID's)	Missing CAN ID Module internal error Damaged circuit wires or damaged module pins.	With vehicle connected to BUDS with MPI2, check for CLUSTER fault or ECM fault Disconnect the cluster connector Measure the voltage of the harness power wires relative to ground (Expected value: Battery voltage) Disconnect MPI2 from DB connector Measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Disconnect the ECM connector Measure the resistance of each CAN wire in the harness, between the Diagnostic and ECM connectors (Expected value < 2 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and Cluster connectors (Expected value < 2 Ohms)
U0155	SCM	Lost Communication With Cluster (lost of CAN ID's)	Missing CAN ID Module internal error Damaged circuit wires or damaged module pins.	Check for Cluster fault Measure the voltage of the cluster harness power wires relative to ground (Expected value: Battery voltage) On the Diagnostic connector, measure the resistance between the two CAN lines (Expected value: 50 to 70 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and SCM connectors (Expected value < 2 Ohms) Measure the resistance of each CAN wire in the harness, between the Diagnostic and Cluster connectors (Expected value < 2 Ohms)

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
U0167	ECM	Lost communication with Vehicle Immobilizer Control Module	The Vehicle Immobilizer is reporting an electrical fault on the communication line.	Check for dirty or oxidized Key contact. Clean key contact if needed. Check for broke key contact Ensure sensor connector is fully inserted. Measure resistance between ECMB-A1 and CC-C (Expected value < 2 Ohms). Measure resistance between ECMB-C2 and CC-E (Expected value < 2 Ohms).
U0300	ECM	Invalid Security Exchange received	Incorrect ECM or CLUSTER, Incorrect software version.	Install the proper ECM or CLUSTER on vehicle. Update security coding using BUDS
U0301	ECM	Variant Coding, software incompatibility (DFC_MoFVar)	Faulty calibration or variant Faulty programming Damaged ECM	Try updating the ECM variant or calibration If the problem persists, reflash ECM If the problem persists, replace ECM.
U0302	ECM	Variant Coding, software incompatibility (DFC_MTVARNPL)	Faulty calibration or variant Faulty programming Damaged ECM	Try updating the ECM variant or calibration If the problem persists, reflash ECM If the problem persists, replace ECM.
U0400	DPS	Variant Coding failure Software incompatibility	Faulty variant coding Faulty programming	Check in the BUDS Tab "vehicle configuration" if the DPS option is checked. Reflash the DPS with the latest software
U0400	DPS GLOBE	VARIANT IMCOMPATIBILITY	vehicle configuration error or DPS software mismatch or error	look at BUDS vehicle config. check DPS for reflash write config and cycle on/off vehicle
U0400	SCM	Variant Coding failure Software incompatibility	SCM not install on expected vehicle Faulty programming	Check if SCM is install on a valid vehicle Update SCM Open Vehicle Configuration in Setting page in BUDS & if check vehicle configuration is set as expected for the vehicle.

PCODE	MODULE	DESCRIPTION	CAUSE	ACTION
U0416	DPS GLOBE	VEHICLE SPEED ERROR VALUE	vehicle speed error value received from ECM	Check if vehicle speed is available in Monitoring page in BUDS Check related fuse(s) Remove the sensor connector, measure the voltage of the harness power wire relative to ground (Expected value: Battery voltage) Measure the resistance of the harness wires, between the ECM and sensor connectors (Expected value < 5 Ohms)
U0426	ECM	Invalid Data Received From Vehicle Immobilizer Control Module	The Vehicle Immobilizer could not read the number of the access key.	Check for dirty or oxidized Key contact. Clean key contact if needed. Check for broke key contact Ensure sensor connector is fully inserted. Measure resistance between ECMB-A1 and CC-C (Expected value < 2 Ohms). Measure resistance between ECMB-C2 and CC-E (Expected value < 2 Ohms).
U220E	ECM	Invalid Check Sum from CLUSTER message	Check Sum error	External troubleshooting is not possible Check for communication fault
U3001	DPS	Module improper shutdown	Lost of power on DPS that can be caused by damaged circuit wires or damaged DPS pins.	Check the two DPS fuses Ensure DPS connector is fully inserted. Check for Damaged tail light, DPS, Cluster circuit wires Check for damaged DPS pins.
U3001	SCM	Module improper shutdown	Lost of power on SCM Damaged circuit wires or damaged SCM pins.	Check fuse Ensure SCM connector is fully inserted. Check for Damaged circuit wires or damaged SCM pins.

INTELLIGENT THROTTLE CONTROL (iTC)

GENERAL

SYSTEM DESCRIPTION

The iTC is an electronic throttle control system that includes:

– Throttle accelerator sensor (TAS)
– Electric throttle actuator (ETA)
– Throttle position sensor (TPS).

The TAS is part of the accelerator pedal module. The ETA and TPS are comprised in the throttle body.

The iTC is often referred to as a "throttle by wire" system (no throttle cable is used).

According to the accelerator pedal position and other EMS inputs, the ECM powers the ETA motor using pulse width modulation (PWM), to control the throttle plate. When the ECM detects through the TPS that the throttle plate has reached the targeted position, the ECM stops the throttle actuator.

Depending on various conditions and the type of key used, the iTC can modify the ETA response, limit the engine torque or vehicle speed.

For torque limitation, the ECM processes the TAS input differently depending on the specific mode. In other words, the driver's demand may not necessarily result in the corresponding throttle opening.

For vehicle speed limitation, the iTC controls the throttle opening to maintain a maximum set speed even if the accelerator is pedal fully depressed.

SYSTEM MAIN FEATURES

The iTC allows the use of different types of keys.

Types of Keys

Optional Performance Key

No limitation, just like the non-DESS keys that come with the Defender.

Optional Normal Key

Limits vehicle speed to maximum 70 km/h (43 MPH) with only 90% engine torque available.

Optional Work Key

Limits vehicle speed to maximum 40 km/h (25 MPH) with full engine torque available.

SYSTEM OTHER FEATURES

Driver's Seat Belt Monitoring

If driver's seat belt not fastened, speed is limited to approximately 20 km/h (12 MPH).

Brake Monitoring

If the ECM receives a brake switch signal while gearbox is in gear and the vehicle moving, the ETA will decrease throttle plate opening and engine speed will drop to idle.

NOTE: A defective brake light switch that would stay in a closed position would force the engine to run at idle.

Low Range Operation

When gearbox is in low range, engine delivers less than the accelerator pedal demand and the accelerator pedal response is smoother than in high gear.

Drive Shaft Saver

In a case where the drive wheels would momentarily leave the ground while the driver holds the throttle, this mode protects the drive system.

The system will enter the drive shaft saver mode if the ECM detects an excessive wheel acceleration rate. In such a case, the iTC will reduce the engine torque. .

Engine Temperature Monitoring

If coolant gets too hot, engine will deliver less than the accelerator pedal demand. The limitation is proportional to the overheat degree.

Battery Voltage Monitoring

If the battery voltage gets low, the engine idle RPM will be increased at approximately 1350 RPM.

Drowned Mode

In case of a fuel flood, the engine can be cranked without fuel injection.

To enter the drowned mode, fully depress the accelerator pedal and hold it while cranking the engine.

Limp Home Mode

When certain faults are occurring, the ECM will enter the limp home mode. In this mode, the engine will deliver less than the accelerator pedal demand.

PROCEDURES

SEAT BELT SWITCH

Seat Belt Switch Wire Information

FUNCTION	PIN	COLOR
Signal (to ECM B pin E3)	A	YE/GY
Ground through ECM (to ECM B pin A1)	B	OG/VT

THROTTLE ACCELERATOR SENSOR (TAS)

TAS Description

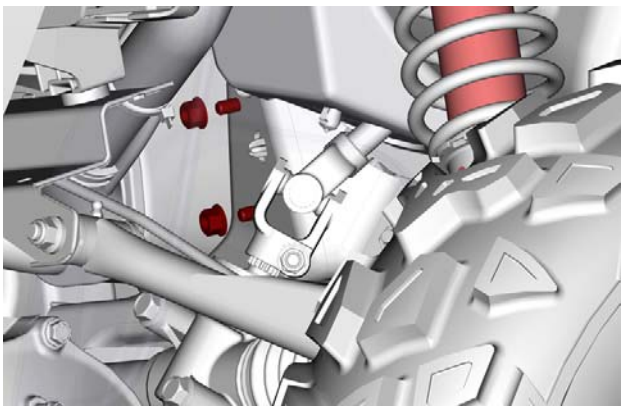
The throttle accelerator sensor (TAS) is a double hall effect sensor that sends a signal to the ECM which is proportional to the accelerator pedal. The redundancy is used for security purposes.

The voltage output of the hall effect sensors are different.

TAS Removal and Installation

The TAS is part of the accelerator pedal.

1. Note the wire routing and locking tie position.
2. Disconnect electrical connector.
3. Remove both accelerator pedal retaining nuts by outside near the steering column. Reach nuts by the LH side of the vehicle.



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To install, reverse the removal procedure, however pay attention to the following:

Route and attach wires correctly.

Tighten nuts to the specified torque.

TIGHTENING TORQUE	
Accelerator pedal retaining nuts	13 N•m ± 1 N•m (115 lbf•**in** ± 9 lbf•**in**)

Carry out the *ECM FIRST INITIALIZATION*, refer to *ELECTRONIC FUEL INJECTION (EFI)* subsection.

TAS Wire Information

FUNCTION	PIN	COLOR
Signal	A	BLUE/GREEN
Ground through ECM	B	BLUE/RED
Voltage input (5 volt)	C	BLUE/ORANGE
Voltage input (5 volt)	D	BLUE/BLACK
Signal	E	BLUE/PINK
Ground through ECM	F	BLUE/VIOLET

TAS Failure

If one or both TAS signal(s) is (are) missing, the engine will be forced to run at idle. The accelerator pedal will not have any effect on engine speed.

TAS Test Using the BRP Diagnostic Software

The TAS signal can be monitored using the BRP diagnostic software.

Connect the vehicle to the BRP diagnostic software. Refer to *COMMUNICATION TOOLS* subsection.

Select:

– **Measurements** page

– **Vehicle** or **ECM** button
– **Presets** tab.

Double click on "ECM - Basic" to enter the monitoring display.

The TAS signal should vary from near 0% to near 100% depending on the pedal position, which confirms the TAS signal reaches the ECM.

If the TAS signal is above 2% with the accelerator pedal at rest, replace the accelerator pedal assembly.

ELECTRONIC FUEL INJECTION (EFI) (HD5)

SERVICE TOOLS

Description	Part Number	Page
ECM ADAPTER TOOL	529 036 166	1
FLUKE 115 MULTIMETER	529 035 868	1
OETIKER PLIER	295 000 070	9

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	15
SYNTHETIC GREASE	779162	13

GENERAL

The following tools are required to test most of the electrical parts.

REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	
ECM ADAPTER TOOL (P/N 529 036 166)	

⚠ WARNING

Fuel is flammable and explosive under certain conditions.
Ensure work area is well ventilated.
Do not smoke or allow open flames or sparks in the vicinity.
Fuel lines remain under pressure at all times. Always proceed with care and use appropriate safety equipment when working on pressurized fuel system.
Wipe off any fuel spillage.
Do not allow fuel to spill on hot engine parts and/or on electrical connectors.
Replace any damaged, leaking or deteriorated fuel lines or connections.
Always, pressurize the fuel system if any fuel related component was disconnected or removed.
Proceed with care when removing/installing high pressure test equipment.

SYSTEM DESCRIPTION

Refer to the *ENGINE MANAGEMENT SYSTEM* subsection for a general layout of the various EFI system components.

The electronic fuel injection system (EFI) is comprised of various sensors used for detecting ongoing operating conditions of the engine and vehicle, and includes all the components that perform the required adjustments to the engine.

Electrical System

ECM (Engine Control Module)

From input signals, the ECM acknowledges driver demands and converts them to an engine torque requirement through calculation of several variables. Then, the ECM controls the iTC, the injection system and the ignition system to meet the torque requirement.

The ECM manages the engine torque requirements and controls engine operation to ensure it is delivering optimum performance and fuel economy. The ECM also controls idle RPM and limits maximum engine speed through the iTC system.

EFI Sensors

The ECM reads the inputs from the sensors which it compares to predetermined parameters stored in the ECM, makes computations, and activates the outputs accordingly (injector, ignition coil etc.).

Signals from sensors are used by the ECM to determine the injection and ignition parameters (referenced to fuel maps) as required to maintain the optimum air-fuel ratio.

Air Intake System

Air Filter

Air, drawn into the air filter housing, first passes through an inlet duct.

After it passes through the air filter, an air duct (intake adapter) is used to channel the air to the throttle body.

Throttle Body

The throttle body is mounted on the intake manifold.

Air for combustion, drawn in by the engine, flows through the air intake system, then through the throttle body where it is regulated by the electronic throttle actuator (ETA).

The ETA allows the ECM to control the throttle plate, and therefore engine torque.

The TPS is also incorporated in the throttle body. It provides a signal to the ECM of the actual throttle plate position.

Fuel System

Fuel Rail

The fuel rail is mounted on the intake manifold. The fuel rail secures the injector to the manifold and also provides the injector the fuel pressure that is received from the fuel pump.

The fuel pressure applied to the fuel rail is regulated by the fuel pressure regulator located in the fuel pump module.

Fuel Injector

The fuel injector is used to inject fuel into the intake port of the cylinder head.

Fuel Pump

An electric fuel pump with an integrated pressure regulator and fuel system filters is used. For more details on the fuel pump unit, refer to *FUEL TANK AND FUEL PUMP* subsection.

ADJUSTMENT

IDLE SPEED

Idle speed is not adjustable. The ECM controls the idle speed of the engine primarily through control of the throttle plate position.

The vehicle multifunction gauge can provide an accurate digital readout of the engine's idle speed.

The engine RPM may also be verified using the BRP diagnostic software (BUDS2).

Connect the vehicle to BUDS2. Refer to *COMMUNICATION TOOLS* subsection.

Select the following:
- Measurements
- Presets
- ECM - basic.

NOTE: The multifunction gauge and the BRP diagnostic software use the same signal to provide the engine RPM indication.

TROUBLESHOOTING

DIAGNOSTIC TIPS

The first step in troubleshooting the EFI system is to check for fault codes using the BRP diagnostic software BUDS2. Refer to *COMMUNICATION AND TOOLS* and *DIAGNOSTIC AND FAULT CODES* subsections.

However, engine problems are not necessarily related to the electronic fuel injection system.

It is important to ensure that the engine, fuel delivery system and electrical systems are operating normally.

After a problem has been solved, be sure to clear the fault(s) in the ECM using the BRP diagnostic software.

⚠ WARNING

Electrical actuators and electronic modules may be powered up as soon as the ignition switch is set to ON. Always disconnect the battery prior to disconnecting any electrical or electronic parts.

Never use a battery charger to temporarily substitute the battery as it may cause the ECM to function erratically, or not at all.

Check related-circuit fuse solidity and condition with an ohmmeter. A visual inspection could lead to a false diagnosis.

Electrical Related Problems

It is important to check the following in the electrical system:
- Battery voltage
- Fuses
- Ground connections
- Wiring and connectors.

Ensure that all electronic components are genuine OEM. Any modification to the wiring harness may lead to poor system operation or generate fault codes.

Electrical Connections

Pay particular attention to ensure that terminals and pins are not out of their connectors, corroded, or out of shape.

When probing terminals, pay attention not to deform the terminals as this could cause a loose or intermittent connection that would be difficult to troubleshoot.

PROCEDURES

ENGINE CONTROL MODULE (ECM)

NOTE: As a first troubleshooting step, always check for applicable fault codes using the BRP diagnostic software (BUDS2).

Quick Test to Validate ECM Operation

Turn ignition key to ON.

NOTE: Setting the ignition switch to ON wakes up the ECM, which then turns on the following.

QUICK INDICATION THAT ECM IS FUNCTIONING (ASSUMING THE OBSERVED COMPONENT IS IN GOOD WORKING ORDER)
Multifunction gauge turns ON.
Fuel pump turns on for approx. 5 seconds.
Rear lights turn on.

ECM First Initialization

This procedure performs a reset of the following values in the ECM:

– TAS (Throttle Accelerator Sensor)
– TPS (Throttle Position sensor)
– GBPS (Gearbox Position Sensor).

This reset **must** be carried out whenever the ECM has been replaced.

This reset **may** be carried out whenever any of the following components have been replaced instead of their respective reset procedures:

– Throttle body (for TPS)
– GBPS (Gearbox Position Sensor).

1. Connect vehicle to the BRP diagnostic software, refer to *COMMUNICATION TOOLS* subsection.
2. Select the following:
   – **Setting** tab
   – **ECM** tab.
   – **ECM first initialization** tab.

If the operation is successful, a message will be displayed stating that the reset was successful.

If an error occurred or a component is out of range, a message may be displayed. Follow the instructions in the message and repeat the procedure.

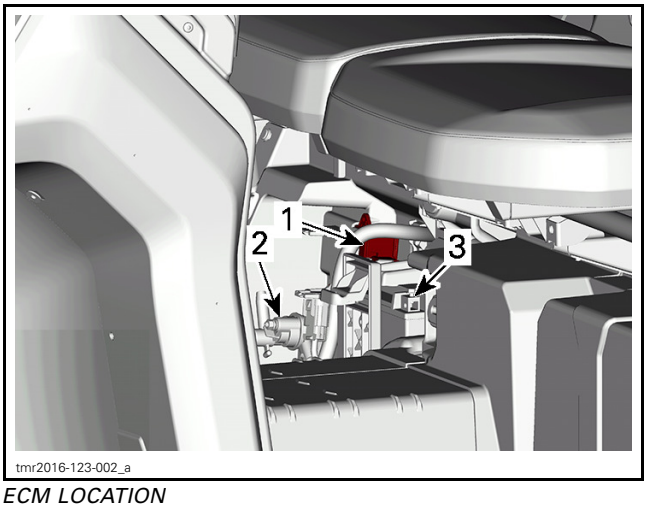
3. Check for fault codes.

If a fault code is generated, carry out the service actions, reset the fault and repeat the reset procedure.

4. Start engine and make sure it operates normally throughout its full engine RPM range.

ECM Access

The ECM is located under the right passenger's seat, to the right of the fuse box and behind the starter solenoid.

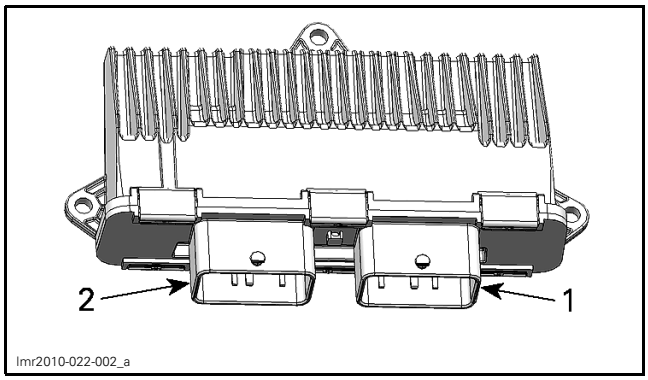


ECM LOCATION
1. ECM
2. Starter solenoid
3. Battery

ECM Connector Identification

There are 2 connectors connected to the ECM:

– Engine harness connected to ECM-A
– Vehicle system control harness connected to ECM-B.



1. *Connector A*
2. *Connector B*

The ECM connectors have 48 pins.

NOTE: For connector information, cleaning and probing, refer to *WIRING HARNESS AND CONNECTOR* subsection.

ECM Adapter Tool

To probe ECM connector terminals, use the ECM adapter tool.

NOTE: This tool will prevent deforming or enlarging terminals which would lead to bad ECM terminal contact creating intermittent or permanent problems.

ECM Power Supply Test

1. Disconnect connector "B" from the ECM.
2. Install ECM connector "B" on the ECM adapter tool.
3. Install a jumper wire between B-H2 and B-M2 on the ECM adapter tool.
4. Turn the ignition switch to ON.
5. Use the multimeter and select Vdc.
6. Check for voltage as follows.

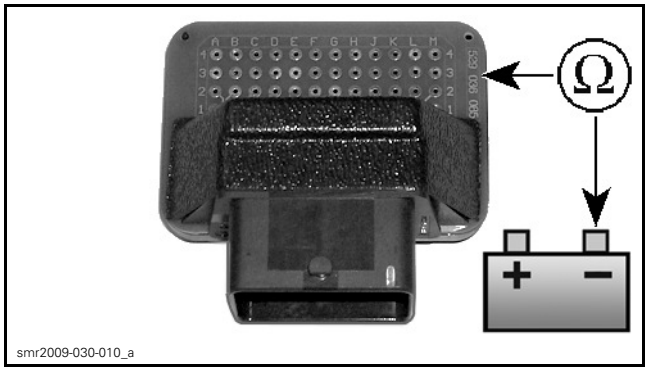
ECM ADAPTER	BATTERY	VOLTAGE
B-M4	Negative post	Battery voltage

If voltage is not measured, check the following:
– Main relay
– Wiring and connections, refer to the *WIRING DIAGRAM*.

Testing the Continuity of ECM Ground Circuits

1. Disconnect connector "B" from ECM.
2. Install the ECM adapter tool on ECM-B connector.
3. Use the multimeter and select Ω.
4. Probe adapter terminals as per following table.

ECM ADAPTER	BATTERY POST	RESISTANCE
Pins B-L1, B-M2 and B-M3	Ground	Close to 0 Ω (continuity)



If any measurement is out of specification, check the grounds. Refer to *POWER DISTRIBUTION AND GROUNDS* subsection.

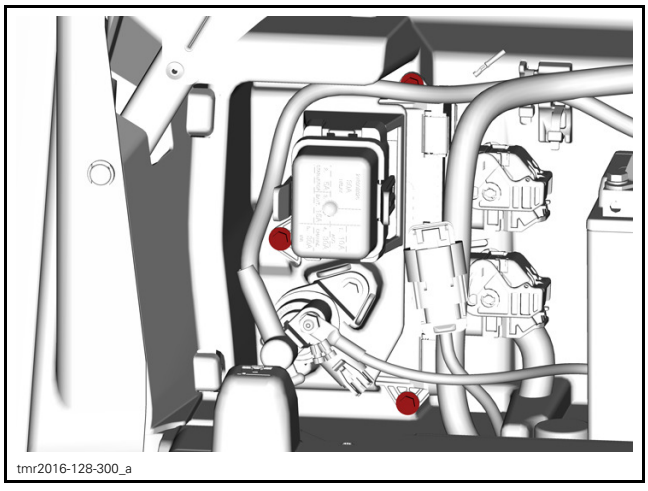
Removing the ECM

NOTE: If a new ECM is to be installed, first read the procedures in *REPLACING THE ECM* in this subsection.

1. Disconnect battery cables.

NOTICE Always disconnect the BLACK negative (–) battery cable first, then disconnect RED positive (+) cable.

2. Disconnect both ECM connectors from ECM.
3. Unscrew all retaining screws and remove the ECM from its support.



Installing the ECM

Reverse removal procedure however, pay attention to the following.

TIGHTENING TORQUE	
ECM retaining screws	2.5 N•m ± 0.5 N•m (22 lbf•**in** ± 4 lbf•**in**)

1. Reconnect ECM connectors.
2. Reconnect battery cables.

⚠ WARNING

Always reconnect the RED positive (+) battery cable first, then reconnect BLACK negative (–) cable.

3. If a new ECM is installed, refer to *REPLACING THE ECM* in this subsection.

Replacing the ECM

NOTE: Prior to replacing an ECM, ensure that all the recommendations in the general introduction of this subsection have been followed and all applicable testing procedures have been carried out.

When the ECM is replaced, data must be entered into the new ECM . Refer to *ECM MANUAL DATA ENTRY FOR ECM REPLACEMENT* further in this subsection.

ECM Data Entry for ECM Replacement

Use one of the following 2 methods to collect the required information. The 1st being the easiest:

1. Use BUDS2 to obtain the data from a saved "*.buds2" file on your PC computer.
2. Collect the information from the vehicle and on the Knowledge Center.

Once the required information has been collected, refer to *ENTERING THE COLLECTED INFORMATION INTO THE ECM*.

1st Collecting Method: Obtaining the Data from a Saved .buds2 File

1. Start BUDS2.

NOTE: It is not necessary to perform any connection. The PC computer can be used alone.

2. In BUDS2, click on the **Open a BUDS2 file** button.

Make sure you are at: C:\Program Files(x86)\BRP\BUDS2\Files.

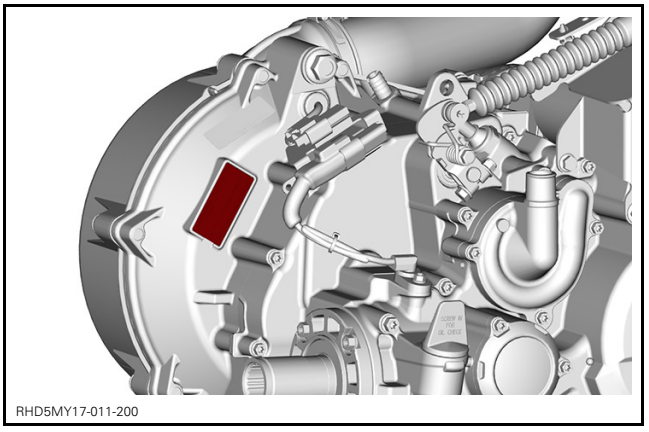
IMPORTANT: Be sure to use the file that specifically matches the vehicle you are servicing.

NOTE: The file name structure is as follows:
VIN_date read (yyyymmdd)_hour read (hhmmss).mpem
Example: **2BPSBK8C68V000168_20090206_111640.buds2** Therefore: VIN: 2BPSBK8C68V000168 Date: 2009 02 06 Hour: 11h 16m 40s

3. Select the **Summary/ Vehicle** page tab and record (write down) the following information.
   1. Vehicle serial number
   2. Engine serial number
   3. Vehicle model number
   4. Customer name.

2nd Collecting Method: Collect the Information from the Vehicle and BOSSWeb

1. Record engine serial number.



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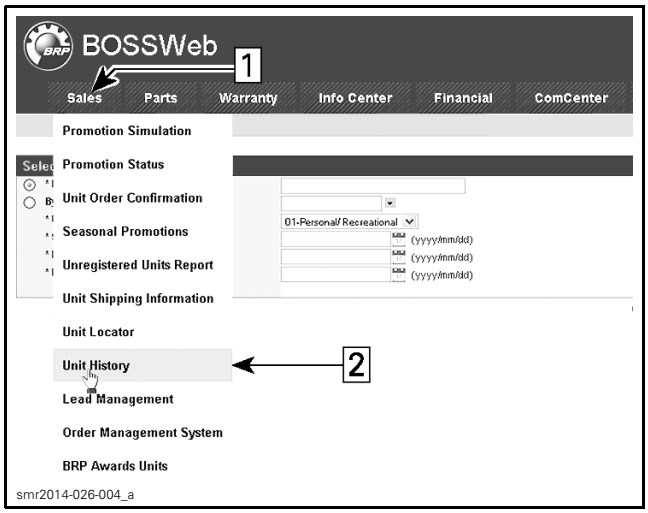
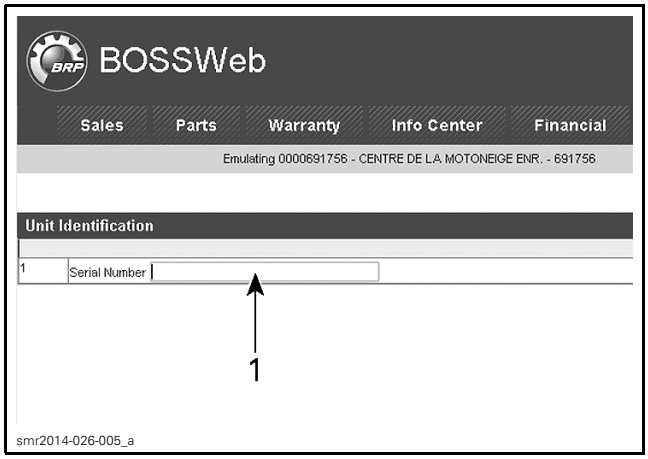
2. Record the following numbers from BOSSWeb. Look in **Sales** menu and choose **Unit history**.
   1. Vehicle serial number
   2. Vehicle model number
   3. Customer name.



SERVICE, UNIT HISTORY
1. *Click on* SALES *menu*
2. *Select* Unit History



1. *Vehicle Serial Number here*

3. Enter the recorded data in the new ECM as detailed in *ENTERING THE COLLECTED INFORMATION INTO THE ECM*.

Entering the Collected Information Into the ECM

1. Connect the vehicle to BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
2. In BUDS2, click the **Scan** button to read the new ECM.
3. Select the **Summary/ Vehicle** page tab and write all of the following information you recorded previously.
   1. Vehicle serial number (VIN)
   2. Engine serial number
   3. Vehicle model number
   4. Customer name.

NOTICE . Enter only the appropriate product model number as obtained when gathering the information.

NOTICE Pay particular attention when typing the V.I.N. and model numbers. Once **Write Data** button is pressed, the data cannot be modified.

4. Perform the *CLOSED THROTTLE RESET* procedure, refer to *ADJUSTMENTS* in this subsection.
5. Start the engine and ensure proper operation.
6. Reinstall any remaining removed parts.

FUEL INJECTOR

Testing the Fuel Injector Operation (Dynamic)

NOTE: As a first troubleshooting step, always check for applicable fault codes using BRP diagnostic software (BUDS2)

1. Connect vehicle to BUDS2 software. Refer to *COMMUNICATION TOOLS*
2. Turn key to the **ON** position.
3. Click the following:
   – **Scan** button
   – **Functions** tab.
   – **Activate Fuel Injector**

You should hear the fuel injector "clic" when activating, if not, carry out *TESTING THE FUEL INJECTOR RESISTANCE*.

Testing for Fuel Injector Leaks

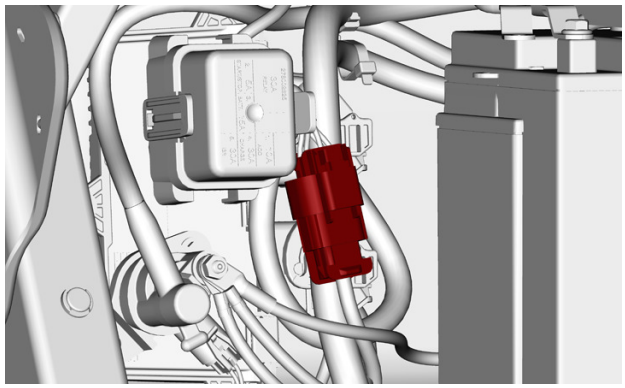
Carry out the *TESTING THE FUEL PUMP PRESSURE* as detailed in the *FUEL TANK AND FUEL PUMP* subsection.

Testing the Fuel Injector Resistance

Disconnect connector “A” from the ECM.

Disconnect the engine connector (HIC).

NOTE: The HIC connector is located to the right of the ECM.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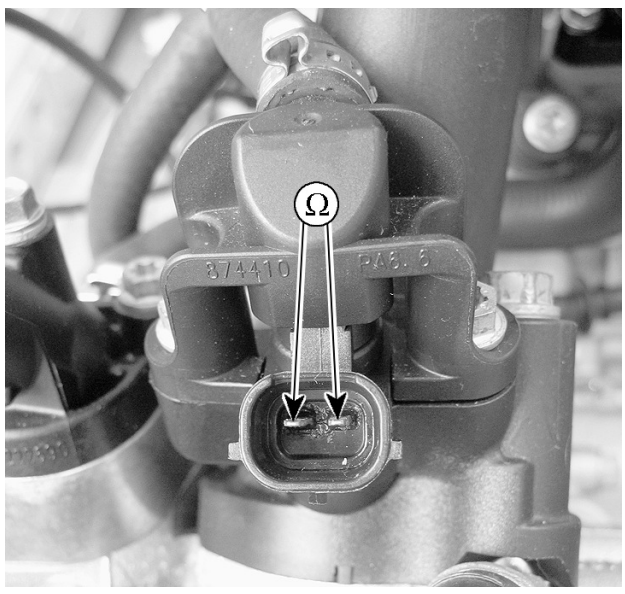
Check resistance value between terminals as follows.

FUEL INJECTOR RESISTANCE TEST AT HIC CONNECTOR		
HIC CONNECTOR	ECM CONNECTOR "A"	RESISTANCE @ 20°C (68°F)
D	A-K1	11.4 - 12.6 Ω

If resistance value obtained is incorrect, remove injector connector and check resistance value between injector pins as follows.

FUEL INJECTOR RESISTANCE TEST AT INJECTOR CONNECTOR		
INJECTOR PIN		RESISTANCE @ 20°C (68°F)
1	2	11.4 - 12.6 Ω



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TYPICAL

If readings are out of specifications, replace injector.

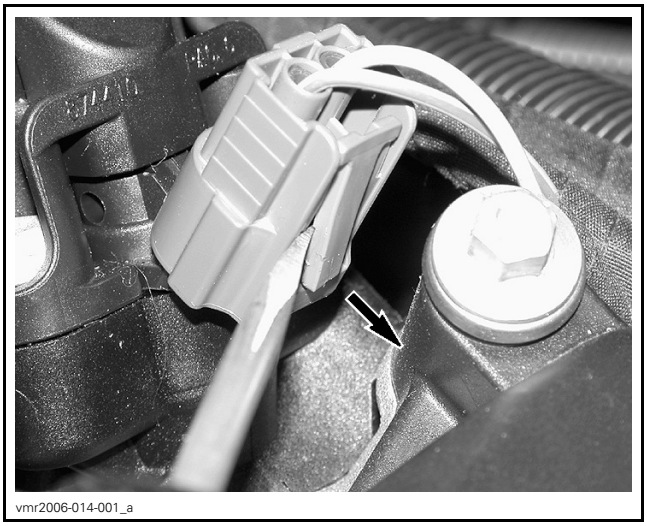
If readings are good, carry out *TESTING THE FUEL INJECTOR INPUT VOLTAGE*.

Testing the Fuel Injector Input Voltage

Reconnect connector "A" to ECM.

Disconnect the fuel injector connector.

NOTE: If the connector is hard to unlock, gently use a screwdriver to release connector.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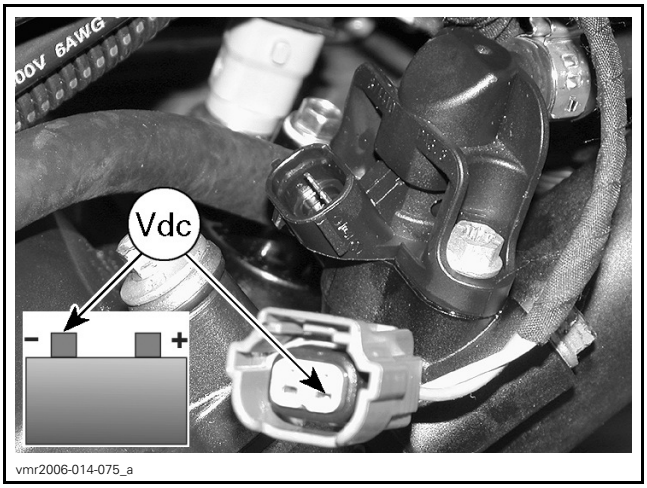
TYPICAL

NOTE: It is not necessary to activate the injector since it is continuously powered when the ignition key is set to ON.

Use a multimeter and set it to Vdc. Read voltage.

INJECTOR CONNECTOR		
WIRE		MEASUREMENT
VIOLET/ BLUE	Battery ground	Battery voltage



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TYPICAL

If supply voltage is not good, check continuity between fuse F5 and injector (see *WIRING DIAGRAMS*).

NOTE: Probe fuse exactly as shown. This validates fuse at the same time.

Use a multimeter and set it to Ω. Read resistance.

INJECTOR CIRCUIT		MEASUREMENT
WIRE		
VIOLET/ BLUE	Fuse F5	Close to 0 Ω

If continuity is good, check relay and wiring from battery.

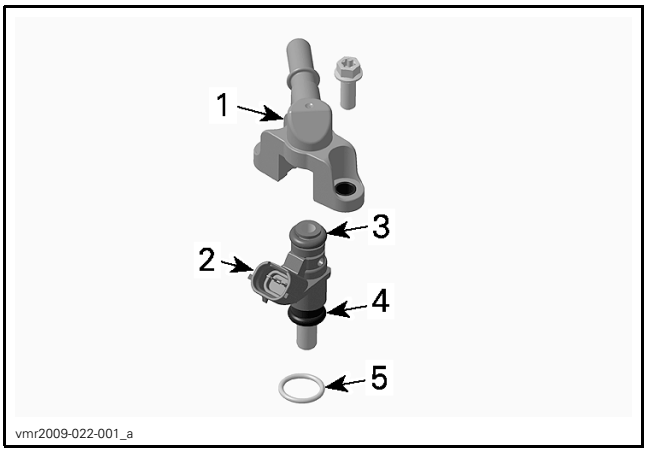
If continuity is faulty, check fuse and if OK, repair/replace wiring going to injector.

If supply voltage is good, check ground circuit between injector and ECM (see *WIRING DIAGRAMS*).

– If ground circuit is faulty, repair/replace wiring and connectors.
– If ground circuit is good, refer to *REPLACING THE ECM*.

Removing the Fuel Injector

Remove the fuel rail refer to *FUEL RAIL* for the procedure.



TYPICAL - FUEL RAIL ASS'Y
1. *Fuel rail*
2. *Fuel injector*
3. *Injector top O-ring*
4. *Injector bottom O-ring*
5. *Manifold O-ring*

Then pull fuel injector out of the fuel rail.

Installing the Fuel Injector

For the installation, reverse the removal procedure. Pay attention to the following details.

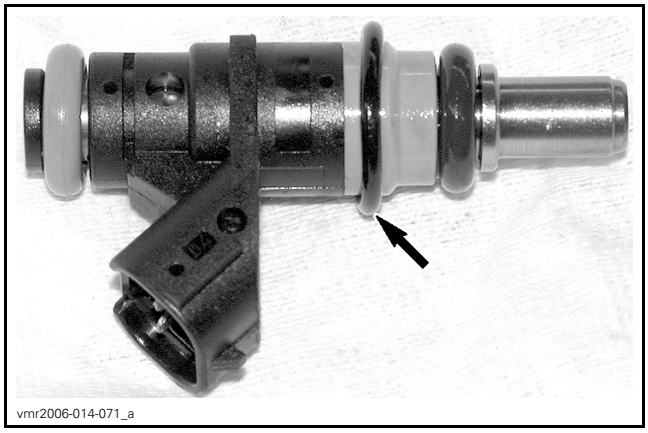
NOTICE **If installing the removed injector(s), always install NEW O-rings.**

Lubricate O-rings to ease insertion in rail.

FUEL INJECTOR O-RINGS	
Service product	Engine oil

Install fuel injector with your hand. Do not use any tool.

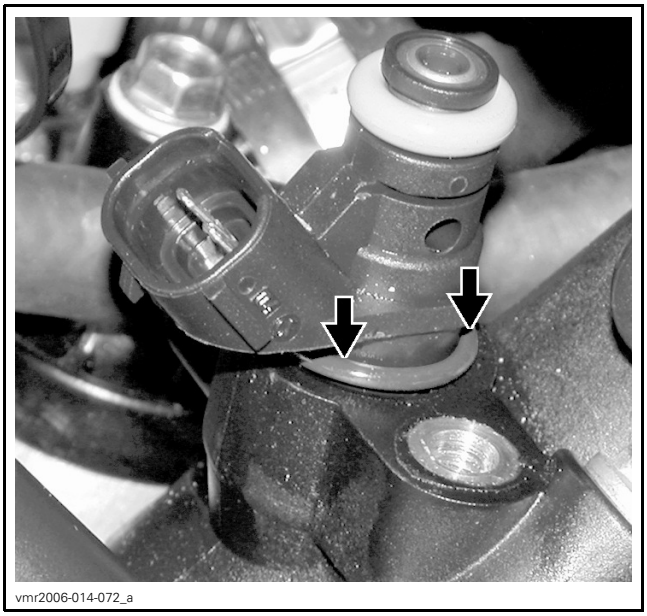
Position the manifold O-ring on injector as in following illustration.



TYPICAL - MANIFOLD O-RING POSITION

Carefully insert injector in manifold paying attention to the manifold O-ring.

NOTICE **Gently push O-ring in evenly all around while inserting injector. O-ring must be completely inserted and not visible, before completing the insertion of the injector.**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Firmly push injector until it bottoms out.

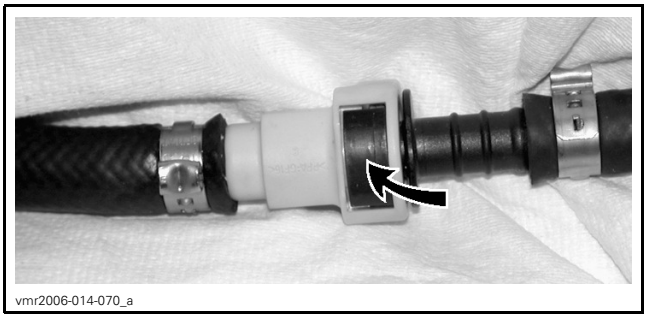
Reinstall fuel rail.

FUEL RAIL

Replacing the Fuel Rail

Removing the Fuel Rail

1. Disconnect the battery.
2. Wrap a rag around the inlet hose and release the quick fitting.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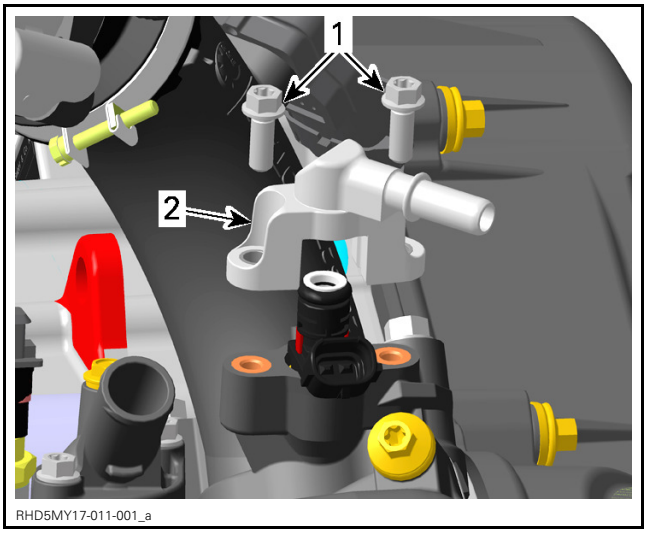
TYPICAL

3. Unscrew rail retaining screws.
4. Gently pull rail off by hand.



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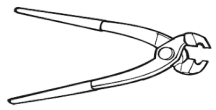
1. *Retaining screws*
2. *Fuel rail*

To disconnect fuel rail from hose, cut clamp on fuel hose. Refer to *FUEL TANK AND FUEL PUMP* for clamp removal/installation procedures.

REQUIRED TOOL	
OETIKER PLIER (P/N 295 000 070)	

NOTE: If fuel rail is removed for access to fuel injector, it is not necessary to cut hose clamp. Only to replace fuel rail.

Installing the Fuel Rail

For installation, reverse the removal process however, pay attention to the following.

Install new clamps using pliers as per removal (if fuel rail was replaced).

Lubricate fuel injector O-rings to ease insertion in rail.

FUEL INJECTOR O-RINGS	
Service product	Engine oil

Install fuel rail and evenly tighten screws a little at a time each side.

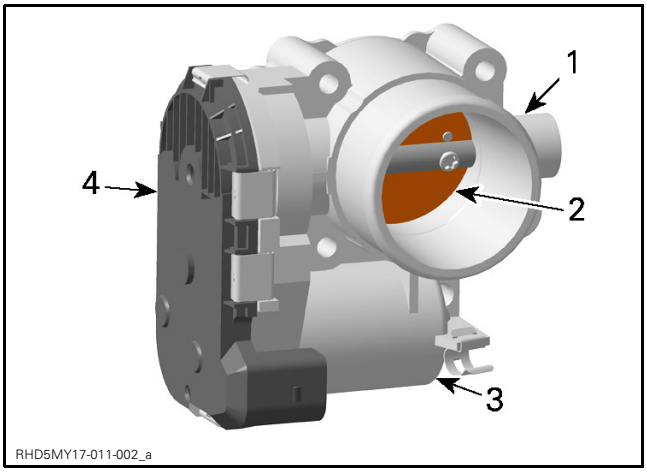
TIGHTENING TORQUE	
Fuel rail retaining screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

⚠ WARNING

Perform a fuel pressure test and ensure that there is no leak. Refer to *FUEL TANK AND FUEL PUMP*. Run engine and check for leaks.

THROTTLE BODY

Throttle Body Description



1. Throttle body
2. Throttle plate
3. Electronic throttle actuator (electric motor inside)
4. Throttle position sensor (TPS) (inside)

Throttle Body Access

Tilt cargo box.

Lubricating the Throttle Body

No lubrication is required.

Cleaning the Throttle Body

1. Remove air inlet bellow from throttle body.
2. Check throttle body cleanliness using a flashlight. Fully open throttle plate and verify:

– Throttle body bore
– Throttle plate edge.

Look for:

– Dirt
– Oily surfaces
– Carbon and salt deposits on throttle plate and the surrounding bore.

3. Clean as necessary.

THROTTLE BODY CLEANING	
Service product	GUNK INTAKE MEDIC or an equivalent throttle body cleaner

NOTICE Only use an appropriate throttle body cleaner that will not damage O-rings and EFI sensors.

⚠ CAUTION Use the product in a well ventilated area. Refer to product manufacturer's warnings.

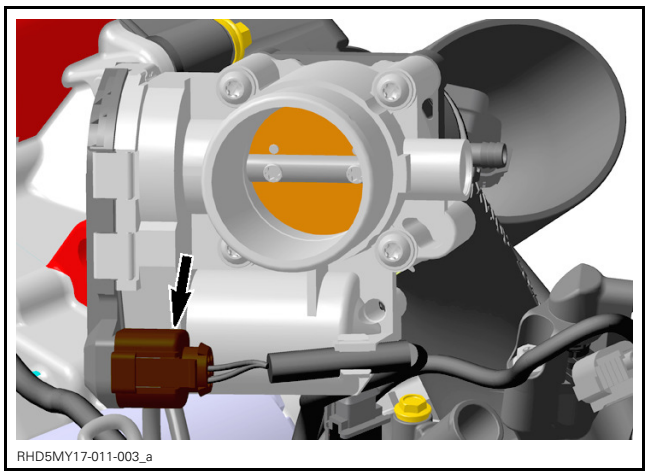
4. To avoid getting dirt into engine, spray cleaner on a clean rag then rub rag against throttle plate and bore. A toothbrush may also be used.

⚠ CAUTION Ensure key is removed so that nobody can activate the electrical system, otherwise the ECM would turn on and the throttle actuator (ETA) would cycle. This could cause serious finger injury as the throttle plate moves quickly.

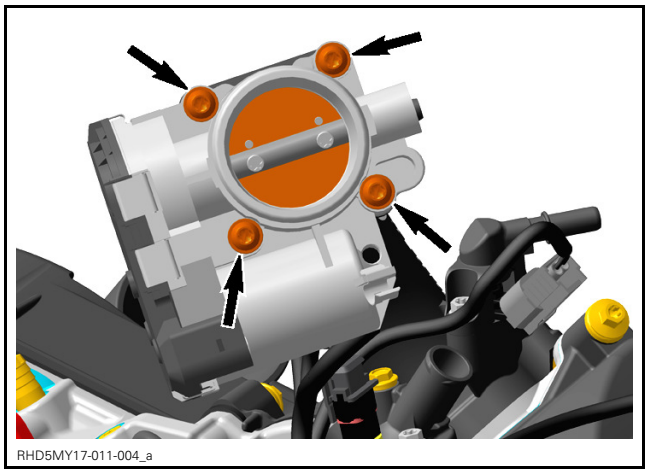
5. Gently open throttle plate and hold fully open to reach all surfaces.
6. To remove residual dirt, spray cleaner on throttle plate and on bore.
7. Reinstall removed parts.

Removing the Throttle Body

1. Disconnect air inlet bellow from throttle body.
2. Disconnect throttle body connector.



3. Remove screws retaining throttle body to intake adapter.



4. Pull throttle body off intake adapter.

Installing the Throttle Body

Installation of the throttle body is the reverse of the removal procedure. However, pay attention to the following.

TIGHTENING TORQUE	
Throttle body retaining screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

1. Perform the *INITIALIZATION OF THE THROTTLE POSITION SENSOR* reset procedure. Refer to *THROTTLE POSITION SENSOR (TPS)* in this subsection.

THROTTLE POSITION SENSOR (TPS)

TPS Description

NOTE: The TPS is part of the throttle body.

The throttle position sensor (TPS) is a double potentiometer that sends signals to the ECM that are proportional to the throttle plate angle.

NOTE: As a first troubleshooting step, always check for applicable fault codes using B.U.D.S. software.

Initialization of the Throttle Position Sensor

NOTE: The TPS initialization procedure **must** be carried out whenever the throttle body (ETC) is replaced, unless an ECM first initialization reset is carried out.

This operation performs a reset of the TPS basic values in the ECM. This reset is very important as the TPS values are part of the basic parameters for all fuel mapping calculations and control of several settings such as for idle speed, LIMP HOME mode and maximum RPM of the engine.

NOTICE **An improperly set TPS may lead to improper idle speed (too low or too high), poor engine performance, poor engine starting and engine stop on deceleration, fault codes and possible engine damage. Emission compliance may also be affected.**

Use the BUDS2 software to perform this setting. Refer to *COMMUNICATION TOOLS* subsection.

1. Turn key to the **ON** position.
2. Ensure throttle lever is completely released.
3. In BUDS2, select
   - **Settings** button
   - **ECM** page tab
   - **Initialization Tab** page
   - **Reset TPS**.

Reset is completed.

Exit BUDS2.

NOTE: If the throttle valve was not within the allowed range when the Closed Throttle Reset was carried out, no error message would be displayed. However, a fault code would be set when the engine is started.

4. Start engine and make sure it operates normally through its full engine RPM range.
5. Check for fault codes using BUDS2, If a fault code related to the throttle actuator appears, clear it, then carry out another Closed Throttle Reset procedure. To clear faults, refer to *DIAGNOSTIC AND FAULT CODES* subsection.

Testing the TPS Wear

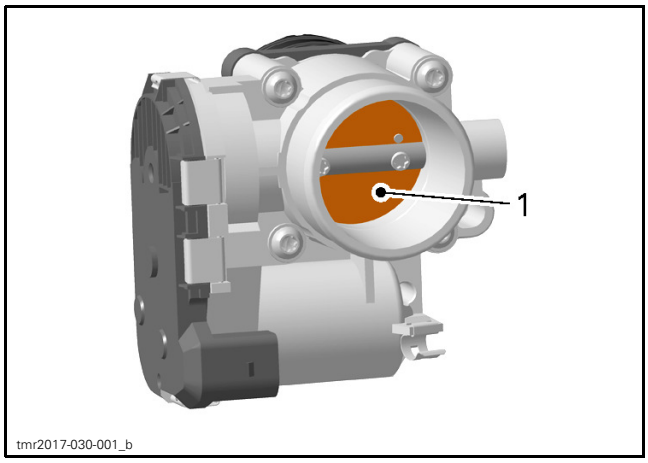
1. With the engine turned off, slowly press on the throttle lever and pay attention for smooth operation without physical stops.
2. Activate the electrical system to wake up the ECM.
3. Connect vehicle to BUDS2 software. Refer to *COMMUNICATION TOOLS* subsection.
4. Select the following:
   - **Measurements** tab
   - **ECM** tab.
5. Slowly and regularly move the throttle lever.
6. Observe the Throttle Opening indication movement

NOTE: The indication should move gradually and regularly as you move the throttle lever. If the TPS indication is erratic or suddenly drops off, it may indicate a worn TPS that needs to be replaced. An initial slight delay after the throttle lever is moved and before the indication starts to move is normal.

If the indication behavior is not as expected, proceed with the following steps.

7. Manually move the throttle plate in the throttle body using a blunt tool (without sharp tip).

⚠ **CAUTION** **Do not move throttle plate with your fingers. Otherwise, if ECM should turn off, it would quickly close the throttle plate which could cause finger injury.**



1. Push here

8. Check the indication movement again.

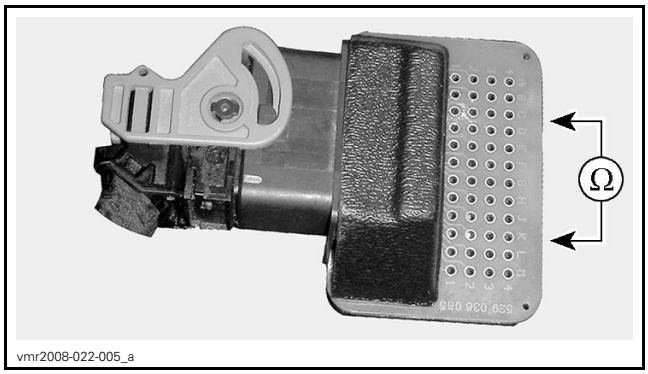
– If the indication moves as expected, check the throttle accelerator sensor (TAS). Refer to *THROTTLE ACCELERATOR SENSOR (TAS)* in this subsection.
– If the indication does not move as expected, perform the *TPS RESISTANCE TEST* in this subsection.

Testing the TPS Resistance

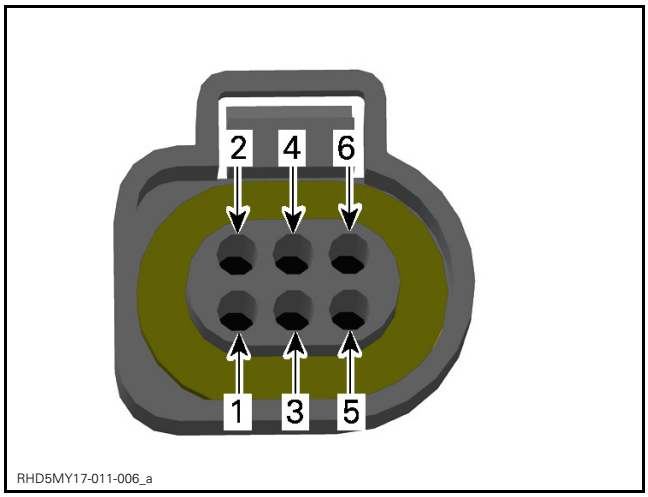
1. Ensure the throttle body connector is properly connected.
2. Disconnect ECM connector A from the ECM and install it on the ECM adapter tool.
3. Set multimeter to Ω.
4. Probe circuit as per following table while using your hand to manually move throttle plate.

ECM ADAPTER		FULLY CLOSED THROTTLE PLATE (1)		FULLY OPEN THROTTLE PLATE	
		RESISTANCE (Ω)			
PIN		MIN.	MAX.	MIN.	MAX.
A-A2	A-K4	875	1625	875	1625
A-A2	A-K3	954	1934	228	585
A-A2	A-F3	254	634	980	1983
A-K3	A-K4	228	585	954	1934
A-K3	A-F3	1385	2315	1385	2315
A-K4	A-F3	980	1983	254	634

(1) To obtain the fully closed position, it is necessary to push against the throttle plate in the throttle body with your hand and hold it in this position for the measurement.



If any resistance value is incorrect, check wire continuity between ECM and throttle body before assuming the TPS is at fault. Refer to *WIRING DIAGRAM* subsection.

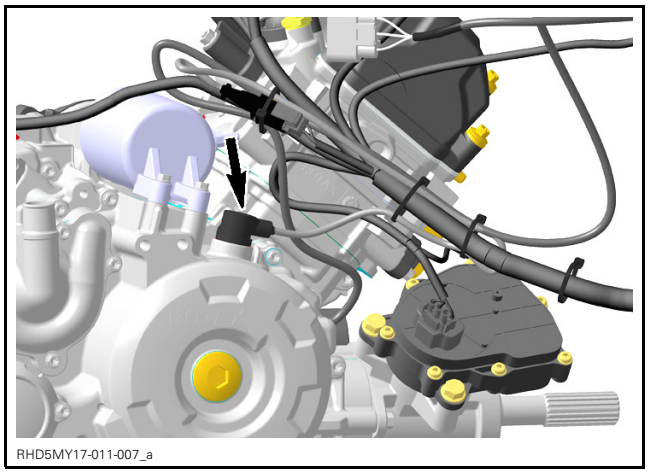


THROTTLE BODY CONNECTOR PIN-OUT

Replacing the TPS

Carry out a *INITIALIZATION OF THE THROTTLE POSITION SENSOR* procedure as detailed in *THROTTLE BODY* of this subsection.

CRANKSHAFT POSITION SENSOR (CPS)

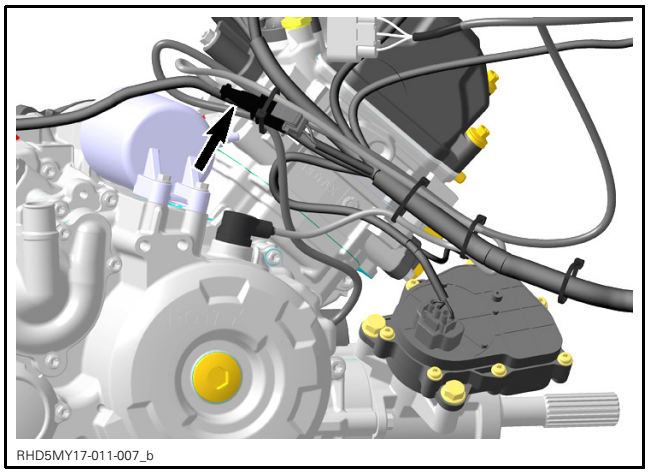


CPS

NOTE: Take into account that a CPS fault can be triggered by bent or missing encoder wheel teeth. First check fault codes using B.U.D.S., then check the encoder wheel teeth condition if necessary (refer to *MAGNETO AND STARTER* subsection).

Testing the CPS Resistance

Disconnect CPS wiring harness connector.



CPS CONNECTOR LOCATION

Probe terminals as per following table.

CPS CONNECTOR		MEASUREMENT
PIN		RESISTANCE Ω @ 20°C (68°F)
1	2	700 - 900 Ω

If resistance is not within specifications, replace the CPS.

If resistance tests good, **reconnect** the CPS connector.

Install ECM-A connector on ECM adapter.

Using a multimeter, recheck resistance as per table.

ECM CONNECTOR		MEASUREMENT
PIN		RESISTANCE Ω @ 20°C (68°F)
A-H1	A-K2	700 - 900 Ω

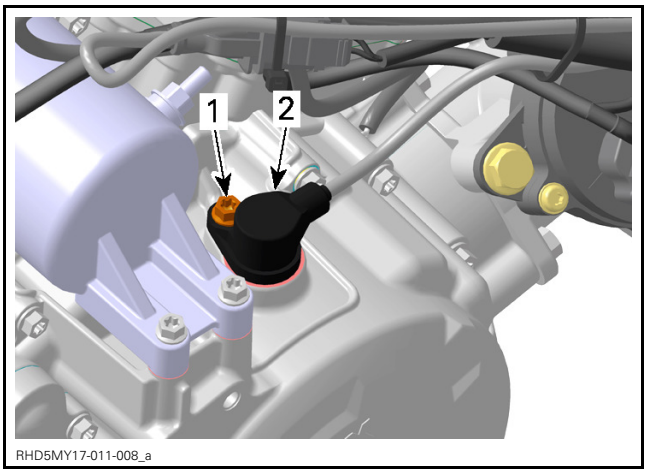
If resistance value is correct, refer to *REPLACING THE ECM*.

If resistance value is incorrect, repair the connectors or replace the wiring harness between ECM connector and the CPS.

Replacing the CPS

Disconnect CPS connector and cut harness locking tie.

Remove CPS retaining screw and pull out CPS.



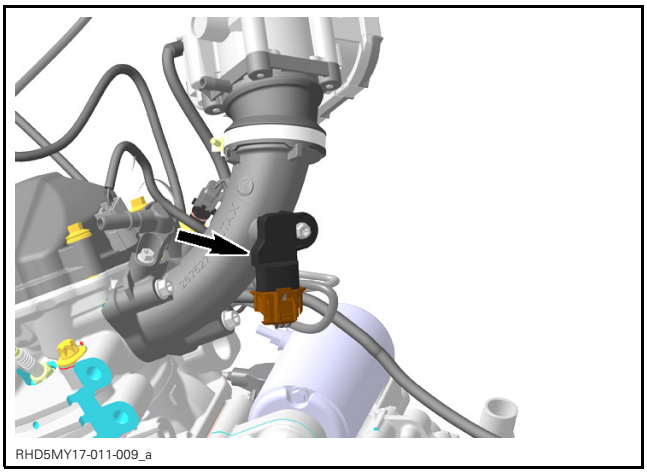
1. *Retaining screw*
2. *CPS*

Install new CPS and secure harness with a new locking tie.

CPS O-RING LUBRICATION	
Service product	SYNTHETIC GREASE (P/N 779162)

TIGHTENING TORQUE	
CPS retaining screw	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

MANIFOLD AIR PRESSURE AND TEMPERATURE SENSOR (MAPTS)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NOTE: This sensor is a multifunction device.

MAPTS Pressure Function

Before the engine is started, when power is applied to the system, the sensor measures the ambient air atmospheric pressure. The ambient pressure is, at that moment, stored in the ECM. Thereafter, once the engine is started, it measures the air pressure in the intake manifold at operating RPMs.

The sensor must be correctly installed on intake manifold. Otherwise, the MAPTS could generate a fault code for an unexpected sensor range at idle when it reads the atmospheric pressure. If this is the case, remove sensor and check for oil or dirt on its end and if problem persists, check throttle plate condition/position and the wiring harness. Perform the following tests.

Testing the MAPTS (Pressure Function)

1. Connect vehicle to BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
2. Select the following:
   - **Measurements** page tab
   - **ECM** page.
3. Look for and take note of the MAPTS pressure reading while the engine is stopped.

NOTE: The indicated intake air pressure in BUDS2 must be within 3.4 kPa (.5 PSI) of local atmospheric pressure when the engine is stopped.

MAPTS PRESSURE FUNCTION QUICK TEST			
RESULT	SERVICE ACTION		
NO READING	Circuit Continuity Test of MAPTS Pressure Function	MAPTS Input Voltage Test	Repair or replace wiring
VALUE IS OUT OF RANGE	Replace MAPTS		

4. Perform the same test with a new MAPTS and compare both readings.

Testing the MAPTS Input Voltage

Check the voltage output from ECM to the pressure sensor.

1. Turn ignition key ON.
2. Remove electrical connector from MAPTS.
3. Measure input voltage as per following table.

MAPTS CONNECTOR		MEASUREMENT
PIN		VOLTAGE
1	3	5 Vdc

If voltage test is good, replace the MAPTS.

If voltage test is not good, carry out *TESTING THE MAPTS CIRCUIT CONTINUITY (PRESSURE FUNCTION)*.

Testing the MAPTS Circuit Continuity (Pressure Function)

1. Disconnect the ECM "A" connector.
2. Install ECM-A connector on ECM adapter tool.
3. Check continuity of the following circuits.

TESTING THE MAPTS CIRCUIT CONTINUITY (PRESSURE FUNCTION)		
ECM-A	MAPTS CONNECTOR	RESISTANCE VALUE
Pin B4	Pin 3	Close to 0 Ω
Pin G4	Pin 4	
Pin H2	Pin 1	

If resistance is not within specification, repair or replace the wiring harness between ECM connector and the MAPTS.

MAPTS Temperature Function

The sensor monitors the temperature in the intake manifold.

Testing the MAPTS (Temperature Function)

1. Connect vehicle to BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
2. Select the following:
   - **Measurements** page tab
   - **ECM** page.
3. Look for and take note of the MAPTS temperature reading while the engine is stopped.

NOTE: If the complete vehicle is at room temperature, BUDS2 should display the ambient air temperature at the intake manifold.

4. Perform the same test with a new MAPTS and compare both readings.

If the engine's MAPTS temperature reading is significantly different than the new MAPTS, replace it.

NOTE: Both sensors must feel same ambient air temperature.

If there is no reading, carry out *TESTING THE MAPTS RESISTANCE (TEMPERATURE FUNCTION)*.

Testing the MAPTS Resistance (Temperature Function)

Disconnect the connector from the MAPTS.

Check the resistance of the sensor itself as shown.

MAPTS		MEASUREMENT
PIN		RESISTANCE Ω @ 20°C (68°F)
1	2	2280 - 2740

If resistance is not within specification, replace the MAPTS.

If resistance tests good, **reconnect** the MAPTS and disconnect the connector "A" from the ECM.

Install ECM-A connector on ECM adapter tool.

Using a multimeter, recheck resistance value as per following table.

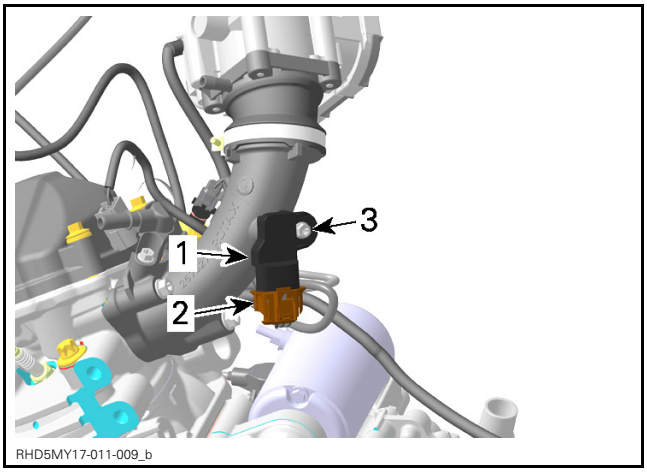
ECM CONNECTOR		MEASUREMENT
PIN		RESISTANCE Ω @ 20°C (68°F)
A-H2	A-H3	2280 - 2740

MAPTS TEMPERATURE SENSOR TEST RESULTS			
RESULT	SERVICE ACTION		
NO READING	Circuit Continuity Test of MAPTS Temperature Function	MAPTS Input Voltage Test	Repair or replace wiring
INCORRECT RESISTANCE VALUE	Replace MAPTS		

Testing the MAPTS Circuit Continuity (Temperature Function)

TESTING THE MAPTS CIRCUIT CONTINUITY (TEMPERATURE FUNCTION)		
ECM-A	MAPTS CONNECTOR	RESISTANCE VALUE
Pin H2	Pin 1	Close to 0 Ω
Pin H3	Pin 2	

MAPTS Replacement



1. *MAPTS*
2. *MAPTS connector*
3. *Retaining screw*

Disconnect MAPTS connector and remove the MAPTS from the plenum.

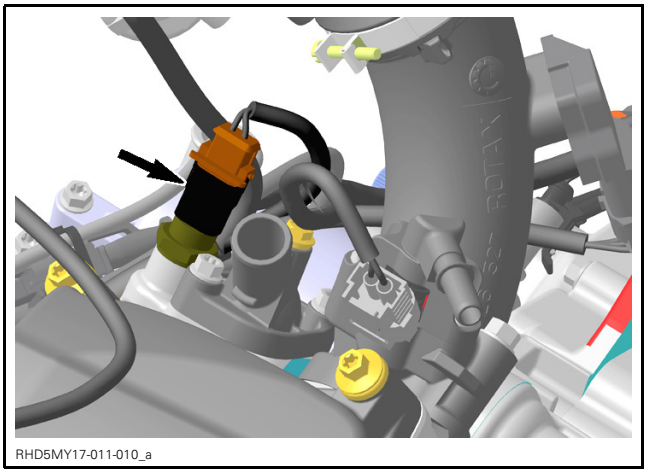
Install new MAPTS as per following table.

TIGHTENING TORQUE	
MAPTS retaining screw	6 N•m ± 0.7 N•m (53 lbf•**in** ± 6 lbf•**in**) + LOCTITE 243 (BLUE) (P/N 293 800 060)

COOLANT TEMPERATURE SENSOR (CTS)

CTS Location

The CTS is located on the RH side of the engine, on the cylinder head.



Testing the CTS using BUDS2

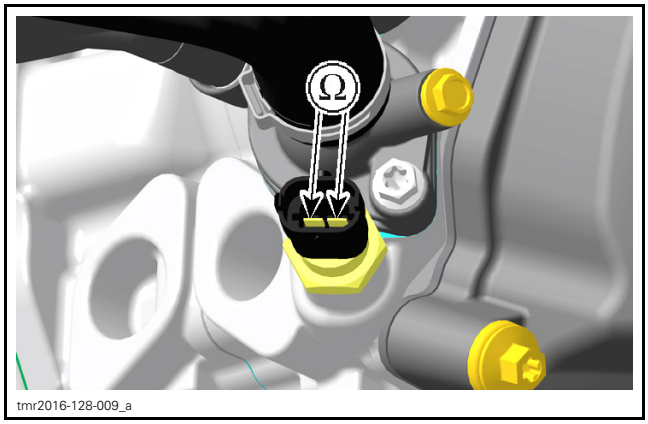
1. Connect the vehicle to BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
2. Select the following:
   - **Measurements** page tab
   - **ECM** page.
3. Look for the engine temperature indication.

The engine temperature gauge in BUDS2 should provide an indication of the actual engine coolant temperature. Otherwise, perform *TESTING THE CTS RESISTANCE*.

Testing the CTS Resistance

1. Disconnect the plug connector from the CTS and check the resistance of the sensor itself.

CTS SENSOR		MEASUREMENT
PIN		RESISTANCE Ω @ 20°C (68°F)
1	2	2280 - 2740



If resistance is out of specification, replace the CTS.

If resistance test is good, **reconnect** the CTS and disconnect the ECM connector "A" from the ECM.

2. Install ECM-A connector on ECM adapter tool.
3. Using a multimeter, recheck resistance from the ECM connector as per table.

ECM "A" CONNECTOR		MEASUREMENT
PIN		RESISTANCE Ω @ 20°C (68°F)
A1	J2	2280 - 2740

If resistance value is correct, refer to *ECM REPLACEMENT*.

If resistance value is incorrect, repair the connectors or replace the wiring harness between ECM connector and the CTS.

Replacing the CTS

1. Drain coolant, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.
2. Disconnect CTS connector and remove CTS.
3. Install the new CTS and torque as specified.

TIGHTENING TORQUE	
CTS	16 N•m ± 2 N•m (142 lbf•**in** ± 18 lbf•**in**)

4. Reinstall remaining removed parts.
5. Refill and bleed the cooling system, refer to *COOLING SYSTEM* subsection.

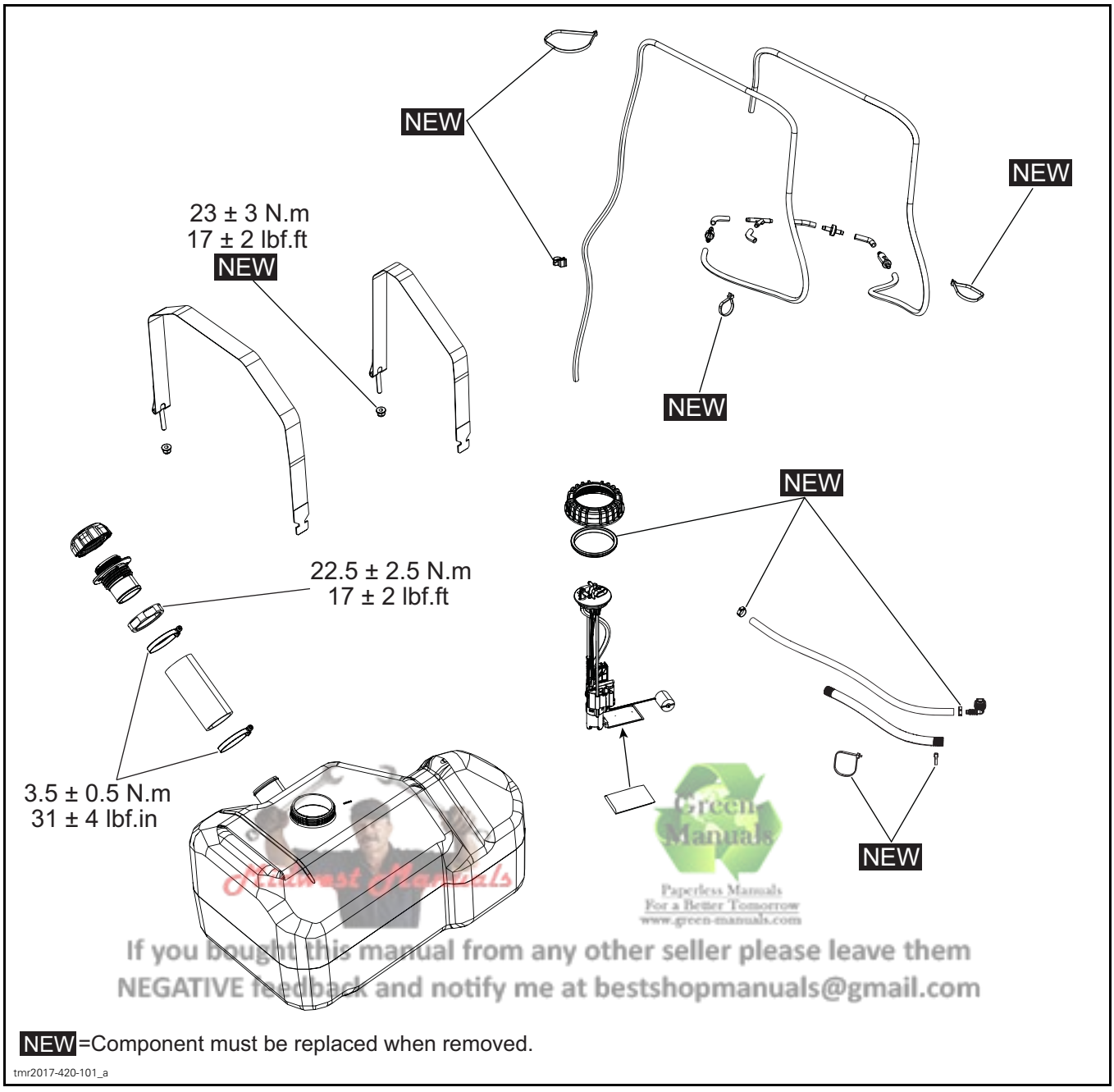
FUEL TANK AND FUEL PUMP

SERVICE TOOLS

Description	Part Number	Page
FLUKE 115 MULTIMETER	529 035 868	8
FUEL HOSE ADAPTER	529 036 396	5
FUEL PUMP NUT TOOL	529 035 899	9
OETIKER PLIER	295 000 070	7
PRESSURE GAUGE	529 036 395	5
SMALL HOSE PINCHER	295 000 076	4, 13
VACUUM/PRESSURE PUMP	529 021 800	4, 13

SERVICE TOOLS – OTHER SUPPLIER

Description	Part Number	Page
FLUKE RIGID BACK PROBE	TP88	8



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NEW=Component must be replaced when removed.

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GENERAL

⚠ WARNING

Fuel is flammable and explosive under certain conditions. Ensure work area is well ventilated. Do not smoke or allow open flames or sparks in the vicinity.

⚠ WARNING

Always disconnect battery prior disconnecting a fuel system pressure hose.

⚠ WARNING

Always proceed with care and use appropriate safety equipment when working on pressurized fuel system. Wear safety glasses.

⚠ WARNING

Do not allow fuel to spill on hot engine parts and/or on electrical connectors.

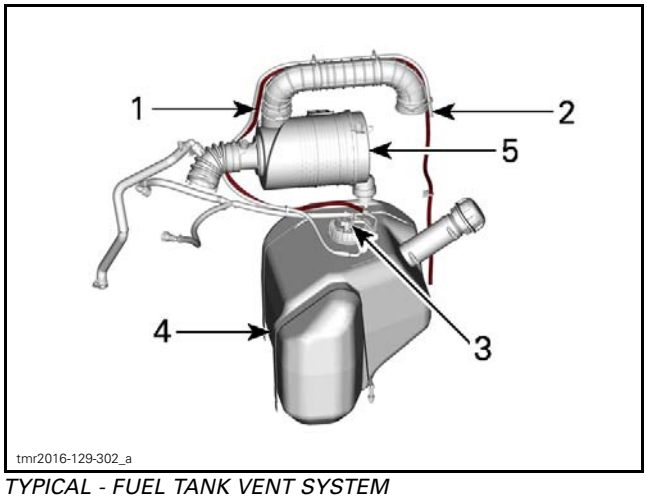
When the repair is completed, ensure that all hoses are connected and secured. Perform the *FUEL PRESSURE TEST* and the *FUEL TANK LEAK TEST* as explained in this subsection.

Fuel lines remain under pressure at all times. Proceed with care when removing/installing high pressure test equipment.

SYSTEM DESCRIPTION

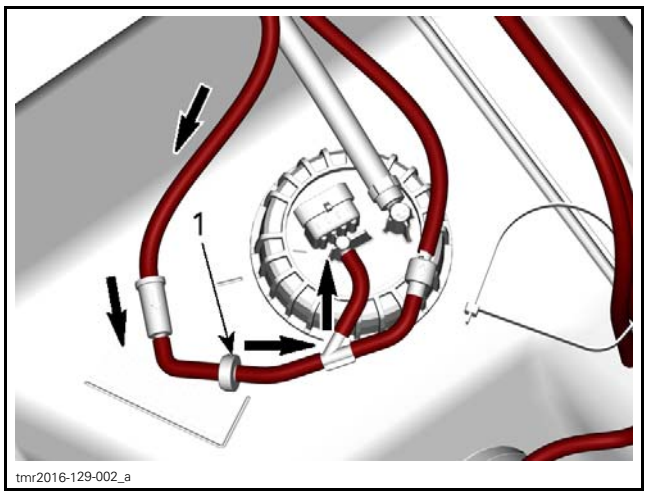
Fuel Tank Vent System

The vent system provides the relief of overpressure or negative pressure in the fuel tank



TYPICAL - FUEL TANK VENT SYSTEM
1. *Vent hose*
2. *Vent system hose inlet*
3. *Vent system connected to fuel pump*
4. *Fuel tank*
5. *Engine air intake system*

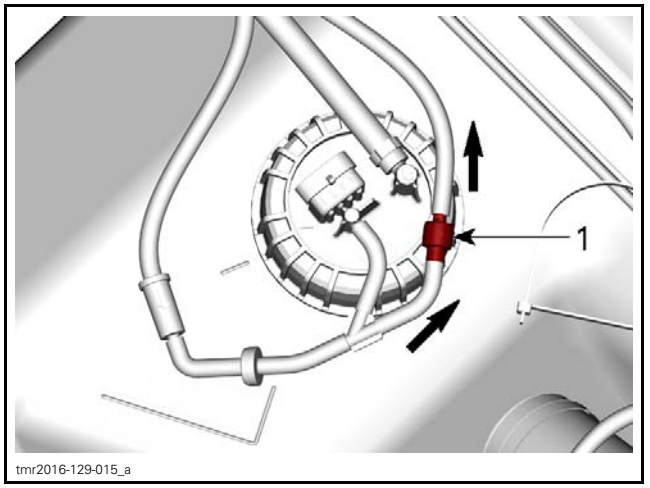
Air can enter the fuel tank at all times through the vent system INLET check valve. This prevents negative pressure within the fuel tank which could cause a fuel starvation.



TYPICAL - AMBIENT AIR PRESSURE IN
1. *Vent inlet check valve*

The inlet check valve also prevents fuel from flowing out through the inlet of the vent system.

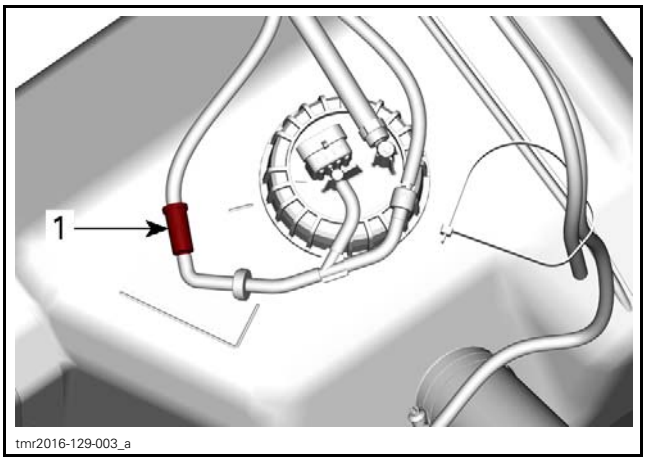
If the pressure in the fuel tank builds up and exceeds 2.5 kPa - 7.6 kPa (.36 PSI - 1.1 PSI), the pressure relief valve opens and lets the excess pressure evacuate through the vent system OUTLET hose.



TYPICAL - OVER PRESSURE RELIEF
1. *Outlet pressure relief valve*

Fuel Tank Vent Breather Filter

The vent system is equipped with an in-line breather filter that prevents the entry of particles such as dust or small insects. It is located next to the fuel pump, on the inlet hose, before the air inlet check valve.



1. Breather filter

Fuel Pump Module

The fuel pump module is inserted in the fuel tank. It provides fuel delivery for the EFI system and encompasses the following components:

– Electric fuel pump
– Fuel pump pre-filter
– Fuel pressure regulator
– Fuel level sender.

Fuel Filters

The system comprises one level of filtration:

– A replaceable pre-filter element attached to the bottom of the fuel pump.

Fuel Pump Pressure Regulator

The fuel pressure regulator is integral to the fuel pump module. The pressure regulator maintains proper fuel pressure for the EFI system.

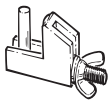
INSPECTION

FUEL TANK LEAK TEST

⚠ WARNING

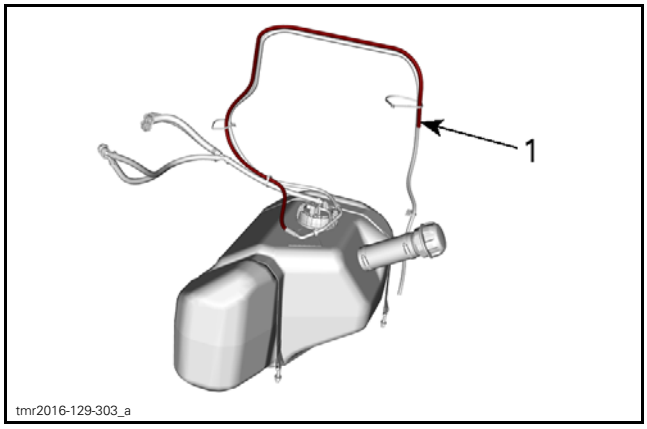
Always carry out a fuel tank leak test whenever the fuel tank shows signs of wear or damage which may cause a leak, or when the fuel pump has been removed or replaced, or if you suspect a leak. If the fuel tank is damaged, the fuel tank should be replaced even if no leak is present. Do not attempt to repair the fuel tank.

1. Refill fuel tank and ensure fuel tank cap is in good condition and properly installed.
2. Block the outlet vent hose using a small hose pincher.

REQUIRED TOOL	
SMALL HOSE PINCHER (P/N 295 000 076)	

3. Pressurize the fuel tank through the inlet vent hose.

REQUIRED TOOL	
VACUUM/PRESSURE PUMP (P/N 529 021 800)	



1. Fuel tank vent hose inlet

PRESSURE	TIME WITHOUT PRESSURE DROP
14 kPa (2 PSI)	3 minutes

If pressure drops, locate fuel leak(s) and repair or replace leaking component(s).

To locate a leak, check for a fuel smell or leaking fuel.

To ease locating leak(s), spray soapy water on all hose connections and components; bubbles will indicate the leak location(s).

FUEL SYSTEM PRESSURE TEST

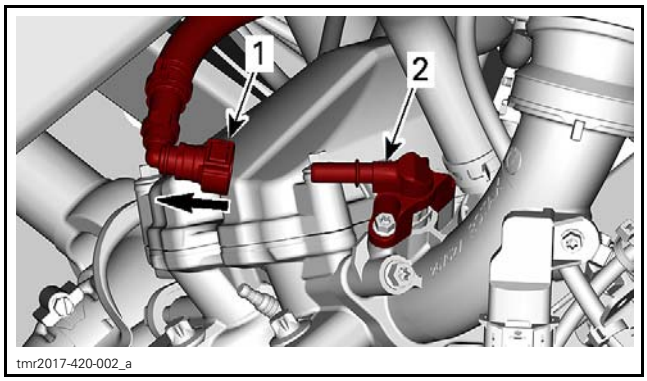
The pressure test will show the available pressure in the system. It validates the pressure regulator and the fuel pump, and allows for checking the fuel system for leaks (high pressure side).

Ensure there are no leaks from hoses and fittings. Repair any leaks.

NOTE: Refer to the *FUEL SYSTEM DIAGNOSTIC FLOW CHART* in this subsection to help diagnose a fuel system related problem.

1. Ensure the fuel level in the tank is sufficient.

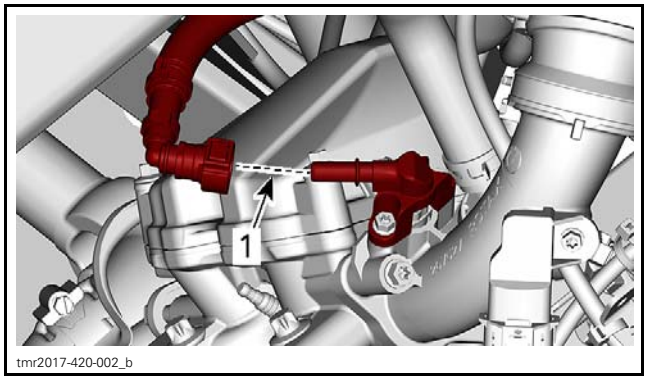
2. Ensure the battery voltage is over 12 volts.
3. Disconnect fuel pump electric connector
4. Release fuel pressure by running the engine until it runs out of gas.
5. Disconnect the fuel pressure hose. Refer to *DISCONNECTING A FUEL PRESSURE HOSE* in *FUEL HOSE AND OETIKER CLAMPS*.



1. Fuel pressure hose fitting
2. Fuel rail

REQUIRED TOOLS	
PRESSURE GAUGE (P/N 529 036 395)	
FUEL HOSE ADAPTER (P/N 529 036 396)	

6. Install the fuel hose adapter between the disconnected fitting and the fuel rail (in-line installation).



1. Fuel hose adapter location

7. Install the pressure gauge on the fuel hose adapter.
8. Reconnect the fuel pump electric connector.
9. Clear fault codes using the appropriate BRP diagnostic software. Refer to the *COMMUNICATION TOOLS*.
10. Turn ignition key ON or activate the fuel pump using the BRP diagnostic software.
11. Monitor the fuel pressure reading and compare to the specification.

FUEL PRESSURE (AT 12V ± 0.1V)
350 kPa ± 10 kPa (51 PSI ± 1 PSI)

12. Start engine and observe fuel pressure.
13. Stop engine.
14. Refer to *TEST RESULT*.

Test Result

The fuel pressure should be within specification in static or dynamic tests.

Rapid Pressure Drop

If there is a rapid pressure drop after the engine is stopped, check for leakage at:

– A fuel hose
– The fuel rail.

NOTE: The fuel pump check valve (integral to the fuel pump module) may also be at fault.

If no leak is detected, replace fuel pump.

Slow Pressure Drop

If there is a slow pressure drop after the engine is stopped, check the fuel injector for leaks as follows:

NOTE: The fuel pressure regulator or fuel pump check valve (integral to the fuel pump module) may also be at fault.

1. With the fuel rail connected, remove the intake manifold from the cylinder head.
2. From the inside of the intake manifold, check if the fuel injector tip is leaking.

If the fuel injector leaks, replace it.

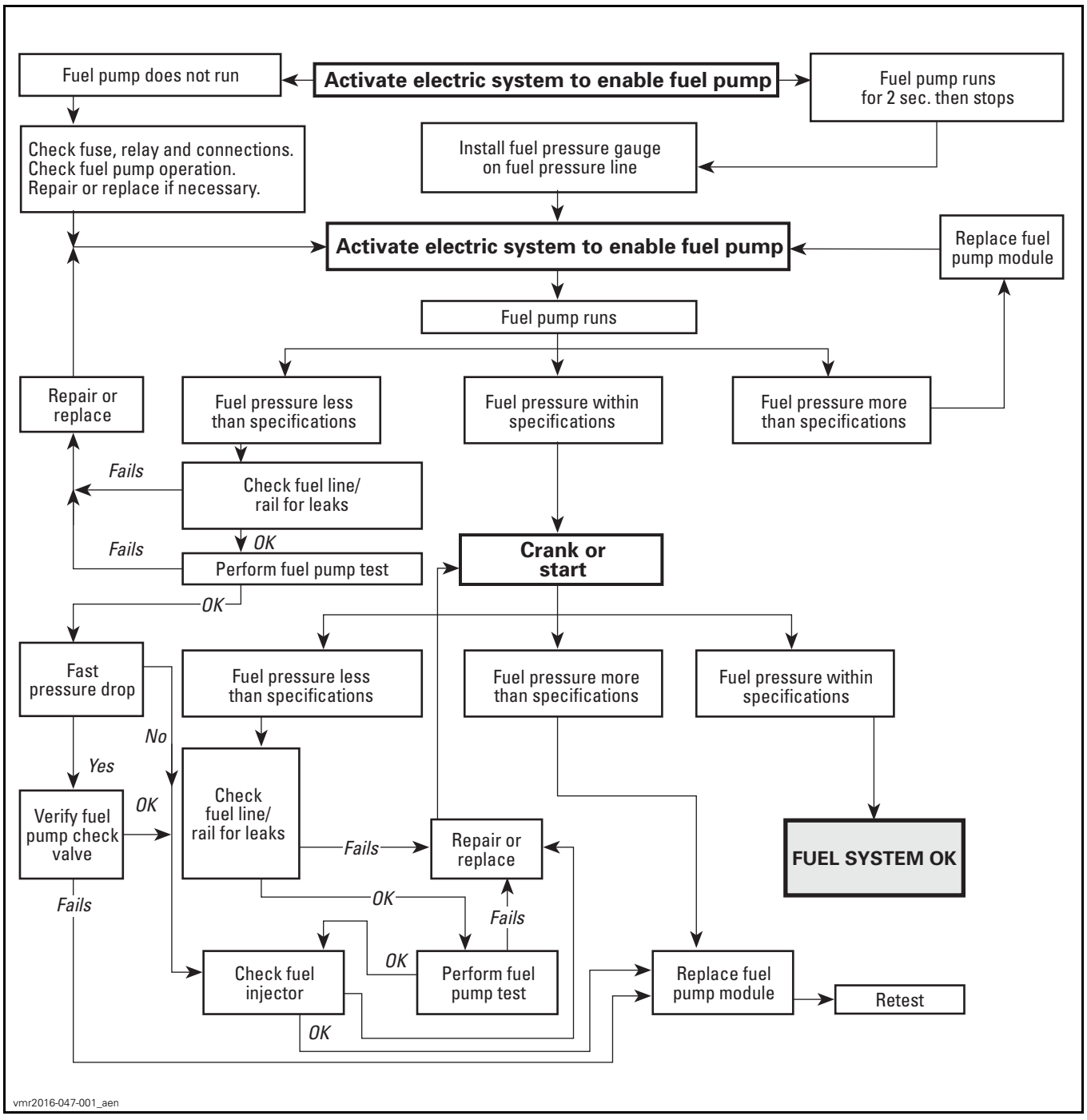
If no leak is detected, replace the fuel pump.

3. Reinstall the intake manifold.

TIGHTENING TORQUE	
Intake manifold retaining screws	20 N•m ± 2 N•m (15 lbf•ft ± 1 lbf•ft)

TROUBLESHOOTING

FUEL SYSTEM DIAGNOSTIC FLOW CHART

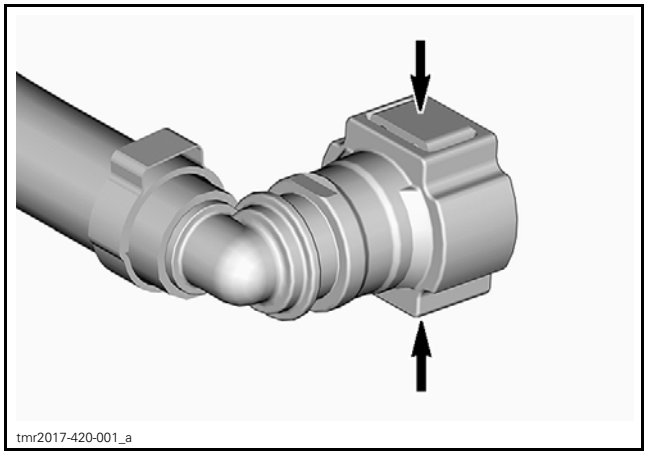


PROCEDURES

FUEL HOSE AND OETIKER CLAMPS

Disconnecting a Fuel Pressure Hose

1. Drain fuel tank. Refer to *FUEL TANK DRAINING*.
2. Release fuel pressure by running engine until it runs out of fuel.
3. Carefully disconnect the fuel hose fitting from the injector by pressing on the release tab of the quick disconnect fitting.



Replacing a Fuel Hose

When replacing fuel hoses, be sure to use hoses and clamps as available from BRP parts department. This will ensure continued proper and safe operation.

⚠ WARNING

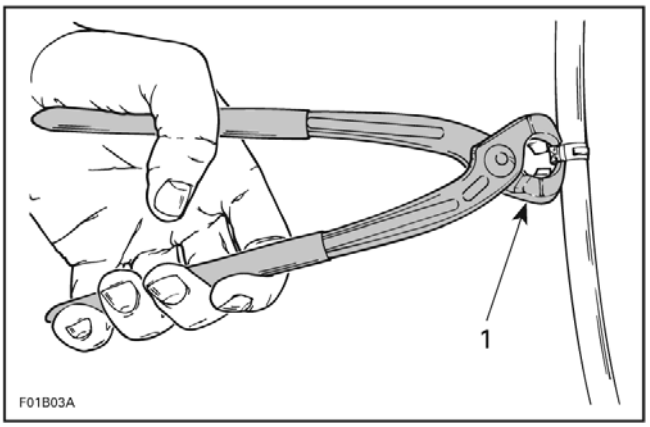
Use of fuel lines other than those recommended by BRP may compromise fuel system integrity.

⚠ WARNING

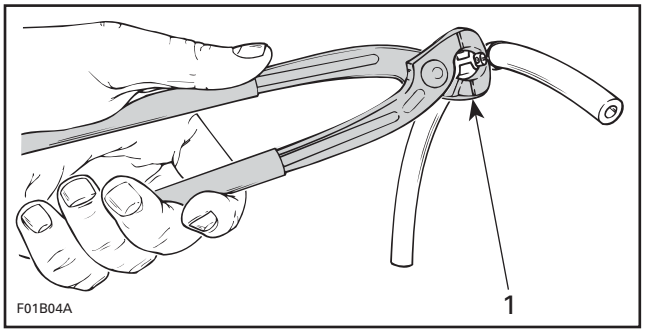
Whenever removing a hose in the fuel system, always use new Oetiker clamps at assembly. Then validate fuel system tightness by performing a fuel pressure test.

Replacing an Oetiker Clamp

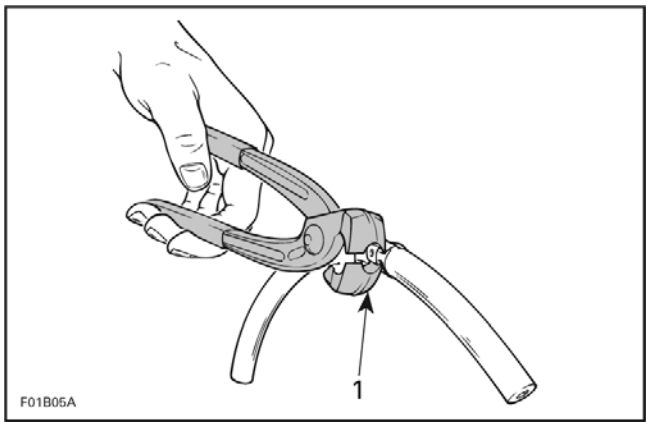
REQUIRED TOOL	
OETIKER PLIER (P/N 295 000 070)	



1. Cutting clamp



1. Securing clamp



1. Securing clamp in limited access

FUEL TANK

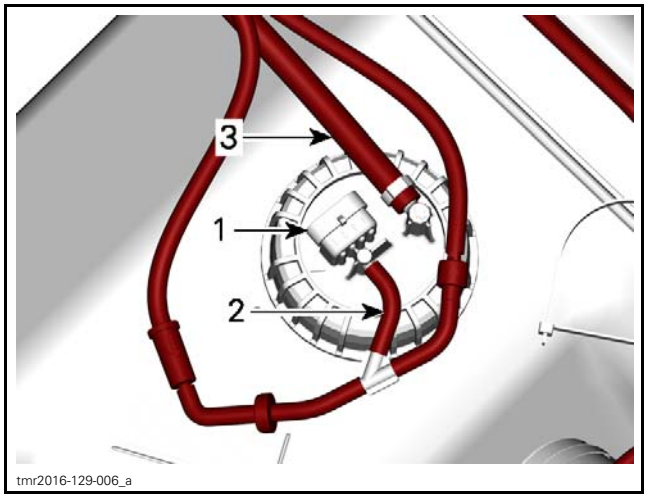
Draining the Fuel Tank

Remove fuel tank cap and siphon gas into an approved fuel container.

Removing the Fuel Tank

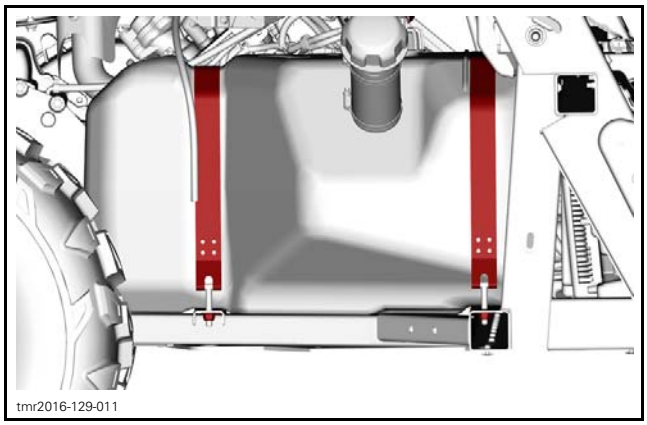
1. Drain fuel tank. Refer to *FUEL TANK DRAINING* in this subsection.
2. Disconnect fuel pressure hoses from the fuel rail. Refer to *DISCONNECTING A FUEL PRESSURE HOSE* in *FUEL HOSE AND OETIKER CLAMPS*.

3. Disconnect the following from the fuel pump module:
   – Fuel pump electric connector
   – Vent hose



1. Fuel pump connector
2. Vent hose
3. High pressure fuel hose

4. Unscrew fuel tank retaining nuts (2) and unhook straps.



5. Loosen fuel filler neck hose clamp.
6. Remove fuel tank.

Inspecting the Fuel Tank

Inspect fuel tank for any damages or cracks which may result in fuel leaks.

If cracks, gouges or other damages which may lead to a fuel leak, or damages to attachment points that could prevent the tank from being secure are found, replace fuel tank.

Installing the Fuel Tank

Installation is the reverse of the removal procedure. However, pay attention to the following.

Use **NEW** retaining nuts.

TIGHTENING TORQUE	
Fuel tank straps retaining nuts	23 N•m ± 3 N•m (17 lbf•ft ± 2 lbf•ft)

Be sure to properly connect and route:
– Fuel tank vent tube
– Fuel pump pressure hose
– Electrical connector.

Refill tank and ensure there are no leaks by performing a *FUEL TANK LEAK TEST* and a *FUEL PUMP PRESSURE TEST* as described in this subsection.

FUEL PUMP

Testing the Fuel Pump Pressure

Refer to *INSPECTION* in this subsection.

Testing the Fuel Pump Operation (Quick Test)

1. Turn ignition key to ON.
2. Listen for fuel pump operation.

NOTE: Fuel pump should come ON for a few seconds, then stop.

If fuel pump does not come ON, carry out the following:
– Check fuel pump relay fuse (F5) and Main relay (R2).
– Use the applicable BRP diagnostic software to read fault codes. Refer to the *COMMUNICATION TOOLS* subsection.
– Carry out a fuel pump input voltage test.

Testing the Fuel Pump Input Voltage

1. Disconnect the fuel pump connector.
2. Turn ignition key ON.
3. Read voltage as follows.

NOTE: The fuel pump voltage will be read only when the fuel pump is activated.

REQUIRED TOOLS	
FLUKE 115 MULTIMETER (P/N 529 035 868)	
FLUKE RIGID BACK PROBE (P/N TP88)	

FUEL PUMP INPUT VOLTAGE TEST		
TEST PROBES		VOLTAGE READING
Fuel pump connector Pin 3	Fuel pump connector Pin 4	Battery voltage

If battery voltage is read, carry out a fuel pump resistance test.

If battery voltage is not read, test fuel pump power input as follows.

FUEL PUMP POWER WIRE TEST		
TEST PROBES		VOLTAGE READING
Fuel pump connector Pin 3	Battery ground	Battery voltage

If battery voltage is now read, check fuel pump ground circuit between fuel pump connector FP-4 and battery ground.

If battery voltage is still not read, check the following:

– Fuse (F5)
– Main relay (R2)
– Fuel pump relay input voltage (control and power circuits)
– Fuel pump relay control circuit continuity to ECM-B M1
– Wiring and connectors.

Testing the Fuel Pump Resistance

1. Ensure fuel pump connector is properly connected.
2. Remove main relay (R2).

Disconnect fuel pump connector and measure resistance at fuel pump connector.

FUEL PUMP RESISTANCE TEST		
TEST PROBES		RESISTANCE READING
Fuel pump connector (pump side) Pin 3	Fuel pump connector (pump side) Pin 4	Approximately 2 Ω

If test failed at pump connector, replace fuel pump.

If test succeeded at pump connector, check wiring and connectors from:

– Fuse box to fuel pump
– Fuel pump to battery ground.

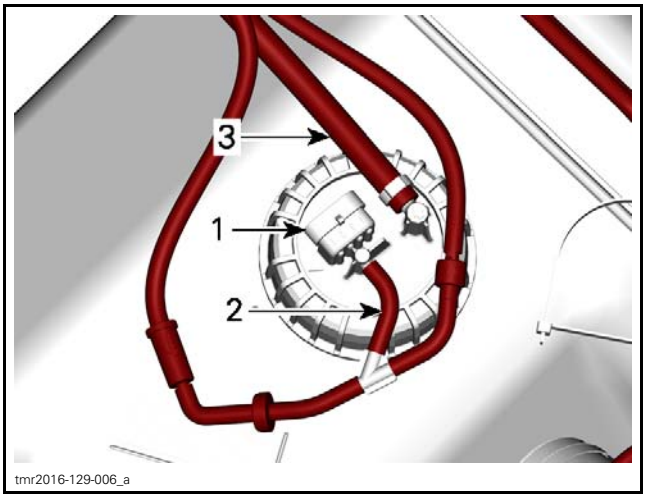
Repair or replace as necessary.

Releasing Fuel System Pressure

Refer to *DISCONNECTING A FUEL PRESSURE HOSE* in this subsection.

Removing the Fuel Pump

1. Release the pressure of the fuel system.
2. Disconnect the following from the fuel pump:
   – Fuel pump electric connector
   – Fuel system vent hose
   – Fuel pump pressure hose.



1. Fuel pump connector
2. Vent hose
3. High pressure fuel hose

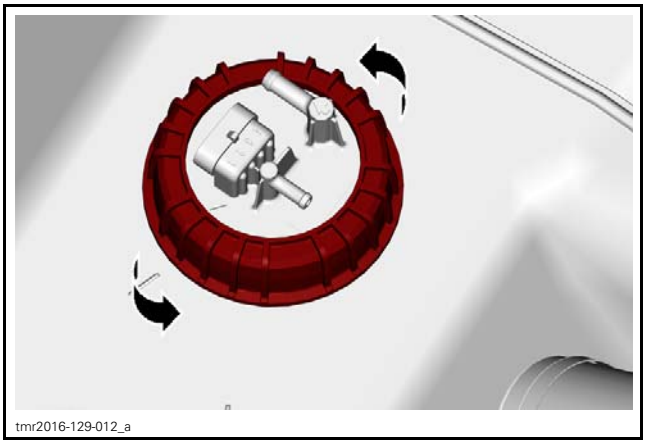
3. Remove fuel pump retaining nut.

⚠ WARNING

Fuel vapors are flammable and explosive under certain conditions. Use only non-sparking tools.

⚠ CAUTION Replace fuel pump gasket whenever fuel pump retaining nut is loosened.

REQUIRED TOOL	
FUEL PUMP NUT TOOL (P/N 529 035 899)	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TYPICAL - FUEL PUMP REMOVAL
1. Fuel pump retaining nut

4. Carefully pull out and rotate fuel pump as required.

NOTICE Pay attention not to damage fuel sender and fuel pump prefilter.

5. Discard gasket ring.
6. Wipe off any fuel spillage.

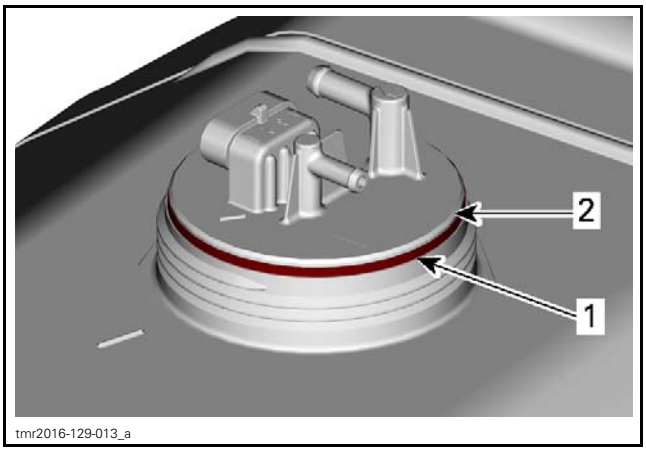
Installing the Fuel Pump

The installation is the reverse of the removal procedure. However, pay attention to the following.

Rotate fuel pump during insertion as per removal procedure.

⚠ CAUTION Pay attention not to damage fuel sender and fuel pump pre-filter.

1. Install a NEW gasket ring.
2. Place gasket so that it is properly located between fuel pump and fuel pump mounting neck on fuel tank.



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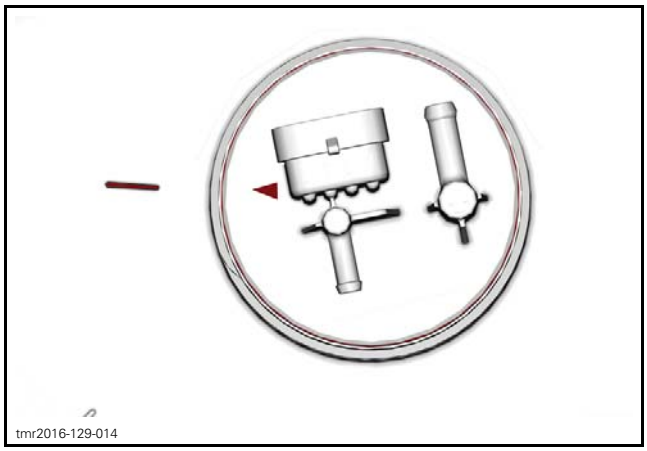
TYPICAL
1. Gasket ring here
2. Fuel pump flange

⚠ WARNING

Ensure gasket ring makes good contact all around fuel pump and fuel pump mounting neck on fuel tank.

3. Ensure proper fuel pump orientation as in following illustration.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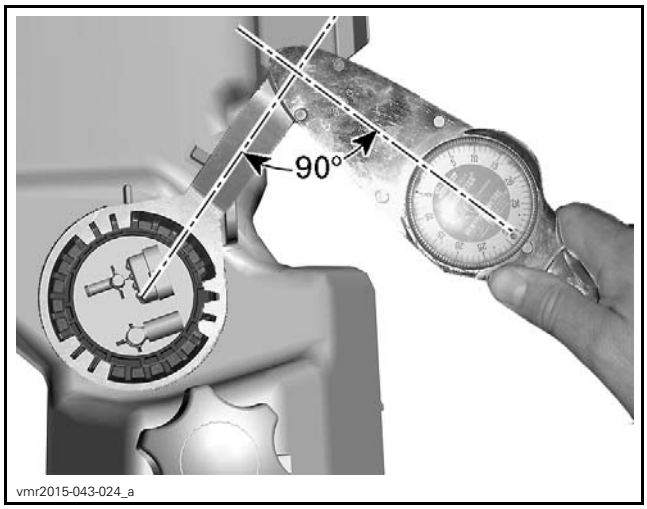
4. Insert fuel pump retaining nut over the fuel pressure hose and electrical wiring connector.
5. While firmly holding pump against tank, engage fuel pump retaining nut on fuel tank flange.

NOTE: If necessary, move the pump in order to ensure the flange is sitting completely flat on the tank.

6. Tighten fuel pump retaining nut to specification.
   - 6.1 Ensure pump locking ring is fully engaged.
   - 6.2 To apply the proper torque to the fuel pump retaining nut, install the fuel pump nut tool on a torque wrench with it's handle perpendicularly (90°) to the torque wrench.
   - 6.3 Ensure pump is properly aligned with index marks after nut it tightened to specification.



TYPICAL - TORQUE WRENCH PERPENDICULAR TO TOOL HANDLE

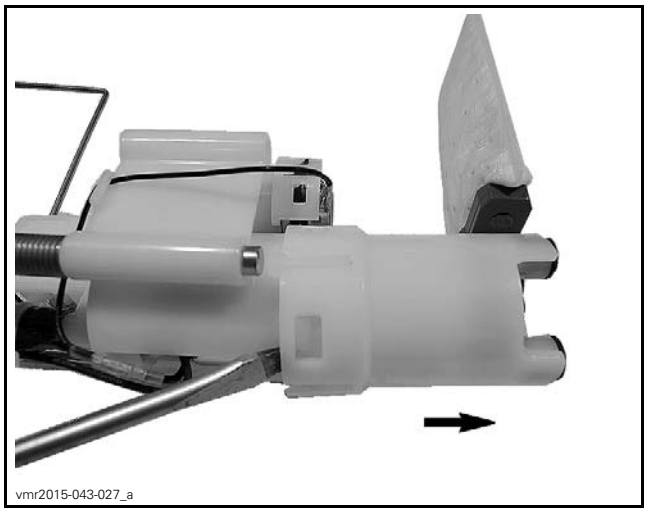
TIGHTENING TORQUE	
Fuel pump retaining nut	29 N•m ± 1 N•m (21 lbf•ft ± 1 lbf•ft)

7. Install fuel pressure hose on fuel pump using a **NEW** Oetiker clamp.
8. Install fuel vent tube on fuel pump.
9. Install electrical connector on fuel pump.
10. Refuel tank and ensure there are no leaks by performing a *FUEL TANK LEAK TEST* and a *FUEL PUMP PRESSURE TEST* as described in this subsection.
11. Check fuel level sender operation.

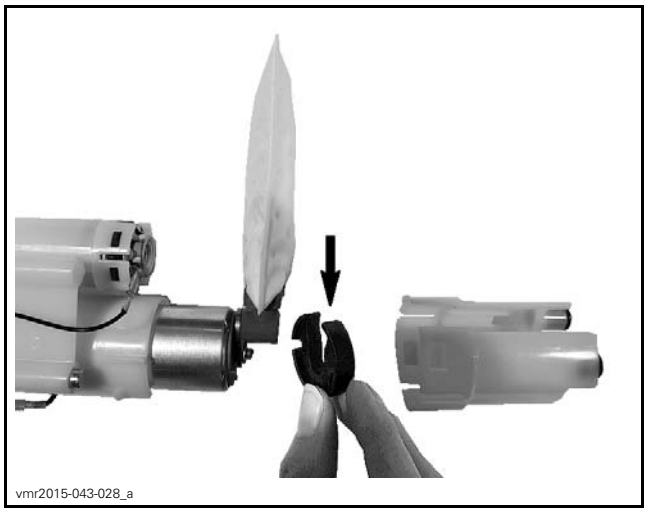
FUEL PUMP PRE-FILTER (STRAINER)

Replacing the Fuel Pump Pre-filter

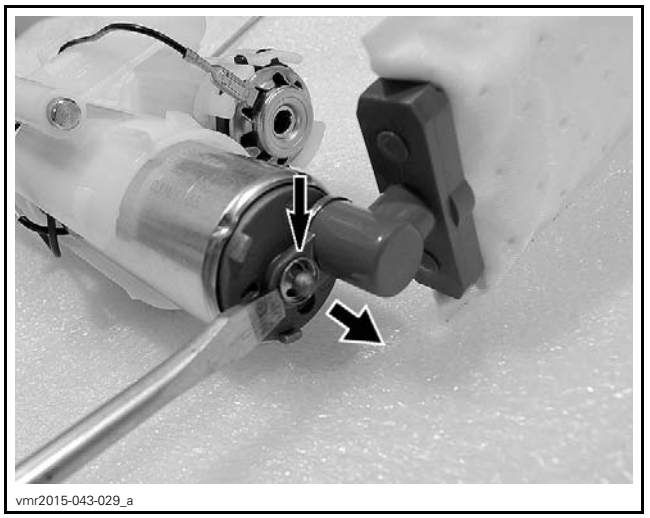
1. Remove *FUEL PUMP*, see *REMOVING THE FUEL PUMP* in this subsection.
2. Unlock 3 tabs on strainer plastic ring.



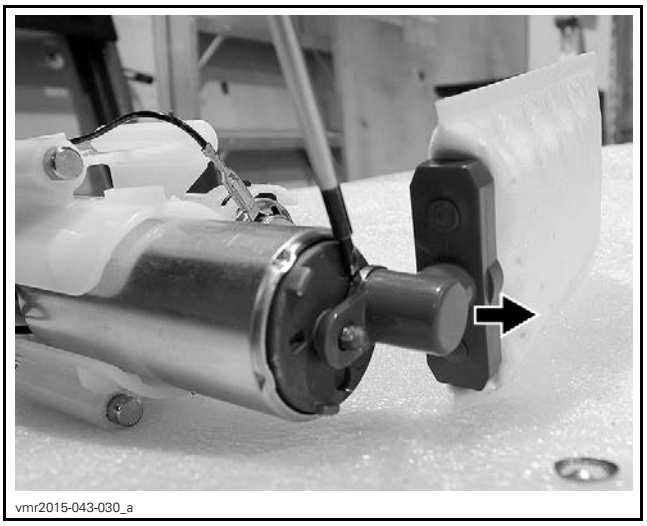
3. Remove rubber pad.



4. Remove push nut securing strainer to fuel pump. Be careful not to break the assembly locator pin.



5. Pull strainer off fuel pump.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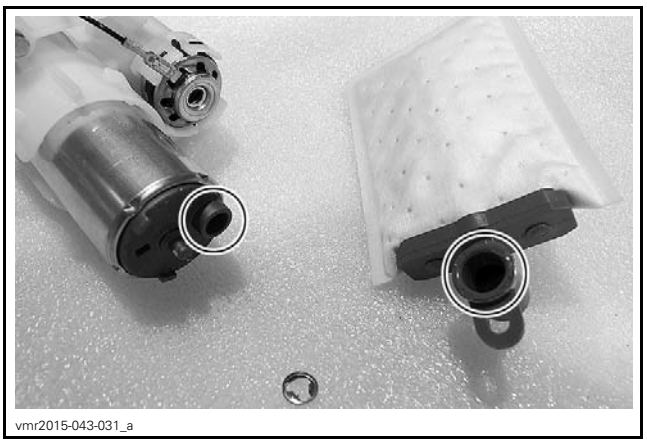
6. Before installing new strainer on fuel pump, lubricate assembly areas circled, with o-ring lubricant or clean oil.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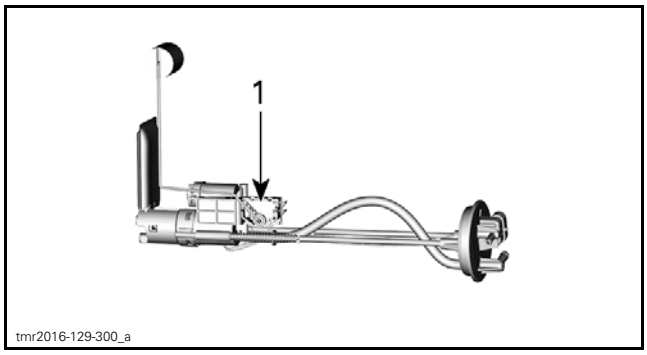
7. Insert the new strainer on fuel pump making sure to press it in fully and tightly against the fuel pump surface.
8. Using a small nut driver or socket, press in a **NEW** push nut to secure strainer.
9. Reinstall remaining removed parts.

FUEL LEVEL SENDER

The fuel level sender is a float actuated variable resistance type that is part of the fuel pump.



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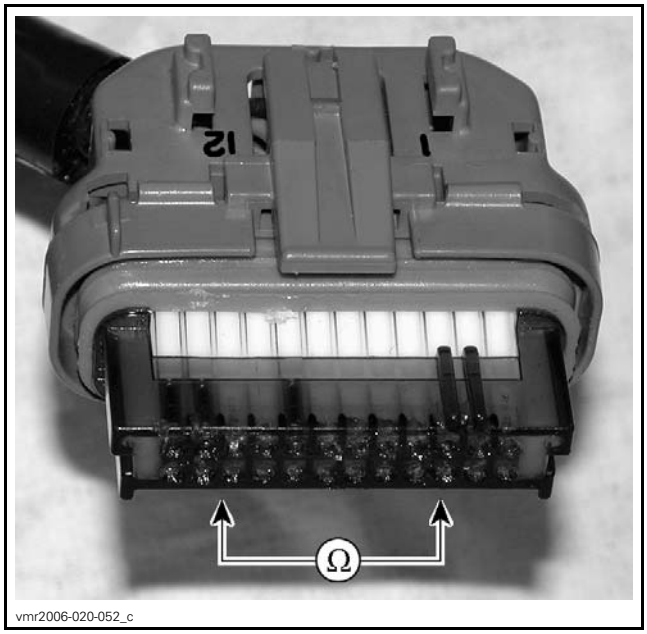
1. Fuel level sender

Testing the Fuel Level Sender Resistance (Fuel Pump Module Installed)

1. Disconnect multifunction gauge, refer to the *LIGHTS/GAUGE/ACCESSORIES* subsection.
2. Measure the resistance of the fuel level sender as follows.

FUEL LEVEL SENDER RESISTANCE TEST		
FUEL LEVEL	GAUGE CONNECTOR	RESISTANCE Ω @ 20°C (68°F)
Full	Pins 4 and 21	6 Ω ± 1
Empty		90 Ω ± 4.5



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MULTIFUNCTION GAUGE CONNECTOR

If readings are out of specification, refer to *FUEL LEVEL SENDER RESISTANCE TEST (AT FUEL PUMP CONNECTOR)*.

If readings are as specified, refer to *FUEL LEVEL SENDER INPUT VOLTAGE TEST*.

Testing the Fuel Level Sender Resistance (at Fuel Pump Connector)

FUEL LEVEL SENDER RESISTANCE TEST		
FUEL LEVEL	FUEL PUMP CONNECTOR (PUMP SIDE)	RESISTANCE Ω @ 20°C (68°F)
Full	Pins 1 and 2	6 Ω ± 1
Empty		90 Ω ± 4.5

If resistance test at fuel pump connector is failed, replace fuel pump module.

Testing the Fuel Level Sender Input Voltage

1. Set ignition switch to ON.
2. Disconnect fuel pump connector.
3. Measure for input voltage as follows.

FUEL LEVEL SENDER INPUT VOLTAGE TEST		
FUEL PUMP CONNECTOR (HARNESS SIDE)	BATTERY	VOLTAGE
Pin 2	Negative terminal	5V

TEST RESULT	SERVICE ACTION
5V is not read	Test wiring continuity between fuel level sender and multifunction gauge
Wiring continuity is good	Replace multifunction gauge
Wiring continuity is not obtained	Repair or replace wiring

Replacing the Fuel Level Sender Replacement

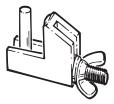
Replace fuel pump. Refer to *FUEL PUMP* in this subsection.

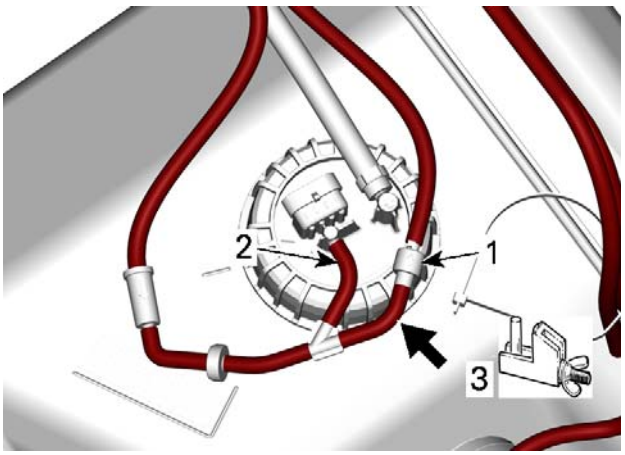
FUEL TANK VENT VALVES

Testing the Fuel Tank Vent Valve

Testing the Inlet Check Valve

1. Install a small hose pincher between the pressure relief valve and the vent inlet.

REQUIRED TOOL	
SMALL HOSE PINCHER (P/N 295 000 076)	

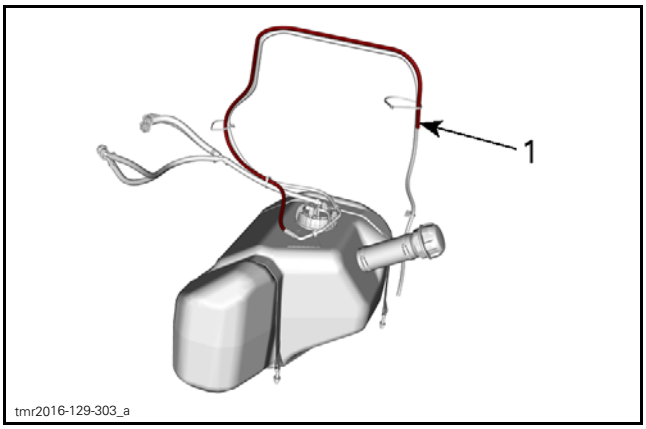


tmr2016-129-002_e

TYPICAL
1. *Pressure relief valve*
2. *Fuel pump vent inlet*
3. *Install small hose pincher here*

2. Connect the vacuum/pressure pump to the fuel tank vent hose inlet.

REQUIRED TOOL	
VACUUM/PRESSURE PUMP (P/N 529 021 800)	



tmr2016-129-303_a

1. *Fuel tank vent hose inlet*

3. Remove fuel tank cap.
4. Set vacuum/pressure pump to **PRESSURE** and activate pump. The gauge on the pump **should not change in reading**.

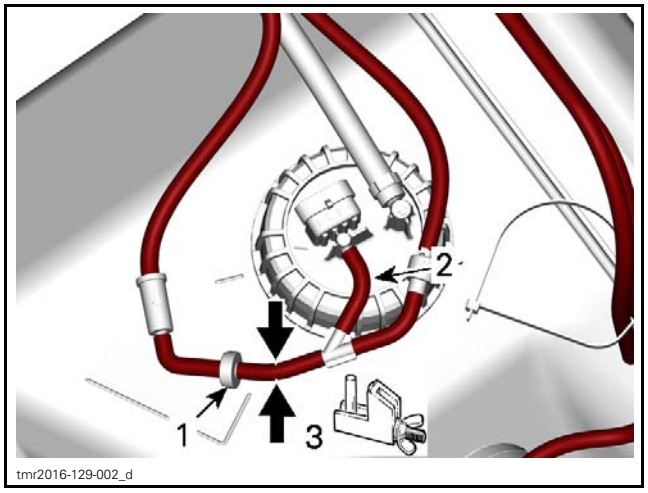
5. Set vacuum/pressure pump to **VACUUM** and activate pump. The **gauge should increase in reading**.

If the test failed, carry out the following:

– Ensure breather filter is properly installed, refer to *PERIODIC MAINTENANCE PROCEDURES*.
– Ensure inlet check valve is properly installed, refer to *FUEL TANK VENT VALVE INSTALLATION* in this subsection.
– Test inlet check valve separately. If good, replace the breather filter, refer to *PERIODIC MAINTENANCE PROCEDURES*.

Testing the Pressure Relief Valve

1. Install the small hose pincher between the inlet check valve and the inlet fitting.

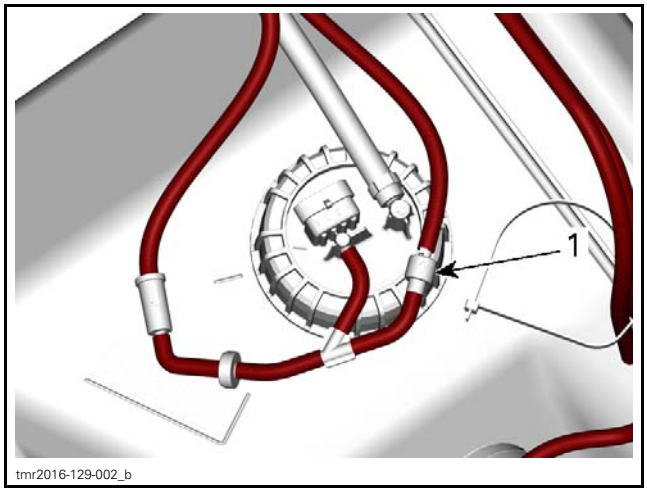


TYPICAL
1. Inlet check valve
2. Vent inlet fitting
3. Install small hose pincher here

2. Set vacuum/pressure pump to **PRESSURE** and activate pump. The **gauge should increase in reading**.
3. Set vacuum/pressure pump to **VACUUM** and activate pump. The gauge on the pump **should not change in reading**.

If the test failed, carry out the following:

– Ensure pressure relief valve is properly installed, refer to *PRESSURE RELIEF VALVE INSTALLATION* in this subsection.
– Replace pressure relief valve if it fails the test.

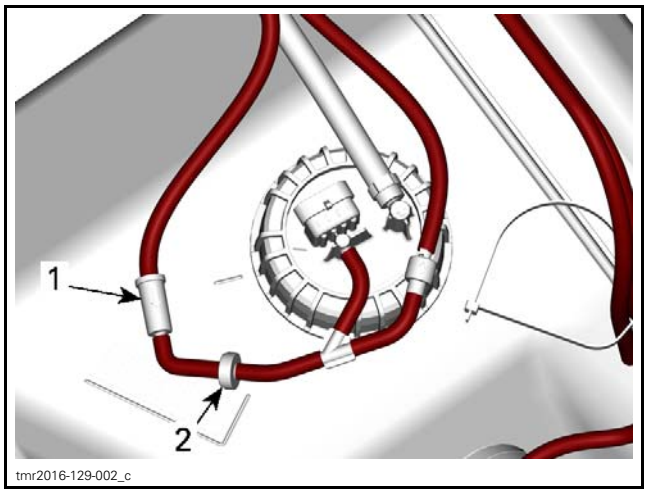


TYPICAL
1. Pressure relief valve flow direction arrow

Installing the Fuel Tank Vent Valve

Installing the Inlet Check Valve

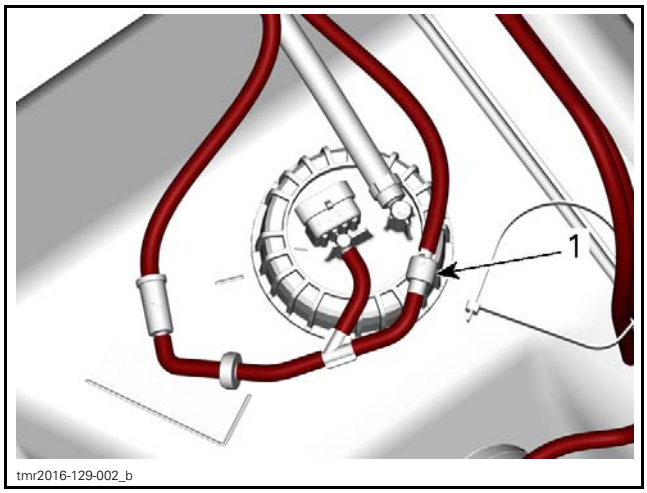
Ensure white portion of inlet check valve is towards the vent breather filter.



TYPICAL
1. Vent breather filter
2. White portion of inlet check valve

Installing the Pressure Relief Valve

Ensure pressure relief valve flow arrow is pointing away from fuel pump vent fitting.



TYPICAL
1. Pressure relief valve flow direction arrow

POWER DISTRIBUTION AND GROUNDS

GENERAL

OVERVIEW

The battery is the primary source of power for the electrical system, it is recharged by the magneto.

Some components are permanently connected to the battery (unswitched) while some require a relay or switch to be closed (switched). Refer to the color *WIRING DIAGRAM* on *KNOWLEDGE CENTER*.

At high RPM if the magneto power is greater than the loads, the rectifier/regulator will regulate power as necessary.

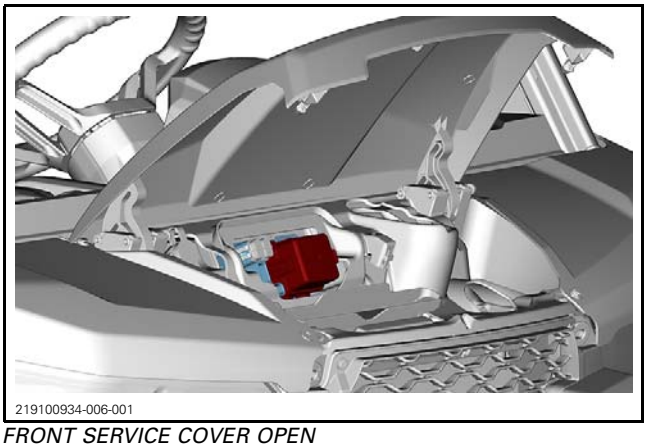
The system uses an external voltage regulator/rectifier.

FUSE HOLDERS PF3 - PF4

The fuse holders are located on the front fuse box (PF1) support.

FUSE HOLDERS		
NO	DESCRIPTION	RATING
PF3	DPS	40 A
PF4	Accessory post (Under dash terminal block)	40 A

FRONT FUSE BOX (PF1)



FRONT SERVICE COVER OPEN

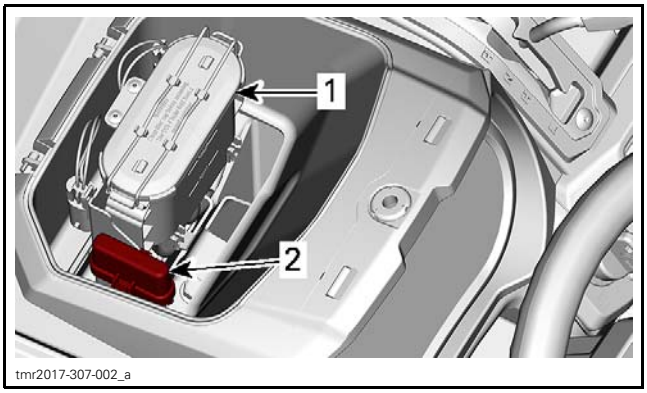
Fuses

FUSE IDENTIFICATION			
Fuses			
	F7	4X4 actuator Switches back lighting	10 A
	F10	Accessories	10 A
	F11	Headlights **If equipped:** Turn signal module Front position lights Horn Trailer light module F2/F3 in console fuse box	20 A
	F12	Accessories connector (DC3) 12V outlet 1 (DC1)	10 A
	F14	DC outlet 2	10 A
	F16	Taillights Brake lights	10 A
	Spare	N/A	20 A

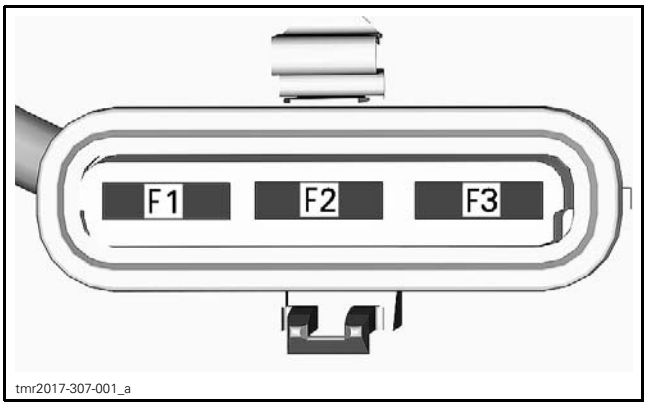
Relays

RELAY IDENTIFICATION		
Relays	R3	ECM accessory 12 volt Fuses F7/F11/F12/F16
	R8	Brake lights
	R9	Fuses F10/F14 (12 V outlet 2 and accessories)

CONSOLE FUSE BOX (PFT) (T MODELS ONLY)



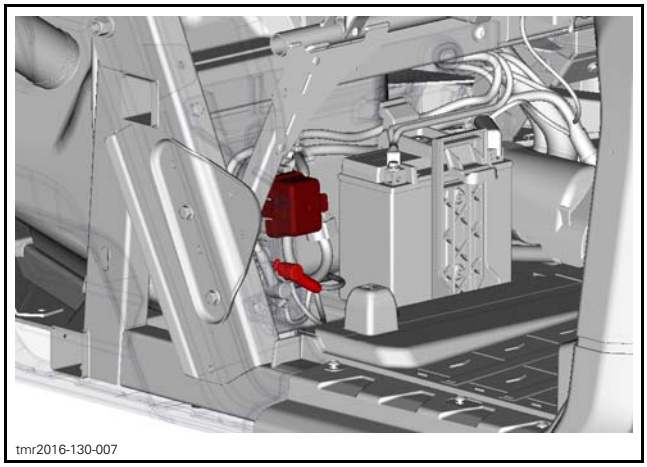
IN FRONT OF GAUGE - COVER OPEN
1. *Brake fluid reservoir*
2. *Console fuse box*



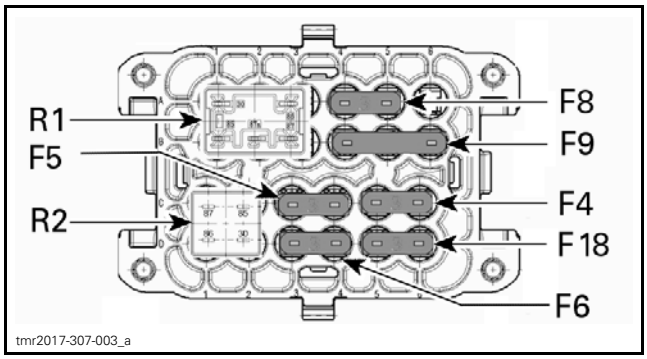
Fuses

FUSE IDENTIFICATION			
Fuses	F1	Console indicator lights Buzzer	5 A
	F2	Trailer connector relay	5 A
	F3	Trailer connector Licence plate lights	5 A

REAR FUSE BOX (PF2)



BATTERY COVER REMOVED



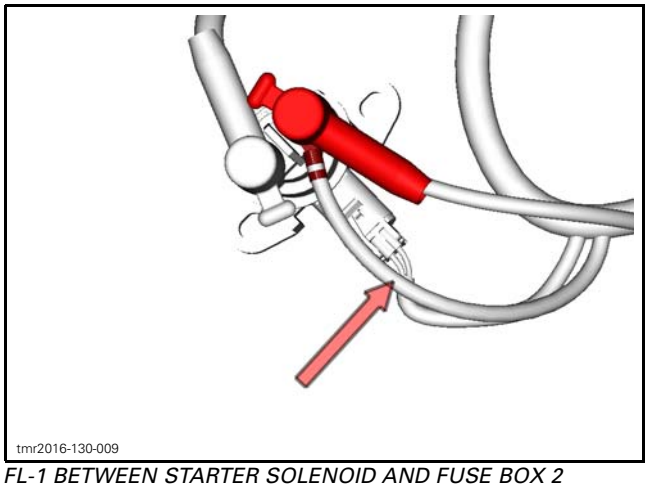
Fuses

FUSE IDENTIFICATION			
Fuses	F4	Gauge DPS unit Relay R3 Diagnostic connector Brake light switch F1 in consolefuse box (T Models)	10 A
	F5	Relay R1 Ignition coil Fuel injectors Speed sensor Fuel pump	10 A
	F6	Engine Control Module (ECM)	10 A
	F8	Ignition switch Clock	10 A
	F9	Cooling fan (thermal fuse)	25 A
	F18	Oxygen sensor Emission control	10 A

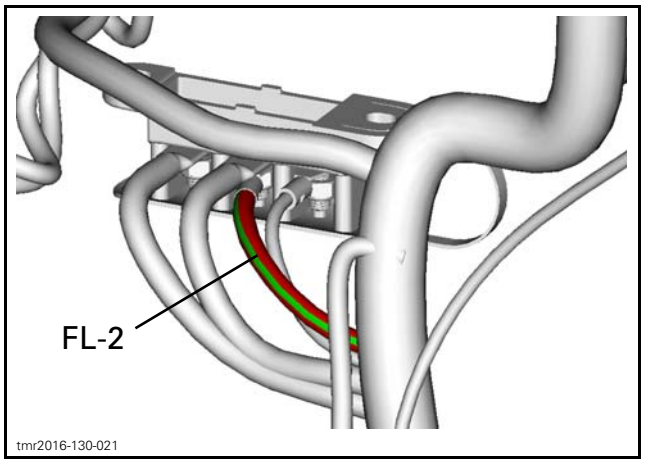
Relays

RELAY IDENTIFICATION		
Relays	R1	Cooling fan
	R2	Main

FUSIBLE LINKS



FL-1 BETWEEN STARTER SOLENOID AND FUSE BOX 2

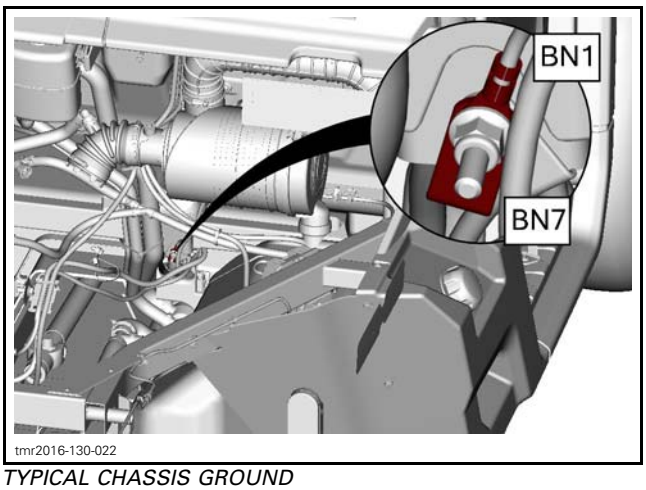


FL-2 BETWEEN UNDER DASH ACCESSORY POST AND FUSE BOX 1 (RD/GN WIRE)

Fusible link gauge (AWG) varies by current capacity.

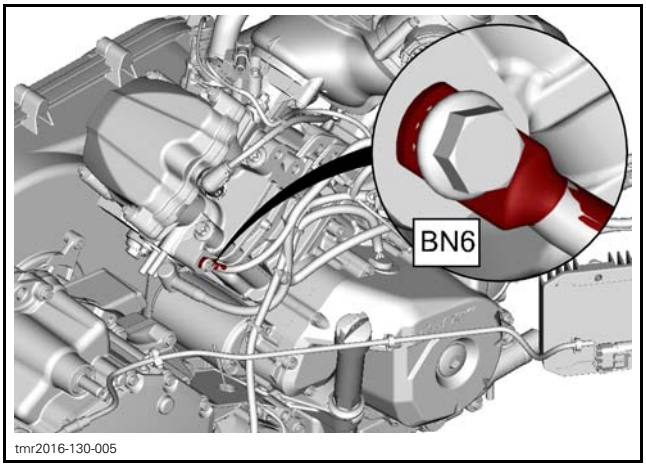
FUSIBLE LINK IDENTIFICATION			
Fusible links (FL)	FL-1	Protects fuse rear box (PF-2)	18 AWG
	FL-2	Protects front fuse box (PF-1)	14 AWG

GROUND LOCATIONS



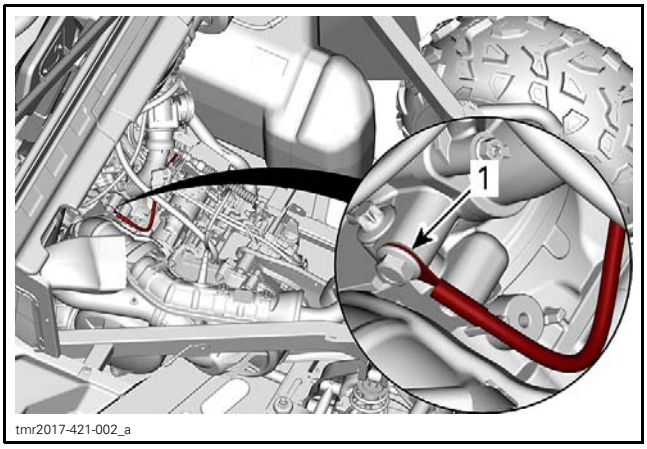
TYPICAL CHASSIS GROUND

TIGHTENING TORQUE	
Chassis ground terminal	10 N•m ± 2 N•m (89 lbf•**in** ± 18 lbf•**in**)



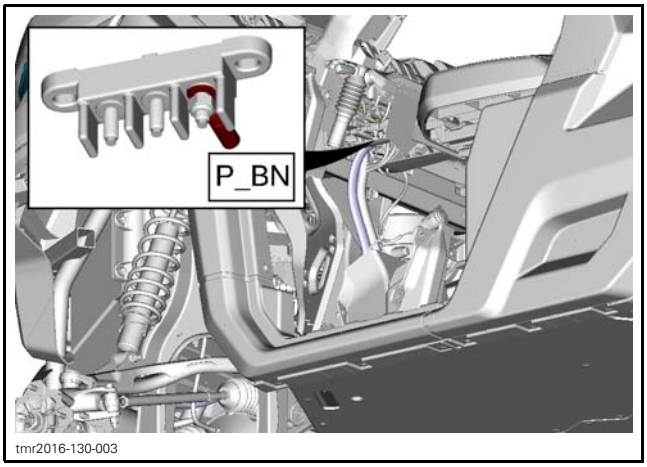
V-TWIN ENGINE GROUND

TIGHTENING TORQUE	
V-Twin engine ground terminal	9 N•m ± 1 N•m (80 lbf•**in** ± 9 lbf•**in**)



SINGLE CYLINDER ENGINE GROUND
1. BN6 - Engine ground

TIGHTENING TORQUE	
Single Cylinder Engine ground terminal	17.5 N•m ± 2.5 N•m (155 lbf•**in** ± 22 lbf•**in**)



UNDER DASH ACCESSORY POST (RD/BU WIRE)

TIGHTENING TORQUE	
Accessory post ground terminal	3.5 N•m ± 0.5 N•m (31 lbf•**in** ± 4 lbf•**in**)

WIRING HARNESS AND CONNECTORS

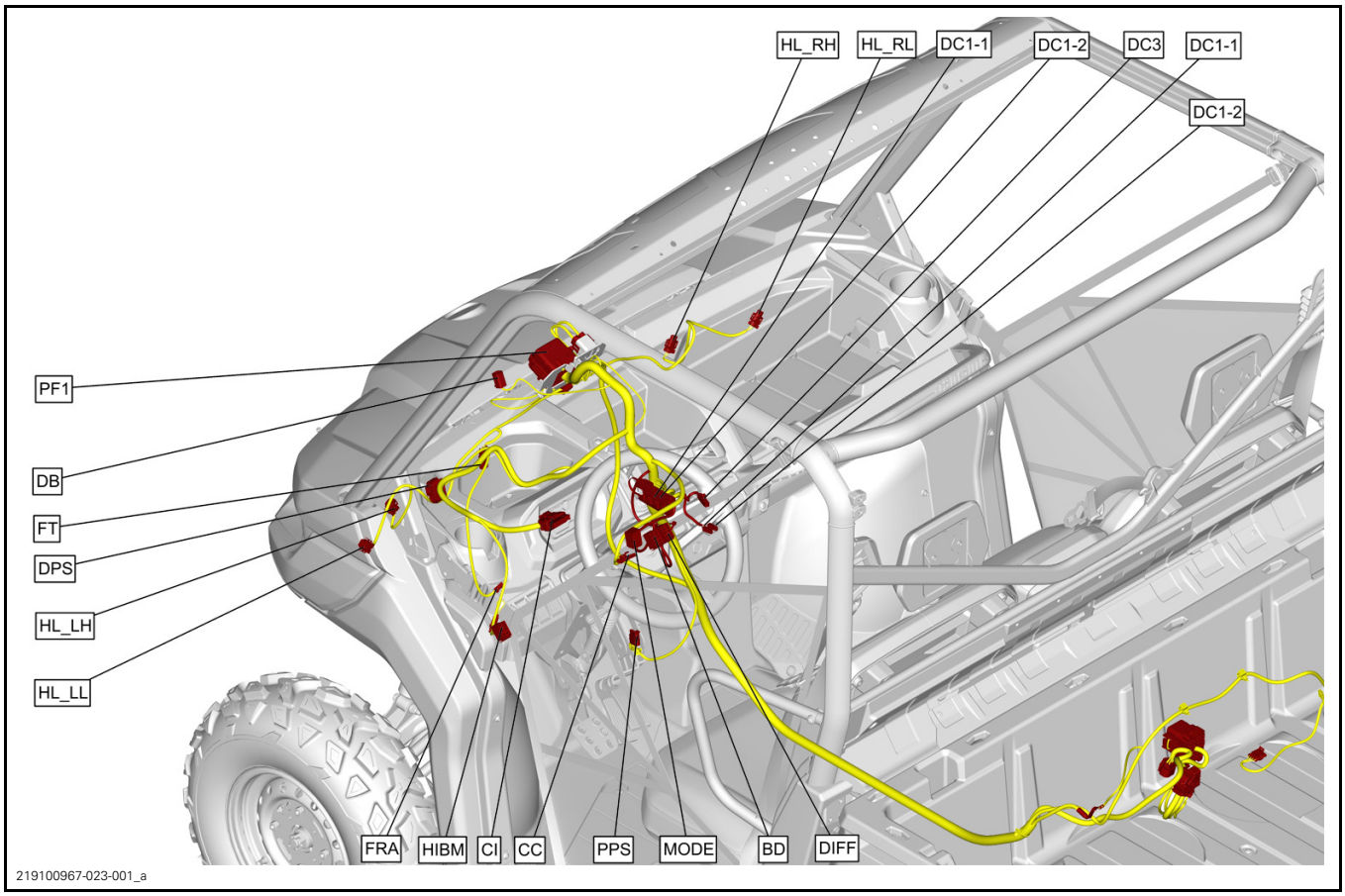
SERVICE TOOLS

Description	Part Number	Page
CRIMPING TOOL (HEAVY GAUGE WIRE)	529 035 730	13
ECM ADAPTER TOOL	529 036 166	9
ECM TERMINAL REMOVER 2.25	529 036 175	10
ECM TERMINAL REMOVER 3.36	529 036 174	10

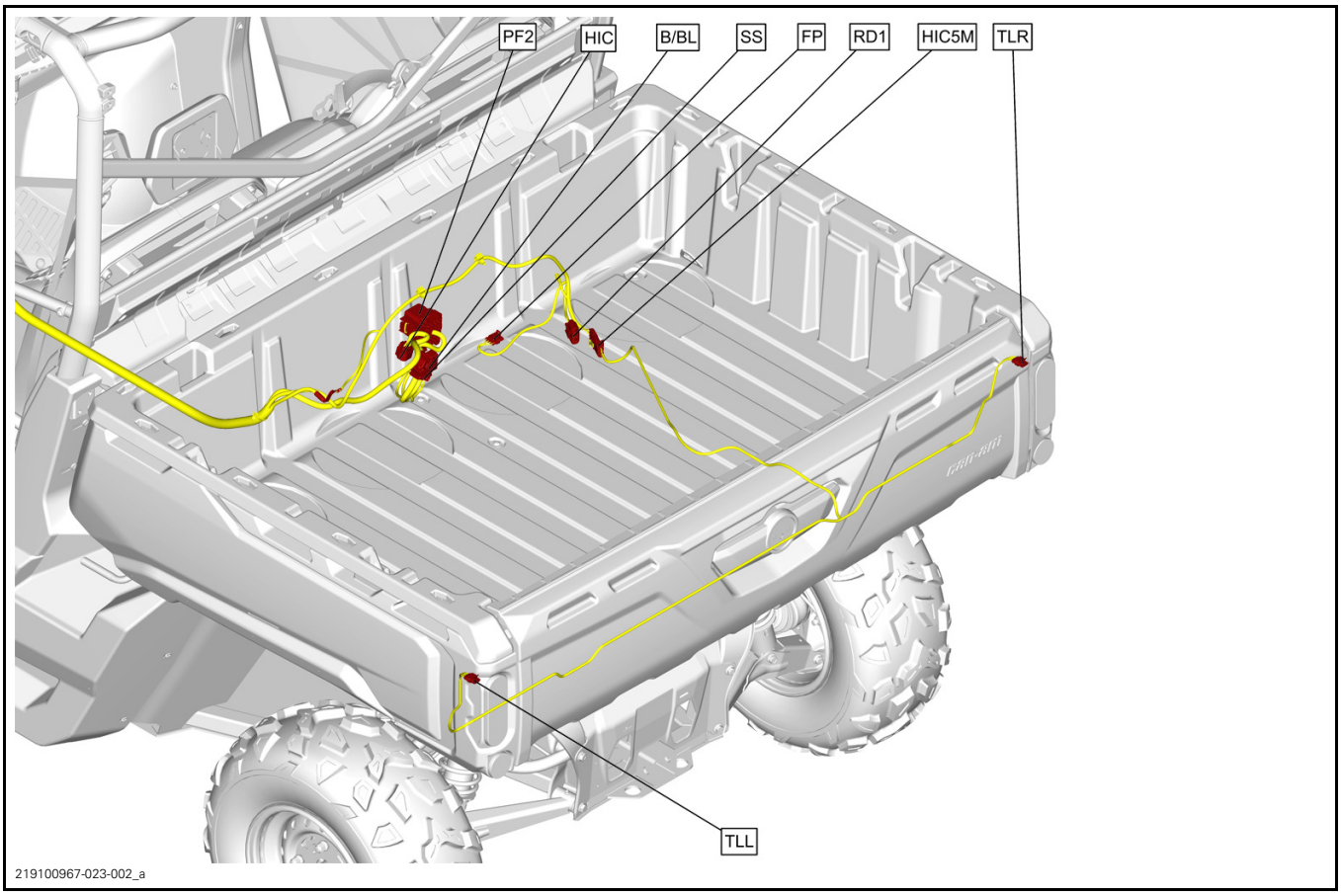
SERVICE TOOLS – OTHER SUPPLIER

Description	Part Number	Page
GM TERMINAL EXTRACTOR	12094430	7
SNAP-ON TERMINAL REMOVER TOOL	TT600-4	11
SNAP-ON TERMINAL REMOVER TOOL	TT600-4	11

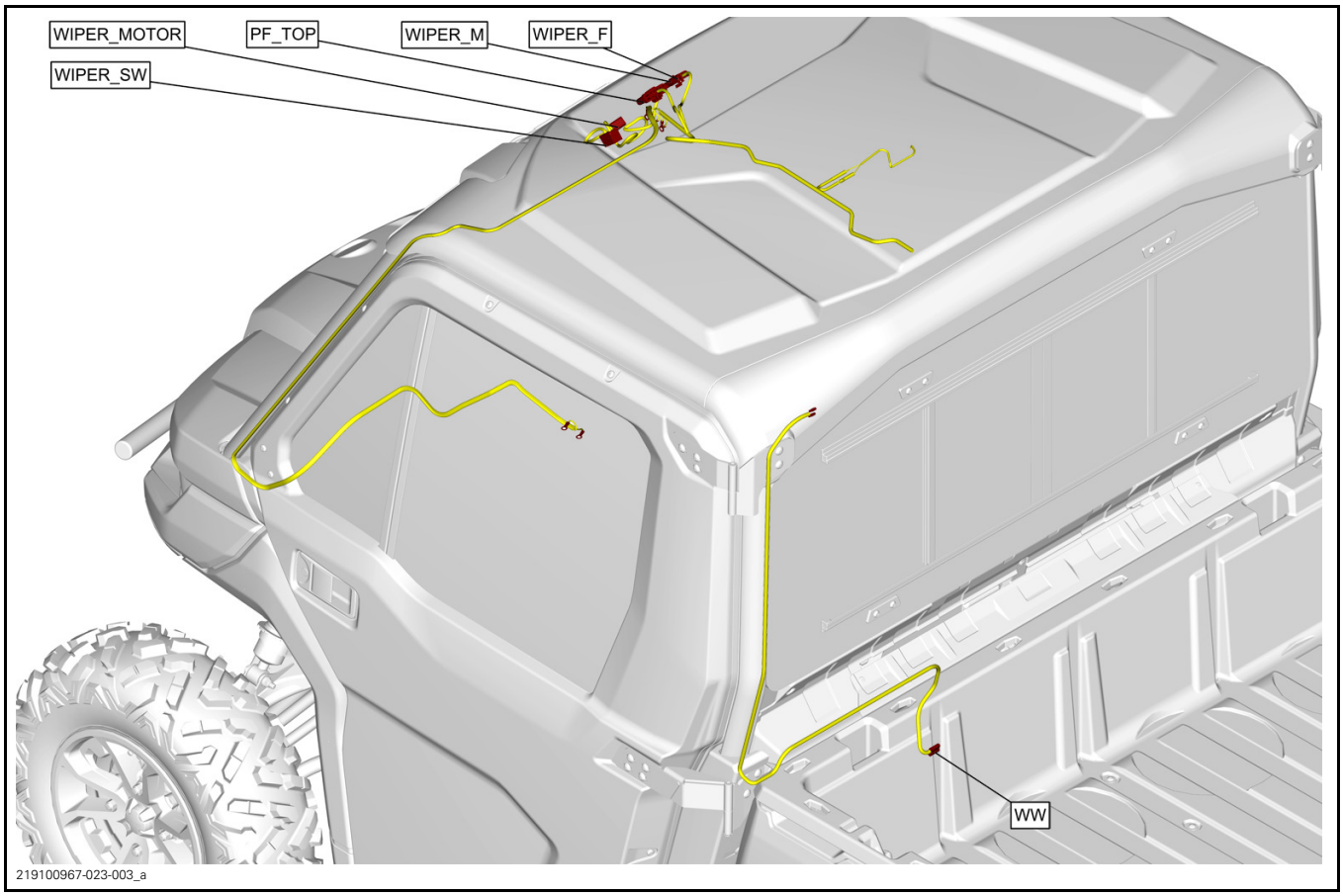
MAIN HARNESS (FRONT)



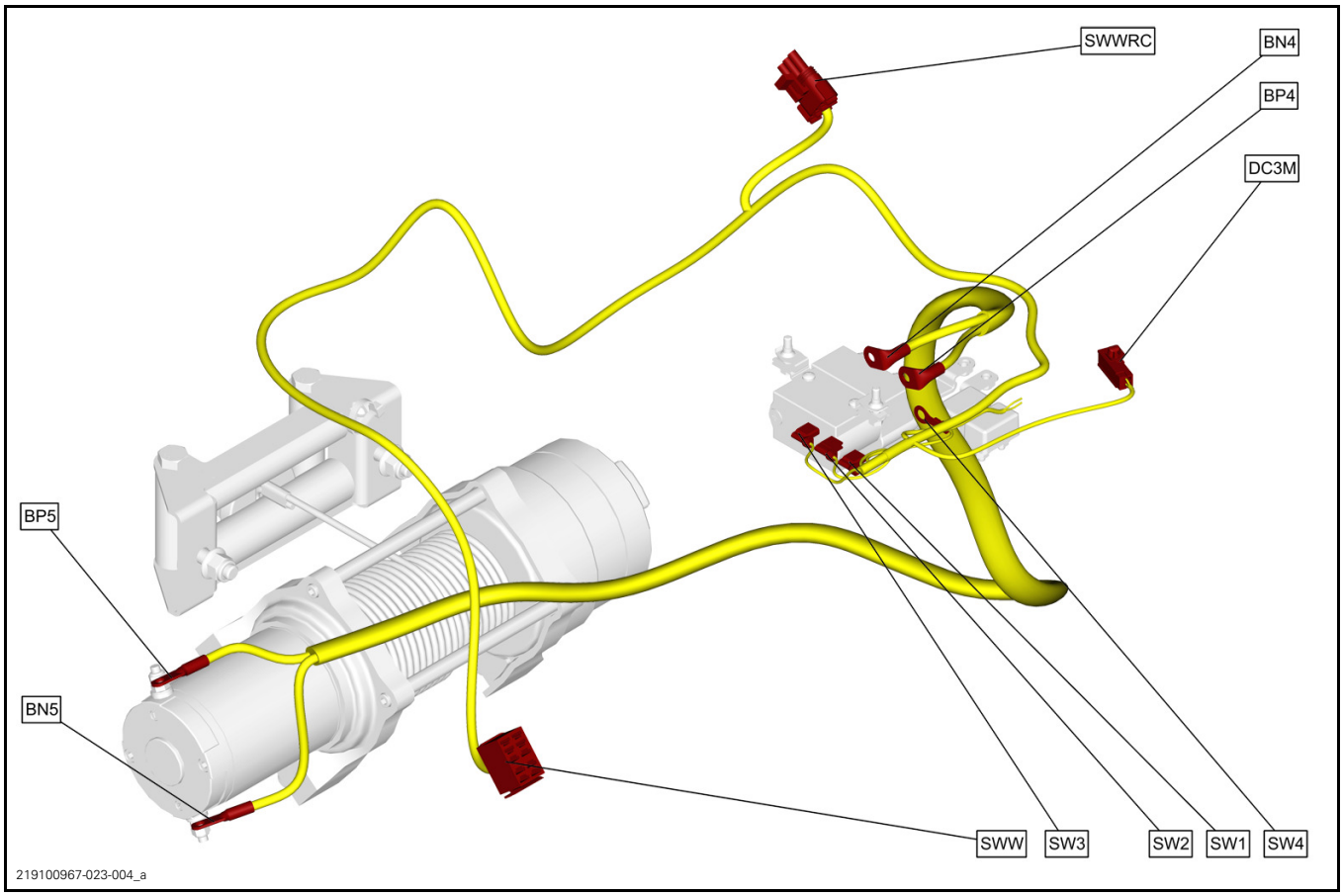
MAIN HARNESS (REAR)



ROOF HARNESS



WINCH HARNESS



GENERAL

The wiring harnesses illustrations are typical. Several variants of the connector types, such as different number of pin cavities, are used on the vehicle.

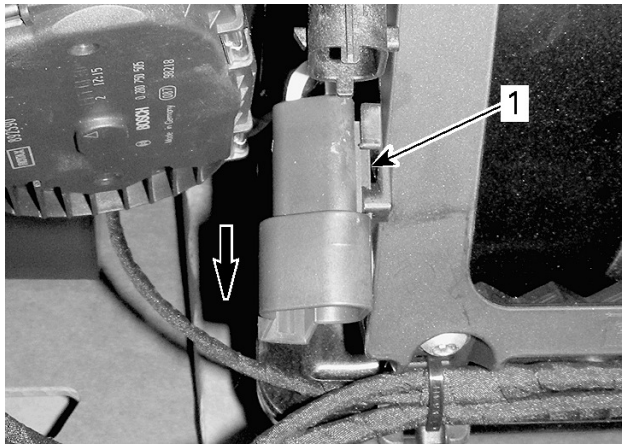
For engine harness, consult applicable *ENGINE MANAGEMENT SYSTEM (EMS)* subsection.

PROCEDURES

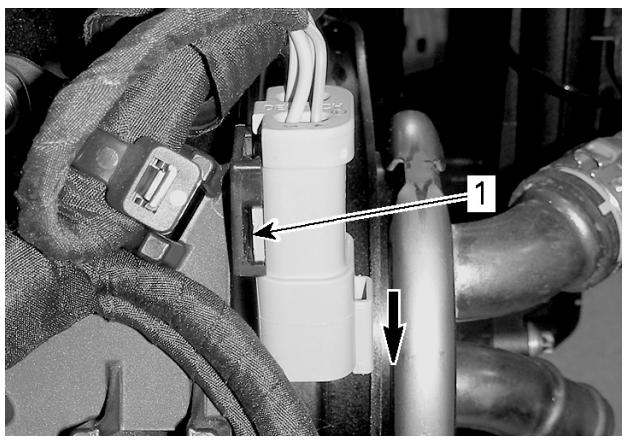
DEUTSCH CONNECTORS

Removing a Deutsch Connector from its Support

1. Insert a small flat screwdriver between the support and the Deutsch connector.
2. Pry the connector away from the support slightly while sliding it out in the direction shown.



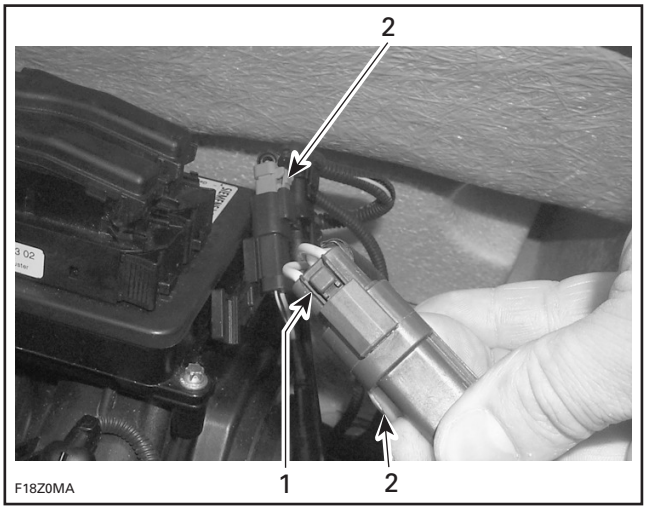
TYPICAL - MALE CONNECTOR REMOVED FOR CLARITY
1. Insert screwdriver here



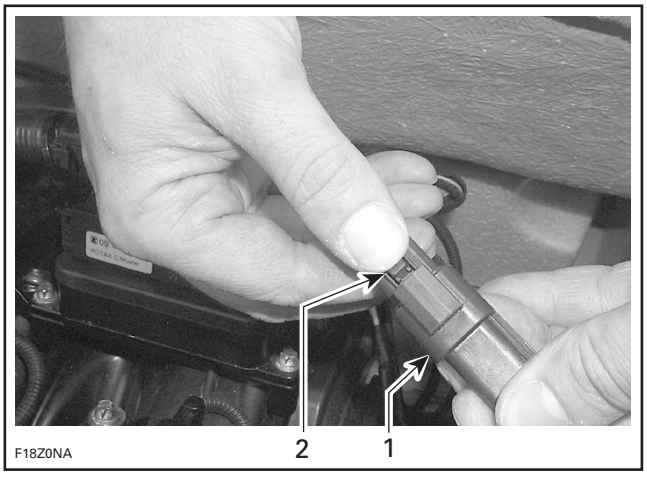
TYPICAL - MALE CONNECTOR REMOVED FOR CLARITY
1. Insert screwdriver here

Disconnecting a Deutsch Connector

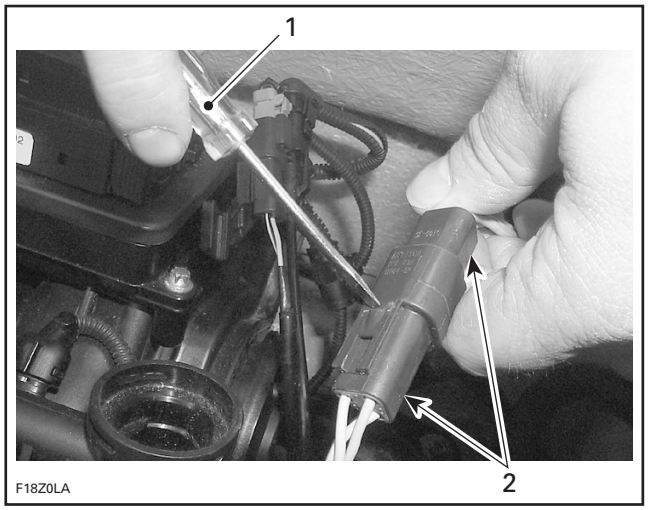
1. To disconnect a Deutsch connector, press the release tab and twist a small flat screwdriver between the male and female housing to disengage and disconnect them.



TYPICAL
1. Release tab
2. Deutsch connector

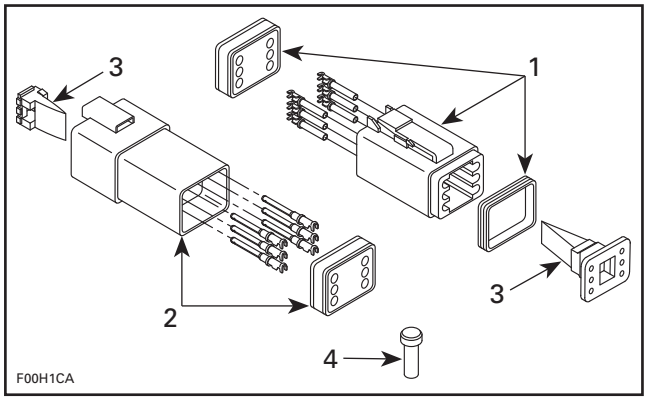


TYPICAL
1. Deutsch connector
2. Press release button



TYPICAL
1. *Flat screwdriver*
2. *Deutsch connector*

Disassembling and Reassembling a Deutsch Connector



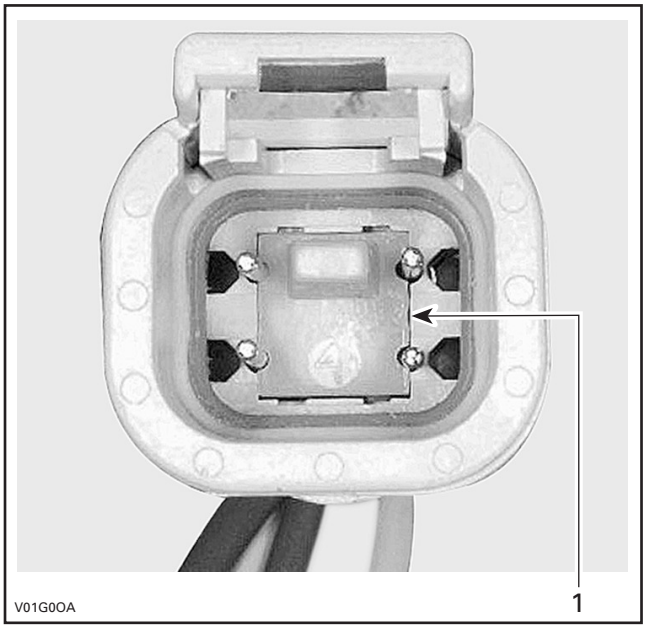
TYPICAL - DEUTSCH CONNECTOR
1. *Male connector*
2. *Female connector*
3. *Secondary lock*
4. *Sealing cap*

NOTICE Do not apply dielectric grease on terminal inside connector.

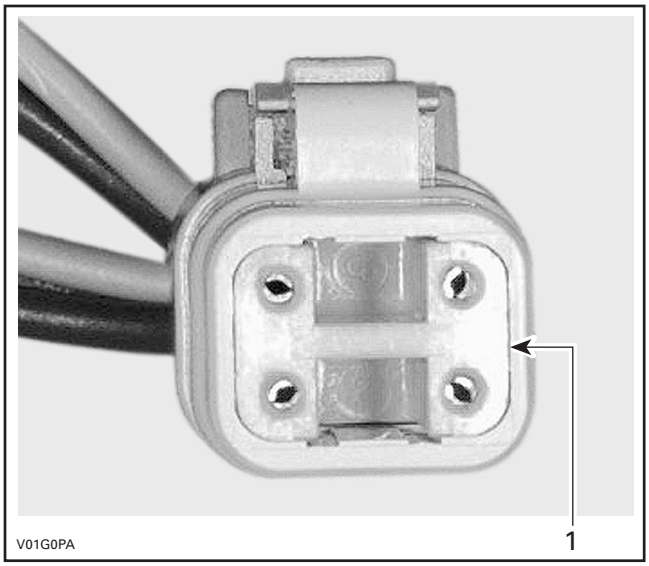
Removing a Terminal

To remove terminals from connector, proceed as follows:

1. Using long nose pliers, pull out the secondary plastic lock from between the terminals.



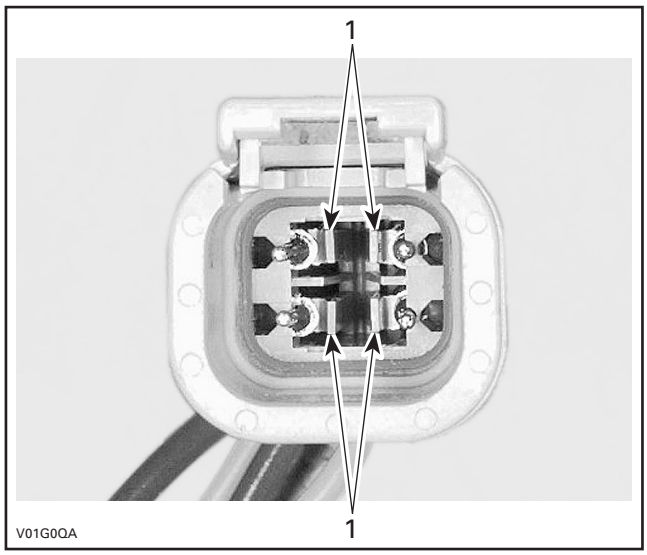
FEMALE CONNECTOR
1. *Female lock*



MALE CONNECTOR
1. *Male lock*

NOTE: Before pin extraction, push wire forward to relieve pressure on retaining tab.

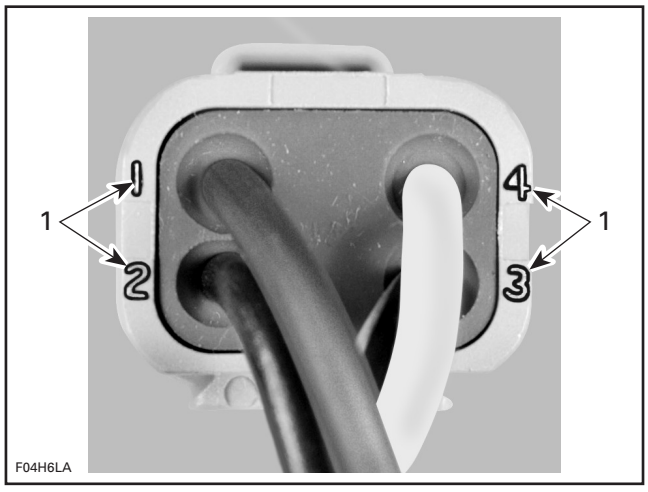
2. Insert a 4.8 mm (.189 in) wide screwdriver blade inside the front of the terminal cavity.
3. Pry the retaining tab away from the terminal while gently pulling the wire and terminal out of the back of the connector.



FEMALE CONNECTOR
1. Retaining tab

Inserting a Terminal

1. For insertion of a terminal, ensure the secondary plastic lock is removed.
2. Insert terminal through the back of the connector in the appropriate position, and push it in as far as it will go. You should feel or hear the terminal lock engage.
3. Pull back on the terminal wire to be sure the retention fingers are holding the terminal.
4. After all required terminals have been inserted, the lock must be installed.



CONNECTOR PIN-OUT
1. Terminal position identification numbers

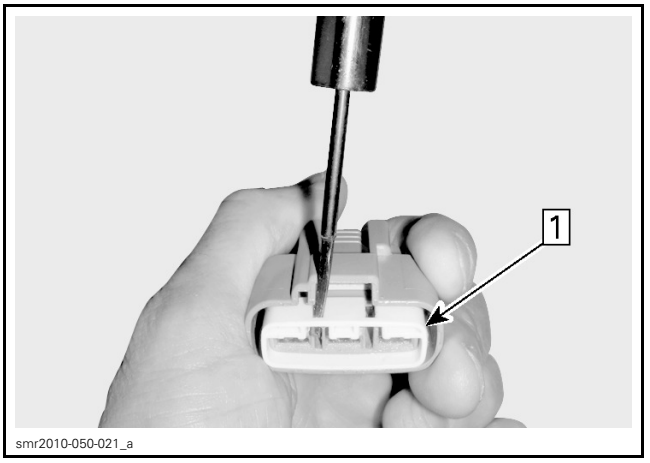
FURUKAWA CONNECTOR

Furukawa Connector Application

Voltage regulator/rectifier.

Removing a Terminal

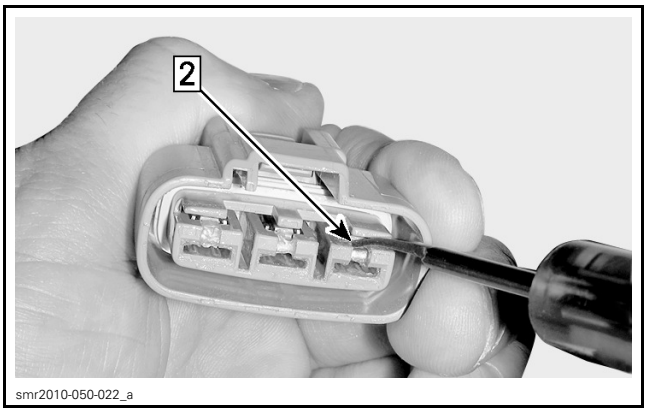
1. Remove the secondary lock (plastic insert).



Step 1: Remove the secondary lock

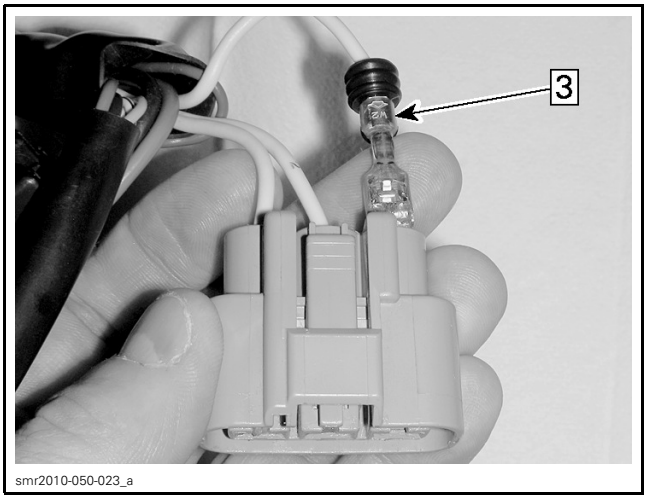
2. Carefully insert the GM TERMINAL EXTRACTOR (P/N 12094430) between the lock and the pin to release the pin.

GM TERMINAL EXTRACTOR (P/N 12094430)



Step 2: Insert GM extractor tool (P/N 12094430)

3. Gently pull on the wire to extract the pin out the back of the connector.



Step 3: Pull wire to extract pin

NOTICE Before installing terminals in the connectors, ensure all terminals are properly crimped on the wires. After installation of the wire terminals in the connectors, ensure they are properly locked by gently pushing on them as if to extract them.

MOLEX CONNECTOR

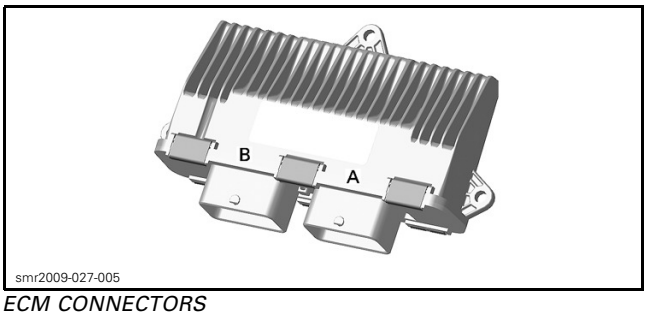
Molex Connector Application

The Molex connector is used on the ECM.

There are 2 MOLEX connectors on the ECM.

The engine wiring harness connector is connected to ECM connector "A". The vehicle wiring harness connector is connected to ECM connector "B".

Each ECM connector has 48 pins.

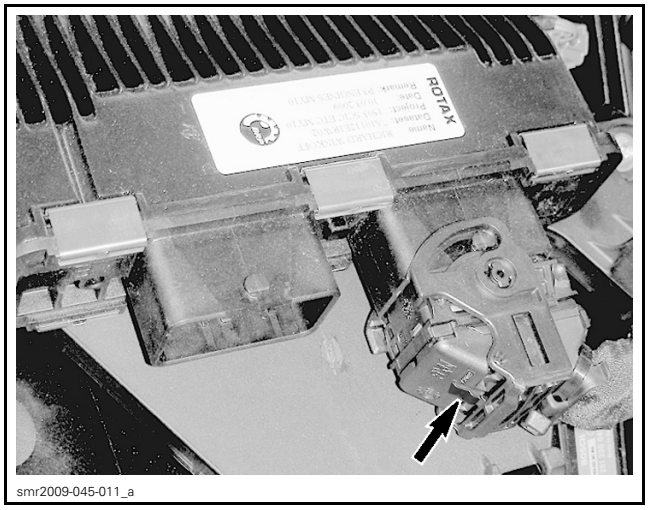


ECM CONNECTORS

Do not apply any product to the pins in the ECM connector.

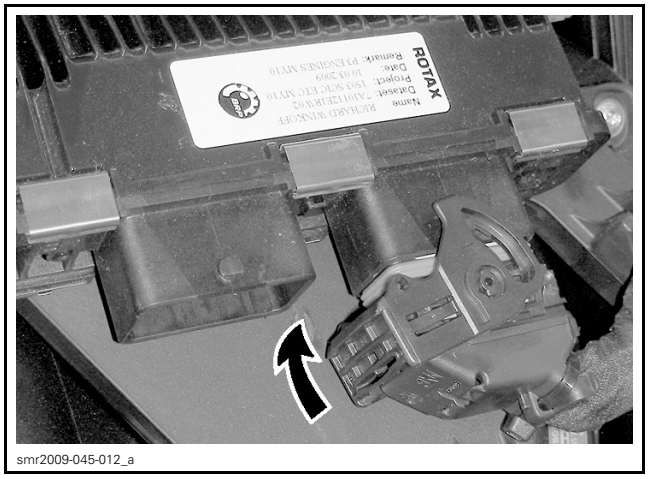
Removing the Connector

1. Press and hold the locking tab on the connector to be disconnected.



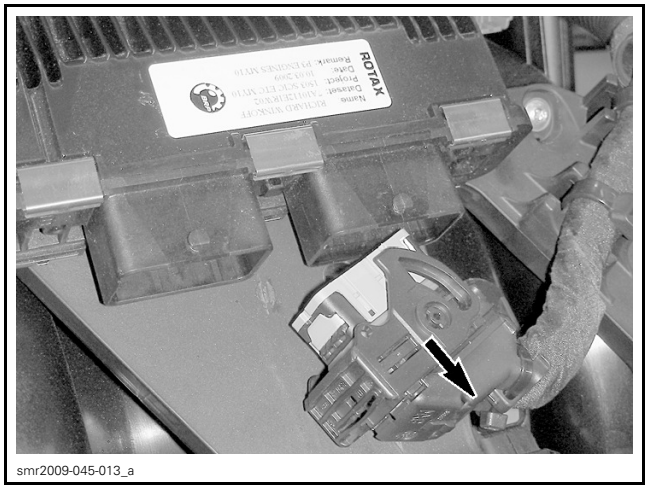
LOCKING TAB TO PRESS AND HOLD

2. As you hold the locking tab, rotate the connector locking cam until it stops.



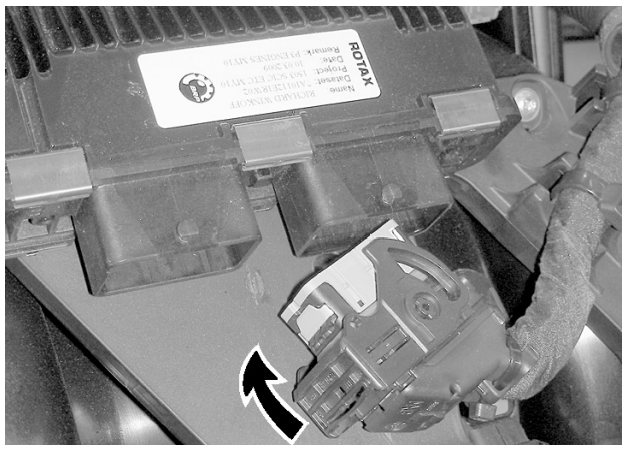
CONNECTOR LOCKING CAM ROTATION TO RELEASE

3. Pull connector off ECM.



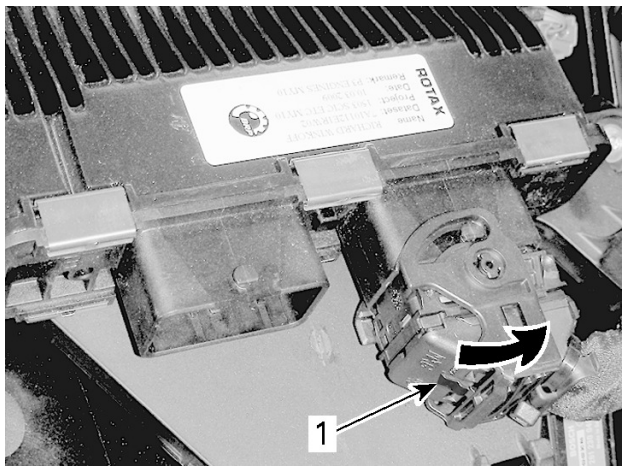
Installing the Connector

1. Fully open connector locking cam.



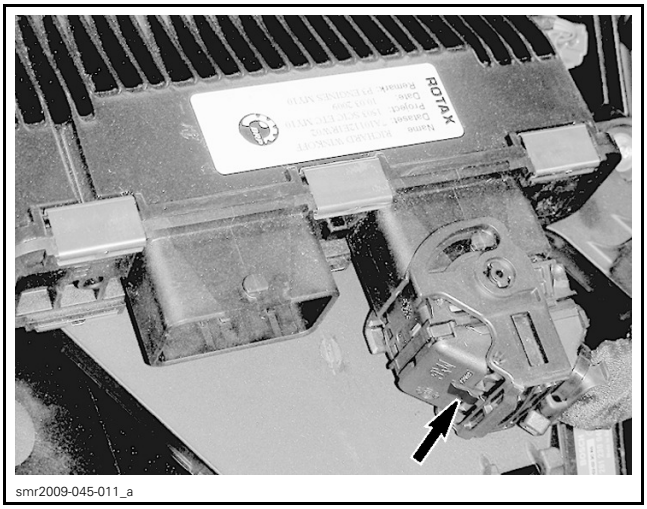
CONNECTOR LOCKING CAM IN RELEASE POSITION

2. Insert connector on ECM.
3. As you push the connector onto the ECM, rotate the connector locking cam until it snaps locked.



1. Locked here

4. Ensure the locking tab is fully out.



LOCKING TAB FULLY OUT

Inspecting the Connector

Before replacing an ECM, always check electrical connections.

1. Ensure connector locking mechanism is functioning properly.
2. Ensure all wire terminals (pins) are properly locked in the connector.
3. Ensure they are very tight, make good contact with the pins in the ECM.
4. Ensure the pins in the harness connector and the ECM connector are clean, shiny and corrosion-free.
5. Check wiring harness for signs of scoring.

NOTE: A "defective ECM module" could possibly be repaired simply by disconnecting and reconnecting it.

NOTICE **Do not apply any lubricant product to the pins of the ECM connector.**

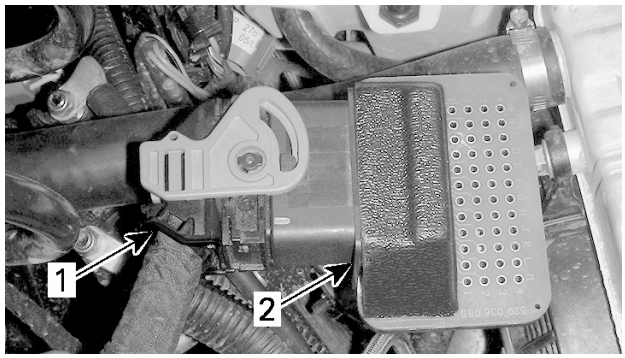
Probing the Connector

The most recommended and safest method to probe the MOLEX (ECM) connector terminals is to use the required tool. This tool will prevent deforming or enlarging of the terminals, which would lead to bad ECM terminal contact creating intermittent or permanent problems.

REQUIRED TOOL	
ECM ADAPTER TOOL (P/N 529 036 166)	

1. Disconnect the ECM connector to be probed, and reconnect it on the ECM adapter.

2. Probe wire terminals of the circuit to be tested directly in the adapter holes.



vmr2008-139-016_a

TYPICAL
1. ECM connector
2. ECM adapter

NOTICE Never probe directly on the ECM harness connector. This could change the shape or enlarge the terminals and create intermittent or permanent contact problems.

Removing a Terminal (Harness Connector)

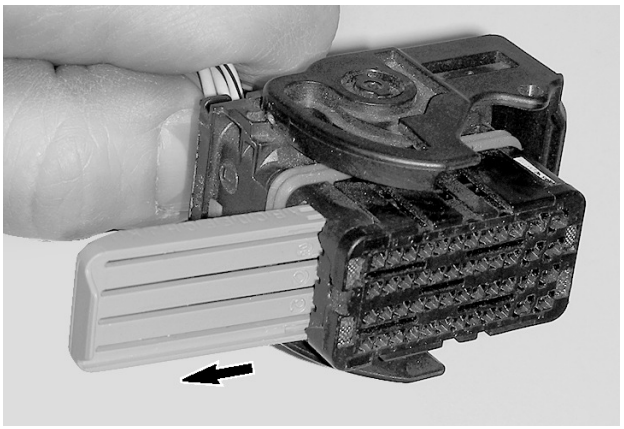
To remove a signal terminal from the ECM harness connector, ECM TERMINAL REMOVER 2.25 (P/N 529 036 175).

REQUIRED TOOL	
ECM TERMINAL REMOVER 2.25 (P/N 529 036 175)	

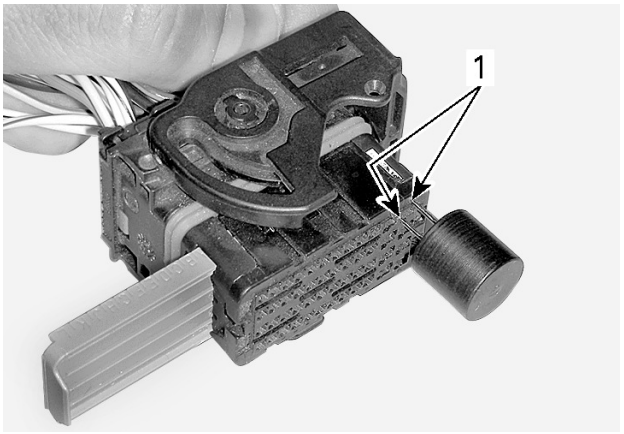
To remove a power terminal, use the ECM TERMINAL REMOVER 3.36 (P/N 529 036 174).

REQUIRED TOOL	
ECM TERMINAL REMOVER 3.36 (P/N 529 036 174)	

1. Remove rear protector from connector.
2. Pull out the connector lock.


smr2009-045-025_a

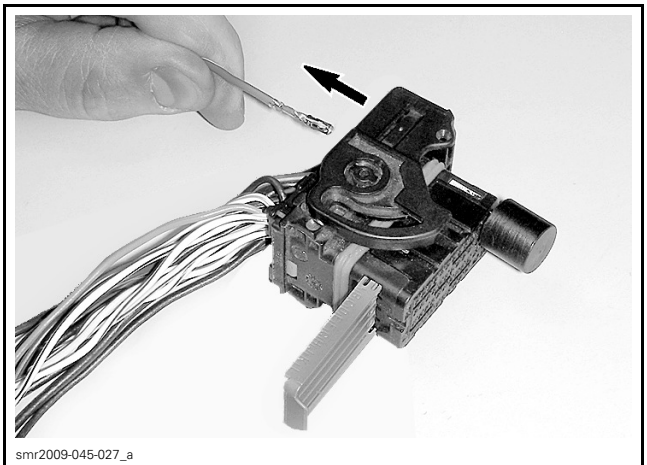
3. Insert tool to unlock terminal.



smr2009-045-026_a

1. Unlock here

4. Gently pull on the wire to extract the terminal out the back of the connector.


smr2009-045-027_a

NOTICE Before installing wire terminals in the connector, ensure all terminals are properly crimped on wires. After installation of wire terminals in the connectors, ensure they are properly locked by gently pulling on them as if to extract them.

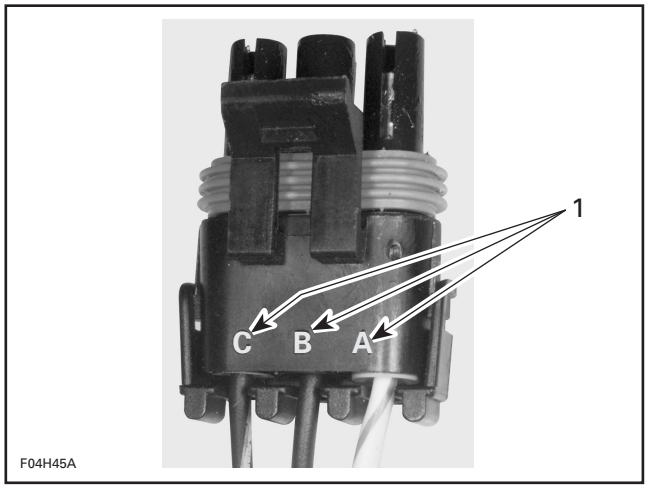
PACKARD CONNECTORS

Packard Connector Application

Packard connectors are used to connect:

– Electrical harnesses
– Gauges
– VCM
– EFB
– Headlamps.

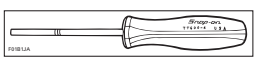
3-Pin Packard Connector



VIEW OF A 3-PIN PACKARD CONNECTOR
1. Identification letters

NOTE: This type of connector also comes in other pin configurations.

To remove a terminal from a 3-pin Packard connector, SNAP-ON TERMINAL REMOVER TOOL (P/N TT600-4).

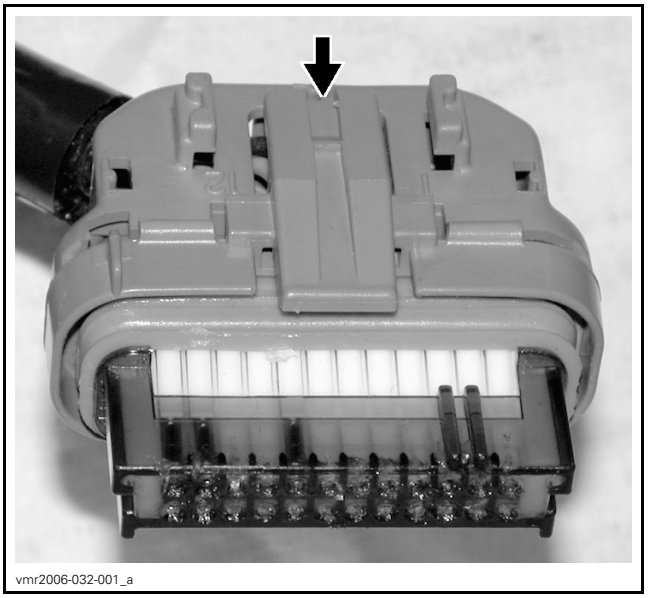
REQUIRED TOOL	
SNAP-ON TERMINAL REMOVER TOOL (P/N TT600-4)	

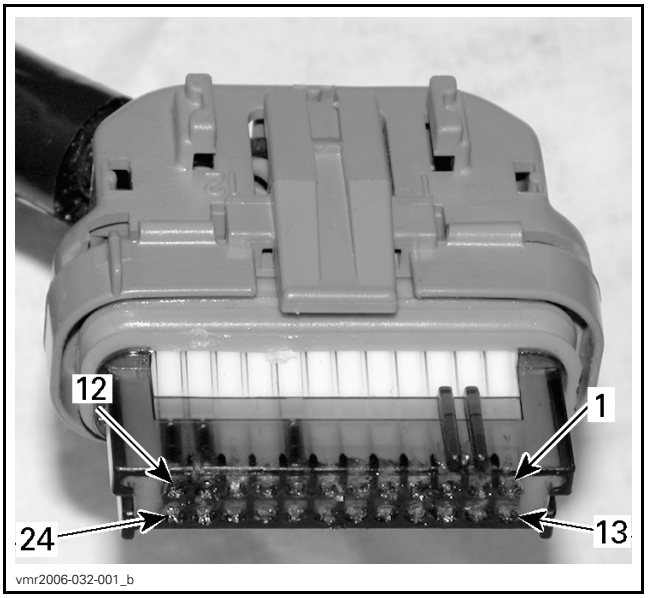
⚠ WARNING

Ensure all terminals are properly crimped on wires and connectors are properly fastened.

PACKARD CONNECTOR (MULTIFUNCTION GAUGE)

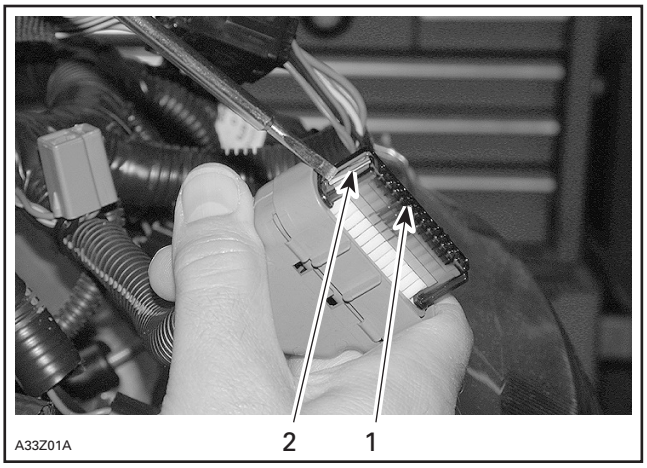
Firmly push down tab and hold to unlock connector while pulling it out.





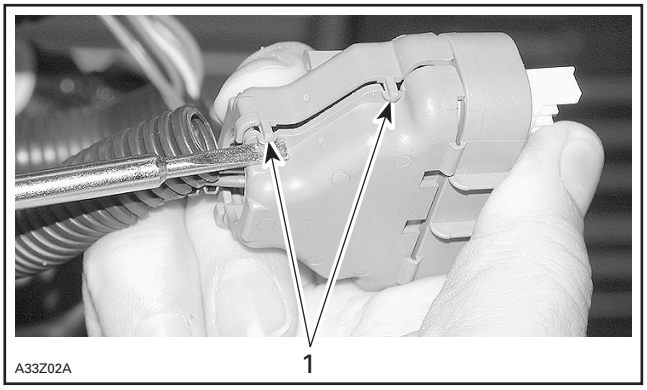
CONNECTOR PINOUT

Push on both tabs to remove retainer.



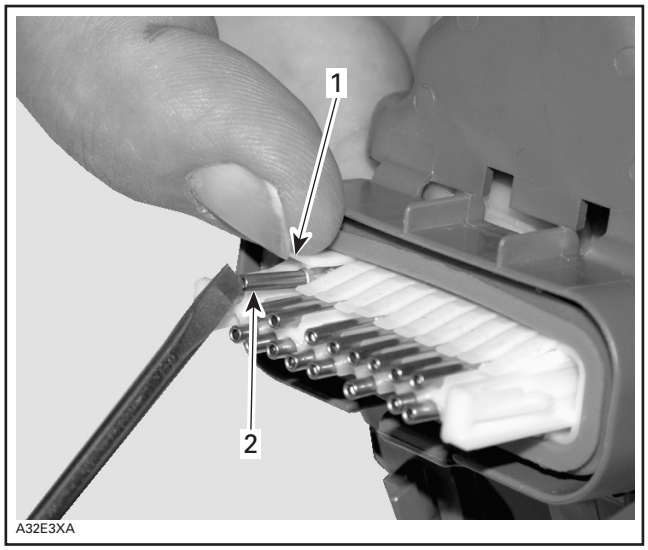
TYPICAL
1. Retainer
2. Tab (one on each side)

Open housing by lifting 4 tabs.



TYPICAL
1. Tabs (2 on each side)

Lift the top plastic lock of the female terminal to be removed and hold in position. Lift the female terminal to unlock from the housing and push out of housing.

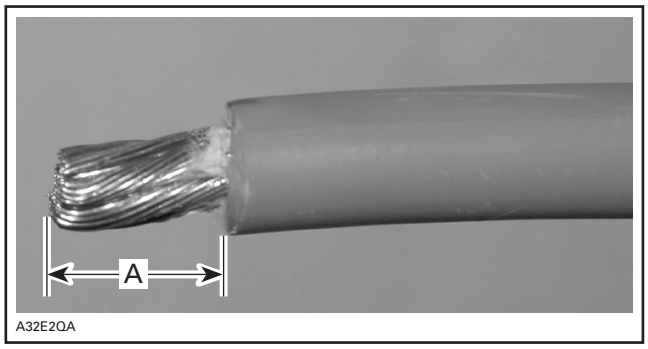


TYPICAL
1. Lift and hold plastic lock
2. Lift to unlock and push out

BATTERY AND STARTER CABLE TERMINALS

Crimping a Cable

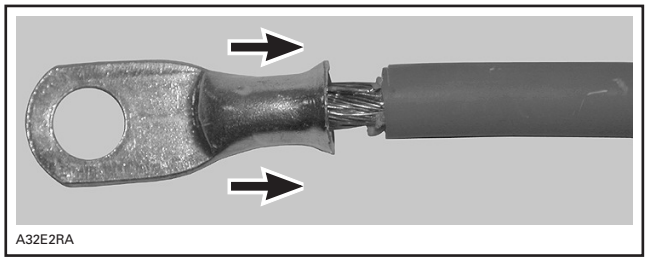
Carefully strip the wire approximately to 10 mm (3/8 in) in length, using a wire stripping tool or sharp blade/knife.



A. 10 mm (3/8 in)

NOTE: Make sure not to cut wire strands while stripping the wire.

Install the appropriate terminal on the wire according to the requirement. Refer to appropriate *PARTS CATALOG*.

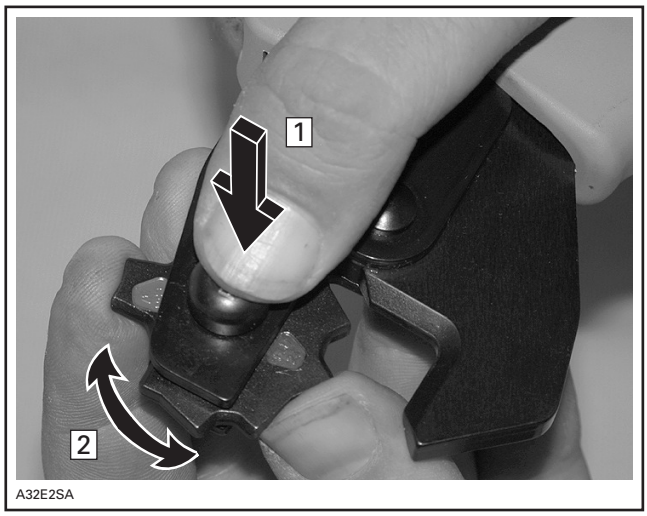

A32E2RA

INSTALLATION OF TERMINAL

Follow the instructions provided with the required tool to select the proper position of the tool.

REQUIRED TOOL	
CRIMPING TOOL (HEAVY GAUGE WIRE) (P/N 529 035 730)	

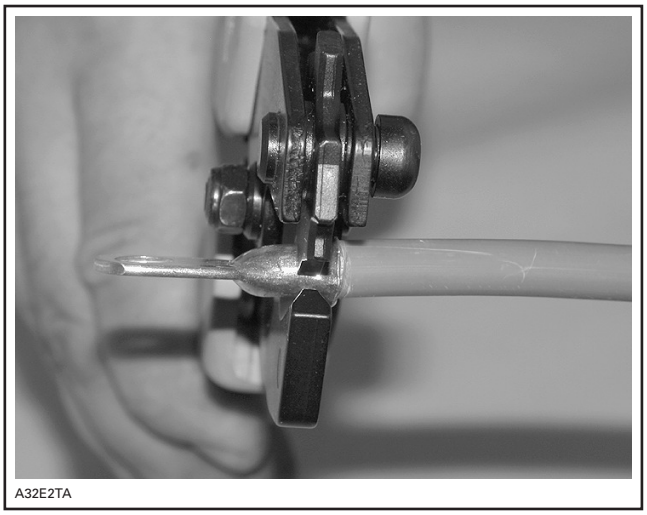
NOTE: Different wires require different crimping pliers settings.



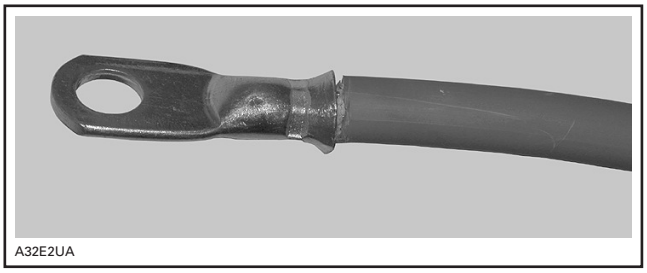
A32E2SA

POSITIONING THE CRIMPING PLIERS
Step 1: Press
Step 2: Rotate

After positioning the crimping pliers, crimp the terminal already installed on wire.


A32E2TA

CRIMPING OF WIRE


A32E2UA

PROPERLY CRIMPED WIRE

To verify, if the wire is properly crimped, apply some pulling force on wire and the terminal at the same time from both directions.

NOTICE **Never weld the wire to the terminal. Welding can change the property of the wire and it can become brittle and break.**

Install the protective heat shrink rubber tube on the terminal. Heat the heat shrink rubber tube using the heat gun so that it grasps the wire and the terminal.

NOTICE **Make sure that the protective heat shrink rubber tube has been properly installed and no part of wire is exposed.**

SPLICES REPAIR PROCEDURE

This section gives the procedures in order to quickly repair electrical harness splices.

1. Make sure to perform the usual tests described in *ELECTRICAL SYSTEM* sections before investigating the harness splices.
2. If an electrical issue can not be found with the usual tests, locate the main harness splice that is involved in the faulty circuit and repair it as described further in this section.

3. To repair a splice, we recommend the use of a tin solder meeting the followings requirements or an equivalent.

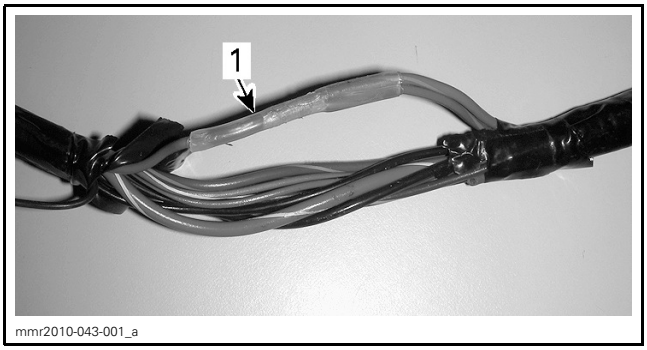
TIN SOLDER REQUIREMENTS
SN 60
PB 40
DIA 0.062
FLUX RA 2%

CASE 1: Wire Detached from Splice

⚠ WARNING

Repairs described in this section should never be performed on harness sections that can be exposed to water.

1. Locate splice. Refer to splices location diagrams.
2. Remove wires from protector tube.
3. Locate the shrink tube protecting the defective splice.



mmr2010-043-001_a

1. Shrink tube

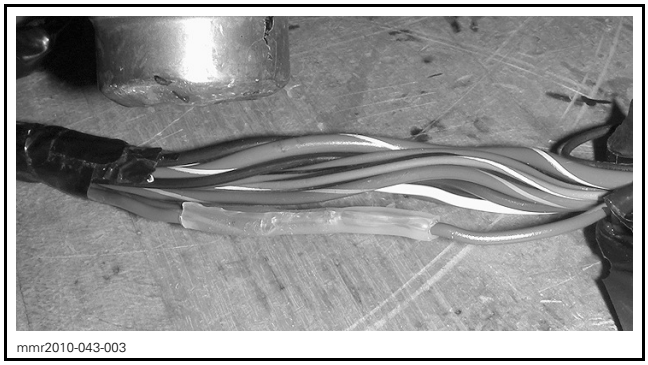
4. Remove the shrink tube.

4.1 Using a blade, cut the shrink tube.

mmr2010-043-002

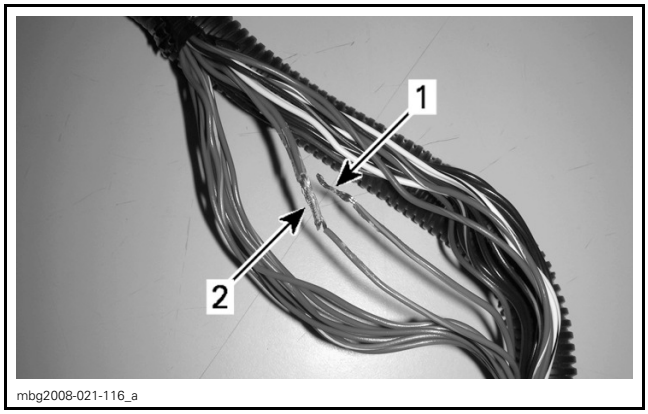
NOTICE **Be careful with the blade to avoid cutting wires insulation.**

4.2 Slightly heat the shrink tube using a heat gun.


mmr2010-043-003

4.3 Remove the shrink tube with long nose pliers.

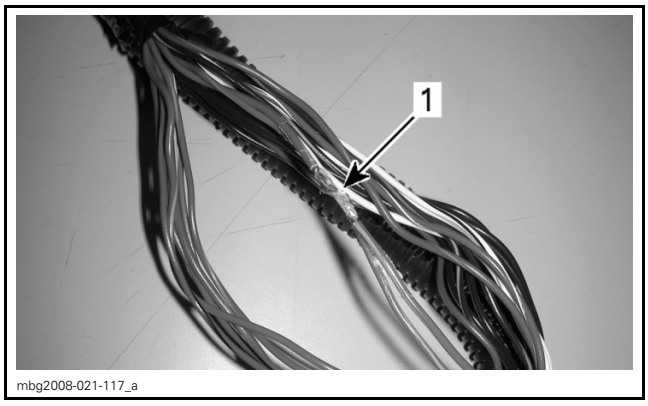
5. Locate detached wire from splice.



mbg2008-021-116_a

1. Detached wire
2. Splice

6. Twist detached wire around splice.



mbg2008-021-117_a

1. Twisted wire

7. Perform a tin solder on twisted wire.
8. Apply electrical tape to cover splice.

NOTE: Make sure tape overlaps on wire insulation, approximately 13 mm (1/2 in) each side.

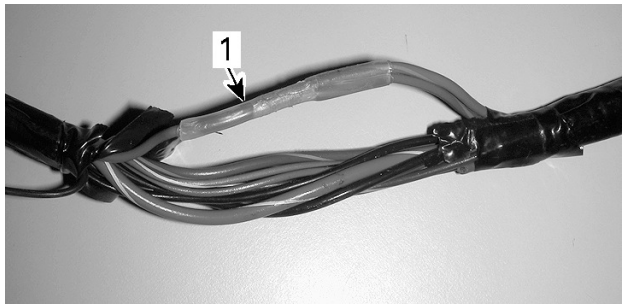
9. Reinstall wires into protector tube.

CASE 2: Wire Broken from Splice

⚠ WARNING

Repairs described in this section should never be performed on harness sections that can be exposed to water.

1. Locate splice. Refer to splices location diagrams.
2. Remove wires from protector tube.
3. Locate the shrink tube protecting the defective splice.



mmr2010-043-001_a

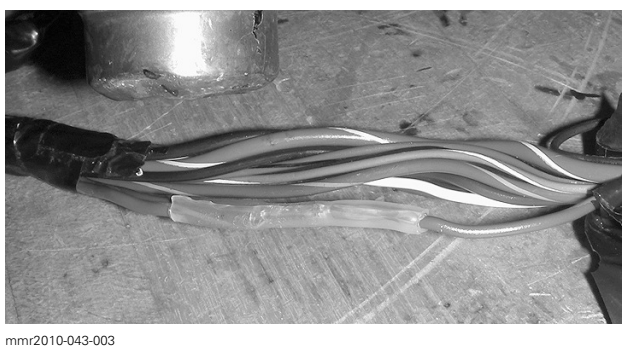
1. Shrink tube

4. Remove the shrink tube.
   4.1 Using a blade, cut the shrink tube.

mmr2010-043-002

NOTICE **Be careful with the blade to avoid cutting wires insulation.**

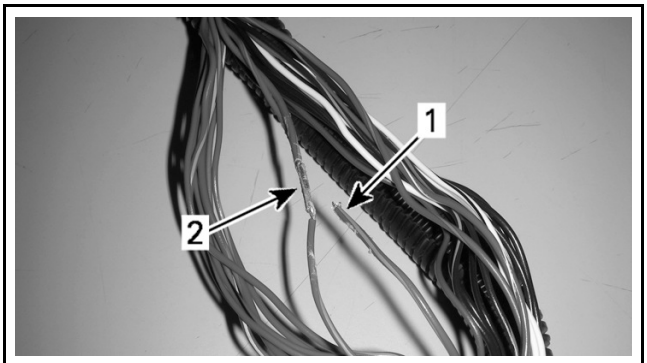
   4.2 Slightly heat the shrink tube using a heat gun.



mmr2010-043-003

   4.3 Remove the shrink tube with long nose pliers.

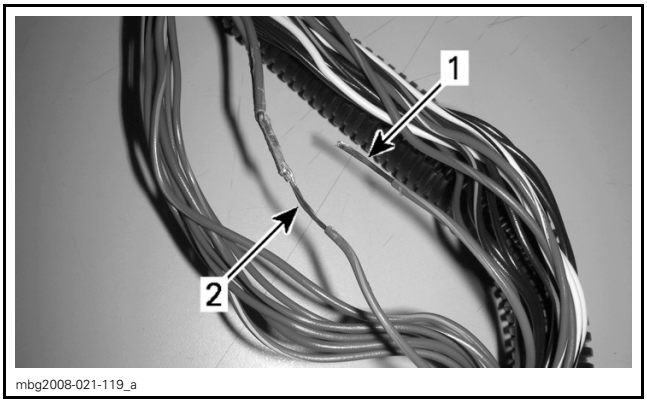
5. Locate broken wire from splice.



mbg2008-021-118_a

1. Broken wire
2. Splice

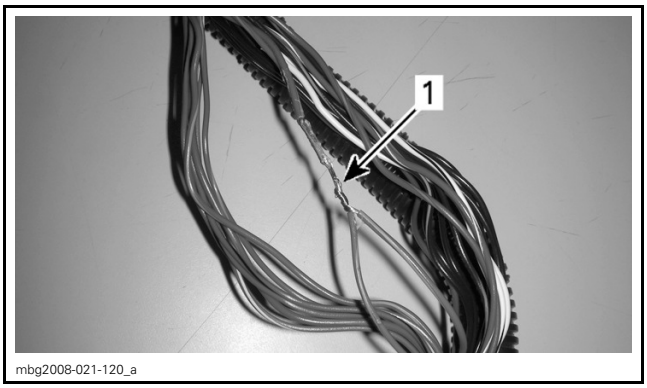
6. Strip wire insulation at the end of broken wire.
7. Strip wire insulation below the splice.



mbg2008-021-119_a

1. Broken wire stripped
2. Splice wire stripped

8. Twist wire around stripped wire.



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1. Twisted wire

9. Perform a tin solder on twisted wire.
10. Apply electrical tape to cover splice.

NOTE: Make sure tape overlaps on wire insulation, approximately 13 mm (1/2 in) each side.

11. Reinstall wires into protector tube.

NOTE: Always perform a solder on a bigger wire (lower gage).

IGNITION SYSTEM (1 cyl)

SERVICE TOOLS

Description	Part Number	Page
ECM ADAPTER TOOL	529 036 166	4
FLUKE 115 MULTIMETER	529 035 868	3

GENERAL

SYSTEM DESCRIPTION

The battery supplies the primary side of ignition coil through the main relay (R2) while the ECM completes the circuit for each cylinder by switching it to the ground at the right moment. The ECM can detect open and short circuit in the primary winding but it does not check the secondary winding.

The ECM controls the ignition system. For more information, refer to *ENGINE MANAGEMENT* section.

Ignition Timing

Ignition timing is not adjustable.

TROUBLESHOOTING

It is good practice to check for fault codes using the BRP diagnostic software (BUDS2) as a first troubleshooting step. Refer to *DIAGNOSTIC AND FAULT CODES* subsection.

Always refer to the *WIRING DIAGRAM* when troubleshooting an electrical circuit.

Refer to *POWER DISTRIBUTION* for fuse and relay information.

DIAGNOSTIC GUIDELINES

The following is provided to help in diagnosing the probable cause of a problem. It is a guideline and should not be assumed to list all possible causes.

ENGINE WILL NOT START (ENGINE TURNS OVER)

1. Fouled or defective spark plug
   - *Replace.*
2. Defective CPS
   - *Check operation of CPS and replace if necessary. Refer to ELECTRONIC FUEL INJECTION (EFI).*
3. Defective trigger wheel / Damaged trigger wheel.
   - *Check, refer to ROTOR in the MAGNETO AND STARTER subsection.*
4. Defective ignition circuit
   - *Check fuse 5 of fuse box 2, ignition coil and wiring condition.*
5. Defective fuel pump
   - *Check fuel pump, refer to FUEL SYSTEM.*
6. Defective fuel injectors or circuit
   - *Check fuel injectors, refer to ELECTRONIC FUEL INJECTION (EFI).*

ENGINE HARD TO START

1. Spark plug faulty, fouled or worn out
   - *Check spark plug condition. Replace if necessary.*
2. Low fuel pressure
   - *Test fuel pressure, refer to FUEL SYSTEM.*

ENGINE MISFIRES, RUNS IRREGULARLY

1. Fouled, defective, worn spark plugs
   - *Check/verify heat range/gap/replace.*
2. Defective or loose CPS
   - *Check. Refer to ELECTRONIC FUEL INJECTION (EFI).*
3. Damaged trigger wheel.
   - *Check. Refer to ROTOR in the MAGNETO AND STARTER subsection.*
4. Defective ignition circuit
   - *Check ignition coil, fuse 5, and wiring condition.*
5. Poor engine grounds
   - *Check/clean/repair.*
6. Fuel level indicator lamp is ON
   - *Check fuel level.*

ENGINE CONTINUALLY BACKFIRES

1. Fouled, defective spark plugs
   - *Clean/replace.*

2. Defective or loose CPS
   - *Check, refer to ELECTRONIC FUEL INJECTION (EFI).*
3. Damaged trigger wheel.
   - *Check, refer to ROTOR in the MAGNETO AND STARTER subsection.*

PROCEDURES

SAFETY PRECAUTIONS

⚠ WARNING

To prevent powerful electric shock while cranking engine, do not touch any of the ignition components (ignition coil, spark plug wire, etc.) nor tester leads. Also make sure that tester leads do not touch any metallic object.

IGNITION SWITCH

Testing the Ignition Switch (Quick Test)

Turn ignition switch to ON position.

If multifunction gauge turns on (assuming it works), the ignition switch is good.

If multifunction gauge does not turn on, check the following in this order:
– Battery
– Fusible links between starter solenoid and fuse box 2
– Fuses 4 and 8 of fuse box 2
– ECM is properly powered (refer to *ENGINE MANAGEMENT*)
– Ignition switch.

Ignition Switch Wire Identification

FUNCTION	PIN	WIRE COLOR
Ground signal to ECM in OFF position	A	YE/OG
12 Vdc input from fuse 8 of fuse box 2	B	BG/WH
12 Vdc output (accessories)	C	YE/BU
12 Vdc output (ECM, starter solenoid and start switch)	D	BK/YE
Ground (through ECM)	F	OG/VT

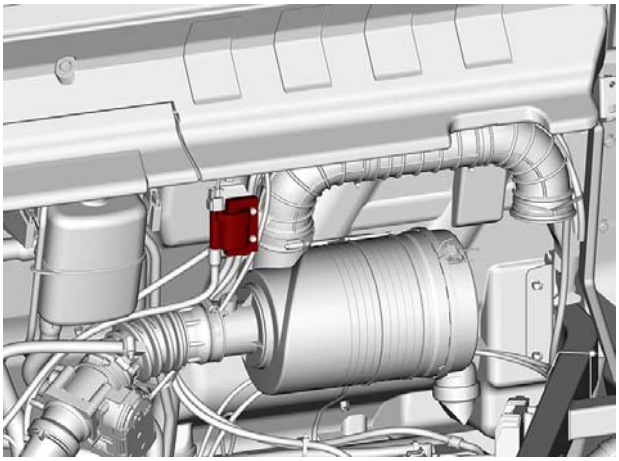
IGNITION COIL

When troubleshooting an ignition coil problem, first carry out a spark occurrence test, refer to *SPARK PLUG* in this subsection.

If there is no spark, carry out *TESTING THE IGNITION COIL INPUT VOLTAGE* and *TESTING THE IGNITION COIL GROUND CIRCUIT CONTINUITY*.

Ignition Coil Access

Tilt the cargo box to reach the ignition coil.



RHD5MY17-012-201

Installing the Ignition Coil

Install new elastic nuts and tighten to the specified torque.

TIGHTENING TORQUE	
Ignition coil retaining bolt	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

Quick Test with BUDS2

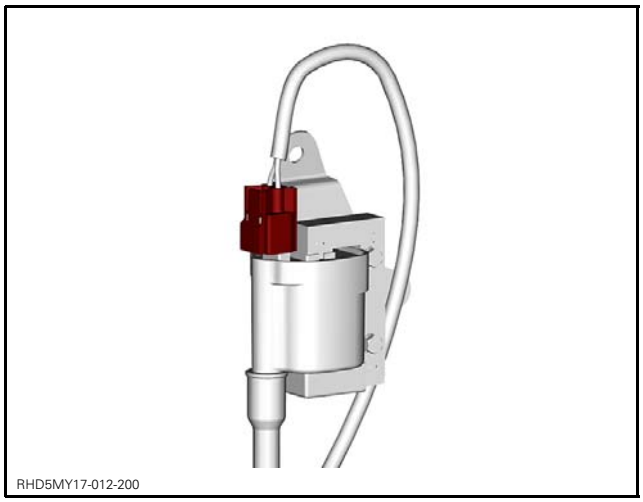
Connect the vehicle to the BRP diagnostic software (BUDS2). Refer to *COMMUNICATION TOOLS* subsection.

Select:
– **Functions** page
– **Vehicle** or **ECM** button
– **IO Controls** tab
– **Activate Ignition Coil** function.

NOTE: Keep in mind that even if there is a spark during this static test, voltage requirement is higher to produce a spark in the combustion chamber when engine is running. Ignition coil could be not working in real operation. Replacing ignition coil may be necessary as a test. Ensure spark plug cable is on the appropriate cylinder.

Testing the Ignition Coil Input Voltage

Disconnect the ignition coil input connector.


RHD5MY17-012-200

Using a small screwdriver, remove the plastic connector pin lock for easy access to pins.

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1. Remove plastic pin lock

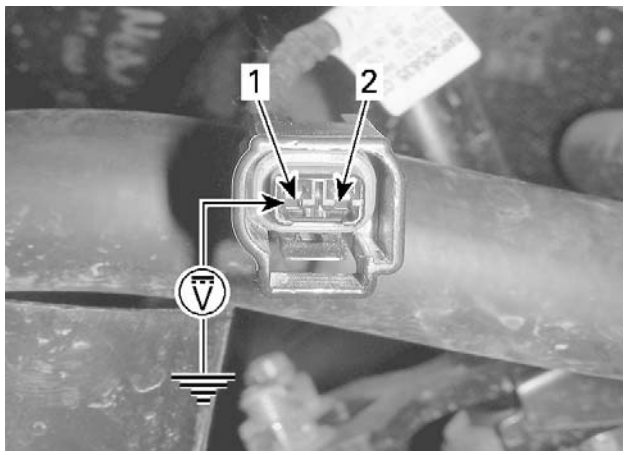
Turn ignition switch to ON.

Measure coil input voltage as follows.

REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	

Check the input voltage as per following table.

MULTIMETER PROBE POSITIONS		VOLTAGE
Ignition coil connector pin 1	Battery ground	Battery voltage



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IGNITION COIL INPUT VOLTAGE TEST
1. Pin 1
2. Pin 2

If you did not read battery voltage, check:
– Fuses and relay. Refer to *WIRING DIAGRAM*.
– Continuity of the ignition coil input circuit.

If battery voltage was read, proceed with *TESTING THE IGNITION COIL GROUND CIRCUIT CONTINUITY*.

If the measure is out of specification, verify the coil ground wire and connection.

Testing the Ignition Coil Supply Circuit Continuity

Disconnect the ignition coil connector.

Disconnect the HIC connector.

Check wiring continuity as per following table.

MULTIMETER PROBE POSITIONS		RESISTANCE
Ignition coil connector pin 1	HIC connector pin E	Close to 0 Ω

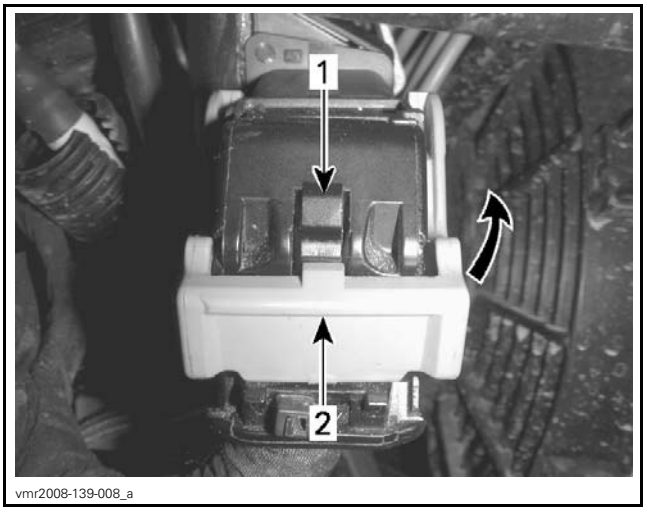
If circuit is open or has a high resistance, repair the wiring / connectors.

If the resistance is correct, check the continuity of the ignition coil ground circuit.

Testing the Ignition Coil Ground Circuit Continuity

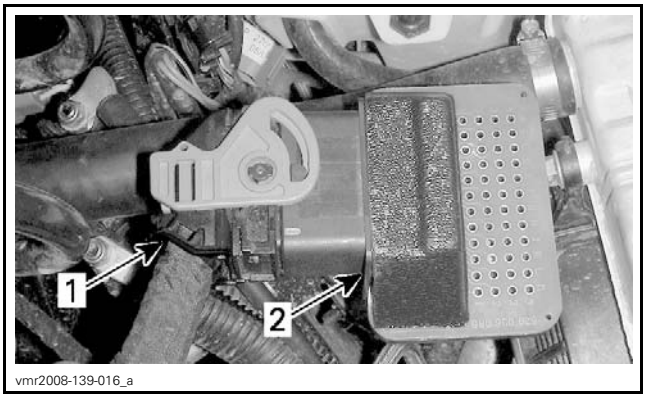
Disconnect ignition coil input connector.

Disconnect ECM connector "A" and connect it to the ECM adapter tool.



TYPICAL
1. *Press to release connector lock*
2. *Push to rotate connector lock upwards*

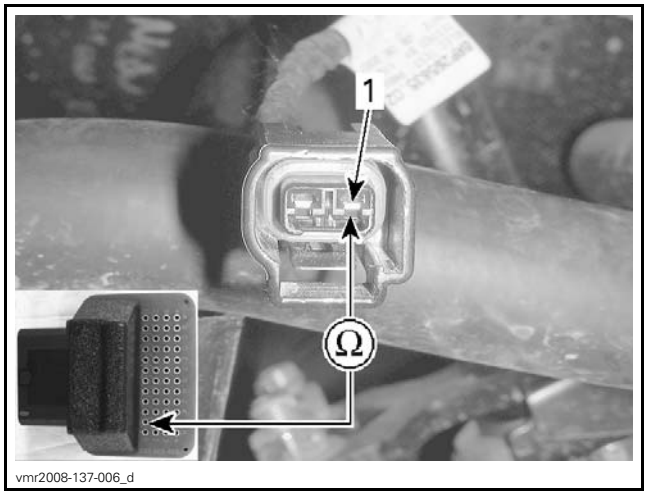
REQUIRED TOOL	
ECM ADAPTER TOOL (P/N 529 036 166)	



1. *ECM connector*
2. *Adapter tool*

Check wiring continuity as per following table.

IGNITION COIL GROUND CIRCUIT CONTINUITY TEST		
TEST PROBES		RESISTANCE
Coil input connector pin 2	ECM A pin M2	Close to 0 Ω



COIL GROUND CIRCUIT CONTINUITY TEST
1. *Pin 2 (BROWN/BLACK)*

Testing the Ignition Coil Resistance

NOTE: An ignition coil with good resistance measurements can still be faulty. Voltage leak can occur at high voltage levels which is not detectable with an ohmmeter. Replacing the ignition coil may be necessary as a test.

Primary Windings

Disconnect ECM "A" connector and connect it to the ECM ADAPTER TOOL (P/N 529 036 166).

Disconnect the HIC connector.

Using a multimeter, check resistance in primary winding as follows.

MULTIMETER PROBE POSITIONS		RESISTANCE @ 25°C (77°F)
ECM A-M2	HIC pin E	0.47 ± 0.05 Ω

If any resistance is not good, measure resistance directly on coil. If second test is ok, check the wiring / connectors.

Secondary Winding

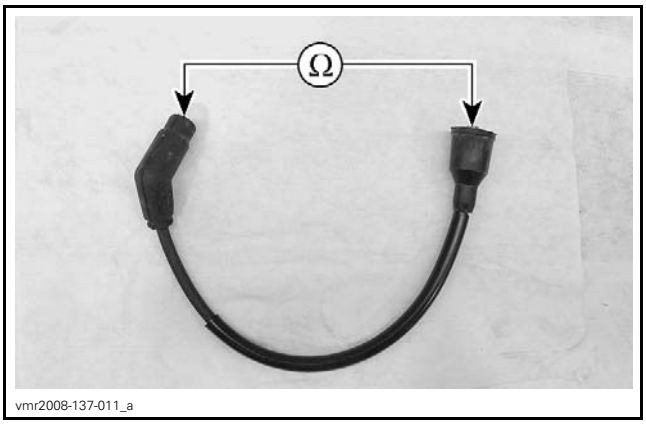
A resistance test of the ignition coil secondary winding is not possible due to internal circuitry.

Testing the Spark Plug Cable Resistance

Disconnect the spark plug cable from the spark plug and the ignition coil.

Measure resistance through the cable.

SPARK PLUG CABLE		RESISTANCE @ 20°C (68°F)
Coil side	Spark plug side	5 KΩ ± 1 KΩ



SPARK PLUG CABLE RESISTANCE TEST

If resistance value obtained is not close to value specified, or cable shows signs of deterioration, replace spark plug cable.

SPARK PLUG

Replacing the Spark Plug

Removing the Spark Plug

Unplug the spark plug cable.

Clean the spark plug area with pressurized air.

Unscrew spark plug.

Installing the Spark Plug

Prior to installation make sure that contact surfaces of the cylinder head and spark plug are free of grime.

1. Using a wire feeler gauge, verify the electrode gap as specified in *TECHNICAL SPECIFICATIONS*.
2. Hand screw spark plug into cylinder head, then tighten with a torque wrench and an appropriate socket.

TIGHTENING TORQUE	
Spark plug	11 N•m ± 1 N•m (97 lbf•**in** ± 9 lbf•**in**)

Testing for Spark Occurrence

⚠ WARNING

Never check for ignition spark from an open coil and/or spark plug as spark may cause potential fuel vapors to ignite.

Use an approved inductive type spark tester to test for ignition. Follow spark tester manufacturer procedures.

Remove the LH side panel for access to the spark plug and spark plug cable.

Turn ignition switch to ON.

Set engine stop switch to RUN.

Press and hold the start button.

If nothing happens when the start button is pressed, refer to the *STARTING SYSTEM* subsection.

If the starter rotates the engine and there is no spark indicated by the tester, follow the ignition system troubleshooting sequence as indicated.

If the inductive spark tester indicates ignition to the spark plug, install a new spark plug.

If a known good spark plug does not solve the problem, continue testing the other system components. The ignition spark may not be correct due to other system components being out of tolerance.

NOTE: Keep in mind that even if there is a spark during this static test, the voltage requirement to produce a spark in the combustion chamber is higher when the engine is running. The ignition coil may not be functioning properly. Replacing the ignition coil may be necessary as a test.

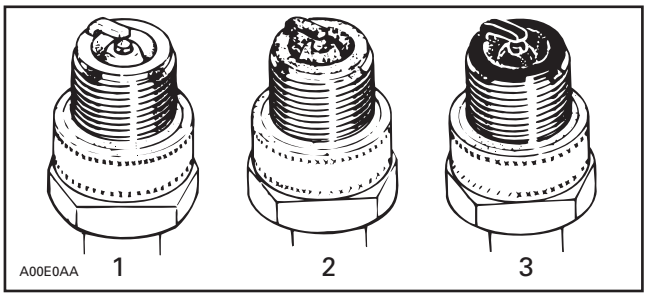
Troubleshooting a Fouled Spark Plug

Fouling of the spark plug is indicated by irregular running or misfiring of the engine, decreased engine speed due to misfiring, reduced performance, and increased fuel consumption. This may be due to a loss of compression.

Other possible causes are: a clogged air filter, incorrect or bad fuel, defective ignition system, incorrect spark plug gap, lubricating oil entering the combustion chamber, or use of a spark plug with a temperature rating too cold for the engine requirement.

The plug face of a fouled spark plug has either a wet or dry black carbon deposit. Such coatings form a conductive connection between the center electrode and the ground electrode.

Spark Plug Analysis



TYPICAL
1. *Overheated (light grey, white)*
2. *Normal (light brown, brown)*
3. *Fouled (black, wet or dry, dark deposits, grey, melted coating)*

The plug face reveals the condition of the engine, operating condition, method of driving and fuel mixture. For this reason it is advisable to inspect the spark plug at prescribed intervals, examining the plug face (i.e. the part of the plug projecting into the combustion chamber).

CHARGING SYSTEM

GENERAL

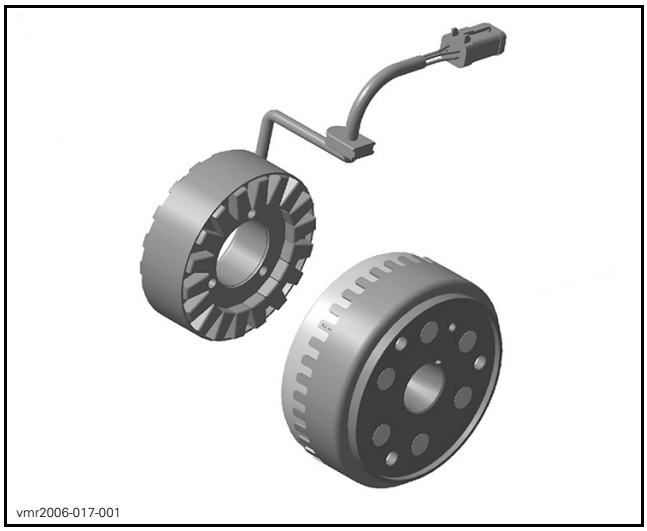
SYSTEM DESCRIPTION

The purpose of the charging system is to keep the battery at a full state of charge and to provide the electrical system with the required electrical power for normal vehicle operation.

Magneto

The magneto is the primary source of electrical energy. It transforms magnetic field into electric current (AC).

The magneto has a 3 phase series stator.

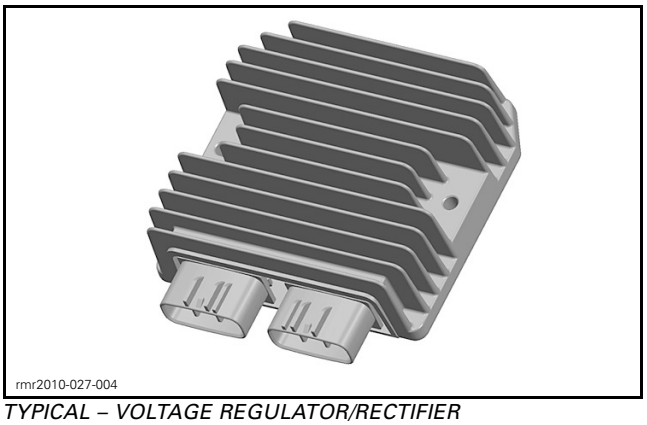


TYPICAL

Voltage Regulator/Rectifier

The rectifier receives AC current from the magneto and transforms it into direct current (DC).

The voltage regulator, included in the same unit, limits voltage to prevent any damage to electrical components.



TYPICAL – VOLTAGE REGULATOR/RECTIFIER

Battery

The battery supplies DC power to the electric starter for cranking the engine. During engine starting, it also supplies DC power to the entire electrical system.

At low engine RPM operation and high current load conditions, it supplements the magneto output and helps to maintain a steady system voltage.

INSPECTION

CHARGING SYSTEM OUTPUT

First ensure that battery is in good condition prior to performing the following tests.

Testing the Output Voltage Using BUDS2

1. Connect the vehicle to the BRP diagnostic software (BUDS2).
2. In BUDS2, go to:
   – **Measurements** page
   – **Vehicle** or **ECM** button
   – **ECM - Basic** tab.
3. Start engine with the less consumption as possible (no lights, no accessories).
4. Increase engine RPM as specified in the following table and read voltage in the **Battery Voltage (V)** box.

OUTPUT VOLTAGE TEST USING BUDS2	
ENGINE SPEED	VOLTAGE (DC)
4000 RPM	14.8 ± .4 Vdc

If voltage is above specification, replace voltage regulator/rectifier.

If voltage is below specification, check stator output and wiring harness prior to concluding that voltage regulator/rectifier is defective. Refer to *MAGNETO AND STARTER* subsection.

TROUBLESHOOTING

It is good practice to check for fault codes using the BRP diagnostic software (BUDS2) as a first troubleshooting step.

BATTERY REGULARLY DISCHARGED OR WEAK

1. Loose or corroded battery cables connections.
   - *Tighten or repair battery cables connections.*
2. Worn or defective battery.
   - *Charge and test battery.*
3. Defective magneto stator.
   - *Test stator, refer to MAGNETO AND STARTER subsection.*
4. Defective regulator/rectifier.
   - *Test system voltage.*
5. Damaged magneto rotor or Woodruff key.
   - *Replace magneto rotor or Woodruff key, refer to MAGNETO AND STARTER subsection.*

PROCEDURES

Ensure battery is fully charged.

Refer to *WIRING HARNESS AND CONNECTORS* subsection for harness layout and connector locations on vehicle.

Refer to appropriate *WIRING DIAGRAM* for additional information.

⚠ WARNING

Ensure vehicle is in PARK when performing charging system tests.

BATTERY LOAD TEST

1. Connect a battery load tester.
2. Ensure proper test conditions.

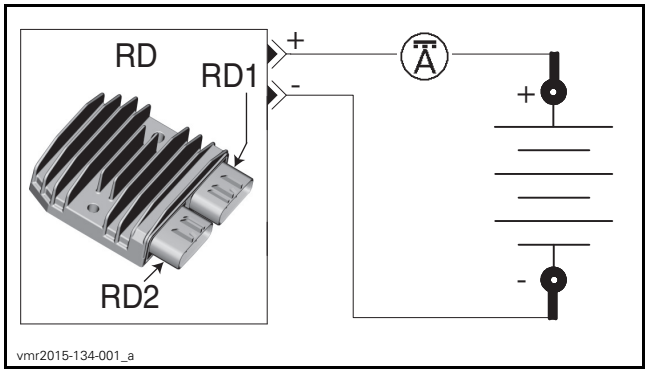
TEST CONDITIONS	
Initial battery voltage‡	Above 12.5 Vdc
Engine	OFF
Load	3 times the amp-hour (AH) rating
Time	15 seconds

‡ Required for accurate testing

SPECIFICATION	
Battery	Above 9.6 Vdc

If battery voltage drops below specification during test, replace battery and perform a *CHARGING SYSTEM LOAD TEST*.

CHARGING SYSTEM LOAD TEST

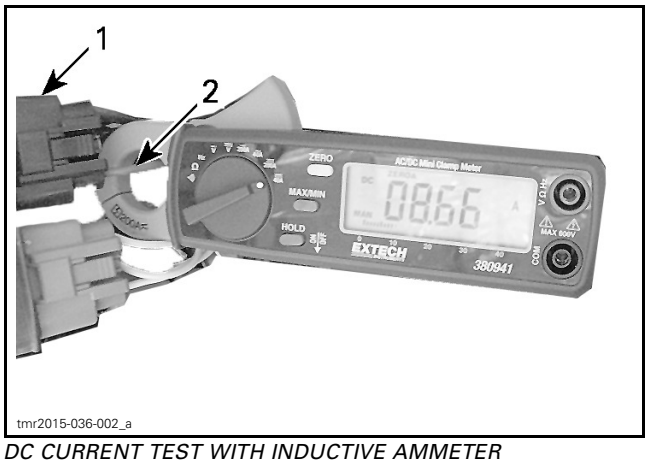


1. Connect a battery load tester.
2. Start vehicle and read voltage on tester.

SPECIFICATION	
Voltage	12.5 - 15 Vdc

If voltage is **above** specification, replace regulator and continue *CHARGING SYSTEM LOAD TEST*.

3. Connect an ammeter around RD1-1 wire.



DC CURRENT TEST WITH INDUCTIVE AMMETER
1. Output connector of voltage regulator
2. Ammeter clamped over RED wire

4. Ensure proper test conditions.

TEST CONDITIONS	
Battery voltage at idle‡	Above 12.6 Vdc
Engine	Increase to 4000 RPM
Load	As required to decrease battery voltage to 12 Vdc
Time	15 seconds
‡ Required for accurate testing	

5. Read amperage on ammeter.

MODEL	SPECIFICATION
All models	50 ± 5 Amps

NOTE: With a fully charged battery and no electrical loads, specification is less than 10A.

If amperage or voltage is not within specification, verify magneto and wires. Refer to *MAGNETO AND STARTER* subsection.

If the magneto is within specifications, replace the voltage regulator.

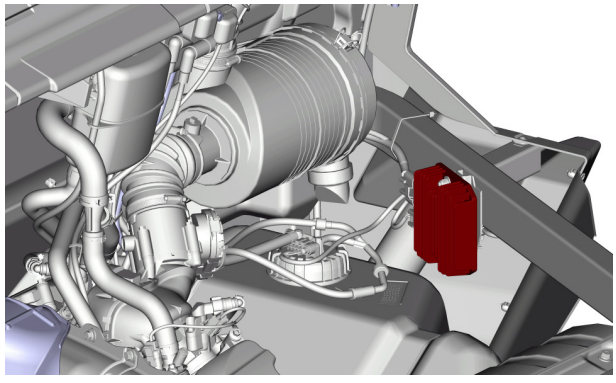
VOLTAGE REGULATOR (RD)

Testing the Voltage Regulator Continuity

Due to internal circuitry, there is no static test available.

Voltage Regulator Location

The voltage regulator is located on the RH member of the extension frame, near the air filter housing.



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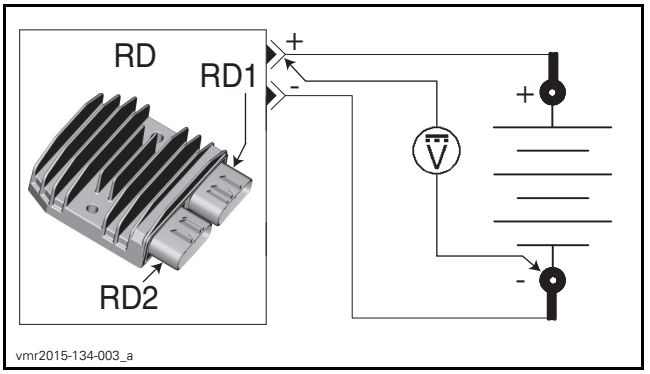
Voltage Regulator Wire Identification

FUNCTION	PIN	COLOR
12 Vdc output	RD1-1	RD
12 Vdc ground	RD1-3	BK
12 Vac input	RD2-1	YE
12 Vac input	RD2-2	YE
12 Vac input	RD2-3	YE

Testing the Voltage Regulator Power

1. Check voltage at RD1-1.



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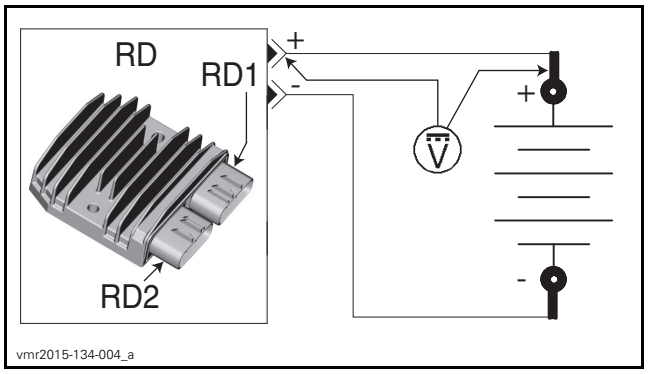
TEST CONDITIONS	
RD1-1	Hot at all times

BACKPROBE	PROBE	SPECIFICATION
RD1-1	BAT2 (-)	Battery voltage

2. Connect a battery load tester.
3. Start vehicle.
4. Ensure proper test conditions.

TEST CONDITIONS	
Battery voltage at idle‡	Above 12.6 Vdc
Engine	Increase to 4000 RPM
Load	As required to decrease battery voltage to 12 Vdc
Time	15 seconds
‡ Required for accurate testing	

5. Measure voltage drop.

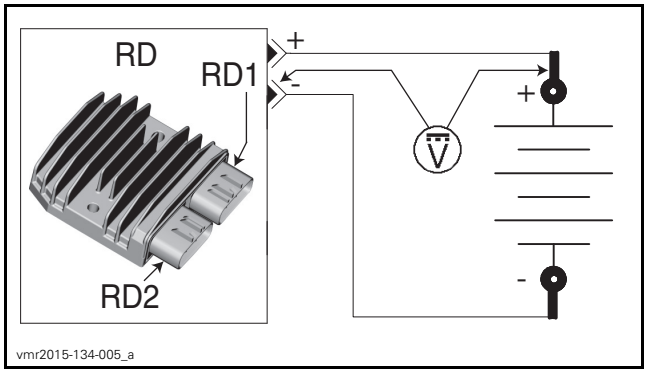


BACKPROBE	PROBE	SPECIFICATION
RD1-1	BAT1 (+)	Under 0.2 Vdc

If voltage drop is above specification, locate and repair damaged connector/wire.

Testing the Voltage Regulator Ground

1. Check ground at RD1-3.



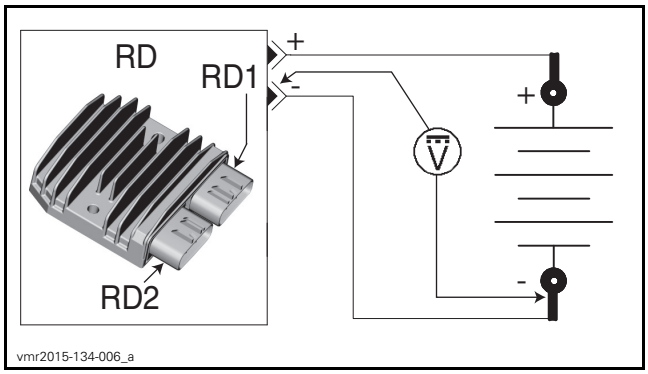
TEST CONDITIONS	
RD1-3	Permanent ground

BACKPROBE	PROBE	SPECIFICATION
RD1-3	BAT1 (+)	Battery voltage

2. Connect a battery load tester.
3. Start vehicle.
4. Ensure proper test conditions.

TEST CONDITIONS	
Battery voltage at idle‡	Above 12.6 Vdc
Engine	Increase to 4000 RPM
Load	As required to decrease battery voltage to 12 Vdc
Time	15 seconds
‡ Required for accurate testing	

5. Measure voltage drop.



BACKPROBE	PROBE	SPECIFICATION
RD1-3	BAT2 (-)	Under 0.4 Vdc

If voltage drop is above specification, locate and repair damaged connector/wire.

BATTERY

Battery Information

These vehicles are equipped with a VRLA battery (Valve Regulated Lead Acid). **It is a maintenance-free type battery.**

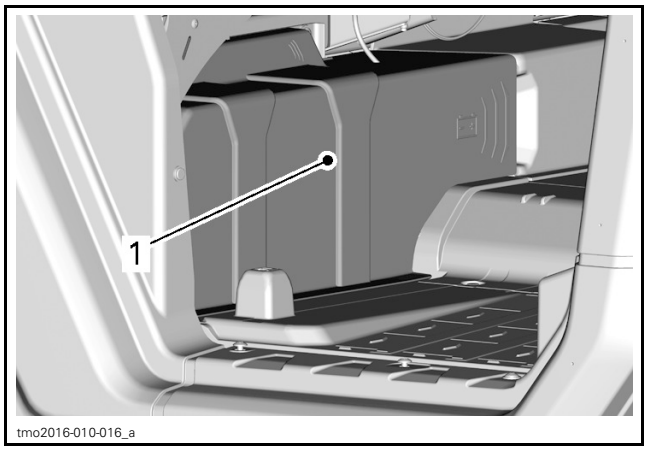
Refer to battery manufacturer's instructions for proper filling, activation and routine charging procedures.

Battery Location

The battery is located underneath the right passenger's seat.

Removing the Battery

1. Remove under seat storage compartment if equipped.
2. Remove battery cover

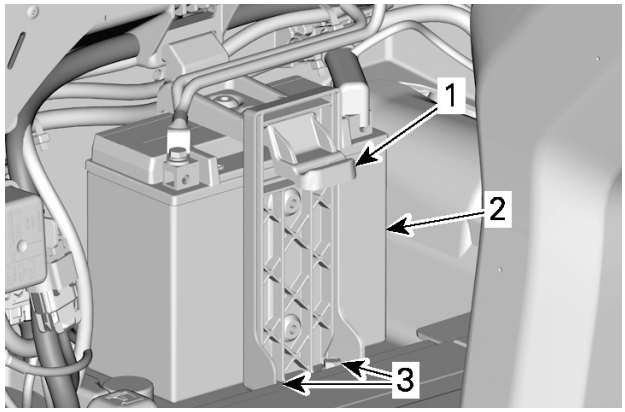


1. Battery cover

3. Disconnect BLACK (-) cable first, then the RED (+) cable.

NOTICE Always respect this order for removal; disconnect BLACK (-) cable first.

4. Remove battery holder retaining screws.



1. Battery holder
2. Battery
3. Battery holder retaining screw(s)

5. Remove battery holder.

6. Remove battery.

Cleaning the Battery

Clean the battery rack, cables and battery posts using a solution of baking soda and water.

Remove corrosion (if so) from battery cable terminals and battery posts using a firm wire brush. Rinse with clear water and dry well.

Inspecting the Battery

Visually inspect battery casing for cracks or any other damages. If casing is damaged, replace battery and thoroughly clean battery support with a water and baking soda solution.

Inspect condition of battery posts, battery support, holding strap and strap attachment points and wire terminal lugs.

Battery Storage

It is not necessary to remove the battery during vehicle storage but it is recommended for long term storage.

If the battery is left in the vehicle during storage or used infrequently, disconnect the BLACK (-) negative battery cable to eliminate battery current drain from the electrical equipment.

Recharge the battery once a month with an approved battery charger as per manufacturer's recommendations.

Clean battery, battery support and connections as required, refer to *CLEANING THE BATTERY* in this section.

For other recommendations during storage, refer to battery manufacturers instructions.

⚠ WARNING

Ensure battery is stored in a safe place, out of reach for children.

Activating a New Battery

Refer to the instructions provided with the battery.

Charging a Battery

⚠ WARNING

Always wear safety glasses and charge in a well ventilated area. Never charge or boost a battery while it is installed on vehicle. Do not open the sealed cap during charging. Do not place battery near open flame.

NOTICE If battery becomes hot, stop charging and allow it to cool before continuing.

NOTE: Sealed VRLA batteries have an internal safety valve. If battery pressure increases due to overcharging, the valve opens to release excess pressure, preventing battery damage.

An automatic charger is a fast and convenient way for error-proof charging.

Always follow the battery manufacturer's charging instructions.

When using a constant current charger, charge battery according to the chart below.

Battery Voltage Below 12.8 V and Above 11.5 V

STANDARD CHARGING (RECOMMENDED)	
APPROXIMATE TIME	CHARGE
4 - 9 HOURS	2 A

QUICK CHARGING	
APPROXIMATE TIME	CHARGE
50 MINUTES	10 A

Installing the Battery

The installation is the reverse of the removal procedure. However, pay attention to the following details.

NOTICE Always connect RED (+) cable first then BLACK (-) cable.

Tighten battery holder retaining screws to specification.

TIGHTENING TORQUE	
Battery holder retaining screws	3.4 N•m ± 0.3 N•m (30 lbf•**in** ± 3 lbf•**in**)

STARTING SYSTEM

GENERAL

SYSTEM DESCRIPTION

The starting system is composed of an electric starter supplied in current by the battery through a solenoid.

The starter solenoid receives a 12 volt input from the ignition switch and the ground signal is provided by the ECM when the following engine cranking conditions are met.

– Gearbox in Park or Neutral position and/or brake pedal held.
– Ignition switch turned to the start position and held until the engine starts.

NOTE: If the ignition switch is left ON for more than 30 minutes, engine will not start unless ignition switch is turned OFF, then ON again.

TROUBLESHOOTING

It is good practice to check for fault codes using the BRP diagnostic software (BUDS2) as a first troubleshooting step. Refer to *DIAGNOSTIC AND FAULT CODES* subsection.

Clear any fault code after solving a problem.

Always refer to the *WIRING DIAGRAM* when troubleshooting an electrical circuit.

Refer to *POWER DISTRIBUTION* for fuse and relay information.

Check all connections, cables and wires. Tighten any loose connections. Replace any chafed or corroded wires/cables.

DIAGNOSTIC GUIDELINES

FUSE 8 IN FUSE BOX 2 BURNS WHILE ATTEMPTING TO CRANK ENGINE

1. Defective D2 Diode
   - *Test diode, see procedure in this subsection.*
2. Defective starter solenoid
   - *Test starter solenoid, see procedure in this subsection.*
3. Wiring short to ground
   - *Check wiring.*

ENGINE DOES NOT CRANK AND GAUGE DOES NOT TURN ON

1. Burnt fuse F8 in fuse box 2
   - *Check fuse.*
2. Connection problem in the starting system
   - *Check all positive and ground cable connections, tighten or repair if necessary.*
3. Defective or discharged battery
   - *Test battery, refer to CHARGING SYSTEM.*
4. Defective ignition switch or circuit
   - *Check ignition switch, refer to IGNITION SYSTEM.*

ENGINE DOES NOT CRANK BUT GAUGE TURNS ON

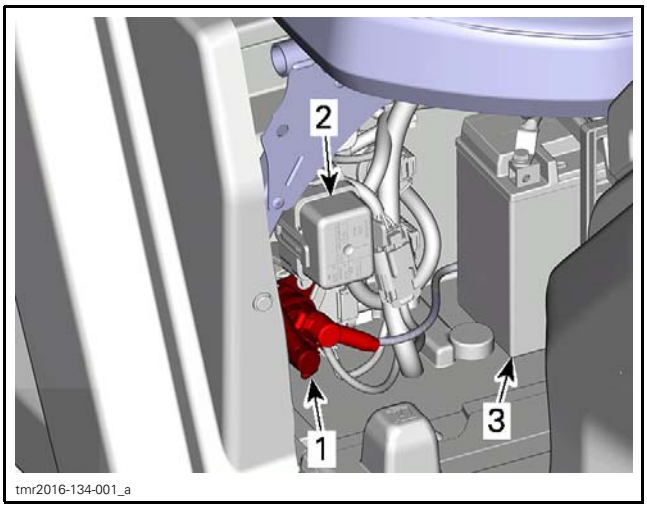
1. Connection problem in the starting system
   - *Check all positive and ground cable connections, tighten or repair if necessary.*
2. Defective brake switch
   - *Check brake switch, refer to BRAKES section.*
3. Defective gearbox position sensor (GBPS)
   - *Check GBPS, refer to GEARBOX AND 4X4 COUPLING UNIT subsection.*
4. Defective starter solenoid or circuit
   - *Test starter solenoid, see procedure in this subsection.*
5. Defective starter motor
   - *Check starter motor, refer to MAGNETO AND STARTER subsection.*

PROCEDURES

STARTER SOLENOID

Starter Solenoid Access

The starter solenoid is located beside the fuse box, underneath passenger seat.



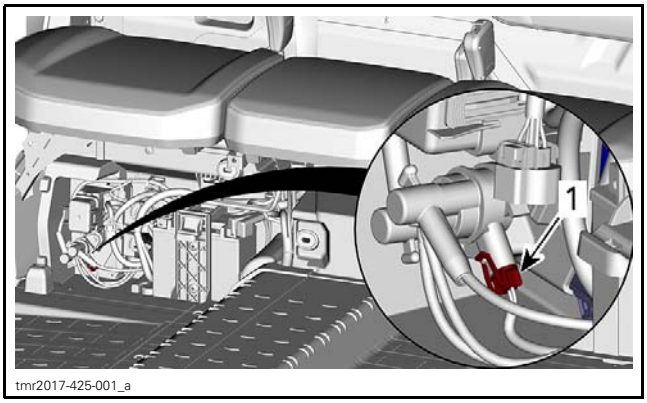
1. Starter solenoid
2. Fuse box
3. Battery

Starter Solenoid Wire Identification

FUNCTION	PIN	WIRE COLOR
12 volt input from ignition switch	SS-A	BK/YE
Ground from ECM-B pin L4	SS-B	OG/BN

Testing the Starter Solenoid Input Voltage

1. Disconnect the starter solenoid connector (SS).



1. Starter solenoid connector

2. Hold ignition switch to START.
3. Measure voltage as per following table.

STARTER SOLENOID INPUT VOLTAGE TEST		
TEST PROBES		RESULT
SS connector pin A	Battery ground	Battery voltage

Testing the Starter Solenoid Ground Signal

1. Disconnect the solenoid connector (SS).
2. Hold ignition switch to START.
3. Measure voltage as per following table.

STARTER SOLENOID GROUND SIGNAL TEST		
TEST PROBES		RESULT
SS connector pin B	Battery positive post	Battery voltage

Testing the Starter Solenoid Winding Resistance

Remove the starter solenoid.

NOTICE **Disconnect the battery negative terminal (-) before removing the starter solenoid.**

With a multimeter, measure the resistance in the solenoid winding as follows.

STARTER SOLENOID WINDING RESISTANCE TEST		
TEST PROBES		RESULT @ 20°C (68°F)
Starter solenoid pin A	Starter solenoid pin B	Approximately 5 Ω

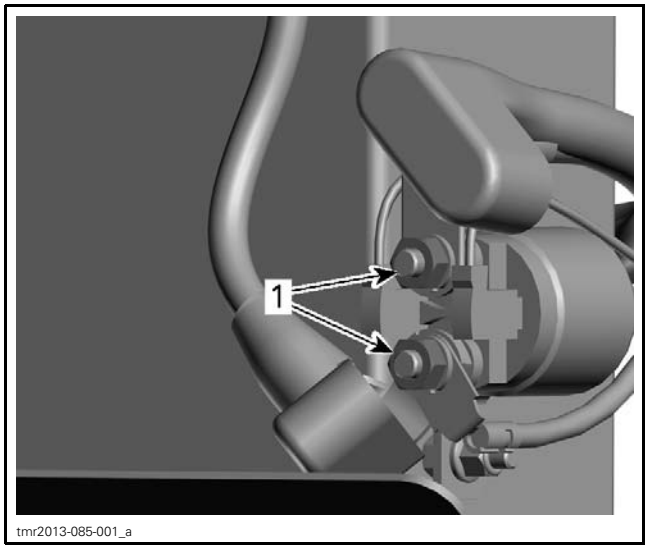
If measurement is out of specification, replace solenoid.

Testing the Starter Solenoid Internal Voltage Drop

Measure voltage as per following table while cranking engine in **drowned mode** (to prevent engine starting).

NOTE: For informations on the drowned mode, refer to *ENGINE MANAGEMENT* subsection.

STARTER SOLENOID INTERNAL VOLTAGE DROP TEST		
TEST PROBES		RESULT (WHILE CRANKING)
Post coming from battery	Post going to starter	0.2 Vdc max.



TYPICAL
1. VDC

If voltage is out of specification, replace solenoid.

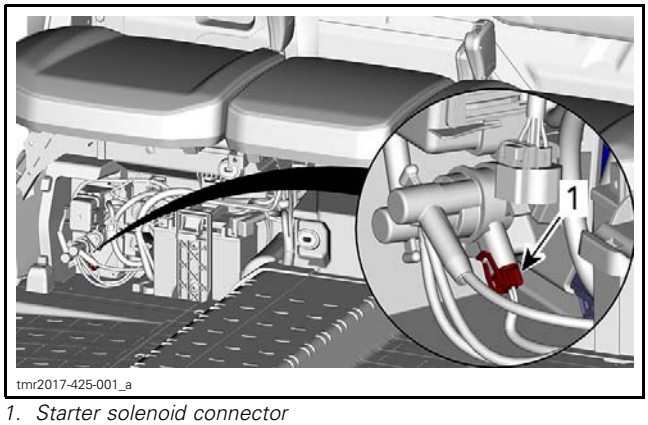
D2 DIODE (STARTER SOLENOID)

Diode Location

The diode is located in the main harness, near starter solenoid.

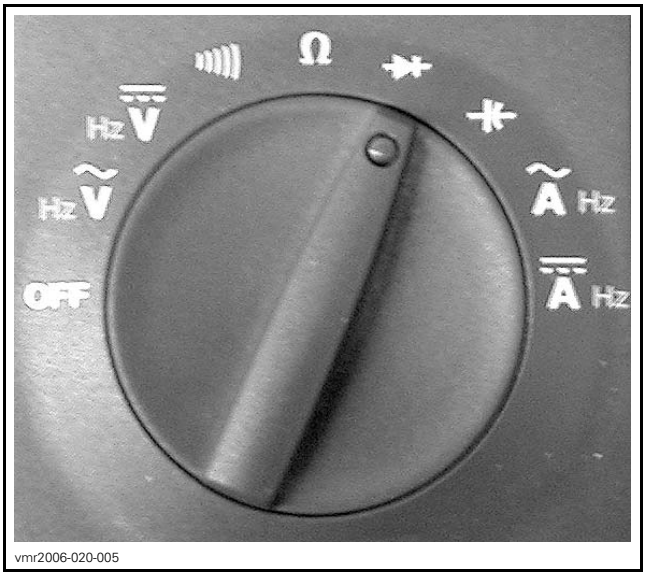
Testing the Diode

1. Make sure ignition switch is OFF.
2. Disconnect the starter solenoid connector (SS).



1. Starter solenoid connector

3. Set multimeter to "diode check".



4. Test diode as per following table.

D2 DIODE TEST		
MULTIMETER POSITIVE PROBE	MULTIMETER NEGATIVE PROBE	RESULT
SS connector pin A	SS connector pin B	Overload (open)
SS connector pin B	SS connector pin A	Approximately 0.5 volts

If diode fails any test, replace it.

LIGHTS

SERVICE PRODUCTS

Description	Part Number	Page
DIELECTRIC GREASE	293 550 004	1

GENERAL

NOTICE It is recommended to always disconnect the battery when replacing any electric or electronic parts. Always disconnect battery exactly in the specified order, BLACK (-) cable first.

TROUBLESHOOTING

DIAGNOSTIC TIPS

IMPORTANT: When troubleshooting an electrical system fault, check battery condition, cables and connections first.

Testing a Circuit

Check the related-circuit fuse condition with a fuse tester or test lamp (a visual inspection could lead to a wrong conclusion).

NOTE: If the ignition switch is left ON for more than 30 minutes, the accessory relay will shut down.

Inspecting an Electrical Connection

When replacing an electric or electronic component, always check electrical connections. Make sure they are tight, make good contact, and are corrosion-free. Dirty, loose or corroded contacts are poor conductors and are often the source of a system or component malfunction.

Pay particular attention to ensure that pins are not bent or pushed out of their connectors.

Ensure all wire terminals are properly crimped on wires, and connector housings are properly fastened.

Check for signs of moisture, corrosion or dullness. Clean pins properly and coat them with DIELECTRIC GREASE (P/N 293 550 004) or other appropriate lubricant when reassembling them, except if otherwise specified such as for the ECM connectors.

Pay attention to ground wires.

PROCEDURES

HEADLIGHTS

Headlight Wire Identification

LOW BEAM - AT BULB		
FUNCTION	PIN	COLOR
12 volt input from light switch	A	GN
Ground	B	BK

HIGH BEAM - AT BULB		
FUNCTION	PIN	COLOR
12 volt input from multifunction switch	C	BU
Ground	B	BK

Headlights Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with accessory relay (R3) activated	Fuse F11 of fuse block PF1

Testing the Headlight

Disconnect headlight connector.

Turn ignition switch ON.

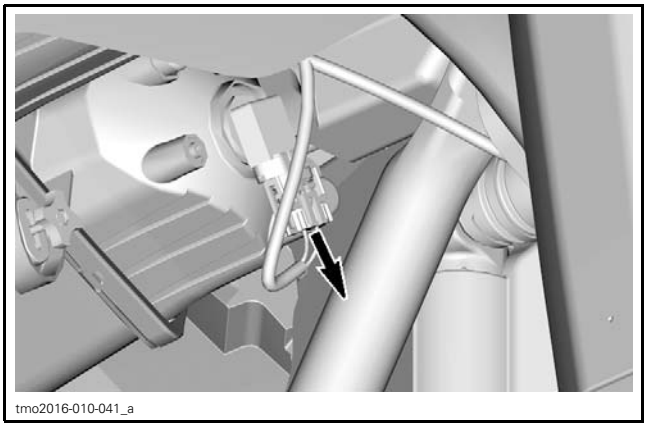
Using a multimeter, measure the voltage on headlight connector as follows.

SWITCH POSITION	WIRE COLOR		VOLTAGE
LO beam	GN	BK	Battery voltage
HI beam	BU	BK	

Replacing a Headlight Bulb

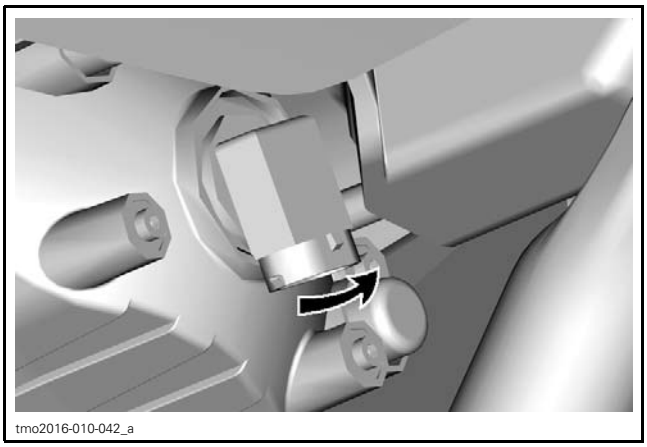
NOTICE Never touch glass portion of a halogen bulb with bare fingers, it shortens its operating life. If glass is touched, clean it with isopropyl alcohol which will not leave a film on the bulb.

Unplug connector from bulb.



TYPICAL

Rotate bulb.



TYPICAL

Pull out bulb.

Reinstall parts in the reverse order.

Validate headlights operation.

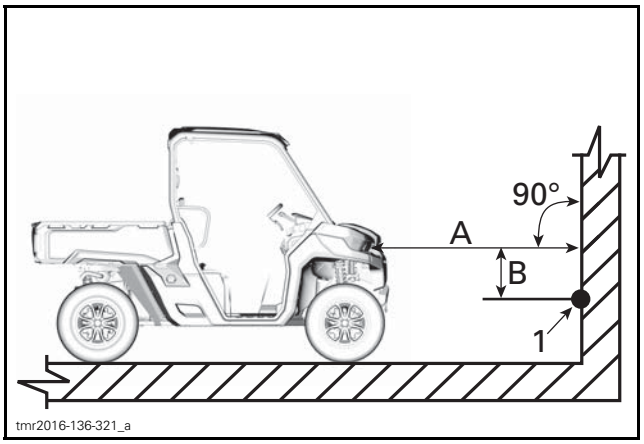
Headlamp Beam Aiming

Select high beam.

Beam aiming is correct when center of high beam is 130 mm (5 in) below the headlight horizontal center line, scribed on a test surface, 5 m (16 ft) away.

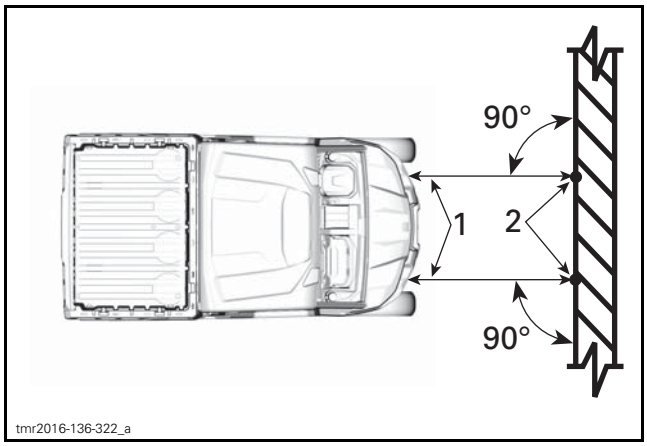
NOTE: Load vehicle as per normal use.

Measure headlight center distance from the ground. Scribe a line at this height on test surface (wall or screen). Light beam center should be 130 mm (5 in) below scribed line.



1. Light beam center

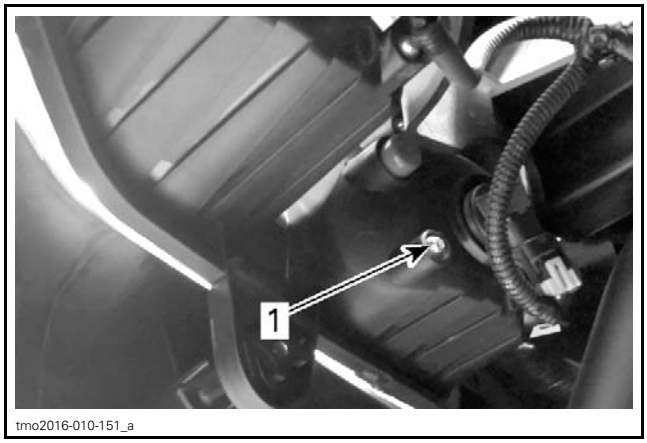
A. 5 m (17 ft)
B. 131 mm (5 in)



1. Headlight center lines
2. Light beam center

Adjusting Beam Aiming

Turn adjustment screws to adjust beam height and side orientation as described below. Adjust both headlight evenly.



1. Adjustment screws

TAILLIGHTS/BRAKE LIGHTS

Taillight/Brake Light Wire Identification

TAILLIGHT/BRAKE LIGHT ASSEMBLY		
FUNCTION	PIN	COLOR
12 volt input to taillight from accessory relay R3	2	VI/WH
12 volt input to brake light from brake light relay (R8)	3	WH/OG
Common ground	1	BK

BRAKE LIGHT RELAY (R8)		
FUNCTION	PIN	COLOR
12 volt input from fuse F16 (in PF1)	7	VT/WH
12 volt input from brake light switch (relay winding input)	15	RD/OG
12 volt output to brake lights	10	WH/OG
Relay winding ground (to ground terminal BN1)	13	BK

BRAKE LIGHT SWITCH		
FUNCTION	PIN	COLOR
12 volt input from fuse F4 (of PF2)	2	OG/GN
12 volt output to R8 relay winding	1	RD/OG

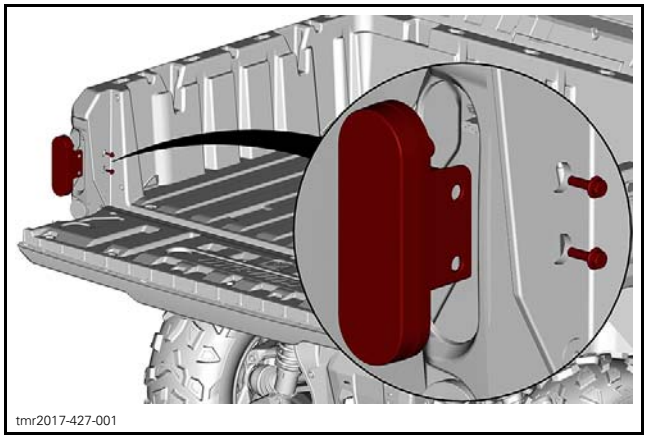
Taillight/Brake Light Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with main relay R2 activated	Fuse F4 of fuse block PF2
Supplied with accessory relay R3 activated	Fuse F16 of fuse block PF1

Replacing the Taillight/Brake Light Bulb

If a LEDs in the taillight or brake light fail, the entire taillight must be replaced.

1. Open tail gate.
2. Remove taillight/brake light assembly retaining screws.
3. Pull the taillight/brake light assembly out of the cargo box side wall.



tmr2017-427-001

4. Disconnect the electrical connector.
5. Install the new taillight/brake light assembly in the reverse order.

TIGHTENING TORQUE	
Taillight/brake light assembly screws	9.5 N•m ± 1.5 N•m (84 lbf•**in** ± 13 lbf•**in**)

LIGHTS

SERVICE PRODUCTS

Description	Part Number	Page
DIELECTRIC GREASE	293 550 004	1

GENERAL

NOTICE It is recommended to always disconnect the battery when replacing any electric or electronic parts. Always disconnect battery exactly in the specified order, BLACK (-) cable first.

TROUBLESHOOTING

DIAGNOSTIC TIPS

IMPORTANT: When troubleshooting an electrical system fault, check battery condition, cables and connections first.

Testing a Circuit

Check the related-circuit fuse condition with a fuse tester or test lamp (a visual inspection could lead to a wrong conclusion).

NOTE: If the ignition switch is left ON for more than 30 minutes, the accessory relay will shut down.

Inspecting an Electrical Connection

When replacing an electric or electronic component, always check electrical connections. Make sure they are tight, make good contact, and are corrosion-free. Dirty, loose or corroded contacts are poor conductors and are often the source of a system or component malfunction.

Pay particular attention to ensure that pins are not bent or pushed out of their connectors.

Ensure all wire terminals are properly crimped on wires, and connector housings are properly fastened.

Check for signs of moisture, corrosion or dullness. Clean pins properly and coat them with DIELECTRIC GREASE (P/N 293 550 004) or other appropriate lubricant when reassembling them, except if otherwise specified such as for the ECM connectors.

Pay attention to ground wires.

PROCEDURES

HEADLIGHTS

Headlight Wire Identification

LOW BEAM - AT BULB		
FUNCTION	PIN	COLOR
12 volt input from light switch	A	GN
Ground	B	BK

HIGH BEAM - AT BULB		
FUNCTION	PIN	COLOR
12 volt input from multifunction switch	C	BU
Ground	B	BK

Headlights Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with accessory relay (R3) activated	Fuse F11 of fuse block PF1

Testing the Headlight

Disconnect headlight connector.

Turn ignition switch ON.

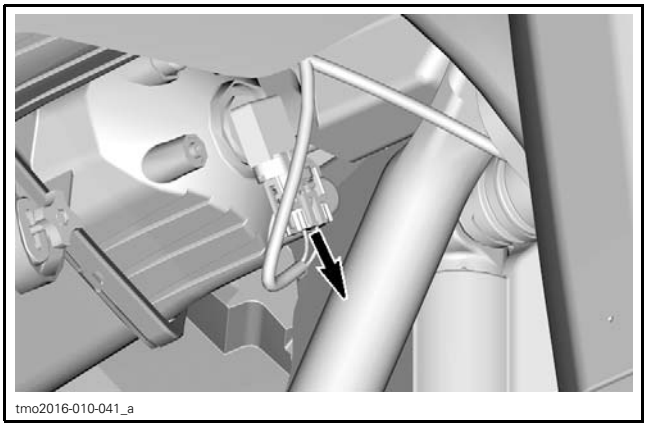
Using a multimeter, measure the voltage on headlight connector as follows.

SWITCH POSITION	WIRE COLOR		VOLTAGE
LO beam	GN	BK	Battery voltage
HI beam	BU	BK	

Replacing a Headlight Bulb

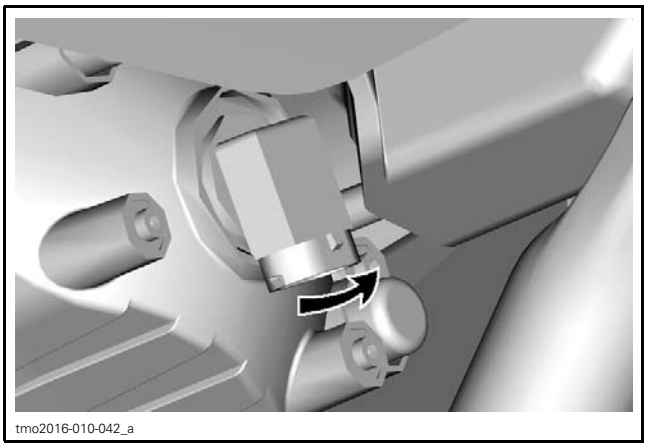
NOTICE Never touch glass portion of a halogen bulb with bare fingers, it shortens its operating life. If glass is touched, clean it with isopropyl alcohol which will not leave a film on the bulb.

Unplug connector from bulb.



TYPICAL

Rotate bulb.



TYPICAL

Pull out bulb.

Reinstall parts in the reverse order.

Validate headlights operation.

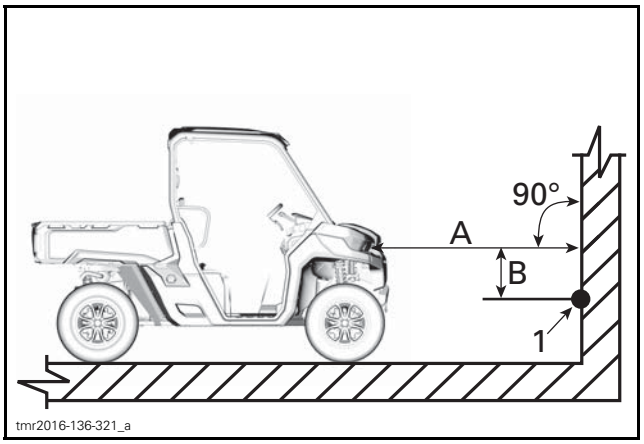
Headlamp Beam Aiming

Select high beam.

Beam aiming is correct when center of high beam is 130 mm (5 in) below the headlight horizontal center line, scribed on a test surface, 5 m (16 ft) away.

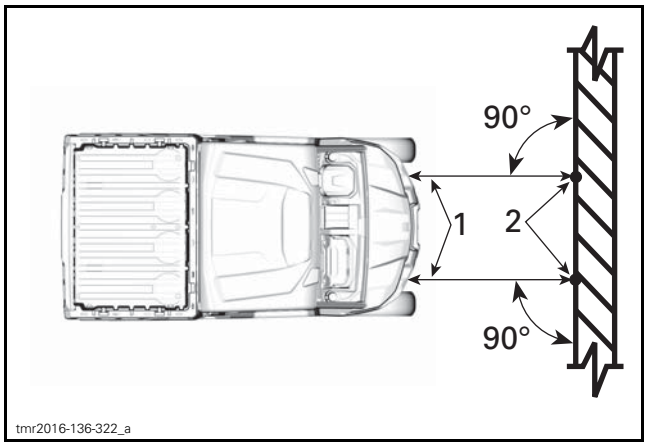
NOTE: Load vehicle as per normal use.

Measure headlight center distance from the ground. Scribe a line at this height on test surface (wall or screen). Light beam center should be 130 mm (5 in) below scribed line.



1. Light beam center

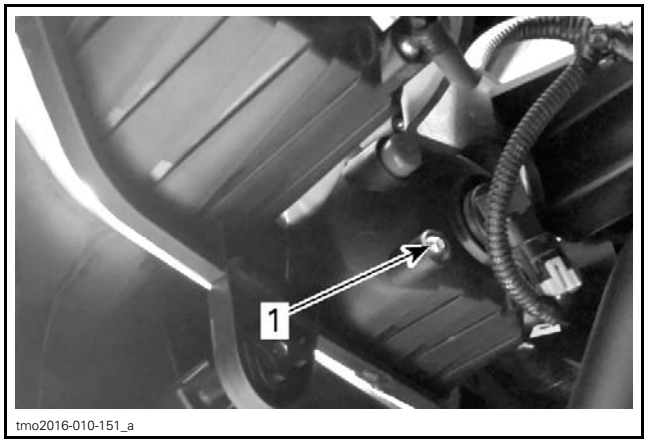
A. 5 m (17 ft)
B. 131 mm (5 in)



1. Headlight center lines
2. Light beam center

Adjusting Beam Aiming

Turn adjustment screws to adjust beam height and side orientation as described below. Adjust both headlight evenly.



1. Adjustment screws

TAILLIGHTS/BRAKE LIGHTS

Taillight/Brake Light Wire Identification

TAILLIGHT/BRAKE LIGHT ASSEMBLY		
FUNCTION	PIN	COLOR
12 volt input to taillight from accessory relay R3	2	VI/WH
12 volt input to brake light from brake light relay (R8)	3	WH/OG
Common ground	1	BK

BRAKE LIGHT RELAY (R8)		
FUNCTION	PIN	COLOR
12 volt input from fuse F16 (in PF1)	7	VT/WH
12 volt input from brake light switch (relay winding input)	15	RD/OG
12 volt output to brake lights	10	WH/OG
Relay winding ground (to ground terminal BN1)	13	BK

BRAKE LIGHT SWITCH		
FUNCTION	PIN	COLOR
12 volt input from fuse F4 (of PF2)	2	OG/GN
12 volt output to R8 relay winding	1	RD/OG

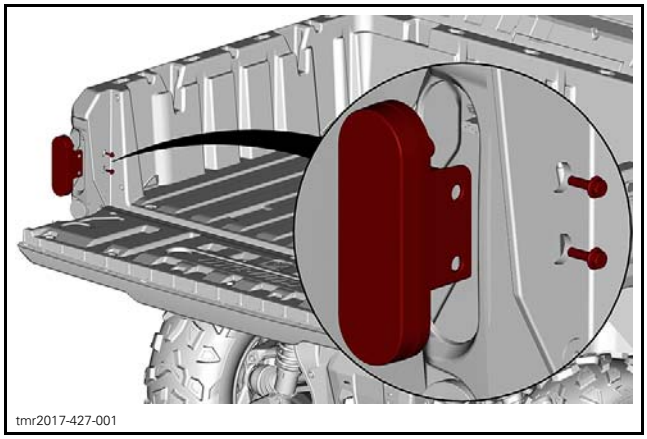
Taillight/Brake Light Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with main relay R2 activated	Fuse F4 of fuse block PF2
Supplied with accessory relay R3 activated	Fuse F16 of fuse block PF1

Replacing the Taillight/Brake Light Bulb

If a LEDs in the taillight or brake light fail, the entire taillight must be replaced.

1. Open tail gate.
2. Remove taillight/brake light assembly retaining screws.
3. Pull the taillight/brake light assembly out of the cargo box side wall.



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4. Disconnect the electrical connector.
5. Install the new taillight/brake light assembly in the reverse order.

TIGHTENING TORQUE	
Taillight/brake light assembly screws	9.5 N•m ± 1.5 N•m (84 lbf•**in** ± 13 lbf•**in**)

GAUGE

SERVICE PRODUCTS

Description	Part Number	Page
DIELECTRIC GREASE	293 550 004	1

GENERAL

NOTICE It is recommended to always disconnect the battery when replacing any electric or electronic parts. Always disconnect battery exactly in the specified order, BLACK (-) cable first.

TROUBLESHOOTING

DIAGNOSTIC TIPS

NOTE: It is a good practice to check for fault codes using the appropriate BRP diagnostic software version as a first troubleshooting step. Refer to *COMMUNICATION TOOLS* subsection.

IMPORTANT: When troubleshooting an electrical system fault, check battery condition, cables and connections first.

Testing a Circuit

Check the related-circuit fuse condition with a fuse tester or test lamp (a visual inspection could lead to a wrong conclusion).

NOTE: If the ignition switch is left ON for more than 30 minutes, the accessory relay will shut down.

Inspecting an Electrical Connection

When replacing an electric or electronic component, always check electrical connections. Make sure they are tight, make good contact, and are corrosion-free. Dirty, loose or corroded contacts are poor conductors and are often the source of a system or component malfunction.

Pay particular attention to ensure that pins are not bent or pushed out of their connectors.

Ensure all wire terminals are properly crimped on wires, and connector housings are properly fastened.

Check for signs of moisture, corrosion or dullness. Clean pins properly and coat them with DIELECTRIC GREASE (P/N 293 550 004) or other appropriate lubricant when reassembling them, except if otherwise specified such as for the ECM connectors.

Pay attention to ground wires.

PROCEDURES

MULTIFUNCTION GAUGE

Multifunction Gauge Wire Identification

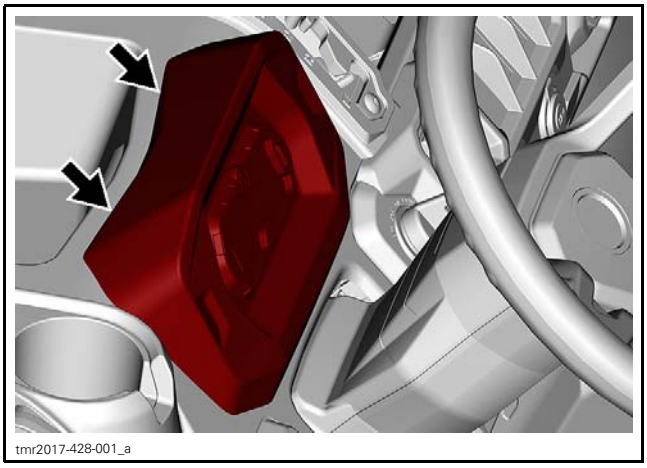
FUNCTION	PIN	COLOR
12 volt input from fuse F4	17	OG/GN
12 volt input from fuse F8	16	OG/BG
Ground	20	BK
CAN LO	18	WH/BK
CAN HI	19	WH/BG
Fuel level gauge supply	4	BR/PK
Fuel level gauge ground	21	VI/PK
2WD/4WD switch signal (-)	7	BK/BG
HI beam signal (+)	5	BU
Turn signal input (If equipped)	8	OG

Multifunction Gauge Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied at all times	Fuse 8 of fuse block 2 (from fuse link 1)
Supplied with main relay activated	Fuse 4 of fuse block 2 (from main relay R2)

Removing the LCD Multifunction Gauge

1. Release retaining tabs at the top of the gauge support using a small flat screwdriver.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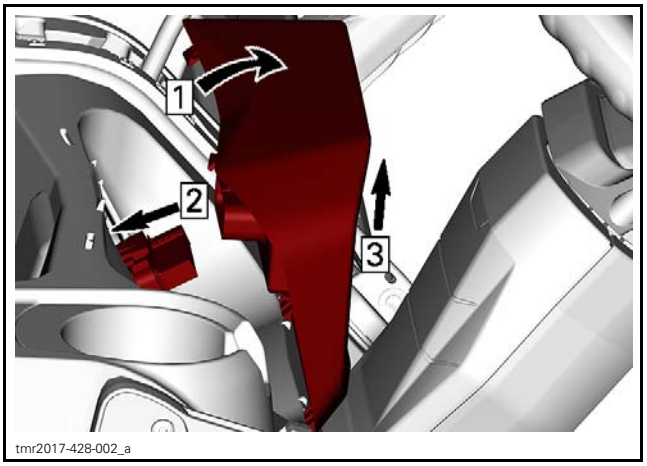
2. Tilt the top of the gauge support rearwards.
3. Disconnect the gauge connector.
4. Pull the gauge support upwards to release the bottom tabs.



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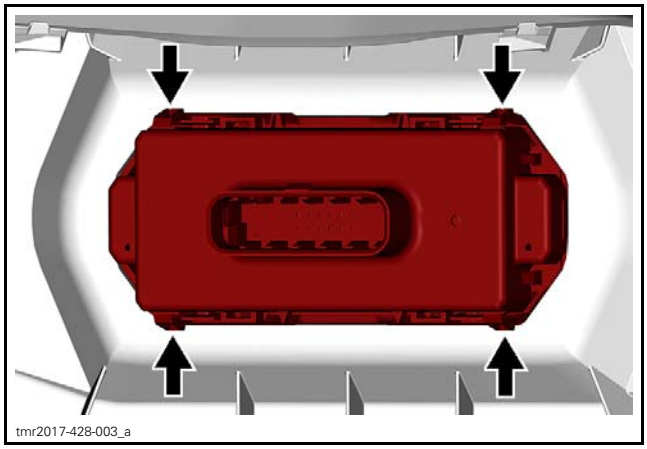
5. Remove the gauge from the support by releasing the four tabs at the back.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Removing the Analog/Digital Multifunction Gauge

1. Release retaining clips at the top of gauge.

tmr2016-136-302

2. Disconnect the gauge connector.

tmr2016-136-303

Installing the Multifunction Gauge

The installation is the reverse of the removal procedure.

"MAINTENANCE REQUIRED" Message

Resetting the Message Manually

1. Select PARK.
2. Turn ignition switch to ON. Do NOT start engine.
3. Using the MODE button, display the odometer (vehicle total mileage).
4. Press SET button on the multifunction gauge and keep it pressed until step 6.
5. Switch headlights HI and LOW beam 3 times quickly.
6. Turn ignition switch to OFF.

NOTE: Steps 4 and 5 must be completed within 5 seconds.

NOTE: Do not turn ignition switch to ON before the multifunction gauge turns off.

Resetting the Message Using the BRP diagnostic software (BUDS2)

Connect to the diagnostic software. Refer to *COMMUNICATION TOOLS AND B.U.D.S.* subsection.

Select:
- **Summary** page
- **Vehicle** button.

Click on the **Reset Service** button.

Multifunction Gauge Set-Up Using the BRP Diagnostic Software (BUDS2)

Connect to the BRP diagnostic software version. Refer to *COMMUNICATION TOOLS AND B.U.D.S.* subsection.

Changing Language and Units of Measurement

Select:
- **Settings** page
- **Vehicle** or **Cluster** button
- **Configuration** tab.

Select the parameter to be changed.

Changing Tire Size

Select:
- **Settings** page
- **Vehicle** or **ECM** button
- **Configuration** tab.

In **Change Tire Size**, select the appropriate size.

New Multifunction Gauge Registration

Whenever multifunction gauge is replaced, it is required to use the BRP diagnostic software to register it in the ECM.

IMPORTANT: If a multifunction gauge from another vehicle is installed and is not registered in ECM through the diagnostic software, **engine starting will not be allowed until gauge is registered with proper coding**.

Select:
- **Summary** page
- **Vehicle** or **Cluster** button
- **Health** tab.

Click on "Handle Security Coding Mismatch".

Click "Yes".

Testing the Multifunction Gauge Using the BRP Diagnostic Software (BUDS2)

Connect to the appropriate BRP diagnostic software version. Refer to *COMMUNICATION TOOLS AND B.U.D.S.* subsection.

Wow Test

This function is used to check if the indicator lights, display and analog indicators (if applicable) are functional.

NOTE: This function does not test the signals or external circuits.

Select:
- **Functions** page
- **Cluster** button
- **Routines** tab.

Select **Execute Cluster WOW Test**.

Monitoring Measurement Values

Select:
- **Measurements** page
- **Cluster** button
- **Preset** or **Custom** tab.

In **Preset** tab, select desired preset values (for example: Cluster Basic).

In **Custom** tab, a large list of measurements is displayed. It is possible to choose several values by clicking "Please Select".

ACCESSORIES

SERVICE PRODUCTS

Description	Part Number	Page
DIELECTRIC GREASE	293 550 004	1

GENERAL

NOTICE It is recommended to always disconnect the battery when replacing any electric or electronic parts. Always disconnect battery exactly in the specified order, BLACK (-) cable first.

TROUBLESHOOTING

DIAGNOSTIC TIPS

IMPORTANT: When troubleshooting an electrical system fault, check battery condition, cables and connections first.

Testing a Circuit

Check the related-circuit fuse condition with a fuse tester or test lamp (a visual inspection could lead to a wrong conclusion).

NOTE: If the ignition switch is left ON for more than 30 minutes, the accessory relay will shut down.

Inspecting an Electrical Connection

When replacing an electric or electronic component, always check electrical connections. Make sure they are tight, make good contact, and are corrosion-free. Dirty, loose or corroded contacts are poor conductors and are often the source of a system or component malfunction.

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Check for signs of moisture, corrosion or dullness. Clean pins properly and coat them with DIELECTRIC GREASE (P/N 293 550 004) or other appropriate lubricant when reassembling them, except if otherwise specified such as for the ECM connectors.

Pay attention to ground wires.

PROCEDURES

CONSOLE SWITCHES

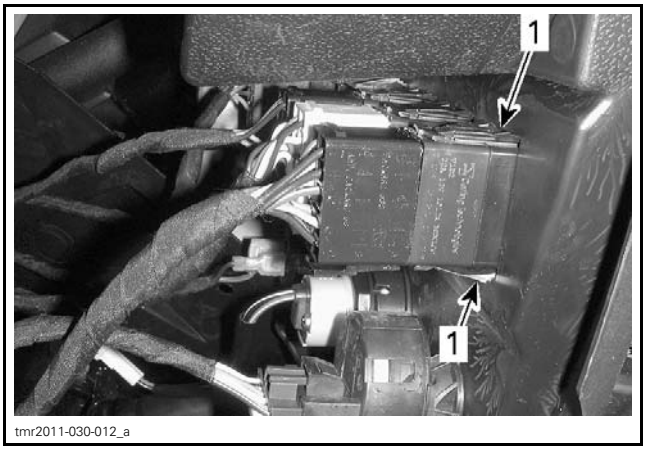
Switches Access

The switches connectors can be reached by the openings underneath the dash.

Replacing a Switch

Disconnect electrical connector.

Release retaining clips, then push switch out of the console.



TYPICAL
1. Retaining clips

For installation, reverse removal procedure.

Switches Illumination Wire Identification

SWITCHES BACK LIGHTING		
FUNCTION	PIN	COLOR
12 volt input from fuse F7	See note	RD/BK

NOTE: The back lighting circuit of all console switches is supplied by the RD/BK wire but the pin location differ from one to another.

Switches Back Lighting Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with accessories relay activated	Fuse F7 of fuse block 1 (from accessories relay R3)

12 VOLT POWER OUTLET

Replacing a 12 Volt Power Outlet

Unplug the connectors of the power outlet.

Unscrew the retaining nut.

Reverse procedure for installation.

12 Volt Power Outlet Wire Identification

12 VOLT POWER OUTLET		
FUNCTION	PIN	COLOR
12 volt input from fuse F12	2	RD/BN
Ground	1	BK

12 Volt Power Outlet Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with accessories relay R3 activated	Fuse F12 of fuse block 1 (from accessories relay R3)

WINCH

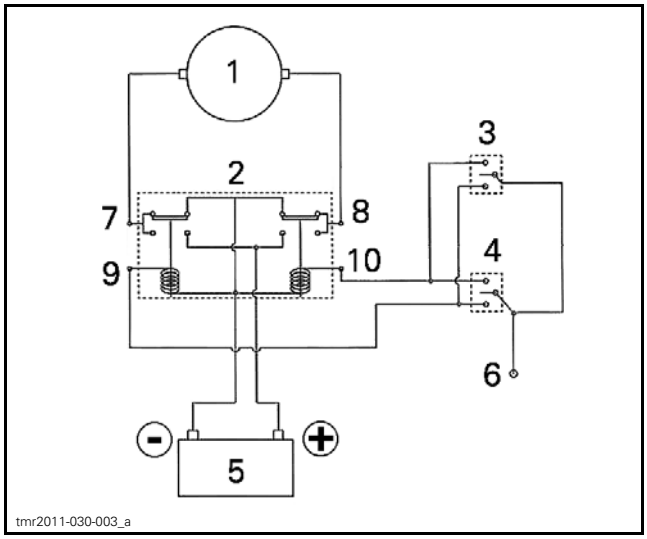
Identifying Winch Wire

WINCH RELAY		
FUNCTION	PIN	COLOR
12 volt input from battery (winch power)	RD	RD
Ground	BK	BK
12 volt input from switch ("IN")	SW2	GN/BU
12 volt input from switch ("OUT")	SW1	LT BU
Motor power (switches polarity depending on rotation direction)	BP4	RD (with Yellow tape)
Motor power (switches polarity depending on rotation direction)	BN4	RD (without tape)

WINCH SWITCH		
FUNCTION	PIN	COLOR
12 volt input from fuse 7	2	RD/BK
12 volt output to relay winding ("IN")	1	GN/BU
12 volt output to relay winding ("OUT")	3	LT BU

⚠ WARNING

Before testing, make sure the winch is in FREESPOOL mode (Freespool clutch disengaged).



SIMPLIFIED WINCH WIRING DIAGRAM
1. *Winch motor*
2. *Winch relay*
3. *Winch remote control*
4. *Winch switch*
5. *Battery*
6. *12 volt input to switch (switch pin 2 - from fuse 12)*
7. *Winch motor power (BP4)*
8. *Winch motor power (BN4)*
9. *12 volt input to relay winding ("IN" - SW1)*
10. *12 volt input to relay winding ("OUT" - SW2)*

Winch Switch Circuit Protection

CONDITION	CIRCUIT PROTECTION
Supplied with accessories relay activated	Fuse 12 of fuse block 1 (from accessories relay R3)

Winch Motor Circuit Protection

Two circuit breakers (50 A) are used to protect the winch motor in case of overheating.

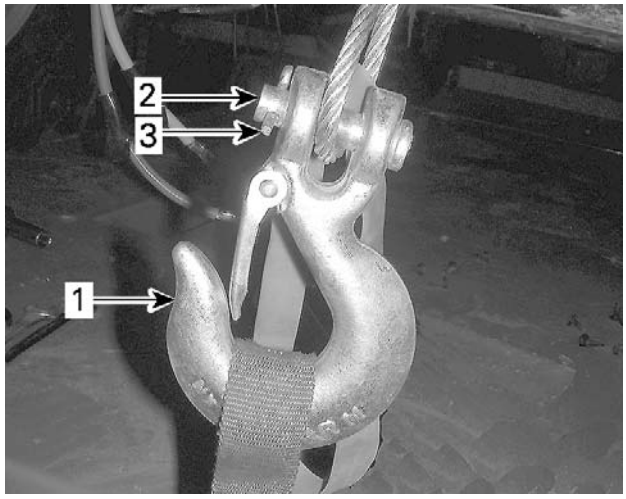
Removing the Winch

1. Disconnect, the battery BLACK (-) cable first, then the RED (+) cable.

⚠ WARNING

Always respect this order for disassembly; disconnect BLACK (-) cable first. Electrolyte or fuel vapors can be present in engine compartment and a spark may ignite them and possibly cause personal injuries.

2. Remove the hook.
   2.1 Remove and discard the cotter pin.
   2.2 Remove the hook pin.



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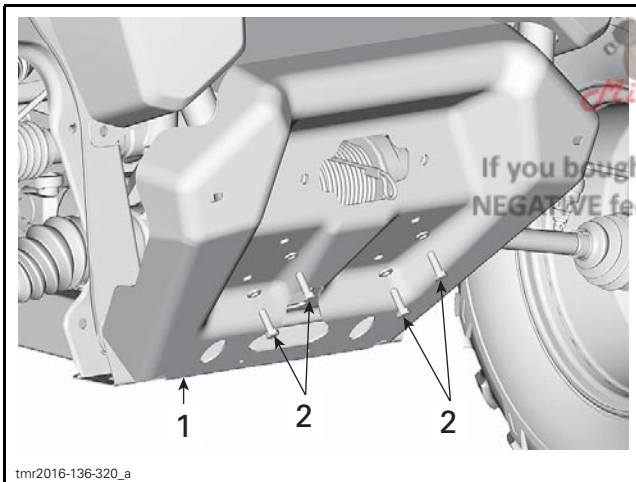
1. Hook
2. Hook pin
3. Cotter pin

3. Remove the four retaining screws from underneath the winch motor.



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1. Bumper plate
2. Retaining screws

4. Disconnect both winch power cables.

NOTE: Note the position of the power cables for reinstallation.

5. Pass the cable through the roller fairlead.
6. Remove winch.

Installing the Winch

For the installation, reverse the removal procedure, however pay attention to the following.

Tighten winch retaining screws to specification.

TIGHTENING TORQUE	
M8 x 25 Bolt	16 N•m ± 2 N•m (142 lbf•**in** ± 18 lbf•**in**)

Connect wires the YELLOW wire at front and the BLUE one at back.

Install a **NEW** cotter pin on the hook pin.

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FRONT DRIVE

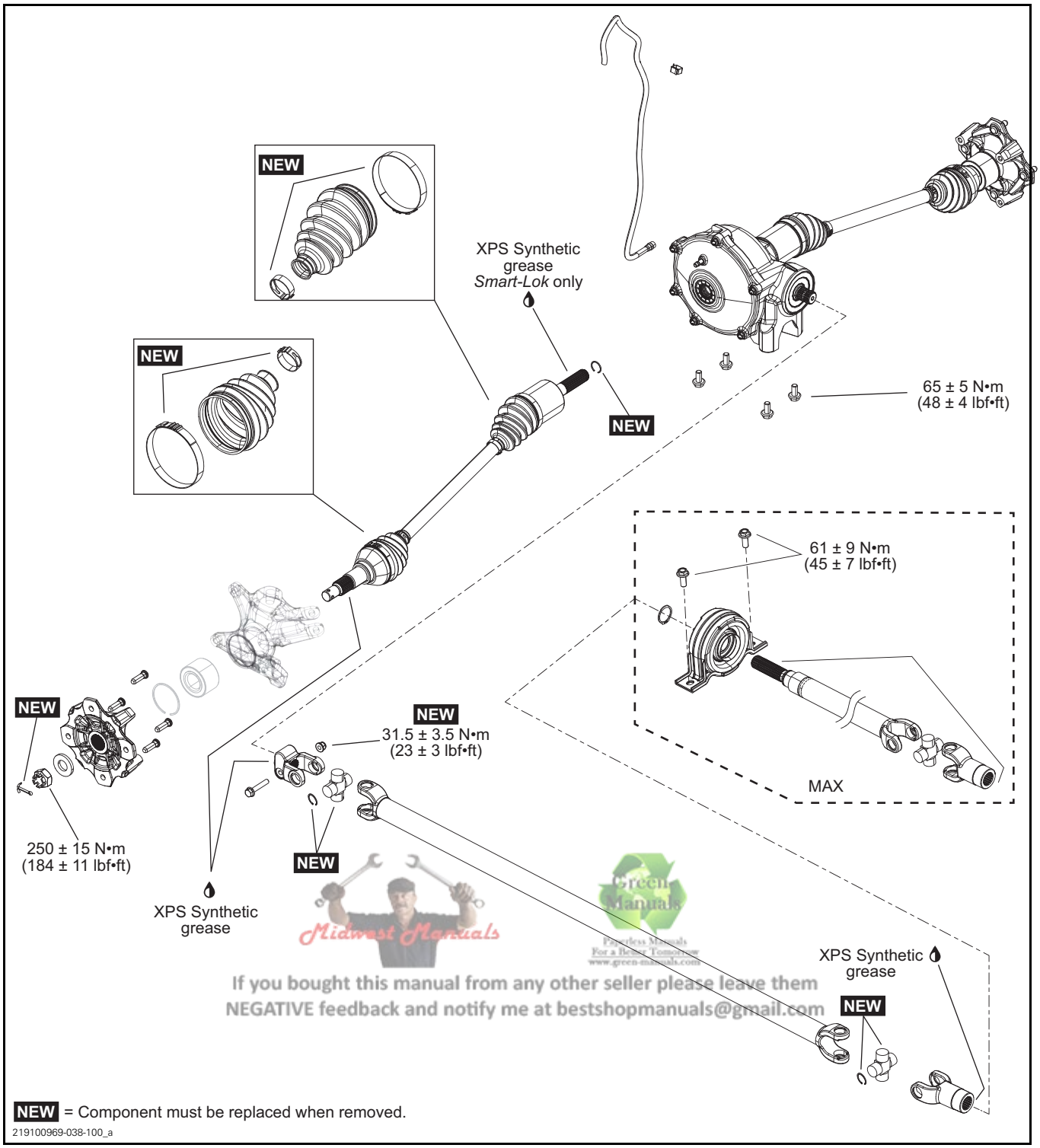
SERVICE TOOLS

Description	Part Number	Page
BACKLASH MEASUREMENT TOOL	529 036 387	9
CV BOOT CLAMP PLIER	529 036 120	5
CV JOINT EXTRACTOR	529 036 005	5

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 271 (RED)	293 800 005	12–13
SYNTHETIC GREASE	779162	5–6, 12–13

FRONT DRIVE SHAFTS AND FRONT PROPELLER SHAFT



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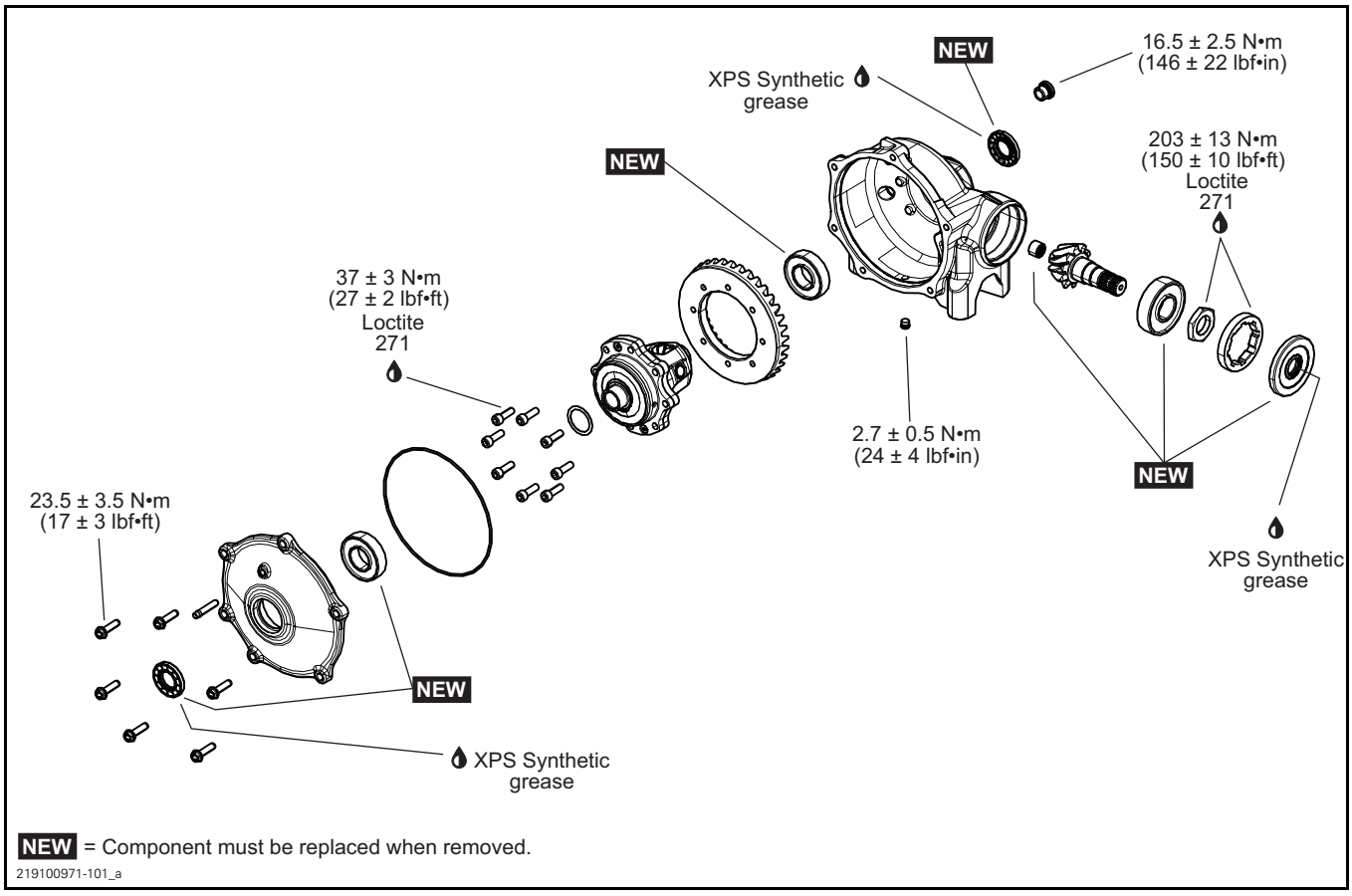
FRONT DIFFERENTIAL



NEW = Component must be replaced when removed.

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GENERAL

The procedure explained below is the same for the RH and LH sides unless otherwise specified.

IMPORTANT
For any information concerning the inspection, the disassembly and the assembly of a Smart-Lok differential, refer to the *SMART-LOK DIFFERENTIAL* subsection.

SYSTEM DESCRIPTION

When one wheel is spinning above a certain rate faster than the other wheel, the Visco-Lok® system progressively locks the wheels through its multi-plate clutch.

In the event of a failure, the entire Visco-Lok pump and its carrier will have to be replaced. The Visco-Lok pump itself is a non-serviceable item.

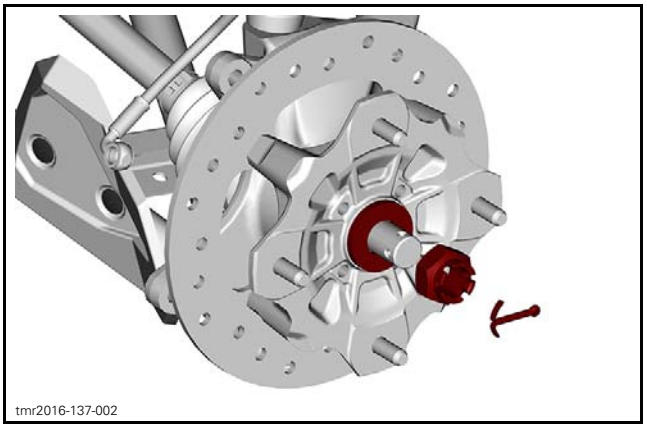
NOTE: If the pump was disassembled, its viscous fluid would be lost and it could not be replaced.

PROCEDURES

WHEEL HUB

Removing the Wheel Hub

1. Lift and support vehicle. Refer to *INTRODUCTION* section for proper procedure.
2. Select the 4WD position and place the transmission lever on "P".
3. Remove caliper from knuckle. Refer to *BRAKES* subsection.
4. Remove the following parts:
   - Wheel
   - Cotter pin
   - Castellated nut
   - Belleville washer.



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5. Remove wheel hub.

Inspecting the Wheel Hub

Check wheel studs for damaged threads and overall conditions

Check wheel hub for cracks or other damages.

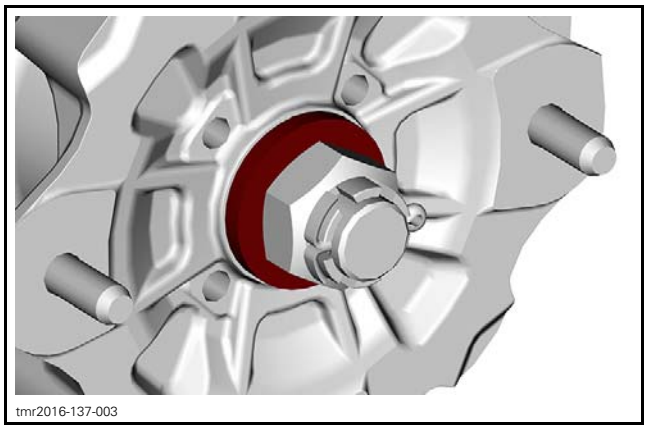
Check inner splines for wear or other damages.

Replace wheel hub and / or studs if any damage is detected.

Installing the Wheel Hub

The installation is the reverse of removal procedure. However, pay attention to the following.

Install Belleville washer with its domed side outwards.



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TIGHTENING TORQUE	
Castellated nut	250 N•m ± 15 N•m (184 lbf•ft ± 11 lbf•ft)

NOTE: Tighten further castellated nut if required to align grooves with drive shaft hole.

Install a new cotter pin.

FRONT DRIVE SHAFT

Removing the Front Drive Shaft

1. Remove the wheel hub. Refer to procedure in this subsection.
2. Remove the knuckle. Refer to *STEERING SYSTEM* subsection.
3. Strongly pull drive shaft out of differential.
4. Discard the stop ring at the end of the shaft.

Inspecting the Front Drive Shaft

Inspect the condition of boots. If there is any damage or evidence of leaking lubricant, replace them. Refer to *DRIVE SHAFT BOOT*.

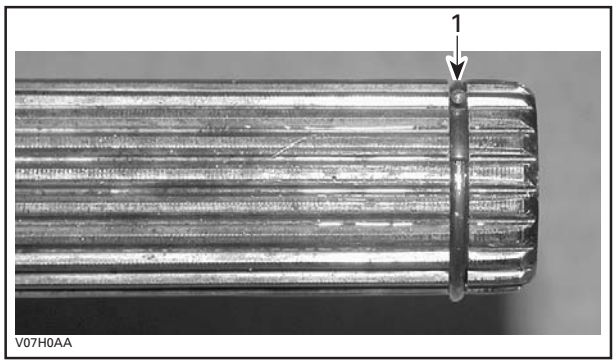
Check splines for excessive wear. Replace if necessary.

NOTE: If the splines on plunging joint are worn, a check of differential inner splines should be done.

Installing the Front Drive Shaft

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install a new stop ring.



1. Stop ring

Models with Smart-Lok Differential

Apply grease to the differential side splines of the shaft.

SERVICE PRODUCT
SYNTHETIC GREASE (P/N 779162)

All models

Apply grease to the wheel side splines of the shaft.

SERVICE PRODUCT
SYNTHETIC GREASE (P/N 779162)

DRIVE SHAFT BOOT

Removing the Drive Shaft Boot

1. Remove the drive shaft from the vehicle.
2. Remove drive shaft boot clamps.

REQUIRED TOOL	
CV BOOT CLAMP PLIER (P/N 529 036 120)	

3. Dislodge the large boot end.
4. Separate the joint from the shaft. Two procedures can be done.

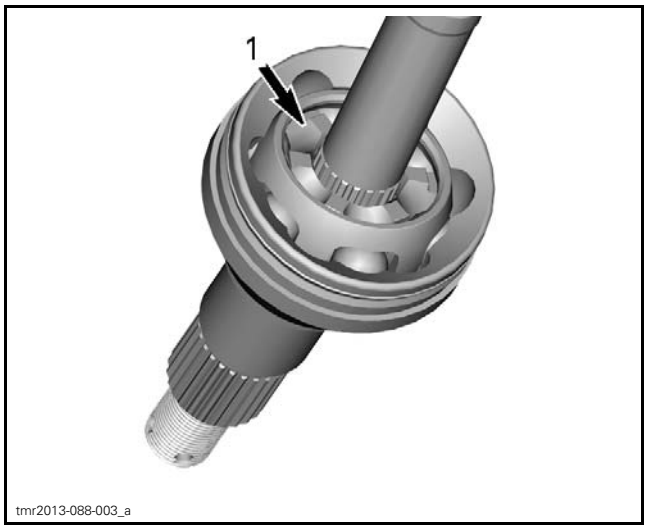
Without the Special Tool

1. Clamp joint housing in a vise.
2. Align shaft with joint.
3. Pull hard on shaft to remove from joint.
4. Remove boot from drive shaft.
5. Remove and discard the circlip.

With the Special Tool

REQUIRED TOOL	
CV JOINT EXTRACTOR (P/N 529 036 005)	

1. Place drive shaft in vice with the joint downward.
2. Install the cv joint extractor on the bearing.



TYPICAL - CV JOINT SHOWN
1. Position joint extractor tool here

3. With a hammer, hit on the tool to separate joint from shaft.
4. When joint and shaft are separated, remove boot from drive shaft.
5. Remove and discard the circlip.

Installing the Drive Shaft Boot

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install the new circlip.

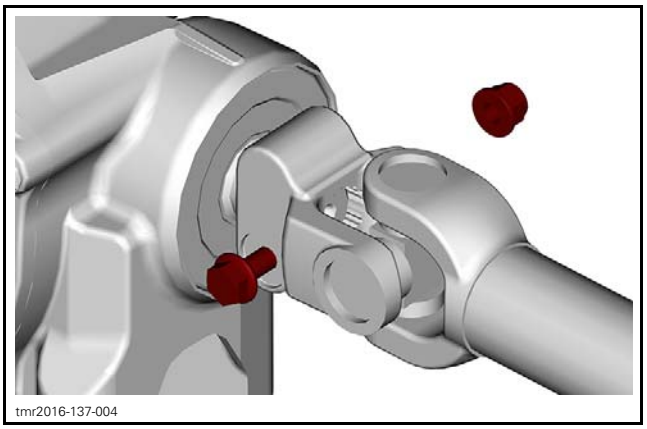
Pack bearing area with grease included with the new boot kit.

NOTE: Do not use or add other grease.

FRONT PROPELLER SHAFT

Removing the Front Propeller Shaft

1. Remove propeller shaft screw and nut on differential end.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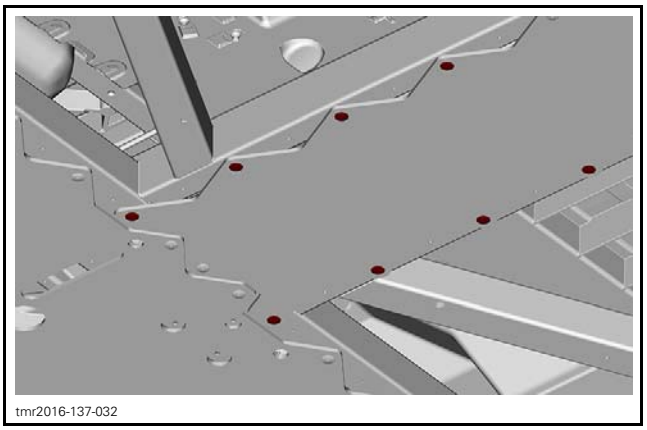
2. Remove the 4 first row of rivets on the central skid plate starting from the rear.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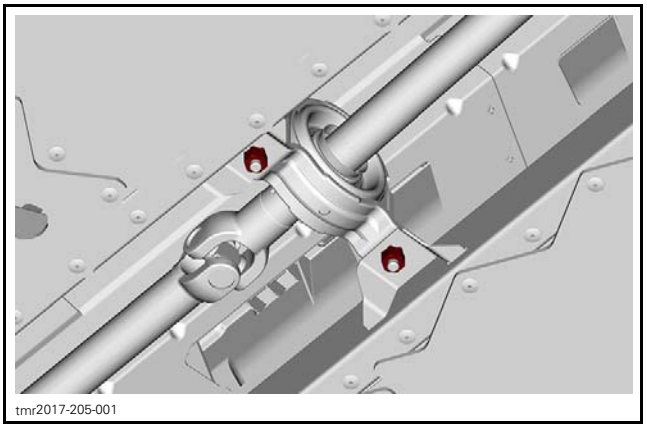
3. Remove both retaining bolts and nuts securing bearing flange.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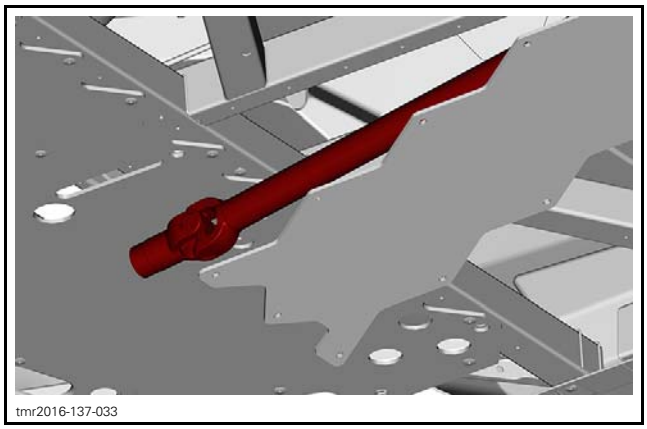
4. Dislodge the propeller shaft from the differential side first by pushing it towards the engine. When it is disengaged from the differential, move it towards front, beside the differential to disengage from the engine.
5. Remove front propeller shaft through skid plate opening.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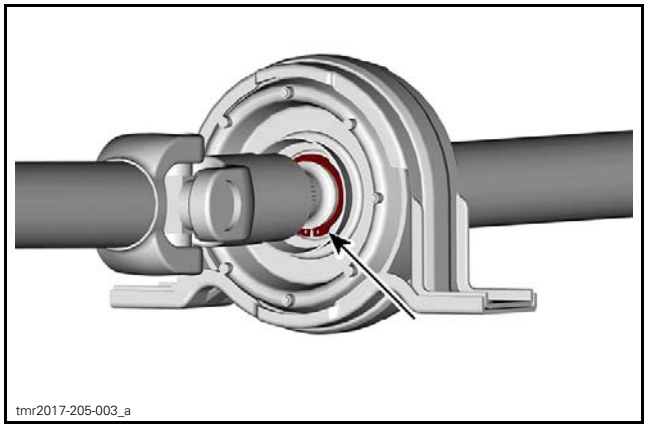
6. Remove circlip to separate propeller shaft halves.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Inspecting the Front Propeller Shaft

Inspect if propeller shaft is not bent or twisted.

Check propeller shaft splines for wear or damage.

Check both U-joint crosses. They should rotate smoothly without any play.

Replace if required.

Installing the Front Propeller Shaft

The installation is the reverse of the removal procedure. However, pay attention to the following.

Apply grease to splines on engine side.

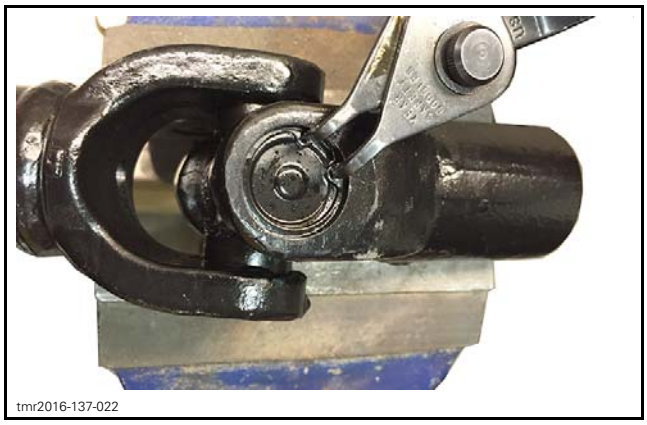
SERVICE PRODUCT
SYNTHETIC GREASE (P/N 779162)

TIGHTENING TORQUE	
Propeller shaft nut	31.5 N•m ± 3.5 N•m (23 lbf•ft ± 3 lbf•ft)
Bearing flange retaining bolts	61 N•m ± 9 N•m (45 lbf•ft ± 7 lbf•ft)

PROPELLER SHAFT U-JOINTS

Removing the Propeller Shaft U-Joint

1. Remove internal snap ring from bearing caps.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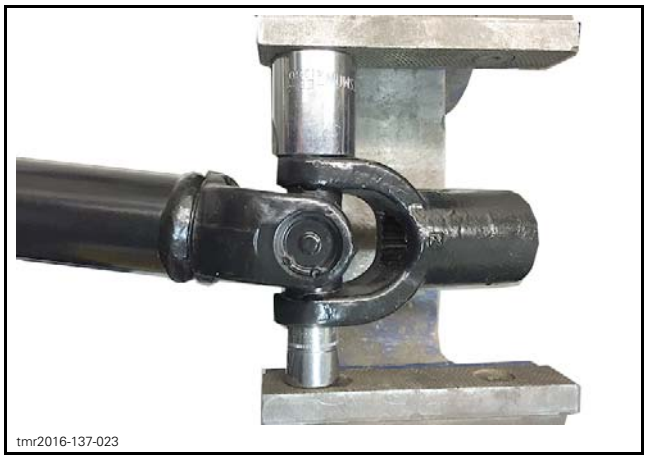
2. In a vice, use a suitable box to lock the yoke on one side, and a smaller one to push on the U-joint cross on the other side..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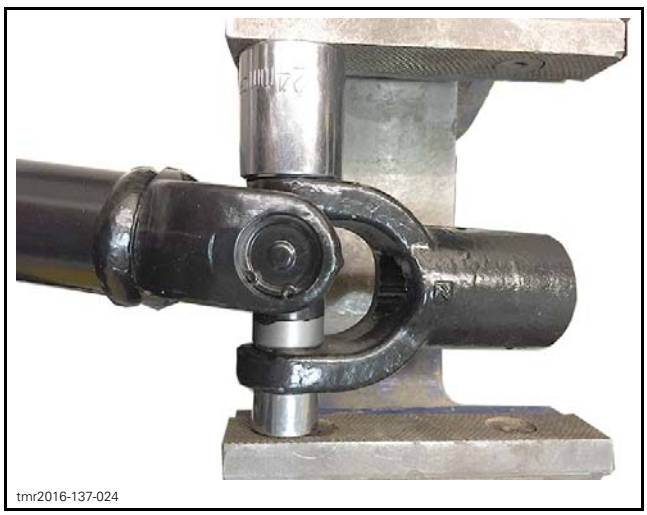
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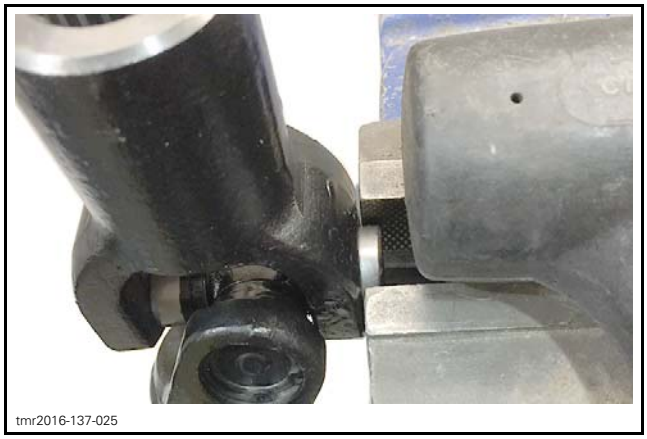
3. Squeeze the bearing cap in vice and hit the yoke with a soft hammer to remove it.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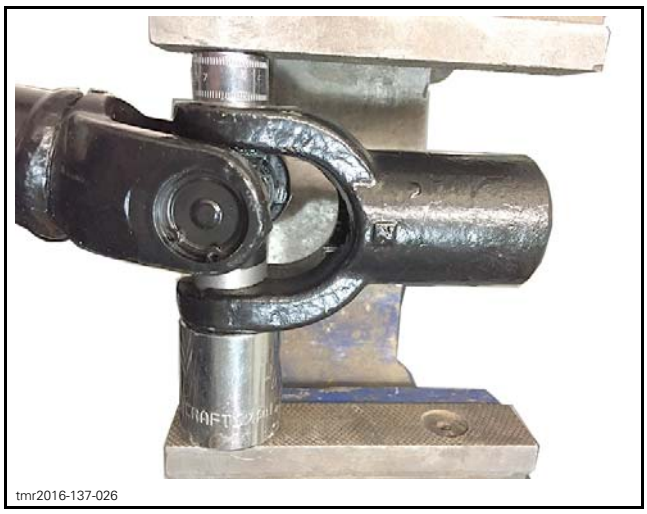
4. Press the cross on the other side of the yoke to disengage it.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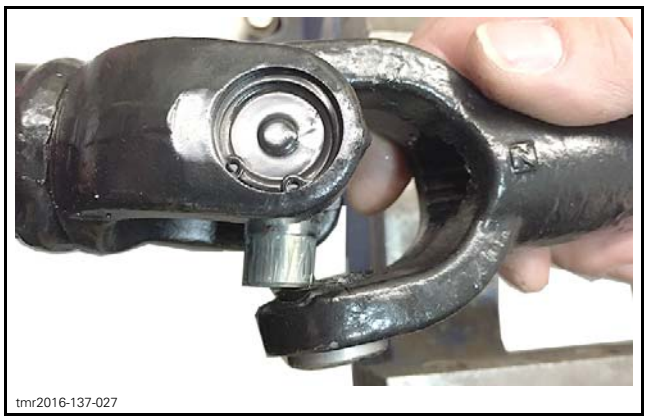
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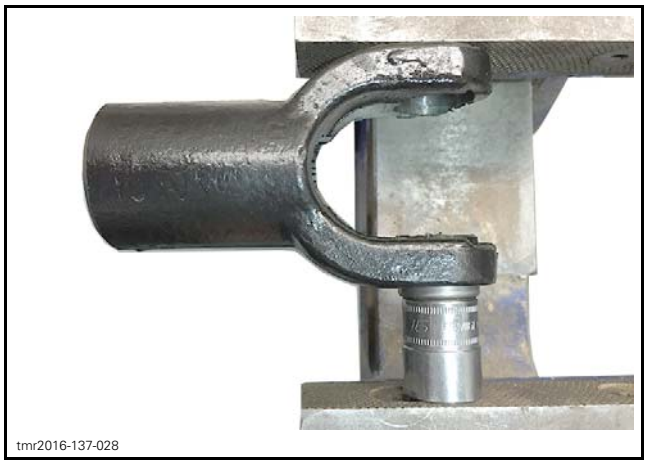
5. Remove bearing cap.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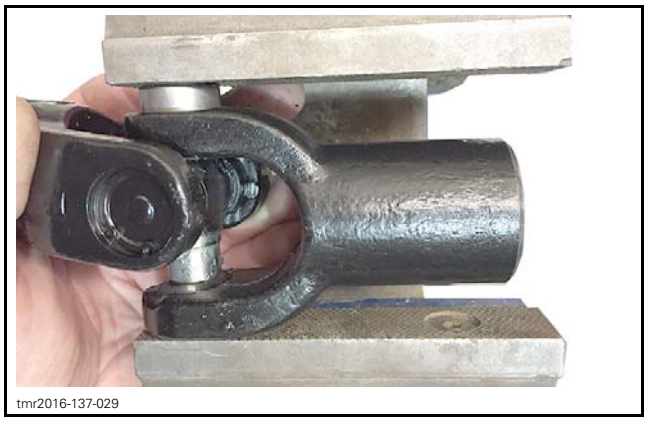
6. Repeat steps to remove the remaining bearing caps.
7. Remove U-joint cross.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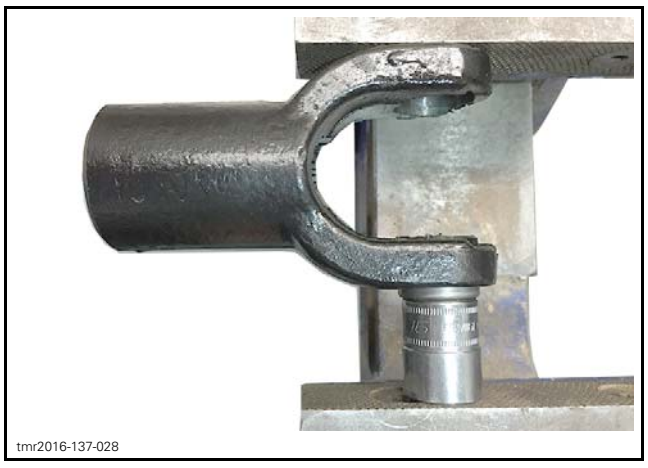
Installing the Propeller Shaft U-Joint

1. Use a vise to insert the first bearing cap flush with the inner wall of the yoke.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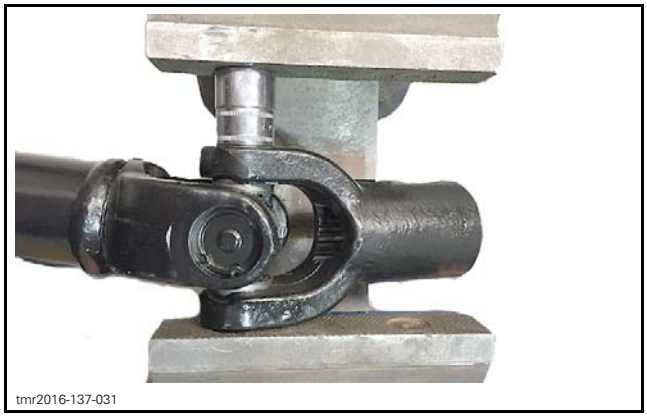
2. Install new U-joint cross in yoke and slide it in the bearing cap.

NOTICE Ensure bearing needles are perfectly positioned in caps to avoid damage to cross.

3. Fully seat bearing cap on one side.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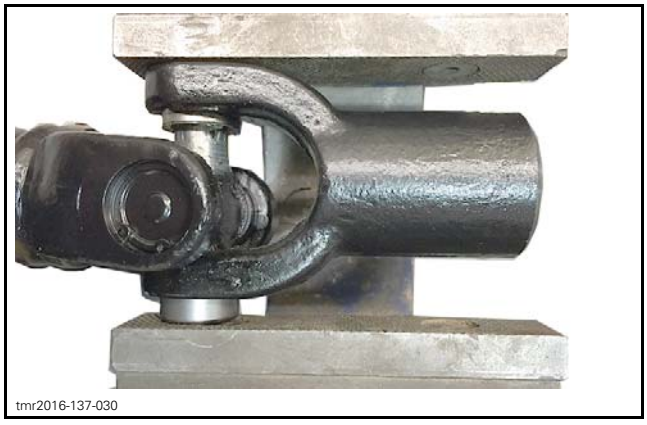
4. Install snap ring.
5. Install the second bearing cap, then snap ring.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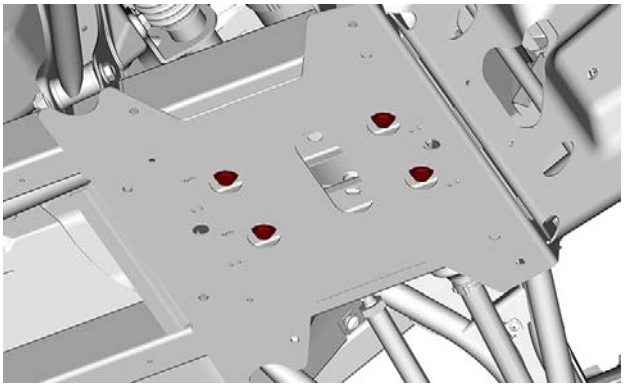
Ensure U-joint is operating smoothly.

FRONT DIFFERENTIAL

Removing the Front Differential

1. Drain the differential. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.
2. Remove both drive shafts. Refer to *REMOVING THE FRONT DRIVE SHAFT* procedure in this subsection.
3. Remove front bumper. Refer to *FRAME* subsection.
4. Remove the 4 retaining screws from the bottom skid plate.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5. Remove the differential with the propeller shaft from the front of vehicle.
6. Remove the propeller shaft if required.

Inspecting the Front Differential (Assembled)

Check if oil seals are brittle, hard or damaged. Replace if necessary.

Backlash Inspection

When measuring backlash, the differential cover should be upside down to pull the ring gear out of mesh.

1. Measure the backlash with a dial indicator.

REQUIRED TOOL	
BACKLASH MEASUREMENT TOOL (P/N 529 036 387)	

2. Place the backlash measurement tool at the end of pinion gear.

tmr2017-205-002

A. 23 mm (29/32 in)

3. Position the dial indicator tip against the tab at a 90° angle and right in the dimple.
4. Gently, move the tab back and forth. Note the result.

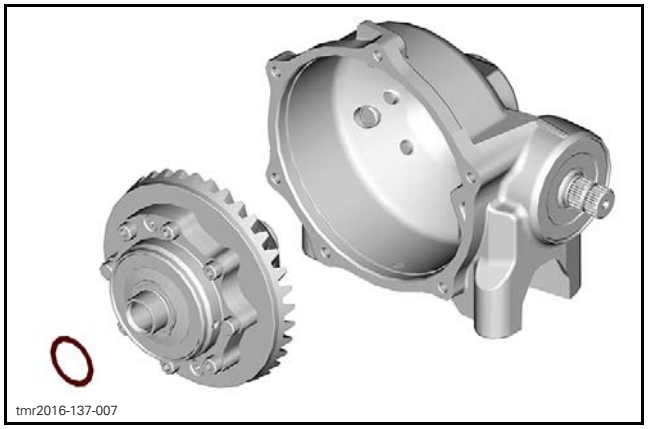
NOTE: While measuring the backlash, make sure the ring gear is not moving.

5. Rotate pinion gear 1/2 turn and check backlash again. Note the result.
6. Rotate pinion gear 1 turn and check backlash again.

BACKLASH SPECIFICATION
0.1 mm (.004 in) to 0.25 mm (.01 in)

If backlash is out of specification, split front differential housing and adjust shim thickness as per following guideline.

BACKLASH ADJUSTMENT GUIDELINE	
BACKLASH MEASUREMENT	WHAT TO DO
Below 0.1 mm (.004 in)	Remove shim(s) and recheck backlash
Above 0.25 mm (.01 in)	Add shim(s) and recheck backlash


tmr2016-137-007

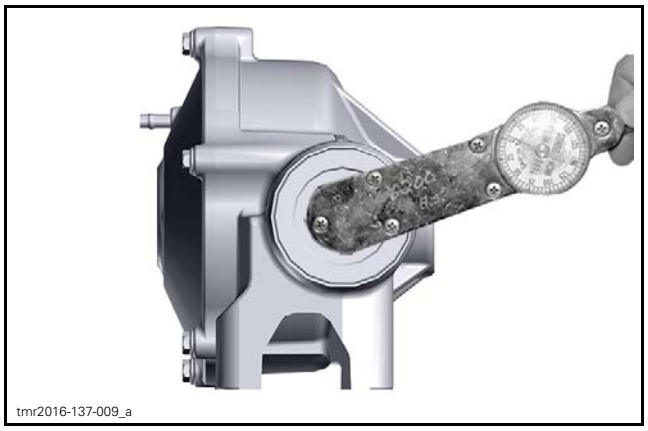
BACKLASH SHIM

Preload Inspection

Install the spline adapter tool on the pinion shaft.

REQUIRED TOOL
Spline driver (P/N 529036386)

Using a needle torque wrench, measure the drag torque.



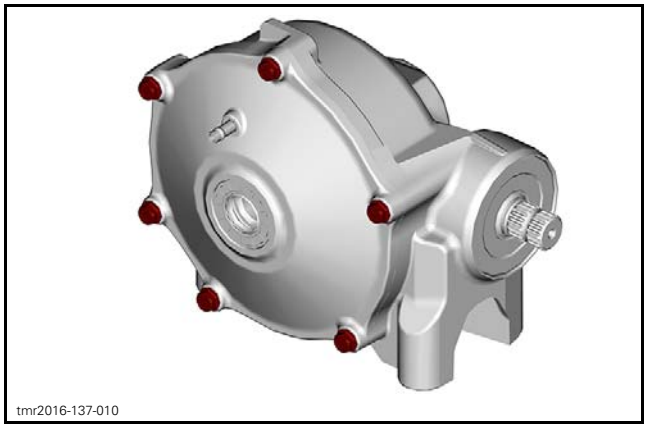
PRELOAD SPECIFICATION
Maximum 0.50 N•m (4 lbf•**in**)

If preload is out of specification, split front differential housing and check all bearings conditions.

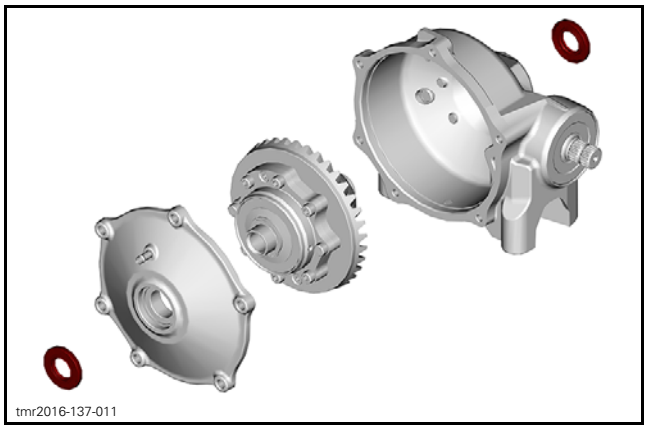
Front Differential Disassembly

Differential Housing

1. Remove front differential housing screws.

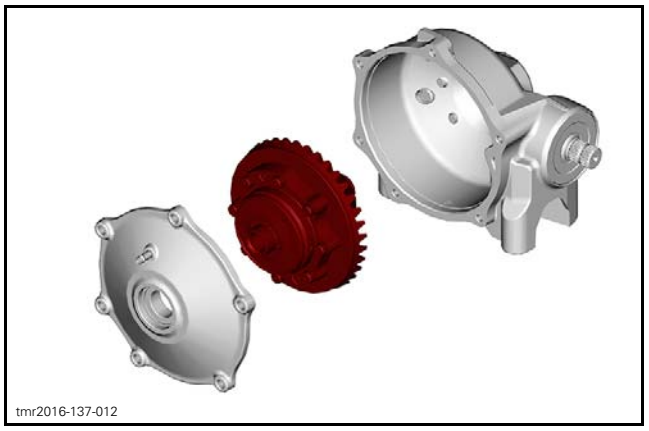


2. Separate half housings.
3. Remove oil seals.

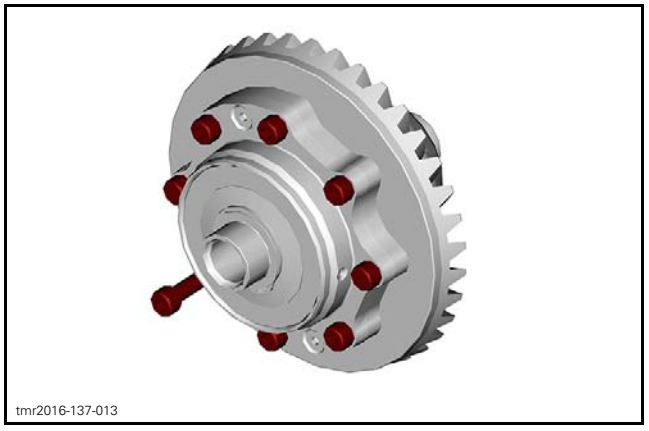


Visco-Lok Carrier/Ring Gear

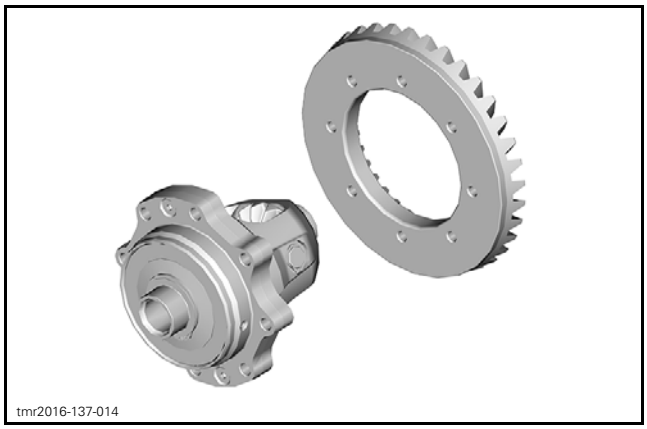
1. Remove Visco-Lok carrier/ring gear out of half housing.



2. Remove screws securing ring gear to Visco-Lok unit.



3. Separate ring gear from Visco-Lok unit.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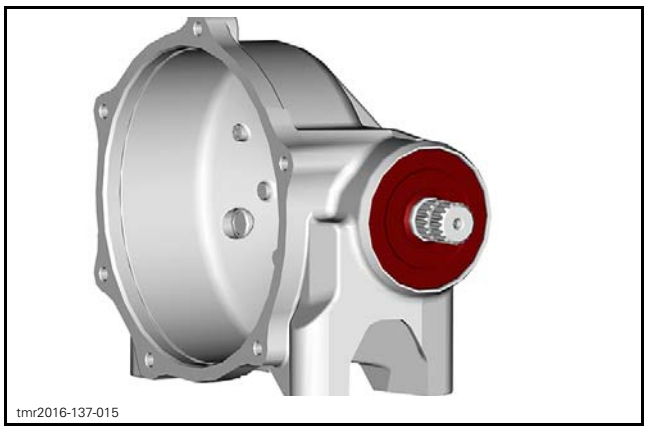
Pinion Gear

REQUIRED TOOL
Multifunctional differential tool (P/N 529036385)
Spline driver (P/N 529036386)

1. Remove and discard oil seal.


tmr2016-137-015

2. Unscrew the pinion nut.
   - 2.1 Lock the multifunctional tool with the pinion driver.
   - 2.2 Slide the tools until it engage the nut.
   - 2.3 Unscrew the nut.

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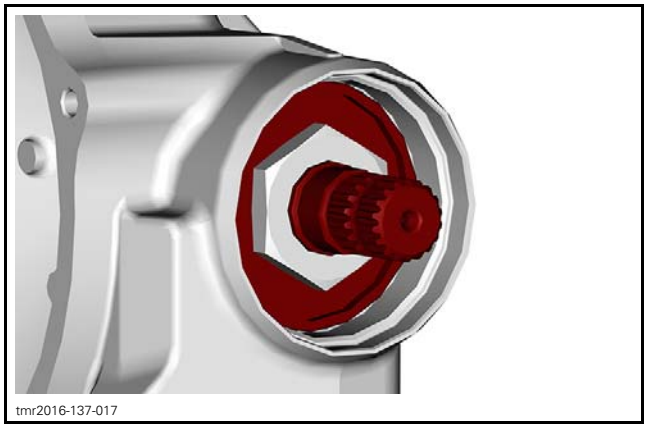
3. Remove bearing and pinion gear together.

NOTE: If pinion is hard to pull out, attach the propeller shaft to it and pull while hitting the yoke with a soft hammer.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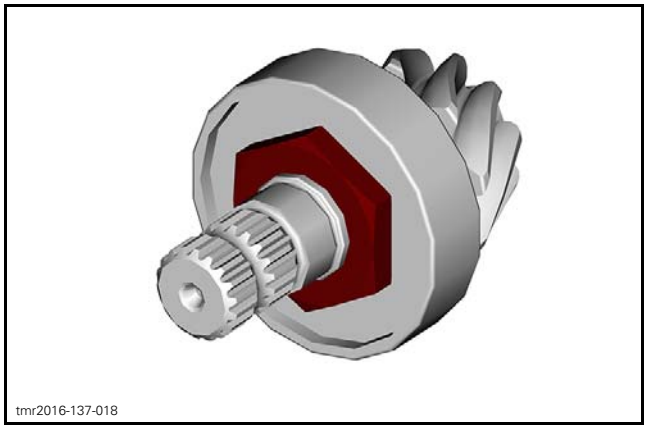
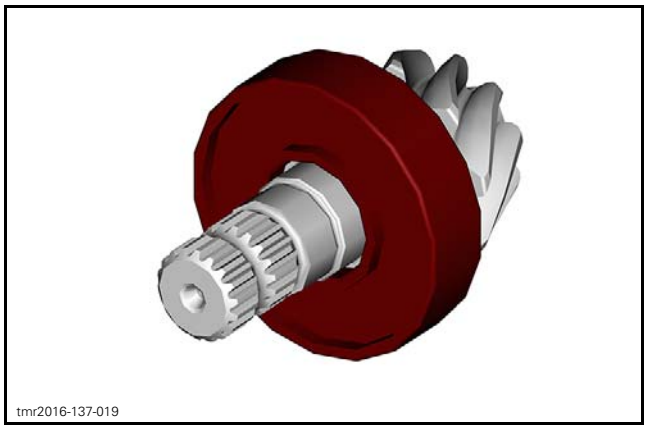
4. Remove nut from pinion.
   - 4.1 Install the multifunctional tool in a vice.
   - 4.2 Slide the spline driver on the pinion shaft.
   - 4.3 Slide the pinion and the spline driver in the multifunctional tool until the nut is engaged.
   - 4.4 Turn the spline driver clockwise to unscrew the pinion.


tmr2016-137-018

5. Remove bearing from pinion gear.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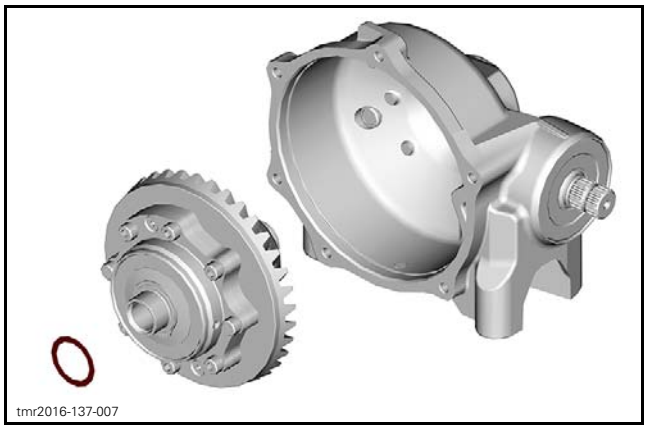
6. Remove and discard the needle bearing.

Front Differential Assembly

Adjustment is required when any of the following part is changed.
- Pinion gear
- Ring gear
- Viscolok unit
- Housing.

As a preliminary setup, install shim according to the following table.

RECOMMENDED SHIM THICKNESS	
BACKLASH	0.5 mm (.02 in) (as a preliminary adjustment)


tmr2016-137-007

BACKLASH SHIM

Prior to finalizing assembly, proceed in this order:
- Temporarily assemble final drive using recommended torques.
- Do not apply thread locker product.
- Do not install a new pinion nut.
- Check backlash.
- Check preload.

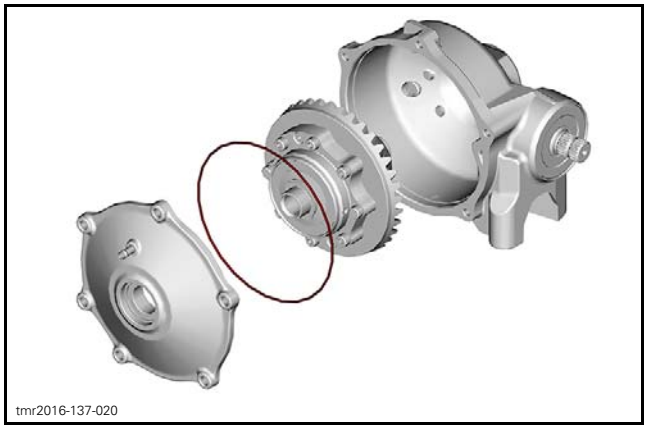
Visco-Lok Carrier/Ring Gear

The installation is the reverse of the removal procedure. However, pay attention to the following.

Tighten ring gear screws to specification.

TIGHTENING TORQUE	
Ring gear screws	37 N•m ± 3 N•m (27 lbf•ft ± 2 lbf•ft) + LOCTITE 271 (RED) (P/N 293 800 005)

Check condition of seal. Replace if damaged.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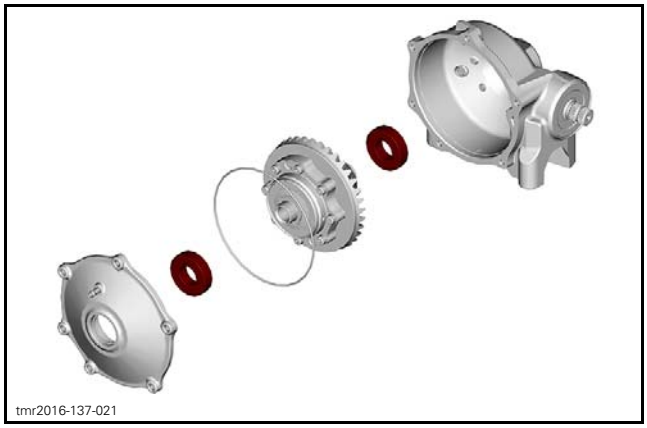
Check bearings. Replace with new bearings if necessary.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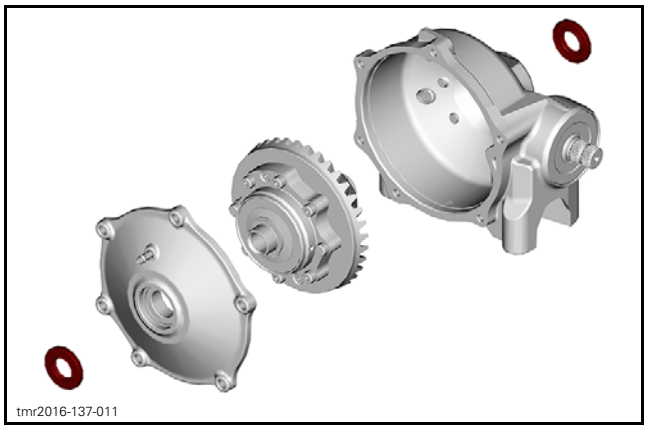
Apply SYNTHETIC GREASE (P/N 779162) on new oil seals and install.



Tighten differential housing screws to specification.

TIGHTENING TORQUE	
Differential housing screws	23.5 N•m ± 3.5 N•m (17 lbf•ft ± 3 lbf•ft)

Pinion Gear

Install a new ball bearing.

Install a new O-ring.

Install a new needle bearing.

Apply LOCTITE 271 (RED) (P/N 293 800 005) to pinion nut.

Install and tighten the pinion nut to specification.

TIGHTENING TORQUE	
Pinion nut (housing and shaft)	203 N•m ± 13 N•m (150 lbf•ft ± 10 lbf•ft) + LOCTITE 271 (RED) (P/N 293 800 005)

Apply SYNTHETIC GREASE (P/N 779162) on new oil seal and install.

Installing the Front Differential

The installation is the reverse of the removal procedure. However, pay attention to the following.

TIGHTENING TORQUE	
Differential retaining screw	65 N•m ± 5 N•m (48 lbf•ft ± 4 lbf•ft)

Refill the front differential with recommended oil. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

REAR DRIVE

SERVICE TOOLS

Description	Part Number	Page
BACKLASH MEASUREMENT TOOL	529 035 665	7
CV BOOT CLAMP PLIER	529 036 120	5
CV JOINT EXTRACTOR	529 036 005	5
SPANNER SOCKET	529 035 649	9

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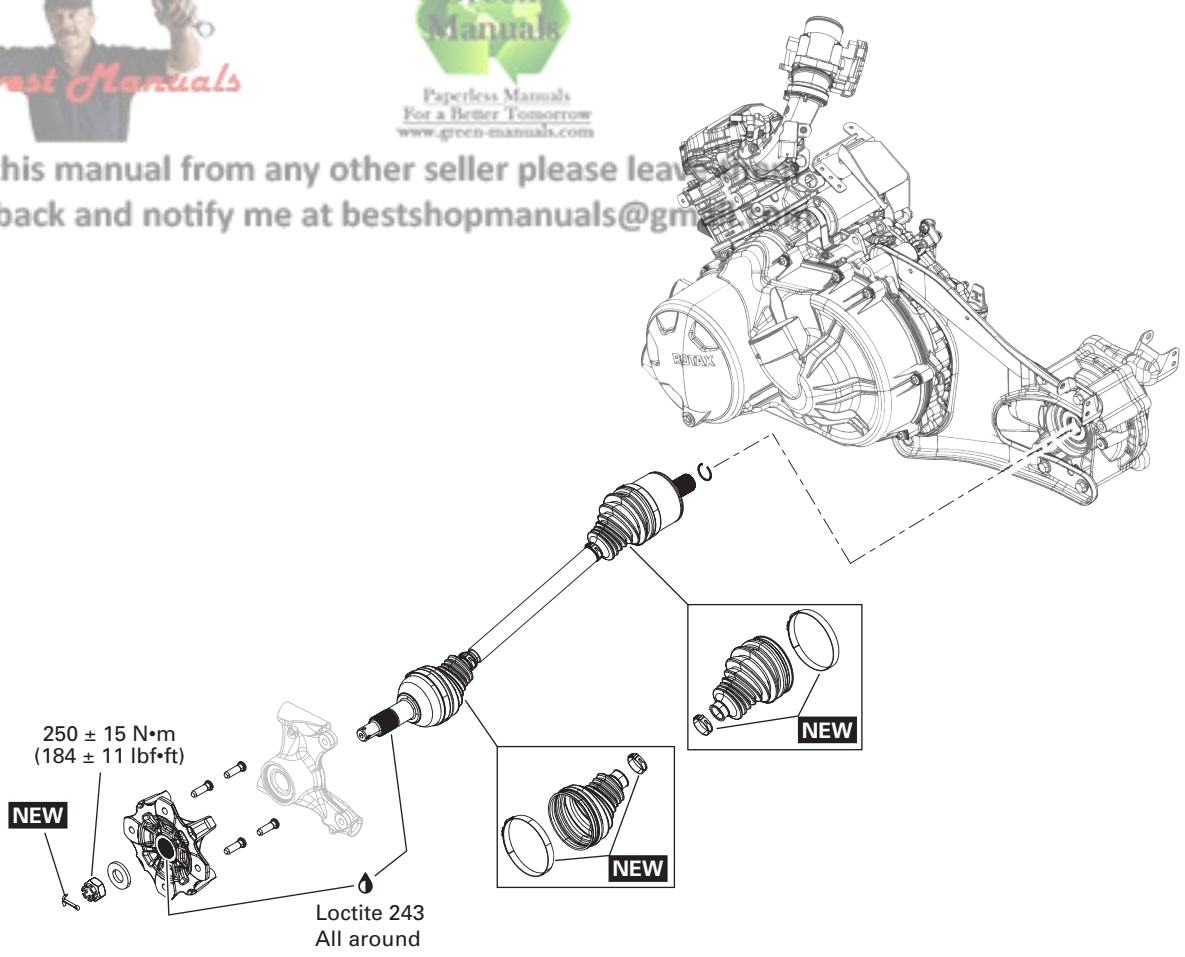
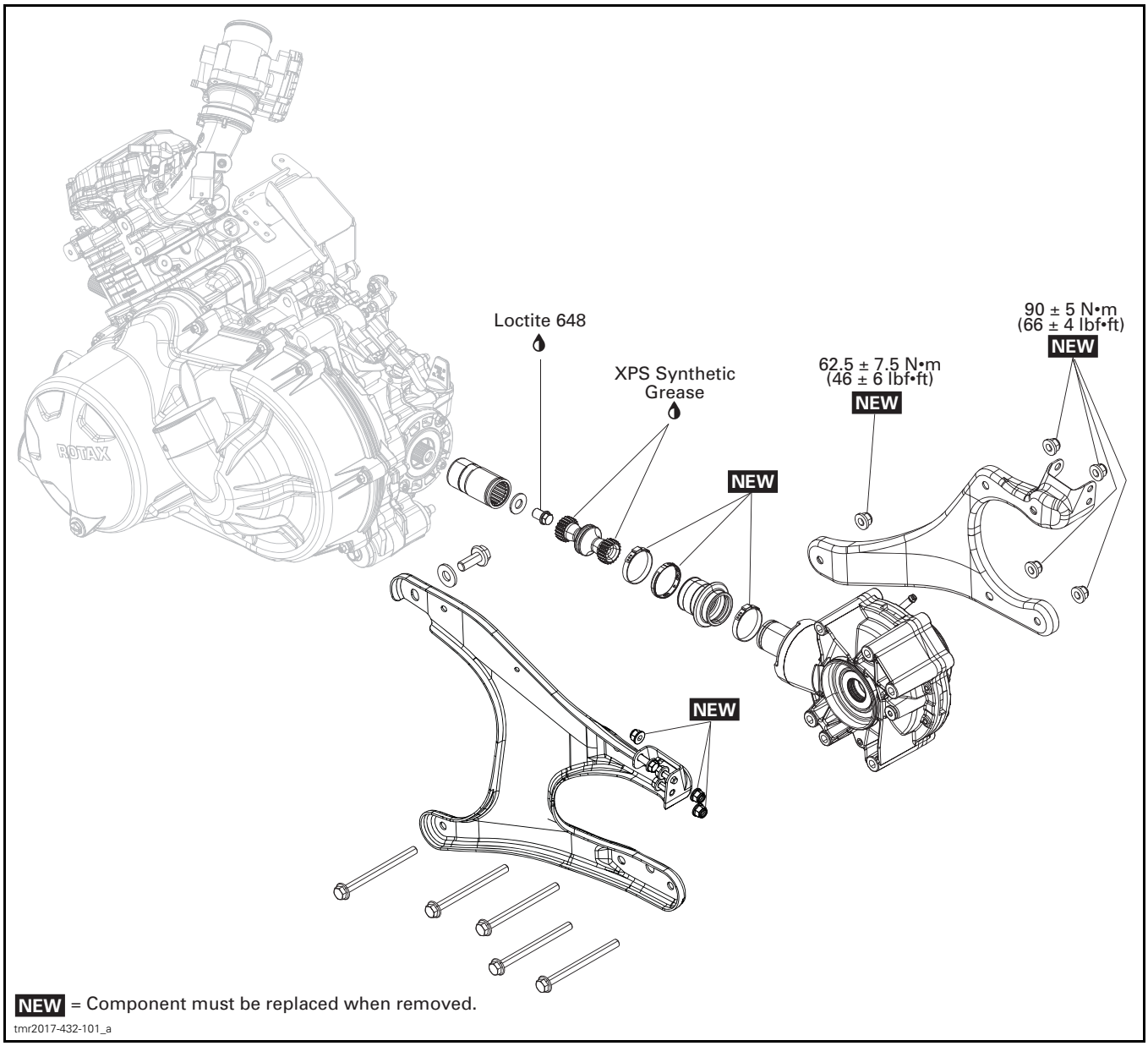
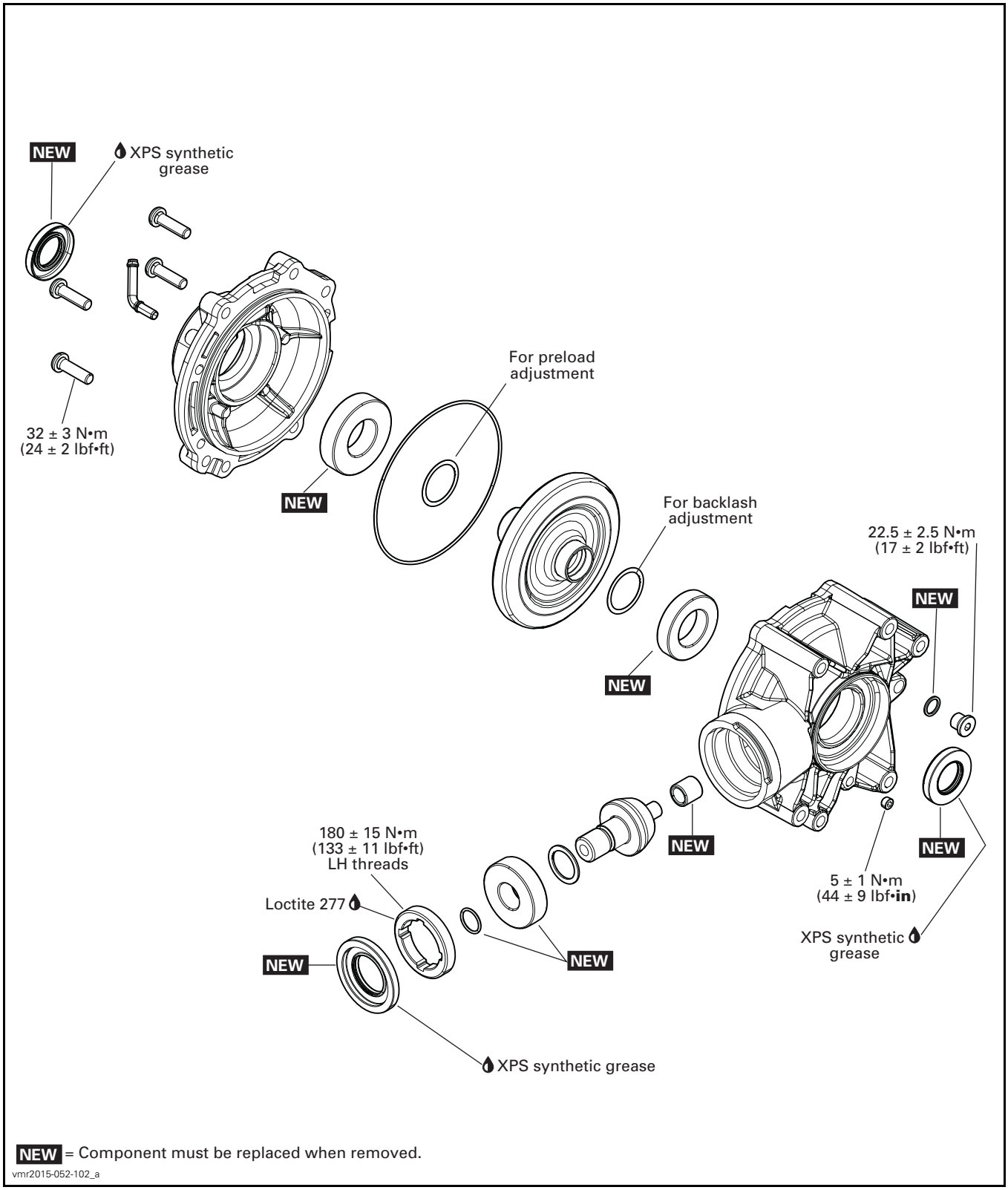


NEW = Component must be replaced when removed.

tmr2017-432-100_a


Loctite 648
XPS Synthetic Grease
NEW
62.5 ± 7.5 N•m
(46 ± 6 lbf•ft)
NEW
90 ± 5 N•m
(66 ± 4 lbf•ft)
NEW
NEW
NEW = Component must be replaced when removed.
tmr2017-432-101_a



NEW = Component must be replaced when removed.

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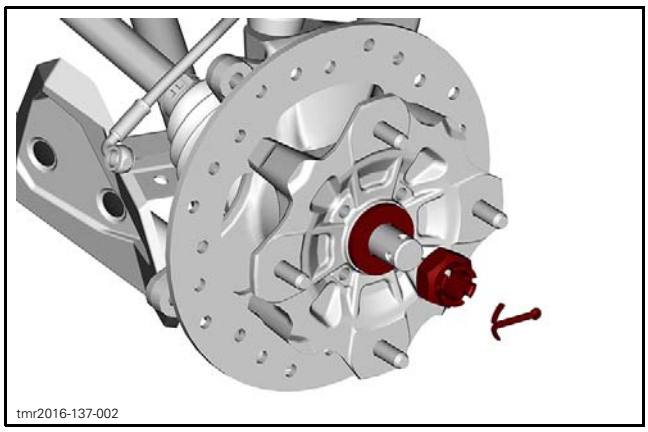
PROCEDURES

WHEEL HUB

Removing the Wheel Hub

1. Lift and support vehicle. Refer to *INTRODUCTION* section for proper procedure.
2. Select the 4WD position and place the transmission lever on PARK
3. Remove caliper from knuckle if applicable. Refer to *BRAKES* subsection.
4. Remove the following parts:
   – Cotter pin
   – Castellated nut
   – Belleville washer.


tmr2016-137-002

5. Remove wheel hub.

Inspecting the Wheel Hub

Check wheel studs for damaged threads and overall conditions

Check wheel hub for cracks or other damages.

Check inner splines for wear or other damages.

Replace wheel hub and / or studs if any damage is detected.

Installing the Wheel Hub

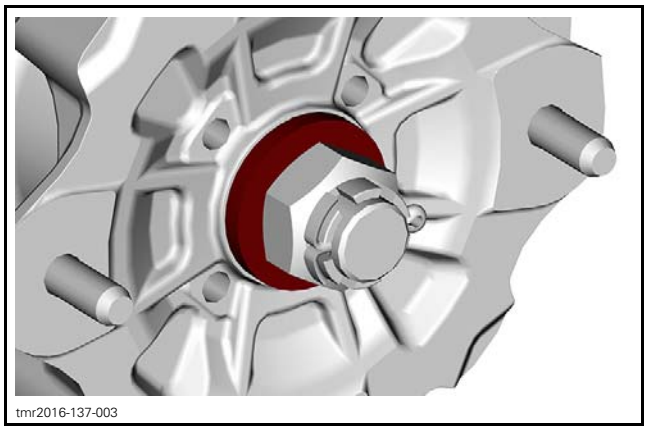
The installation is the reverse of removal procedure. However, pay attention to the following.

Apply service products and tighten fasteners as per exploded view.

Install Belleville washer with its domed side outwards.

NOTE: Tighten the castellated nut further if required to be able to install the cotter pin.

Install a new cotter pin.


tmr2016-137-003

DRIVE SHAFT

Removing the Rear Drive Shaft

1. Remove the wheel hub. Refer to procedure in this subsection.
2. Remove the knuckle. Refer to *STEERING SYSTEM* subsection.
3. Pry drive shaft out of final drive unit.
4. Discard the stop ring at the end of the shaft.

Inspecting the Rear Drive Shaft

Inspect the condition of boots. If there is any damage or evidence of leaking lubricant, replace them. Refer to *DRIVE SHAFT BOOT*.

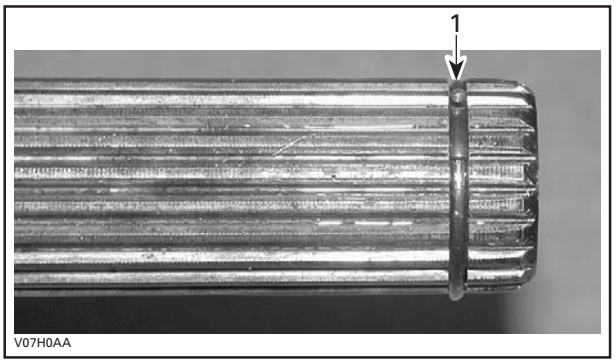
Check splines for excessive wear. Replace if necessary.

NOTE: If the splines on plunging joint are worn, a check of differential inner splines should be done.

Installing the Rear Drive Shaft

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install a new stop ring.



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1. Stop ring

Apply service products and tighten fasteners as per exploded view.

DRIVE SHAFT BOOT

Removing the Drive Shaft Boot

1. Remove the drive shaft from the vehicle.
2. Remove drive shaft boot clamps.

REQUIRED TOOL	
CV BOOT CLAMP PLIER (P/N 529 036 120)	

3. Dislodge the large boot end.
4. Separate the joint from the shaft. Two procedures can be done.

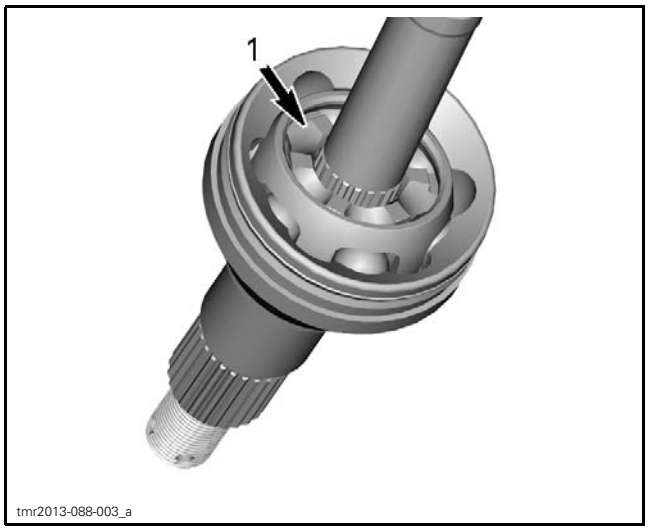
Without the Special Tool

1. Clamp joint housing in a vise.
2. Align shaft with joint.
3. Pull hard on shaft to remove from joint.
4. Remove boot from drive shaft.
5. Remove and discard the circlip.

With the Special Tool

REQUIRED TOOL	
CV JOINT EXTRACTOR (P/N 529 036 005)	

1. Place drive shaft in vice with the joint downward.
2. Install the cv joint extractor on the bearing.



TYPICAL - CV JOINT SHOWN
1. Position joint extractor tool here

3. With a hammer, hit on the tool to separate joint from shaft.
4. When joint and shaft are separated, remove boot from drive shaft.
5. Remove and discard the circlip.

Installing the Drive Shaft Boot

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install the new circlip.

Pack bearing area with grease included with the new boot kit.

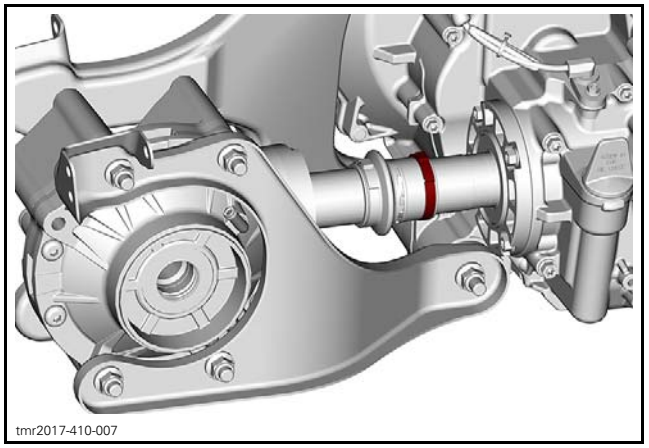
NOTE: Do not use or add other grease.

FINAL DRIVE UNIT

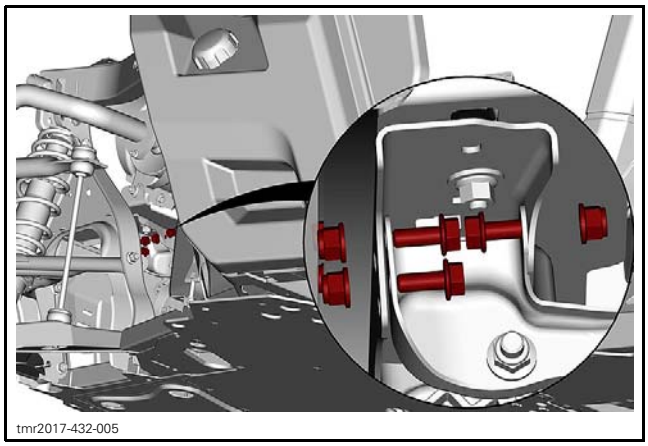
NOTE: In the following illustrations, some parts have been hidden for clarity.

Removing the Final Drive Unit (Engine in Vehicle)

1. Drain the final drive unit oil. Refer to *MAINTENANCE PROCEDURES*.
2. Remove both drive shafts. Refer to procedure in this subsection.
3. Disconnect the vent hose.
4. Cut the Oetiker clamp located near the engine.



5. Remove the bolts securing the RH support the rear engine support.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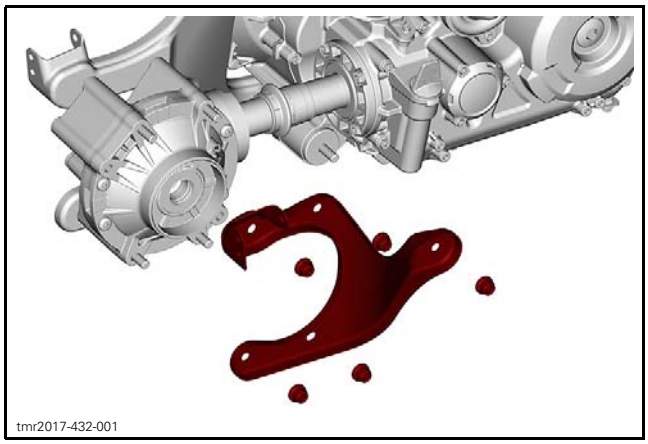
6. Remove the RH side support but leave the screws in place.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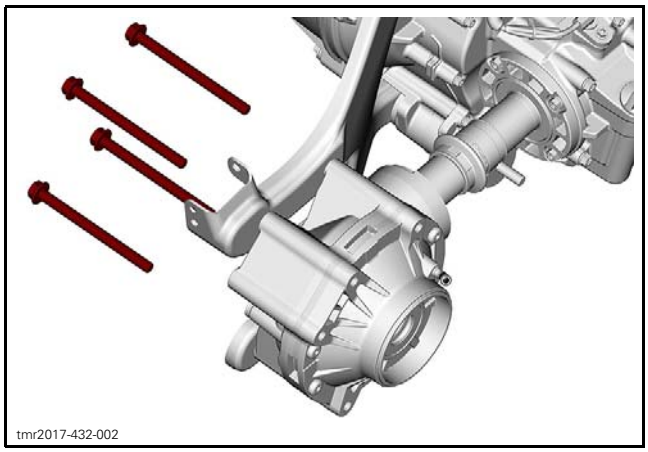
7. Support the final drive unit and remove the four screws on the LH side.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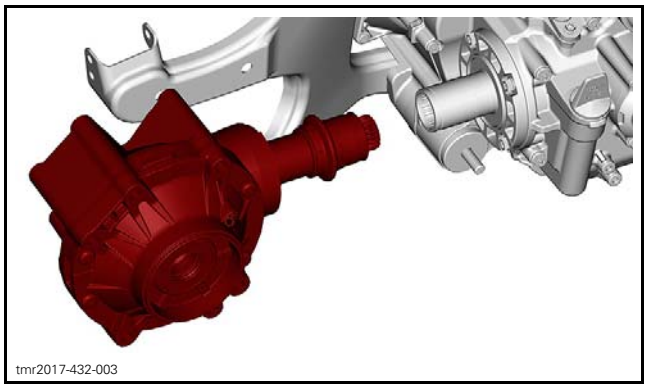
8. Pull the final drive unit off the engine.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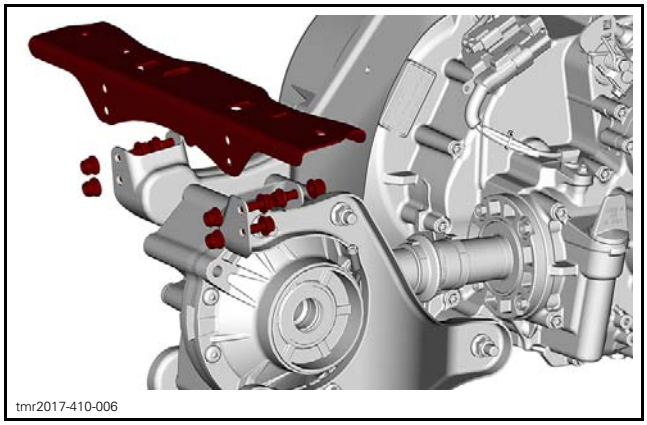
Removing the Final Drive Unit (Engine Out of the Vehicle)

1. Drain the final drive unit oil. Refer to *MAINTENANCE PROCEDURES*.
2. Remove the exhaust system. Refer to the *EXHAUST SYSTEM* subsection.
3. Remove the rear engine support.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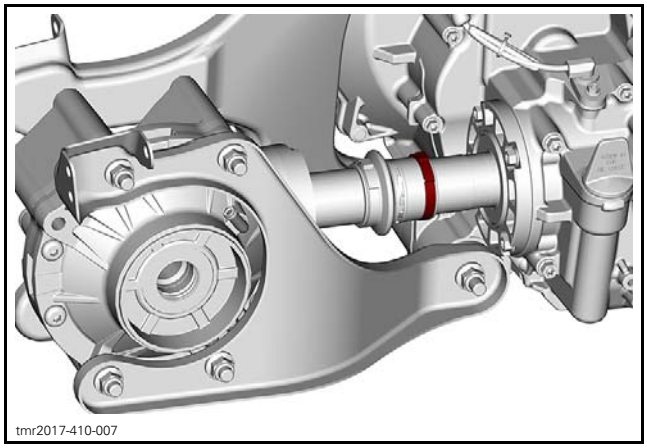
4. Cut the Oetiker clamp located near the engine.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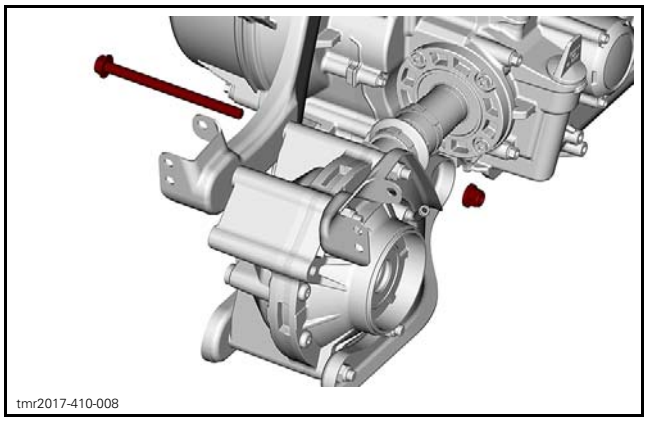
5. Remove the final drive unit supports front bolt.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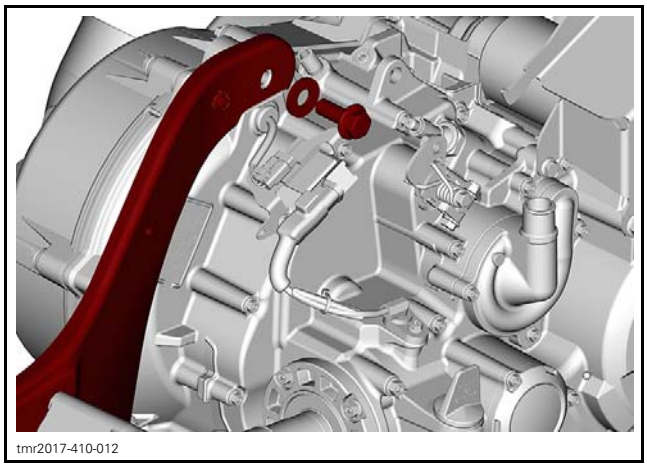
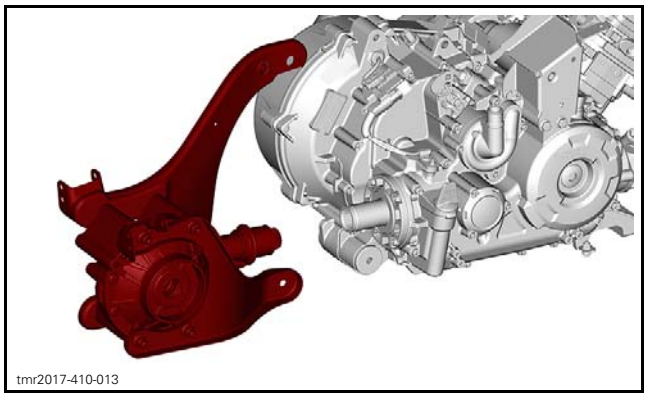
6. Remove the LH final drive unit support upper screw.


tmr2017-410-012

7. Pull the final drive unit, along with the supports, off the engine.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8. Remove the LH and RH supports from the final drive unit.

Inspecting the Final Drive (Assembled)

Manually turn final drive gear; it should turn smoothly. Repair if necessary.

Check if oil seals are brittle, hard or damaged. Replace if necessary.

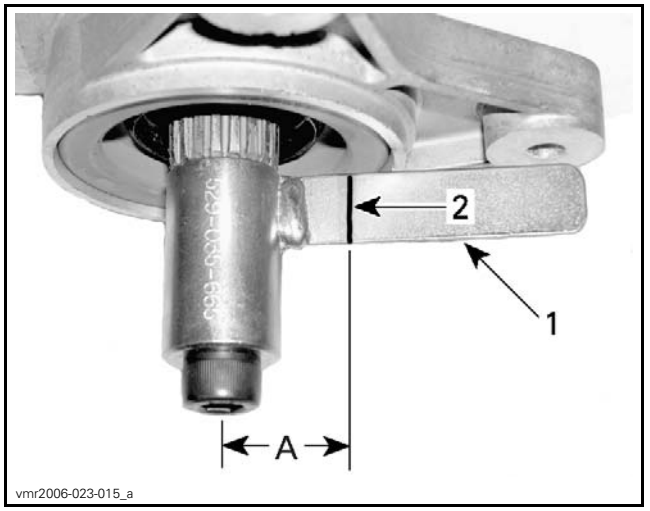
Measuring the Backlash

Remove the coupling sleeve from the pinion shaft. Refer to *COUPLING SLEEVES* in this subsection.

Using a dial indicator and the BACKLASH MEASUREMENT TOOL (P/N 529 035 665), measure the backlash.

Place the backlash measurement tool at the end of pinion shaft.

From center of tool bolt, measure 25.4 mm (1 in) and scribe a mark on the tab.



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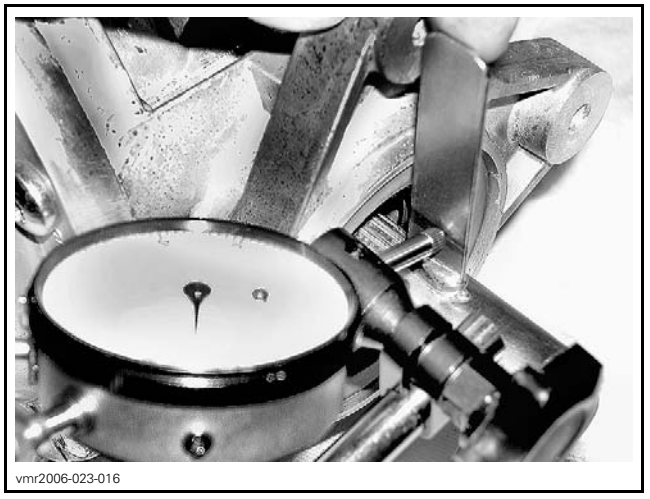
1. Tab of backlash measurement tool
2. Mark on tab
A. 25.4 mm (1 in)

Position the dial indicator tip against the tab at a 90° angle and right on the previously scribed mark.

Gently, move the tool tab back and forth. Note the backlash result.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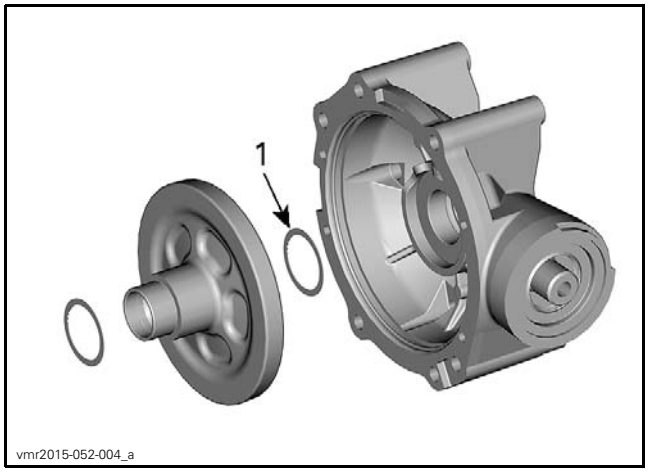
Rotate pinion gear 1/2 turn and recheck backlash. Note the result.

Rotate pinion gear 1 turn and recheck backlash.

BACKLASH SPECIFICATION
0.1 mm (.004 in) to 0.35 mm (.014 in)

If backlash is out of specification, split final drive housing and adjust shim thickness as per following guideline.

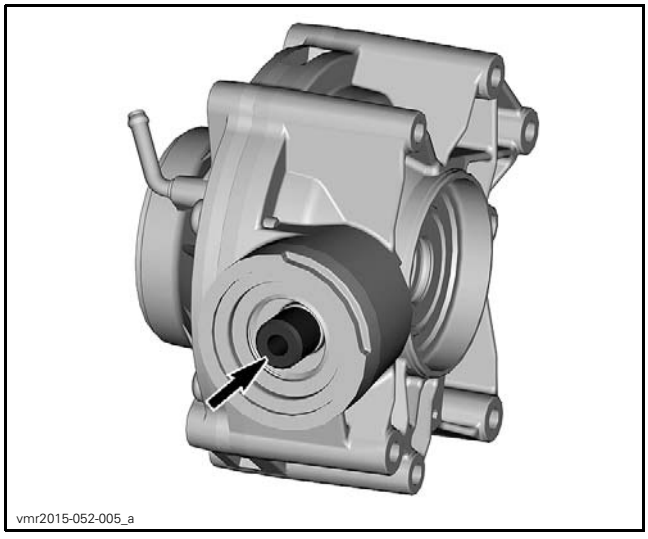
BACKLASH ADJUSTMENT GUIDELINE	
BACKLASH MEASUREMENT	WHAT TO DO
Below 0.1 mm (.004 in)	Add shim(s) and recheck backlash
Above 0.35 mm (.014 in)	Remove shim(s) and recheck backlash



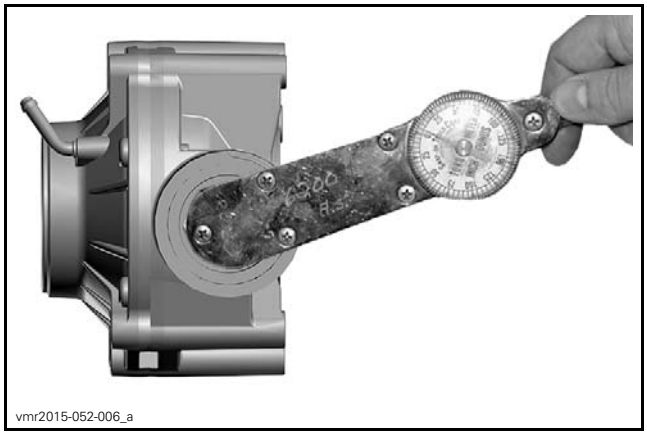
1. Backlash shim

Measuring the Preload Inspection

Screw the propeller shaft screw in pinion gear.



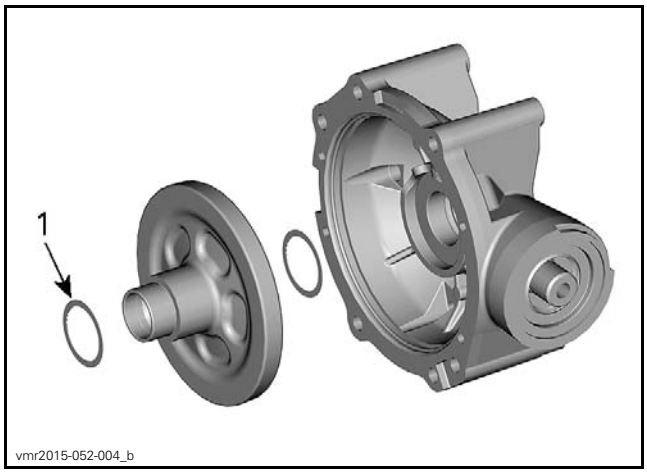
Using a needle torque wrench, measure the preload.



PRELOAD SPECIFICATION
0.06 N•m (.5 lbf•**in**) to 0.50 N•m (4 lbf•**in**)

If preload is out of specification, split final drive housing and adjust shim thickness as per following guideline.

PRELOAD GUIDELINE	
PRELOAD MEASUREMENT	WHAT TO DO
Below 0.06 N•m (.5 lbf•**in**)	Add shim(s) and recheck preload
Above 0.50 N•m (4 lbf•**in**)	Remove shim(s) and recheck preload



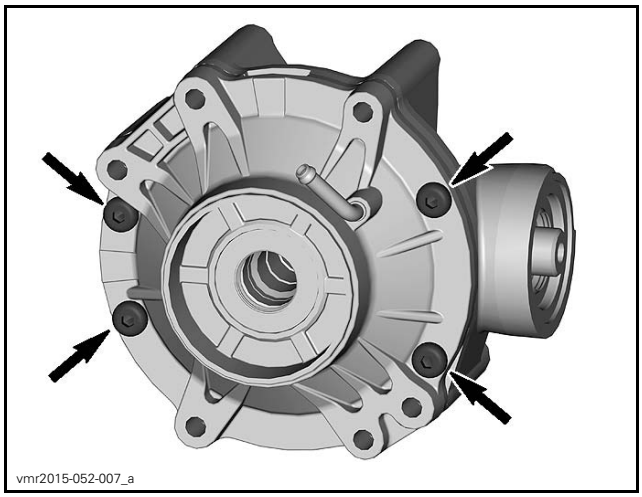
1. Preload shim

Disassembling the Final Drive

Ring Gear

Remove the coupling sleeve from the pinion shaft.

Remove the final drive housing screws.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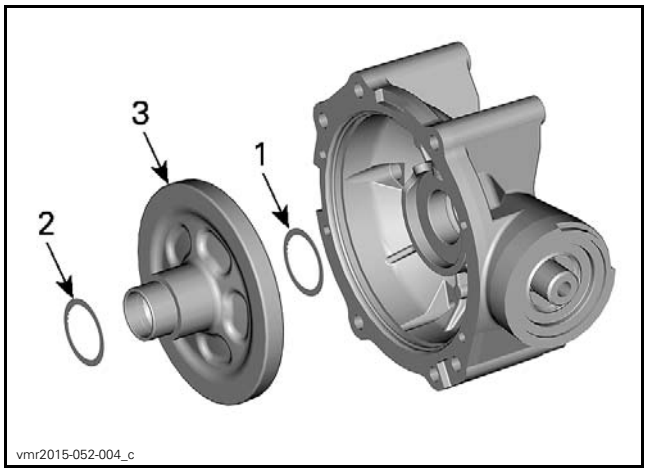
Split final drive housings.

NOTE: Be careful to keep track of shims on ring gear.



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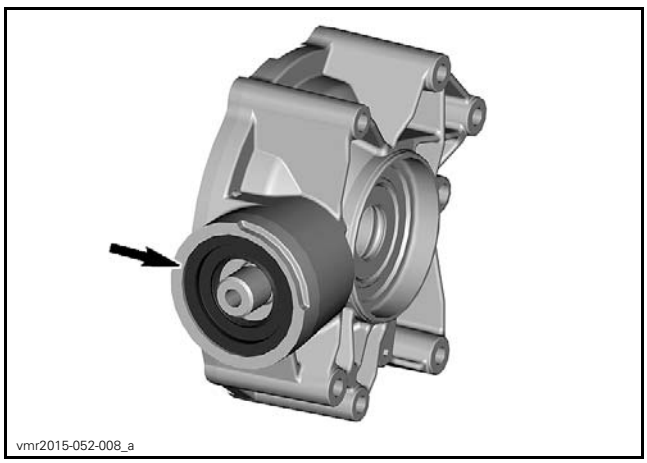
1. *Backlash shim*
2. *Preload shim*
3. *Ring gear*

Extract ring gear out of half housing.

Pinion Gear

Remove and discard oil seal.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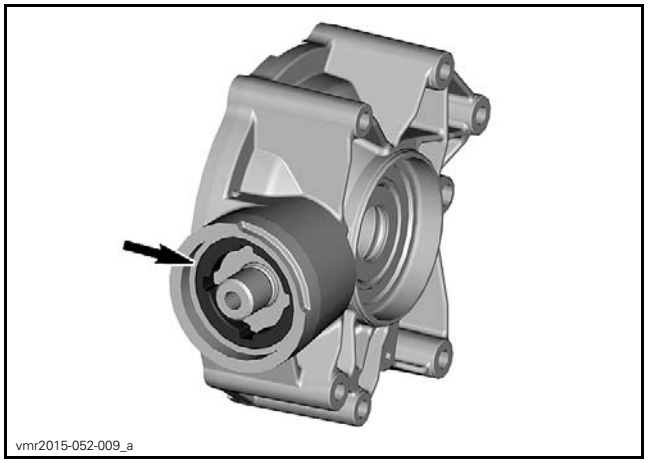
Unscrew the pinion nut. Use the SPANNER SOCKET (P/N 529 035 649).

529035649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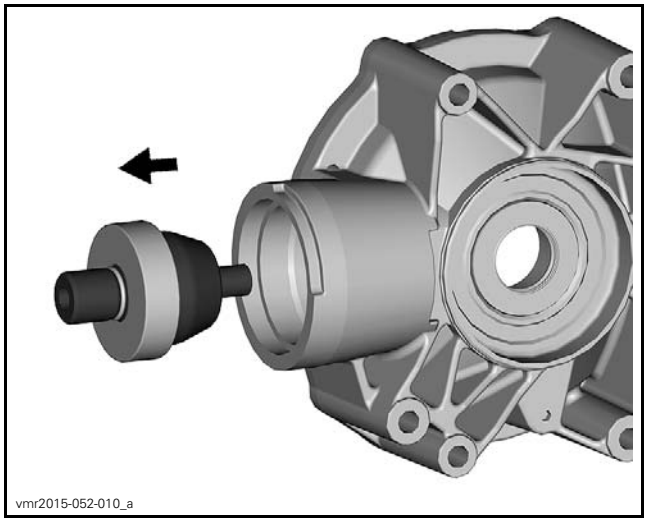
NOTE: The pinion nut is left hand threaded. Unscrew by turning clockwise.

Remove the bearing along with the pinion gear. Be careful to keep track of shims. Discard bearing.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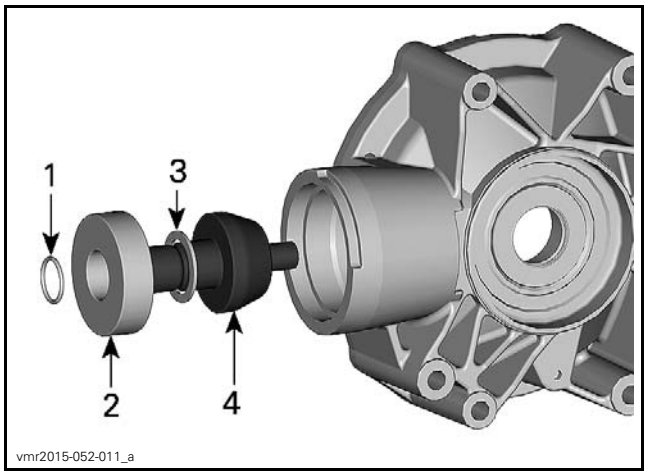
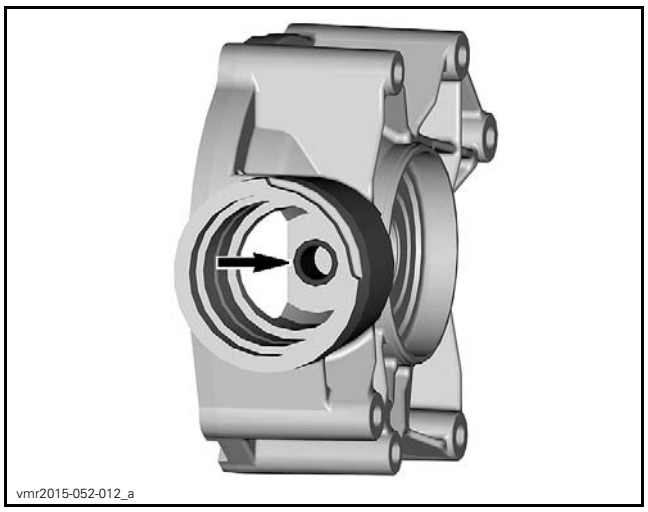


1. O-ring
2. Ball bearing
3. Pinion gear shim
4. Pinion gear

The pinion gear and bearing can be easily removed using the following suggested tool:

PART	QTY
Pipe: 83 mm (3-1/4 in) diameter x 127 mm (5 in)	1
Threaded rod: M10 x 1.25 x 178 mm (7 in)	1
M10 x 1.25 nut	3
Flat bar	1

Remove and discard the needle bearing.



Installing the Final Drive Unit

The installation is the reverse of removal procedure, however, pay attention to the following.

Apply service products and tighten fasteners as per exploded view.

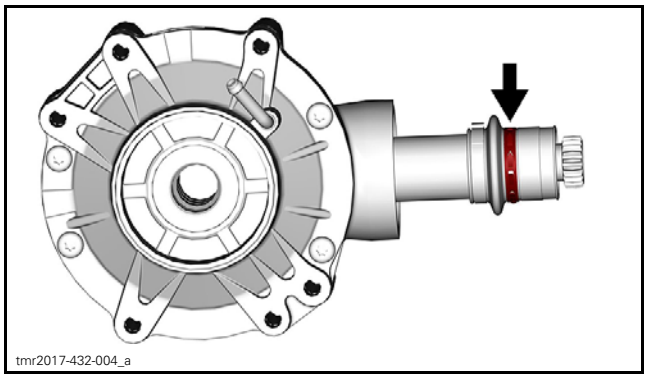
NOTE: If the engine was removed, tighten the final drive unit bolts first.

Fill the final drive unit with recommended oil. Refer to *MAINTENANCE PROCEDURES*.

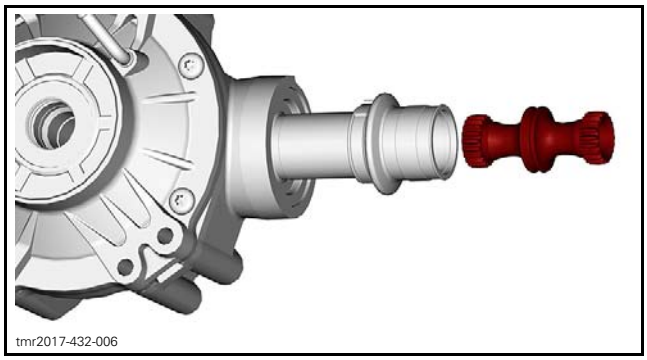
PROPELLER SHAFT

Removing the Propeller Shaft

1. Remove the final drive unit. Refer to procedure in this subsection.
2. Cut the Oetiker clamp located in the center of the boot.



3. Pull the propeller shaft off the final drive unit.



Inspecting the Propeller Shaft

Inspect the boot. If there is any damage, replace it.

Check splines for excessive wear. Replace if the propeller shaft if damaged.

Installing the Propeller Shaft

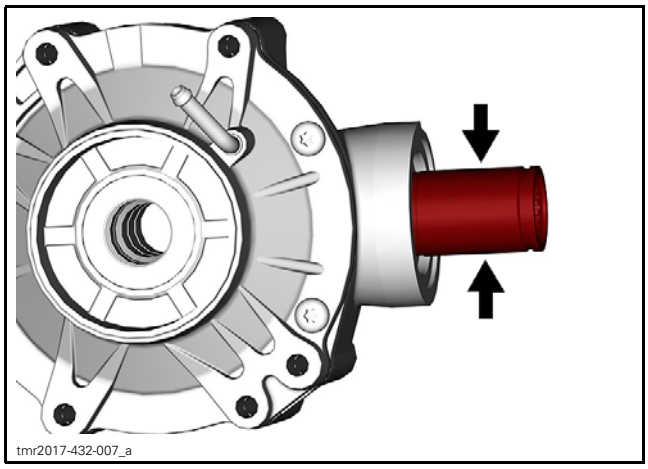
The installation is the reverse of removal procedure, however, pay attention to the following.

Apply service products and tighten fasteners as per exploded view.

COUPLING SLEEVES

Removing the Final Drive Unit Coupling Sleeve

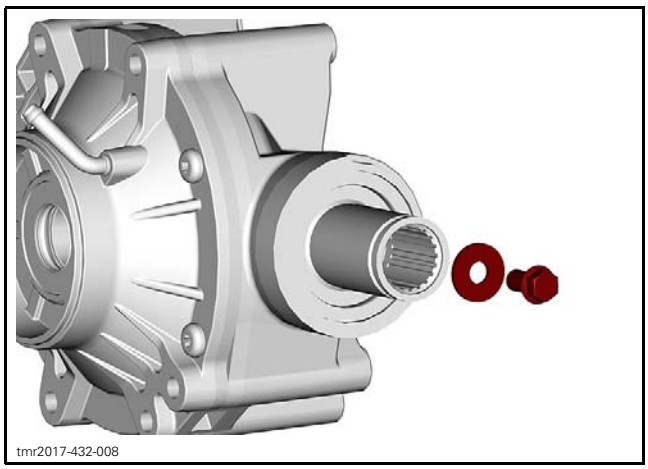
1. Remove the propeller shaft, refer to procedure in this subsection.
2. Cut the remaining Oetiker clamp, then remove the propeller shaft boot.
3. Hold the coupling sleeve in a vice.



HOLD HERE

NOTICE **Be careful not to damage the coupling sleeve.**

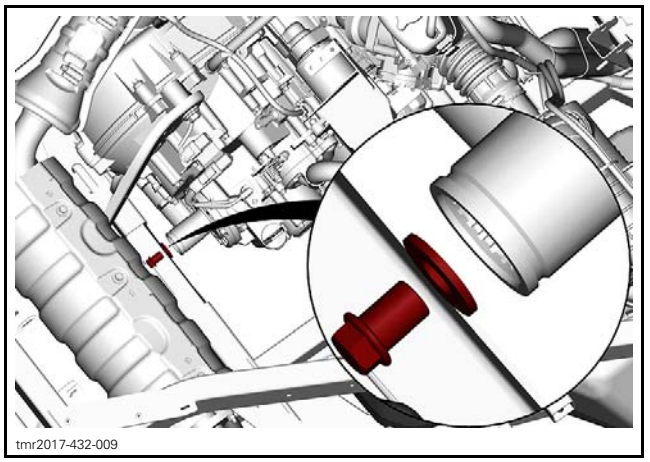
4. While supporting the final drive unit, remove the screw and washer retaining the coupling sleeve to the pinion shaft.



5. Separate the final drive unit and the coupling sleeve.

Removing the Engine Coupling Sleeve

1. Remove the final drive unit. Refer to procedure in this subsection.
2. Place the gearbox in PARK.
3. Remove the screw and washer retaining the coupling sleeve to the output shaft.



4. Remove the coupling sleeve.

Installing the Coupling Sleeve

The installation is the reverse of removal procedure, however, pay attention to the following.

Apply service products and tighten fasteners as per exploded view.

WHEELS AND TIRES

PROCEDURES

TIRES

⚠ WARNING

Do not rotate tires. The front and rear tires have a different size. Respect direction of rotation when applicable.

Tire Pressure

⚠ WARNING

Tire pressure greatly affects vehicle handling and stability. Insufficient pressure may cause tire to deflate and rotate on wheel. Excessive pressure may burst the tire. Always follow recommended pressure.

Check pressure when tires are **cold** before using the vehicle. Tire pressure changes with temperature and altitude. Recheck pressure if one of these conditions has changed.

Refer to technical specifications for tire pressure table.

Tire Inspection

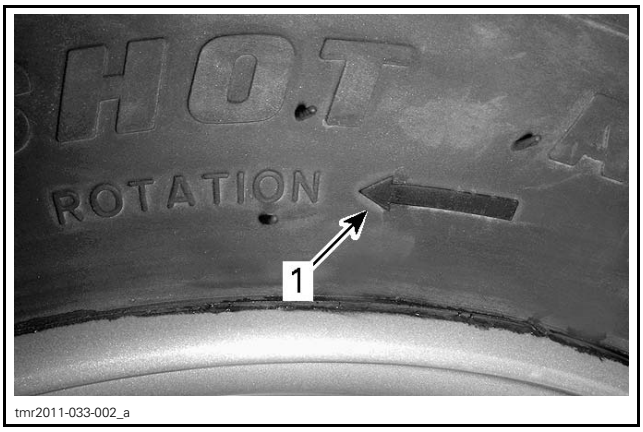
Check tire for presence of slits, bulges, wear or other damage. Replace if necessary.

Tire Replacement

Use an automotive tire changer to replace tires.

⚠ WARNING

- Replace tires only with the same type and size as original tires.
- For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.



TYPICAL
1. Direction of rotation

WHEELS

Removing the Wheel

Loosen nuts just enough to be able to unscrew them once the vehicle will be off the ground.

Lift and support the vehicle. Refer to *INTRODUCTION* subsection.

Remove nuts, then remove wheel.

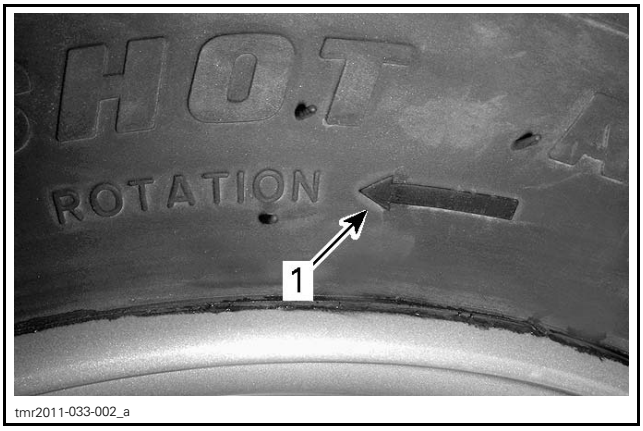
Inspecting the Wheel

Inspect wheel for wear or damage especially at the mounting holes.

Installing the Wheel

Check wheel studs and wheel nuts thread condition.

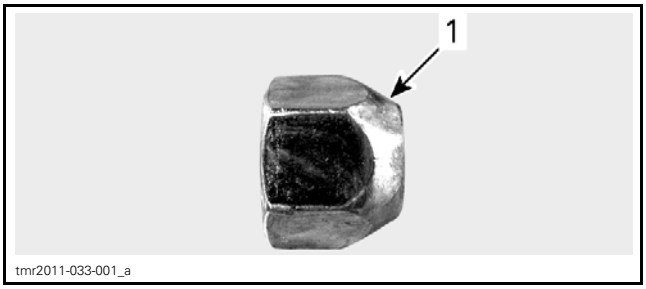
Check if tires are unidirectional.



TYPICAL
1. Direction of rotation

Install in the right direction of rotation.

Install lug nuts with the taper towards the wheel.



TYPICAL
1. Taper (towards the wheel)

Tighten wheel lug nuts to the specified torque using the illustrated sequence.

TIGHTENING TORQUE	
Wheel lug nuts	100 N•m ± 10 N•m (74 lbf•ft ± 7 lbf•ft)

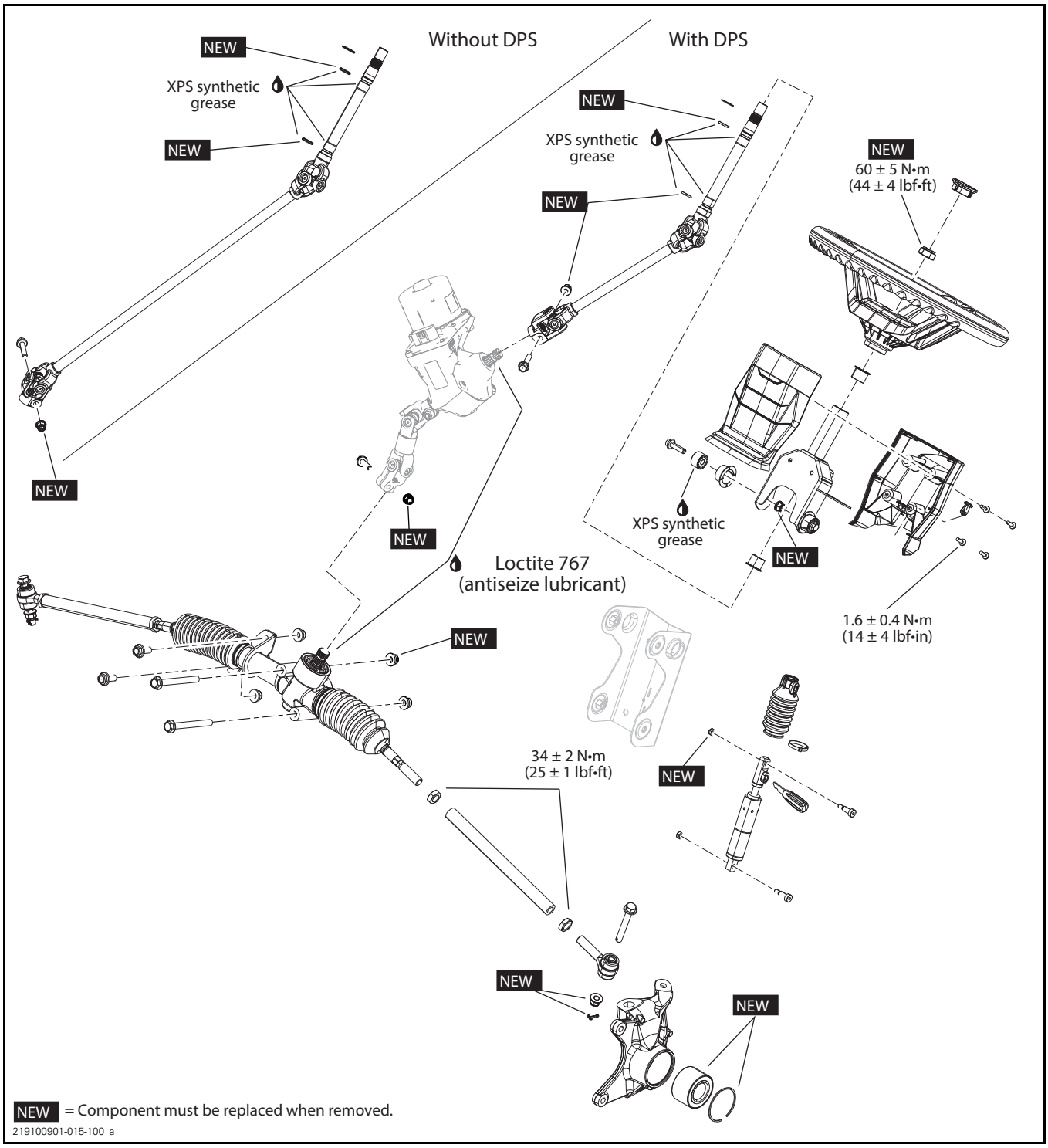
TIGHTENING SEQUENCE

NOTICE Always use the recommended wheel nuts for the type of wheel. Using a different nut could cause damages to the rim or studs.

STEERING SYSTEM

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 767 (ANTISEIZE LUBRICANT)	293 800 070	6
SYNTHETIC GREASE (EUR)	779231	6
SYNTHETIC GREASE	779162	6


Without DPS
With DPS
NEW
XPS synthetic grease
NEW
NEW
XPS synthetic grease
NEW
NEW
60 ± 5 N•m
(44 ± 4 lbf•ft)
NEW
NEW
XPS synthetic grease
NEW
Loctite 767
(antiseize lubricant)
1.6 ± 0.4 N•m
(14 ± 4 lbf•in)
NEW
34 ± 2 N•m
(25 ± 1 lbf•ft)
NEW
NEW
NEW
NEW = Component must be replaced when removed.
219100901-015-100_a

GENERAL

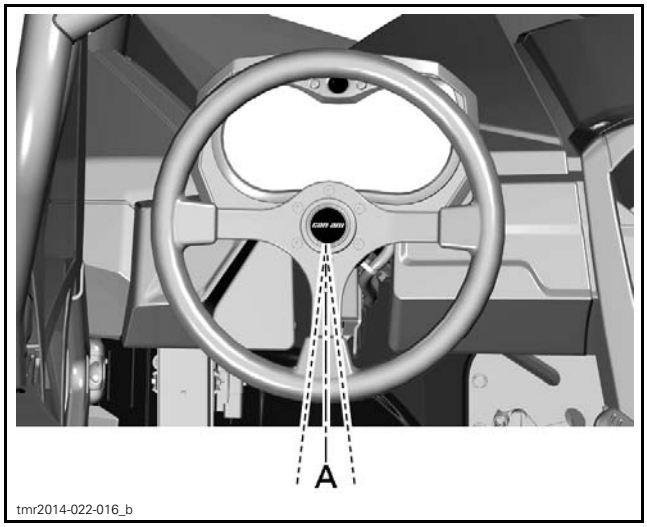
NOTICE Never perform arc welding in the DPS area. Otherwise, poor DPS operation might occur.

The procedures described below are the same for the RH and LH sides, unless otherwise instructed.

ADJUSTMENT

ALIGNING THE WHEELS

1. Place vehicle on a level surface.
2. Inflate tires to recommended pressure.
3. Find rack and pinion center to center as follows:
   - 3.1 Calculate the total steering wheel rotations from side to side.
   - 3.2 Position the steering wheel at **half** the total rotations.
4. Check steering wheel position:
   - 4.1 If steering wheel is centered (within ± 5°), go to **step 6**.
   - 4.2 If steering wheel is offset more than 5°, go to **step 5**.

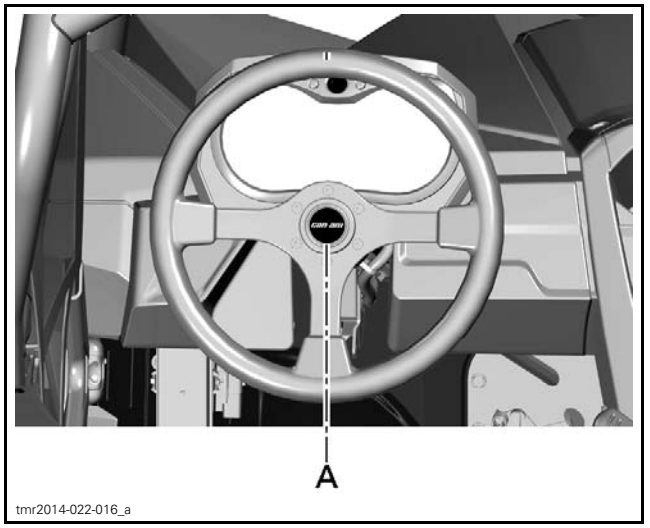


TYPICAL
A. Steering wheel angle ± 5°

5. Reposition steering wheel on steering shaft as follows:

   NOTICE Make sure rack and pinion does not move during steering wheel repositioning.

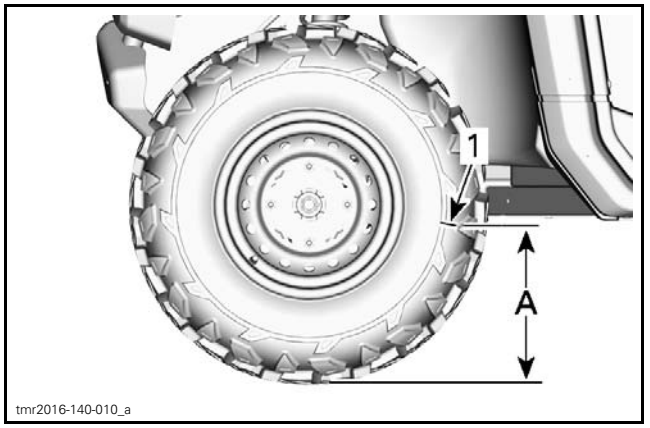
   - 5.1 Remove steering wheel. Refer to *REMOVING THE STEERING COLUMN*.
   - 5.2 Reinstall steering wheel to the closest centered position (nearest spline).
6. Center steering wheel.



TYPICAL
A. Steering wheel centered

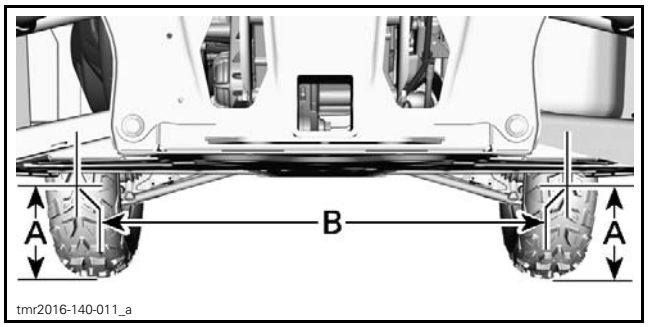
7. Place one mark on each front tire with a chalk at height of the center of the wheel. The mark must be under the frame, from a side point of view.

NOTE: The marks must be at the exact same height on each front tire.



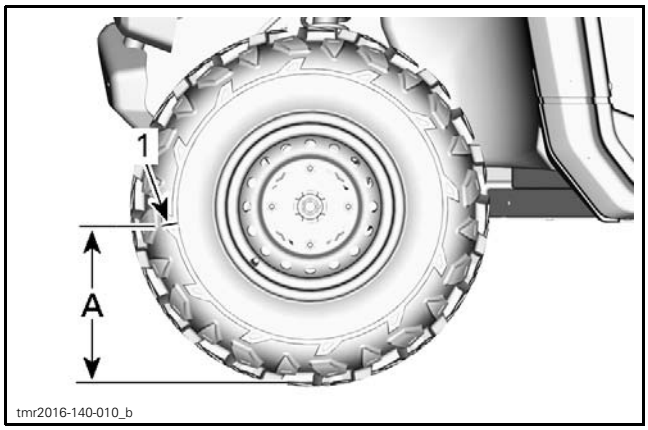
FRONT LH VIEW
1. Mark tire
A. Distance from ground to mark

8. Measure and note the distance between the center of the wheels, level with the marks on the tires.



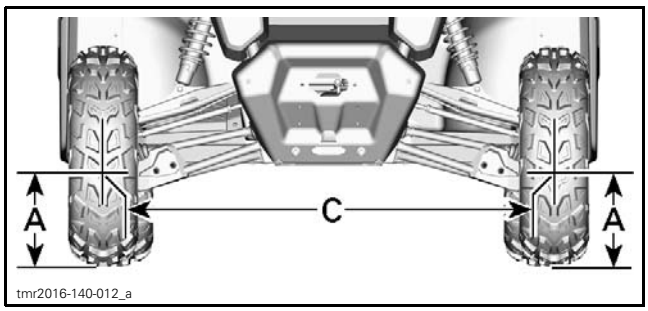
REAR VIEW
A. Height of mark
B. Measure distance

9. Move vehicle so that the marks are positioned towards front at the same height.



FRONT LH VIEW AFTER ROTATION
A. Height of mark

10. Measure and note the distance between the same two marks as step 8.



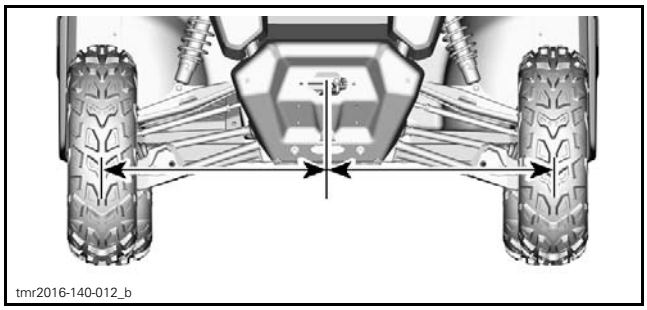
FRONT VIEW
A. Height of mark
C. Measure distance

11. The difference between the front and the rear measurements must be as per the following specification:

MAXIMUM TOE
0 mm ± 4.8 mm (0 in ± .19 in)

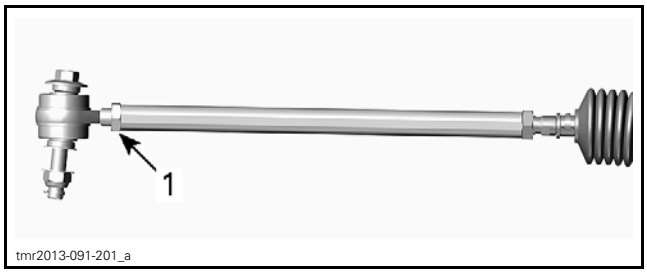
Adjusting the Front Toe

1. If the front wheel toe measurement is out of specification lock steering wheel at center.
2. Measure the distance between vehicle center and each wheel.



DISTANCE BETWEEN VEHICLE CENTER AND WHEEL

3. Loosen tie-rod end locking nut.



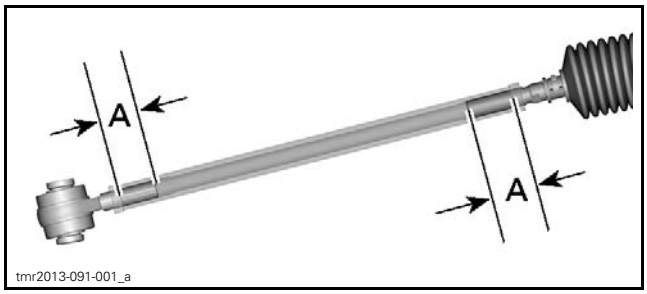
FRONT TIE ROD ASSEMBLY
1. Tie rod end locking nut

4. Turn tie-rod adjustment sleeve until distance measured in step 2 is equal for each wheel.

NOTE: Adjustment sleeve and inner tie rod will turn together.

⚠ WARNING

The minimum inner tie-rod and tie rod end engagement in adjustment sleeve must be 25 mm (1 in).



FRONT TIE ROD ASSEMBLY
A. Minimum engagement length

5. Tighten tie-rod adjustment sleeve locking nuts to specification.

TIGHTENING TORQUE	
Tie rod end locking nut	34 N•m ± 2 N•m (25 lbf•ft ± 1 lbf•ft)

6. Recheck that vehicle toe is within limits by repeating procedure.

TROUBLESHOOTING

UNEQUAL TURNING RADIUS

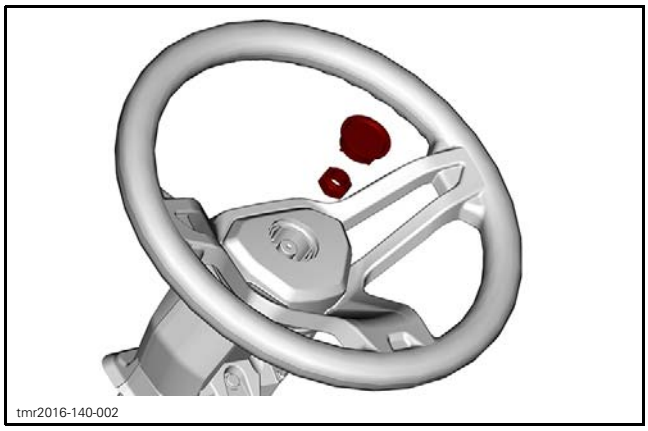
1. **Rack and pinion not centered during steering system parts installation.**
   - *Refer to ALIGNING THE WHEELS in this subsection.*

PROCEDURES

STEERING WHEEL

Removing the Steering Wheel

1. Remove steering wheel center cap and nut.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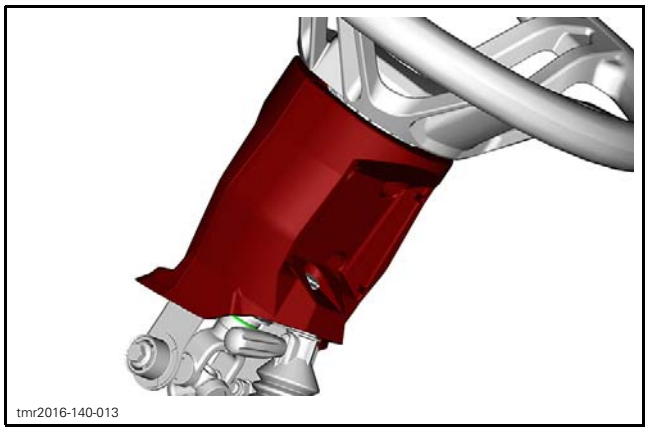
2. Remove the cover.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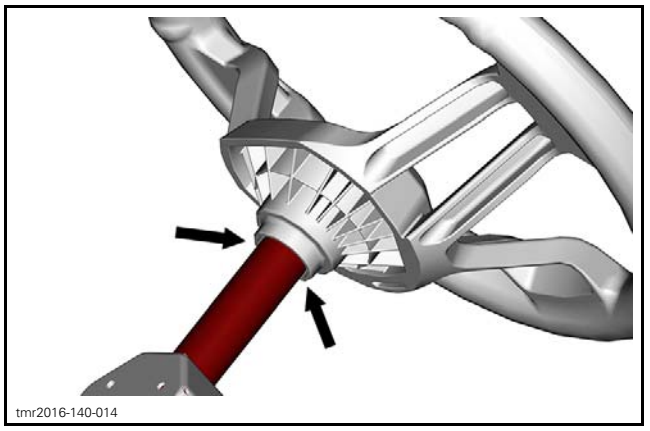
3. Use a suitable wheel extractor that sits on the steering wheel shoulder, around the pivot tube, to remove the steering wheel.


tmr2016-140-014

Installing the Steering Wheel

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install a new nut and tighten to specification.

TIGHTENING TORQUE	
Steering wheel nut	60 N•m ± 5 N•m (44 lbf•ft ± 4 lbf•ft)

STEERING COLUMN

Removing the Steering Column

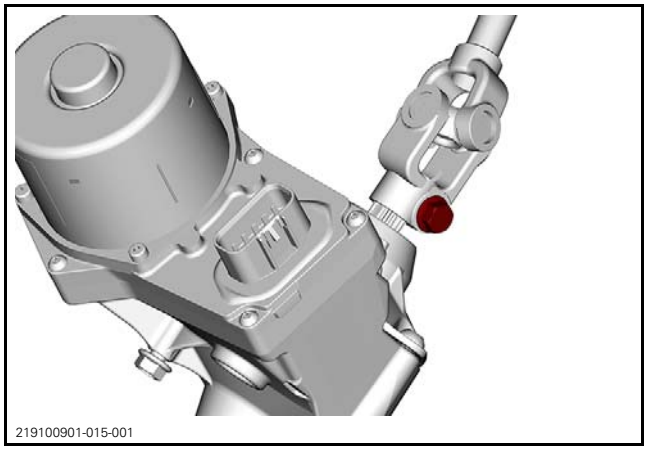
1. Position the front wheels parallel to the rear wheels.

Models without DPS

2. Remove both front wheels.

All Models

3. Remove the LH and RH lower dash boards. Refer to *BODY* subsection.
4. Remove bolt and nut securing lower U-joint to:
   – DPS unit input shaft, if equipped
   – Rack and pinion shaft (no DPS).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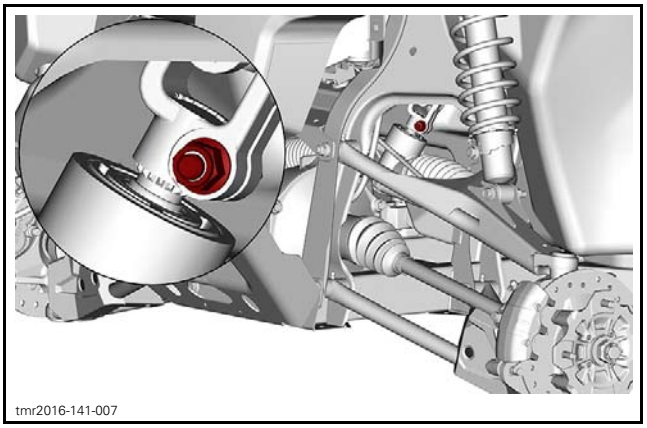
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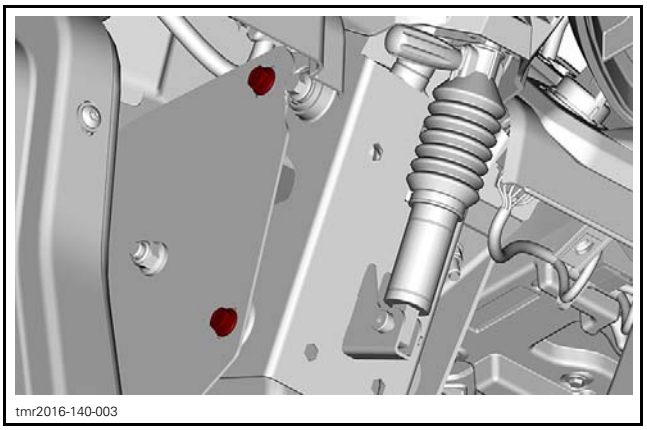
5. Remove screws on each side of the steering support.


tmr2016-140-003

6. Remove steering column from vehicle.
7. Remove steering support and cover if required.

Inspecting the Steering Column

Check steering column for wear, cracks or bending.

Check steering shaft for wear, cracks or bending.

Ensure universal joints are not worn and move freely.

Ensure steering shaft O-rings are not worn, brittle, hard or otherwise damaged.

Replace if necessary.

Installing the Steering Column

The installation is the reverse of the removal procedure. However, pay attention to the following.

Prior to installing the steering column, position front wheels parallel with longitudinal axis of the vehicle.

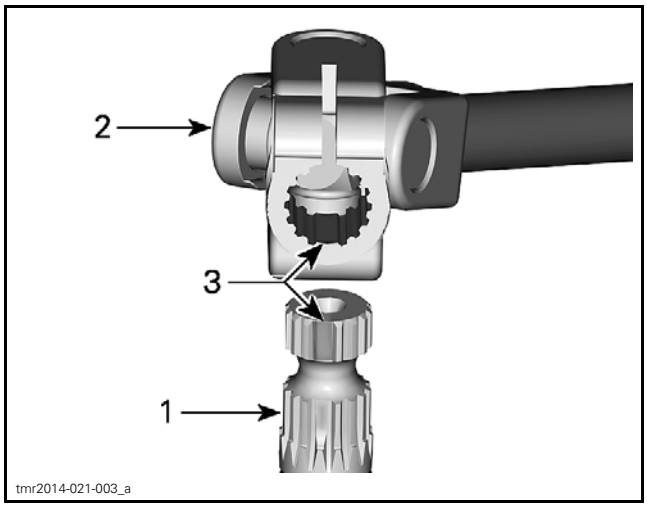
Refer to exploded view for proper grease and antiseize application.

COUNTRY	GREASE REQUIRED
Scandinavia	SYNTHETIC GREASE (EUR) (P/N 779231)
All other countries	SYNTHETIC GREASE (P/N 779162)

SERVICE PRODUCT REQUIRED
LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070)

Model with DPS

NOTE: Make sure to match blind spline between the DPS input shaft and the steering column lower U-joint.



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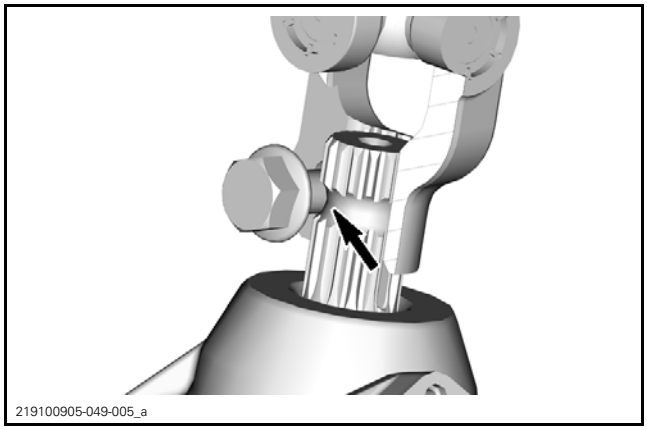
1. DPS input shaft
2. Lower steering column U-joint
3. Blind splines (alignment keys)

All Models

IMPORTANT: Make sure to engage bolt in the input shaft groove.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YOKE CROSSCUT - INPUT SHAFT GROOVE

NOTE: Tightening torque must be applied on the nut only.

TIGHTENING TORQUE	
Steering shaft yoke nut	40 N•m ± 5 N•m (30 lbf•ft ± 4 lbf•ft)

Check front wheel alignment. Refer to *ALIGNING THE WHEELS* in this subsection.

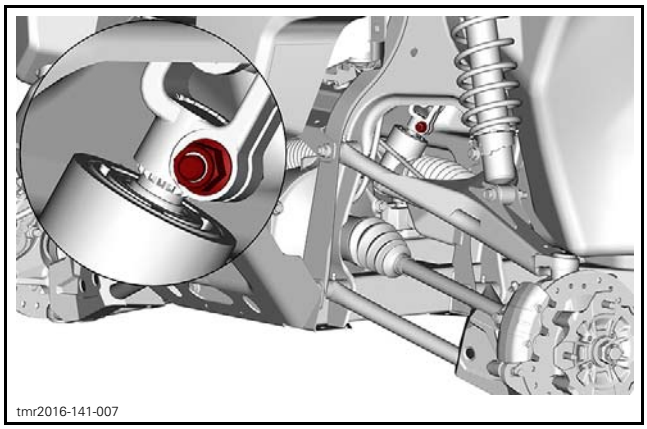
RACK AND PINION

Servicing the Rack and Pinion

The rack and pinion cannot be serviced except for replacement of the boots and tie rods.

Removing the Rack and Pinion

1. Remove both front wheels.
2. Detach tie-rod ends from knuckles. Refer to *REPLACING THE TIE ROD END* in this subsection.
3. Remove the lower yoke pinch bolt and nut.


tmr2016-141-007

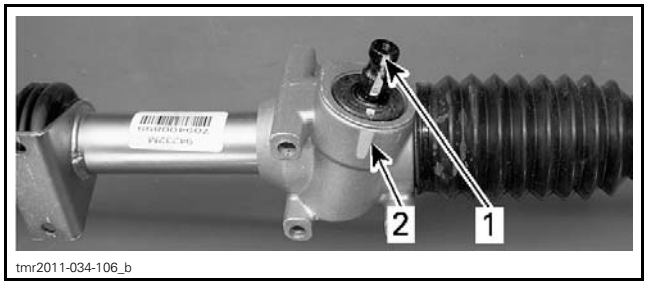
4. Remove the bolts and nuts securing rack and pinion to frame.
5. Disengage the rack and pinion shaft from the lower yoke.
6. From the LH side, remove rack and pinion from vehicle.

Installing the Rack and Pinion

The installation is the reverse of the removal procedure. However, pay attention to the following.

Find rack and pinion center as follows:

– Calculate the total pinion shaft rotations from side to side
– Position the pinion shaft at **half** the total rotations
– Using a paint marker, make an alignment mark on pinion and on the rack housing.



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1. Alignment mark on pinion
2. Alignment mark on rack housing

Ensure steering wheel is centered (horizontal).

Apply antiseize on pinion shaft.

Position rack and pinion in frame and engage pinion in lower yoke. Make sure steering wheel remains centered.

Install rack and pinion retaining bolts and nuts.

Install lower yoke pinch bolt and nut.

Check steering alignment. Refer to *ALIGNING THE WHEELS* in this subsection.

TIE ROD ADJUSTMENT SLEEVE

Always perform a thorough inspection before replacing a tie rod adjustment sleeve. If any other components of the steering or suspension systems are damaged, replace the component(s).

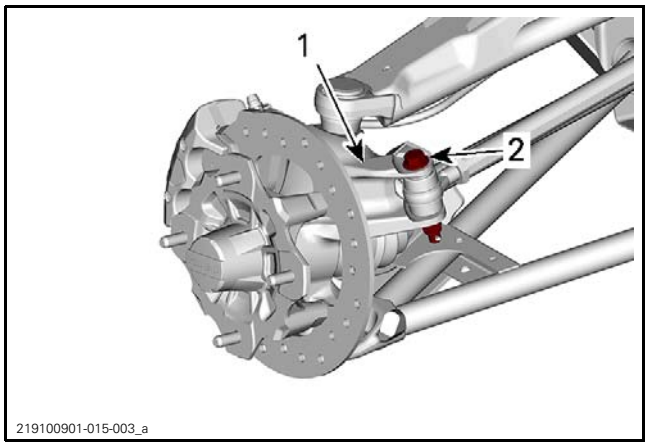
Inspecting the Steering components

Before removing any components:

1. Raise front wheels off the ground.
2. Turn steering wheel from stop to stop.
3. Ensure steering wheel turns smoothly.

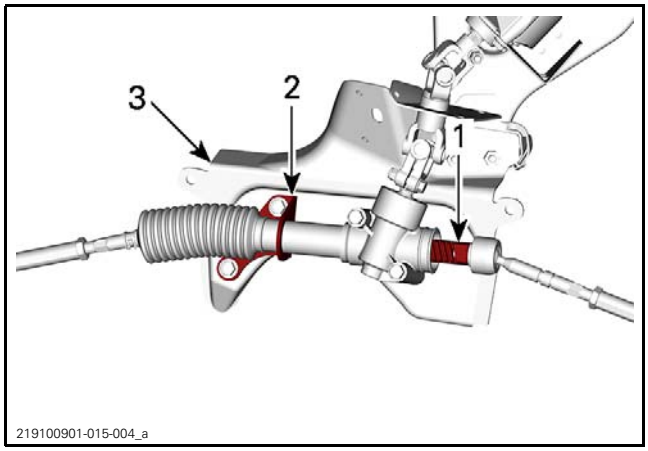
Before replacing the tie rod adjustment sleeve, inspect the following:

– Knuckle must not be cracked
– Tie rod end bolt must not be bent



TYPICAL
1. *Knuckle*
2. *Tie rod end bolt*

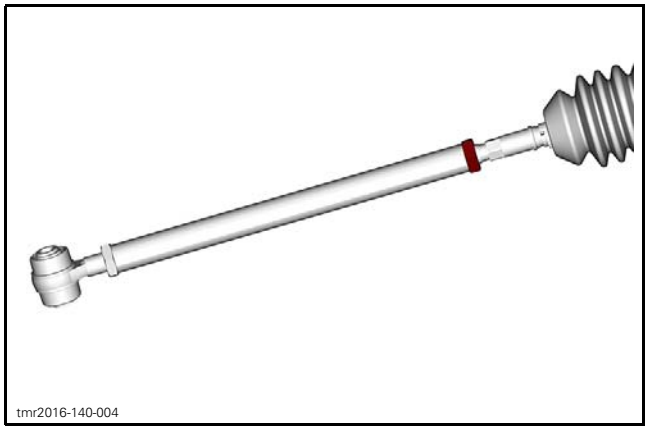
– Rack and pinion shaft must not be loose
– Rack and pinion mounting bracket must not be cracked or deformed
– Rack and pinion steering support must not be cracked or deformed



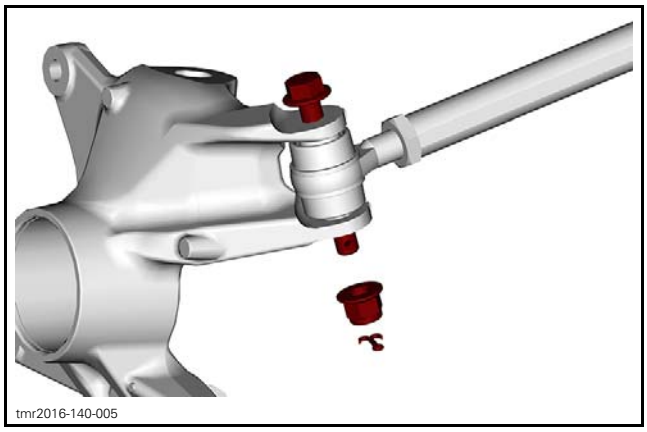
TYPICAL
1. *Rack and pinion shaft*
2. *Rack and pinion mounting bracket*
3. *Rack and pinion steering support*

Removing the Tie Rod

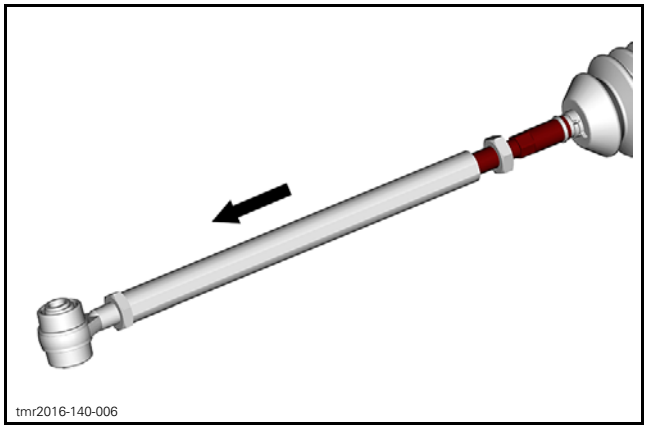
1. Loosen inner tie rod adjustment sleeve locking nut.



2. Remove tie rod end bolt.



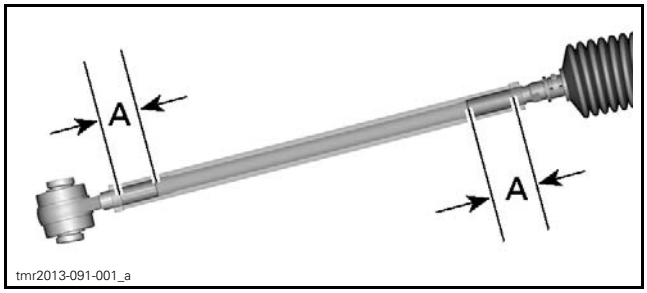
3. Hold inner tie rod and unscrew tie rod adjustment sleeve.



Installing the Tie Rod

The installation is the reverse of the removal procedure. However, pay attention to the following.

Adjust inner and outer tie rods to the nominal engagement length.



A. Tie rod engagement length

NOMINAL TIE ROD ENGAGEMENT LENGTH A
32 mm (1-1/4 in)

⚠ WARNING

The minimum tie-rod engagement length at both ends must be 25 mm (1 in).

1. Lock inner locking nut.

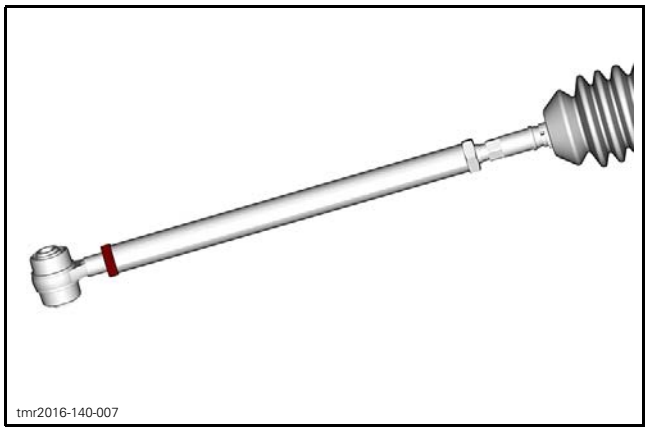
TIGHTENING TORQUE	
Tie rod locking nut	34 N•m ± 2 N•m (25 lbf•ft ± 1 lbf•ft)

Align vehicle. Refer to *ALIGNING THE WHEELS* in this subsection.

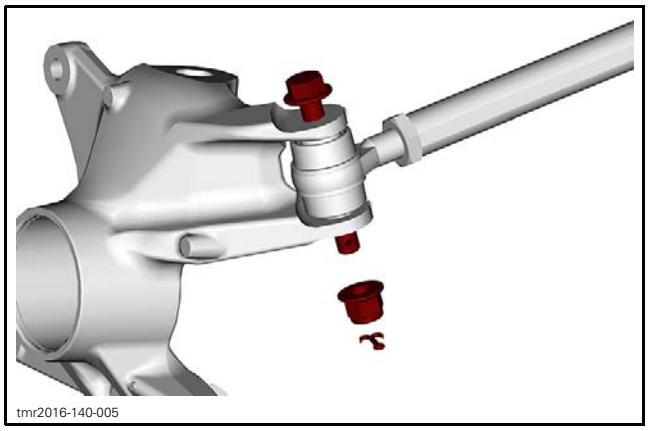
TIE-ROD ENDS

Replacing the Tie-Rod End

1. Remove front wheel.
2. Loosen tie rod locking nut.

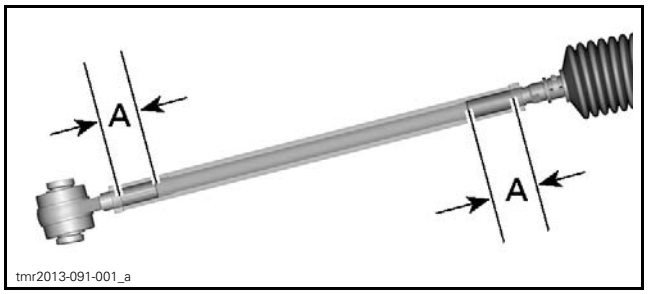


3. Detach tie-rod end.



4. Install new tie-rod end.
5. Adjust tie-rod end to the nominal engagement length.

NOTE: The tie rod must be engaged the same amount at both ends for the tie-rod adjustment to be centered.



RH TIE ROD ASSEMBLY SHOWN
A. Nominal engagement length

TIE-ROD END NOMINAL ENGAGEMENT LENGTH A
32 mm (1-1/4 in)

⚠ WARNING

The minimum tie-rod engagement length at both ends must be 25 mm (1 in).

6. Tighten tie-rod end locking nut to specification.

TIGHTENING TORQUE	
Tie rod end locking nut	34 N•m ± 2 N•m (25 lbf•ft ± 1 lbf•ft)

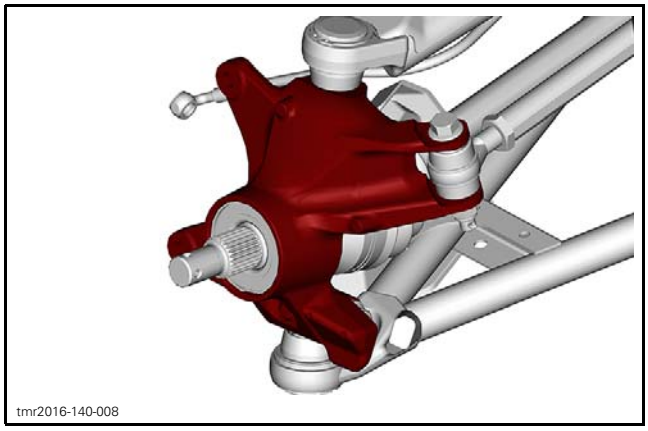
7. Attach tie-rod end to steering knuckle.
8. Install a new tie-rod end retaining nut and tighten to specification.

TIGHTENING TORQUE	
Tie rod end retaining nut	48 N•m ± 6 N•m (35 lbf•ft ± 4 lbf•ft)

9. Install a new cotter pin. Both ends of cotter pins must be folded.
10. Install front wheel.
11. Check steering alignment, refer to *ALIGNING THE WHEELS* in this subsection.

KNUCKLES

Removing the Knuckle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Remove front wheel.

1. Remove caliper, refer to *BRAKES* subsection.
2. Remove wheel hub, refer to *FRONT DRIVE* subsection.
3. Detach tie-rod end from knuckle (front knuckles). Refer to *TIE-ROD ENDS* in this subsection.
4. Detach upper and lower suspension arm from knuckle. Refer to *FRONT SUSPENSION* subsection.
5. Remove knuckle from vehicle.

Inspecting the Knuckle

Check knuckle for cracks or other damages.

Replace if necessary.

Installing the Knuckle

The installation is the reverse of the removal procedure.

WHEEL BEARINGS

Inspecting the Wheel Bearing (Maintenance)

Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

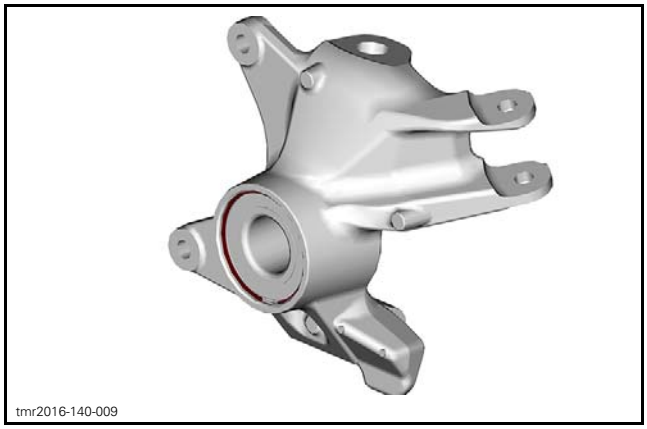
Inspecting the Wheel Bearing (During Component Removal)

Whenever the drive axle or knuckle is removed, check if wheel bearing turns freely and smoothly.

Replace if necessary.

Removing the Wheel Bearing

1. Remove knuckle from vehicle, refer to *REMOVING THE KNUCKLE* in this subsection.
2. Remove and discard circlip.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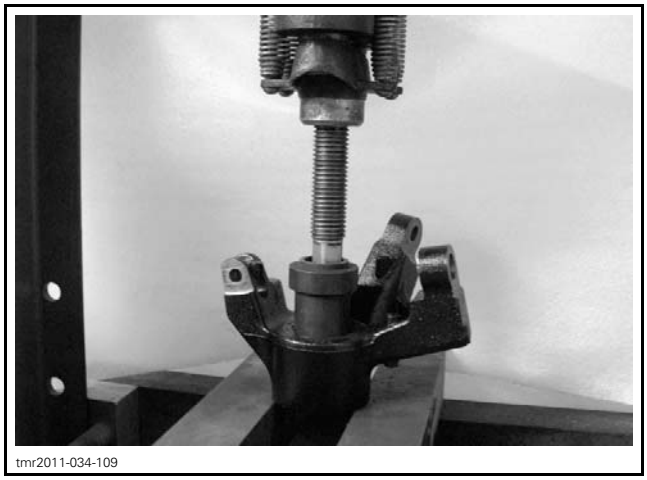
3. Install knuckle on a press.
4. Remove bearing from knuckle with an appropriate bearing remover.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TYPICAL

NOTE: Heat the knuckle to ease bearing removal.

⚠ WARNING

Clean all grease, outside and inside, from knuckle before heating it.

Installing the Wheel Bearing

The installation is the reverse of the removal procedure. However, pay attention to the following.

To ease wheel bearing installation:

– Place bearing in a freezer for 10 minutes.
– Place knuckle in oven to 100°C (212°F) for 30 minutes maximum.

When knuckle is cooled down, install new circlip.

DYNAMIC POWER STEERING (DPS)

SERVICE TOOLS

Description	Part Number	Page
FLUKE 115 MULTIMETER	529 035 868	5

SERVICE PRODUCTS

Description	Part Number	Page
DIELECTRIC GREASE	293 550 004	11
LOCTITE 767 (ANTISEIZE LUBRICANT)	293 800 070	10

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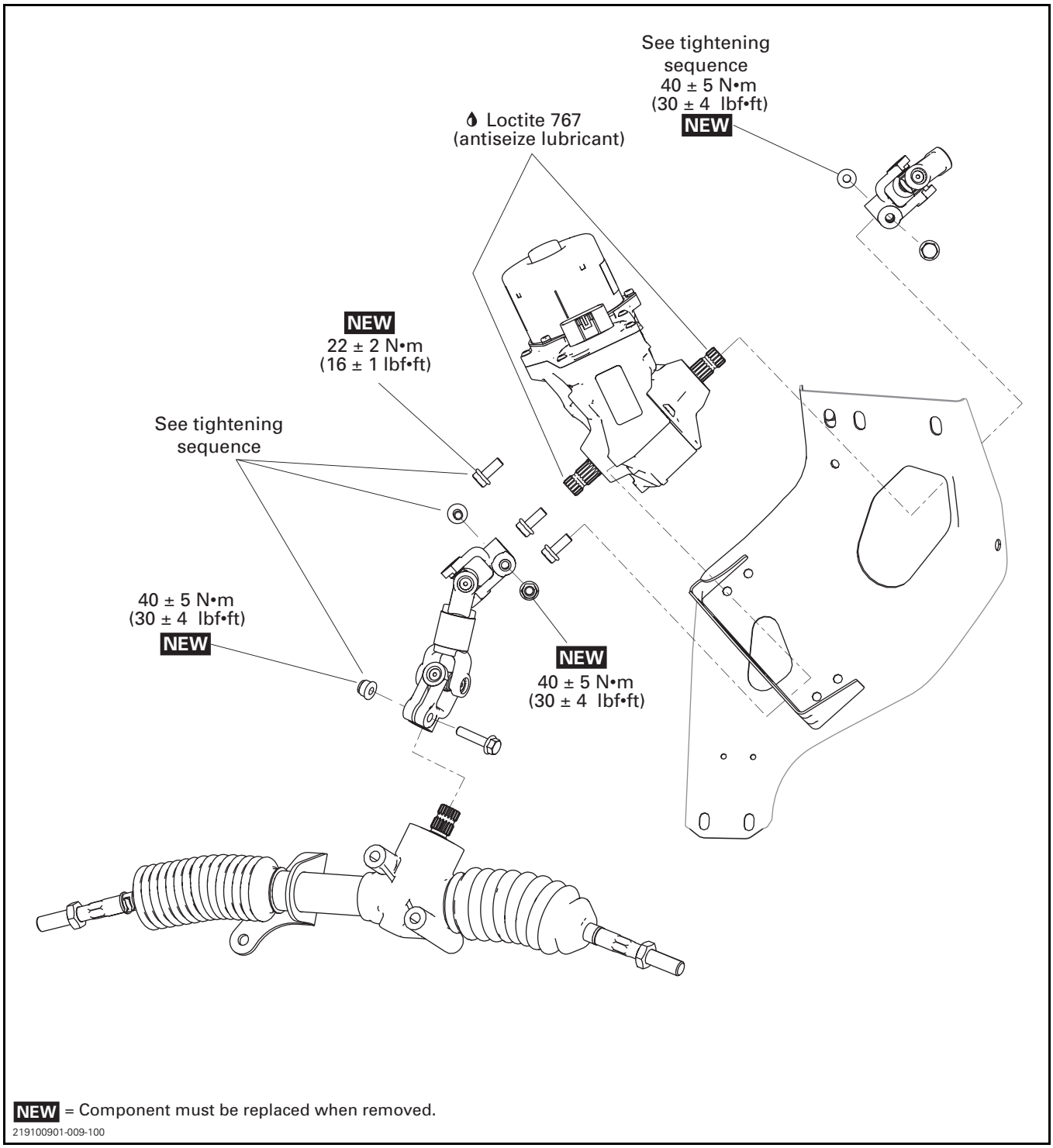

NEW = Component must be replaced when removed.

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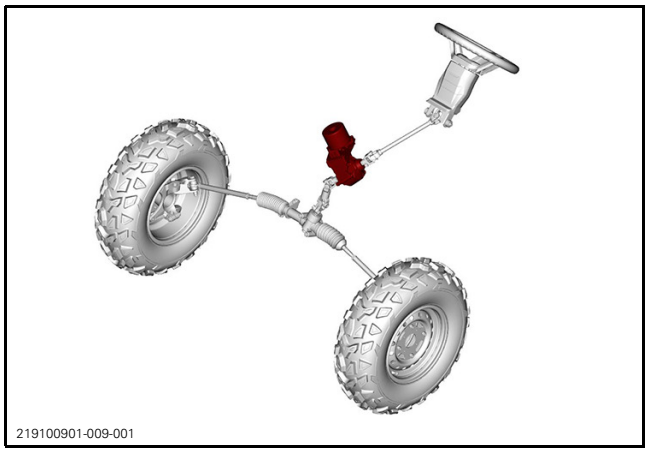
GENERAL

NOTICE Never perform arc welding in the DPS area. Otherwise, poor DPS operation might occur.

SYSTEM DESCRIPTION (FEATURES)

The Dynamic Power Steering (DPS) provides a computer controlled, variable power assist, achieved by an electric motor to optimize the amount of steering input required by the rider.



The DPS system uses the following parameters to determine how much steering assist it provides:
- Engine RPM
- Battery/electrical system voltage
- Vehicle speed
- DPS shaft torque sensor input.
- DPS internal temperature.

The amount of steering assist provided is dependent on the handlebar effort (steering torque), electrical power available, and vehicle speed.

The greater the handlebar effort (torque), the greater the assist will be.

The slower the vehicle speed, the greater the assist will be.

If the electrical system is activated but the engine is **not** running, DPS assist will be provided for approximately 30 seconds. DPS assist will resume once the engine is started.

After turning the ignition key OFF, DPS assist will be provided for approximately 20 seconds.

When the handlebar is in the straight ahead position, there is no steering assist.

Steering torque may also come from the wheels due to rough terrain. Steering kickback is reduced while providing feedback to the driver.

The greater the power steering assist, the greater the load on the electrical system.

When the electrical system is under high load (battery not at full charge, operating the vehicle for prolonged periods of time at slow speed and low RPM which, requires higher power steering assist), the battery power reserve will gradually decrease. This further increases the load on the charging system and the electrical system voltage will drop. As system voltage drops, so does power steering assist.

NOTE: It is important to maintain the battery at a full state of charge to ensure proper DPS operation.

DPS Derating Explanation

Derating is an internal protection system integrated in the DPS electronic module.

This system protects the electronic components when the DPS works too intensively and the internal temperature reaches a critical level, or when the battery voltage becomes too low.

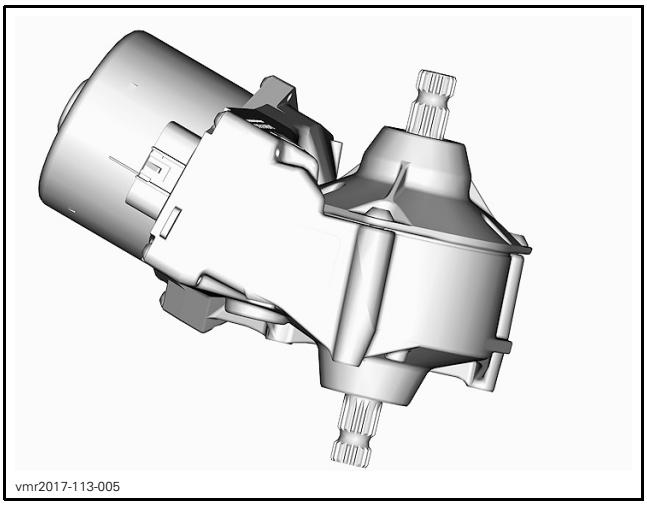
The internal protection system decreases the assistance level available to protect its electronic board. The normal assistance level will return when riding conditions are back to normal and the internal temperature decreases, and/or when the battery voltage increases above a threshold voltage.

NOTE: This reaction is a normal protective behavior of the unit and does not necessarily raise a fault in the cluster. However, under extreme conditions, a scrolling DPS OVERHEAT message may appear in the cluster. When the DPS is allowed to cool down below the threshold recovery temperature, the DPS OVERHEAT message will cease.

DPS SYSTEM DESCRIPTION (COMPONENTS)

DPS Unit

The DPS unit is a self contained unit that includes the steering gear, the DPS module, the DPS motor, and the torque sensor.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DPS UNIT

The DPS module provides DC power to the motor. The amount and duration of that DC power is determined by the inputs to the DPS module.

The DPS motor does not "spin", but rather turns in very small increments based on the amount, duration, and direction of DC power delivered by the DPS module.

NOTE: Should the DPS unit fail, the vehicle steering is still available with moderate increase in steering effort.

Steering Torque Sensor

The steering column is connected to the shaft on the DPS unit. A small area of the DPS shaft is magnetized. Inside the DPS unit, a torque sensor surrounds the magnetized area of the DPS shaft.

When the steering is turned, torque is applied to the shaft which tends to twist it slightly, deforming the magnetic field in the shaft. The sensor detects the torque by measuring the deviation of the magnetic field.

The torque sensor is very sensitive and can detect very small changes in the magnetic field. The harder the steering is turned, the greater the magnetic deviation, the greater the power steering assist.

NOTICE **The internal torque sensor is very sensitive to external magnetic source. All components touching the DPS unit must be kept in a non-magnetic area and avoid any contact with components. If a magnetic source or part is in contact with the DPS shaft, or touching components, it will affect the torque reading values and inadvertently affect the behavior of the DPS unit.**

ADJUSTMENT

RESETTING THE TORQUE OFFSET

When replacing the following parts or adjusting steering alignment, the sensor torque offset **MUST** be reset to zero for proper system operation.

PART ADJUSTED OR REPLACED	WHAT TO DO
– DPS unit – Steering column – Tie rod – Tie rod end – Knuckle – Wheel bearing – Ball joint – Front suspension arm (lower/upper) – Steering alignment	Reset Torque Offset in **Setting, DPS**

1. Position the steering wheel at the center position.
2. Connect vehicle to the BRP diagnostic software BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
3. Check if a software update is available and warranted for the DPS. Select:
   – **Flash** page.
   – **DPS** or **Vehicle** button.
   – **Flash** tab.

If an update is available, install it before resetting the torque offset.

REQUIRED CONDITIONS TO ALLOW THE RESET PROCEDURE
DPS unit temperature above freezing point.
Steering wheel should be free and centered. There MUST NOT be any effort applied to the steering column.
Torque sensor value must be within offset threshold value of ± 10Nm.
Engine not running.

4. To reset the torque offset, select:
   – **Settings** page.
   – **DPS** or **Vehicle** button.
   – **Initialization** tab.
5. Select **Torque Sensor Offset**.

NOTE: Torque reading must be stable and not exceeding 2Nm during procedure. Torque sensor reset may not be possible if the torque value is over the 10Nm above the original setting.

With the steering wheel centered and no effort is applied, if the indicated **Torque Sensor** value is over the threshold value of 1.5Nm, a steering imbalance may be noticeable.

If all steering components are undamaged, in good working order, and the steering components were correctly aligned, repeated torque offset reset procedures will not solve the problem if the torque offset is greater than ±10Nm. DPS unit replacement may be required.

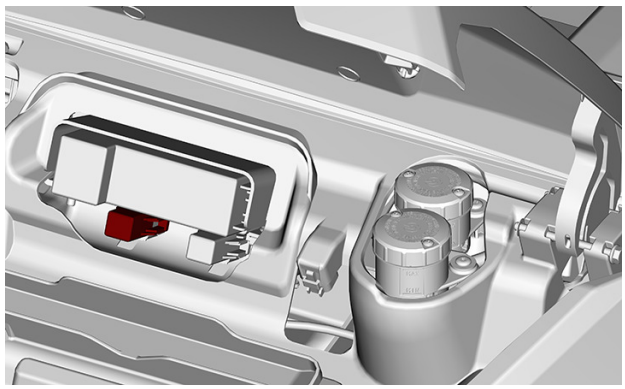
PROCEDURES

DPS UNIT

REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	

Testing the DPS Fuse

A 40 A fuse located in fuse box **no. 3** (PF3-F1) under the hood, provides power to the DPS motor.

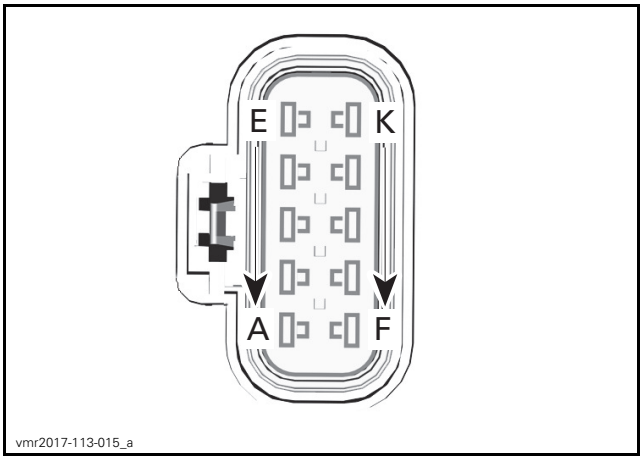


tmr2016-141-002

1. Remove the DPS fuse cap to expose the fuse contacts.
2. Set the multimeter to VDC and test for a voltage drop across the DPS fuse while the DPS is in operation.
3. If a voltage is measured, turn power off and remove fuse.
4. Check fuse continuity, fuse contacts and fuse box contact condition. Replace fuse as required.

DPS Wire Identification

For circuit details, refer to *WIRING DIAGRAM*.



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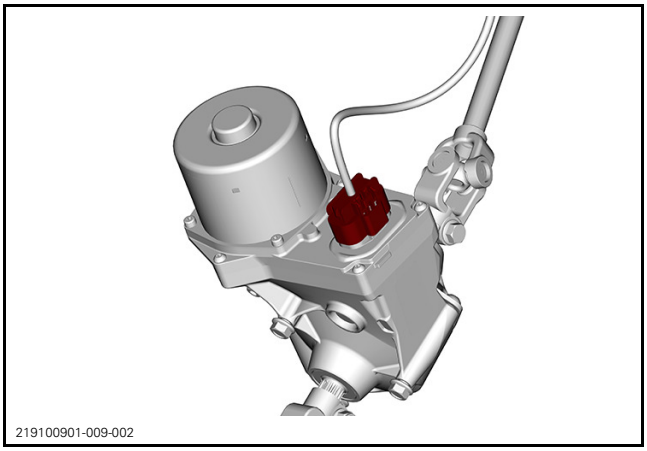
DPS CONNECTOR HARNESS SIDE

DPS CONNECTOR		
FUNCTION	PIN	COLOR
12 volt input (from fuse F1)	C	RD/PK
12 volt input (from fuse F1)	D	RD/PK
12 volt input (from fuse F1)	E	RD/PK
12 volt switched input (from fuse F4)	G	OR/GN
CAN HI	J	WH/BE
CAN LO	K	WH/BK
Ground	A	BK
Ground	B	BK
Ground	F	BK

Testing the DPS Input Voltage

1. Disconnect the DPS connector.



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2. Test for 12 Vdc DPS motor power at DPS connector as per following table.

MULTIMETER PROBE POSITIONS		VOLTAGE
DPS connector pin C	Battery ground	Battery voltage
DPS connector pin D		
DPS connector pin E		

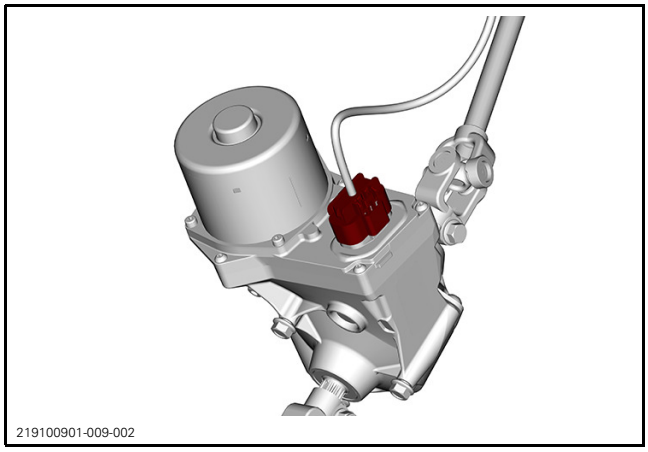
If NO voltage is measured, test the 40 A DPS fuse (F1). If good, check wires and connector pins. Replace or repair defective parts and reset fault codes.

If battery voltage is measured, test the DPS ignition signal voltage.

NOTE: This test may also be carried out by connecting a 12 Vdc test light between connector pins (C, D and E), and the battery (-) negative terminal. The test light must come on bright.

Testing the DPS Ignition Signal Voltage

1. Disconnect DPS connector.



2. Set the ignition switch to ON.
3. Test for 12 Vdc power at the DPS connector as per following table.

MULTIMETER PROBE POSITIONS		VOLTAGE
DPS connector (harness side) pin G	Battery ground	Battery voltage

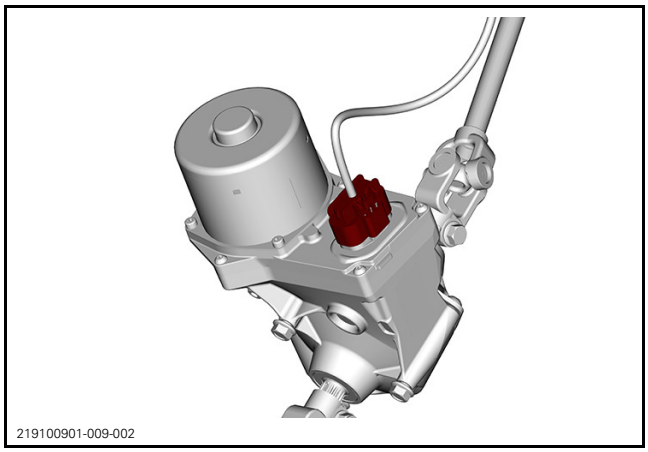
If NO voltage is measured, check wires and connector pins from the DPS unit to the fuse (F4) in the front fuse box (PF1-F4). Replace or repair defective parts and reset fault codes.

If battery voltage is measured, test the DPS ground circuit.

NOTE: This test may also be carried out by connecting a 12 Vdc test light between the DPS connector (pin G), and the battery (-) negative terminal. The test light must come on bright.

Testing the DPS Ground Circuit

1. Disconnect the DPS connector.



2. Test for continuity between DPS connector and battery ground.

MULTIMETER PROBE POSITIONS		READING
DPS connector (harness side) pin A	Battery ground	Continuity (close to 0 Ω)
DPS connector (harness side) pin B		
DPS connector (harness side) pin F		

If there is NO continuity or a high resistance is measured, check wires and connector pins from DPS unit to chassis ground post. Replace or repair defective parts and reset fault codes.

If there is good continuity, carry out: *TESTING THE DPS UNIT COMMUNICATION LINK (CAN) CONTINUITY*.

NOTE: This test may also be carried out by connecting a 12 Vdc test light between each GDN connector pin and the battery (+) positive terminal. The test light must come on bright.

Testing the DPS Communication Link (CAN) Continuity

NOTE: DPS unit must receive an RPM signal to provide power steering assist.

1. Disconnect the DPS connector and the diagnostic connector.
2. Test continuity of CAN Bus Wires as per following table.

MULTIMETER PROBE POSITIONS		RESISTANCE @ 20°C (68°F)
DPS CONNECTOR (HARNESS SIDE)	DIAGNOSTIC CONNECTOR	
Pin J	Pin 1	Less than 1 Ω
Pin K	Pin 2	

If resistance measured is out of specification, check wires and connector pins. Carry out repairs as required and reset fault codes using the applicable BRP diagnostic software version.

If resistance measured is good, replace the DPS unit and reset fault codes using the applicable BRP diagnostic software version.

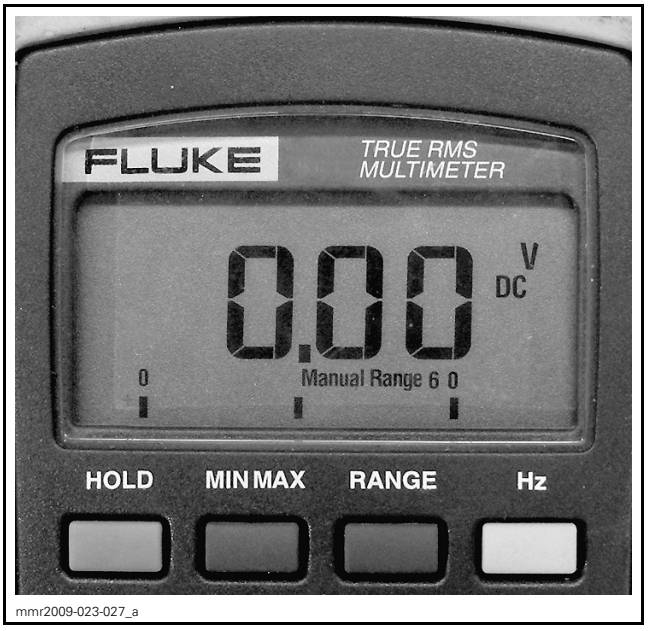
Testing the DPS System Load

If the charging system cannot sustain normal voltage when the DPS is operating, DPS ASSIST may be greatly reduced or nonexistent. Carry out the following steps.

1. Measure the battery voltage.

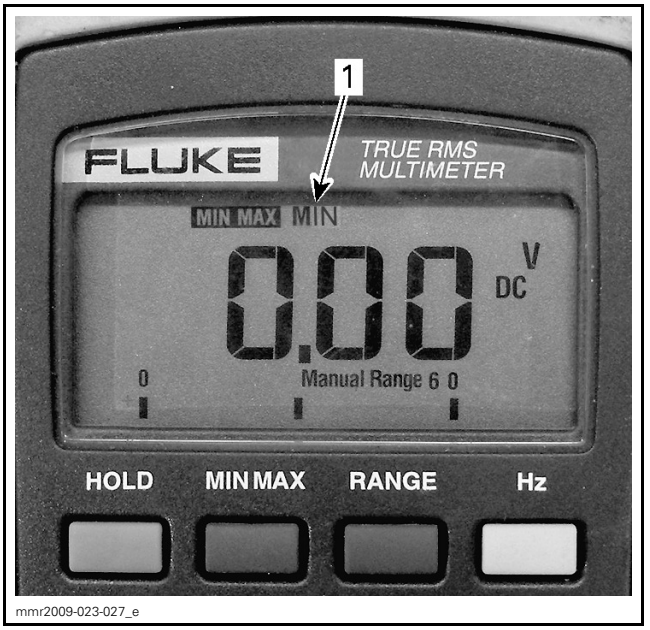
NOTE: If battery voltage is low, recharge battery.

2. Ensure the vehicle transmission is set to PARK.
3. Start the engine.
4. Note the voltage on the multimeter with the engine running (charging system voltage).
5. Press the RANGE button repeatedly to select Manual Range 6 0.



VDC SELECTED TO MANUAL RANGE 6 0

6. Press the MIN MAX button on the multimeter to engage the MIN function.



1. MIN function selected

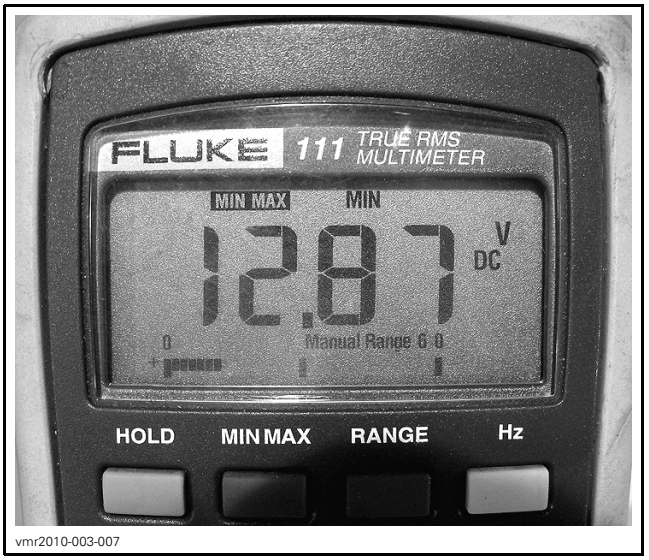
7. Turn the steering momentarily against the frame stops to each side.

NOTE: Do not hold steering against frame stops for an extended period of time.

8. Read the MIN charging system voltage recorded while the steering was turned against each stop.

DPS SYSTEM LOAD TEST			
PROBE POSITIONS		STEERING POSITION	VOLTAGE READING
Battery (-) terminal	DPS fuse holder pin B	LH stop	At least 12 Vdc
		RH stop	

NOTE: Turning the steering momentarily against the frame stops generates maximum DPS load (maximum current draw on electrical system). Electrical system must sustain at least 12 Vdc for proper DPS operation.



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If the electrical system cannot sustain at least 12 Vdc, check the following:

– Battery
– Battery connections
– DPS unit power and ground connections
– Charging system
– Chassis and engine ground studs.

If the previously listed items are correct, , carry out: *TESTING THE DPS UNIT CURRENT.*

Testing the DPS Unit Current

1. Connect vehicle to the BRP diagnostic software BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
2. Select:
   – **Measurements** page.
   – **DPS** button.
   – **Custom** tab.
3. With the vehicle engine running in PARK and without any steering effort, the reading should be as per following table.

TORQUE SENSOR	DPS CURRENT
0 N•m ± 1 N•m (0 lbf•**in** ± 9 lbf•**in**)	0 Amp

4. Turn the steering wheel side to side, momentarily against each steering hard stop and observe the DPS **Torque Sensor** value. The torque value should increase with steering effort applied to the steering wheel.

The **DPS Current** value should increase proportionately to the torque applied, and decrease with the torque as steering assist is provided.

NOTE: The increase and decrease in torque and current readings is very brief as steering assist is quickly provided. Current draw should remain within green scale but may momentarily peak to or exceed 60 amps, then drop off close to 0 amps as torque applied is nulled out by steering assist. If steering is held against hard stops the torque and current readings will remain high.

If current draw tends to remain high, carry out the following:

– *ALIGNING THE STEERING COMPONENTS*
– *RESETTING THE TORQUE OFFSET* (only if steering components alignment did not solve the problem)
– DPS unit replacement.

NOTE: The *ALIGNING THE STEERING COMPONENTS* procedure must always be carried out before even considering a torque offset reset.

5. Turn steering to LH stop and hold at least 8 Nm. Note DPS current value.
6. Turn steering to RH stop and hold at least 8 Nm. Note DPS current value.
7. Repeat previous two steps while holding at (+ or -) 5 Nm. Note DPS current value.

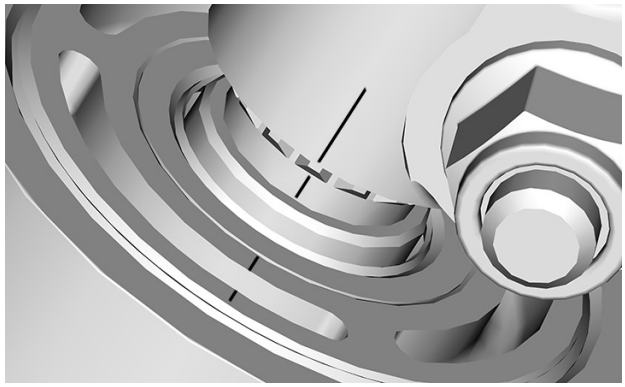
LH and RH DPS current readings should be the same for the same applied torque.

If the *ALIGNING THE STEERING COMPONENTS* and *RESETTING THE TORQUE OFFSET* procedures have been carried out, and the current or steering imbalance is too great, the DPS unit will require replacement to resolve the problem.

Removing the DPS Unit

NOTICE Before proceeding with the DPS removal, remove the 40 Amp DPS fuse (F1) in the fuse box no. 3. Handle the DPS unit with extreme care as it is very sensitive to physical chock. Store unit in a secured area. If the DPS unit is dropped, it must be replaced even if only minimal damage is apparent.

1. Position the front wheels parallel to the rear wheels.
2. Remove both front wheels.
3. Mark the alignment of the lower steering shaft with the input shaft and the rack and pinion housing.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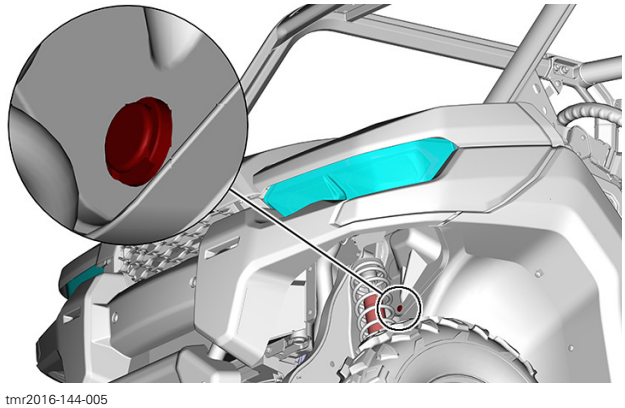
4. Remove access panel under LH front inner fender.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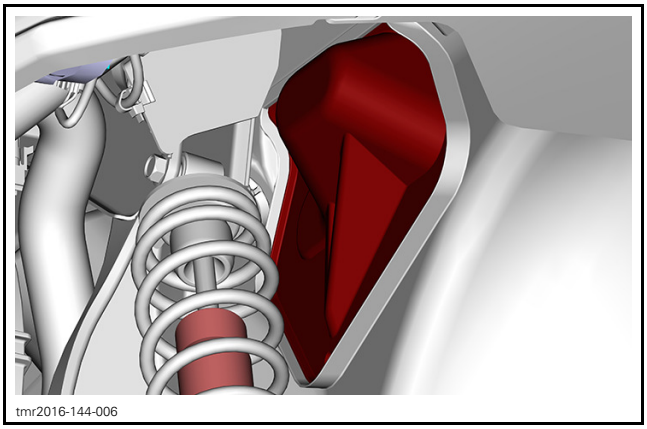
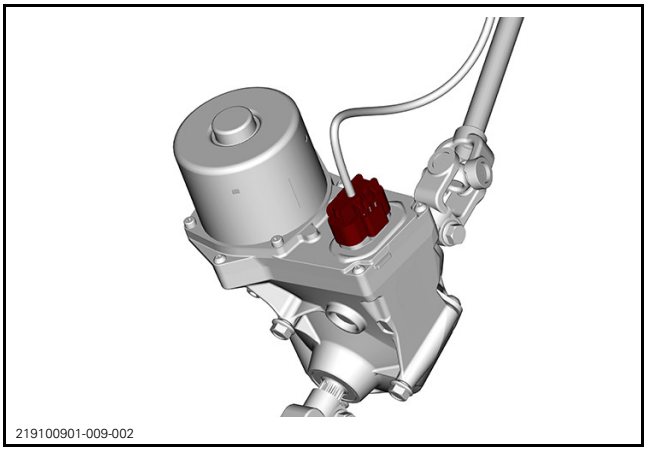
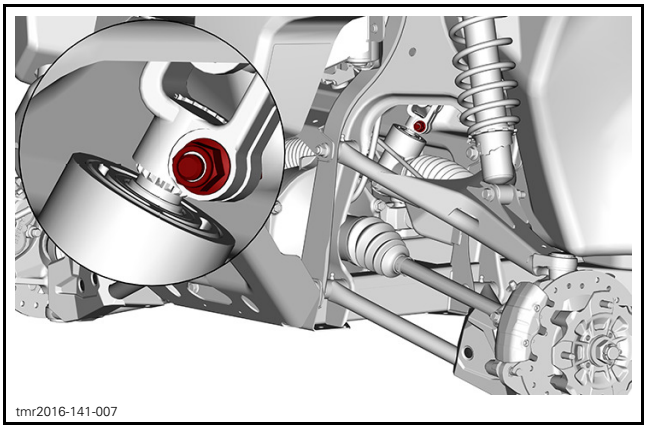

tmr2016-144-006

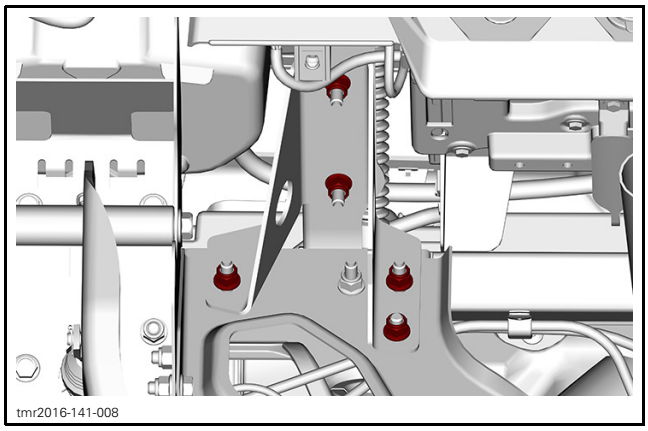
5. Disconnect the electrical connector from the DPS unit.


219100901-009-002

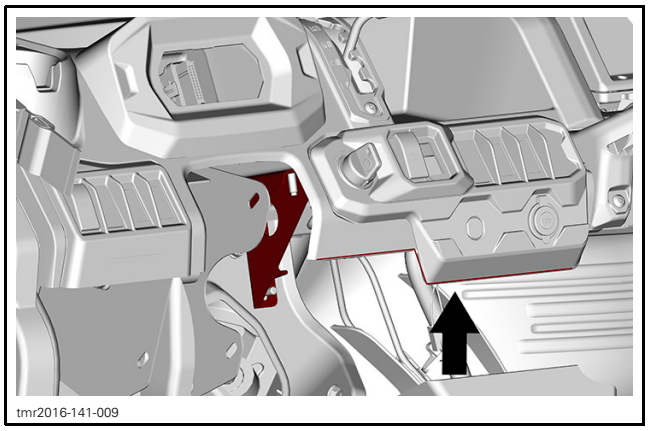
6. Remove steering column. Refer to *REMOVING THE STEERING COLUMN* subsection.
7. Remove the lower steering shaft pinch bolt and nut.


tmr2016-141-007

8. Remove the shifter module support retaining nuts and screw.


tmr2016-141-008

9. Slightly lift the dash board to remove the shifter support.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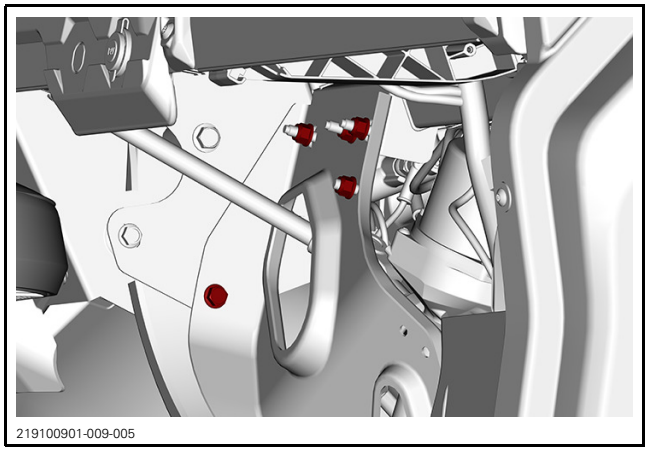
10. Remove all DPS unit support retaining screws.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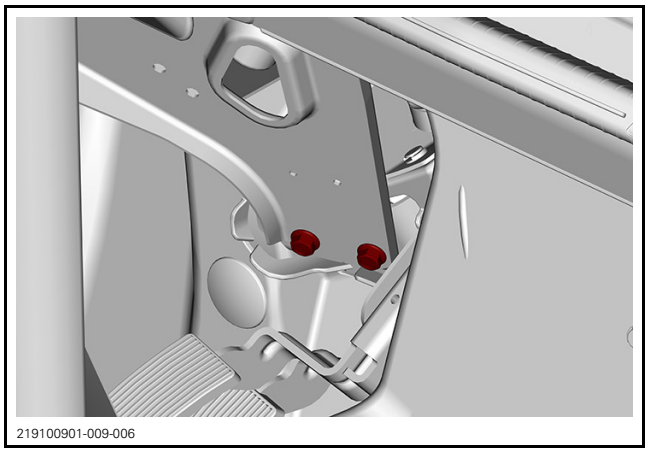

219100901-009-006

11. Pull up on DPS unit and support to disengage from the rack and pinion shaft and remove it from the vehicle.

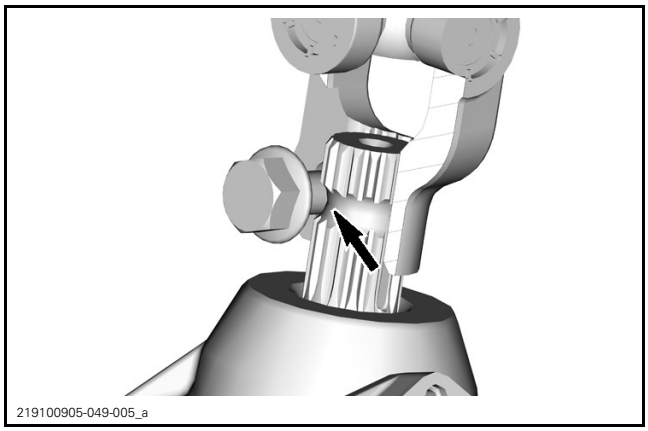
NOTE: If replacing DPS unit, remove the DPS support and the lower steering shaft from the unit.

Installing the DPS Unit

If Replacing DPS Unit

1. Install the support on the new DPS unit.
2. Apply LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070) to DPS input and output shaft splines.
3. Install locking bolt and nut.

IMPORTANT: Make sure to engage bolt in the input shaft groove.


219100905-049-005_a

YOKE CROSSCUT - INPUT SHAFT GROOVE

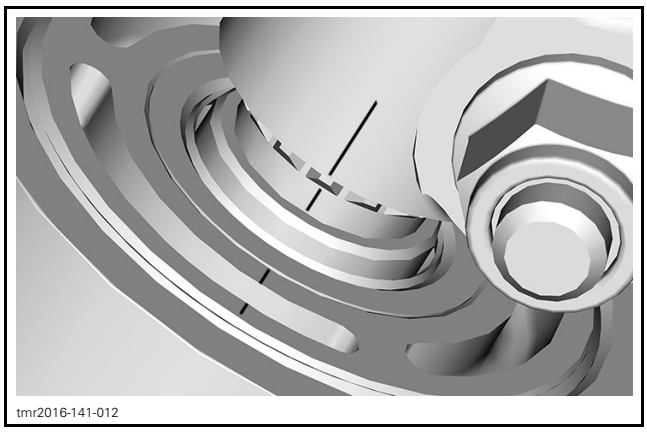
Continue with *IF INSTALLING SAME DPS UNIT*.

If Installing Same DPS Unit

1. Apply LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070) antiseize lubricant to rack and pinion shaft splines.

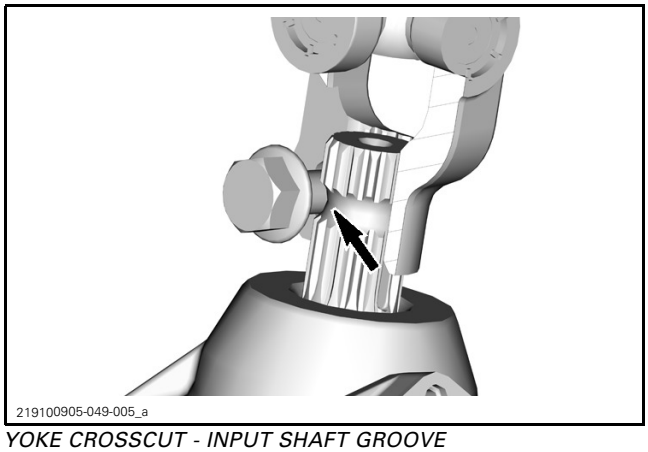
2. While lowering the DPS unit with its support and the lower steering shaft in place, a second technician engage the lower yoke on the rack and pinion shaft.

Make sure to align marks previously made on lower yoke, rack and pinion input shaft and housing.



3. Install and tighten locking bolt and nut.

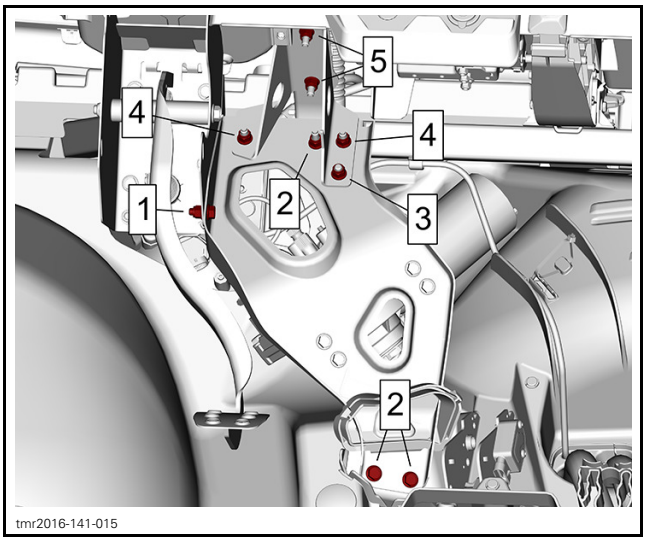
IMPORTANT: Make sure to engage bolt in the input shaft groove.



YOKE CROSSCUT - INPUT SHAFT GROOVE

4. Install shifter support.
5. Install fasteners, then tighten as per the following sequence.

NOTE: Ensure the shifter support makes good contact with the shifter module and the DPS support while tightening the nuts 3, 4, and 5.



6. Install the steering column. Refer to *STEERING SYSTEM* subsection.
7. Apply DIELECTRIC GREASE (P/N 293 550 004) on harness connector terminals.
8. Connect DPS connector to DPS unit.
9. If installing a replacement DPS unit, refer to *REPLACING THE DPS* in this subsection.
10. Align wheels. Refer to *STEERING SYSTEM* subsection.
11. Verify DPS system.

Replacing the DPS Unit

New DPS units **do not** come with the required software programmed into the unit. A DPS unit fault will be generated when the vehicle is powered up. The check engine light will come on and a CHECK DPS message will appear in the multifunction gauge.

The new DPS unit will require 2 mandatory updates. The first update is required for the DPS to recognize what type of vehicle it is installed in, the second to upload the software required for proper operation on that vehicle.

When DPS unit installation is complete, carry out the following steps.

1. Connect the vehicle to the BRP diagnostic software BUDS2. Refer to *COMMUNICATION TOOLS* subsection.
2. Select the **Flash** page.
3. A message window will appear asking you if you would like to update the DPS module; select **YES** and follow the instructions. When a second window appears asking you the same question, select **YES** again.

4. Once the correct DPS software file is installed, go to the **Faults** page and clear the fault codes.
5. Carry out: *RESETTING THE TORQUE OFFSET* (if required) as described in this subsection.
6. Test drive the vehicle to ensure proper DPS operation.

DPS System Final Verification

With the front wheels off the ground:

1. Enable DPS unit (turn ignition switch ON or start engine).

NOTE: Steering assist will be provided for 30 seconds with the ignition switch ON and engine not running.

2. Slowly turn steering wheel from one side to the other 3 times.

Make sure:

– Assistance and travel are equal when turning right or left
– Steering system operates smoothly through all its range.

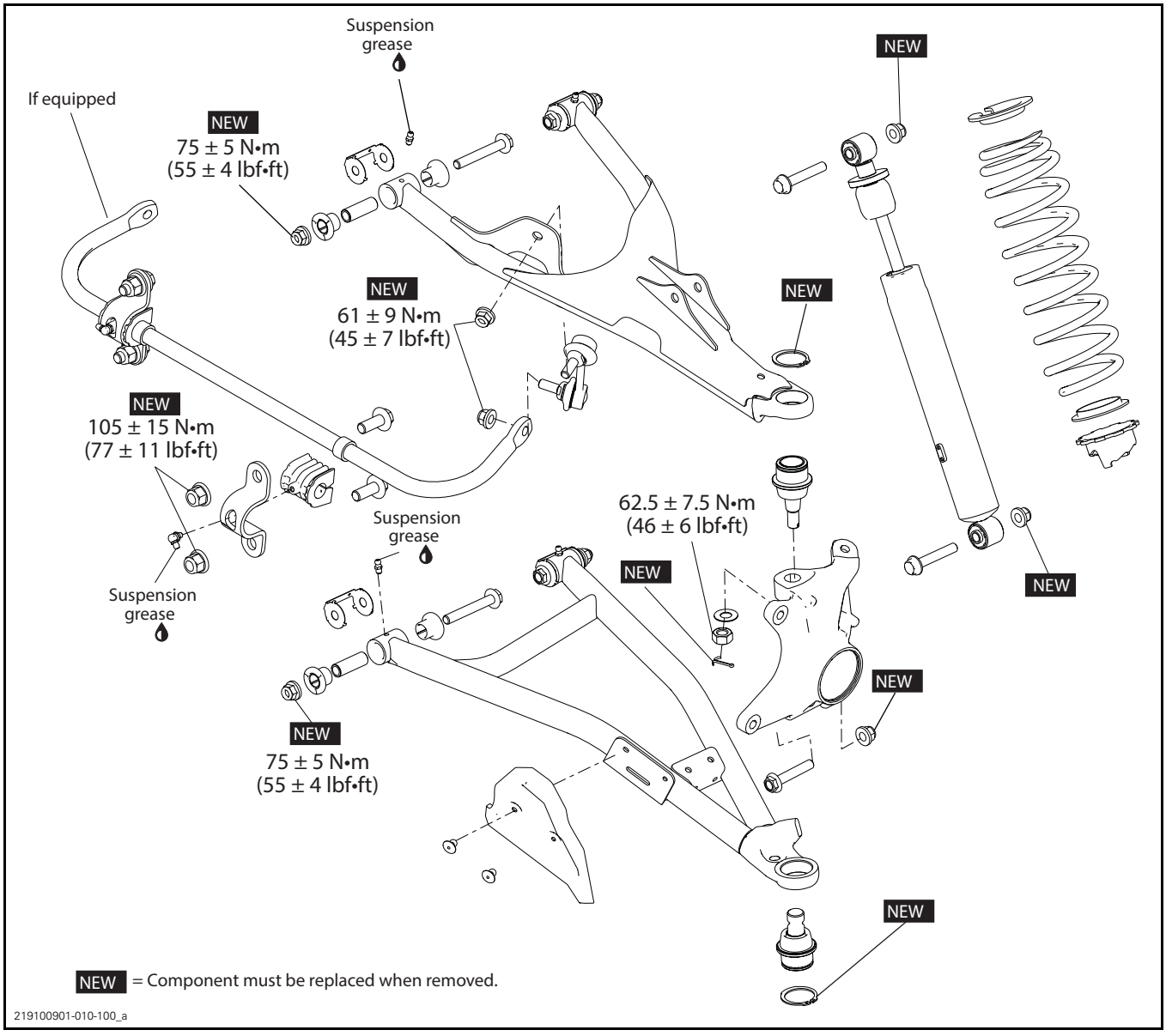
3. Lower vehicle on the ground.
4. Repeat step 2.

RESULT	ACTION
Uneven/incorrect steering behavior	Troubleshoot steering problem

NOTE: A verification carried out with the engine not running and a weak battery may result in unsatisfactory DPS performance. In doubt, retest with the engine running.

5. Perform the *STEERING SYSTEM SELF TEST* procedure in this subsection.
6. Carry out a test ride of the vehicle to ensure proper operation of the DPS unit.

FRONT SUSPENSION



GENERAL

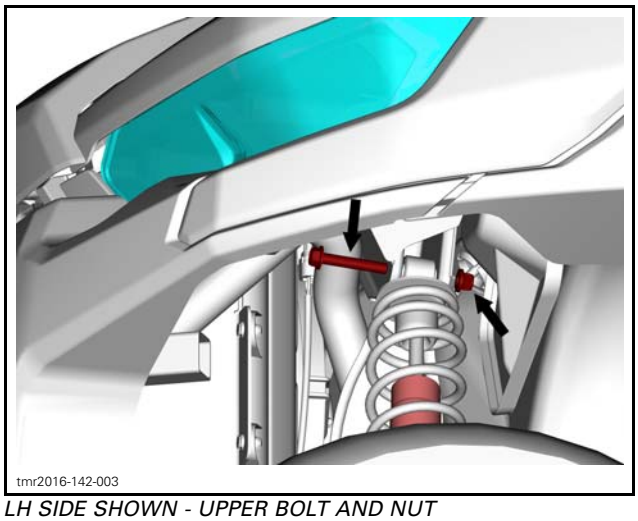
The procedure explained below is the same for the RH and LH sides unless otherwise noted.

PROCEDURES

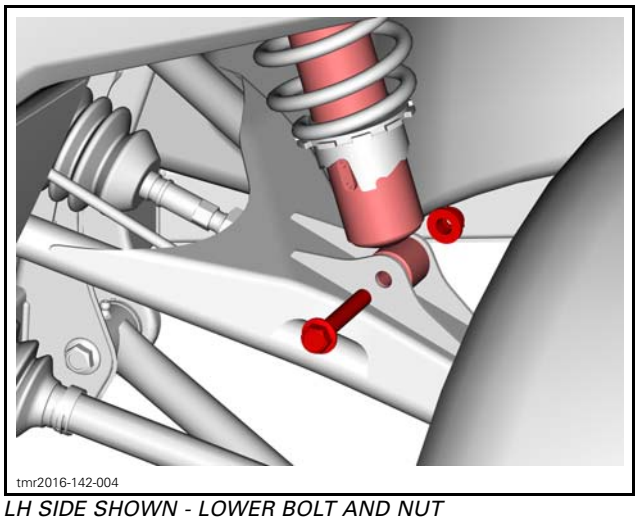
SHOCK ABSORBER

Removing the Shock Absorber

1. Safely lift and support the vehicle of the ground. Refer to *INTRODUCTION* subsection.
2. Remove bolts and nuts retaining shock absorber.



LH SIDE SHOWN - UPPER BOLT AND NUT



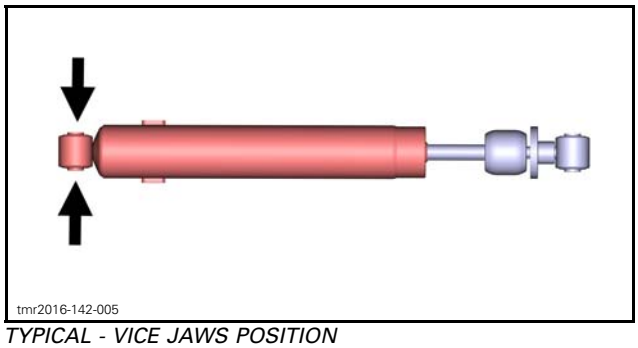
LH SIDE SHOWN - LOWER BOLT AND NUT

3. Remove shock absorber.

Inspecting the Shock Absorber

Remove spring from shock absorber. Refer to *SPRINGS* in this subsection.

Secure the end of shock body in a vise with its rod upward.



TYPICAL - VICE JAWS POSITION

NOTICE Do not clamp directly on shock body.

Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upward.

Check the following conditions that will denote a defective shock:

- A skip or a hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- Oil leakage.
- A gurgling noise, after completing one full compression and extension stroke.

Replace if any faults are present.

Installing the Shock Absorber

The installation is the reverse of the removal procedure.

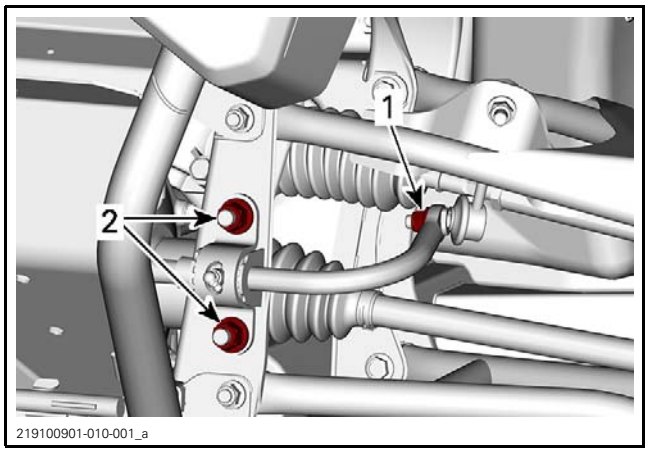
SHOCK ABSORBER SPRINGS

Refer to *SPRINGS* in *REAR SUSPENSION* subsection for complete procedures.

STABILIZER BAR (IF EQUIPPED)

Removing the Stabilizer Bar

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Remove the stabilizer bar retaining screws and link lower nuts.



PARTS REMOVED FOR CLARITY
1. *Stabilizer bar link lower nut*
2. *Stabilizer bar retaining screws*

3. Remove stabilizer bar.

Inspecting the Bar

Check stabilizer bar for cracks, bending or other damages.

Replace if necessary.

Installing the Bar

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install stabilizer link nuts and stabilizer bar screws loosely.

Using the following sequence, tighten fasteners as per the specification.

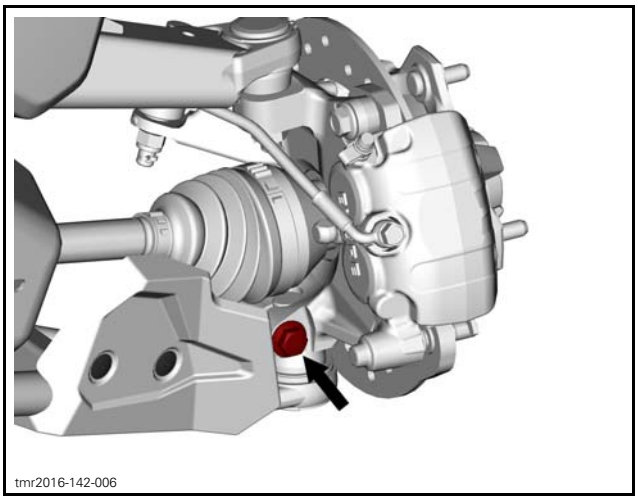
1. Stabilizer link nuts
2. Stabilizer bar screws

TIGHTENING TORQUE	
Stabilizer link nut	61 N•m ± 9 N•m (45 lbf•ft ± 7 lbf•ft)
Stabilizer bar screw	105 N•m ± 15 N•m (77 lbf•ft ± 11 lbf•ft)

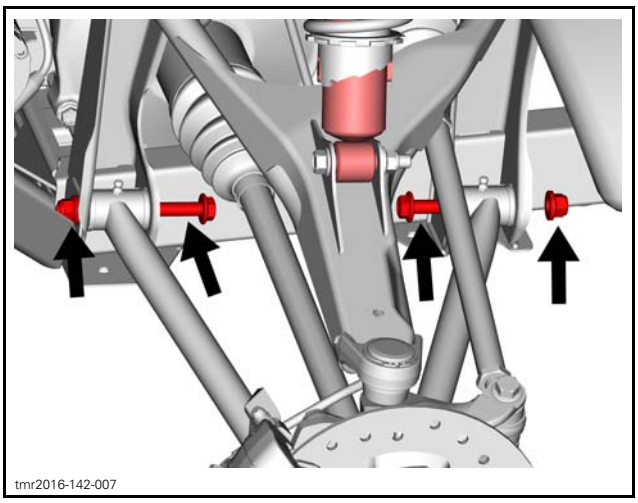
LOWER SUSPENSION ARM

Removing the Lower Suspension Arm

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Remove wheel, refer to *WHEELS AND TIRES* subsection.
3. Remove bolt and nut securing lower ball joint to knuckle.



4. Remove bolts and nuts securing suspension arm to frame.



5. Remove suspension arm.

Installing the Lower Suspension Arm

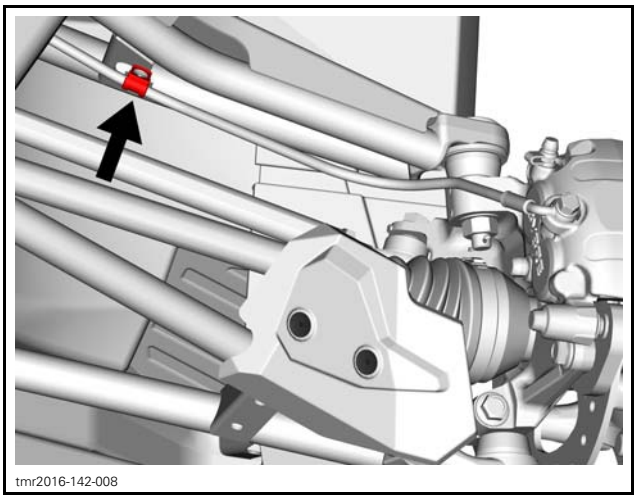
The installation is the reverse of the removal procedure. However, pay attention to the following.

Lubricate suspension arm.

UPPER SUSPENSION ARM

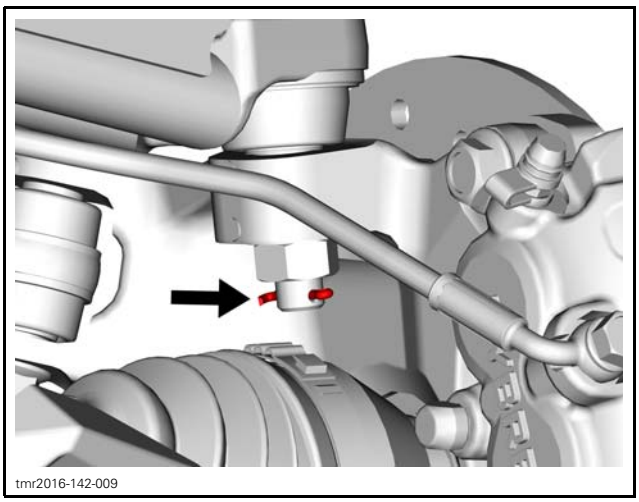
Removing the Upper Suspension Arm

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Remove wheel, refer to *WHEELS AND TIRES* subsection.
3. Remove the clamp retaining brake hose from the suspension arm.


tmr2016-142-008

BRAKE HOSE CLAMP

4. Remove and discard cotter pin retaining ball joint.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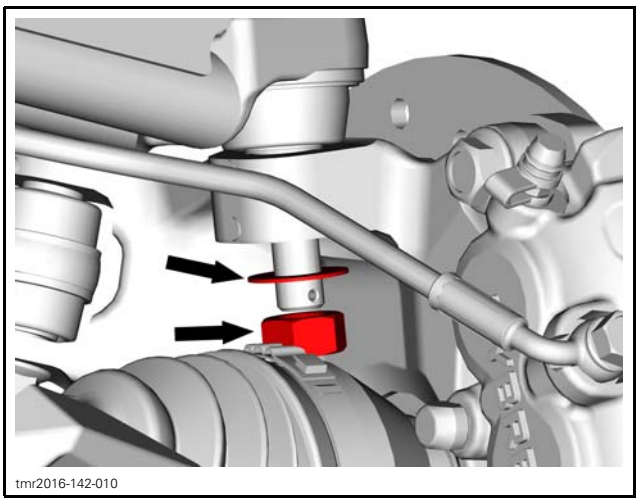
5. Remove ball joint nut and washer.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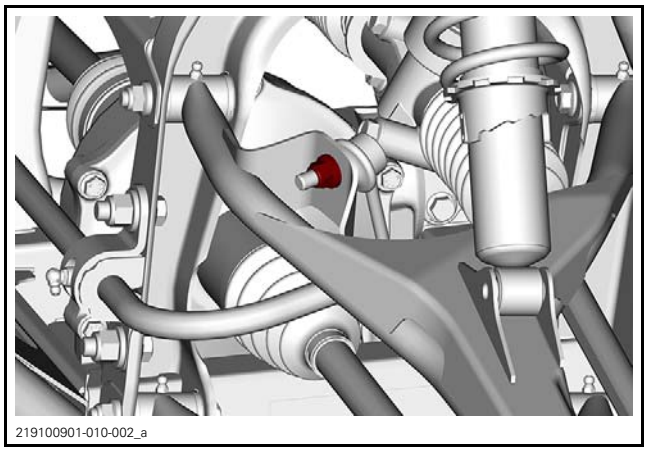
6. Using a plastic hammer, carefully hit on the knuckle side to separate ball joint from knuckle.

NOTE: A ball joint remover can be used if the ball joint is jammed into knuckle.

NOTICE **Never hit on suspension arm to avoid damaging it permanently.**

7. Remove the lower bolt securing the shock absorber.
8. If equipped, remove stabilizer bar link upper nut and move link away.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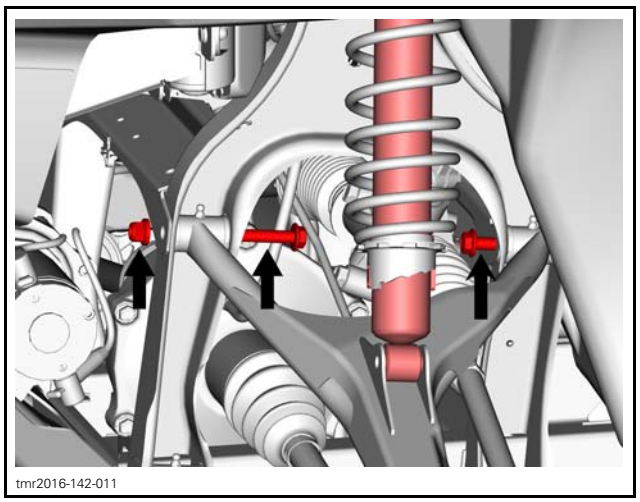
9. Remove fasteners securing suspension arm to frame.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10. Remove suspension arm.

Installing the Upper Suspension Arm

The installation is the reverse of the removal procedure. However, pay attention to the following.

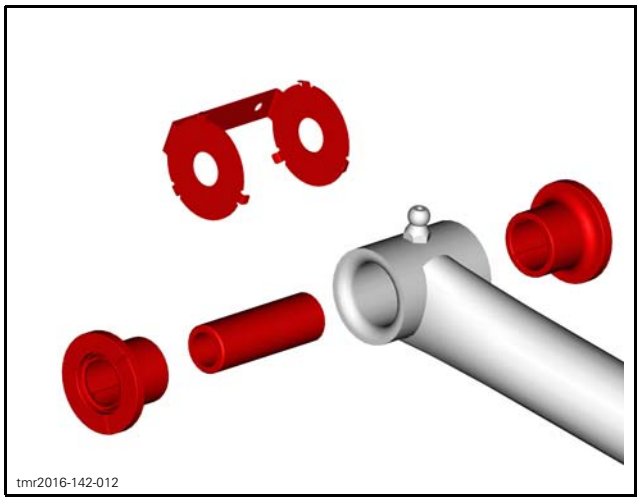
Lubricate suspension arm. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Install a **NEW** cotter pin to secure ball joint nut. Both end of cotter pin must be folded.

SUSPENSION ARM BUSHINGS

Removing the Suspension Arm Bushings

1. Remove wear plates, cushions and inner bushings from suspension arm.



TYPICAL

Installing the Suspension Arm Bushings

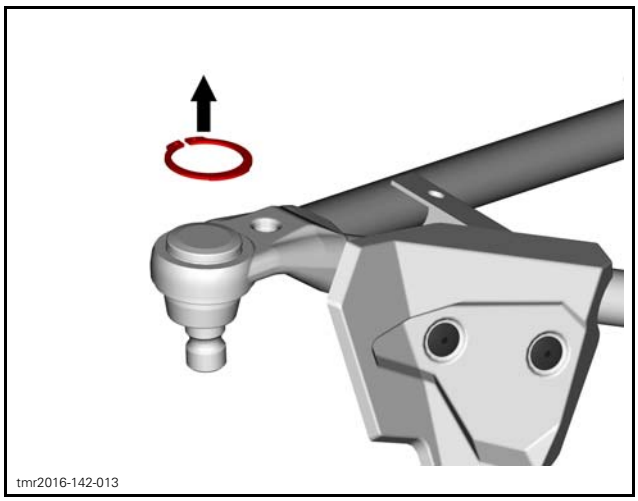
The installation is the reverse of the removal procedure. However, pay attention to the following.

Lubricate suspension arm.

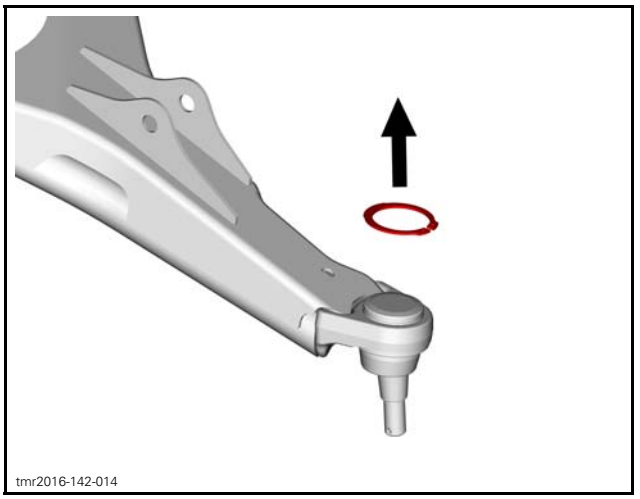
BALL JOINTS

Removing the Ball Joint

1. Remove suspension arm from vehicle. Refer to *SUSPENSION ARM REMOVAL* in this subsection.
2. Remove and discard the circlip from ball joint.

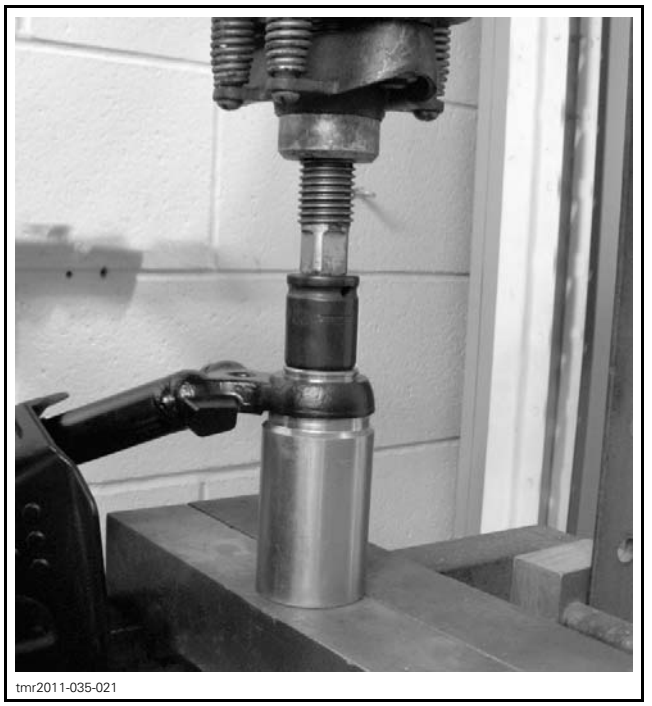


LOWER BALL JOINT



UPPER BALL JOINT

3. Install suspension arm on a press.
4. Use an appropriate ball joint remover.



5. Remove ball joint from suspension arm.

NOTICE **Make sure that suspension arm is properly supported on the press during ball joint removal.**

Installing the Ball Joint

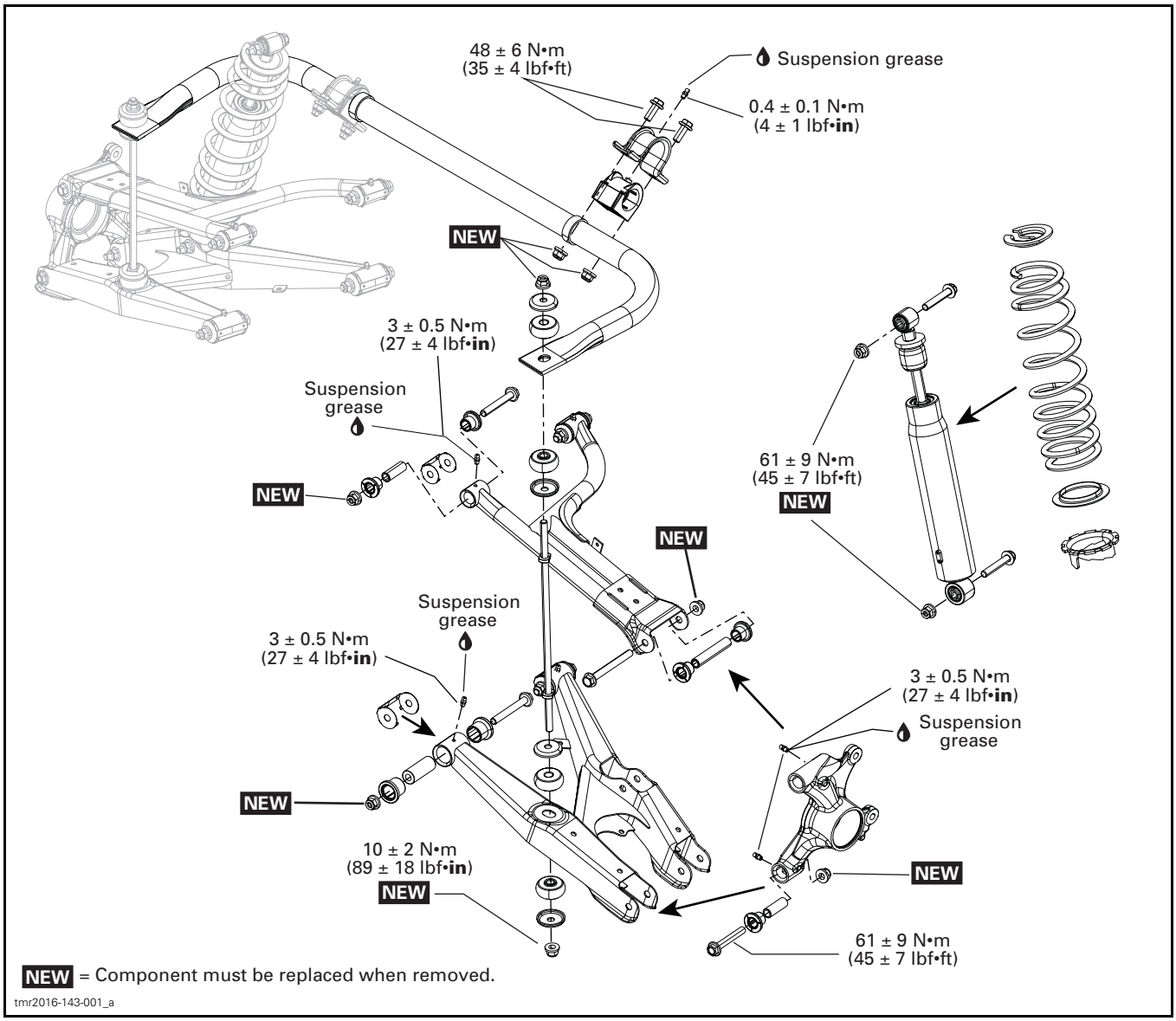
The installation is the reverse of the removal procedure. However, pay attention to the following.

Install a **NEW** circlip to secure ball joint.

REAR SUSPENSION

SERVICE TOOLS

Description	Part Number	Page
SPRING COMPRESSOR	529 036 184	2



GENERAL

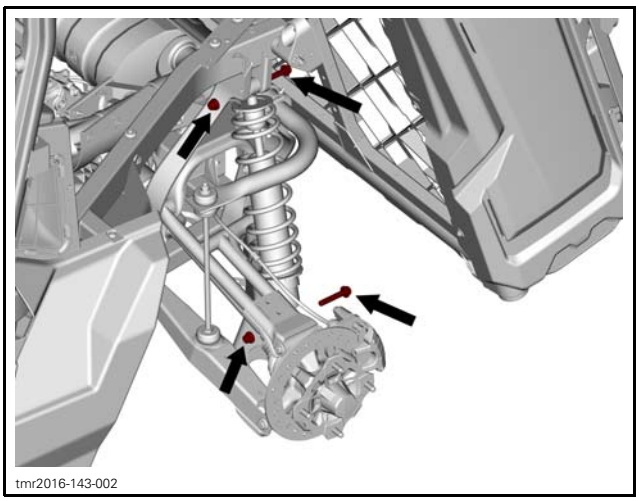
The procedure described below is the same for the RH and LH sides, unless otherwise instructed.

PROCEDURES

SHOCK ABSORBERS

Removing the Shock Absorber

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Open cargo box.
3. Remove bolts and nuts retaining shock absorber.



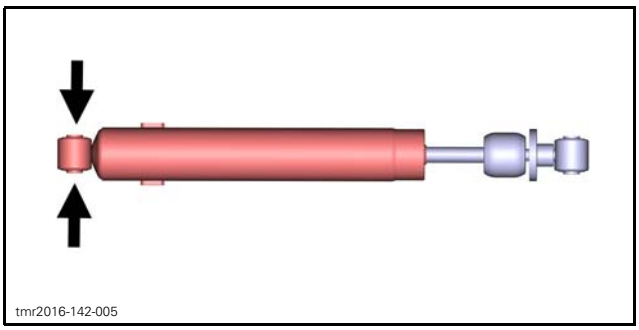
LH SIDE SHOWN - BOLTS AND NUTS

4. Remove shock absorber.

Inspecting the Shock Absorber

Remove spring from shock absorber. Refer to *SPRINGS* in this subsection.

Secure the end of shock body in a vise with its rod upward.



TYPICAL - VICE JAWS POSITION

NOTICE Do not clamp directly on shock body.

Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upward.

Check the following conditions that will denote a defective shock:

– A skip or a hang back when reversing stroke at mid travel.
– Seizing or binding condition except at extreme end of either stroke.
– Oil leakage.
– A gurgling noise, after completing one full compression and extension stroke.

Replace if any faults are present.

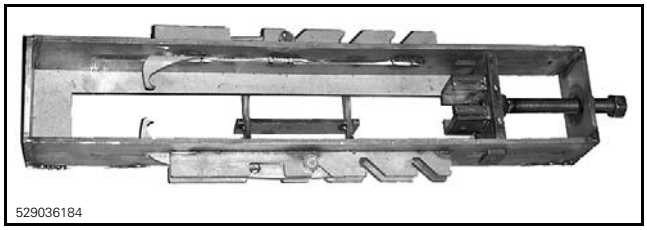
Installing the Shock Absorber

The installation is the reverse of the removal procedure.

SPRINGS

Removing the Spring

1. Remove shock absorber from vehicle. Refer to *SHOCK ABSORBERS* in this subsection.
2. Place the SPRING COMPRESSOR (P/N 529 036 184) in a vice.



3. Position the shock absorber in the tool.
4. Install the spring compressor pins.
5. Tighten spring remover screw until the spring is sufficiently compressed to remove spring cap.
6. Remove spring cap from shock absorber.
7. Release spring remover screw.
8. Remove spring from shock absorber.

Inspecting the Spring

Inspect the spring for damage.

Replace if necessary.

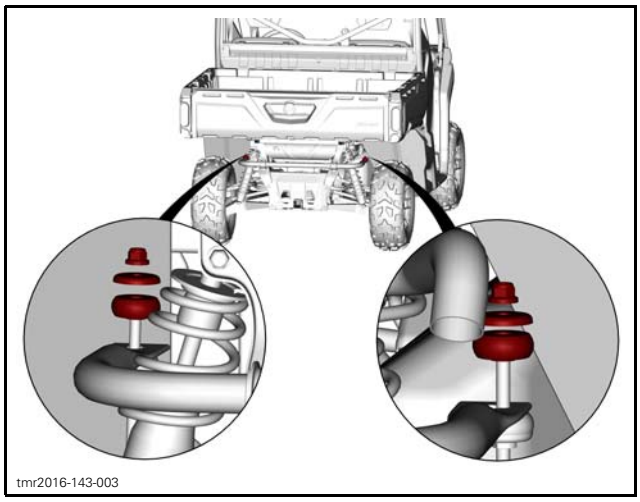
Installing the Spring

The installation is the reverse of the removal procedure.

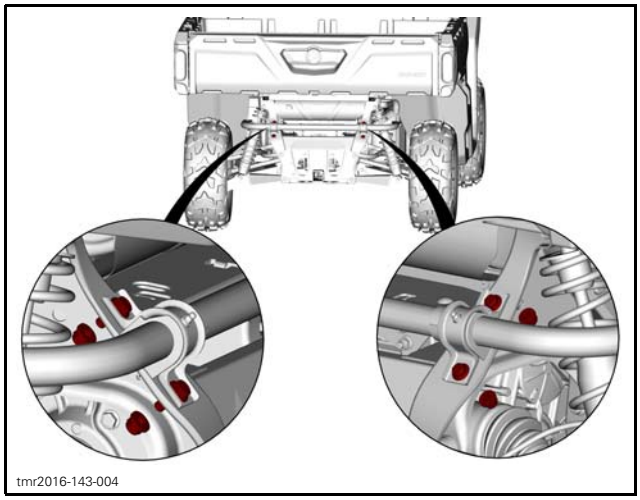
STABILIZER BAR

Removing the Stabilizer Bar

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Remove the stabilizer link upper nuts, stabilizer link bushing plates and stabilizer link bushings.


tmr2016-143-003

3. Remove stabilizer bar retaining screws.


tmr2016-143-004

4. Remove stabilizer bar.

Inspecting the Bar

Check stabilizer bar for cracks, bending or other damages.

Replace if necessary.

Installing the Bar

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install stabilizer link nuts and stabilizer bar screws loosely.

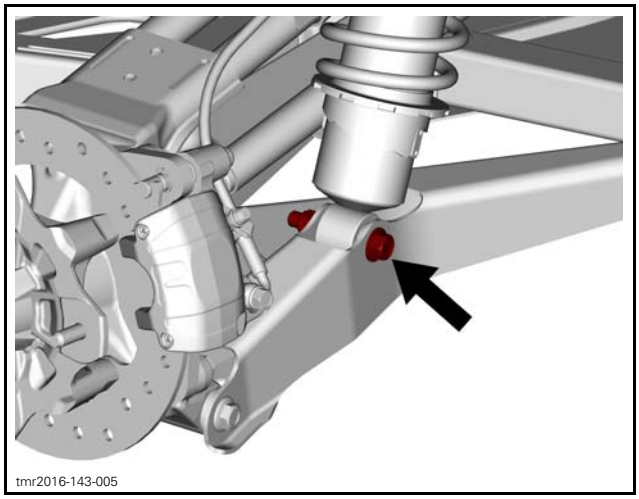
Using the following sequence, tighten fasteners as per the specification.

1. Stabilizer link nuts
2. Stabilizer bar screws

LOWER SUSPENSION ARM

Removing the Lower Suspension Arm

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Remove wheel.
3. Detach the shock absorber from the lower suspension arm.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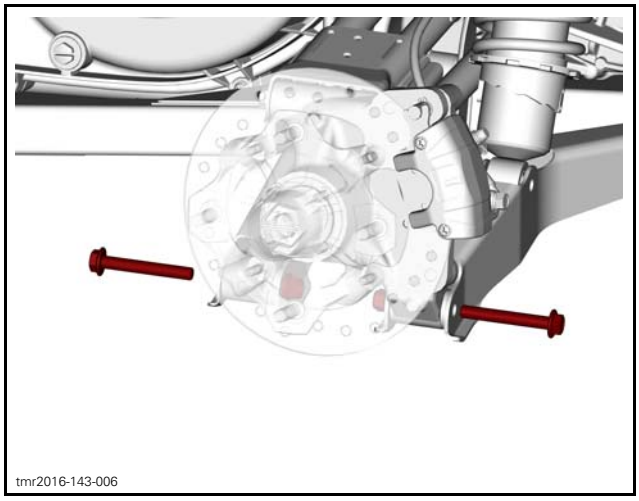
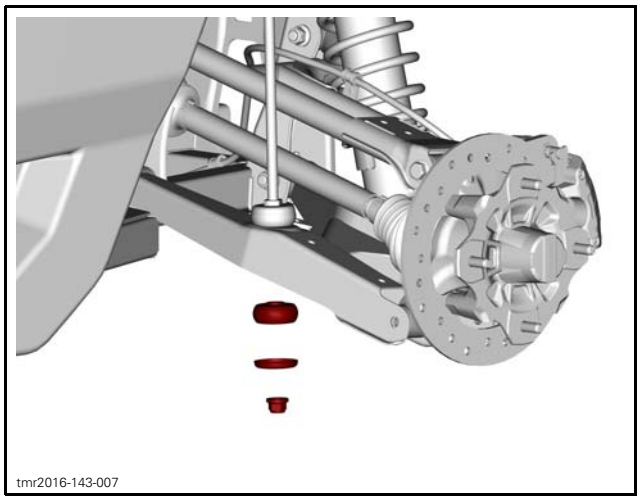
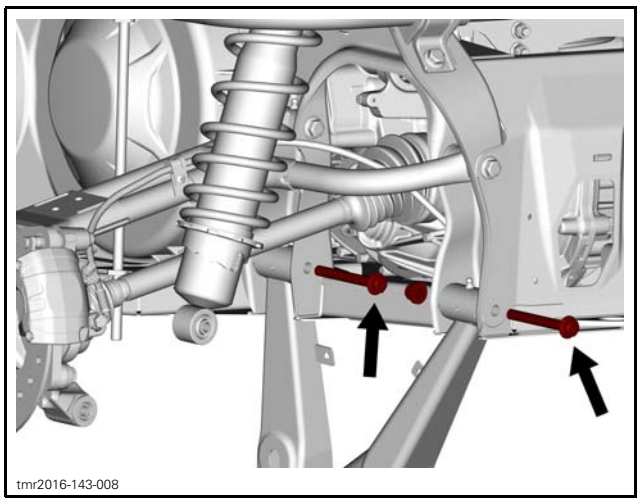
4. Remove bolts and nuts securing lower suspension arm to knuckle.


tmr2016-143-006

5. Detach the stabilizer link from the lower suspension arm.



6. Remove bolts and nuts securing suspension arm to frame.



SUSPENSION ARM TO THE FRAME - BOLTS AND NUTS

7. Remove suspension arm.

Installing the Lower Suspension Arm

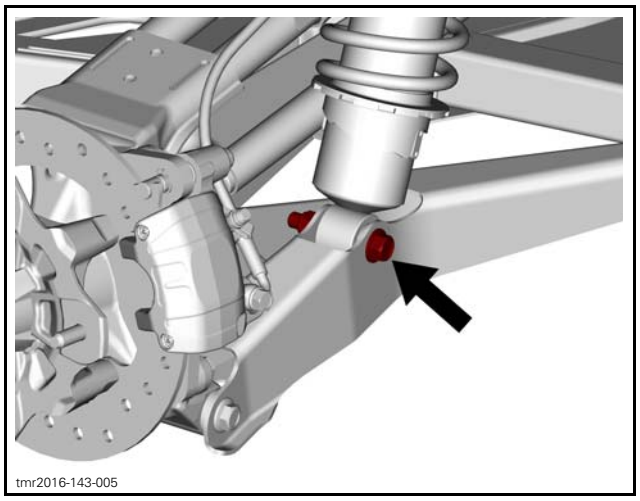
The installation is the reverse of the removal procedure. However, pay attention to the following.

Lubricate suspension arm. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

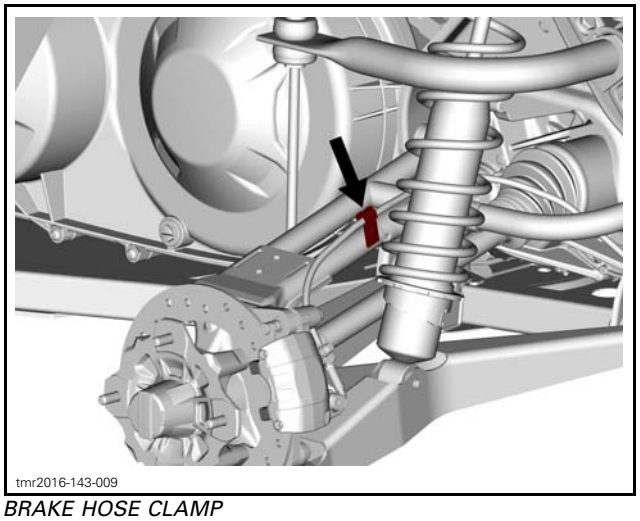
UPPER SUSPENSION ARM

Removing the Upper Suspension Arm

1. Safely lift and support the vehicle off the ground. Refer to *INTRODUCTION* subsection.
2. Remove wheel.
3. Detach the shock absorber from the lower suspension arm.

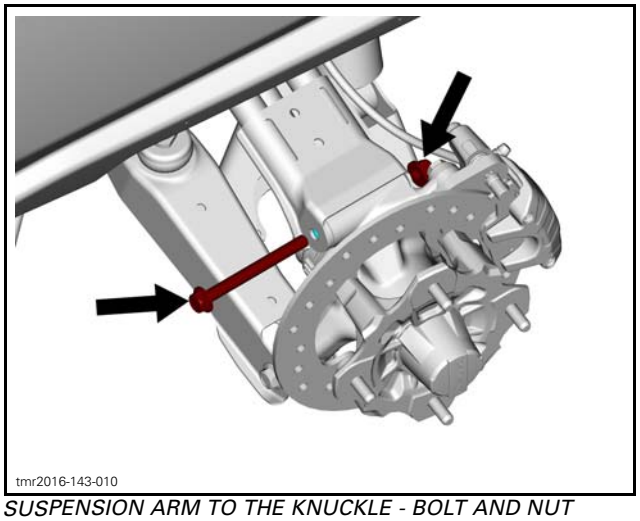


4. Remove the clamp retaining brake hose from the suspension arm.



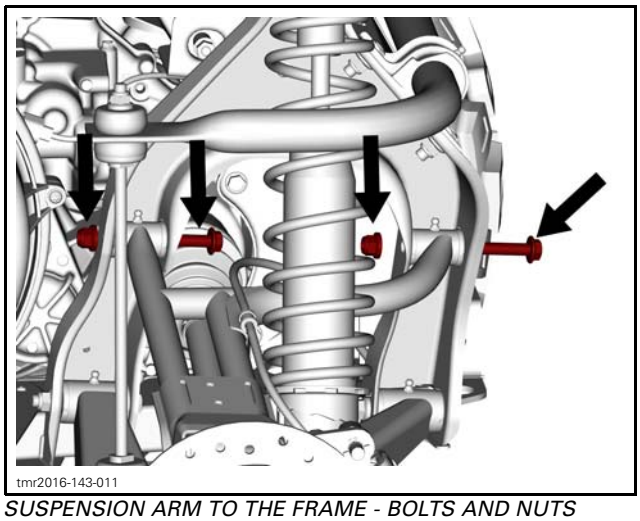
BRAKE HOSE CLAMP

5. Separate the suspension arm from the knuckle.



SUSPENSION ARM TO THE KNUCKLE - BOLT AND NUT

6. Remove fasteners securing suspension arm to frame.


tmr2016-143-011

SUSPENSION ARM TO THE FRAME - BOLTS AND NUTS

7. Remove suspension arm.

Installing the Upper Suspension Arm

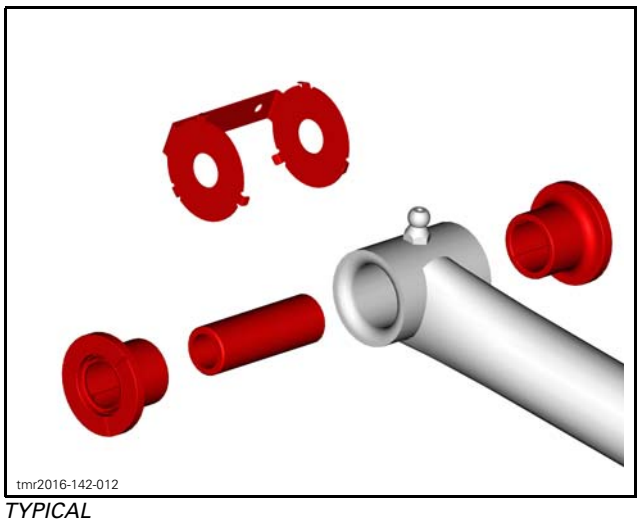
The installation is the reverse of the removal procedure. However, pay attention to the following.

Lubricate suspension arm. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

SUSPENSION ARM BUSHINGS

Removing the Suspension Arm Bushings

1. Remove wear plates, cushions and inner bushings from suspension arm.


tmr2016-142-012

TYPICAL

Installing the Suspension Arm Bushings

The installation is the reverse of the removal procedure. However, pay attention to the following.

Lubricate suspension arm. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

BRAKES

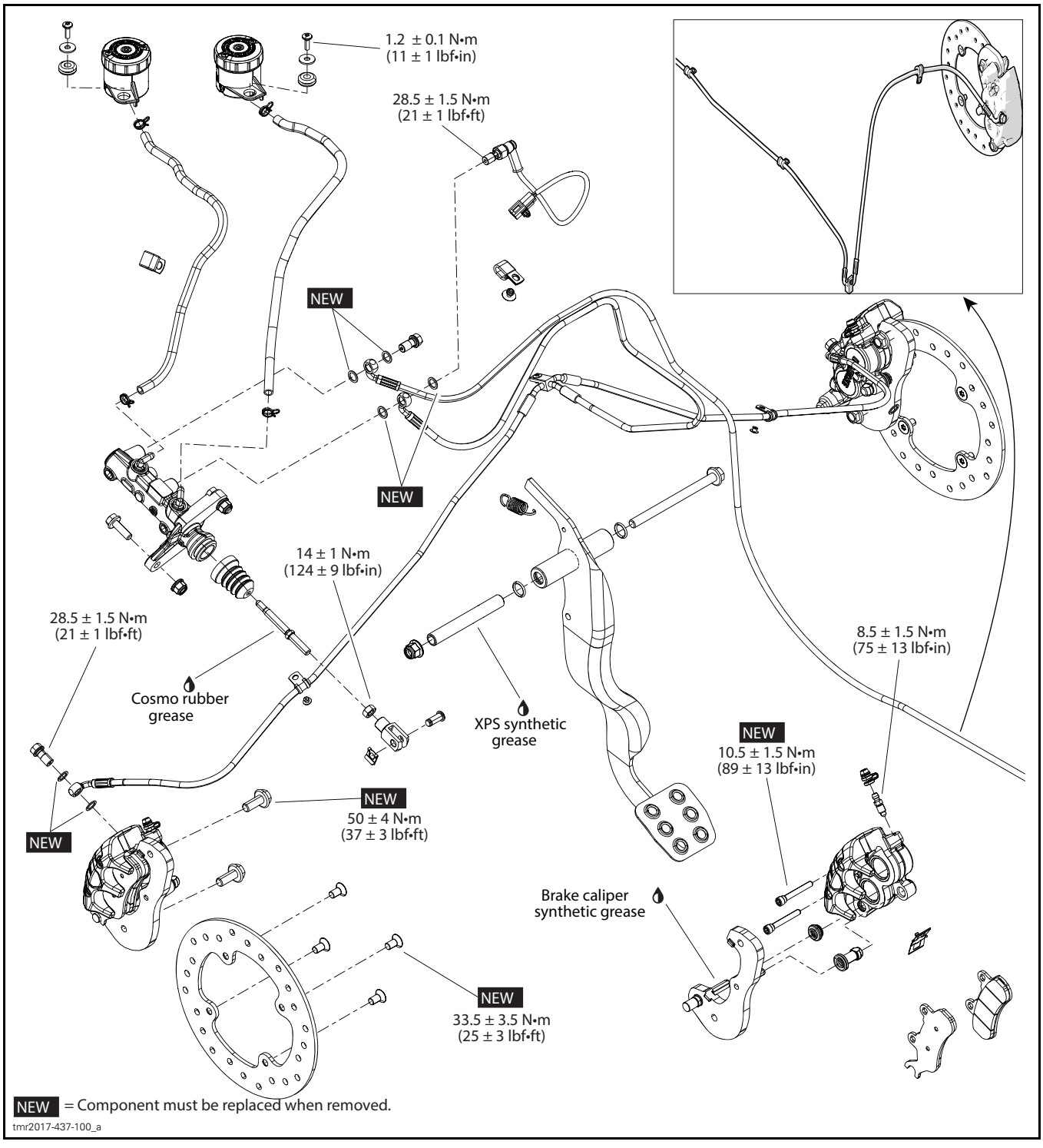
SERVICE TOOLS

Description	Part Number	Page
ECM ADAPTER TOOL	529 036 166	6
FLUKE 115 MULTIMETER	529 035 868	6

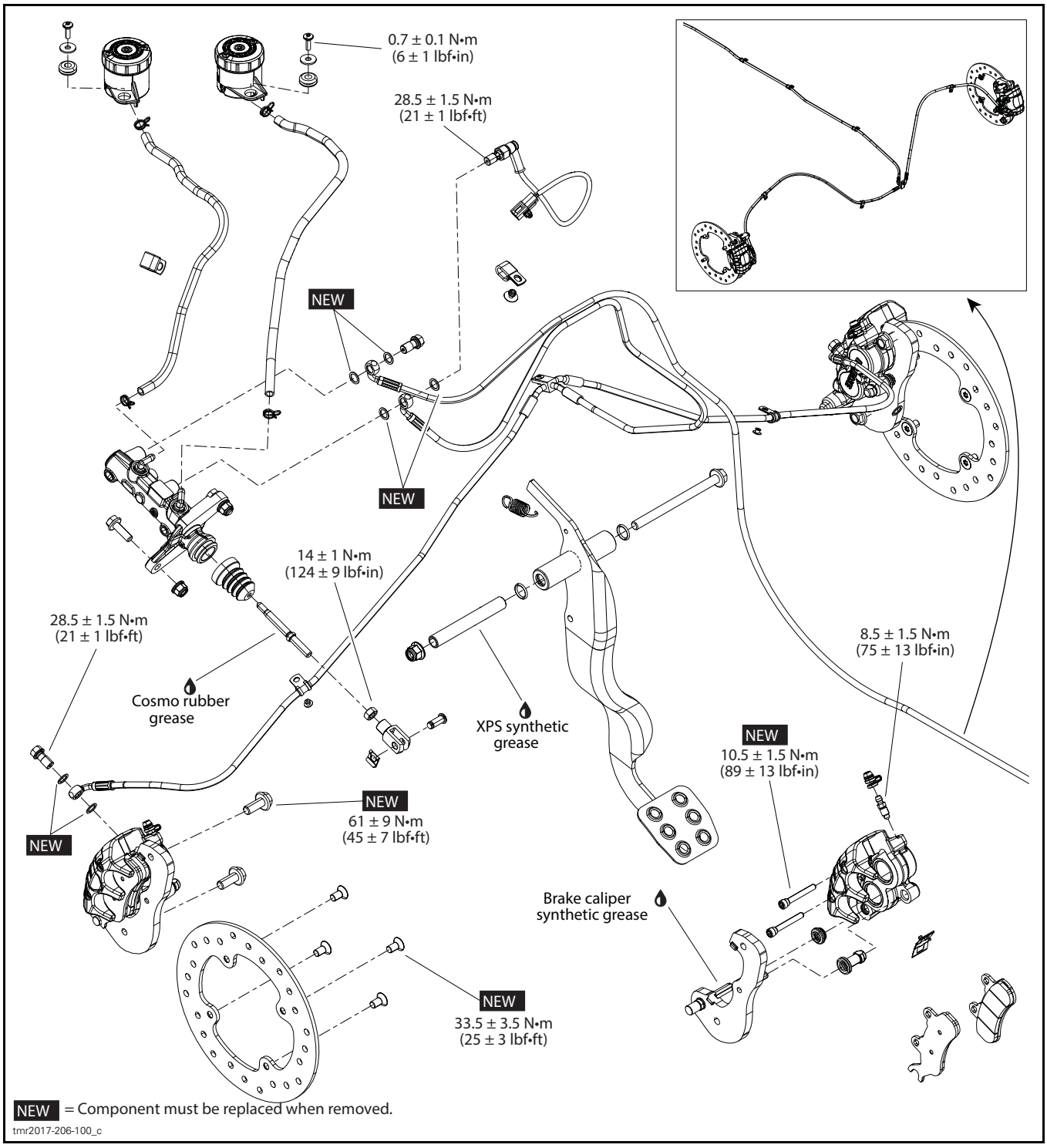
SERVICE PRODUCTS

Description	Part Number	Page
COSMO RUBBER GREASE	715 900 399	7
XPS BRAKES AND PARTS CLEANER (USA)	219 701 705	9–10
XPS BRAKES AND PARTS CLEANER	219 701 776	9–10

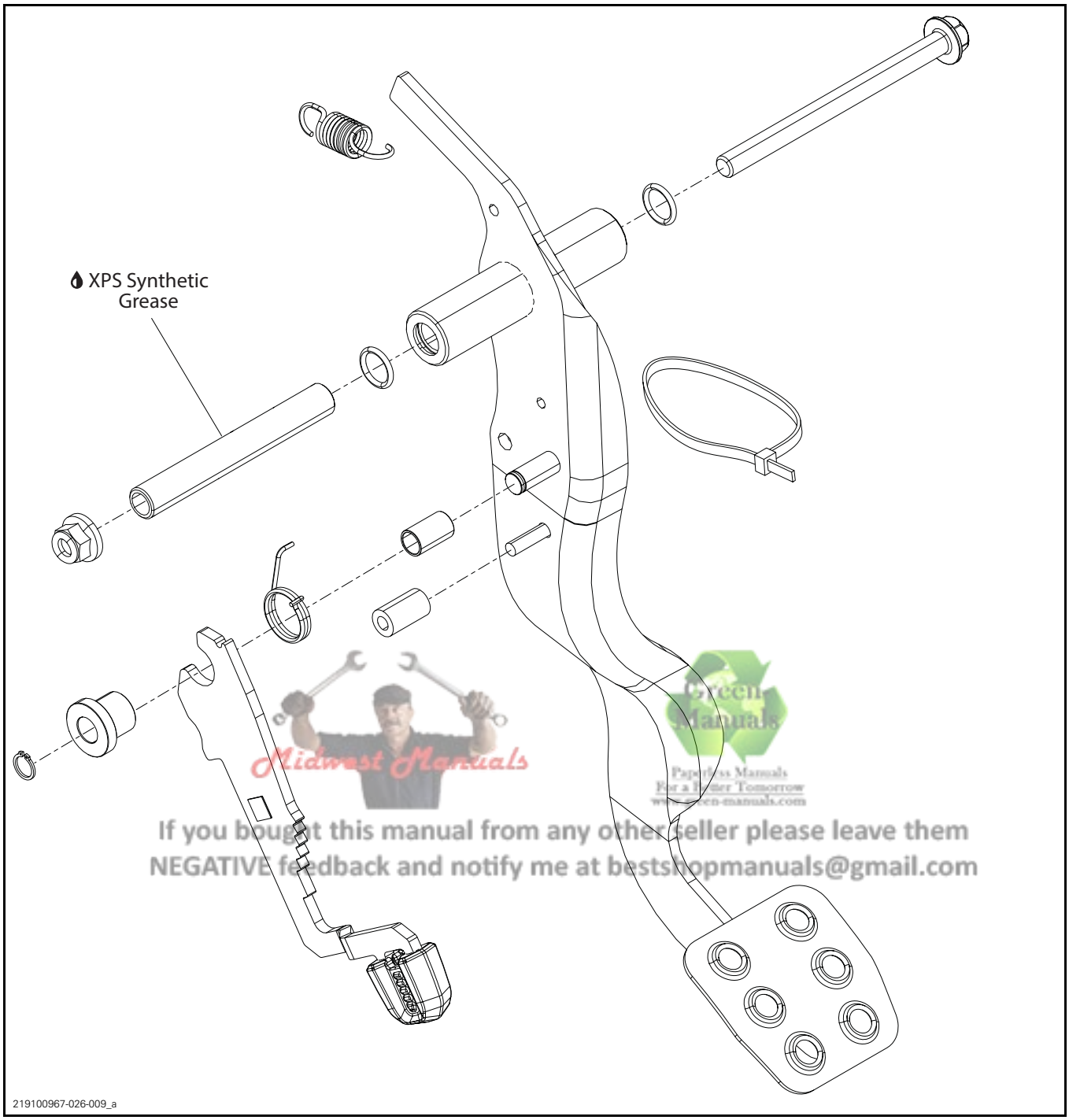
MODEL WITH 1 REAR CALIPER



MODEL WITH 2 REAR CALIPERS



BRAKE LOCKING MECHANISM



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GENERAL

⚠ WARNING

Always check brake system operation after removing or servicing a brake component. If brake pedal feels spongy, make sure all components are properly installed and system is properly bled.

NOTICE Avoid spilling brake fluid on plastic, rubber or painted parts. Protect these parts with a rag when servicing brake system.

Sealing washers must be discarded and replaced with new ones every time a Banjo fitting is unscrewed.

Always clean the area around a brake component before servicing.

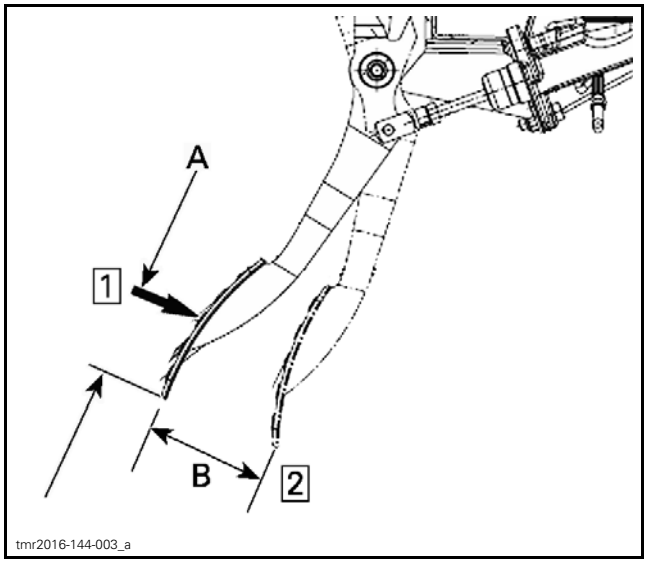
INSPECTION

BRAKE SYSTEM PRESSURE VALIDATION

NOTICE Do not pump up the brake pedal repeatedly before doing the validation.

REQUIRED TOOLS	
Compression force gauge	
Ruler	

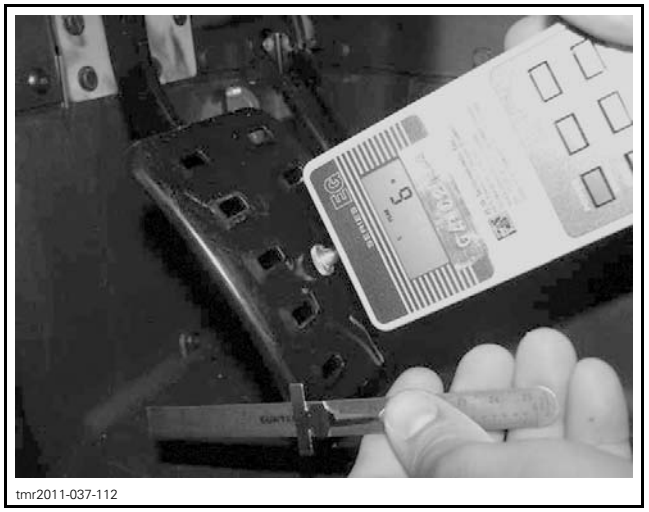
1. Position a ruler perpendicularly to brake pedal.



tmr2016-144-003_a

Step 1: Position compression force gauge at distance A
Step 2: Push brake pedal from distance B

A. 41 mm ± 5 mm (1.6 in ± .2 in)
B. 70 mm (2-3/4 in)



tmr2011-037-112

BRAKE PEDAL LOAD AT 70 MM
Minimum 200 N•m (148 lbf•ft)

2. If load reading is not in accordance with the specification:
   2.1 Clean and inspect the brake system.
   2.2 Bleed brake system.

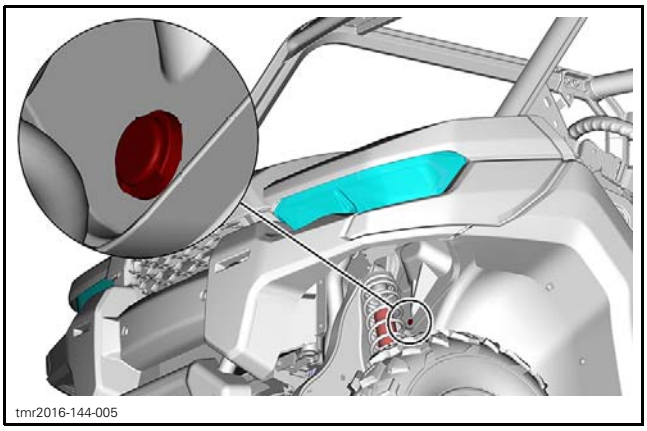
   NOTE: Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

PROCEDURES

BRAKE LIGHT SWITCH

Brake Light Switch Location

Brake light switch is located underneath LH front fender on master cylinder.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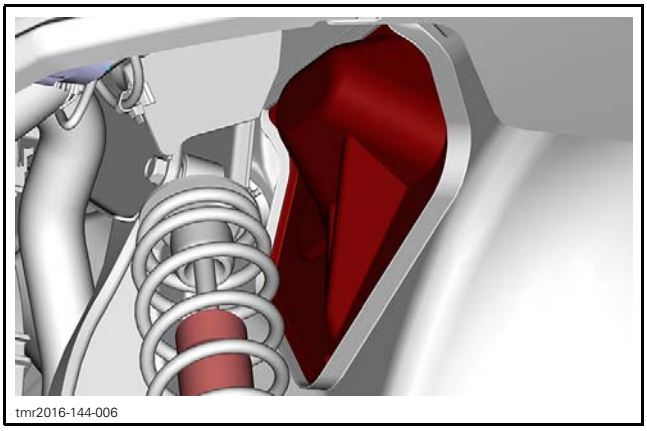
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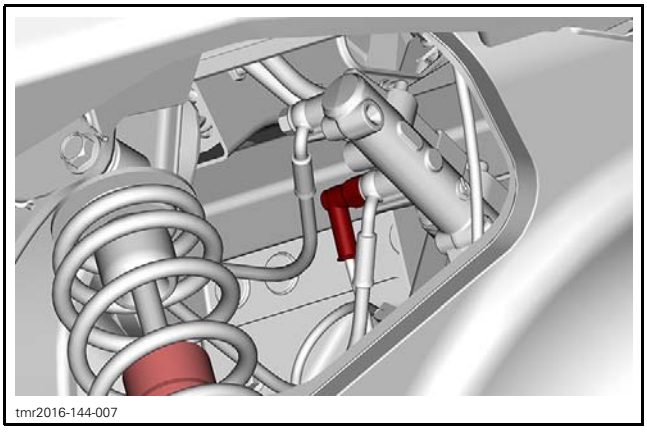
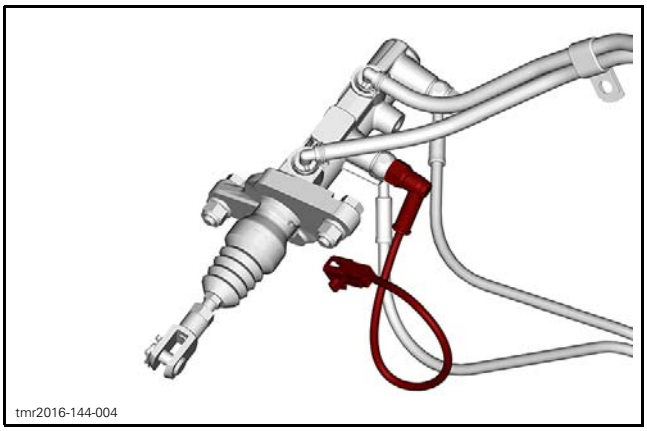

tmr2016-144-007


tmr2016-144-004

Testing the Brake Light Switch Resistance

REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	

1. Disconnect brake light switch connector.
2. Check switch operation as follows.

BRAKE LIGHT SWITCH POSITION	PIN		RESISTANCE
Firmly pushed	1	2	Close to 0 Ω
Released			Infinite (OL)

Replace switch as required.

If the switch tests good, verify wire continuity between harness connector and ECM-B connector.

REQUIRED TOOL	
ECM ADAPTER TOOL (P/N 529 036 166)	

ECM-B CONNECTOR PIN	HARNESS CONNECTOR WIRES	RESISTANCE
C-3	RED/ORANGE	Close to 0 Ω

NOTE: If only the LH taillight does not work, check brake relay (R8) in fuse box 1.

Replacing the Brake Light Switch

1. Disconnect brake light switch connector.
2. Drain front brake line.
3. Remove brake light switch from master cylinder.

NOTE: Use shop rags to catch any spilled brake fluid.

4. Install new sealing washers.
5. Install new brake light switch on master cylinder.

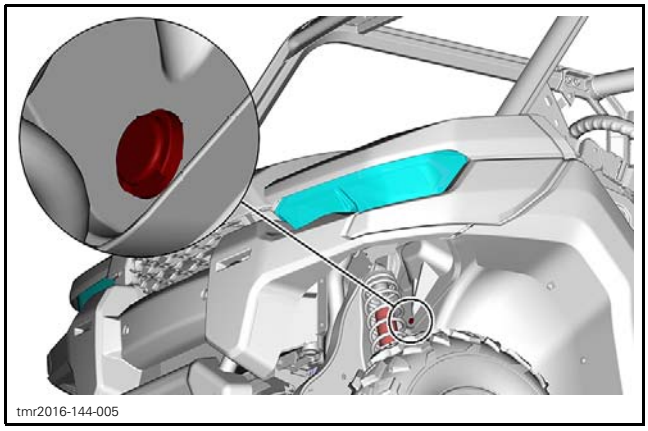
TIGHTENING TORQUE	
Brake light switch	28.5 N•m ± 1.5 N•m (21 lbf•ft ± 1 lbf•ft)

6. Connect brake light switch connector.
7. Refill and bleed brake system. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

MASTER CYLINDER

Removing the Master Cylinder

1. Drain brake system, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.
2. Remove master cylinder protective cover.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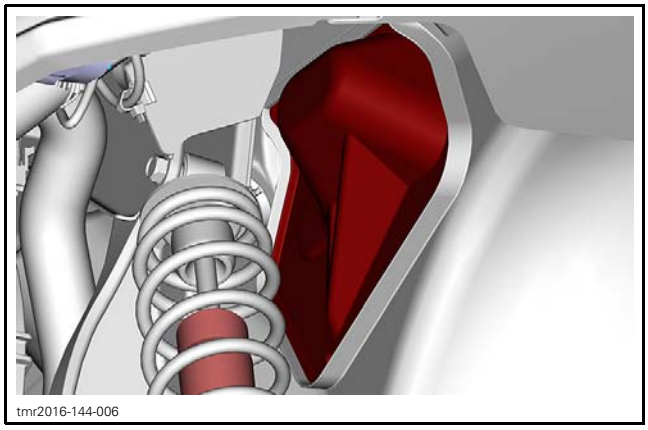
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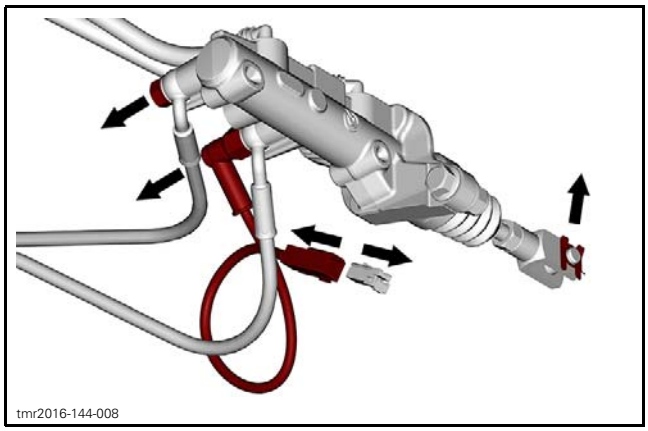
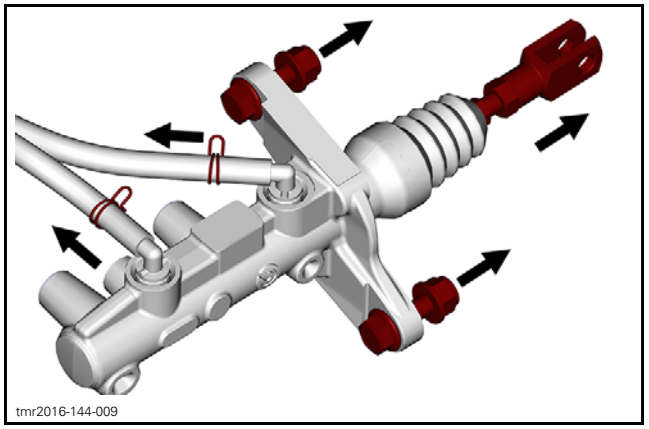
3. Remove / disconnect:
   1. Master cylinder push rod clip
   2. Brake light switch connector
   3. Brake light switch and rear brake hose banjo fitting screw.


tmr2016-144-008

4. Remove / disconnect:
   1. Master cylinder push rod
   2. Brake oil reservoir hoses
   3. Master cylinder screws.


tmr2016-144-009

5. Remove master cylinder from vehicle.

Inspecting the Master Cylinder

Check boot for crack.

Check rod for wear and scratch.

Check master cylinder housing and reservoir for leaks or damage.

Installing the Master Cylinder

The installation is the reverse of the removal procedure. However, pay attention to the following.

Install new sealing washers.

TIGHTENING TORQUE	
Rear brake hose banjo fitting screw	28.5 N•m ± 1.5 N•m (21 lbf•ft ± 1 lbf•ft)
Brake light switch nut	

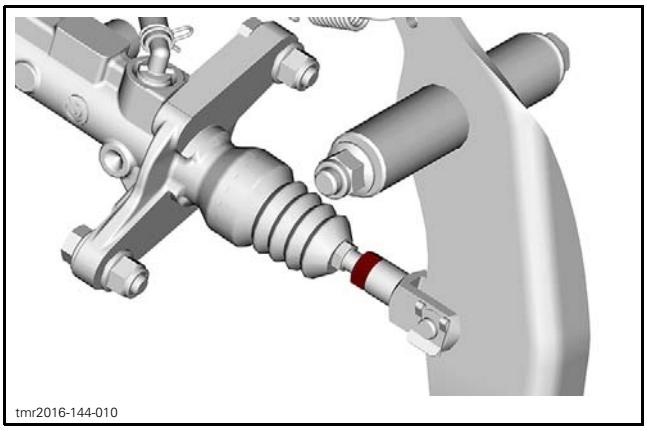
SERVICE PRODUCT	
Push rod end lubrication	COSMO RUBBER GREASE (P/N 715 900 399)
Master cylinder boot lubrication	

Refill and bleed brake system. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Adjust master cylinder rod. Refer to *ADJUSTING THE MASTER CYLINDER ROD* in this subsection.

Adjusting the Master Cylinder Rod

1. Loosen locking nut of master cylinder rod.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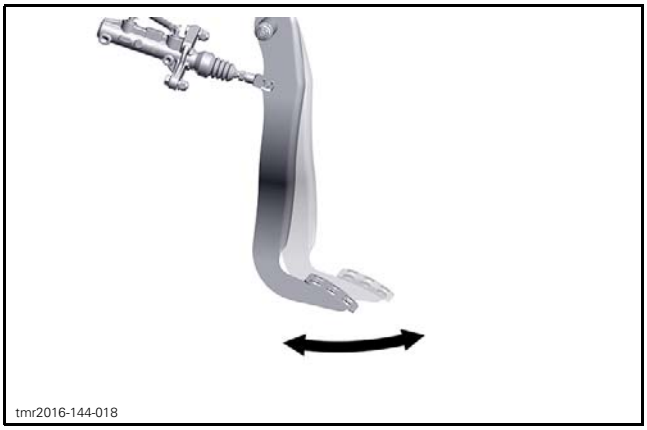
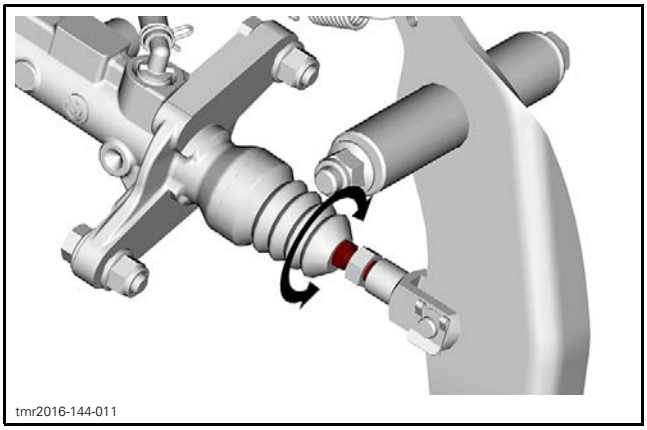
2. Move brake pedal up and down to check if there is a free play.


tmr2016-144-018

3. Rotate master cylinder rod to generate a free play according to specification.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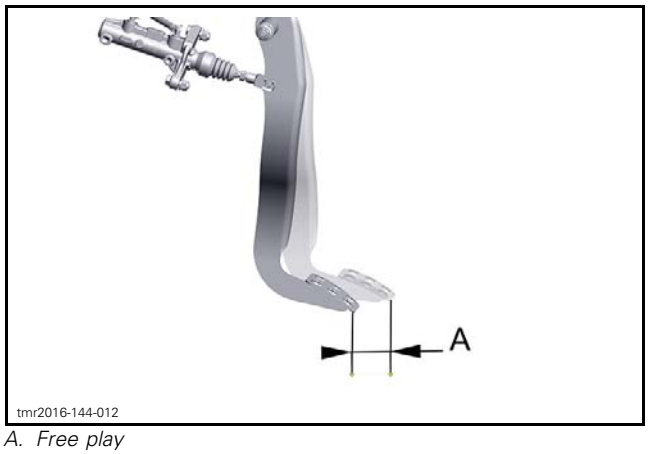


tmr2016-144-012

A. Free play

BRAKE PEDAL FREE PLAY
3.5 mm ± 1.5 mm (1/8 in ± 1/16 in)

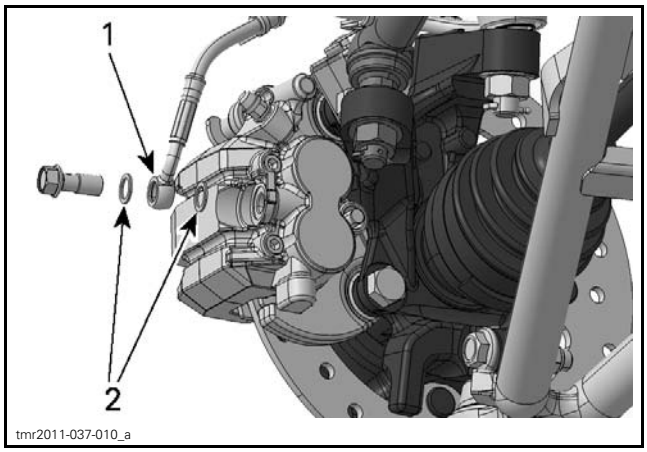
4. Tighten locking nut of master cylinder rod to specification.

TIGHTENING TORQUE	
Rod locking nut	14 N•m ± 1 N•m (124 lbf•**in** ± 9 lbf•**in**)

CALIPER

Removing the Caliper

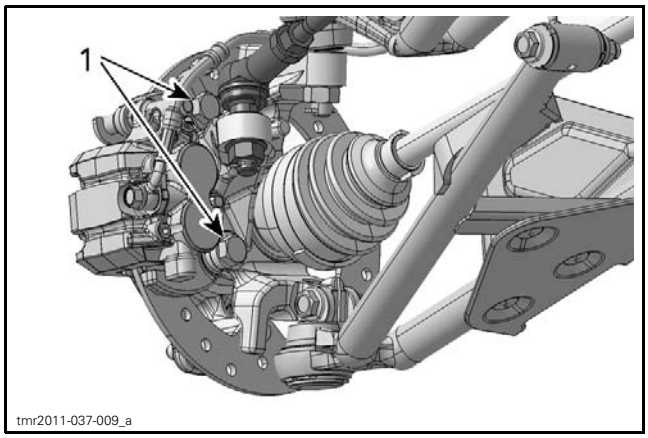
1. Remove wheel. Refer to *WHEELS AND TIRES* subsection.
2. If caliper is removed from vehicle for replacement, remove brake hose banjo fitting screw.



tmr2011-037-010_a

TYPICAL - FRONT CALIPER SHOWN
1. Brake hose
2. Sealing washers

3. Remove screws securing caliper support to knuckle.



TYPICAL - FRONT CALIPER SHOWN
1. Caliper screws

4. Place caliper assembly onto a support.

NOTICE **Do not let caliper hangs by the hose and do not stretch or twist hose.**

Installing the Caliper

The installation is the reverse of the removal procedure. However, pay attention to the following.

If caliper was removed for replacement:

– Install new sealing washers.
– Refill and bleed brake system. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

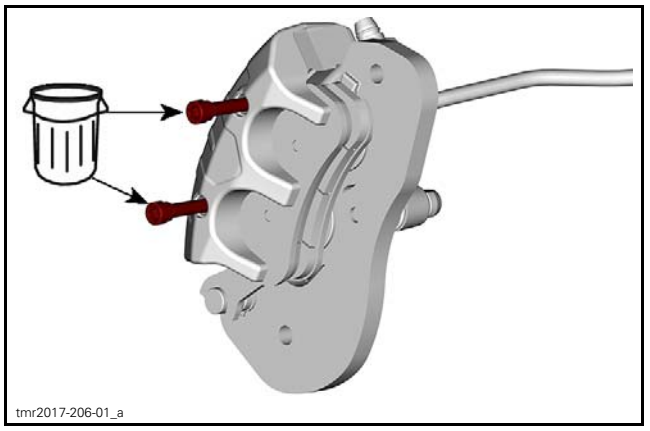
Install new caliper retaining screws

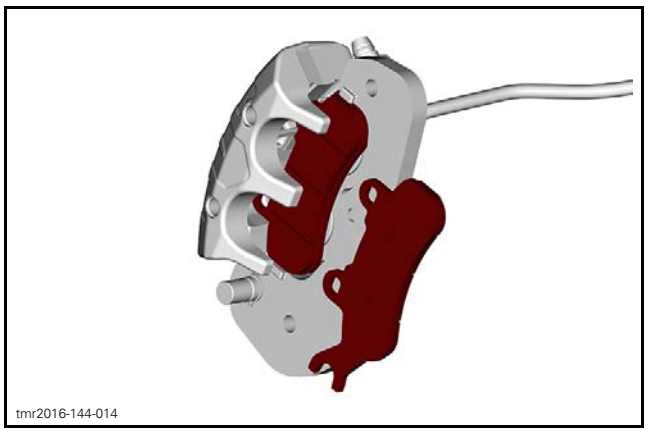
TIGHTENING TORQUE	
Brake hose banjo fitting screw	28.5 N•m ± 1.5 N•m (21 lbf•ft ± 1 lbf•ft)
Caliper retaining screw	61 N•m ± 9 N•m (45 lbf•ft ± 7 lbf•ft)

BRAKE PADS

Replacing the Brake Pads

1. Loosen brake pad pins.
2. Remove caliper from knuckle. Refer to *REMOVING THE CALIPER* in this subsection.
3. Remove and discard brake pad pins and pads.

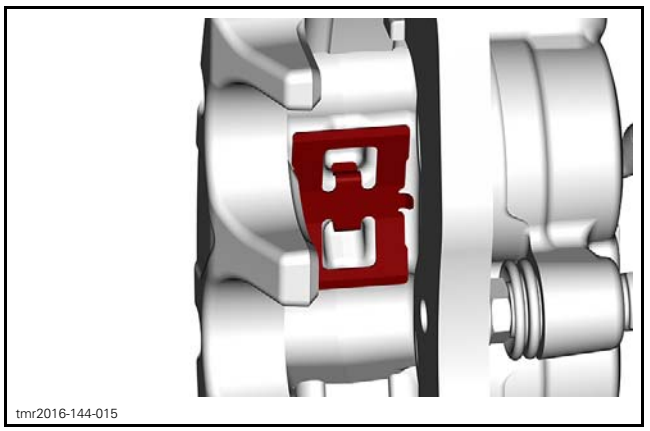


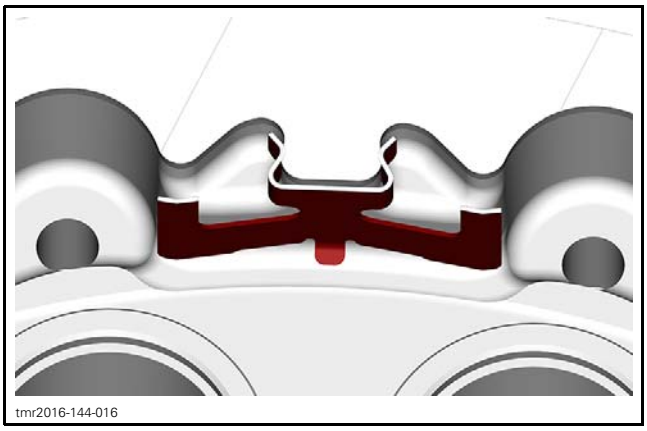


4. Use XPS BRAKES AND PARTS CLEANER (USA) (P/N 219 701 705) or XPS BRAKES AND PARTS CLEANER (P/N 219 701 776) to clean pistons end.
5. Push caliper pistons inward.

NOTE: To avoid damaging pistons, use an old pad to push it into the caliper using a C-clamp.

6. Ensure brake pad spring is properly positioned onto caliper.




tmr2016-144-016

7. Install new brake pads.
8. Use XPS BRAKES AND PARTS CLEANER (USA) (P/N 219 701 705) or XPS BRAKES AND PARTS CLEANER (P/N 219 701 776) to clean brake pad pins.
9. Install new brake pad pins.
10. Install caliper on knuckle, refer to *INSTALLING THE CALIPER* in this subsection.
11. Tighten brake pad pins to specification.

TIGHTENING TORQUE	
Brake pad pin	10 N•m ± 1.5 N•m (89 lbf•**in** ± 13 lbf•**in**)

BRAKE DISC

Inspecting the Brake Disc

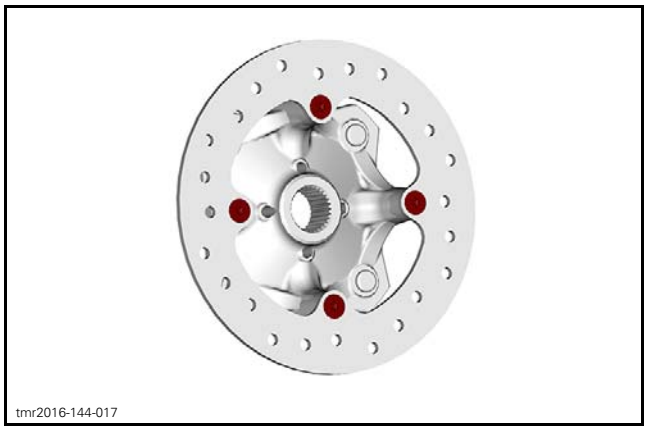
Check disc surfaces for scratches or grooves on both sides.

Measure thickness and warpage of the disc. Ensure measures are as per specifications. Refer to *TECHNICAL SPECIFICATIONS*.

NOTICE **Do not machine Brake discs.**

Replacing the Brake Disc

1. Remove caliper from knuckle. Refer to *REMOVING THE CALIPER* in this subsection.
2. Remove wheel hub. Refer to *FRONT DRIVE* or *REAR DRIVE* subsection.
3. Remove brake disc screws.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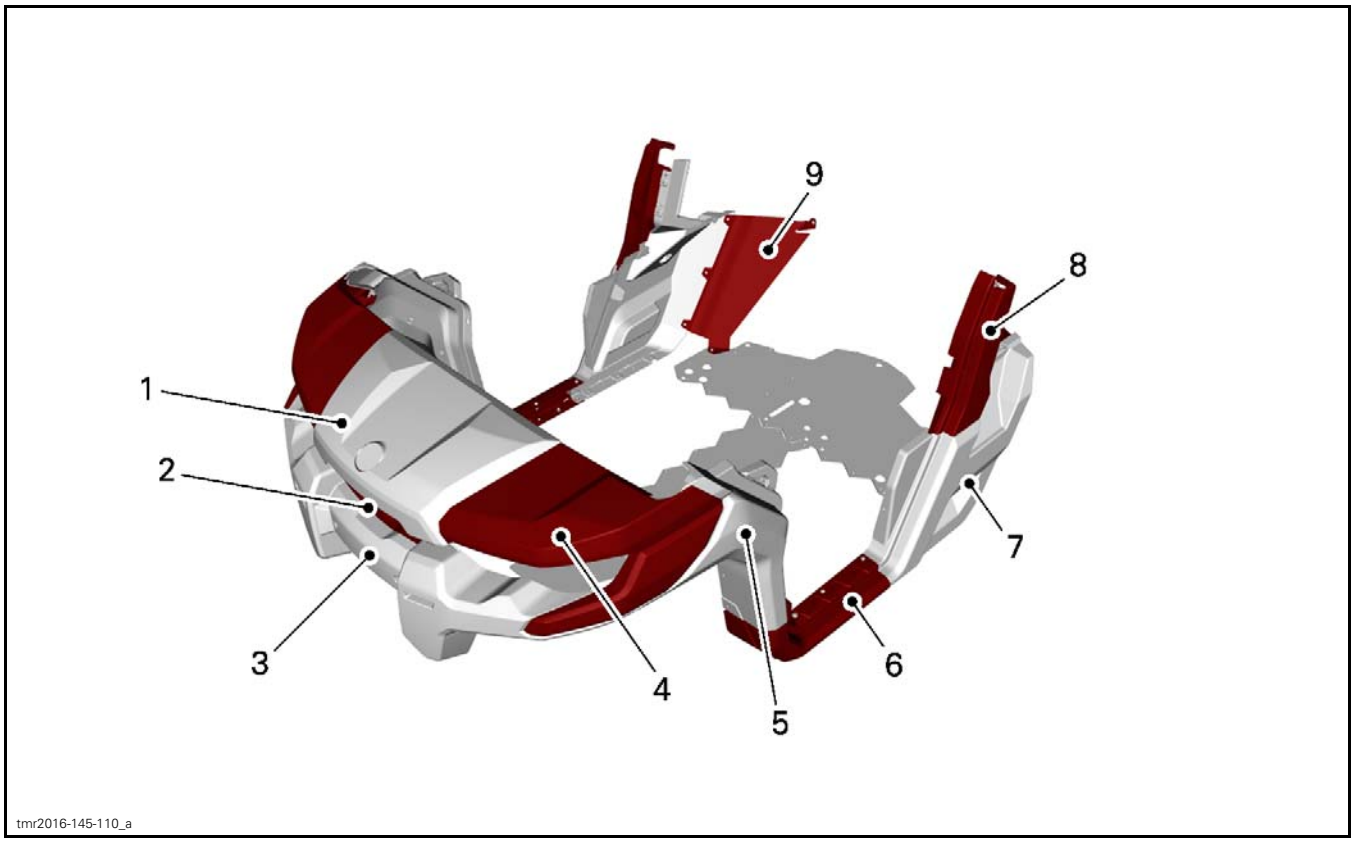
4. Replace brake disc.
5. Install new brake disc screws.
6. Tighten brake disc screws to specification.

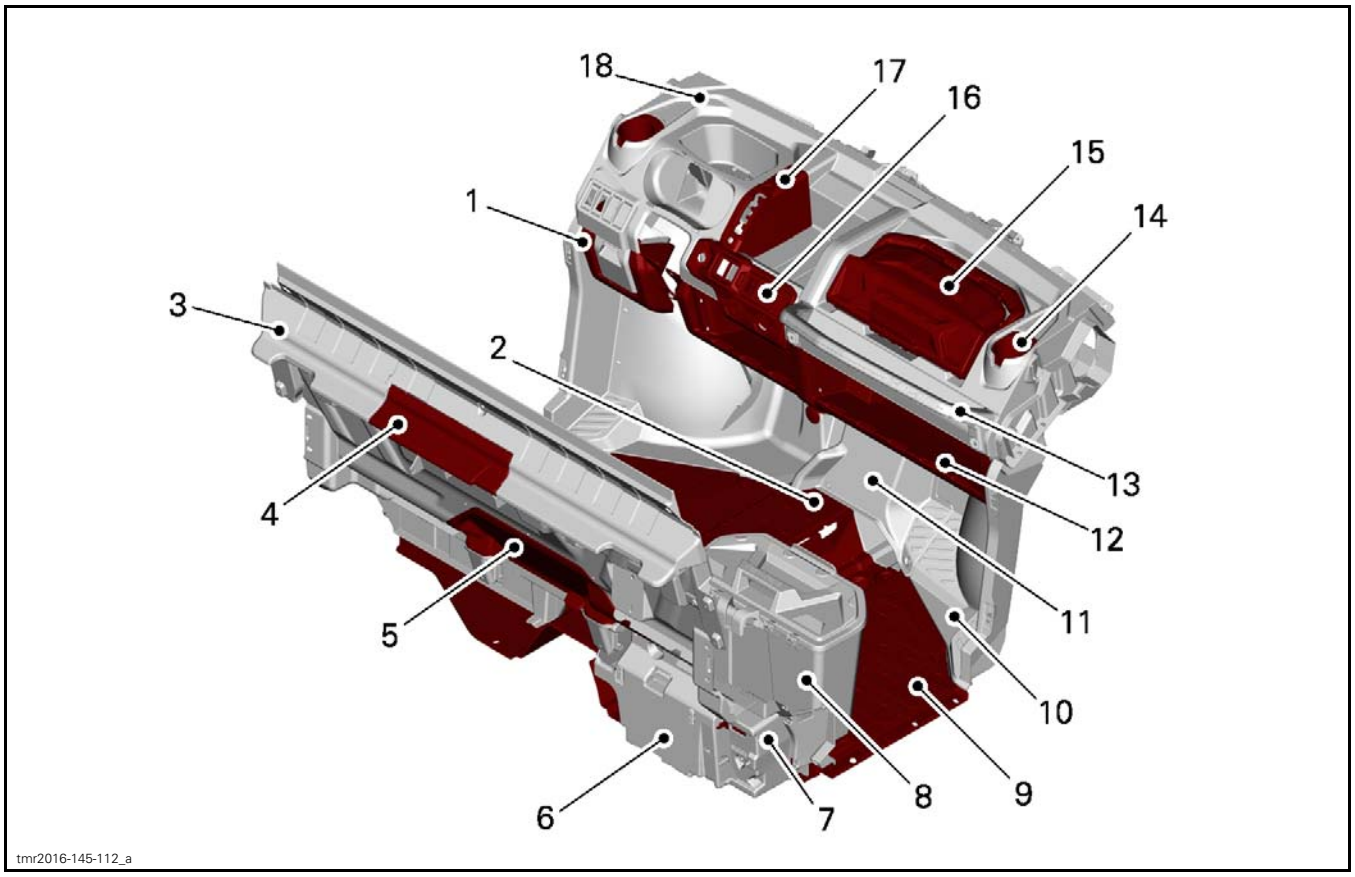
TIGHTENING TORQUE	
Brake disc screw	33.5 N•m ± 3.5 N•m (25 lbf•ft ± 3 lbf•ft)

7. Install wheel hub, then caliper.
8. Install new cotter pin to secure wheel hub nut.

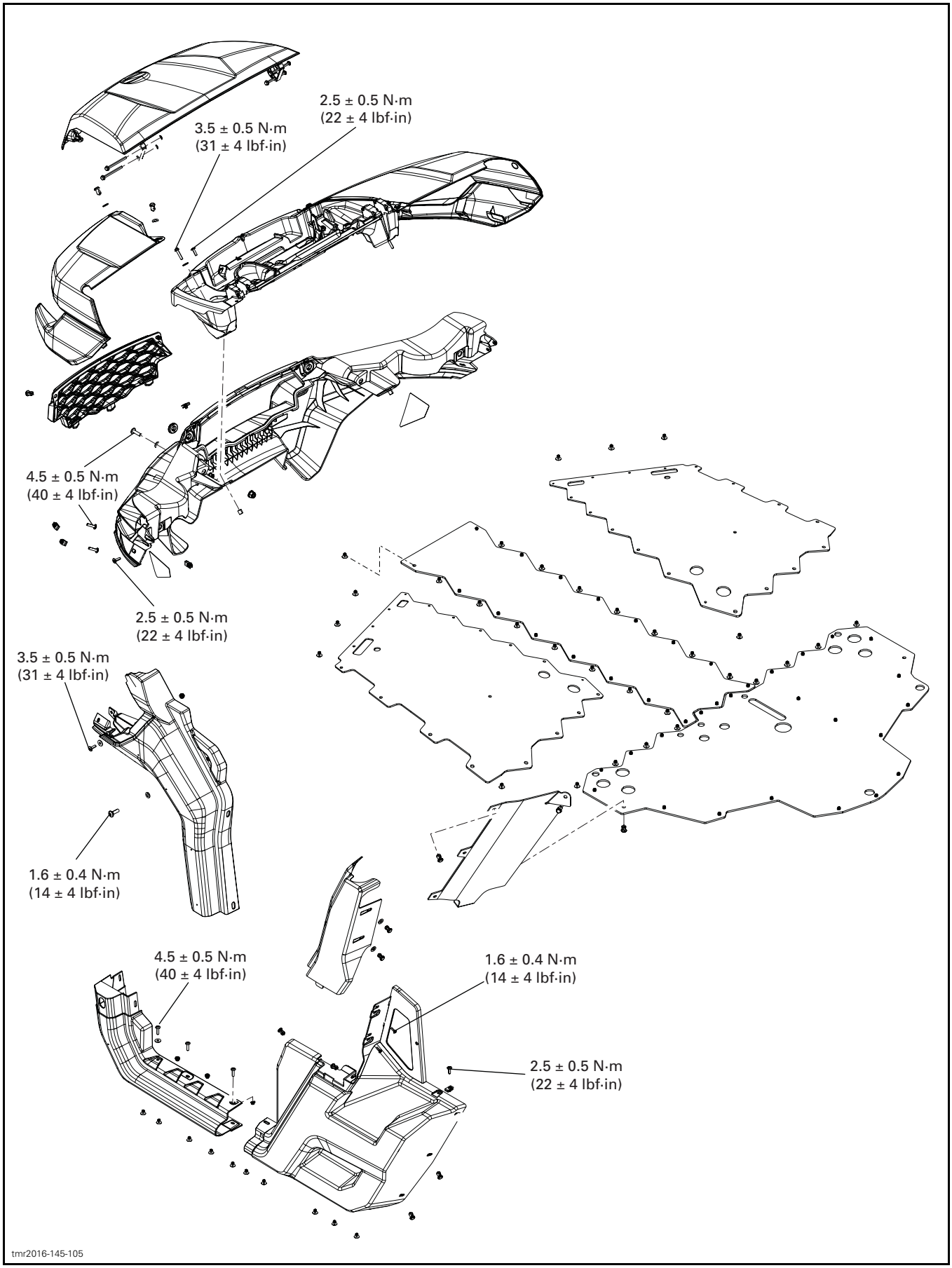
BODY

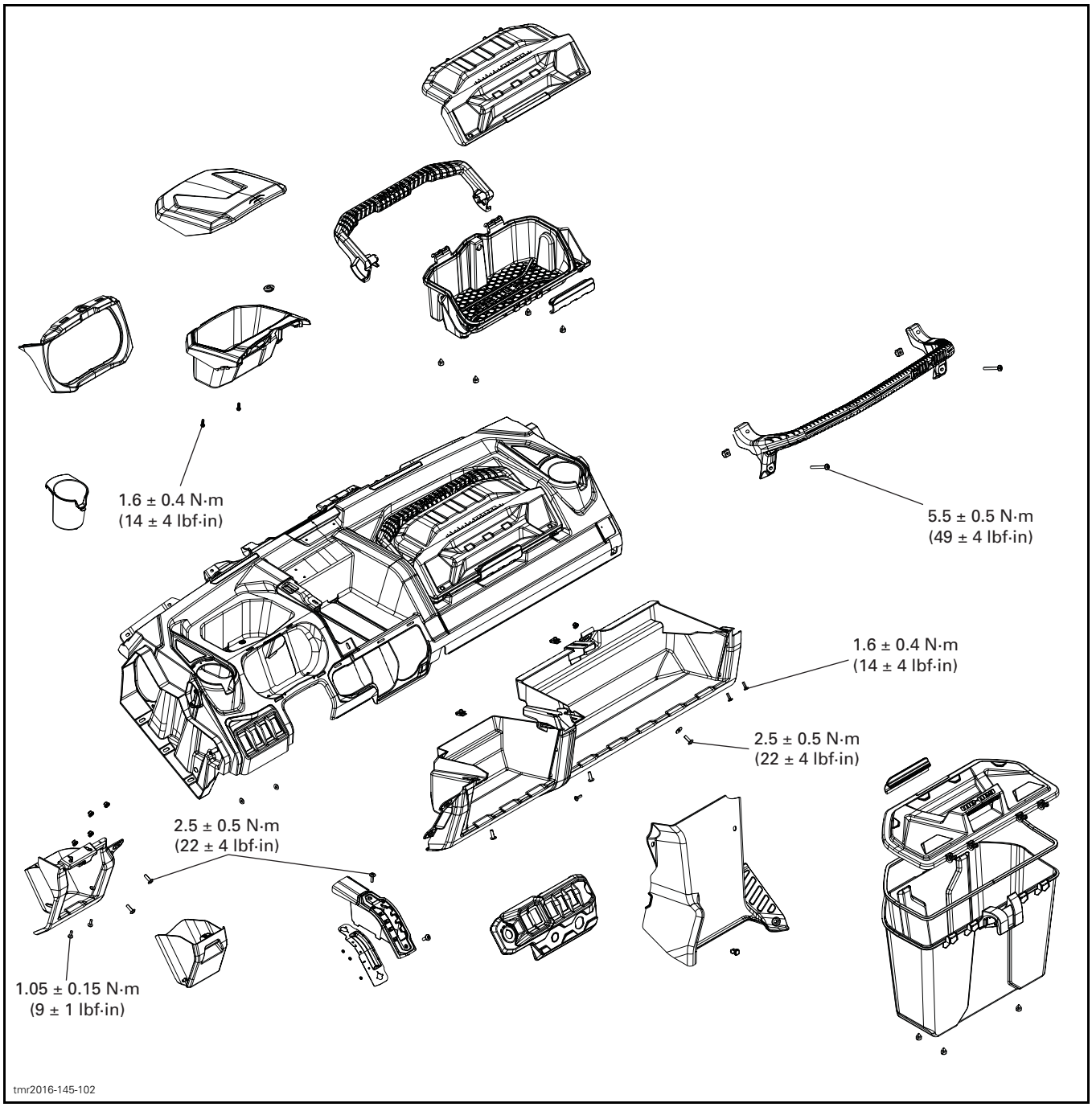


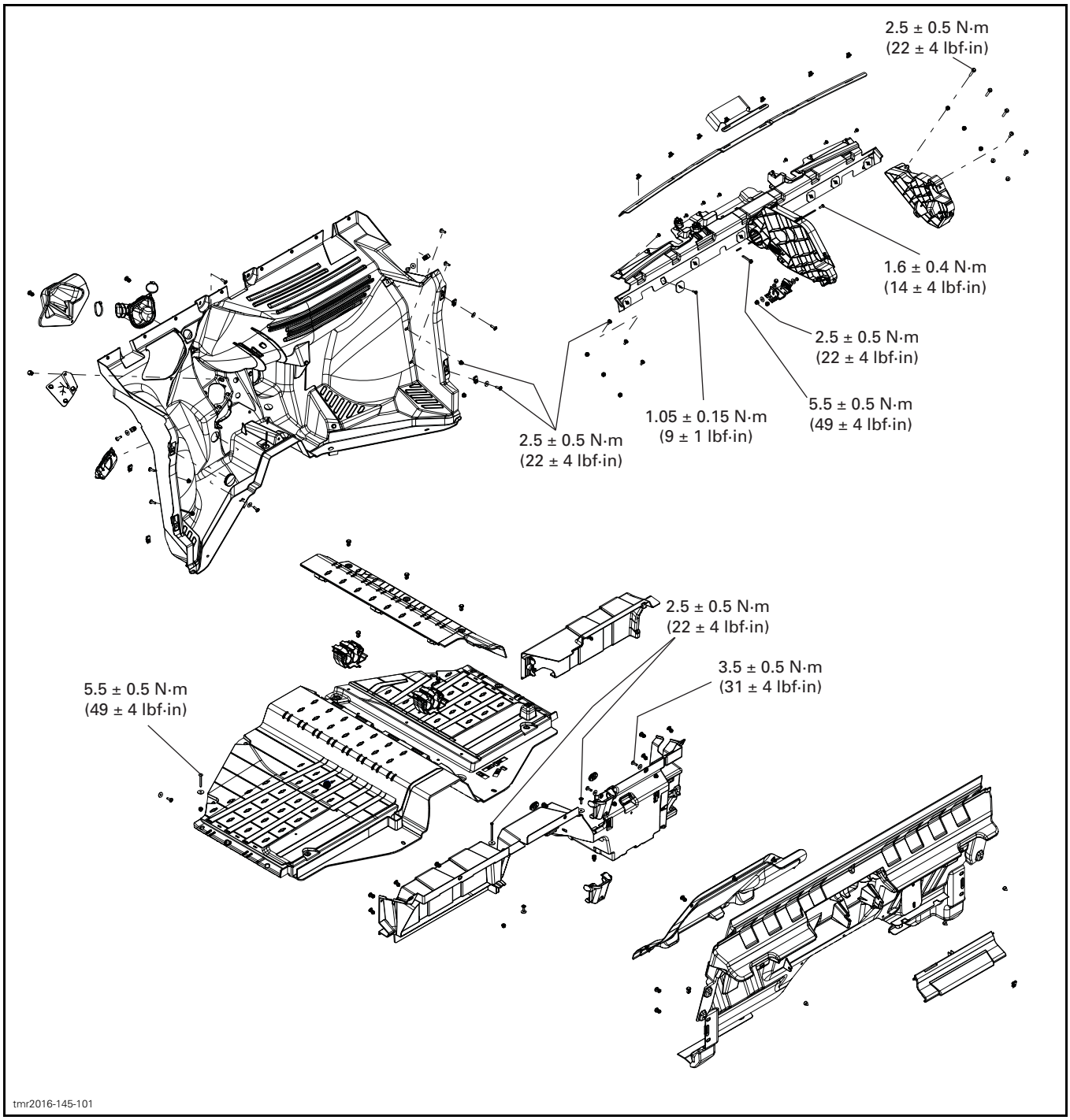
1. *Front service cover*
2. *Front grille*
3. *Front fascia*
4. *Front fender*
5. *Front lateral panel*
6. *Central lateral panel*
7. *Rear lateral panel*
8. *Upper lateral panel*
9. *Rear Deflector*

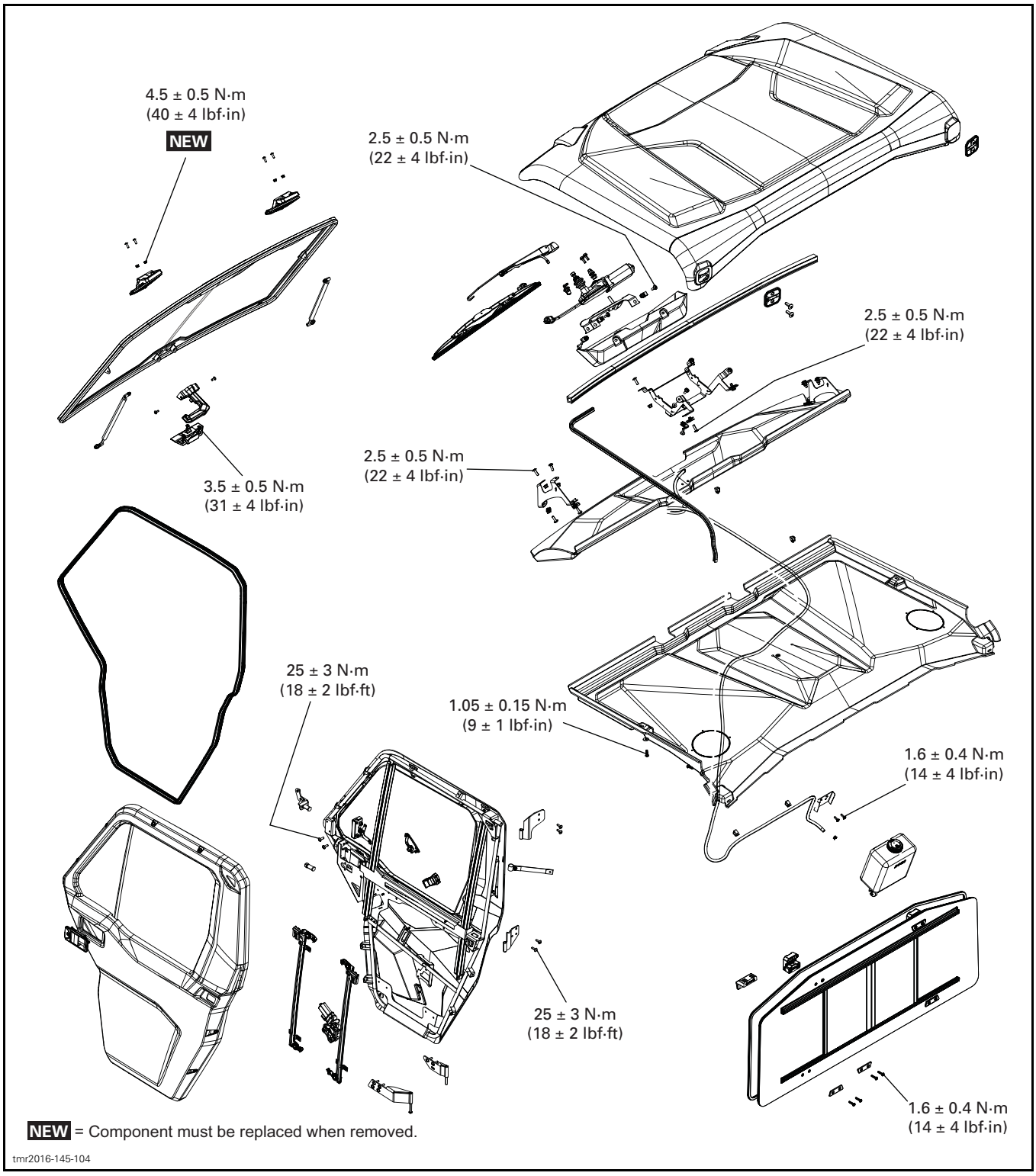


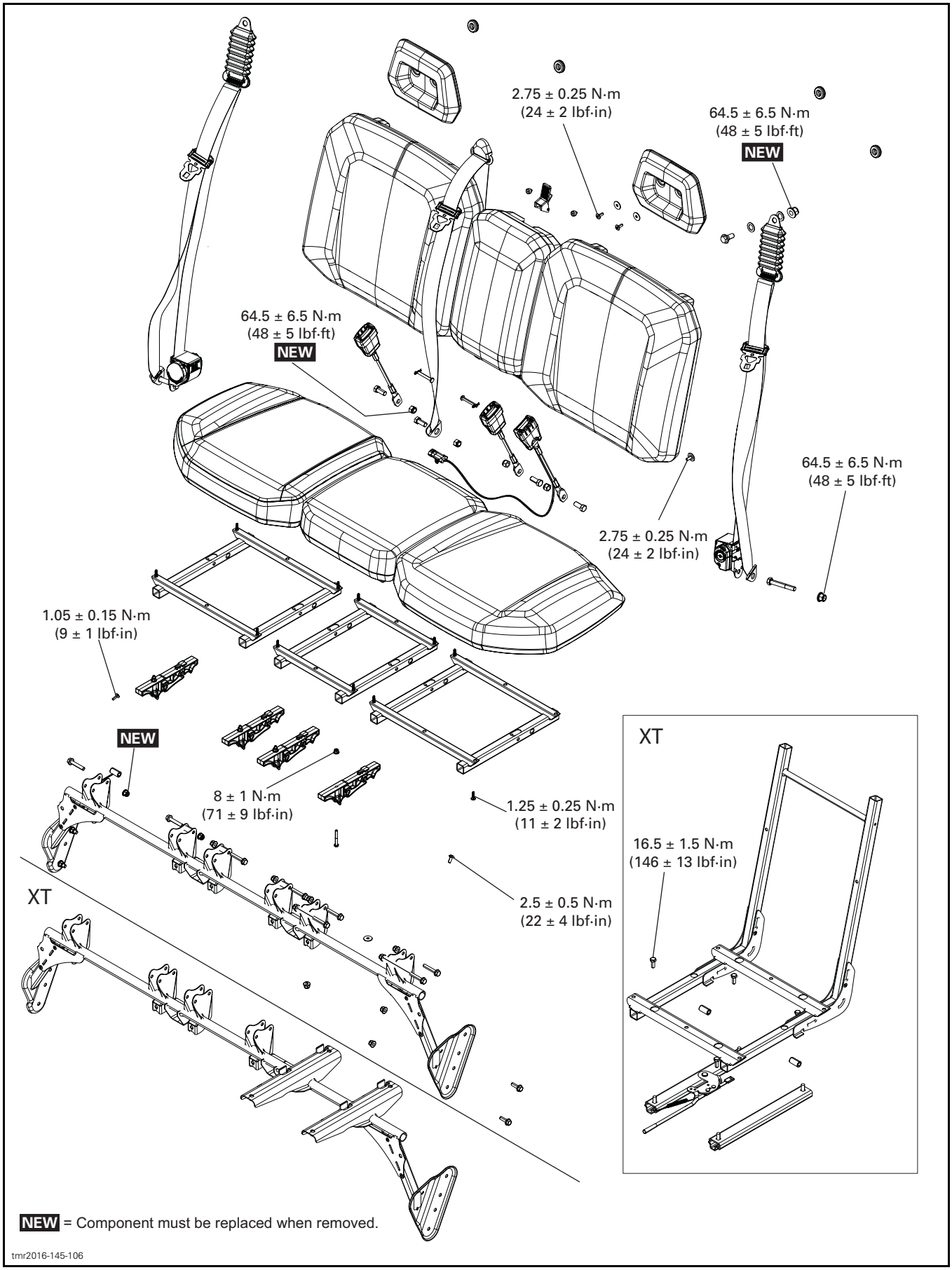
1. *LH lower dash*
2. *Floor cover*
3. *Rear upper bulkhead*
4. *Rear service cover*
5. *Engine service cover*
6. *Rear lower bulkhead*
7. *Battery cover*
8. *Storage box*
9. *Floor*
10. *Front bulkhead*
11. *Front bulkhead cover*
12. *RH lower dash*
13. *Passenger handhold*
14. *Cup holder*
15. *Removable glove box*
16. *Switches panel*
17. *Shift indicator*
18. *Upper dash*

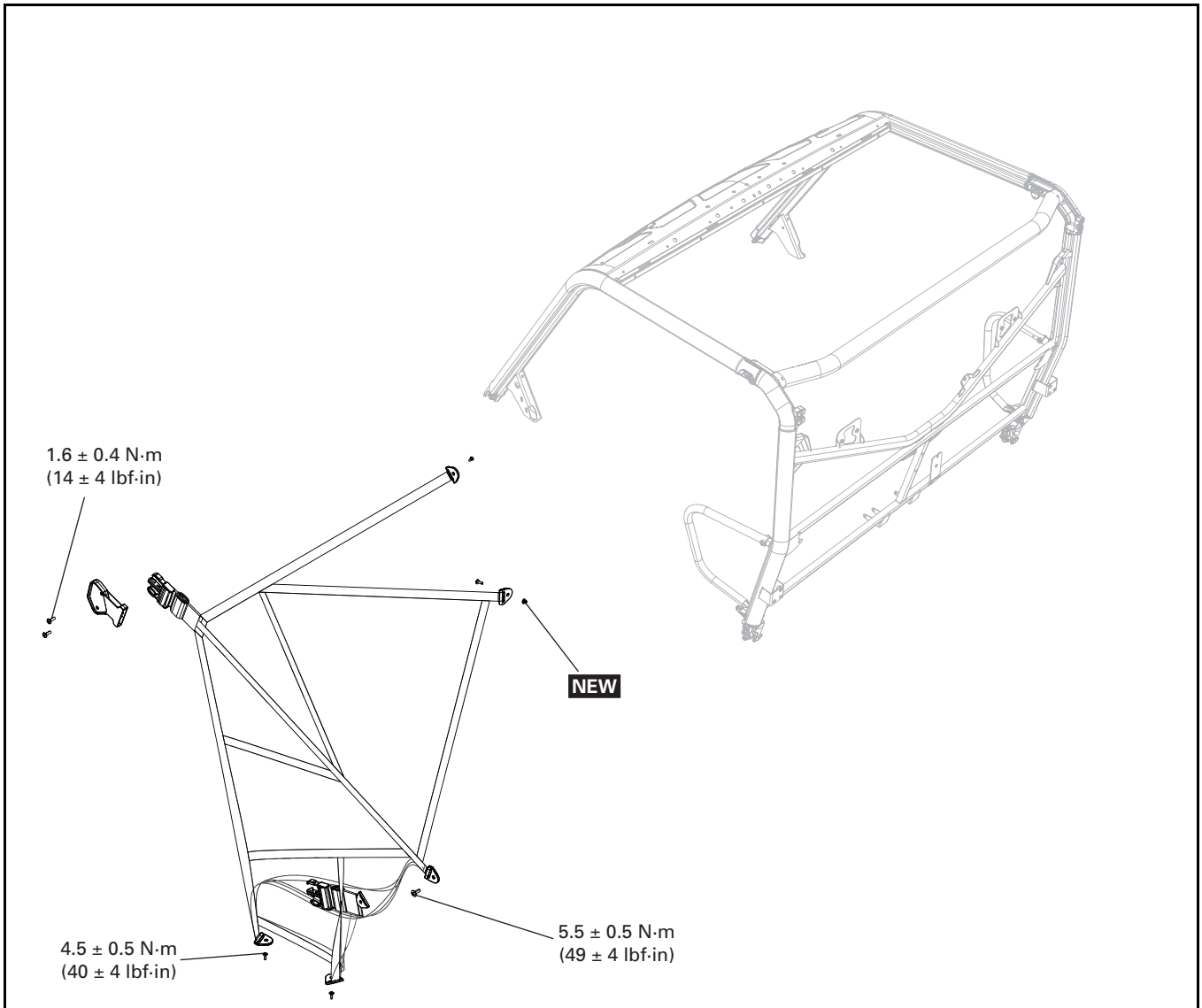

2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
3.5 ± 0.5 N·m
(31 ± 4 lbf·in)
4.5 ± 0.5 N·m
(40 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
3.5 ± 0.5 N·m
(31 ± 4 lbf·in)
1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
4.5 ± 0.5 N·m
(40 ± 4 lbf·in)
1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
tmr2016-145-105


1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
5.5 ± 0.5 N·m
(49 ± 4 lbf·in)
1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
1.05 ± 0.15 N·m
(9 ± 1 lbf·in)
tmr2016-145-102


2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
5.5 ± 0.5 N·m
(49 ± 4 lbf·in)
1.05 ± 0.15 N·m
(9 ± 1 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
3.5 ± 0.5 N·m
(31 ± 4 lbf·in)
5.5 ± 0.5 N·m
(49 ± 4 lbf·in)
tmr2016-145-101


4.5 ± 0.5 N·m
(40 ± 4 lbf·in)
NEW
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
3.5 ± 0.5 N·m
(31 ± 4 lbf·in)
25 ± 3 N·m
(18 ± 2 lbf·ft)
1.05 ± 0.15 N·m
(9 ± 1 lbf·in)
1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
25 ± 3 N·m
(18 ± 2 lbf·ft)
1.6 ± 0.4 N·m
(14 ± 4 lbf·in)
NEW = Component must be replaced when removed.
tmr2016-145-104


2.75 ± 0.25 N·m
(24 ± 2 lbf·in)
64.5 ± 6.5 N·m
(48 ± 5 lbf·ft)
NEW
64.5 ± 6.5 N·m
(48 ± 5 lbf·ft)
NEW
64.5 ± 6.5 N·m
(48 ± 5 lbf·ft)
2.75 ± 0.25 N·m
(24 ± 2 lbf·in)
1.05 ± 0.15 N·m
(9 ± 1 lbf·in)
NEW
8 ± 1 N·m
(71 ± 9 lbf·in)
1.25 ± 0.25 N·m
(11 ± 2 lbf·in)
2.5 ± 0.5 N·m
(22 ± 4 lbf·in)
XT
XT
16.5 ± 1.5 N·m
(146 ± 13 lbf·in)
NEW = Component must be replaced when removed.
tmr2016-145-106



NEW = Component must be replaced when removed.

tmr2016-145-103

PROCEDURES

DECALS

Removing a Decal

Using a heat gun warm up one end of decal for a few seconds until decal can roll off when rubbing with your finger.

Pull decal slowly and when necessary apply more heat to ease removal on the area that has to be peeled off.

If decal tears while pulling off, it has to be heated for a few seconds longer. If decal tends to stretch while pulling off, stop heating and wait a few seconds to let it cool, then peel it off.

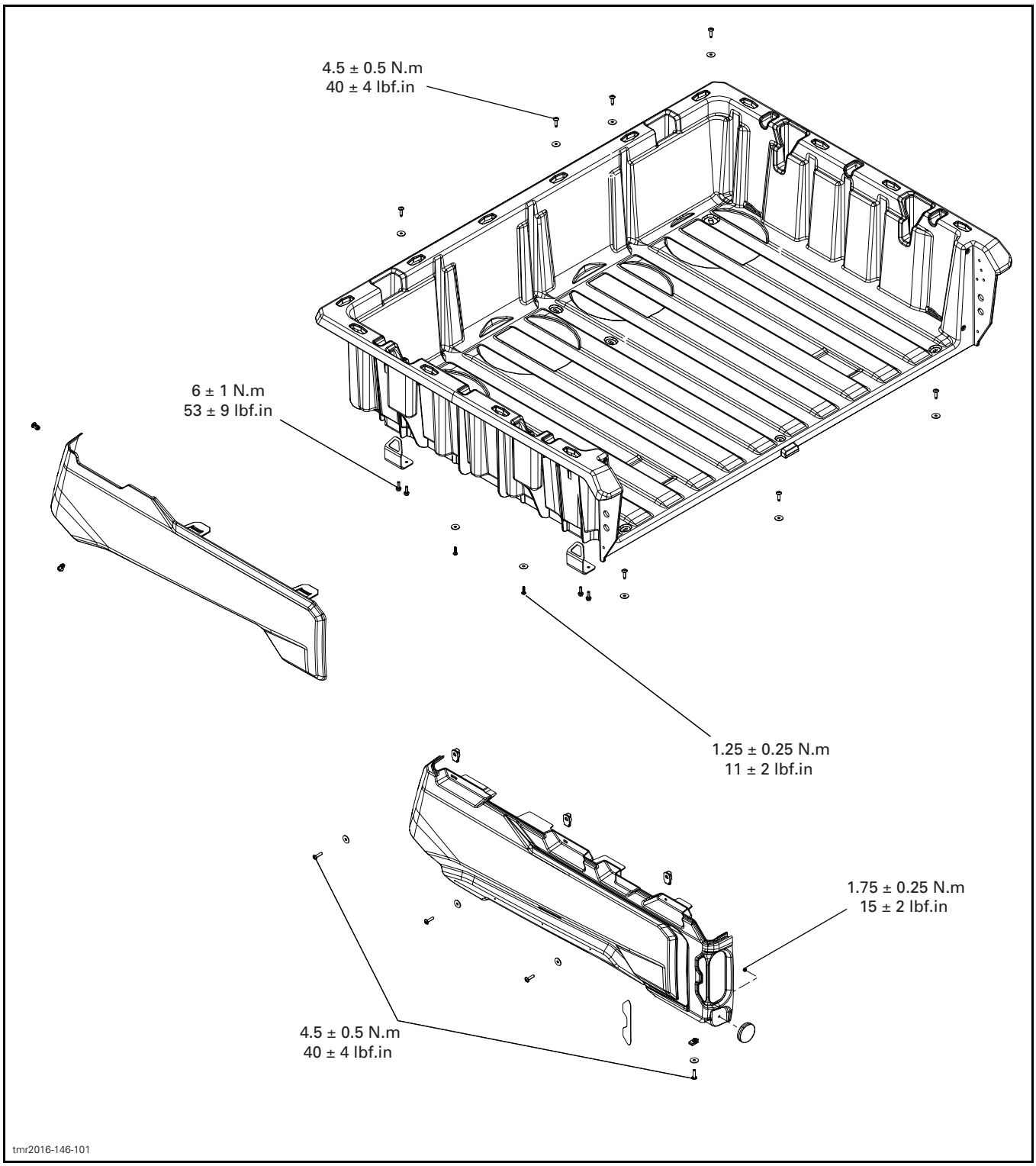
Installing a Decal

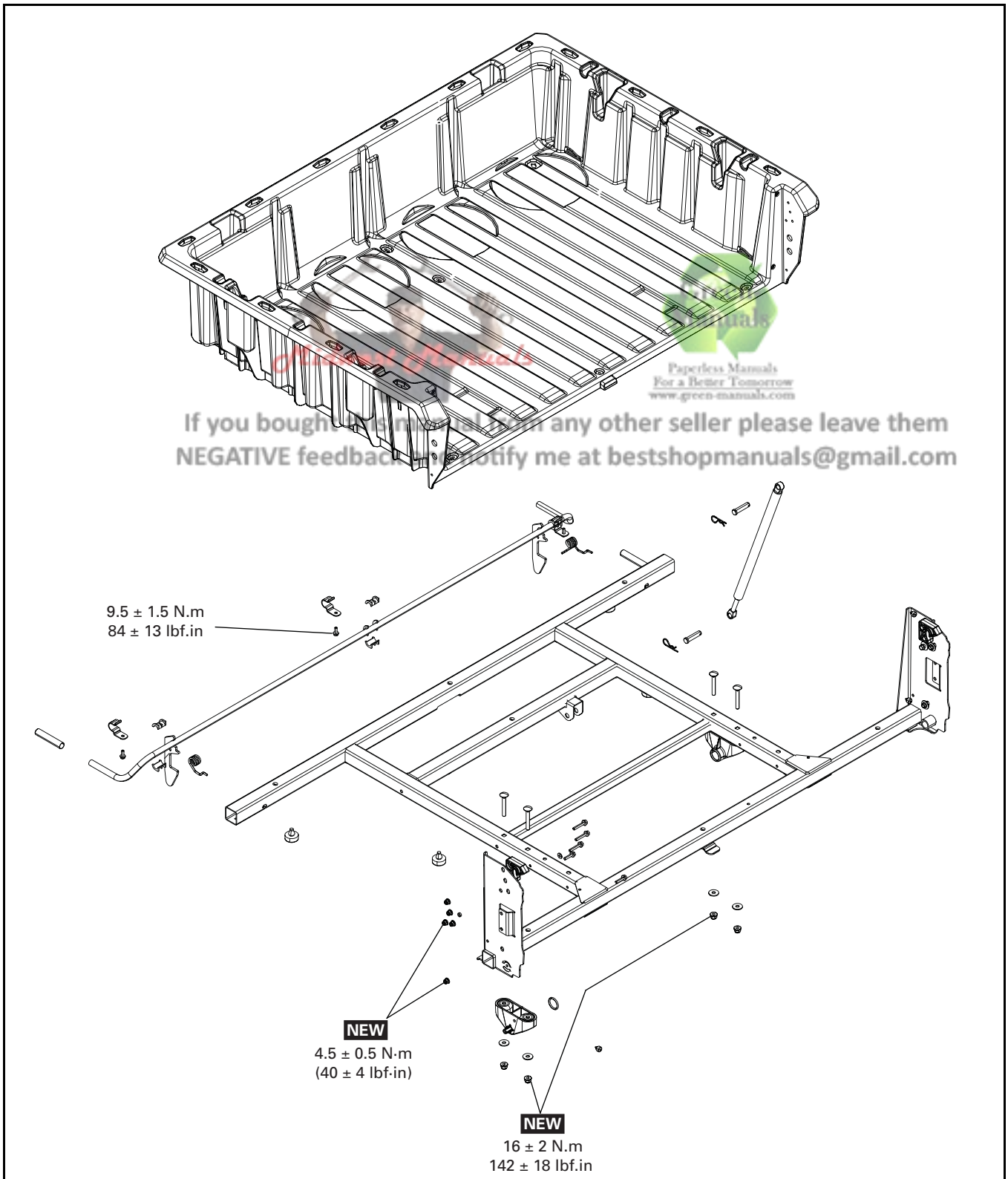
Using isopropyl alcohol, clean the surface and dry thoroughly.

Apply liquid soap to new decal and carefully position it. Using a sponge or a squeegee, remove the air bubbles and surplus water working from the center toward the edges. Allow to air dry.

NOTICE **Do not apply isopropyl alcohol or solvent directly on decals. Use these products in a well ventilated area.**

CARGO BOX


4.5 ± 0.5 N.m
40 ± 4 lbf.in
6 ± 1 N.m
53 ± 9 lbf.in
1.25 ± 0.25 N.m
11 ± 2 lbf.in
1.75 ± 0.25 N.m
15 ± 2 lbf.in
4.5 ± 0.5 N.m
40 ± 4 lbf.in
tmr2016-146-101



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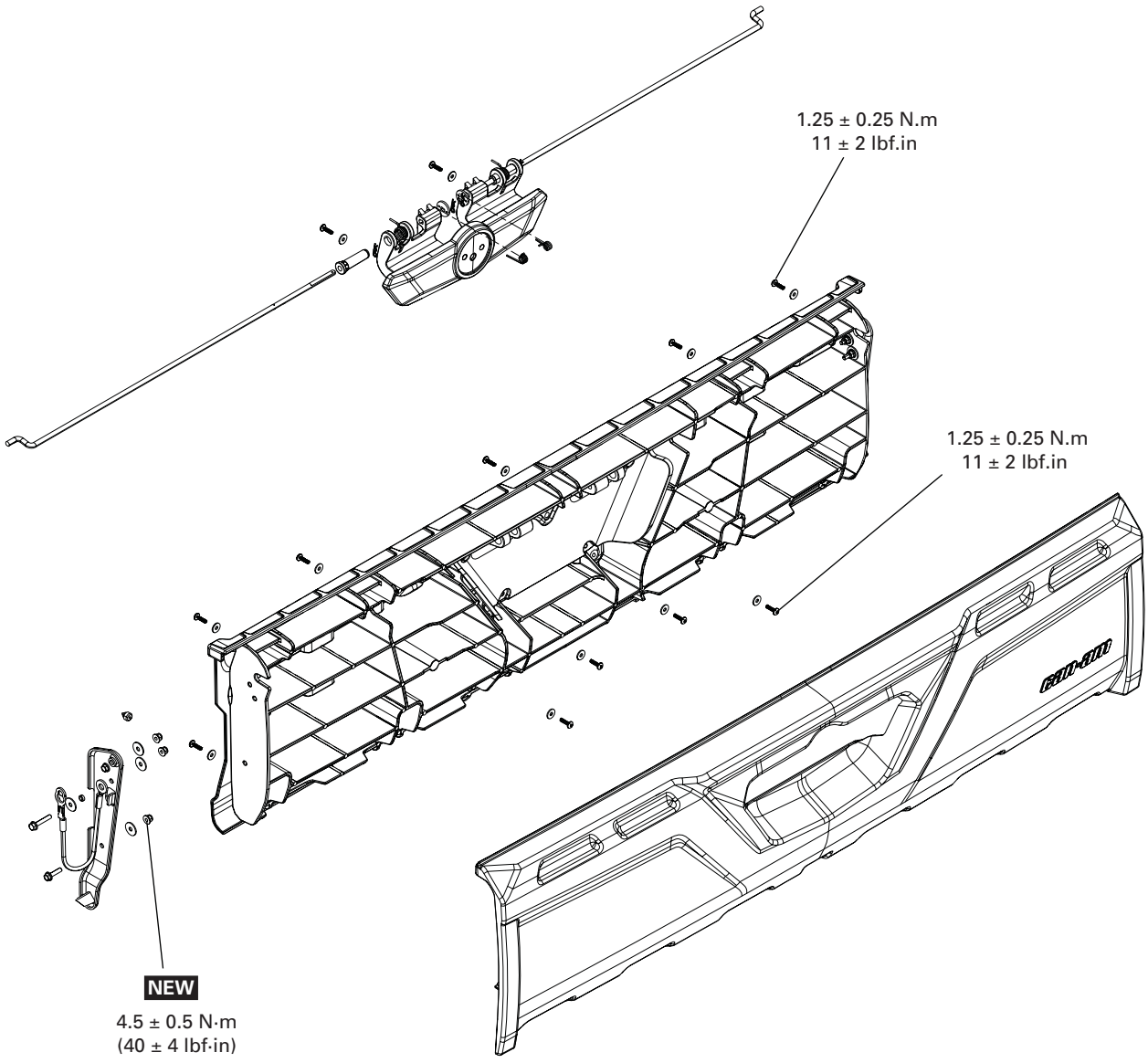
NEW =Component must be replaced when removed.

tmr2016-146-102



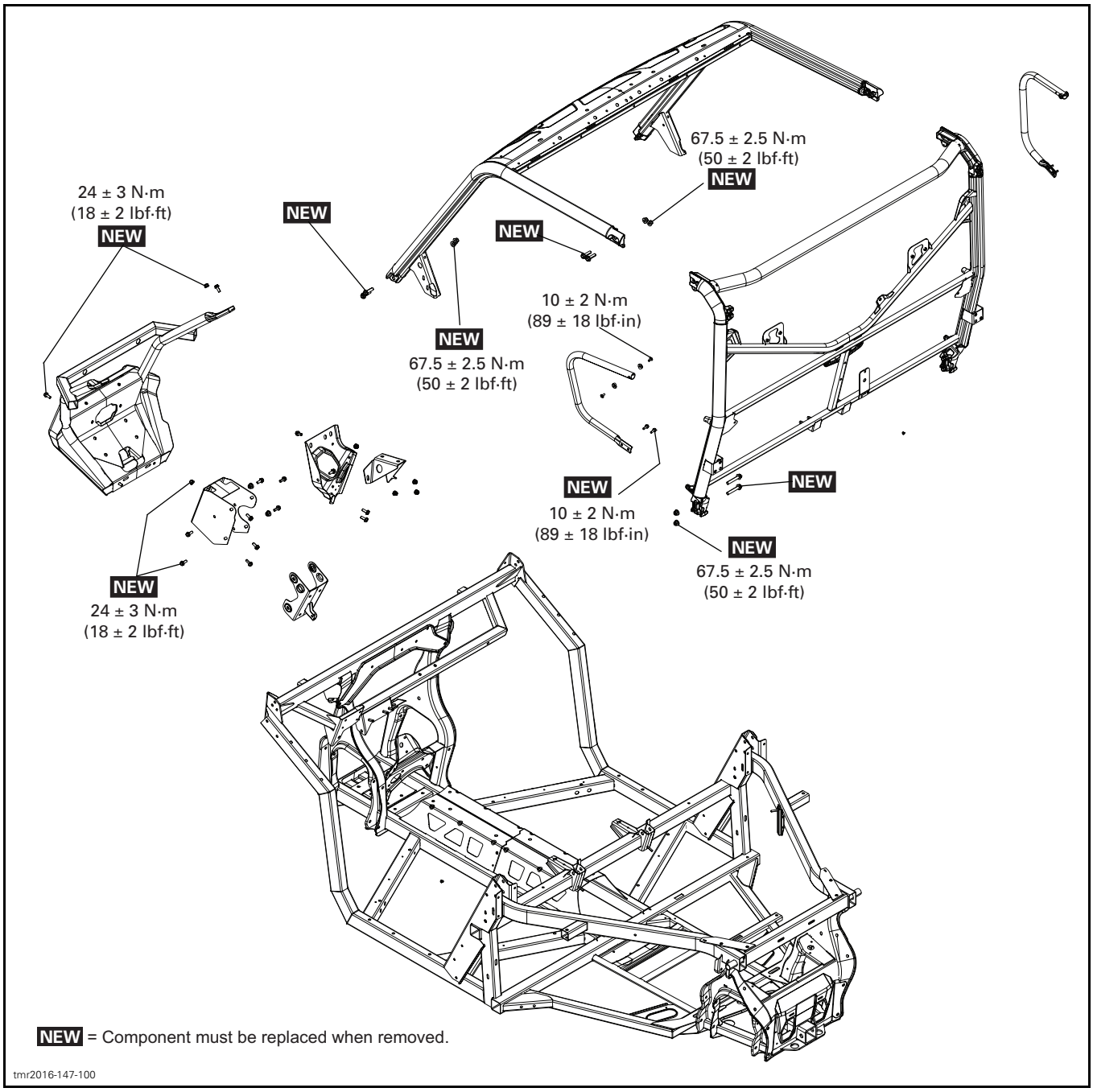
NEW =Component must be replaced when removed.

tmr2016-146-103

FRAME

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	2



PROCEDURES

CAGE

⚠ WARNING

Never modify the mounting points of the shoulder nets and the seat belts. If they are found modified or damaged, contact a BRP service representative.

⚠ WARNING

Never drill holes, weld or modify the cage. Since this is an important protection component, any modification might compromise passenger safety.

Cage Inspection

Check cage for bending, cracks, weld damages or any other damage.

⚠ WARNING

Any damaged cage components must be replaced.

Cage Installation

⚠ WARNING

When the cage mounting bolts are removed, they must be replaced with new ones or under exceptional conditions, have their threads cleaned then have LOCTITE 243 (BLUE) (P/N 293 800 060) applied. Ensure to use only 10.9 grade fasteners.

1. Assemble cage rear section onto vehicle. Do not tighten fasteners.
2. Assemble cage front section onto vehicle. Do not tighten fasteners.
3. Assemble both cage sections together. Do not tighten fasteners.
4. Make sure completed assembly is properly centered without any stressed components. Apply proper torque to all fasteners.

FRAME

Frame Inspection

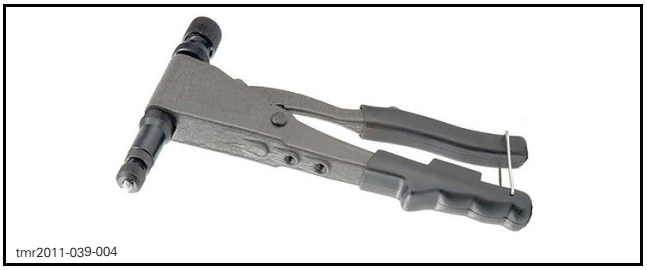
Check frame for bending, cracks, weld damages or any other damage. Replace frame as necessary.

Frame Welding

No welding should be done on frame except if mentioned or required on an approved BRP Bulletin.

Frame Insert Replacement

To install a new blind threaded insert, use a blind threaded insert installer available at any automotive parts retailer.


tmr2011-039-004

After insert installation, ensure insert can hold the torque applied to the screw it retains. Otherwise, install a new insert.

Frame Replacement

NOTE: Blind threaded inserts are not installed on replacement frames. Make sure to order 14 inserts when replacing frame.

ENGINE (HD5)

ENGINE			
Engine type			ROTAX 450, 4-stroke, Single Over Head Camshaft (SOHC), liquid cooled
Number of cylinder			1
Number of valves			4 valves (mechanical adjustment)
Bore			94 mm (3.7 in)
Stroke			61.5 mm (2.42 in)
Displacement			426.8 cm³ (26.04 in³)
Compression ratio			10.3:1
Maximum HP RPM			7500
Intake valve opening			5° BTDC
Intake valve closing			45° ABDC
Exhaust valve opening			55° BBDC
Exhaust valve closing			5° ATDC
Valve clearance	Intake		0.06 mm to 0.14 mm (.0024 in to .0055 in)
	Exhaust		0.11 mm to 0.19 mm (.0043 in to .0075 in)
Valve stem diameter	Intake	New	5.472 mm to 5.486 mm (.2154 in to .216 in)
		Service limit	5.450 mm (.2146 in)
	Exhaust	New	5.461 mm to 5.476 mm (.215 in to .2156 in)
		Service limit	5.440 mm (.2142 in)
Valve out of round	Intake and Exhaust	New	0.005 mm (.0002 in)
		Service limit	0.060 mm (.0024 in)
Valve guide diameter	Intake and Exhaust	New	5.506 mm to 5.518 mm (.2168 in to .2172 in)
		Service limit	5.568 mm (.2192 in)
Valve spring free length		New	40.41 mm (1.591 in)
		Service limit	39.00 mm (1.535 in)
Valve seat contact width	Intake	New	1.05 mm to 1.35 mm (.041 in to .053 in)
		Service limit	1.80 mm (.071 in)
	Exhaust	New	1.25 mm to 1.55 mm (.049 in to .061 in)
		Service limit	2.00 mm (.079 in)
Piston measurement		New	93.950 mm to 93.966 mm (3.6988 in to 3.6994 in)
		Service limit	93.900 mm (3.6969 in)

ENGINE			
Piston/cylinder clearance		New	0.027 mm to 0.057 mm (.0011 in to .0022 in)
		Service limit	0.100 mm (.0039 in)
Piston ring type		1st	Upper compression ring, rectangular
		2nd	Lower compression ring, taper-face
		3rd	Oil scraper ring, standard
Piston ring end gap	Upper compression ring	New	0.20 mm to 0.35 mm (.008 in to .014 in)
	Lower compression ring		0.35 mm to 0.55 mm (.014 in to .022 in)
	Oil scraper ring		0.20 mm to 0.70 mm (.008 in to .028 in)
	Upper compression ring	Service limit	0.60 mm (.024 in)
	Lower compression ring		0.85 mm (.033 in)
	Oil scraper ring		1.00 mm (.039 in)
Ring/piston groove clearance	Upper compression ring	New	0.03 mm to 0.07 mm (.0012 in to .0028 in)
	Lower compression ring		0.02 mm to 0.06 mm (.0008 in to .0024 in)
	Oil scraper ring		0.01 mm to 0.18 mm (.0004 in to .0071 in)
	Upper compression ring	Service limit	0.150 mm (.0059 in)
	Lower compression ring		0.150 mm (.0059 in)
	Oil scraper ring		0.250 mm (.0098 in)
Rocker arm bore diameter		New	12.036 mm to 12.050 mm (.4739 in to .4744 in)
		Service limit	12.060 mm (.4748 in)
Rocker arm shaft diameter		New	12.00 mm to 12.018 mm (.4724 in to .4731 in)
		Service limit	11.990 mm (.472 in)
Cylinder bore		Nominal new	93.993 mm to 94.007 mm (3.7005 in to 3.7011 in)
Cylinder taper		Maximum new	0.038 mm (.0015 in)
		Service limit	0.090 mm (.0035 in)

ENGINE			
Cylinder out of round		Maximum new	0.015 mm (.0006 in)
		Service limit	0.020 mm (.0008 in)
Camshaft main bearing journal	Spark plug side	New	21.959 mm to 21.980 mm (.8645 in to .8654 in)
		Service limit	21.950 mm (.8642 in)
	Timing chain side	New	34.959 mm to 34.975 mm (1.3763 in to 1.377 in)
		Service limit	34.950 mm (1.376 in)
Camshaft main bearing journal bore	Spark plug side	New	22.000 mm to 22.021 mm (.8661 in to .867 in)
		Service limit	22.040 mm (.8677 in)
	Timing chain side	New	35.000 mm to 35.025 mm (1.378 in to 1.3789 in)
		Service limit	35.040 mm (1.3795 in)
Camshaft lobe	Intake	New	32.890 mm to 33.090 mm (1.295 in to 1.303 in)
		Service limit	32.840 mm (1.293 in)
	Exhaust	New	32.950 mm to 33.150 mm (1.297 in to 1.305 in)
		Service limit	32.900 mm (1.295 in)
Crankshaft axial clearance		New	0.1 mm to 0.4 mm (.004 in to .016 in)
		Service limit	0.5 mm (.02 in)
Crankshaft deflection	MAG/PTO side	New	0.05 mm (.002 in)
Crankshaft pin diameter		New	40.001 mm to 40.025 mm (1.5748 in to 1.5758 in)
		Service limit	39.980 mm (1.574 in)
Crankshaft main journal diameter	MAG/PTO side	New	42.016 mm to 42.040 mm (1.6542 in to 1.6551 in)
		Service limit	42.000 mm (1.6535 in)
Crankcase plain bearing diameter	MAG/PTO side	Service limit	42.100 mm (1.6575 in)
Crankshaft radial play	MAG/PTO side	Service limit	0.07 mm (.0028 in)
Connecting rod big end diameter		Service limit	40.100 mm (1.579 in)
Connecting rod big end radial play		Service limit	0.09 mm (.0035 in)
Connecting rod big end axial play		New	0.100 mm to 0.452 mm (.004 in to .018 in)
		Service limit	0.500 mm (.02 in)
Connecting rod small end diameter		New	20.010 mm to 20.020 mm (.7878 in to .7882 in)
		Service limit	20.060 mm (.7898 in)

ENGINE		
Piston pin diameter	New	19.996 mm to 20.000 mm (.7872 in to .7874 in)
	Service limit	19.980 mm (.7866 in)
Connecting rod/piston pin clearance	Service limit	0.080 mm (.0031 in)

LUBRICATION SYSTEM			
Lubrication	Type		Wet sump with replaceable oil filter
	Oil filter		Replaceable cartridge
	Engine oil pressure	Minimum	350 kPa (51 PSI) at 6000 RPM
	Engine oil	Capacity (oil change with filter)	3 L (3.2 qt (U.S. liq.)) (engine/transmission)
		Recommended	4T 5W40 Synthetic blend oil or 4T 10W50 Synthetic oil or 4T 0W40 Synthetic oil If not available, use a 5W40 or 10W50 motor oil that meets the requirements for API service classification SJ, SL, SM or SN
Oil pressure regulator compression spring free length		New nominal	64 mm (2.52 in)
		Service limit	62 mm (2.441 in)
Oil pump inner and outer rotor clearance		Service limit	0.25 mm (.0098 in)
Oil pump axial clearance		Service limit	0.10 mm (.0039 in)

COOLING SYSTEM		
Coolant	Recommended	Extended life pre-mixed coolant
	If not available	Distilled water and antifreeze solution (50% distilled water, 50% antifreeze) or coolant specifically designed for aluminum engines

TRANSMISSION		
Type		CVT (Continuously Variable Transmission)
Engagement RPM		2000 ± 100 RPM
Drive belt width	Service limit	30.00 mm (1.181 in)
Governor cup roller outer diameter	New	13.80 mm to 14.00 mm (.543 in to .551 in)
	Service limit	13.20 mm (.52 in)
Governor cup roller inner diameter	New	8.025 mm to 8.175 mm (.316 in to .322 in)
	Service limit	9.00 mm (.354 in)
Centrifugal lever pivot bolt diameter	New	6.078 mm to 6.100 mm (.239 in to .24 in)
	Service limit	6.000 mm (.236 in)

TRANSMISSION		
Centrifugal lever bore diameter	New	6.035 mm to 6.078 mm (.238 in to .239 in)
	Service limit	6.200 mm (.244 in)
Centrifugal lever pivot bolt bore diameter	New	6.113 mm to 6.171 mm (.241 in to .243 in)
	Service limit	6.300 mm (.248 in)
Drive pulley sliding sheave large bushing	New	55.000 mm to 55.040 mm (2.165 in to 2.167 in)
	Service limit	55.200 mm (2.173 in)
Drive pulley sliding sheave small bushing	New	30.000 mm to 30.040 mm (1.181 in to 1.183 in)
	Service limit	30.200 mm (1.189 in)
Drive pulley spring free length	Service limit	75 mm (2.953 in)
Drive pulley spring squareness	Service limit	4 mm (.157 in)
Spring sleeve length	New	9.2 mm to 9.4 mm (.362 in to .37 in)
	Service limit	9.0 mm (.354 in)
Driven pulley sliding sheave bushing	New	30.060 mm to 30.100 mm (1.183 in to 1.185 in)
	Service limit	30.200 mm (1.189 in)
Driven pulley fixed sheave bushing	New	30.060 mm to 30.100 mm (1.183 in to 1.185 in)
	Service limit	30.200 mm (1.189 in)
Torque gear on driven pulley	Service limit	7.500 mm (.295 in)
Cam width on top surface	Service limit	6.000 mm (.236 in)
Driven pulley sliding sheave wear on contact surface	Service limit	2.000 mm (.079 in)
Driven pulley spring free length	Service limit	164 mm (6.457 in)
Driven pulley spring squareness	Service limit	3.8 mm (.15 in)

GEARBOX		
Type		Dual range (HI-LO) with park, neutral and reverse
Output shaft axial clearance	New	0.09 mm to 0.18 mm (.004 in to .007 in)
	Service limit	0.30 mm (.012 in)
Bevel gear axial clearance	New	0.02 mm to 0.11 mm (.0008 in to .0043 in)
	Service limit	0.15 mm (.006 in)
Gear groove width	New	5.00 mm to 5.10 mm (.197 in to .201 in)
	Service limit	5.20 mm (.205 in)

GEARBOX			
Counter shaft	MAG side	Service limit	17.990 mm (.708 in)
	PTO side		24.950 mm (.982 in)
Bevel gear shaft	PTO side	Service limit	24.990 mm (.984 in)
Shift fork claw thickness		New	4.800 mm to 4.860 mm (.189 in to .191 in)
		Service limit	4.750 mm (.187 in)
Rear final drive oil		Capacity	250 ml (8.45 U.S. oz)
		Recommended	75W90 Synthetic gear oil or a 75W 90 API GL-5
Overall gear ratio		High	4.070
		Low	6,769
		Reverse	7,608

ELECTRICAL SYSTEM		
Magneto generator output		500 W @ 6000 RPM
Ignition system type		IDI (Inductive Discharge Ignition)
Ignition timing		Not adjustable
Spark plug	Quantity	1
	Make and type	NGK LMAR8D-J
	Gap	0.7 mm to 0.9 mm (.028 in to .035 in)
Engine RPM limiter setting	Forward	8000 rpm
	Reverse	15 km/h (9 MPH) without Override)

FUEL SYSTEM			
Fuel delivery	Type		Electronic Fuel Injection (EFI), 46 mm throttle body, 1 injector per cylinder
Idle speed			1250 rpm ± 50 (not adjustable)
Fuel	Type		Regular unleaded gasoline
	Minimum octane rating	Inside North America	87 (R+M)/2 or higher
		Outside North America	92 RON or higher

VEHICLES (BASE, DPS, PRO, XT, XT CAB AND HUNTING EDITION)

EXHAUST SYSTEM	
Exhaust system	Spark arrester approved by USDA Forest Service Catalyst on NRMM(1) models
(1) For NRMM models identification, refer to *INTRODUCTION* section.	

ELECTRICAL SYSTEM			
Battery	Type		SLA (Sealed Lead Acid)
	Voltage		12 volts
	Nominal rating	Base DPS PRO	18 A•h
		XT XT Cab Mossy Oak Hunting Edition	30 A•h
	Power starter output		0.7 KW
Headlight		HIGH	4 x 35 H8
		LOW	2 x 35 H8
Taillight			2.3/3.5 W

ELECTRICAL SYSTEM			
Fuses	DPS (Single Fuses at Front)	PF3	40 A
	4WD actuator	F7	10 A
	T Vehicle (accessory post)	F10	40 A
	Headlamps	F11	20 A
	DC3/12V accessory outlet 1	F12	10 A
	12 V accessory outlet 2	F14	10 A
	Tail lamps	F16	10 A
	Oxygen sensor Emission control	F18	10 A
	Headlamp configuration	JCT	20 A
	Fuses PF4/F14 Accessory post 12V/outlet 2	R9	50 A
	ECM accessory 12V	R3	30 A
	Brake lights	R8	20 A
	Spare	Spare1	20 A
	Cluster/relays	F4	10 A
	Ignition/injection/fuel pump	F5	10 A
	Engine Control Module (ECM)	F6	10 A
	Ignition switch Clock	F8	10 A
	Cooling fan	F9	25 A (PTC auto resettable)
	Accessory post (Under dash terminal block) (Single Fuses at Front)	PF4	40 A
	Fan	R1	30 A
	Main	R2	20 A
	Spare	Spare2	10 A
	Main	FL1	18 awg
	Accessory post	FL2	14 awg

FUEL SYSTEM		
Fuel delivery	Type	Electronic Fuel Injection (EFI), 54 mm throttle body with iTC (Intelligent Throttle Control), 1 injector per cylinder
Fuel pump	Type	Electrical (in fuel tank)
	Operating pressure	350 kPa (51 PSI)
Idle speed		1250 RPM ± 100 (not adjustable)

FUEL SYSTEM		
Fuel	Type	Regular unleaded gasoline
	Octane rating	87 Pump Posted AKI (R+M)/2) (92 RON)
Fuel tank capacity		40 L (10.6 U.S. gal.)
Fuel remaining when low fuel light turns ON		± 8.5 L (2.2 U.S. gal.)

DRIVE SYSTEM		
Front drive	Base	Spiral bevel gear Visco-lok† auto-locking front differential
	All other models	Spiral bevel gear Visco-lok† QE auto-locking front differential
Front drive ratio		3.6:1
Rear drive	Base and DPS models (HD5)	Locked differential
	All models (HD8/HD10)	Lockable differential
Rear drive ratio	HD8/HD10	3.43:1
	HD5	3.6:1
Front differential oil	Capacity	400 ml (14 U.S. oz)
	Recommended	75W90 Synthetic gear oil or API GL5
CV joint grease		CV joint grease or equivalent
Spline's propeller shaft grease (grease applied to spline connections)		Propeller shaft grease or equivalent

STEERING		
Type		Rack and pinion
Assisted steering system	All models except Base	Dynamic Power Steering (DPS)
Steering wheel		Adjustable tilt steering
Turning radius	3up	3.98 m (13.06 ft)
	MAX	5.26 m (17.26 ft)
Total toe (vehicle on ground)		0° ± 0.2°
Camber angle (vehicle on ground)		0°
Tie-rod maximum length unengaged threads		32 mm (1.26 in)

FRONT SUSPENSION		
Suspension type	All except XT Cab and MAX XT Cab	Double A-arm suspension
	XT Cab and MAX XT Cab	Double arched A-arms with stabilizer bar
Suspension travel		254 mm (10 in)

FRONT SUSPENSION		
Shock absorber	Qty	2
	Type	Gas charged/5 spring preload settings
Preload adjustment type		5 positions cam

REAR SUSPENSION		
Suspension type		Torsional Trailing A-arms (TTA) suspension with stabilizer bar
Suspension travel		254 mm (10 in)
Shock absorber	Qty	2
	Type	Gas charged/5 spring preload settings
Preload adjustment type		5 positions cam

FRONT SUSPENSION FACTORY SETTINGS	
Spring preload	Cam position 1 (soft)

REAR SUSPENSION FACTORY SETTINGS	
Spring preload	Cam position 1 (soft)

BRAKES			
Front brake		Qty	2
		Type	220 mm ventilated disc brakes with hydraulic twin-piston calipers
Rear brake	HD5	Qty	1
		Type	220 mm ventilated disc brake with hydraulic twin-piston calipers
	HD8/HD10 3-UP	Qty	2
		Type	220 mm ventilated disc brake with hydraulic single-piston calipers
	HD8/HD10 MAX	Qty	2
		Type	220 mm ventilated disc brake with hydraulic twin-piston calipers
Brake fluid	3up	Capacity	Approximately 310 ml (10.5 U.S. oz)
		Type	DOT 4
	MAX	Capacity	320 ml (10.8 U.S. oz)
		Type	DOT 4
Caliper			Floating
Brake pad material			Metallic
Minimum brake pad thickness			1 mm (.04 in)
Minimum brake disc thickness			4 mm (.157 in)
Maximum brake disc warpage			0.2 mm (.01 in)

TIRES			
Pressure	Avant	3up	97 kPa (14 PSI)
		MAX	152 kPa (22 PSI)
	Arrière	3up	124 kPa (18 PSI)
		MAX	165 kPa (24 PSI)
Minimum tire thread depth			3 mm (.118 in)
Size	Front	Base HD5	25 x 8 x 12 (in)
		Base HD8 3up	27 x 9 x 12 (in)
		DPS HD5	25 x 8 x 12 (in)
		DPS HD8/HD10 3up MAX models	27 x 9 x 14 (in)
		XT 3up XT Cab 3up Mossy Oak Hunting Edition	27 x 9 x 14 (in)
	Rear	Base HD5	25 x 10 x 12 (in)
		Base HD8 3up	27 x 11 x 12 (in)
		DPS HD5	25 x 10 x 12 (in)
		DPS HD8/HD10 3up MAX models	27 x 11 x 14 (in)
		XT 3up XT Cab 3up Mossy Oak Hunting Edition	27 x 11 x 14 (in)

WHEELS		
Type	Base 3up	Steel
	Base MAX DPS Mossy Oak Hunting Edition PRO XT XT Cab	Cast Aluminum

WHEELS			
Rim size	Front	Base 3up DPS HD5 3up	12 x 6 (in)
		DPS HD8/HD10 3up PRO XT 3up XT Cab 3up	14 x 7 (in)
		Mossy Oak Hunting Edition	14 x 6.5 (in)
		DPS and XT MAX	14 x 6.5 (in)
		Base and XT Cab MAX	14 x 7 (in)
	Rear	Base 3up	12 x 8
		DPS HD5	12 x 7.5 (in)
		All other models	14 x 8.5 (in)
Wheel nuts torque			100 N•m ± 10 N•m (74 lbf•ft ± 7 lbf•ft)

CHASSIS	
Cage type	50 mm (2 in) diameter, high strength steel, ROPS-approved cage
Hitch support	50.8 mm (2 in) x 50.8 mm (2 in)

DIMENSIONS		
Overall length	Base 3up DPS 3up PRO	305 cm (120 in)
	XT 3up XT Cab 3up	310.5 cm (122.2 in)
	Mossy Oak Hunting Edition	319.5 cm (125.8 in)
	MAX Base MAX DPS	387.5 cm (152.5 in)
	MAX XT MAX XT Cab	393.1 cm (154.8 in)

DIMENSIONS		
Overall width	Base 3up DPS 3up XT 3up PRO	157.5 cm (62 in)
	MAX Base MAX DPS MAX XT Models	161.2 cm (63.5 in)
	Mossy Oak Hunting Edition	167.5 cm (66 in)
	XT Cab	165.1 cm (65 in)
Overall height	Base HD5 DPS HD5	191.8 cm (75.5 in)
	Base HD8 3up DPS HD8/HD10 3up MAX Base MAX DPS PRO	193 cm (76 in)
	XT Mossy Oak Hunting Edition	198.1 cm (78 in)
	XT Cab 3up	200.6 cm (79 in)
Wheel base	3up	211.5 cm (83 in)
	MAX	294 cm (115.7 in)

DIMENSIONS			
Wheel track	Front	Base HD5 DPS HD5	130 cm (51 in)
		Base HD8 DPS HD8/HD10 XT 3up PRO	131 cm (51.5 in)
		Mossy Oak Hunting Edition	137.2 cm (54 in)
		MAX Base MAX DPS MAX XT	138.3 cm (54.4 in)
		XT Cab	147.3 cm (58 in)
	Rear	Base 3up DPS 3up XT 3up PRO	126 cm (49.5 in)
		Mossy Oak Hunting Edition	132 cm (52 in)
		MAX Base MAX DPS MAX XT	133.3 cm (52.5 in)
		XT Cab	142.3 cm (56 in)
Ground clearance		All models except XT Cab	28 cm (11 in)
		XT Cab	30.48 cm (12 in)

WEIGHT AND LOADING CAPACITY		
Dry weight	Base HD5	584 kg (1,287.5 lb)
	Base HD8 3up	654 kg (1,441.8 lb)
	DPS HD5	592 kg (1,305.1 lb)
	DPS 3up HD8/HD10	682 kg (1,503.6 lb)
	XT 3up	708 kg (1,560.9 lb)
	Mossy Oak Hunting Edition	753 kg (1,660.1 lb)
	XT Cab 3up	841 kg (1,854.1 lb)
	MAX Base	769 kg (1,695.3 lb)
	MAX DPS	785 kg (1,730.6 lb)
	MAX XT	845 kg (1,862.9 lb)
	MAX XT Cab	1 009 kg (2,224.5 lb)

WEIGHT AND LOADING CAPACITY		
Weight distribution (Front/rear)	Base HD5 DPS HD5	44/56
	Base HD8 DPS HD8/HD10 PRO	42/58
	XT Mossy Oak Hunting Edition	44/56
	XT Cab 3up	47/53
	MAX Base	43/57
	MAX DPS	41/59
	MAX XT	43/57
	MAX XT Cab	46/54
Cargo box capacity	All models except California and HD5	454 kg (1,000 lb)
	HD5 California models	272 kg (600 lb)
Total vehicle load allowed (including driver, passengers, all other loads and added accessories)	All 3up models except HD5, California models and 3up XT Cab	680 kg (1,500 lb)
	All MAX models except California MAX models and MAX XT Cab	794 kg (1,750 lb)
	HD5, California 3up models and 3up XT Cab	545 kg (1,200 lb)
	California MAX models and MAX XT Cab	612 kg (1,350 lb)

WEIGHT AND LOADING CAPACITY		
Gross vehicle weight rating	Base HD5	1 164 kg (2,566.2 lb)
	Base HD8	1 369 kg (3,018.1 lb)
	DPS HD5	1 172 kg (2,583.8 lb)
	DPS HD8/HD10 3up	1 396 kg (3,077.7 lb)
	PRO	1 424 kg (3,139.4 lb)
	Mossy Oak Hunting Edition	1 467 kg (3,234.2 lb)
	XT 3up	1 422 kg (3,135 lb)
	XT Cab 3up	1 419 kg (3,128.4 lb)
	MAX Base	1 599 kg (3,525.2 lb)
	MAX DPS	1 615 kg (3,560.5 lb)
	MAX XT	1 674 kg (3,690.5 lb)
	MAX XT Cab	1 655 kg (3,648.7 lb)
Towing capacity	HD5	680 kg (1,500 lb)
	HD8/HD10	1 134 kg (2,500 lb)
Tongue capacity	HD5	68 kg (150 lb)
	HD8/HD10	113 kg (250 lb)

VEHICLES (TRAXTER T)

EXHAUST SYSTEM	
Exhaust system	Spark arrester approved by USDA Forest Service Catalyst on NRMM(1) models
(1) For NRMM models identification, refer to *INTRODUCTION* section.	

ELECTRICAL SYSTEM			
Battery	Type		SLA (Sealed Lead Acid)
	Voltage		12 volts
	Nominal rating	Base	18 A•h
		PRO	30 A•h
	Power starter output		0.7 KW
Headlight		HIGH	4 x 35 H8
		LOW	2 x 35 H8
Taillight			2.3/3.5 W
Single fuses at front	DPS	PF3-F2	40 A
	Accessory post (Under dash junction block)	PF4-F21	40 A
Front fuse box (PF1)	4WD actuator	F7	10 A
	T Vehicle (accessory post)	F10	10 A
	Headlights Turn signal module Front position lights Horn Trailer light module F2/F3 in console fuse box	F11	20 A
	Accessories connector (DC3) 12V outlet 1	F12	10 A
	12 V accessory outlet 2	F14	10 A
	Taillights Brake lights	F16	10 A
	Fuses PF4-F21/F14 Accessory post 12V/outlet 2	R9	-
	ECM accessory 12 V Fuses F7/F11/F12/F16	R3	-
	Brake lights	R8	-
	Spare fuse	Spare	20 A
Console fuse box (PT-T)	Console indicator lights Buzzer	F1	5 A
	Trailer connector relay	F2	5 A
	Trailer connector Licence plate lights	F3	5 A

ELECTRICAL SYSTEM			
Underseat fuse box (PF2)	Gauge DPS unit Relay R3 Diagnostic connector Brake light switch F1 in console fuse box	F4	10 A
	Relay R1 Ignition coil Fuel injectors Speed sensor Fuel pump	F5	10 A
	Engine Control Module (ECM)	F6	10 A
	Ignition switch Clock	F8	10 A
	Cooling fan	F9	25 A (PTC auto resettable)
	Oxygen sensor Emission control	F18	10 A
	Cooling fan	R1	30 A
	Main	R2	20 A
Fuse links	Main	FL1	18 awg
	Accessory post	FL2	14 awg

FUEL SYSTEM			
Fuel delivery		Type	Electronic Fuel Injection (EFI) with iTC (Intelligent Throttle Control), 1 injector per cylinder
Throttle body		HD5	46 mm with ETA
		HD8/HD10	54 mm with ETA
Fuel pump		Type	Electric (in fuel tank)
		Operating pressure	350 kPa (51 PSI)
Idle speed			1250 RPM ± 100 (not adjustable)
Fuel	Type	Minimum	Regular unleaded gasoline
		Recommended	Super unleaded gasoline containing maximum 10% ethanol
	Octane rating	Minimum	87 Pump Posted AKI I (R+M)/2) (92 RON)
		Recommended	95 E10 RON
Fuel tank capacity			40 L (10.6 U.S. gal.)
Fuel remaining when low fuel light turns ON			± 8.5 L (2.2 U.S. gal.)

DRIVE SYSTEM		
Front drive	HD5	Spiral bevel gear Visco-lok† auto-locking front differential
	HD8/HD10	Spiral bevel gear Visco-lok† QE auto-locking front differential
Front drive ratio		3.6:1
Rear drive	HD5	Locked differential
	HD8/HD10	Lockable differential
Rear drive ratio	HD5	3.6:1
	HD8/HD10	3.43:1
Front differential oil	Capacity	400 ml (14 U.S. oz)
	Recommended	75W90 Synthetic gear oil or API GL5
CV joint grease		CV joint grease or equivalent
Spline's propeller shaft grease (grease applied to spline connections)		Propeller shaft grease or equivalent

STEERING		
Type		Rack and pinion
Assisted steering system	All models except Base	Dynamic Power Steering (DPS)
Steering wheel		Adjustable tilt steering
Turning radius		3.98 m (13.06 ft)
Total toe (vehicle on ground)		0° ± 0.2°
Camber angle (vehicle on ground)		0°
Tie-rod	Nominal engagement	32 mm (1.26 in)
	Minimum engagement	25 mm (.98 in)

FRONT SUSPENSION		
Suspension type		Double A-arm suspension
Suspension travel		254 mm (10 in)
Shock absorber	Qty	2
	Type	Gas charged/5 spring preload settings
Preload adjustment type		5 positions cam

REAR SUSPENSION	
Suspension type	Torsional Trailing A-arms (TTA) suspension with stabilizer bar
Suspension travel	254 mm (10 in)

REAR SUSPENSION		
Shock absorber	Qty	2
	Type	Gas charged/5 spring preload settings
Preload adjustment type		5 positions cam

FRONT SUSPENSION FACTORY SETTINGS	
Spring preload	Cam position 1 (soft)

REAR SUSPENSION FACTORY SETTINGS	
Spring preload	Cam position 1 (soft)

BRAKES			
Front brake		Qty	2
		Type	220 mm ventilated disc brakes with hydraulic twin-piston calipers
Rear brake	HD5	Qty	1
		Type	220 mm ventilated disc brake with hydraulic twin-piston calipers
	HD8/HD10	Qty	2
		Type	220 mm ventilated disc brake with hydraulic single-piston calipers
Brake fluid		Capacity	Approximately 310 ml (10.5 U.S. oz)
		Type	DOT 4
Caliper			Floating
Brake pad material			Metallic
Minimum brake pad thickness			0.5 mm (.02 in)
Minimum brake disc thickness			4 mm (.157 in)
Maximum brake disc warpage			0.2 mm (.01 in)

TIRES			
Pressure	Front	HD5	97 kPa (14 PSI)
		HD8/HD10	69 kPa (10 PSI)
	Rear	HD5	124 kPa (18 PSI)
		HD8/HD10	97 kPa (14 PSI)
Minimum tire thread depth			3 mm (.118 in)
Size	Front	HD5	25 x 8 x 12 (in)
		HD8/HD10	27 x 9 x 14 (in)
	Rear	HD5	25 x 10 x 12 (in)
		HD8/HD10	27 x 11 x 14 (in)

WHEELS			
Type		HD5	Steel
		HD8/HD10	Cast Aluminum
Rim size	Front	HD5	12 x 6 (in)
		HD8/HD10	14 x 7 (in)
	Rear	HD5	12 x 8 (in)
		HD8/HD10	14 x 8.5 (in)
Wheel nuts torque			100 N•m ± 10 N•m (74 lbf•ft ± 7 lbf•ft)

CHASSIS	
Cage type	ROPS-approved profiled cage. Certified ISO 3471 and OSHA OECD code No 4
Hitch support	50.8 mm (2 in) x 50.8 mm (2 in)

DIMENSIONS		
Overall length		305 cm (120 in)
Overall width		157.7 cm (62 in)
Overall height		193 cm (76 in)
Wheel base		211.5 cm (83 in)
Wheel track	Front	130 cm (51 in)
	Rear	126 cm (49.5 in)
Ground clearance	HD5	26.7 cm (10.5 in)
	HD8/HD10	28 cm (11 in)

WEIGHT AND LOADING CAPACITY		
Dry weight	Base HD5	593 kg (1,307 lb)
	Base HD8	663 kg (1,462 lb)
	PRO (HD8/HD10)	708 kg (1,560.9 lb)
Weight distribution (Front/rear)	HD5	44/56
	HD8/HD10	42/58
Cargo box capacity	HD5	272 kg (600 lb)
	HD8/HD10	454 kg (1,000 lb)
Total vehicle load allowed (including driver, passengers, all other loads and added accessories)	HD5	545 kg (1,200 lb)
	HD8/HD10	623 kg (1,373 lb)
Gross vehicle weight rating	Base HD5	1 172 kg (2,583.8 lb)
	Base HD8	1 320 kg (2,910 lb)
	PRO (HD8/HD10)	1 366 kg (3,012 lb)

WEIGHT AND LOADING CAPACITY		
Towing capacity	HD5	680 kg (1,500 lb)
	HD8/HD10	1 134 kg (2,500 lb)
Tongue capacity	HD5	67.5 kg (148.81 lb)
	HD8/HD10	86.2 kg (190 lb)

WIRING DIAGRAM INFORMATION

GENERAL

WIRING DIAGRAM LOCATION

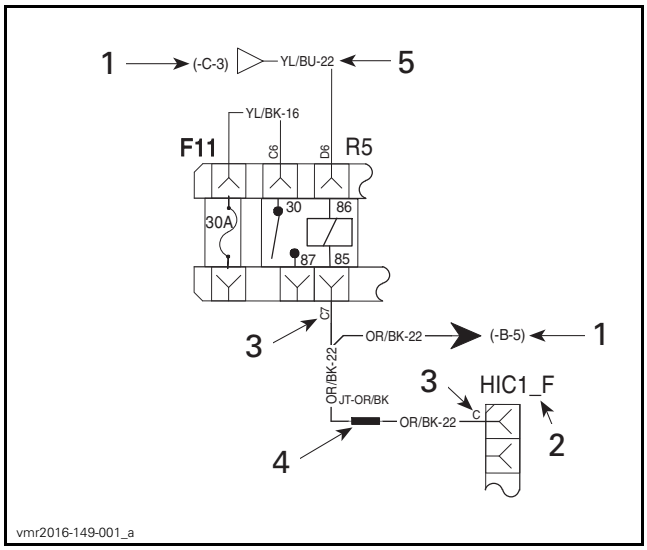
Wiring diagrams are found in the *WIRING DIAGRAM BOOKLET*.

WIRING DIAGRAM WITH COLORED LINES

The wiring diagram on the *KNOWLEDGE CENTER* is in color.

WIRING DIAGRAM CODES

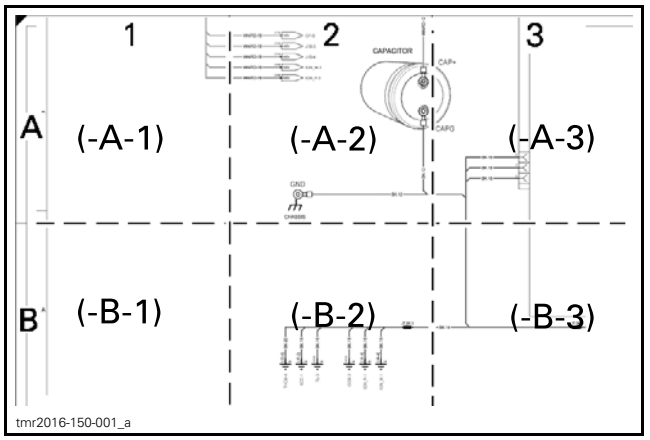
The wiring diagrams use the following codes.



1. *Wiring diagram index*
2. *Connector code*
3. *Connector pin*
4. *Splice*
5. *Color and size*

Wiring Diagram Index

The wiring diagram is separated by rows (letters) and columns (numbers).



WIRING DIAGRAM INDEX

Connector Code

The wire connects to the indicated connector.

Connector Pin

The wire is the indicated pin in the connector.

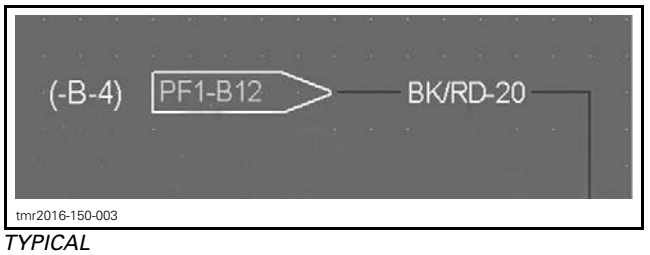
NOTE: Could be identified by either a number or by a letter depending on the type of connector used.

FOLLOWING A CIRCUIT

To follow a circuit, search in the section of the wiring diagram shown in the wiring diagram index.

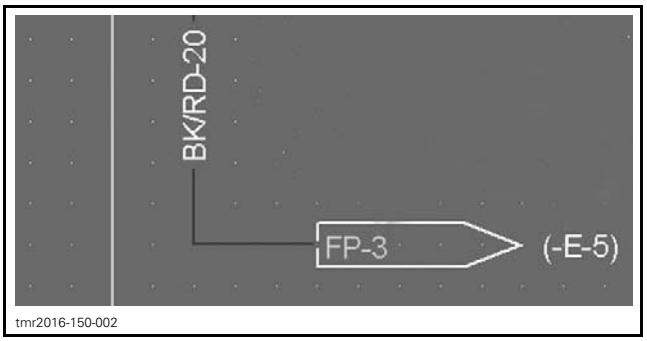
NOTE: The arrow indicates the direction of the power in the circuit.

In this example, the power comes **from** section (-B-4).



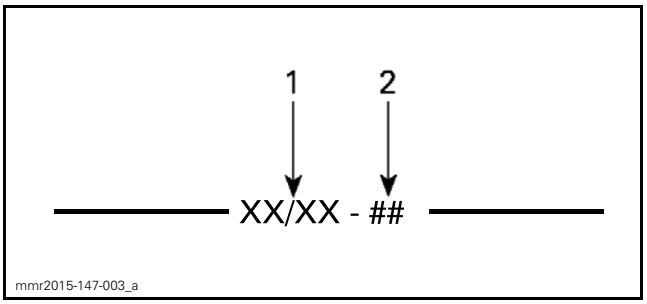
TYPICAL

In following example, the power goes **to** the section (-E-5).



TYPICAL

WIRE COLORS AND SIZES



1. Wire color
2. Wire gauge (AWG)

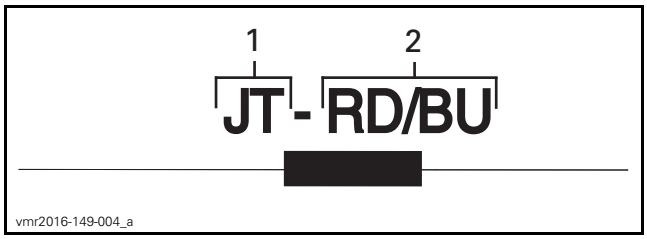
The first color of a wire is the main color, second color is the stripe.

Example: YE/BK is a YELLOW wire with a BLACK stripe.

COLOR CODE					
BG	—	BEIGE	OG	—	ORANGE
BK	—	BLACK	RD	—	RED
BU	—	BLUE	VT	—	VIOLET
BN	—	BROWN	WH	—	WHITE
GN	—	GREEN	YE	—	YELLOW
GY	—	GRAY	PK	—	PINK
LT prefix means a "light" color. E.g: LT GN = Light green.					

SPLICES IN WIRING HARNESS

Splices in wiring harness are indicated on the wiring diagram as follows.



1. JT: Splice indication
2. Spliced wire color

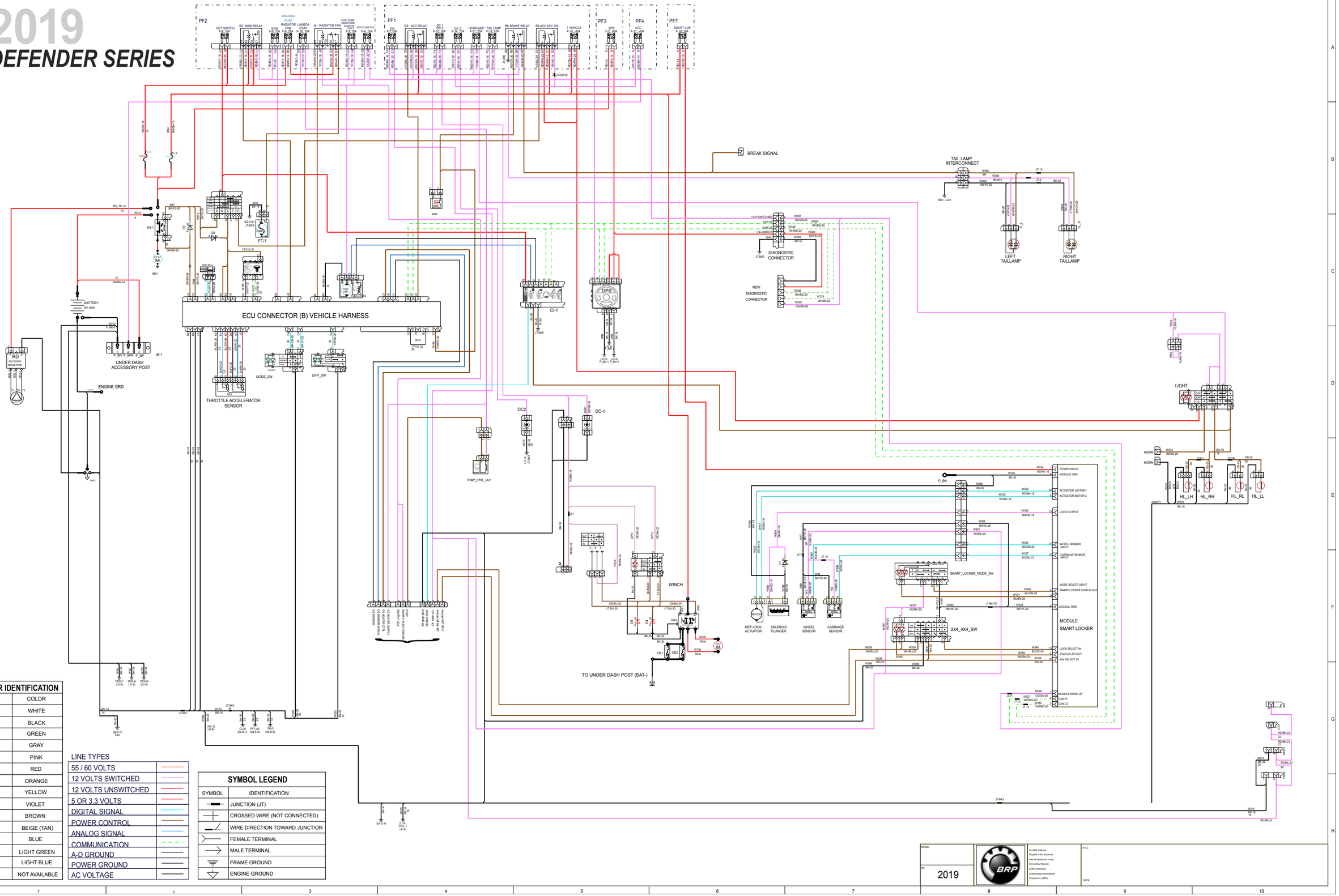
PROCEDURES

This section gives the procedures in order to quickly repair electrical harness splices.

1. Make sure to perform the usual tests described in *ELECTRICAL SYSTEM* sections before investigating the harness splices.
2. If an electrical issue can not be found with the usual tests, locate the main harness splice that is involved in the faulty circuit and repair it as per the *SPLICES REPAIR PROCEDURE* in *WIRING HARNESS AND CONNECTORS* subsection.
3. To repair a splice, we recommend the use of a tin solder meeting the followings requirements or an equivalent.

TIN SOLDER REQUIREMENTS
SN 60
PB 40
DIA 0.062
FLUX RA 2%

2019
DEFENDER SERIES



COLOR IDENTIFICATION	
CODE	COLOR
WH	WHITE
BK	BLACK
GN	GREEN
GY	GRAY
PK	PINK
RD	RED
OG	ORANGE
YE	YELLOW
VT	VIOLET
BN	BROWN
BG	BEIGE (TAN)
BU	BLUE
LT GN	LIGHT GREEN
LT BU	LIGHT BLUE
N/A	NOT AVAILABLE

LINE TYPES
55 / 60 VOLTS
12 VOLTS SWITCHED
12 VOLTS UNSWITCHED
5 OR 3.3 VOLTS
DIGITAL SIGNAL
POWER CONTROL
ANALOG SIGNAL
COMMUNICATION
A-D GROUND
POWER GROUND
AC VOLTAGE

SYMBOL LEGEND	
SYMBOL	IDENTIFICATION
	JUNCTION (JT)
	CROSSED WIRE (NOT CONNECTED)
	WIRE DIRECTION TOWARD JUNCTION
	FEMALE TERMINAL
	MALE TERMINAL
	FRAME GROUND
	ENGINE GROUND

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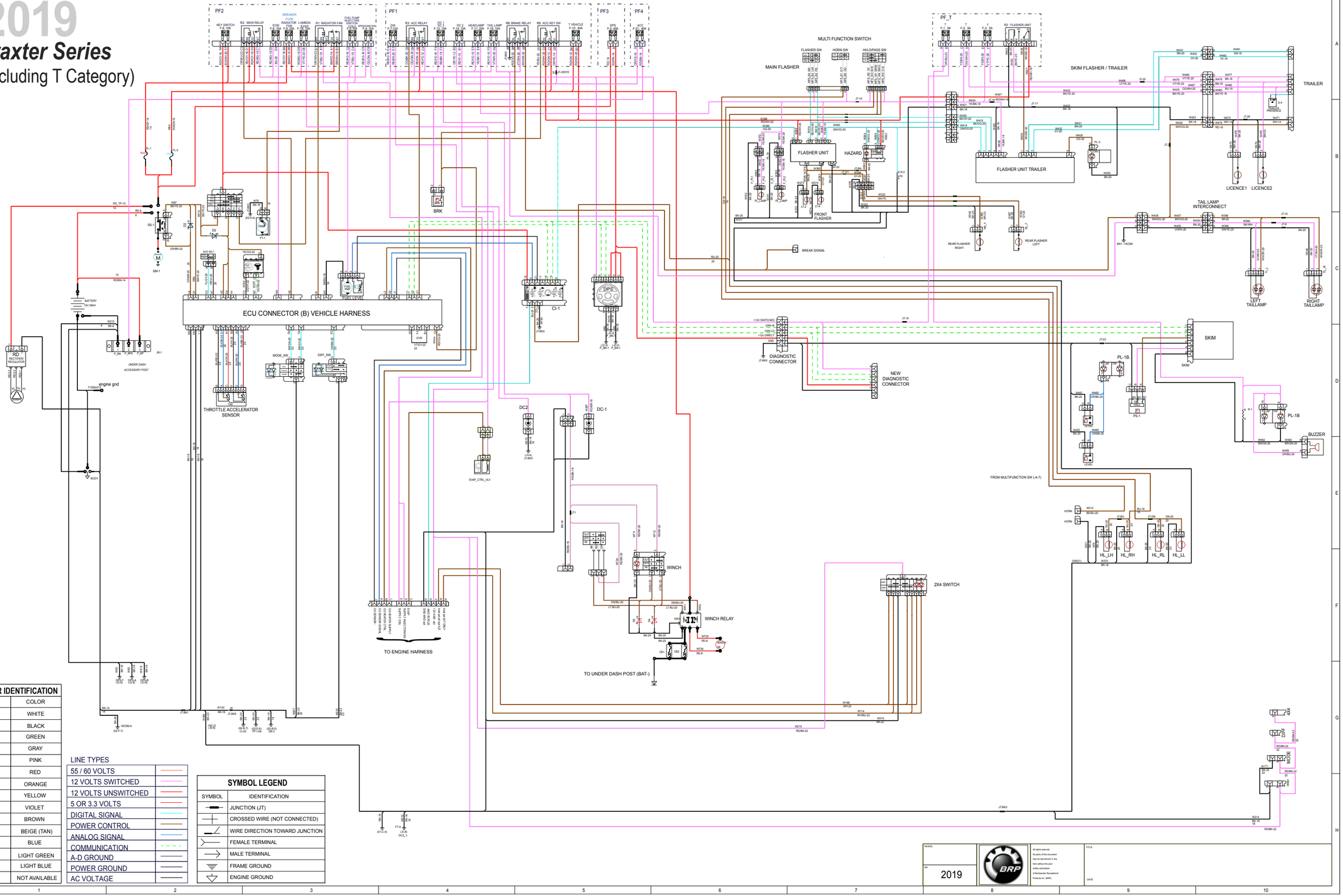
2019

Traxter Series

(including T Category)



COLOR IDENTIFICATION	
CODE	COLOR
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GY	GRAY
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OG	ORANGE
YE	YELLOW
VT	VIOLET
BN	BROWN
BG	BEIGE (TAN)
BU	BLUE
LT GN	LIGHT GREEN
LT BU	LIGHT BLUE
N/A	NOT AVAILABLE

LINE TYPES
55 / 60 VOLTS
12 VOLTS SWITCHED
12 VOLTS UNSWITCHED
5 OR 3.3 VOLTS
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SYMBOL	IDENTIFICATION
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	FRAME GROUND
	ENGINE GROUND

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MODEL: 2019

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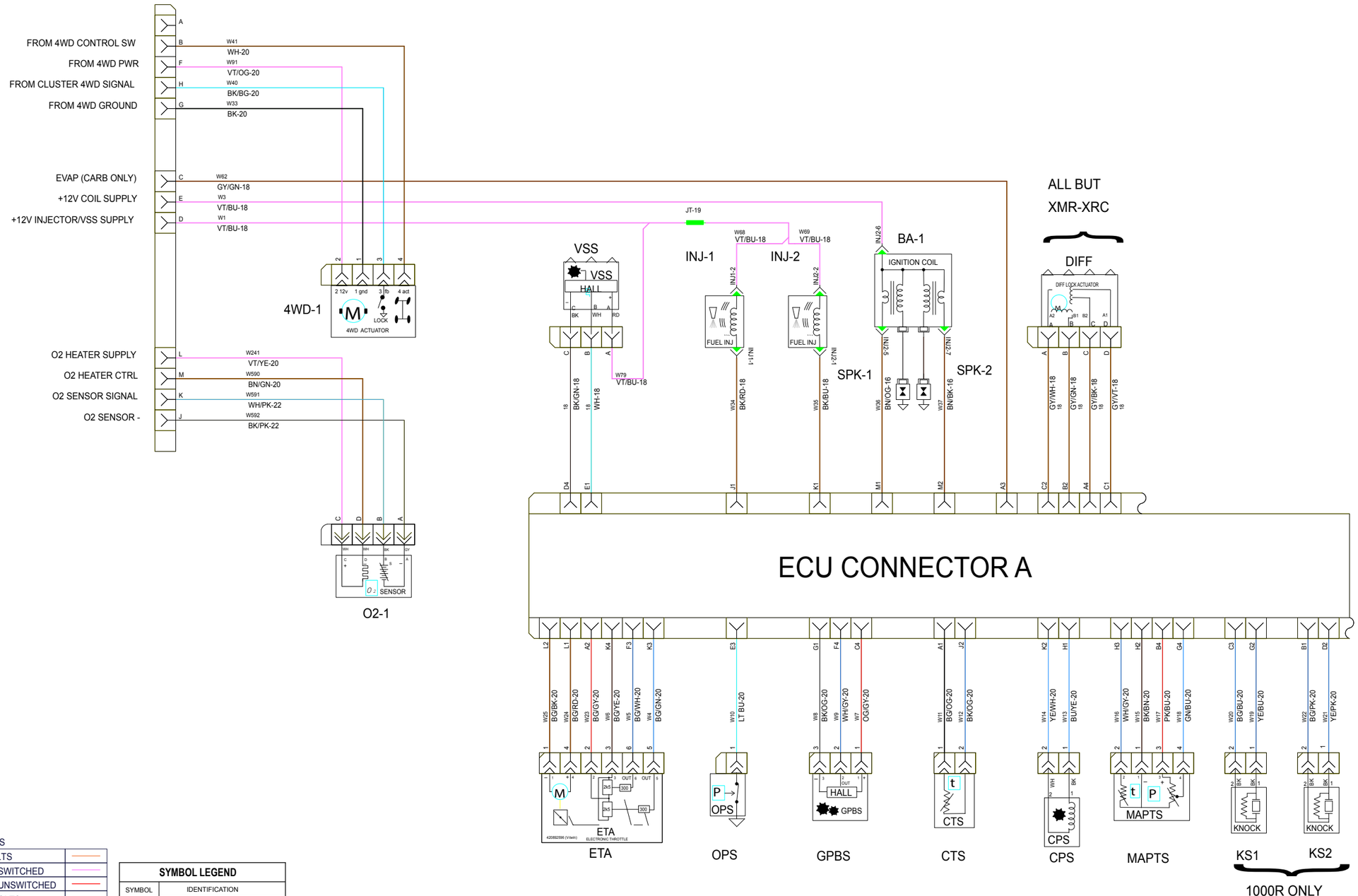
TITLE:

DATE:

2019 ENGINE HARNESS



COLOR IDENTIFICATION	
CODE	COLOR
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BK	BLACK
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BG	BEIGE (TAN)
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LT GN	LIGHT GREEN
LT BU	LIGHT BLUE
N/A	NOT AVAILABLE

LINE TYPES
55 / 60 VOLTS
12 VOLTS SWITCHED
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AC VOLTAGE

SYMBOL LEGEND	
SYMBOL	IDENTIFICATION
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	WIRE DIRECTION TOWARD JUNCTION
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	MALE TERMINAL
	FRAME GROUND
	ENGINE GROUND

MODEL
MY 2019

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TITLE
DATE

Flat rate times are what the manufacturer pays the authorized dealer for warranty work, the times listed are usually unrealistic for even the most experienced mechanic and will take longer to actually complete.

Because of this dealers will usually charge more than the times posted.

I cannot be held responsible for any errors BRP has made in these service flat rate or parts manuals.

If you bought this manual from any other seller, they could be reselling my work.

Please leave them negative feedback & email me at bestshopmanuals@gmail.com .

Our goal is to be one of the BEST sellers on the internet by providing you with the BEST customer service and the BEST manuals on the market.

Thank you for choosing us.

INTRODUCTION

This publication governs all warranty labor allowances for 2019 BRP SSV

1. HOW DOES IT WORK

We follow the procedures detailed in the BRP *SSV Shop Manual*. The flat rate time is the maximum time allowed for a repair involving any given part. FLAT RATE TIME IS NOT CUMULATIVE. You must use the flat rate time given for the longest lasting operation.

NOTE: The *Flat Rate Time Schedule* was prepared by skilled mechanics using the hand tool usually found in workshops and all the special tools mentioned in the *Shop Manual*.

2. COMPILATION

The *Flat Rate Time Schedule* is compiled as follows:

The actual required time to perform the repair plus (+) 30% correction factor up to 3.0 hours or (+) 15% over 3.0 hours time to take into account, among others:

- Vehicle handling
- Obtaining the parts
- Diagnosis
- Cleaning
- Special compensation (rusted bolts).

3. HOW TO USE IT

Refer to the system you need, locate part of series of parts replaced. List JOB CODE in the appropriate column on claim.

SYSTEM		PAGE
01	ENGINE	05
02	CARBURETOR AND FUEL SYSTEM	27
03	IGNITION SYSTEM	31
04	STARTER	33
05	TRANSMISSION SYSTEM	34
06	BRAKE SYSTEM	45
07	STEERING SYSTEM AND FRONT SUSPENSION	47
08	REAR SUSPENSION SYSTEM AND TRACK	54
09	BODY	59
10	ELECTRICAL SYSTEM	72

NOTE: Unless otherwise specified, dismantling order is: top to bottom, exterior to interior, front to rear.

All fractions of hours are in tenths:

0.1 = 6 minutes
0.2 = 12 minutes, and so on

LEGEND:

* REQUIRES PRIOR AUTHORIZATION BY DISTRIBUTOR.
** INDICATE LABOUR TIME ON LINE “LABOUR ONLY“ OF CLAIM.
*** INDICATE $$$ AMOUNT ON “SUB-CONTRACTED LABOUR“ OF CLAIM.

IMPORTANT: Always use the longest flat rate time applicable to the repair performed.

4. JOB REQUIREMENTS

All the flat rate times mentioned in the following pages include the required operations such as: engine timing (rotary valve and ignition), connecting rod(s) alignment, cylinder head(s) torque or use of parallel bar, use of ignition tester, piston clearance/ring end gap measurement, crankshaft to crankcase measurement, cylinder honing, engine leak test.

5. ILLUSTRATIONS

The illustrations contained in this manual do not necessarily show every components of a given system as *Parts Catalog* do. Their purpose is to facilitate recognition of parts related to a flat rate time. Item numbers on illustrations correspond to the four digit Job Code.

6. FLAT RATE TIME SUGGESTION

SEND A WARRANTY CASE ON BOSSWeb INFO CENTER

In the case, you must provide the following information:

Section *Subject*:

- Flat rate time suggestion

Section *Your Question*:

- Model year;
- Model description;
- Description job code;
- Job code;
- Present flat rate;
- Suggested flat rate;
- Detailed repair procedure;

To ensure that your case will be promptly and efficiently processed please indicate the step by step repair procedure you performed.

INTRODUCTION

Cette publication détermine le temps de main-d'oeuvre couvert par la garantie pour les VCC BRP 2019.

1. UTILISATION DU MANUEL

En procédant de la façon indiquée dans le *Manuel de réparation VCC* BRP, chaque temps donné représente le maximum permis pour une réparation portant sur cette pièce. LES TEMPS NE SONT PAS CUMULATIFS. On doit inscrire le temps donné pour l'opération qui prend le plus de temps.

REMARQUE: Le *Barème de temps à taux fixe* a été préparé par des mécaniciens compétents utilisant les outils que l'on retrouve normalement dans les ateliers de réparation, en plus de tous les outils spéciaux mentionnés dans le *Manuel de réparation*.

2. COMPILATION

Le *Barème de temps à taux fixe* a été établi en compilant le temps nécessaire pour faire la réparation plus (+) un facteur de correction de 30% lorsqu'un travail dure 3.0 heures et moins, ou (+) 15% lorsqu'un travail dure plus de 3.0 heures. Cette compilation comprend, entre autres, les étapes suivantes:

- Manutention du véhicule
- Nettoyage
- Aller chercher les pièces, essais physiques
- Compensation spéciale (boulons rouillés)
- Diagnostic.

3. UTILISATION DU BARÈME

Se reporter à la section désirée, repérer la pièce ou l'ensemble de pièces remplacées et inscrire le CODE DE TRAVAIL dans la colonne appropriée sur la formule de réclamation.

SYSTÈME		PAGE
01	MOTEUR	05
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03	SYSTÈME D'ALLUMAGE	31
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09	CARROSSERIE	59
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REMARQUE: Sauf indication contraire, le démontage doit s'effectuer de haut en bas, de l'extérieur vers l'intérieur, de l'avant vers l'arrière.

Toutes les fractions d'heures sont exprimées en dixièmes:

0.1 = 6 minutes
0.2 = 12 minutes, et ainsi de suite

LÉGENDE:

* AUTORISATION REQUISE AVANT LE REMPLACEMENT.
** INSCRIRE LE TEMPS À LA LIGNE «MAIN-D'OEUVRE SEULEMENT».
*** INSCRIRE LE MONTANT $$$ À LA LIGNE «OUVRAGE SOUS-CONTRACTÉ».

IMPORTANT: Toujours utiliser le temps donné à l'opération qui nécessite le plus de temps.

4. TRAVAUX REQUIS

Tous les temps mentionnés dans les pages suivantes incluent les opérations telles que: réglage du moteur (valve rotative et allumage), alignement de la ou des bielles, couple de serrage de la ou des culasses ou l'utilisation de barres parallèles, utilisation du vérificateur d'allumage, mesure du jet des pistons/jeu en bout des segments, mesure de l'écart entre le vilebrequin et le carter, rectification du cylindre, vérification de fuite du moteur.

5. ILLUSTRATIONS

Contrairement aux *Catalogues de pièces*, les illustrations de ce manuel ne montrent pas nécessairement chacune des pièces qu'elles représentent, leur raison d'être étant plutôt de faciliter la reconnaissance des pièces reliées à un barème de temps à taux fixe. **Les numéros d'items sur les illustrations correspondent aux quatre derniers chiffres du code de travail.**

6. SUGGESTION DE BARÈME DE TEMPS À TAUX FIXE

ENVOYEZ UNE REQUÊTE GARANTIE BOSSWeb DEPUIS LA SECTION INFO CENTRE

Dans cette requête, vous devez fournir les informations suivantes:

Section *Objet*:

- Suggestion de barème de temps à taux fixe

Section *Votre Question*:

- L'année modèle;
- Description du modèle;
- Description du code de travail;
- Code de travail;
- Temps actuel;
- Temps suggéré;
- Détails de la marche à suivre;

Pour s'assurer que votre demande sera traitée dans les plus brefs délais et efficacement, s.v.p. nous fournir toutes les étapes de réparation dans les détails de la marche à suivre.

2019

SSV/ VCC

TABLE	DESCRIPTION	MODEL/MODÈLE	ENGINE TYPE/ TYPE DE MOTEUR
18	DEFENDER HD5	6XKA/6XKB/6XKC	427 CVT
	DEFENDER DPS HD5	8WKB/8WKC 8WKD/8WKE	
19	DEFENDER HD8	6WKA/6WKB 6WKC/6WKD	800 CVT
	DEFENDER DPS HD8	8EKB/8EKC/8EKD 8EKF/8EKG/8EKH 8EKJ/8EKK	
	DEFENDER XT HD8	8FKA/8FKB/8FKC 8FKD/8FKE/8FKF	
20	DEFENDER DPS HD10	8BKA/8BKC 8BKD/8BKF	1000 CVT
	DEFENDER MOS HD10	8XKB/8XKC	
	DEFENDER XT HD10	8CKA/8CKB/8CKC 8CKD/8CKE/8CKF 8CKG/8CKH	
	DEFENDER XTP HD10	8VKB/8VKC	
21	DENFEDER CAB HD8	8UKC/8UKF	800 CVT
22	DENFENDER CAB HD10	8TKA/8TKC 8TKD/8TKF	1000 CVT
23	DEFENDER MAX HD8	8ZKB/8ZKC/8ZKD	800 CVT
	DEFENDER MAX DPS HD8	8RKA/8RKB/8RKC 8RKD/8RKE/8RKF 8RKG	
	DEFENDER MAX XT HD8	8SKA/8SKD/8SKE 8SKF/8SKG	
24	DEFENDER MAX DPS HD10	8LKC/8LKF	1000 CVT
	DEFENDER MAX LS HD10	6UKA	
	DEFENDER MAX XT HD10	8MKA/8MKC/8MKD 8MKE/8MKF/8MKG 8MKH	
25	DEFENDER MAX CAB HD10	6MKA/6MKC/6MKD 6MKE	1000 CVT
26	DEFENDER XMR HD10	8YKB/8YKC/8YKD 8YKE/8YKF	1000 CVT
27	DEFENDER MAX XMR HD10	8PKB/8PKC	1000 CVT

ENGINE SYSTEM
SYSTÈME MOTEUR

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
01 *	01	REMOVE AND REPLACE ENGINE (ASS'Y) REMPLACEMENT DU MOTEUR (COMPLET)	4.0	4.5	4.5	4.5	4.5	4.5	4.5
01	03	OIL PRESSURE SWITCH INTERRUPTEUR DE PRESSION D'HUILE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	08	FAN AND/OR FAN SUPPORT VENTILATEUR ET/OU SUPPORT DE VENTILATEUR	1.1	1.1	1.1	1.1	1.1	1.1	1.1
01	18	SENDER TEMPERATURE (ENGINE) CAPTEUR DE TEMPÉRATURE (MOTEUR)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
01	19	THERMOSTAT THERMOSTAT	0.5	1.2	1.2	1.2	1.2	1.2	1.2
01	21	COOLANT HOSE T-FITTING (ONE OR TWO) BOYAU DE LIQUIDE DE REFROIDISSEMENT RACCORD EN T (1 OU 2)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
01	37	RADIATOR INLET HOSE BOYAU D'ENTRÉE DU RADIATEUR	0.7	0.7	0.7	0.7	0.7	0.7	0.7
01	38	WATER PUMP SHAFT (ALL PARTS) ARBRE DE POMPE À L'EAU (TOUTES LES PIÈCES)	4.8	3.5	3.5	3.5	3.5	3.5	3.5
01	45	ENGINE DAMPERS (1 OR ALL) TAMPONS ANTI-VIBRATION (1 OU TOUS)	3.0	4.6	4.6	4.6	4.6	4.6	4.6
01	46	RADIATOR AND/OR GROMMMET RADIATEUR ET/OU PASSE-FILS	1.2	1.2	1.2	1.2	1.2	1.2	1.2
01	50	CRANKSHAFT AND/OR BEARINGS (FRONT/REAR) VILEBREQUIN ET/OU ROULEMENTS (AVANT/ARRIÈRE)		6.5	6.5	6.5	6.5	6.5	6.5
01	56	CRANKCASE COVER GASKET JOINT DE COUVERCLE DE CARTER		2.0	2.0	2.0	2.0	2.0	2.0
01	57	PTO CRANKCASE COVER COUVERCLE DE CARTER PDM		2.0	2.0	2.0	2.0	2.0	2.0
01	58	INTAKE OR EXHAUST VALVE GUIDE (1) GUIDE DE SOUPAPE ADMISSION OU ECHAPPEMENT (1)	2.3						
01	59	INTAKE OR EXHAUST VALVE GUIDES (2) GUIDES DE SOUPAPE ADMISSION OU ECHAPPEMENT(2)	2.4						
01	70	MUFFLER AND/OR EXHAUST GASKET AND/OR CLAMP SILENCIEUX D'ÉCHAPPEMENT ET/OU JOINT D'ÉCHAPPEMENT ET/OU BRIDE DE SERRAGE	0.7	1.0	1.0	1.0	1.0	1.0	1.0
01	73	EXHAUST MANIFOLD (REAR) CONNECTEUR D'ÉCHAPPEMENT (ARRIÈRE)		2.1	2.1	2.1	2.1	2.1	2.1
01	83	EXHAUST MANIFOLD (FRONT) CONNECTEUR D'ÉCHAPPEMENT (AVANT)	0.8	6.2	6.2	6.2	6.2	6.2	6.2
01	84	TUNE PIPE SHIELD (1) COQUILLE TUYAU D'ECHAPPEMENT (1)	0.3	0.3	0.3	0.3	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	85	TUNE PIPE SHIELD (2) COQUILLE TUYAU D'ÉCHAPPEMENT (2)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	86	TUNE PIPE SHIELD (3) COQUILLE TUYAU D'ÉCHAPPEMENT (3)		0.3	0.3	0.3	0.3	0.3	0.3
01	87	MUFFLER SUPPORT SUPPORT DU SILENCIEUX	1.1	1.1	1.1	1.1	1.1	1.1	1.1
01	90	ENGINE OIL FILTER FILTRE À HUILE DU MOTEUR	0.4	0.4	0.4	0.4	0.4	0.4	0.4
01	96	OIL SIEVE AND/OR O-RING AND/OR COLLECTOR AND/OR RUBBER RING AND/OR COVER CRIBLE D'HUILE ET/OU JOINT TORIQUE ET/OU COLLECTEUR ET/OU ANNEAU DE CAOUTCHOUC ET/OU COUVERCLE	2.0	6.5	6.5	6.5	6.5	6.5	6.5
01	98	COOLING RESERVOIR RÉSERVOIR D'ANTIGEL	0.4	0.4	0.4	0.4	0.4	0.4	0.4
01	100	RADIATOR OUTLET HOSE BOYAU DE SORTIE DU RADIATEUR	0.7	0.7	0.7	0.7	0.7	0.7	0.7
01	101	PISTON,BEARING,PIN (1 PISTONS) PISTON,ROULEMENT,AXE (1 PISTONS)	3.0						
01	109	VALVE COVER AND/OR GASKET COUVERCLE DE SOUPAPE ET/OU JOINT D'ÉTANCHÉITÉ	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	111	TIMING GEAR PIGNON DE DISTRIBUTION	1.0	1.5	1.5	4.5	4.5	4.5	4.5
01	113	ROCKER ARM AND/OR PUSH ROD AND/OR ROCKER ARM SHAFT CULBUTEUR ET/OU TIGE POUSSOIR ET/OU ARBRE DE CULBUTEUR	1.1	1.6	1.6	1.6	1.6	1.6	1.6
01	114	CYLINDER HEAD A/O GASKET CULASSE E/O JOINT ÉTANCHE	3.5						
01	116	EXHAUST/INLET VALVE A/O SPRING A/O SEAL VALVE ADMISSION/ÉCHAPPEMENT E/O RESSORT E/O ANNEAU	2.7						
01	117	CYLINDER A/O GASKET CYLINDRE E/O JOINT ÉTANCHE	2.8						
01	119	WATER PUMP HOUSING AND/OR IMPELLER CARTER DE LA POMPE À EAU ET/OU ROUE À AILETTES	0.4	0.7	0.7	0.7	0.7	0.7	0.7
01	122	SHIFT SHAFT ASS'Y ARBRE D'EMBRAYAGE COMPLET	4.8						
01	132	OIL PUMP GEAR ENGRENAGE DE LA POMPE À L'HUILE	4.4	2.0	2.0	2.0	2.0	2.0	2.0
01	133	OIL PIPE TUYAU À L'HUILE		0.3	0.3	0.3	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	134	CAMSHAFT ARBRE À CAME	2.0	2.6	2.6	2.6	2.6	2.6	2.6
01	137	OIL PUMP COVER AND/OR SHAFT AND/OR ROTOR COUVERCLE DE LA POMPE À HUILE ET/OU ARBRE ET/OU ROTOR	4.5	2.1	2.1	2.1	2.1	2.1	2.1
01	138	CRANKCASE RESEAL OR GASKET RECELLEMENT DU CARTER ET/OU JOINT D'ÉTANCHÉITÉ	5.3	7.0	7.0	7.0	7.0	7.0	7.0
01	139	CRANKCASE REPLACEMENT REMPLACEMENT DU CARTER	5.9	7.5	7.5	7.5	7.5	7.5	7.5
01	140	CRANKSHAFT A/O BALANCE SHAFT VILEBREQUIN E/O ARBRE D'EQUILIBRAGE	5.6						
01	152	DRIVE SHAFT AND/OR BEARINGS AND/OR SEALS ARBRE D'ENTRAÎNEMENT ET/OU ROULEMENT À BILLES ET/OU ANNEAUX D'ÉTANCHÉITÉ	4.4	6.0	6.0	6.0	6.0	6.0	6.0
01	153	GEARS BOX ASS'Y / MAIN SHAFT BOITE D'ENGRENAGE COMPLET/ ARBRE PRINCIPAL	6.0						
01	154	TIMING CHAIN CHAÎNE D'ENGRENAGE	3.7	3.4	3.4	3.4	3.4	3.4	3.4
01	155	OUT PUT SHAFT ARBRE DE SORTIE	6.0						
01	172	SHIFT DRUM TAMBOUR D'EMBRAYAGE	6.0						
01	179	CHAIN GUIDE GUIDE DE CHAÎNE	1.0	1.4	1.4	1.4	1.4	1.4	1.4
01	182	OIL RADIATOR AND/OR O-RING RADIATEUR D'HUILE ET/OU JOINT D'ÉTANCHÉITÉ		2.5	2.5	2.5	2.5	2.5	2.5
01	191	CHAIN TENSION GUIDE GUIDE DE TENSION DE CHAÎNE	2.9	3.4	3.4	3.4	3.4	3.4	3.4
01	192	CHAIN TENSIONER (ASS'Y) TENDEUR DE CHAÎNE (COMPLET)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	200	WATER PUMP GEAR ENGREANGE POMPE A EAU	4.3	2.0	2.0	2.0	2.0	2.0	2.0
01	201	PLUG, COMPRESSION SPRING, PRESSURE RETAINER AND BALL VIS, RESSORT DE COMPRESSION, SOUPAPE DE RETENUE ET BILLE		2.0	2.0	2.0	2.0	2.0	2.0
01	205	REAR OUTPUT SHAFT SEAL ANNEAU D'ÉTANCHÉITÉ DE L'ARBRE DE SORTIE ARRIÈRE	3.0	5.0	5.0	5.0	5.0	5.0	5.0
01	209	OUTPUT CRANKSHAFT SEAL (REWIND SIDE) ANN. ETANCH. SORTIE VILBR.(COTE DEMARR.)	0.8						
01	210	MAIN SHAFT SEAL JOINT D'ÉTANCHÉITÉ DE L'ARBRE PRINCIPAL	0.8						

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	215	OIL DIPSTICK JAUGE À HUILE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	216	PRESSURE CAP BOUCHON À PRESSION	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	220	MAIN DRIVE GEAR AND/OR PIN ROUAGE D'ENTRAÎNEMENT PRINCIPALE ET/OU GOUPILLE	4.4	2.1	2.1	2.1			
01	221	INTERMEDIATE GEAR AND/OR PIN AND/OR THRUST WASHER ROUAGE INTERMEDIAIRE ET/OU GOUPILLE ET/OU RONDELLE D'APPUI	4.4	2.1	2.1	2.1	2.1	2.1	2.1
01	223	FRONT OUTPUT SHAFT SEAL ANNEAU ÉTANCHÉITÉ ARBRE SORTIE AVANT		4.7	4.7	4.7	4.7	4.7	4.7
01	245	OUTPUT CRANKSHAFT SEAL (PTO SIDE) ANNEAU ÉTANCHÉITÉ SORTIE VILEBREQUIN (CÔTÉ PDM)	1.0	1.3	1.3	1.3	1.3	1.3	1.3
01	246	WATER PUMP GEAR AND/OR SEAL ARBRE POMPE À EAU ET/OU JOINT ÉTANCHÉITÉ	4.3	5.9	5.9	5.9	5.9	5.9	5.9
01	247	REED VALVE AND/OR STOPPER SOUPAPE À CLAPET ET/OU BUTOIR		2.1	2.1	2.1	2.1	2.1	2.1
01	248	BREATHER GEAR AND/OR V-RING RENIFLARD ET/OU ANNEAU ÉTANCHÉITÉ EN «V»		2.1	2.1	2.1	2.1	2.1	2.1
01	250	CRANKSHAFT POSITION SENSOR (CPS) CAPTEUR POSITION DU VILEBREQUIN (CPV)	0.3						
01	255	EXHAUST/INLET VALVES A/O SPRINGS A/O SEALS (4) EXHAUST/INLET VALVES A/O SPRINGS A/O SEALS (4)	3.3						
01	256	EXHAUST AND/OR INLET VALVES AND/OR SPRINGS AND/OR SEALS (8) ÉCHAPPEMENT ET/OU VALVES ADMISSION ET/OU RESSORTS ET/OU ANNEAUX D'ÉTANCHÉITÉ (8)		5.2	5.2	5.2	5.2	5.2	5.2
01	261	TIMING CHAIN (MAG SIDE) CHAÎNE D'ENGRENAGE (CÔTÉ MAG)	2.6	3.2	3.2	3.2	3.2	3.2	3.2
01	264	LONG BLOCK ENSEMBLE CARTER - CYLINDRE - CULASSE	5.2	6.9	6.9	6.9	6.9	6.9	6.9
01	290	REAR ENGINE SUPPORT (PTO SIDE) SUPPORT MOTEUR ARRIERE (COTE PDM)	0.8						
01	292	REAR ENGINE SUPPORT (MAG SIDE) SUPPORT MOTEUR ARRIERE (COTE MAG)	0.5						
01	301	WATER PUMP DYNAMIC SEAL AND/OR OIL SEAL ANNEAU D'ÉTANCHÉITÉ DYNAMIQUE DE LA POMPE À EAU		2.5	2.5	2.5	2.5	2.5	2.5
01	303	TIMING CHAINS (ALL) CHAÎNES D'ENGRENAGE (TOUTES)		5.5	5.5	5.5	5.5	5.5	5.5
01	304	CHAINS TENSION GUIDE (ALL) GUIDE DE TENSION DE CHAÎNES (TOUS)		5.5	5.5	5.5	5.5	5.5	5.5

ENGINE SYSTEM
SYSTÈME MOTEUR

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	305	CHAINS GUIDE (ALL) GUIDE DE CHAÎNES (TOUS)		2.1	2.1	2.1	2.1	2.1	2.1
01	307	VALVE COVERS AND/OR GASKETS (2) COUVERCLES SOUPAPE ET/OU JOINTS D'ÉTANCHÉITÉ (2)		0.5	0.5	0.5	0.5	0.5	0.5
01	308	CYLINDER HEAD GASKET JOINT D'ETANCHEITE DE LA CULASSE	1.4						
01	316	MUFFLER END CAP EMBOUT DE SILENCIEUX	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	320	THROTTLE PEDAL PÉDALE D'ACCÉLÉRATEUR	0.4	0.4	0.4	0.4	0.4	0.4	0.4
01	329	INJECTOR (1) INJECTEUR (1)	0.4						
01	335	COOLANT HOSE (WATER PUMP) BOYAU DE REFROIDISSEMENT (POMPE À EAU)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
01	337	RECIRCULATION HOSE BOYAU DE RECIRCULATION		0.7	0.7	0.7	0.7	0.7	0.7
01	338	INTERMEDIATE HOSE BOYAU INTERMÉDIAIRE	0.7	0.7	0.7	0.7	0.7	0.7	0.7
01	340	PLUG SCREW BOUCHON FILETÉ		0.7	0.7	0.7	0.7	0.7	0.7
01	347	FRONT ENGINE SUPPORT SUPPORT MOTEUR AVANT	3.0						
01	352	OXYGEN SENSOR CAPTEUR D'OXYGEN	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	353	INJECTORS (ALL) INJECTEURS (TOUS)		0.4	0.4	0.4	0.4	0.4	0.4
01	374	HEAT SHIELD SUPPORT SUPPORT DE DEFLECTEUR DE CHALEUR		0.3	0.3	0.3	0.3	0.3	0.3
01	375	FRONT HEAT SHIELD DEFLECTEUR DE CHALEUR AVANT	0.5	1.0	1.0	1.0	1.0	1.0	1.0
01	376	FRONT PIPE HEAT SHEILD (LEFT) DEFLECTEUR DE CHALEUR TUYAU AVANT (GAUCHE)		0.4	0.4	0.4	0.4	0.4	0.4
01	377	FRONT PIPE HEAT SHEILD (RIGHT) DEFLECTEUR DE CHALEUR TUYAU AVANT (DROIT)		6.2	6.2	6.2	6.2	6.2	6.2
01	378	FRONT PIPE HEAT SHEILD (MUFFLER) DEFLECTEUR DE CHALEUR TUYAU AVANT (SILENCIEUX)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
01	379	REAR HEAT SHEILD (MUFFLER) DEFLECTEUR DE CHALEUR ARRIERE (SILENCIEUX)	0.3	0.6	0.6	0.6	0.6	0.6	0.6
01	380	INLET HOSE (HEATER UNIT) BOYAU D'ENTRE (UNITE CHAUFFAGE)		1.7	1.7	1.7	1.7	1.7	1.7
01	381	OUTLET HOSE (HEATER UNIT) BOYAU DE SORTIE (UNITE CHAUFFAGE)		2.0	2.0	2.0	2.0	2.0	2.0

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	382	THERMOSTAT HOSE BOYAU DU THERMOSTAT		0.7	0.7	0.7	0.7	0.7	0.7
01	383	BLEEDING HOSE BOYAU DE PURGE	1.0	1.0	1.0	1.0	1.0	1.0	1.0
01	384	FRONT CYLINDER HEAD AND/OR GASKET CULASSE AVANT ET/OU JOINT D'ÉTANCHEITE		6.3	6.3	6.3	6.3	6.3	6.3
01	385	REAR CYLINDER HEAD AND/OR GASKET CULASSE ARRIERE ET/OU JOINT D'ÉTANCHEITÉ		3.5	3.5	3.5	3.5	3.5	3.5
01	386	FRONT CYLINDER AND/OR GASKET CYLINDRE AVANT ET/OU JOINT D'ÉTANCHEITE		5.5	5.5	5.5	5.5	5.5	5.5
01	387	REAR CYLINDER AND/OR GASKET CYLINDRE ARRIERE ET/OU JOINT D'ÉTANCHÉITÉ		2.7	2.7	2.7	2.7	2.7	2.7
01	388	EXHAUST/INLET VALVE AND/OR SPRING AND/OR SEAL (FRONT CYLINDER HEAD) VALVE ADMISSION/ÉCHAPPEMENT ET/OU RESSORT ET/OU ANNEAU (CULASSE AVANT)		5.5	5.5	5.5	5.5	5.5	5.5
01	389	EXHAUST/INLET VALVE AND/OR SPRING AND/OR SEAL (REAR CYLINDER HEAD) VALVE ADMISSION/ÉCHAPPEMENT ET/OU RESSORT ET/OU ANNEAU (CULASSE ARRIÈRE)(TOUS)		2.7	2.7	2.7	2.7	2.7	2.7
01	390	EXHAUST/INLET VALVES AND/OR SPRINGS AND/OR SEALS (FRONT CYLINDER HEAD) (ALL) VALVES ADMISSION/ECHAPPEMENT ET/OU RESSORTS ET/OU ANNEAUX (CULASSE AVANT) (TOUS)		6.1	6.1	6.1	6.1	6.1	6.1
01	391	EXHAUST/INLET VALVES AND/OR SPRINGS AND/OR SEALS (REAR CYLINDER HEAD) (ALL) VALVES ADMISSION/ECHAPPEMENT ET/OU RESSORTS ET/OU ANNEAUX (CULASSE ARRIERE) (TOUS)		3.3	3.3	3.3	3.3	3.3	3.3
01	392	FRONT PISTON, PIN, CIRCLIP ET RINGS PISTON AVANT, GOUPILLE, CIRCLIP ET SEGMENTS		5.6	5.6	5.6	5.6	5.6	5.6
01	393	REAR PISTON, PIN, CIRCLIP ET RINGS PISTON ARRIÈRE, GOUPILLE, CIRCLIP ET SEGEMENTS		2.8	2.8	2.8	2.8	2.8	2.8
01	394	OIL SEAL ANNEAU D'ETANCHEITE D'HUILE	4.8						
01	404	REAR ENGINE SUPPORT (LEFT SIDE) SUPPORT MOTEUR ARRIÈRE (COTÉ GAUCHE)	2.0						
01	405	REAR ENGINE SUPPORT (RIGHT SIDE) SUPPORT MOTEUR ARRIÈRE (COTÉ DROIT)	2.0						
01	406	LINK BRACKET LIEN DE SUPPORT	1.2						

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
01	407	RUBBER MOUNT TAMPON D'ANCRAGE	0.5						
01	412	REAR ENGINE MOUNTS TAMPONS ANCRAGE MOTEUR ARRIÈRE	1.4						
01	413	SHIFTING UNIT (ASS'Y) UNITÉ D'EMBRAYAGE (COMPLET)	3.0						

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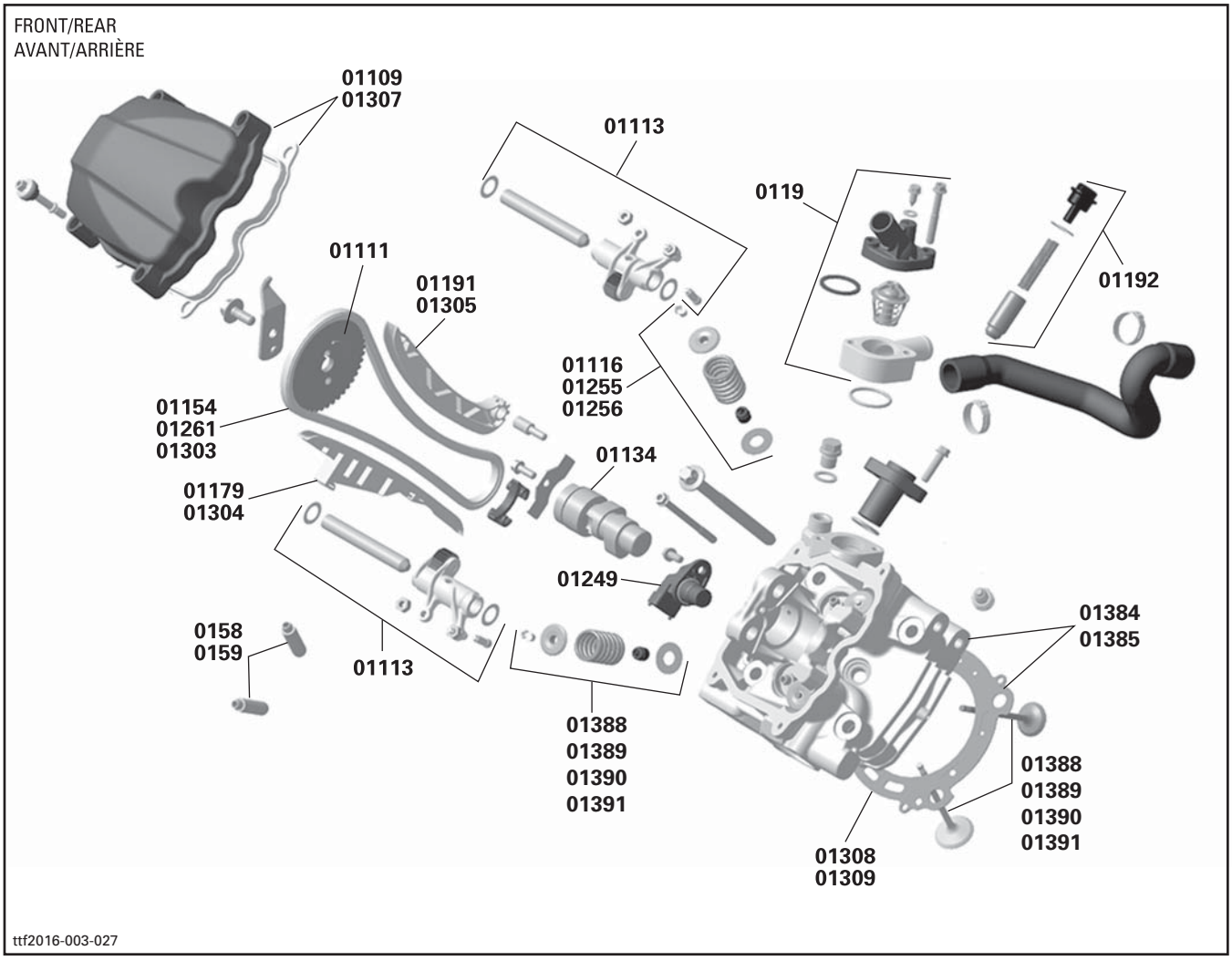
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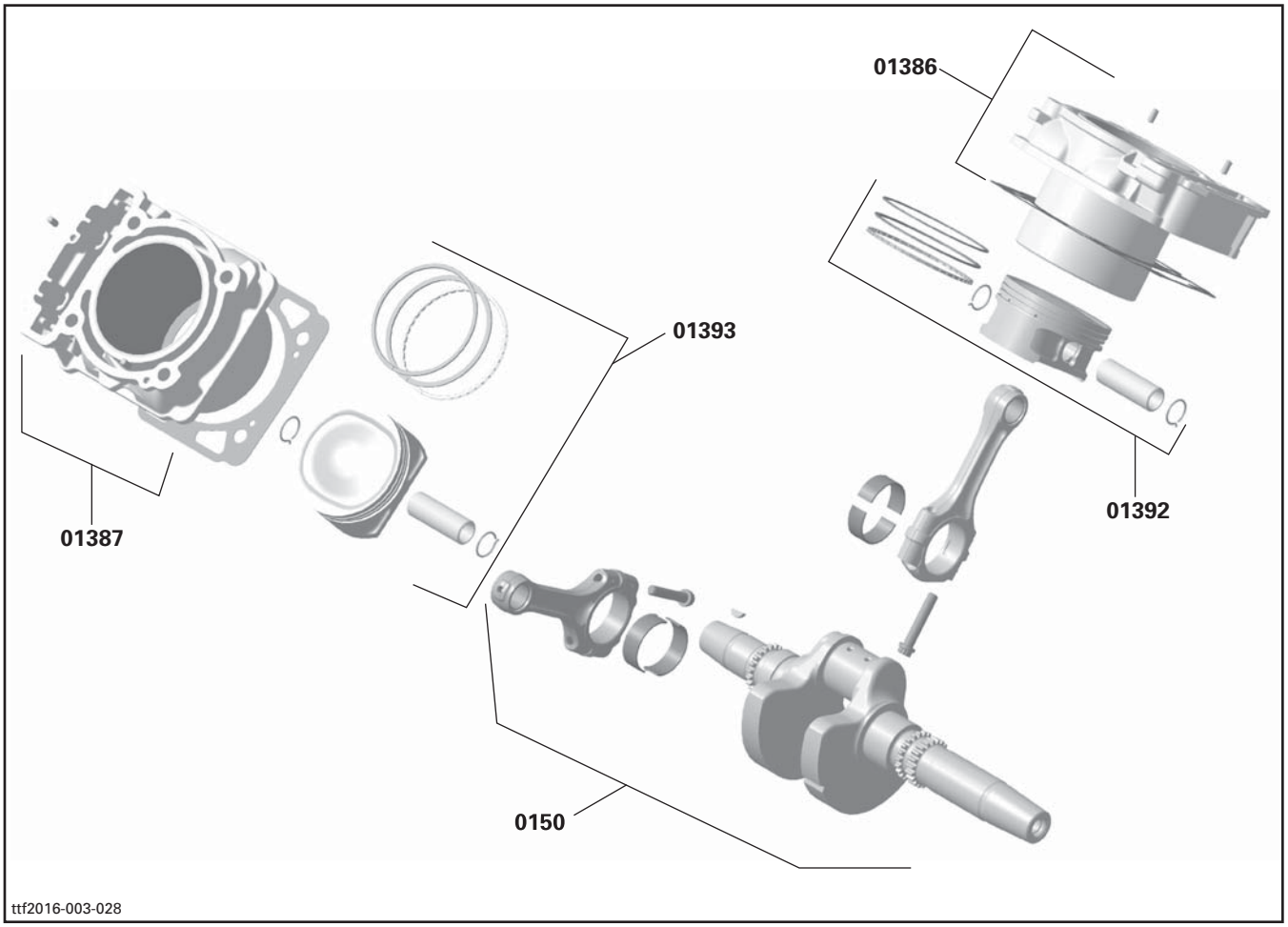

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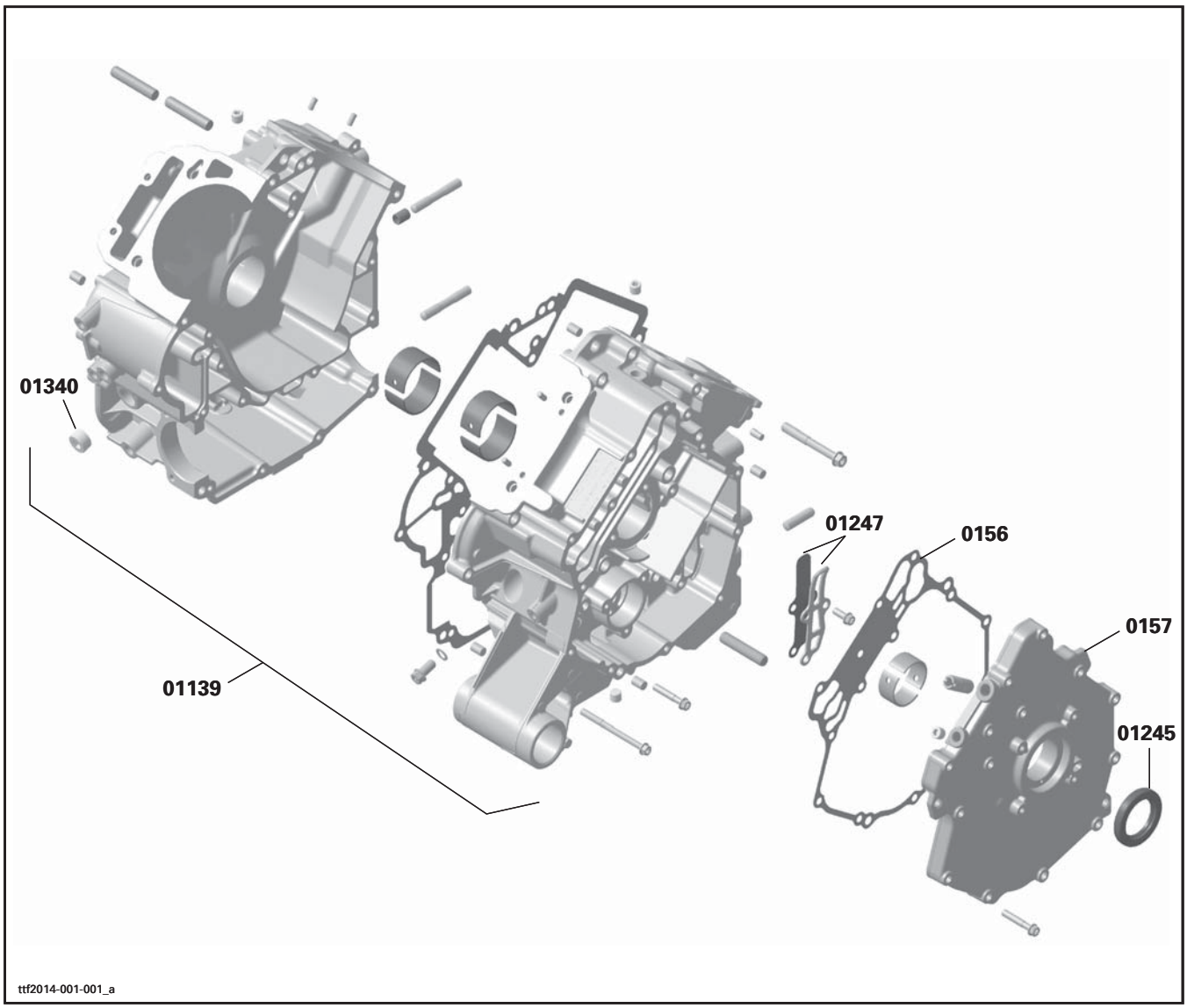

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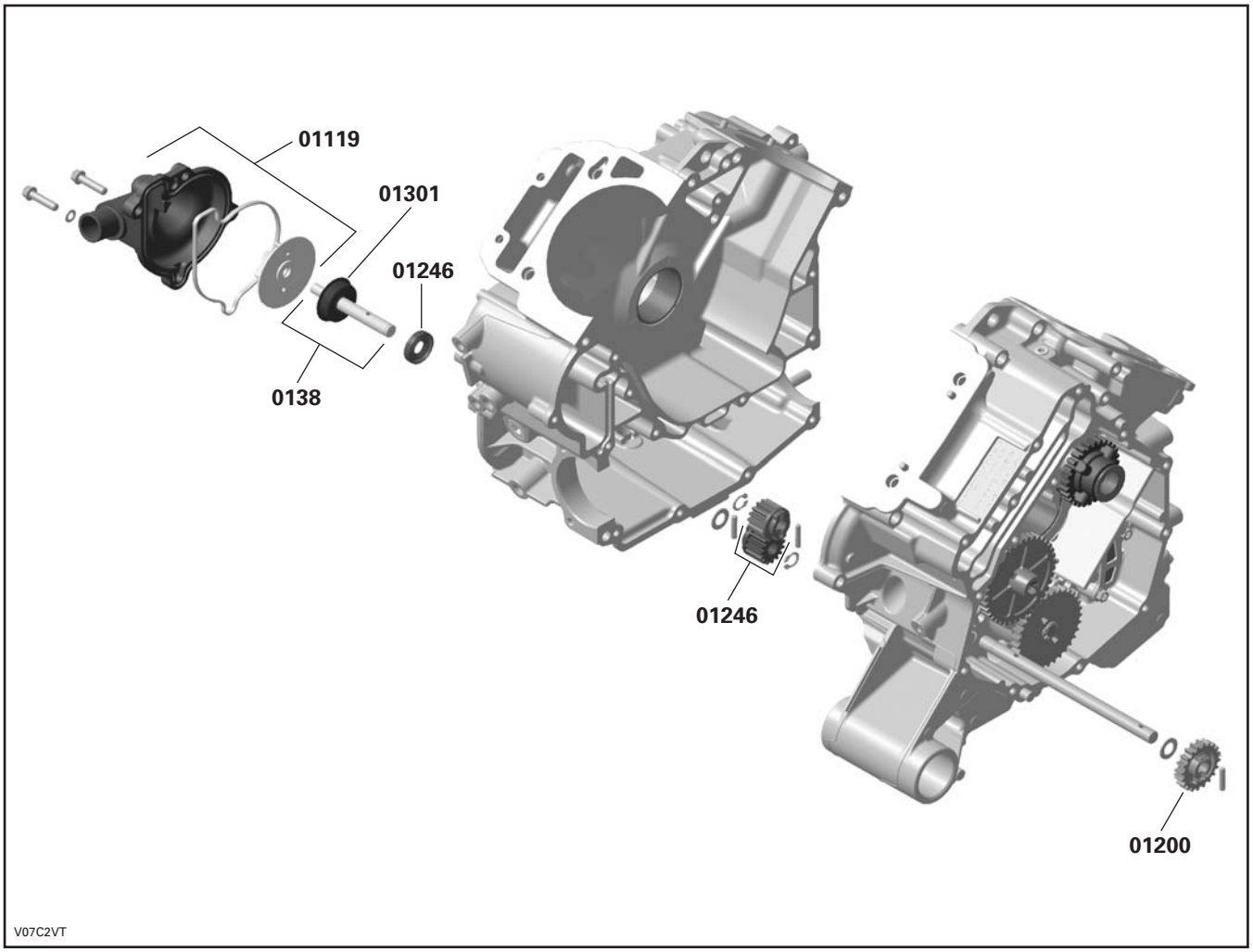

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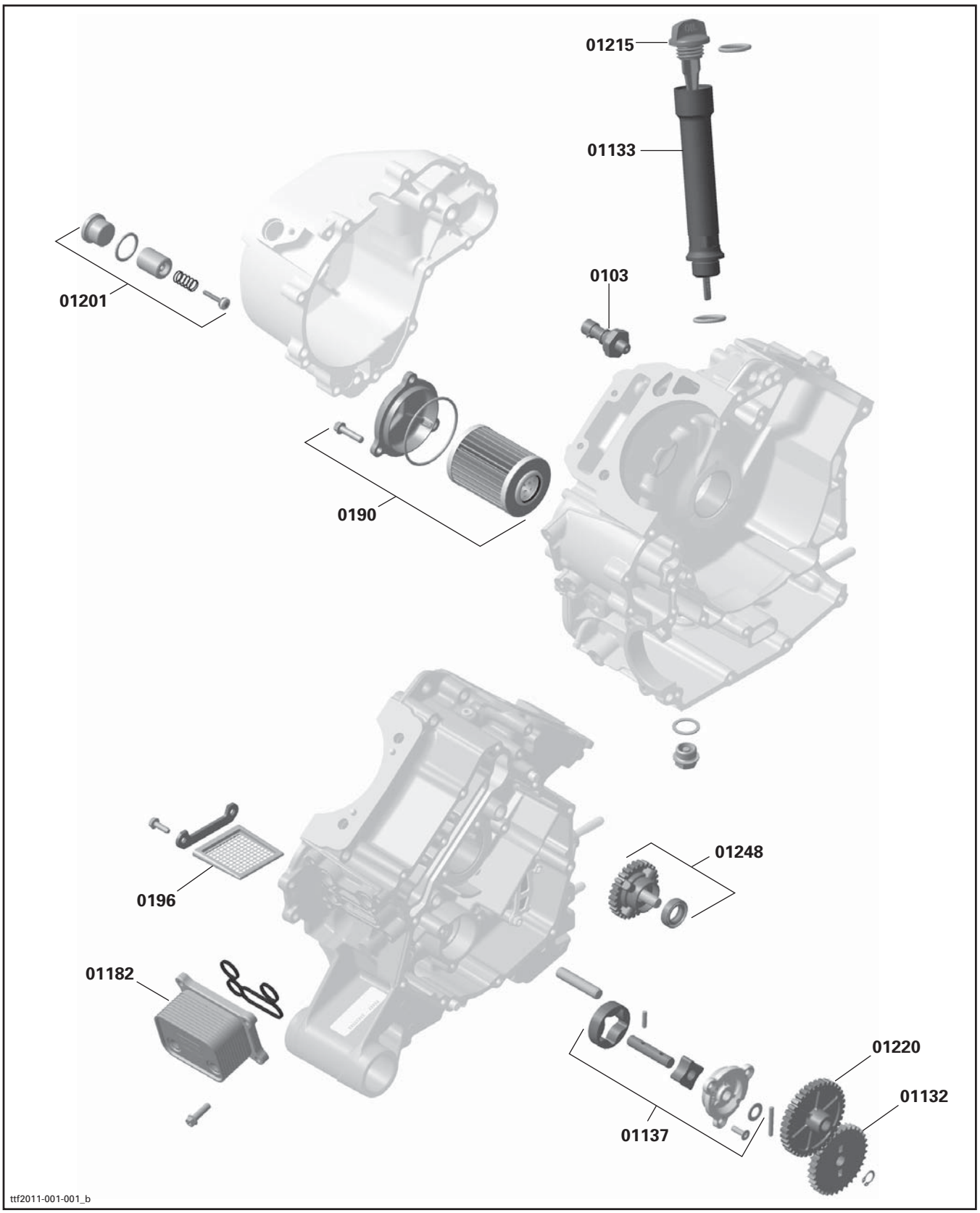
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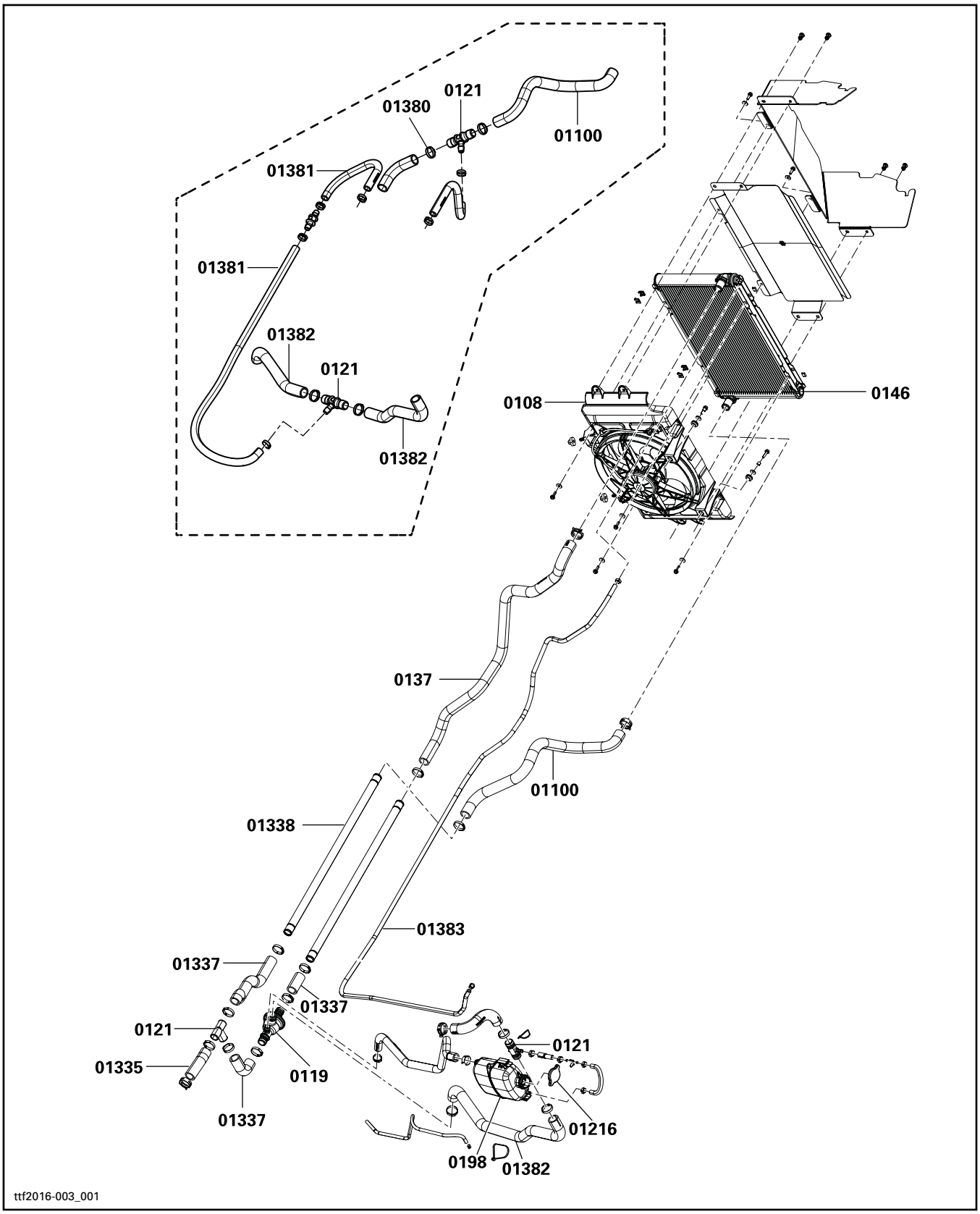
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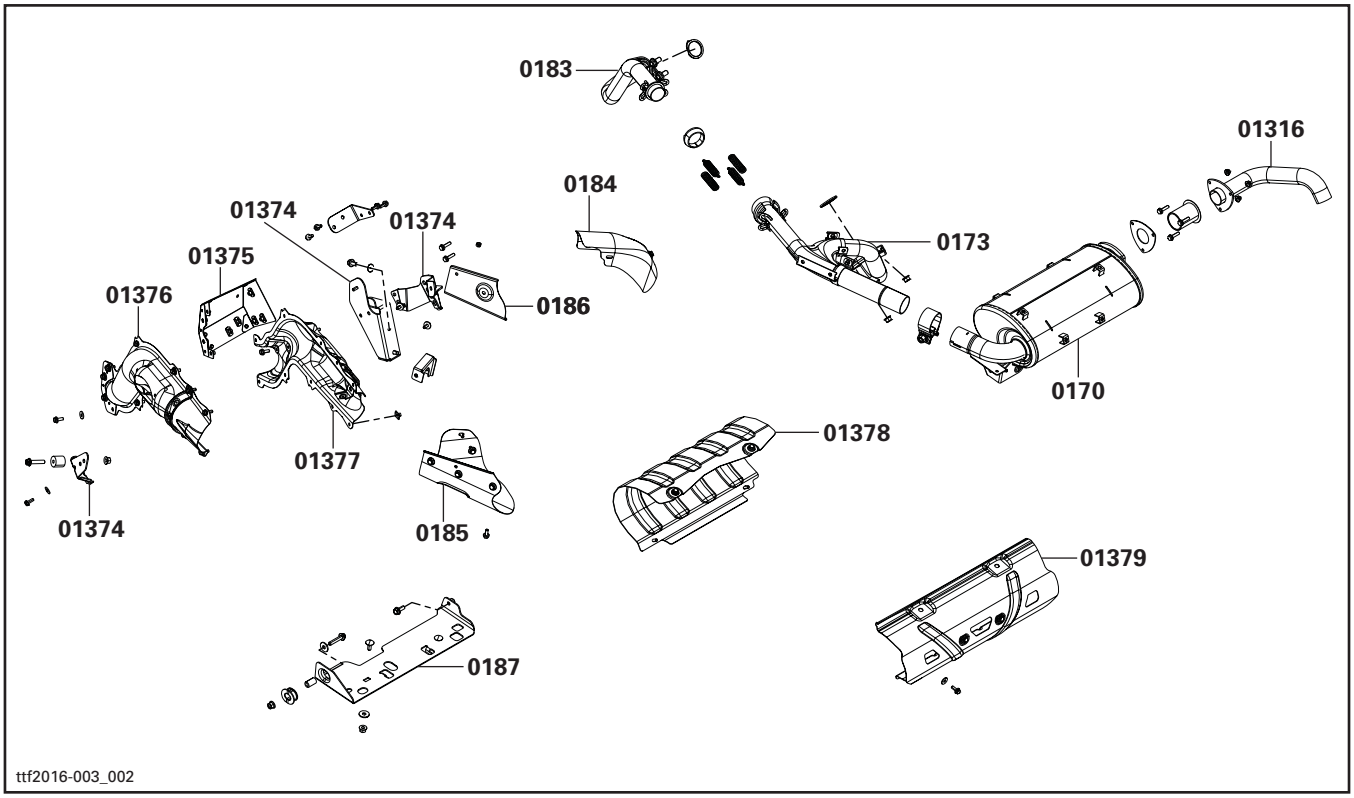
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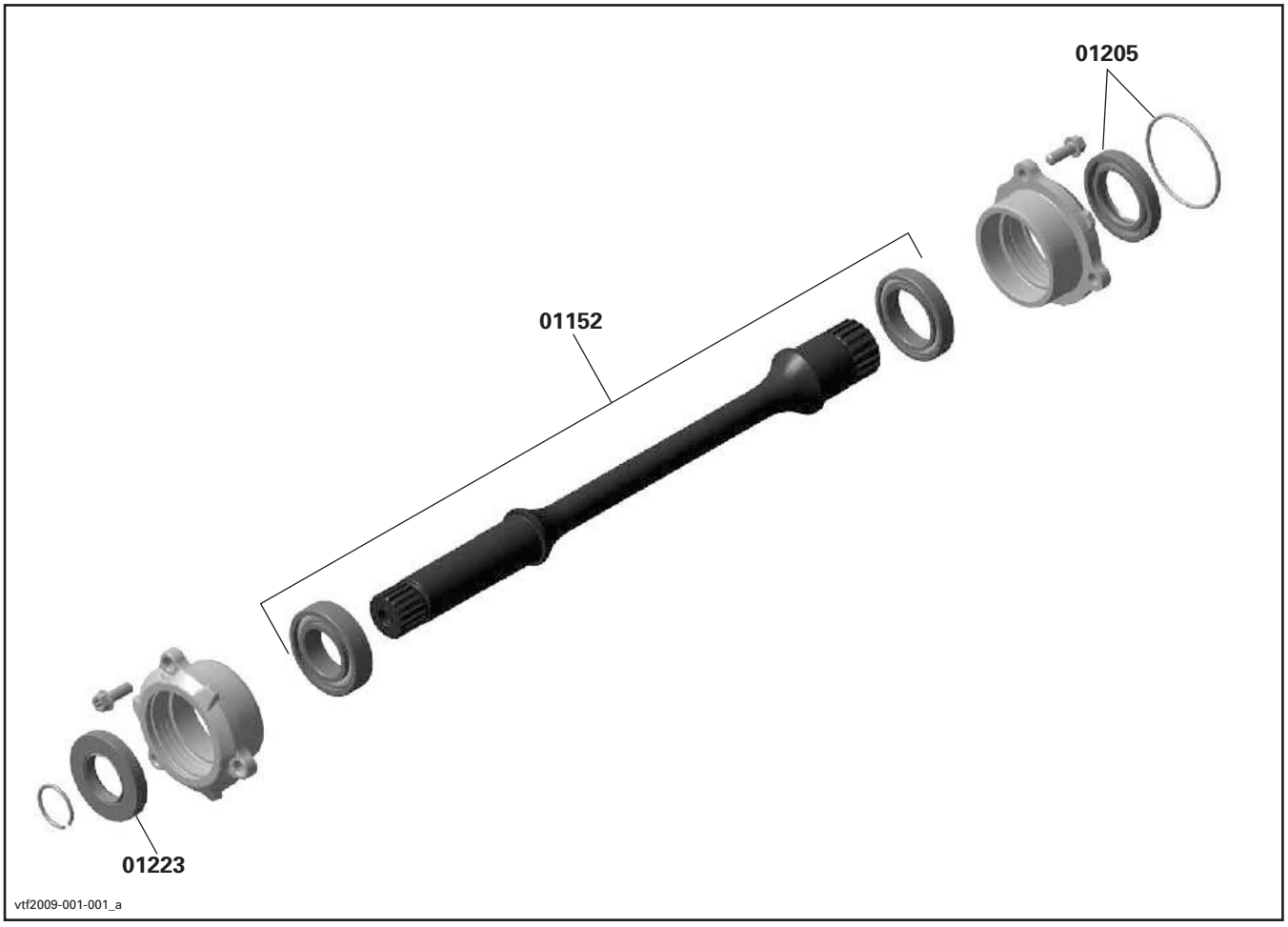

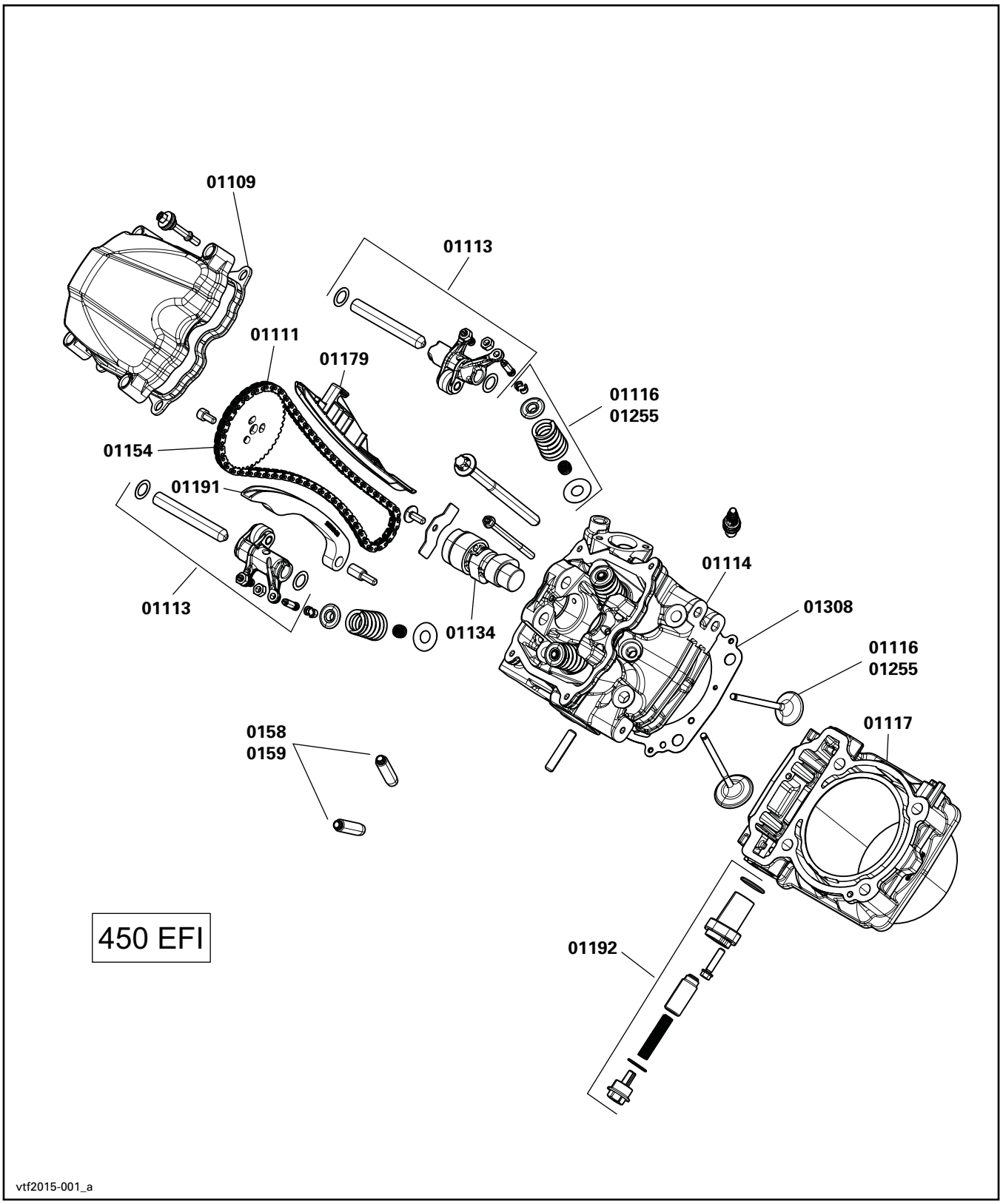
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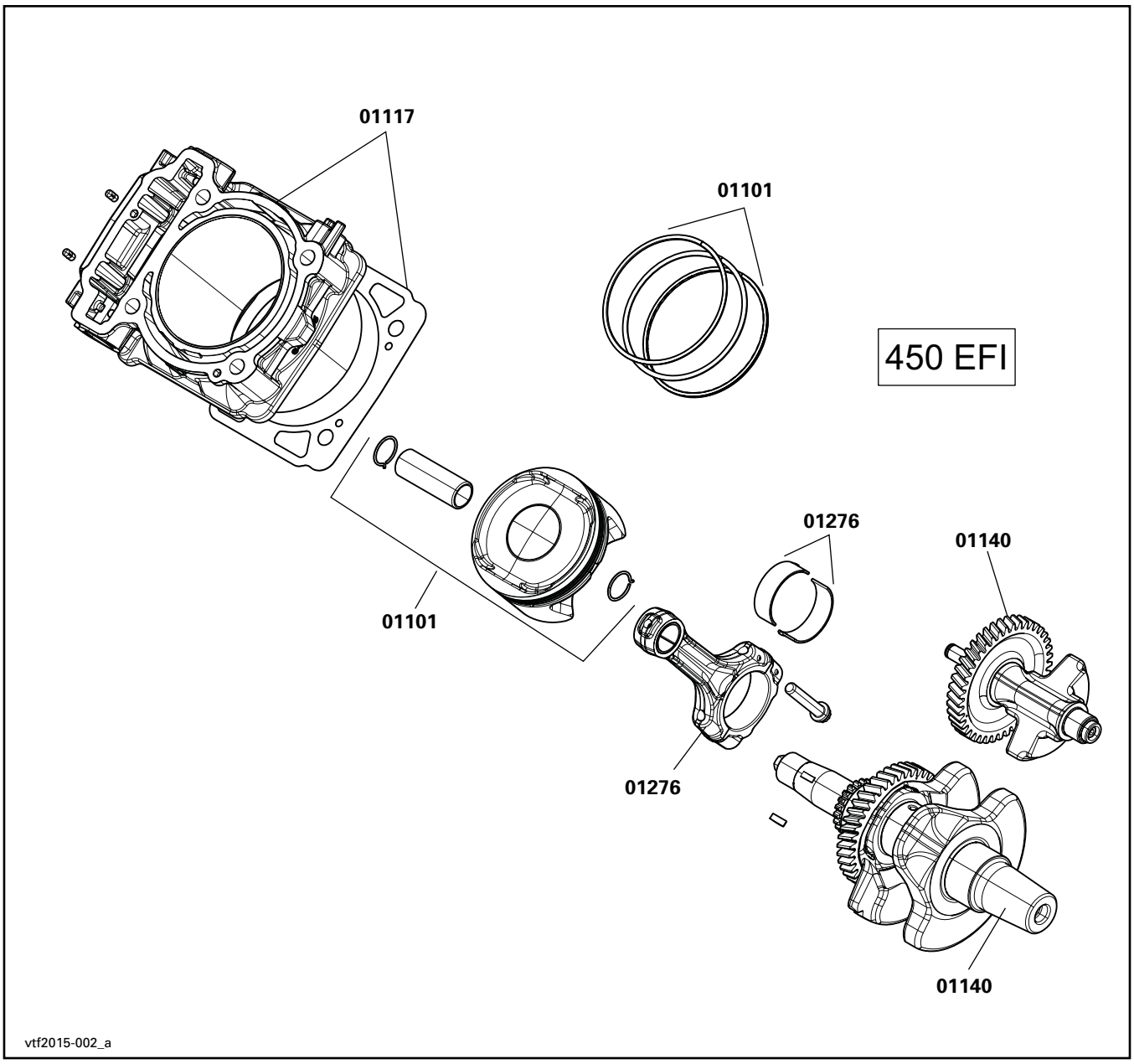
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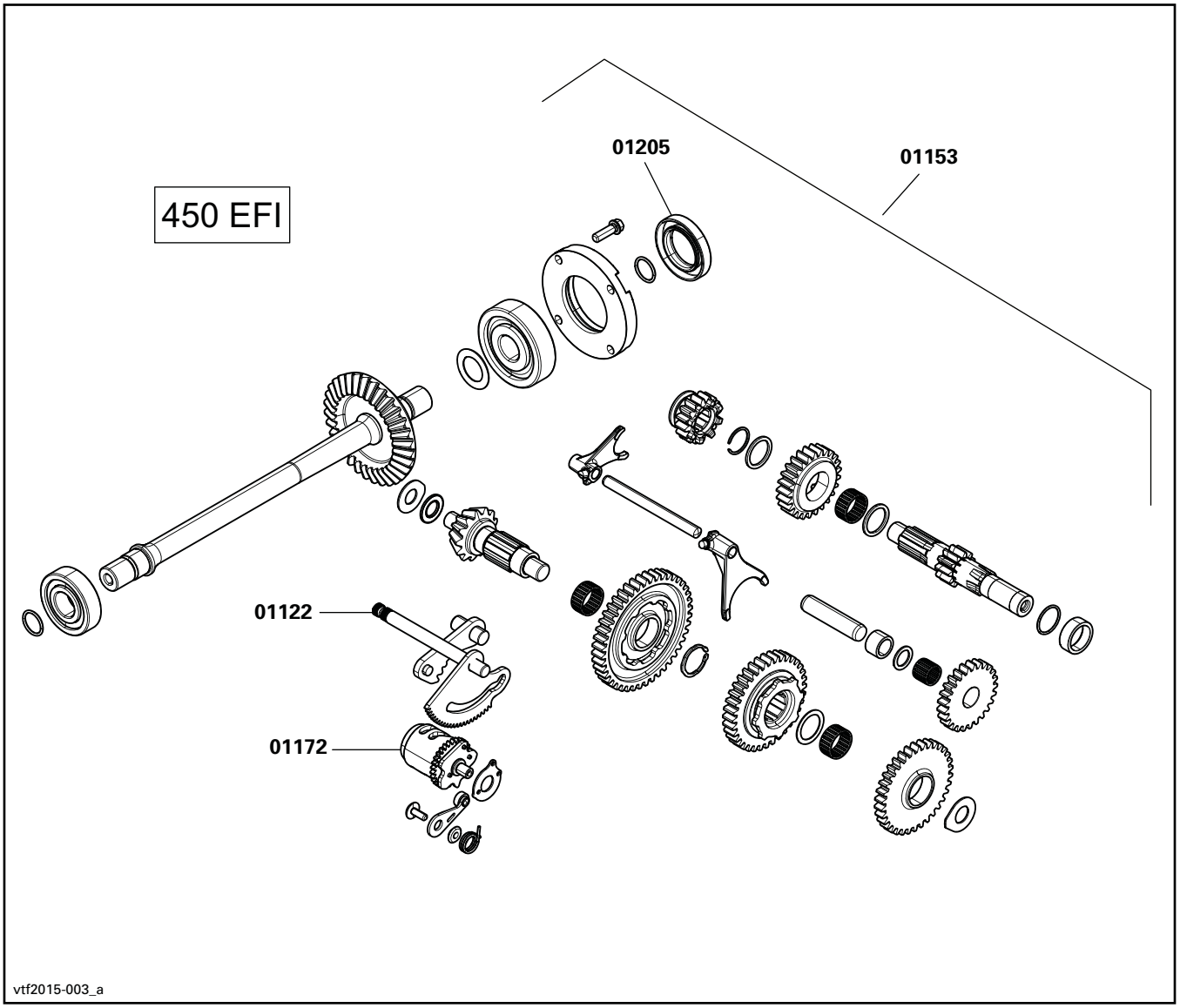
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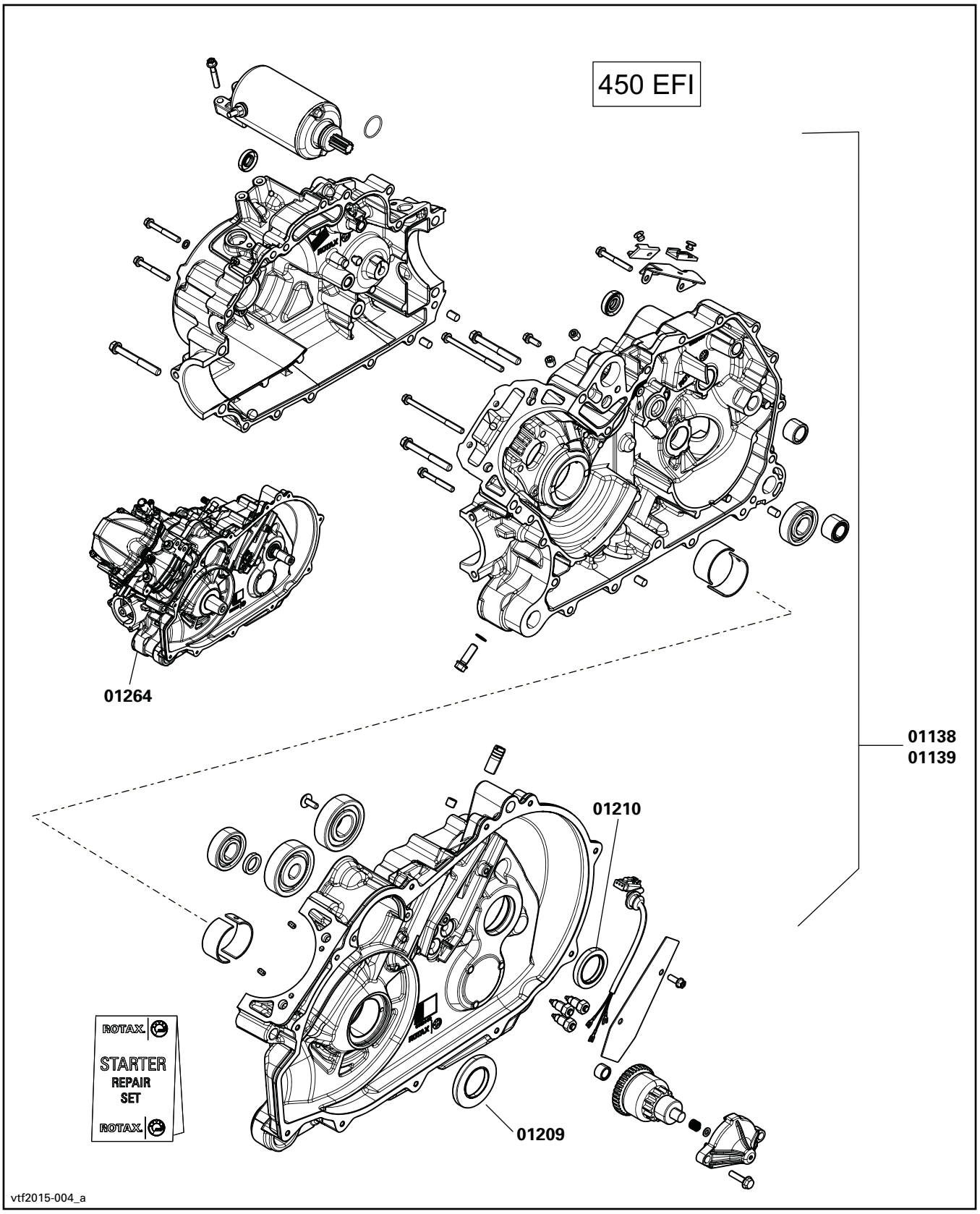
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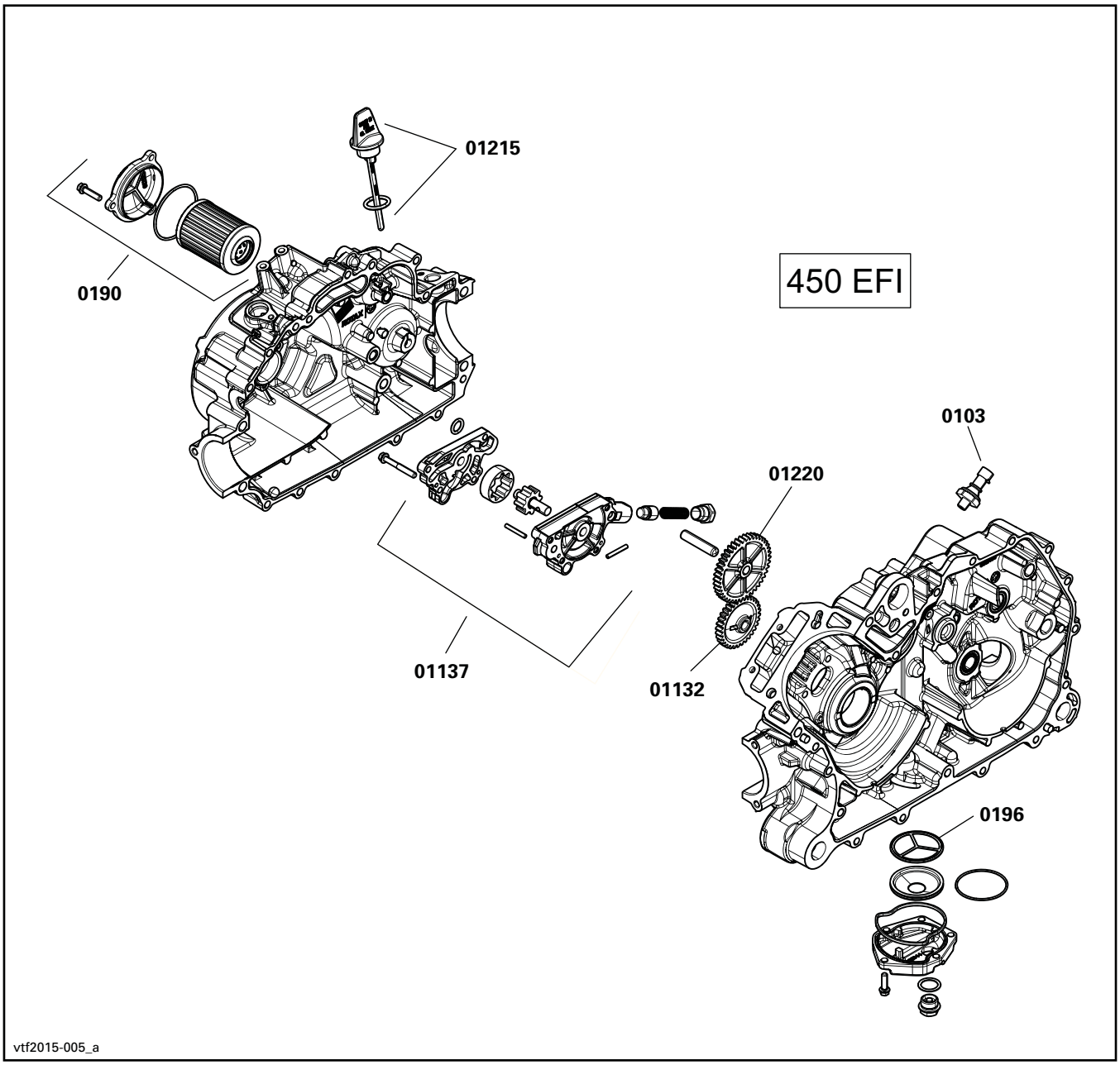
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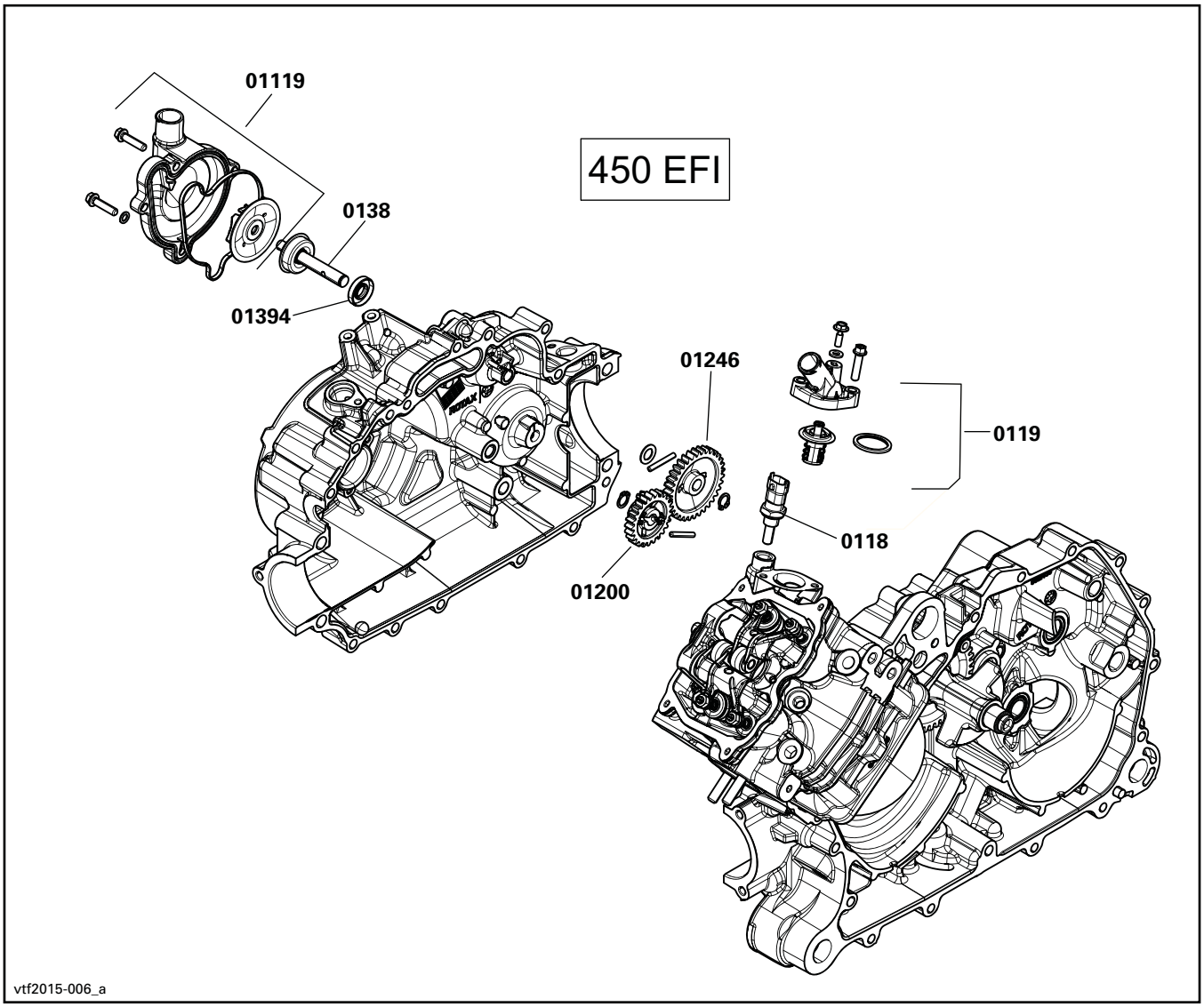
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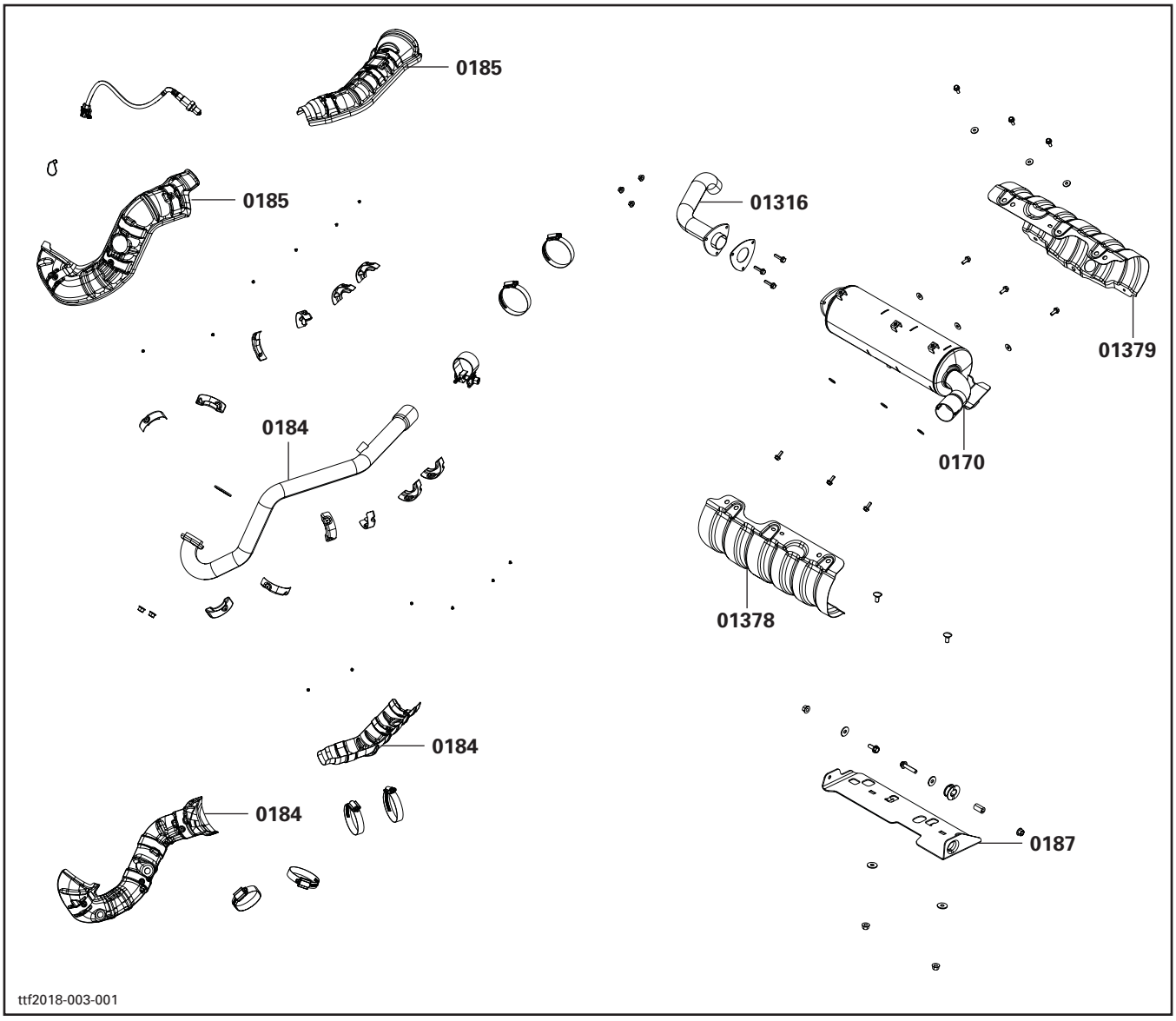
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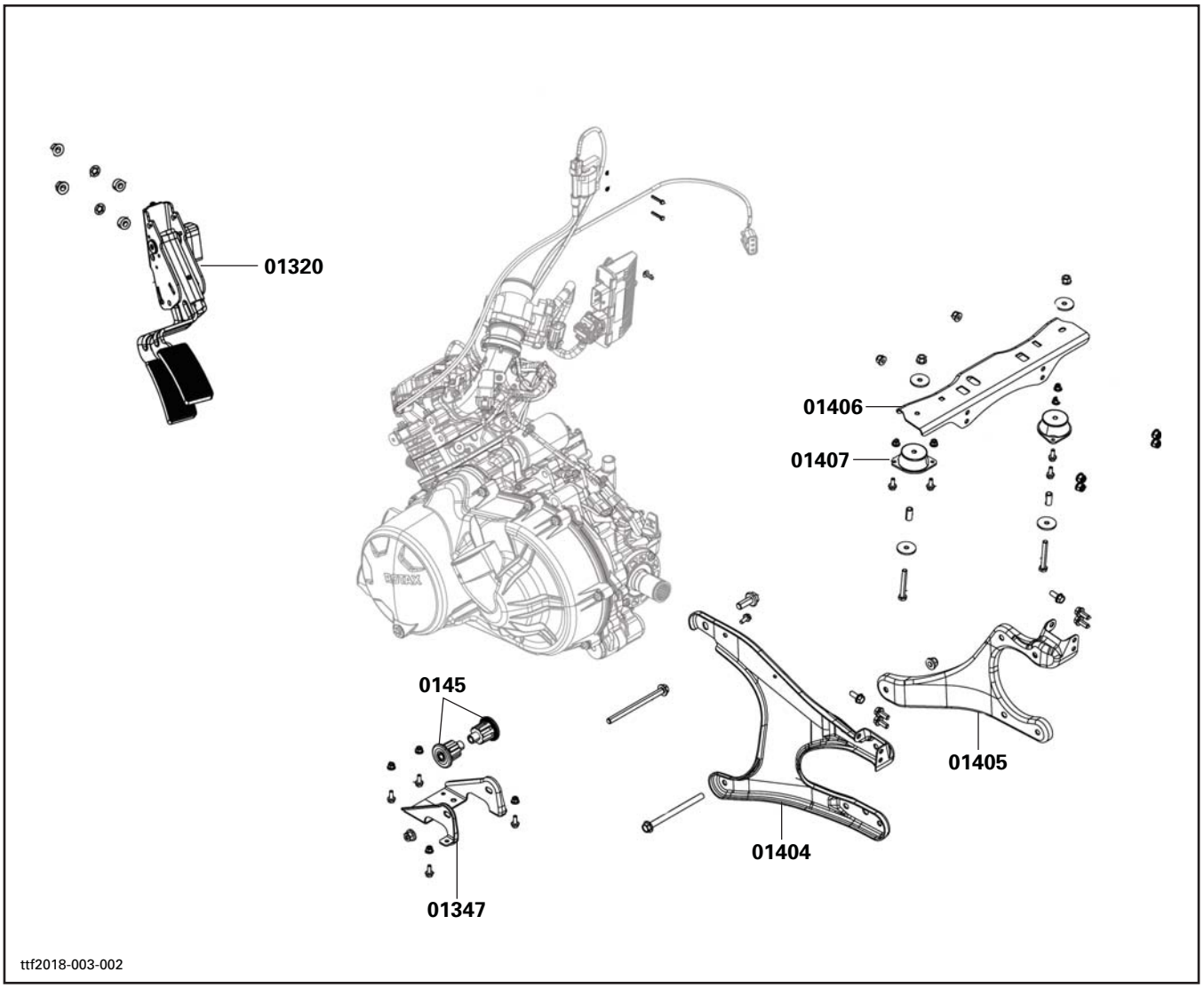
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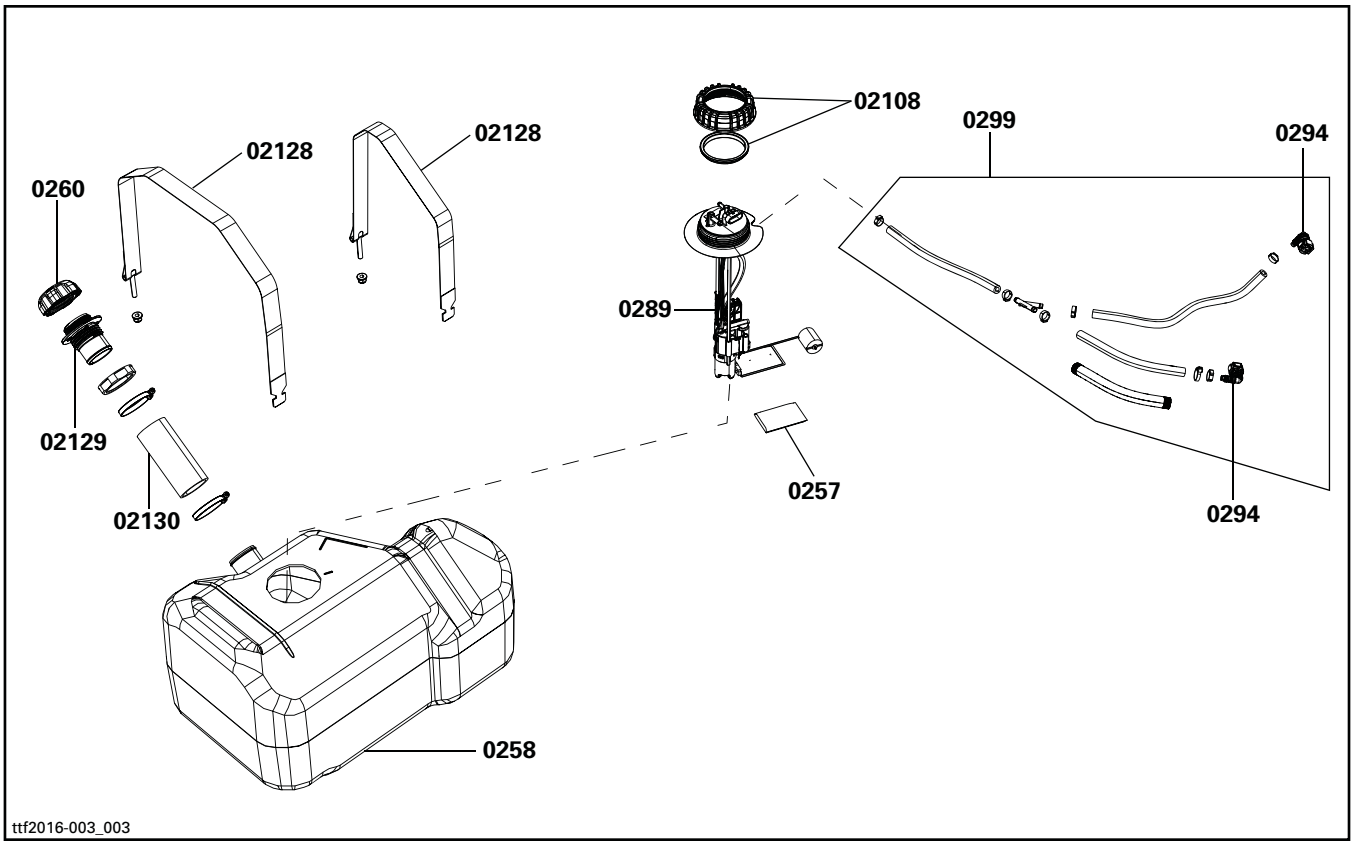
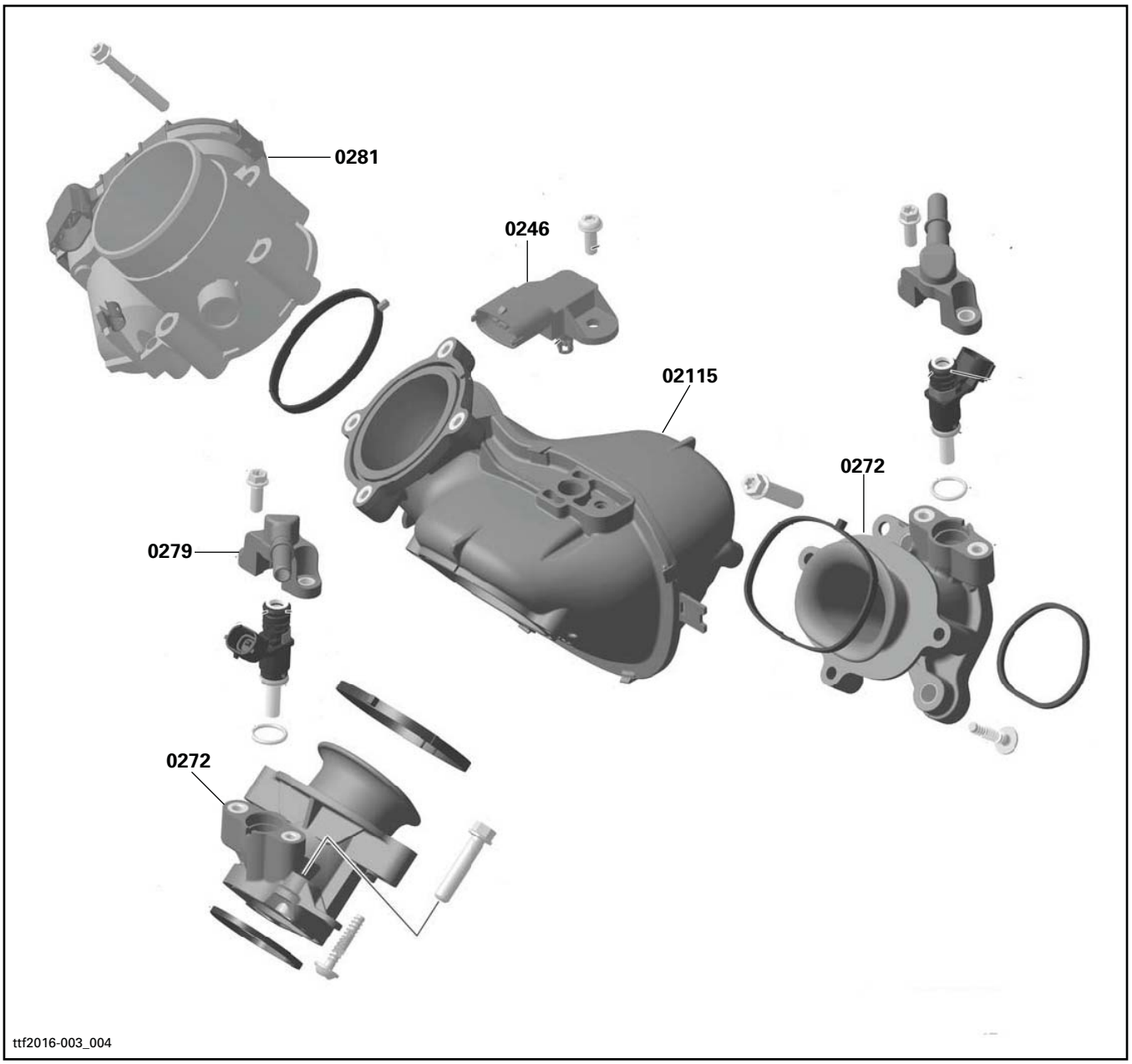
SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
02	00	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	0	0	0	0	0	0	0
02	01	AIR INTAKE SILENCER (ASS'Y) SILENCIEUX D'ADMISSION D'AIR (COMPLET)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	19	AIR INTAKE TUBE TUYAU D'ADMISSION D'AIR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	23	REAR AIR INTAKE TUBE AND/OR SLEEVE TUYAU D'ADMISSION D'AIR ARRIÈRE ET/OU DOUILLE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	46	AIR TEMPERATURE SENSOR CAPTEUR DE TEMPÉRATURE D'AIR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	57	FUEL FILTER FILTRE À ESSENCE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	58	FUEL TANK RÉSERVOIR D'ESSENCE	0.5	0.5	0.5	0.5	0.5	0.5	0.5
02	60	FUEL CAP BOUCHON DU RÉSERVOIR À ESSENCE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	69	AIR FILTER FILTRE À AIR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	72	INTAKE MANIFOLD CONNECTEUR D'ADMISSION	0.4	0.4	0.4	0.4	0.4	0.4	0.4
02	79	FUEL RAIL (1 OR 2) RAMPE D'ESSENCE (1 OU 2)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
02	81	THROTTLE BODY (ASS'Y) CARTER ACCÉLÉRATEUR (COMPLET)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	89	FUEL PUMP MODULE MODULE POMPE À ESSENCE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	94	FEMALE QUICK FITTING CONNECTEUR RAPIDE FEMELLE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	99	FUEL INJECTION HOSE (ASS'Y) BOYAU À INJECTION D'ESSENCE (COMPLET)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	108	FUEL PUMP NUT AND/OR GASKET ECROU DE LA POMPE A ESSENCE ET/OU JOINT D'ETANCHEITE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	115	PLENUM CHAMBRE D'AIR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	119	CHECK VALVE SOUPAPE DE RETENUE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	128	FUEL TANK STRAP (ONE OR TWO) SANGLE DE RESERVOIR D'ESSENCE (UNE OU DEUX)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
02	129	FILLER NECK GOULOT DE REMPLISSAGE	0.4	0.4	0.4	0.4	0.4	0.4	0.4
02	130	FILLER HOSE BOYAU DE REMPLISSAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3

INTAKE AND FUEL SYSTEM
ADMISSION ET SYSTÈME D'ALIMENTATION D'ESSENCE

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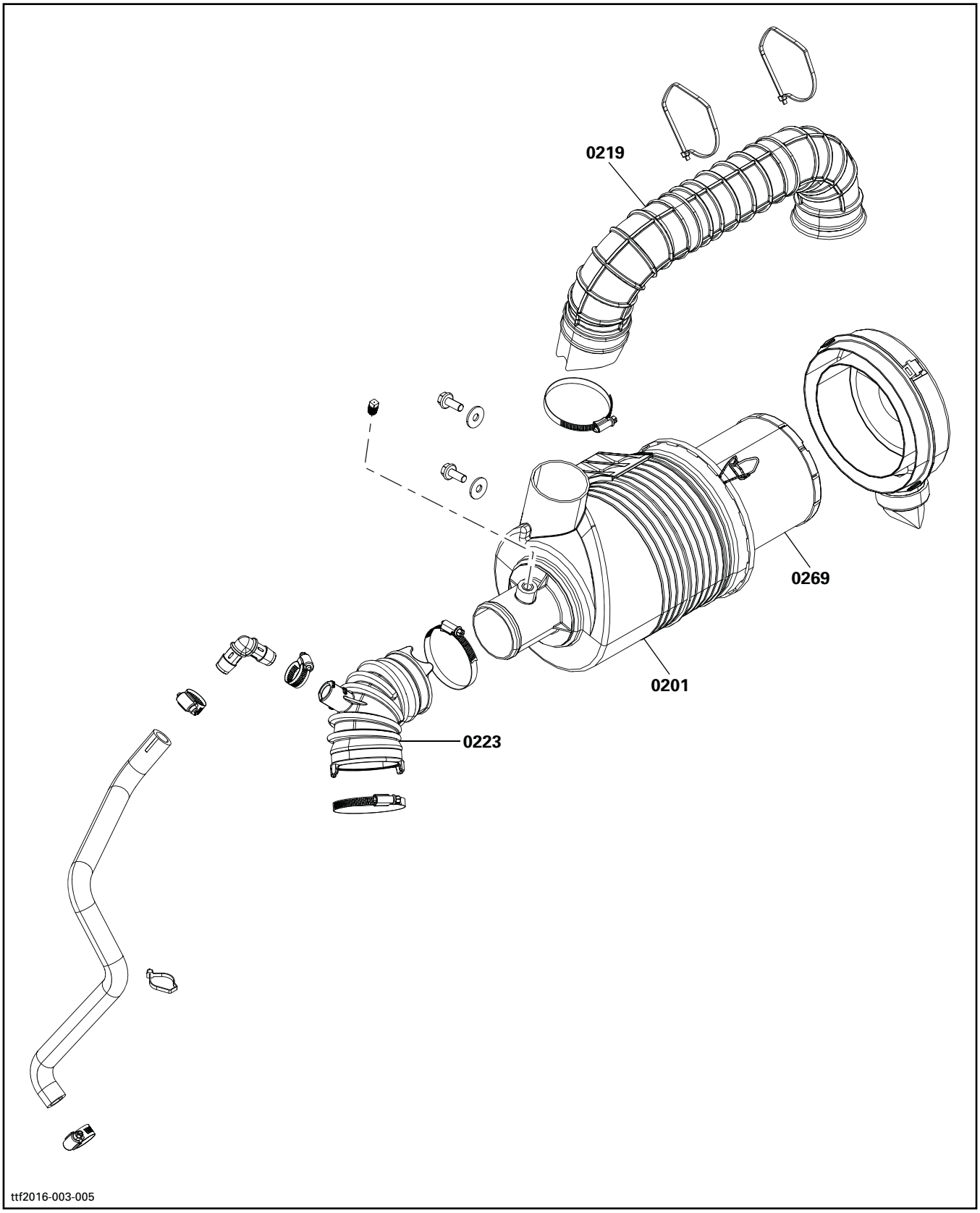
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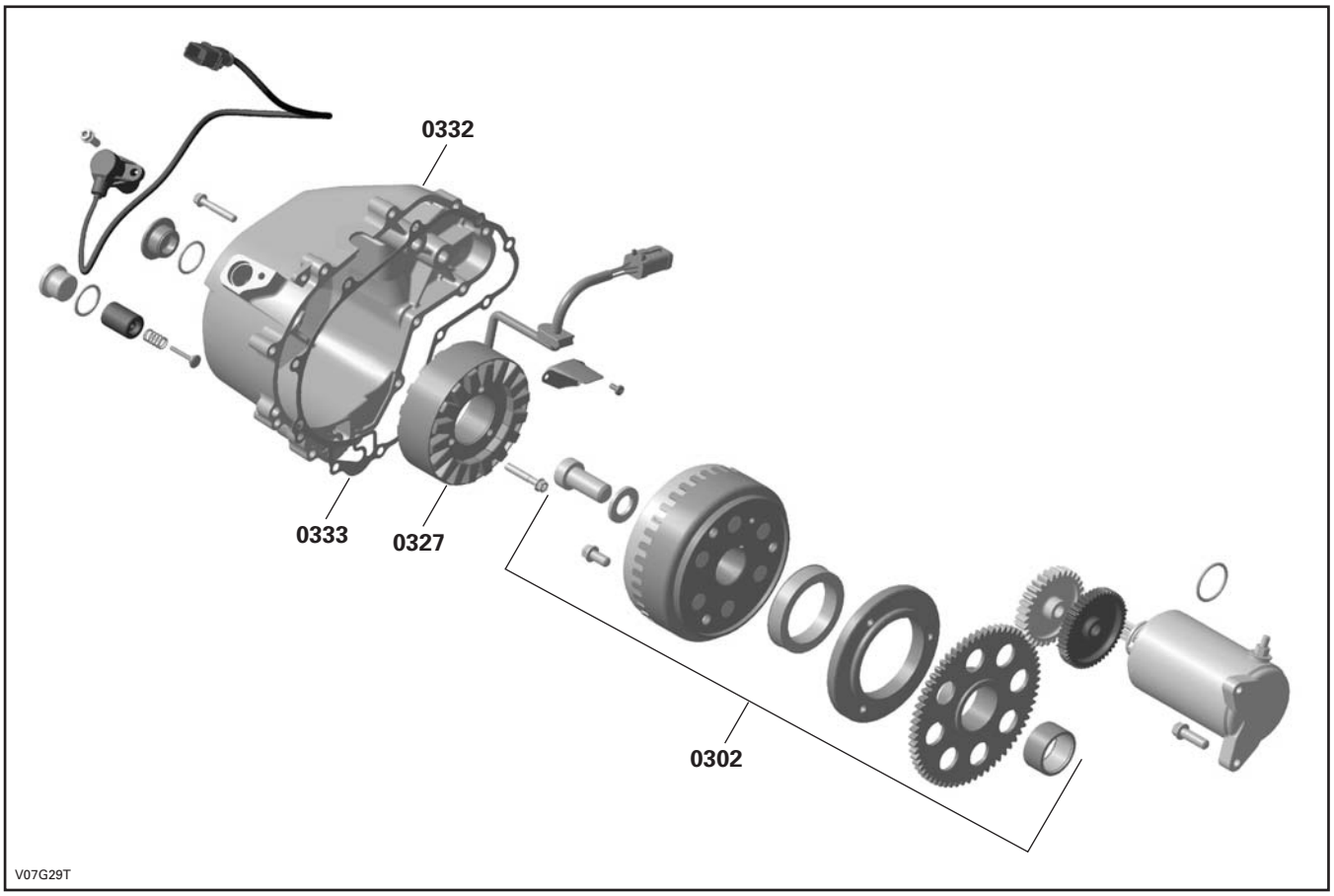
SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
03	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
03	02	MAGNETO (ASS'Y) MAGNÉTO (COMPLET)	3.9	2.3	2.3	2.3	2.3	2.3	2.3
03	08	IGNITION COIL (EACH) BOBINE D'ALLUMAGE (CHAQUE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
03	10	IGNITION CABLE CÂBLE D'ALLUMAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
03	27	STATOR (ASS'Y) STATOR (COMPLET)	3.7	2.1	2.1	2.1	2.1	2.1	2.1
03	32	MAGNETO COVER COUVERCLE DE MAGNETO	3.7	2.1	2.1	2.1	2.1	2.1	2.1
03	33	MAGNETO GASKET COVER JOINT D'ÉTANCHÉITÉ DU COUVERCLE DE MAGNETO		2.0	2.0	2.0	2.0	2.0	2.0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SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
04	**00**	**NO LABOUR INVOLVED AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
04	02	ELECTRIC STARTER (ASS'Y) DÉMARREUR (COMPLET)	0.3	1.3	1.3	1.3	1.3	1.3	1.3
04	03	STARTER RELAY SOLÉNOÏDE DE DÉMARRAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
04	19	STARTER DRIVE LANCEUR DÉMARREUR	0.7	2.3	2.3	2.3	2.3	2.3	2.3

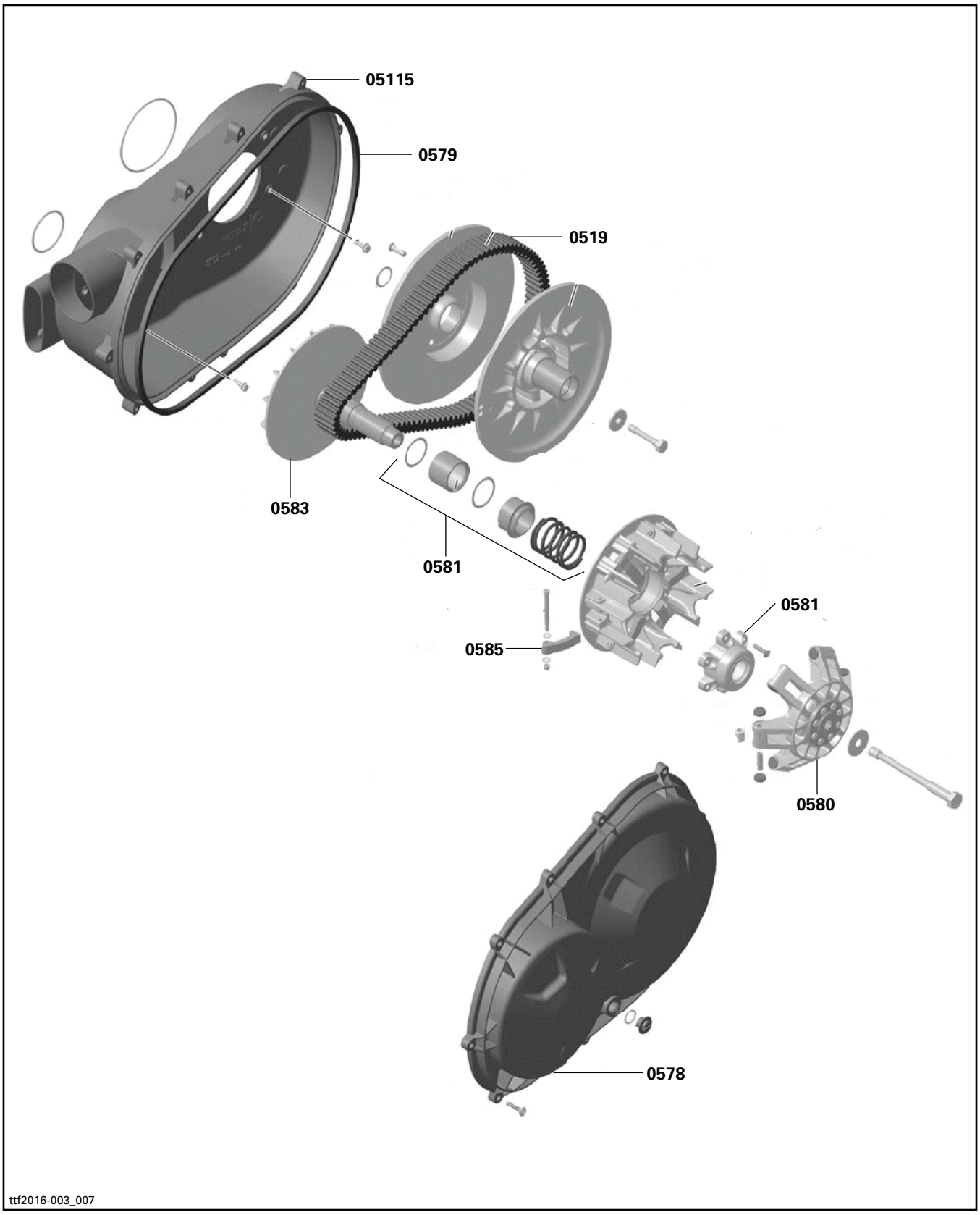
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
05	00	**NO LABOR INVOLVED AUCUNE MAIN-D'OEUVRE IMPLIQUÉE**	0	0	0	0	0	0	0
05	12	DRIVEN PULLEY SLIDING HALF DEMI-POULIE MENEE COULISSANTE	0.5						
05	19	BELT COURROIE	0.4	0.4	0.4	0.4	0.4	0.4	0.4
05	55	LEVER BUTTON BOUTON DE LEVIER	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	56	LEVER (ASS'Y) AND/OR LEVER SPRING LEVIER (COMPLET) ET/OU RESSORT DE LEVIER	0.5	0.5	0.5	0.5	0.5	0.5	0.5
05	59	SPEED SENSOR CAPTEUR DE VITESSE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	63	SOLENOID VALVE (SHIFTING VALVE) SOUPAPE SOLENOIDE (VALVE D'EMBRAYAGE)		0.3	0.3	0.3	0.3	0.3	0.3
05	66	GEARSHIFT LEVER LEVIER D'EMBRAYAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	78	CVT COVER COUVERCLE CVC	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	79	GASKET JOINT D'ÉTANCHÉITÉ	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	80	GOVERNOR CUP COUPOLE RÉGULATEUR	0.7	0.7	0.7	0.7	0.7	0.7	0.7
05	81	ONE WAY CLUTCH, FLANGE, RING, SPRING EMBRAYAGE À ROUE LIBRE, FLASQUE, ANNEAU, RESSORT	0.7	0.7	0.7	0.7	0.7	0.7	0.7
05	82	DRIVE PULLEY (ASS'Y) POULIE MOTRICE (COMPLET)	0.6	0.6	0.6	0.6	0.6	0.6	0.6
05	83	DRIVE PULLEY FIXED HALF POULIE MOTRICE FIXE	0.6	0.6	0.6	0.6	0.6	0.6	0.6
05	84	DRIVEN PULLEY OUTER CAM A/O SPRING CAME POULI MENEE EXT ET/OU RESSORT	0.5						
05	85	CENTRIFUGAL LEVER LEVIER CENTRIFUGE	1.0	1.0	1.0	1.0	1.0	1.0	1.0
05	86	SLIDER SHOES GLISSIÈRES	0.7	0.7	0.7	0.7	0.7	0.7	0.7
05	89	REMOVE AND REPLACE TRANSMISSION ASS'Y REMPLACEMENT DE LA TRANSMISSION (COMPLET)		5.1	5.1	5.1	5.1	5.1	5.1
05	95	AIR INTAKE (CVT) ENTRÉE D'AIR (CVC)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	96	AIR OUTLET (CVT) SORTIE D'AIR (CVC)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	97	FLEXIBLE ADAPTOR ADAPTATEUR FLEXIBLE	0.3	0.3	0.3	0.3	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
05	98	CAM, PLATE, DRIVEN SHAFT, SPRING CAME, PLAQUE, ARBRE POULIE MENÉE, RESSORT	0.5						
05	99	OUTPUT SHAFT ARBRE DE SORTIE		5.9	5.9	5.9	5.9	5.9	5.9
05	100	REAR OUTPUT SHAFT SEALS ANNEAUX ÉTANCHÉITÉ DE L'ARBRE DE SORTIE ARRIÈRE		5.3	5.3	5.3	5.3	5.3	5.3
05	101	GEARS BOX (ASS'Y)/MAIN SHAFT BOÎTE D'ENGRENAGE (COMPLET)/ARBRE PRINCIPAL		6.0	6.0	6.0	6.0	6.0	6.0
05	102	SHIFT SHAFT (ASS'Y) ARBRE D'EMBRAYAGE (COMPLET)		6.0	6.0	6.0	6.0	6.0	6.0
05	103	SHIFT DRUM TAMBOUR D'EMBRAYAGE		6.0	6.0	6.0	6.0	6.0	6.0
05	104	INDEX LEVER (ASS'Y) LEVIER D'INDEXATION (COMPLET)		1.5	1.5	1.5	1.5	1.5	1.5
05	105	MAIN SHAFT SEAL JOINT D'ÉTANCHÉITÉ DE L'ARBRE PRINCIPAL		1.3	1.3	1.3	1.3	1.3	1.3
05	108	ACTUATOR AND/OR FORK AND/OR SEAL ACTUATEUR ET/OU FOURCHETTE ET/OU JOINT D'ÉTANCHÉITÉ	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	109	FORK AND/OR PIN FOURCHETTE ET/OU GOUPILLE	6.0	6.0	6.0	6.0	6.0	6.0	6.0
05	113	SHIFTING SWITCH INTERRUPTEUR D'EMBRAYAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	114	SHIFT SHAFT SEAL ANNEAU ET ANCHE DE L'ARBRE D'EMBRAYAGE		0.4	0.4	0.4	0.4	0.4	0.4
05	115	CVT AIR GUIDE AND/OR O-RINGS GUIDE D'AÉRATION ET/OU JOINT D'ÉTANCHÉITÉ		1.1	1.1	1.1	1.1	1.1	1.1
05	120	GEARBOX POSITION SENSOR CAPTEUR DE POSITION D'ENGRENAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	159	PRIMARY INLET AND/OR ADAPTER ENTRÉE PRIMAIRE ET/OU ADAPTATEUR		0.3	0.3	0.3	0.3	0.3	0.3
05	160	FILTER FILTRE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	161	SHIFTING CABLE CÂBLE D'EMBRAYAGE	1.0	1.0	1.0	1.0	1.0	1.0	1.0
05	165	DRAIN PLUG (CVT) BOUCHON DE VIDANGE (CVC)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
05	188	GEAR HOUSING AND/OR BEARINGS BOITIER D'ENGRENAGE ET/OU ROULEMENTS A BILLES		6.5	6.5	6.5	6.5	6.5	6.5
05	189	GEARBOX COVER AND GASKET COUVERCLE DE LA TRANSMISSION ET JOINT ETANCHE		1.2	1.2	1.2	1.2	1.2	1.2
05	190	BEARING COVER COUVERCLE DE ROULEMENT A BILLE	2.2	2.2	2.2	2.2	2.2	2.2	2.2

TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
05	191	DIFFERENCIAL SEAL (1) JOINT D'ETANCHEITE DU DIFFERENTIEL (1)		0.5	0.5	0.5	0.5	0.5	0.5
05	192	DIFFERENTIAL SEALS (2) JOINTS D'ETANCHEITE DU DIFFERENTIEL (2)		0.9	0.9	0.9	0.9	0.9	0.9
05	208	TOP AIR INTAKE (CVT) ENTRÉE D'AIR SUPERIEUR (CVT)						0.3	0.3
05	209	TOP AIR OUTLET (CVT) SORTIE D'AIR SUPERIEUR (CVT)						0.3	0.3
05	210	CAP ENJOLIVEUR						0.3	0.3
05	211	PIPE VENT TUYAU DE VENTILATION						0.3	0.3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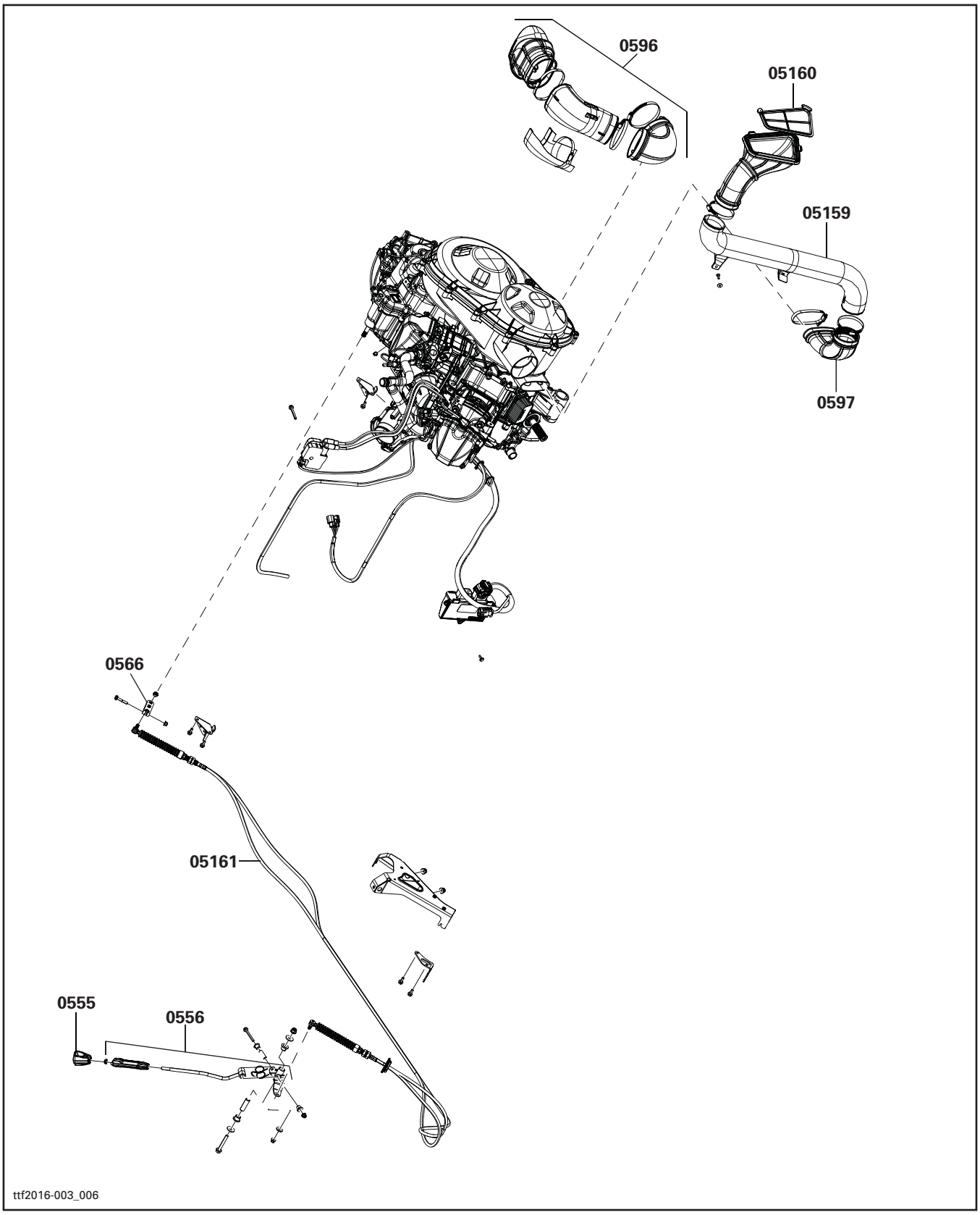
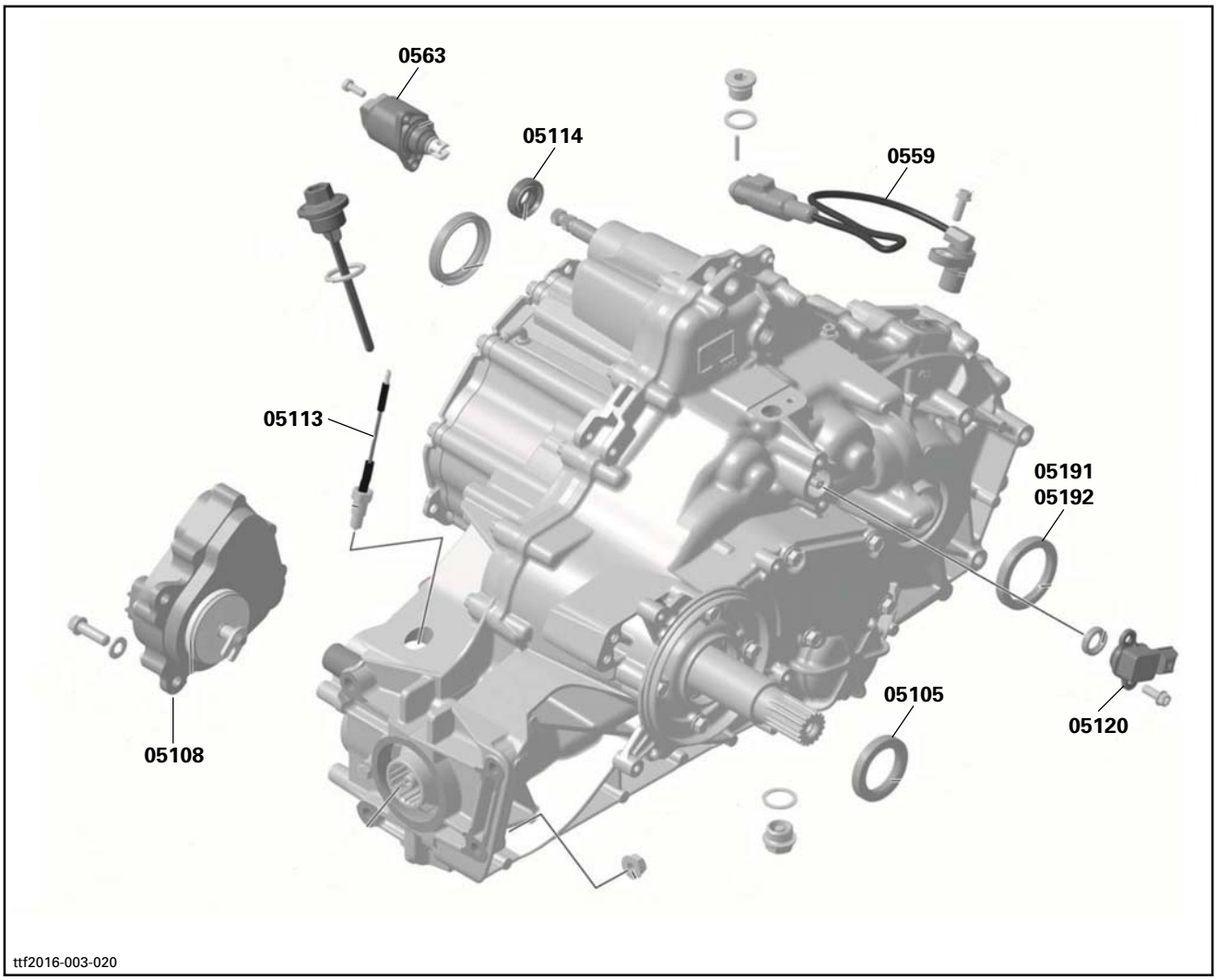
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

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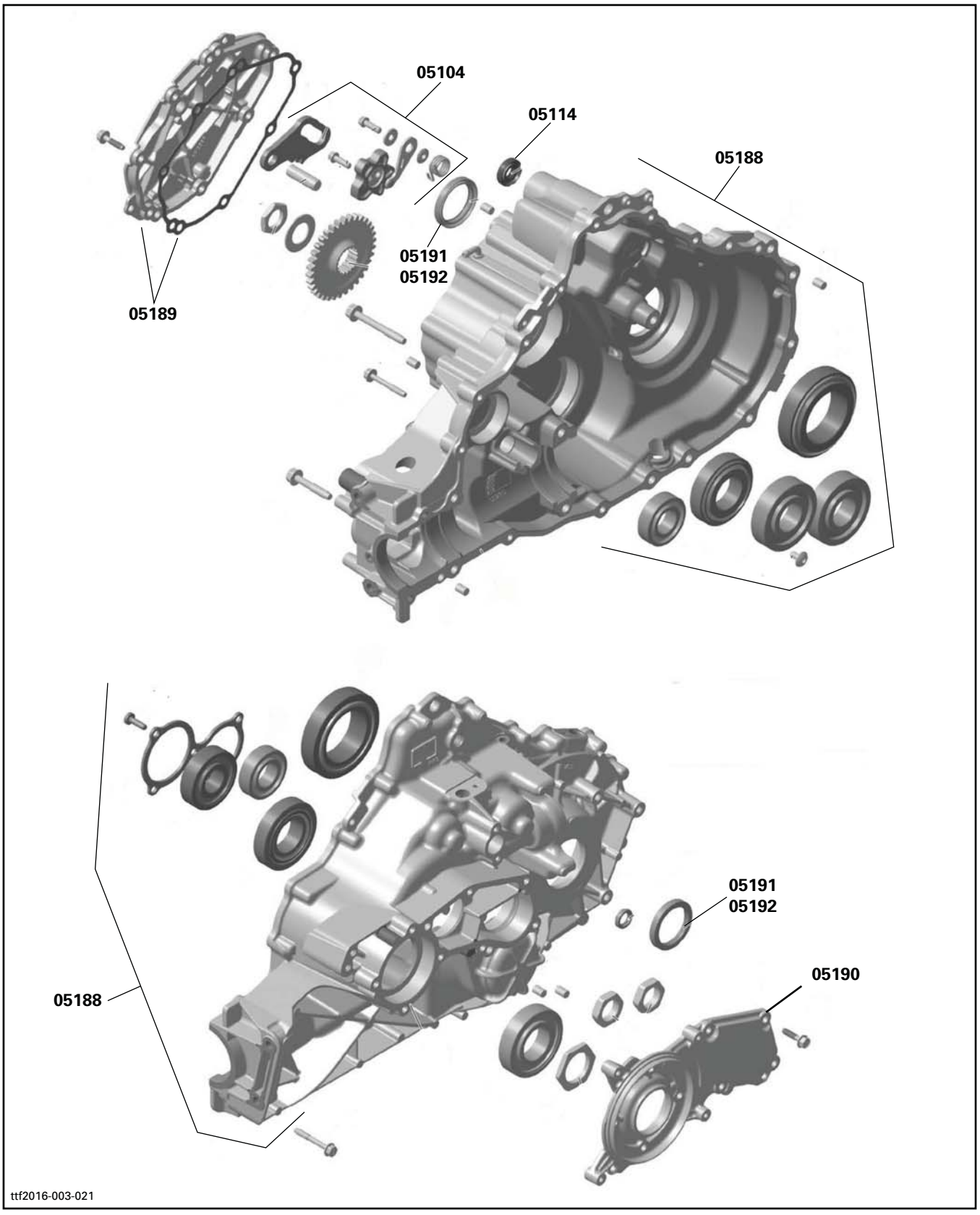
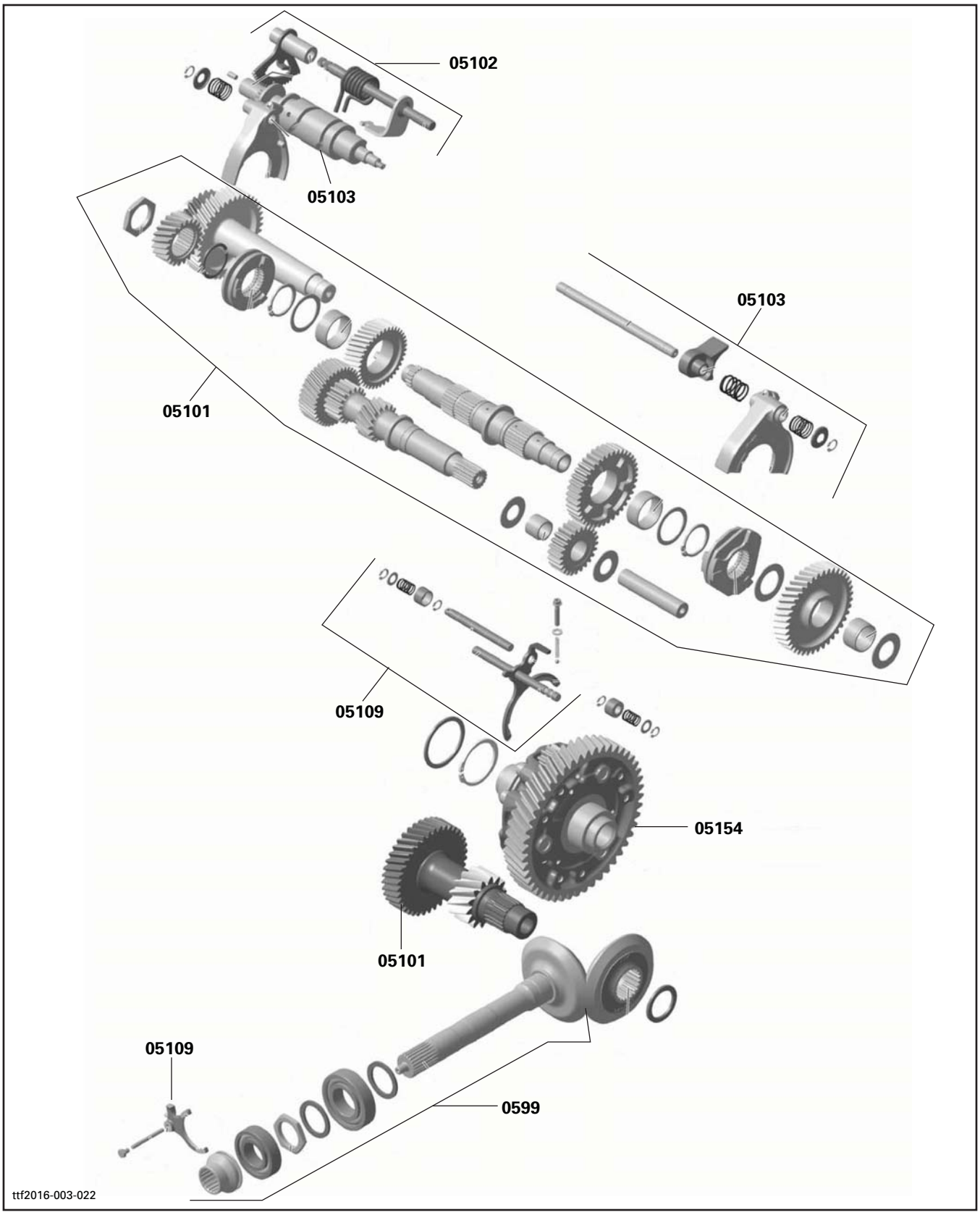
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

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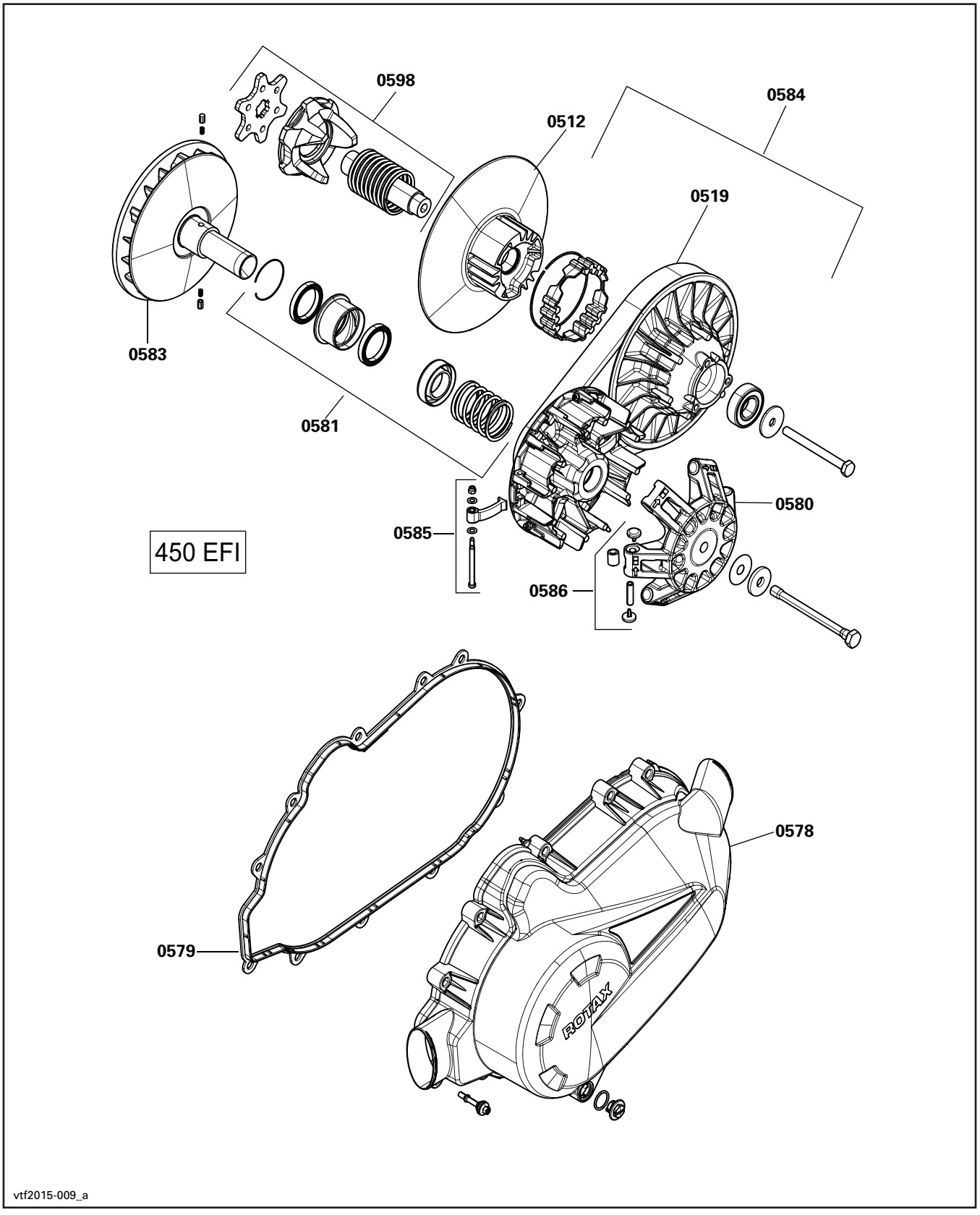
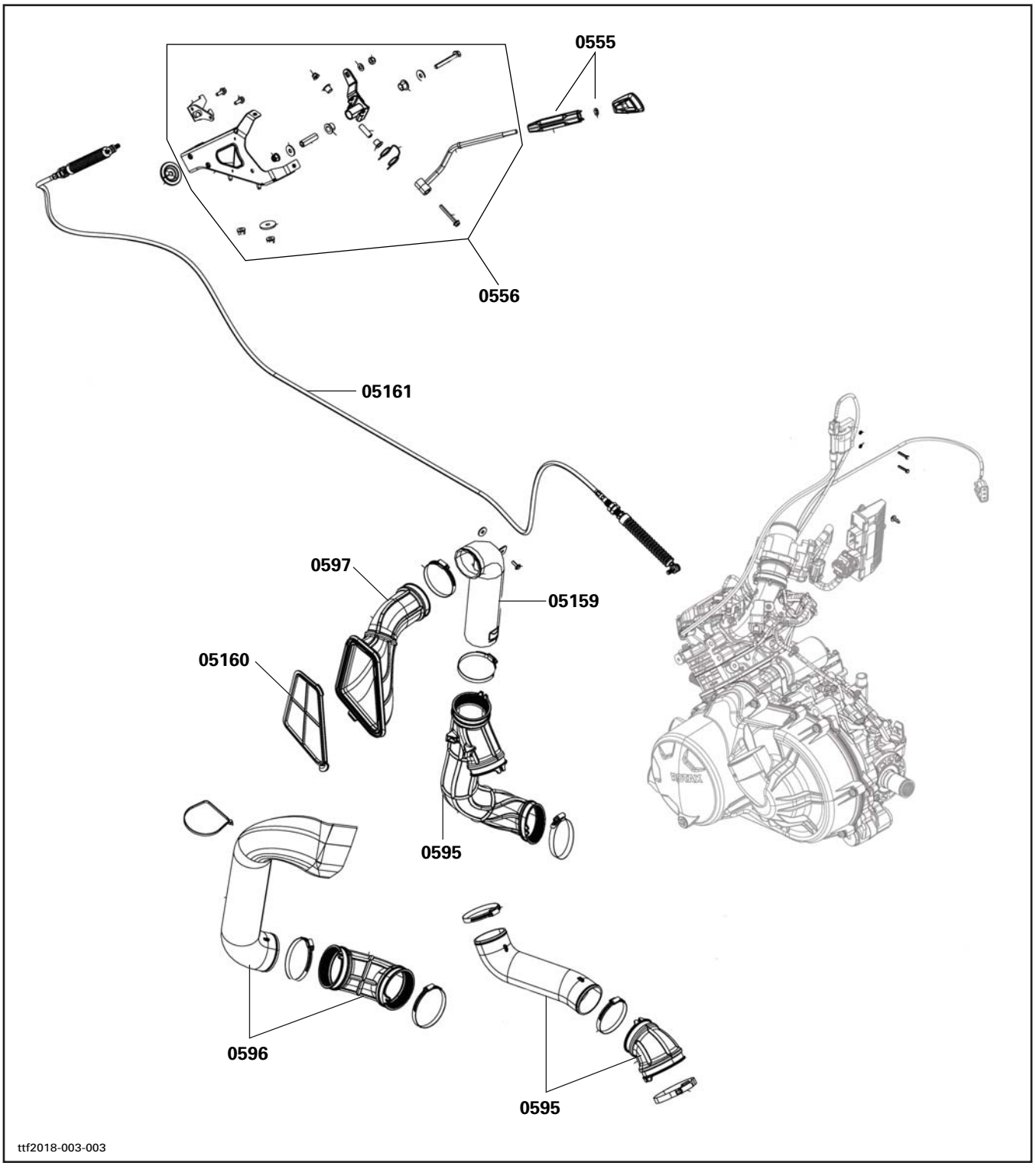
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

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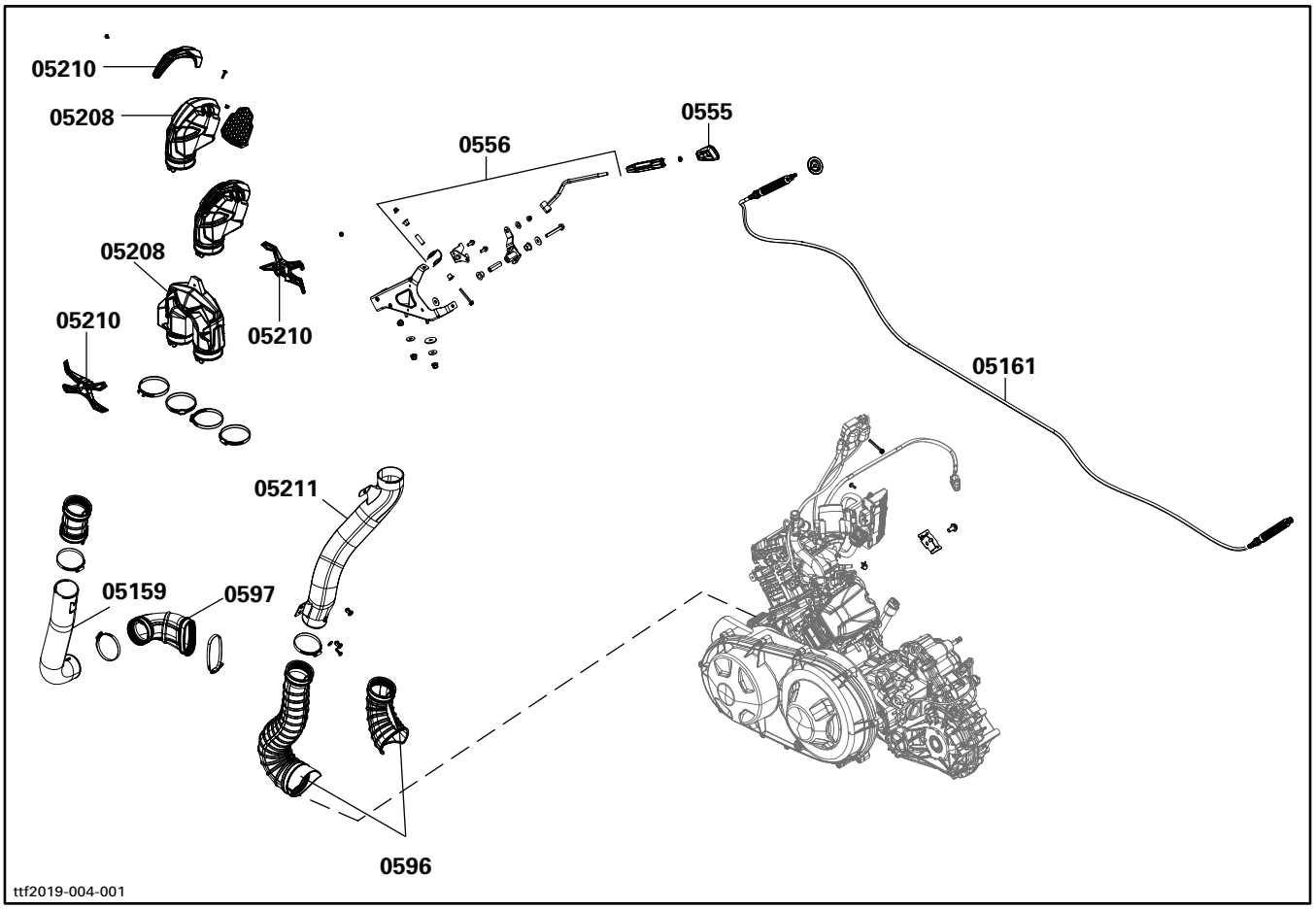
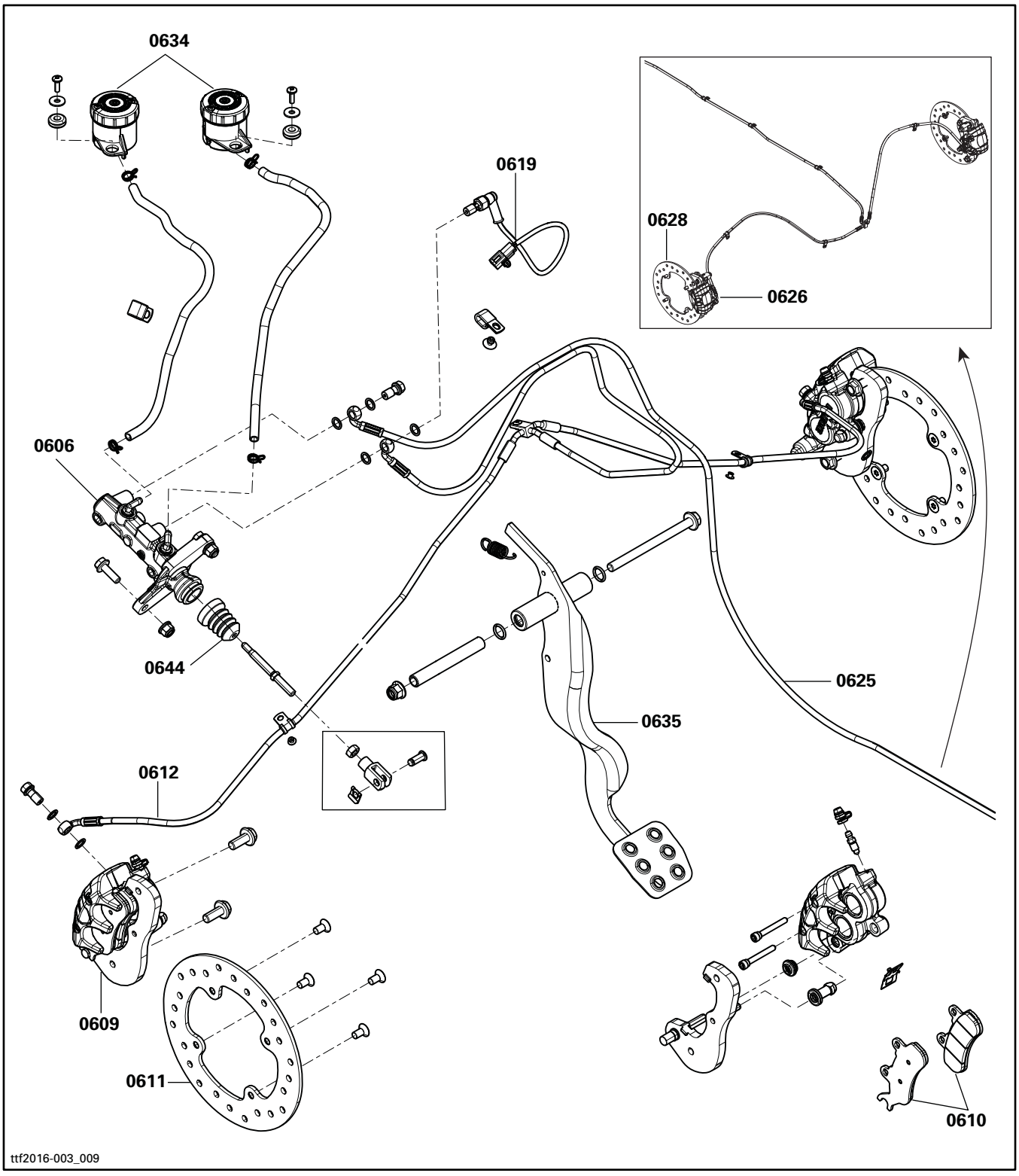
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE



SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
06	**00**	**NO LABOR INVOLVED AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
06	06	MASTER CYLINDER MAÎTRE-CYLINDRE	1.0	1.0	1.0	1.0	1.0	1.0	1.0
06	09	FRONT CALIPER (RH OR LH) ÉTRIER AVANT (DROIT OU GAUCHE)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
06	10	FRONT BRAKE PAD (RH OR LH) PLAQUETTE DE FREIN AVANT (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
06	11	FRONT BRAKE DISC (RH OR LH) DISQUE DE FREIN AVANT (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
06	12	FRONT FLEXIBLE BRAKE HOSE BOYAU FLEXIBLE DE FREIN AVANT	1.0	1.0	1.0	1.0	1.0	1.0	1.0
06	19	BRAKE SWITCH INTERRUPTEUR DE FREIN	0.3	0.3	0.3	0.3	0.3	0.3	0.3
06	25	REAR BRAKE HOSE BOYAU DE FREIN ARRIÈRE	1.2	1.2	1.2	1.5	1.5	1.2	1.5
06	26	REAR CALIPER ÉTRIER ARRIÈRE	0.5	0.5	0.5	0.5	0.5	0.5	0.5
06	27	REAR BRAKE PAD PLAQUETTE DE FREIN ARRIÈRE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
06	28	REAR BRAKE DISC DISQUE DE FREIN ARRIÈRE	0.7	0.7	0.7	0.7	0.7	0.7	0.7
06	34	MASTER CYLINDER RESERVOIR RÉSERVOIR DU MAÎTRE-CYLINDRE	0.5	0.5	0.5	0.5	0.5	0.5	0.5
06	35	BRAKE PEDAL PÉDALE DE FREIN	0.5	0.5	0.5	0.5	0.5	0.5	0.5
06	44	MASTER CYLINDER ROD TIGE DU MAÎTRE-CYLINDRE	0.4	0.4	0.4	0.4	0.4	0.4	0.4

BRAKE SYSTEM
SYSTÈME DE FREIN



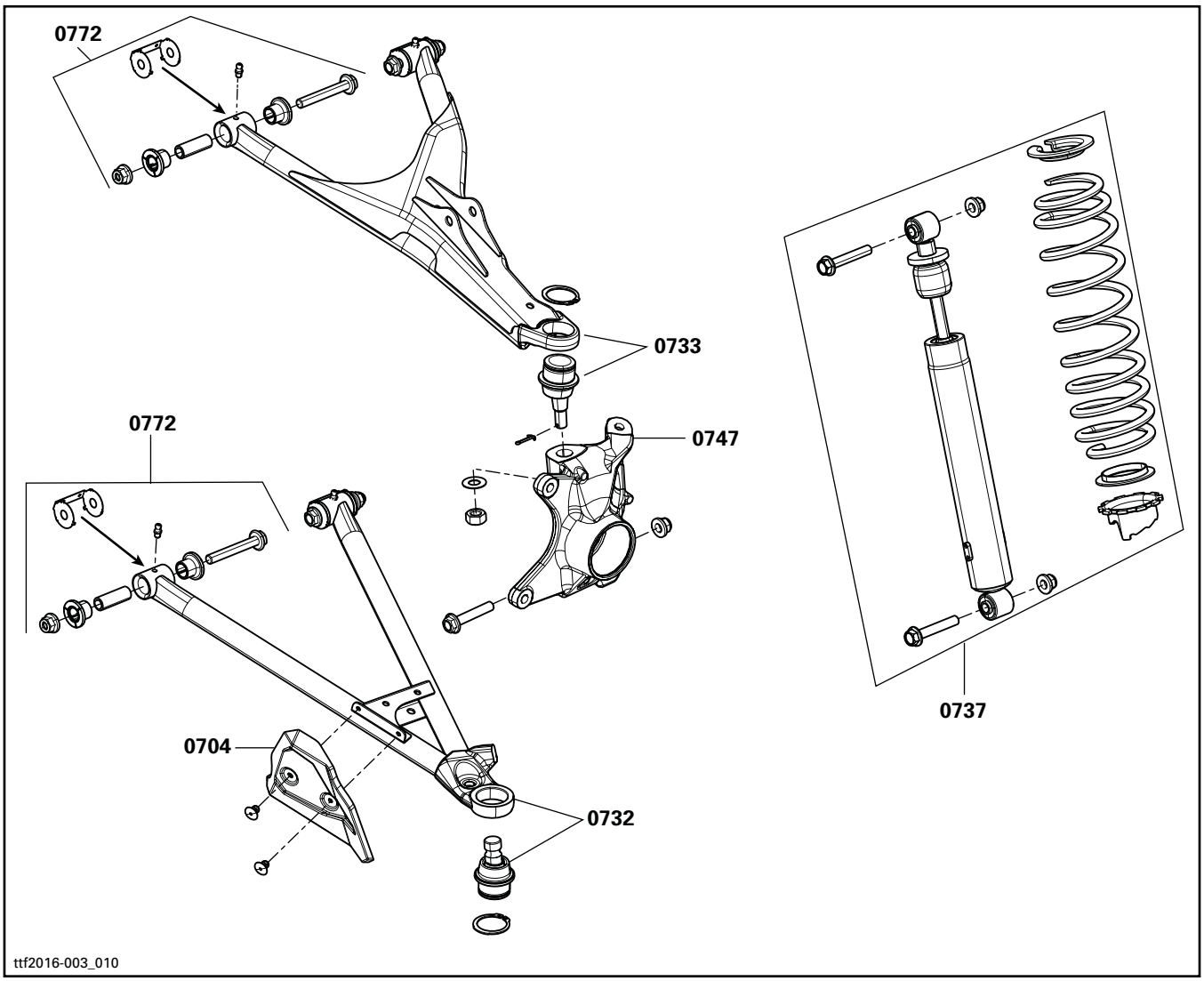
SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
07	**00**	**NO LABOR INVOLVED** **AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
07	04	ARM PROTECTOR (RH OR LH) PROTECTEUR DE BRAS (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
07	13	EXTERNAL BALL JOINT (RH OR LH) JOINT À ROTULE EXTERNE (DROIT OU GAUCHE)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
07	24	MAIN TUBE TUBE PRINCIPAL	1.0	1.0	1.0	1.0	1.0	1.0	1.0
07	27	STEERING COVER COUVRE-GUIDON	0.3	0.3	0.3	0.3	0.3	0.3	0.3
07	32	LOWER ARM AND/OR BALL JOINT (RH OR LH) BRAS INFÉRIEUR ET/OU JOINT À ROTULE (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
07	33	UPPER ARM (RH OR LH) BRAS DE SUSPENSION SUPÉRIEUR (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
07	37	FRONT SHOCK AND/OR SPRING AND/OR STOPPER AND/OR PROTECTOR AND/OR SEAT (RH OR LH) AMORTISSEUR AVANT ET/OU RESSORT ET/OU BUTÉE ET/OU SIÈGE ET/OU PROTECTEUR (DROIT OU GAUCHE)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
07	40	FRONT DIFFERENTIEL (ASS'Y) DIFFÉRENTIEL AVANT (COMPLET)	2.4	2.4	2.4	2.4	2.4	2.4	2.4
07	42	FRONT PROPELLER SHAFT (ASS'Y) ARBRE DE PROPULSION AVANT (COMPLET)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
07	45	CV JOINT (RH OR LH) JOINT HOMOCINÉTIQUE (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
07	46	FRONT WHEEL HUB (SEAL AND/OR BEARING) (RH OR LH) MOYEU DE ROUE AVANT (JOINT ET/OU ROULEMENT) (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
07	47	KNUCKLE (RH OR LH) PORTE-FUSÉE (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
07	50	FRONT RIM AND/OR TIRE JANTE AVANT ET/OU PNEU	0.4	0.4	0.4	0.4	0.4	0.4	0.4
07	64	DOUBLE BALL JOINT JOINT À ROTULE DOUBLE		0.3	0.3	0.3	0.3	0.3	0.3
07	72	INTERNAL BUSHING AND/OR CUSHION (LOWER AND/OR UPPER ARM) (RH OR LH) DOUILLE INTERNE ET/OU COUSSIN (BRAS INFÉRIEUR ET/OU SUPÉRIEUR) (DROIT OU GAUCHE)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
07	82	BALL BEARING ROULEMENT À BILLE				2.2	2.2	2.2	2.2
07	85	RING GEAR AND/OR CARRIER AND/OR SHIM COURONNE DE LANCEMENT ET/OU SUPPORT ET/OU CALE	2.9	2.9	2.9	2.9	2.9	2.9	2.9

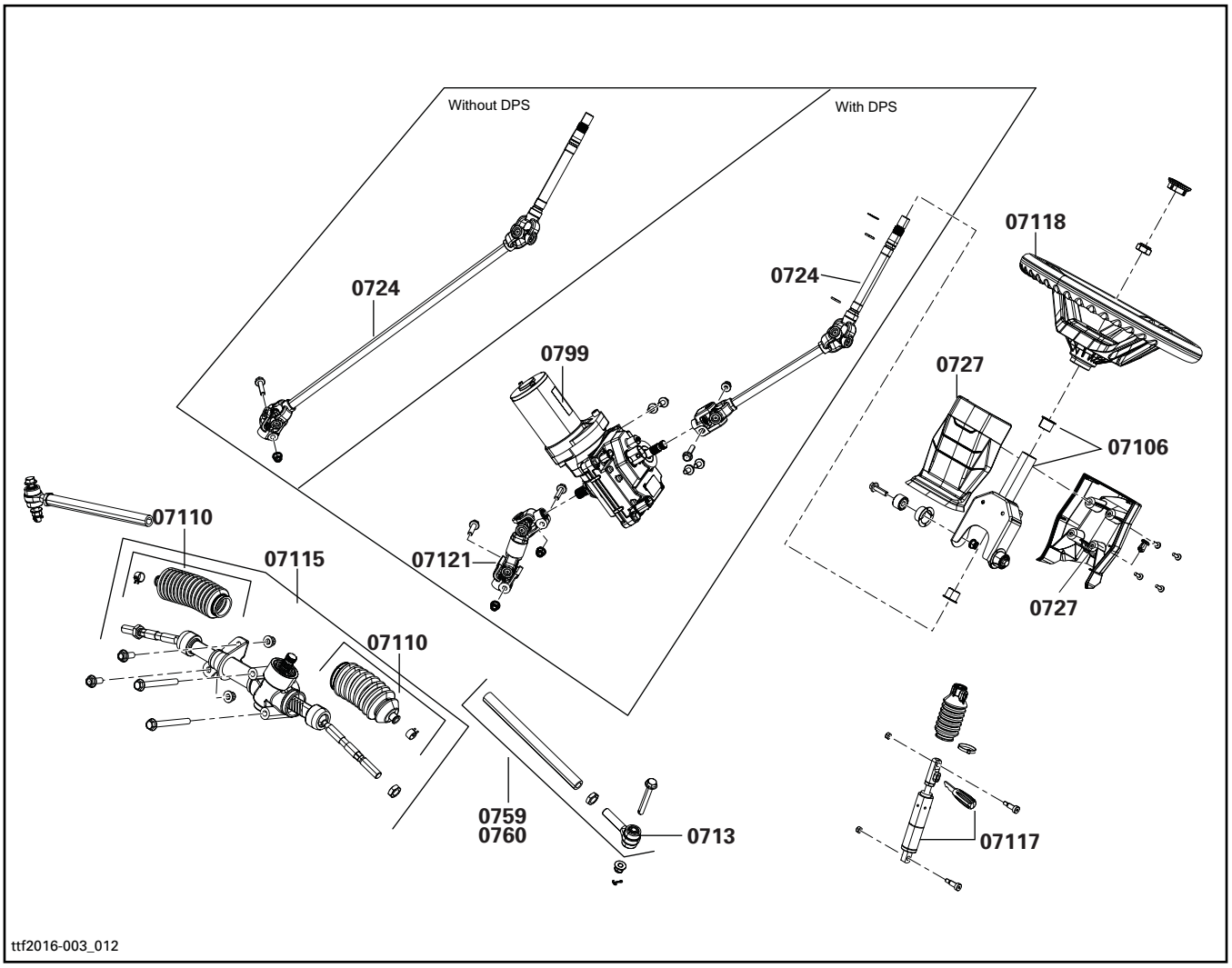
STEERING - FRONT DRIVE SYSTEM AND SUSPENSION
DIRECTION - SYSTÈME D'ENTRAÎNEMENT AVANT ET SUSPENSION

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
07	87	ACTUATOR ACTUATEUR		0.3				0.3	0.3
07	88	RING GEAR DRIVE GEAR AND/OR BEARING AND/OR SHIM PIGNON DE COMMANDE DE LA COURONNE ET/OU ROULEMENT À BILLE ET/OU CALE	2.9	2.9	2.9	2.9	2.9	2.9	2.9
07	89	COVER AND/OR PINION COVER AND/OR SEAL AND/OR BEARING COUVERCLE ET/OU COUVERCLE DE PIGNON ET/OU JOINT D'ÉTANCHÉITÉ ET/OU ROULEMENT À BILLE	3.2	3.2	3.2	3.2	3.2	3.2	3.2
07	90	BOOT WHEEL KIT AND/OR CV JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE ROUE ET/OU JOINT CV (DROIT OU GAUCHE)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
07	91	BOOT DIFFERENTIAL KIT AND/OR PLUNGING JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE DIFFÉRENTIEL ET/OU JOINT PLONGEANT (DROIT OU GAUCHE)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
07	94	UNIT PACK KIT ENSSEMBLE JOINT CARDAN	2.3	2.3	2.3	2.3	2.3	2.3	2.3
07	95	UNIT PACKS KIT (2) ENSSEMBLE JOINTS CARDANS (2)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
07	99	POWER STEERING (DPS) SERVODIRECTION (DPS)	1.6	1.6	1.6	1.6	1.6	1.6	1.6
07	103	DIFFERENTIAL SEAL (1) JOINT D'ÉTANCHÉITÉ DU DIFFÉRENTIEL (1)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
07	104	DIFFERENTIAL SEALS (2) JOINTS D'ÉTANCHÉITÉ DU DIFFÉRENTIEL (2)	1.4	1.4	1.4	1.4	1.4	1.4	1.4
07	106	STEERING COLUMN SUPPORT AND/OR BUSHINGS SUPPORT DE COLONNE DE DIRECTION ET/OU COUSSINETS	0.7	0.7	0.7	0.7	0.7	0.7	0.7
07	115	RACK AND PINION STEERING DIRECTION À CRÉMAILLÈRE	1.8	1.8	1.8	1.8	1.8	1.8	1.8
07	117	ADJUSTMENT CYLINDER CYLINDRE D'AJUSTEMENT	0.3	0.3	0.3	0.3	0.3	0.3	0.3
07	118	STEERING WHEEL VOLANT	0.3	0.3	0.3	0.3	0.3	0.3	0.3
07	120	DIFFERENTIAL OIL SEAL ANNEAU D'ÉTANCHÉITÉ DU DIFFÉRENTIEL	2.6	2.6	2.6	2.6	2.6	2.6	2.6
07	121	COUPLING MANCHON	1.6	1.6	1.6	1.6	1.6	1.6	1.6
07	122	HOSE (DIFFERENTIAL HOSE) BOYAU (BOYAU DU DIFFÉRENTIEL)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
07	130	PROPELLER SHAFT EXTENSION (ASS'Y) EXTENTION D'ARBRE DE PROPULSION (COMPLET)				2.2	2.2	2.2	2.2
07	134	EXTERNAL BALL JOINTS (ALL) JOINTS A ROTULE EXTERNE (TOUS)	1.1	1.1	1.1	1.1	1.1	1.1	1.1

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
07	135	SPEED SENSOR CAPTEUR DE VITESSE		0.3				0.3	0.3
07	136	CLUTCH PACK AND BALL RAMP EMBRAYAGE ET RAMPE A BILLES		3.0				3.0	3.0
07	137	RING GEAR, SHIMS, SPIDER GEARS AND OUTPUT GEARS COURONNE, CALES, SATELITTES ET PIGNONS DE SORTIE		3.1				3.1	3.1

STEERING - FRONT DRIVE SYSTEM AND SUSPENSION
DIRECTION - SYSTÈME D'ENTRAÎNEMENT AVANT ET SUSPENSION

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With DPS
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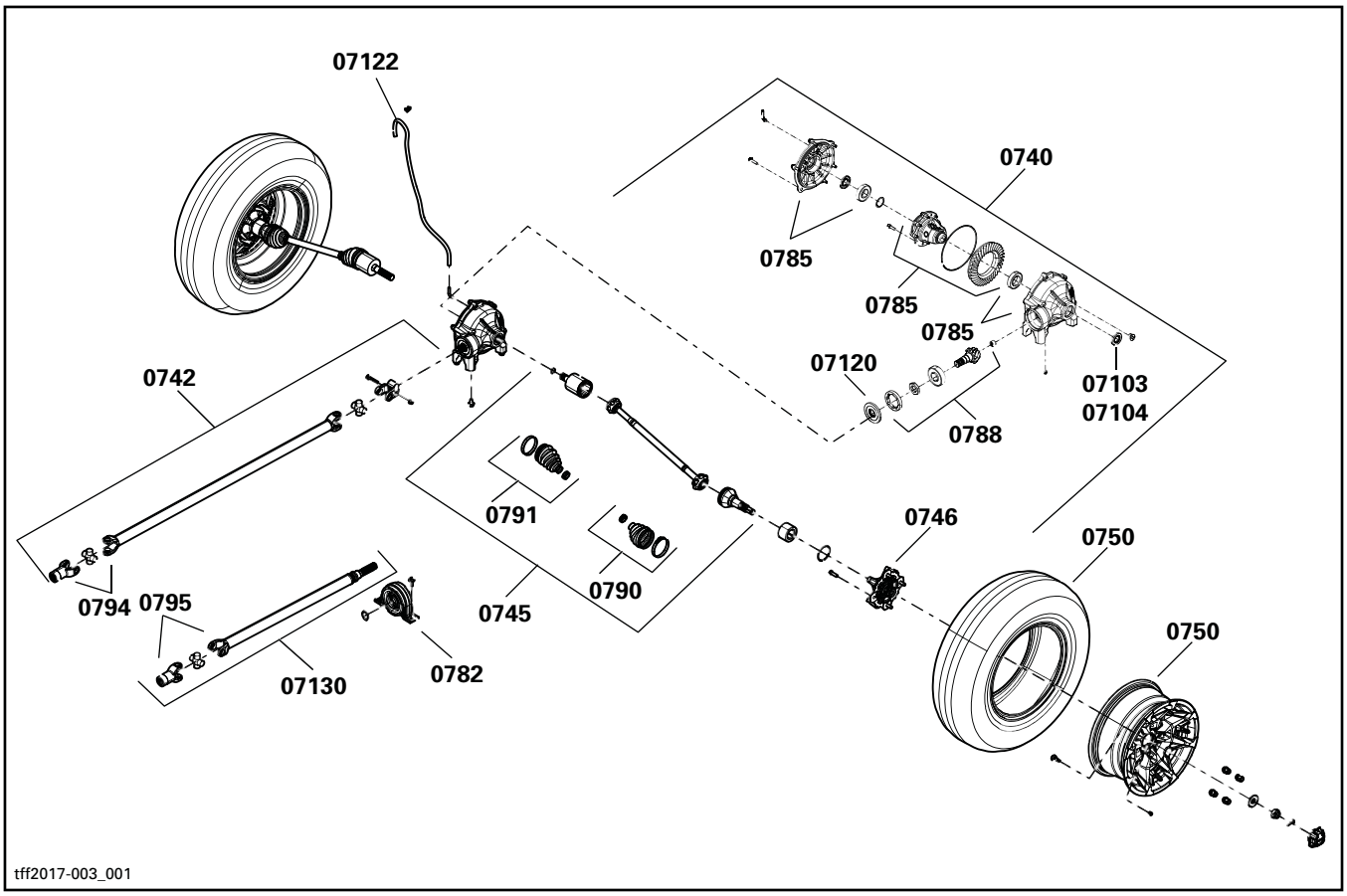
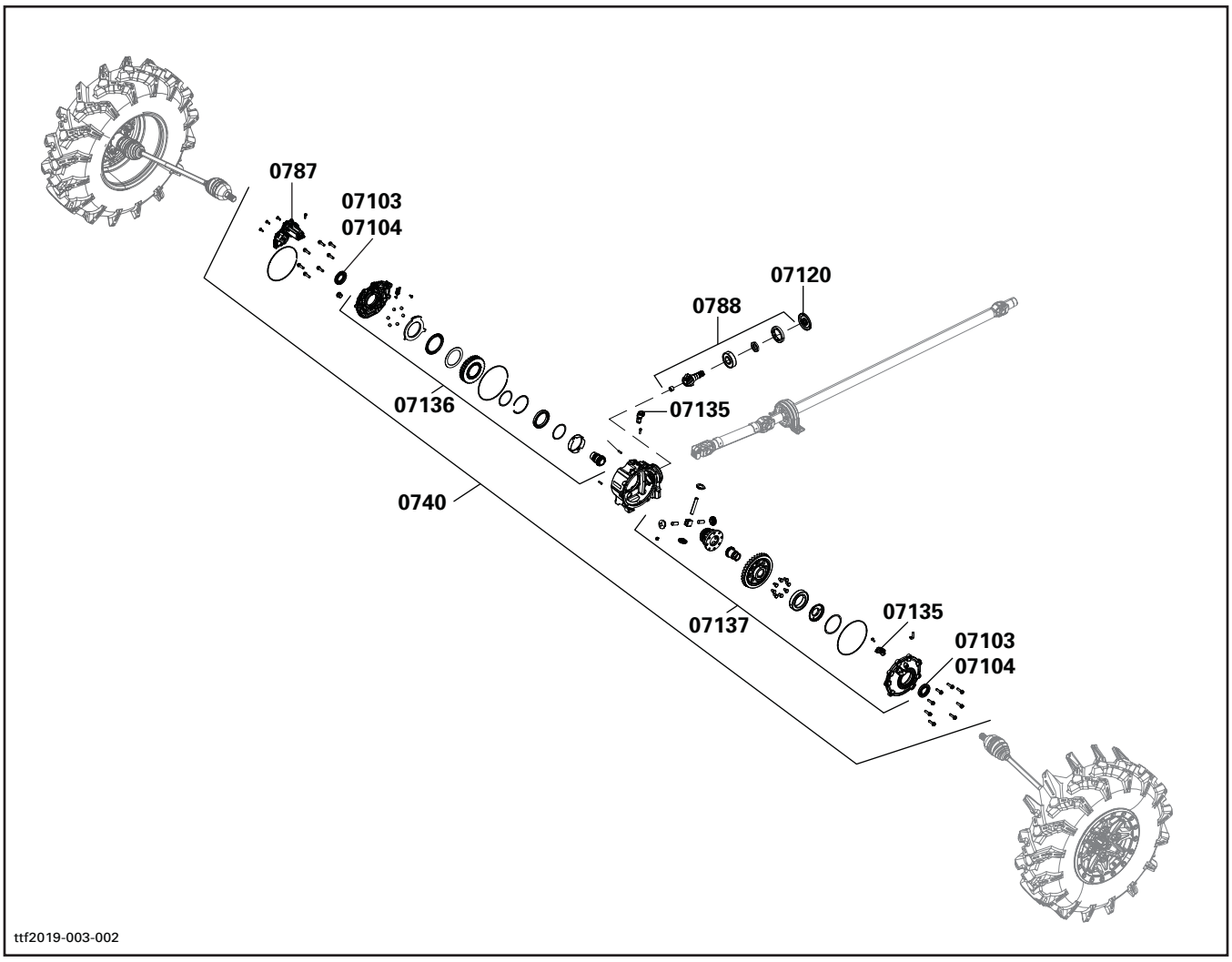
STEERING - FRONT DRIVE SYSTEM AND SUSPENSION
DIRECTION - SYSTÈME D'ENTRAÎNEMENT AVANT ET SUSPENSION

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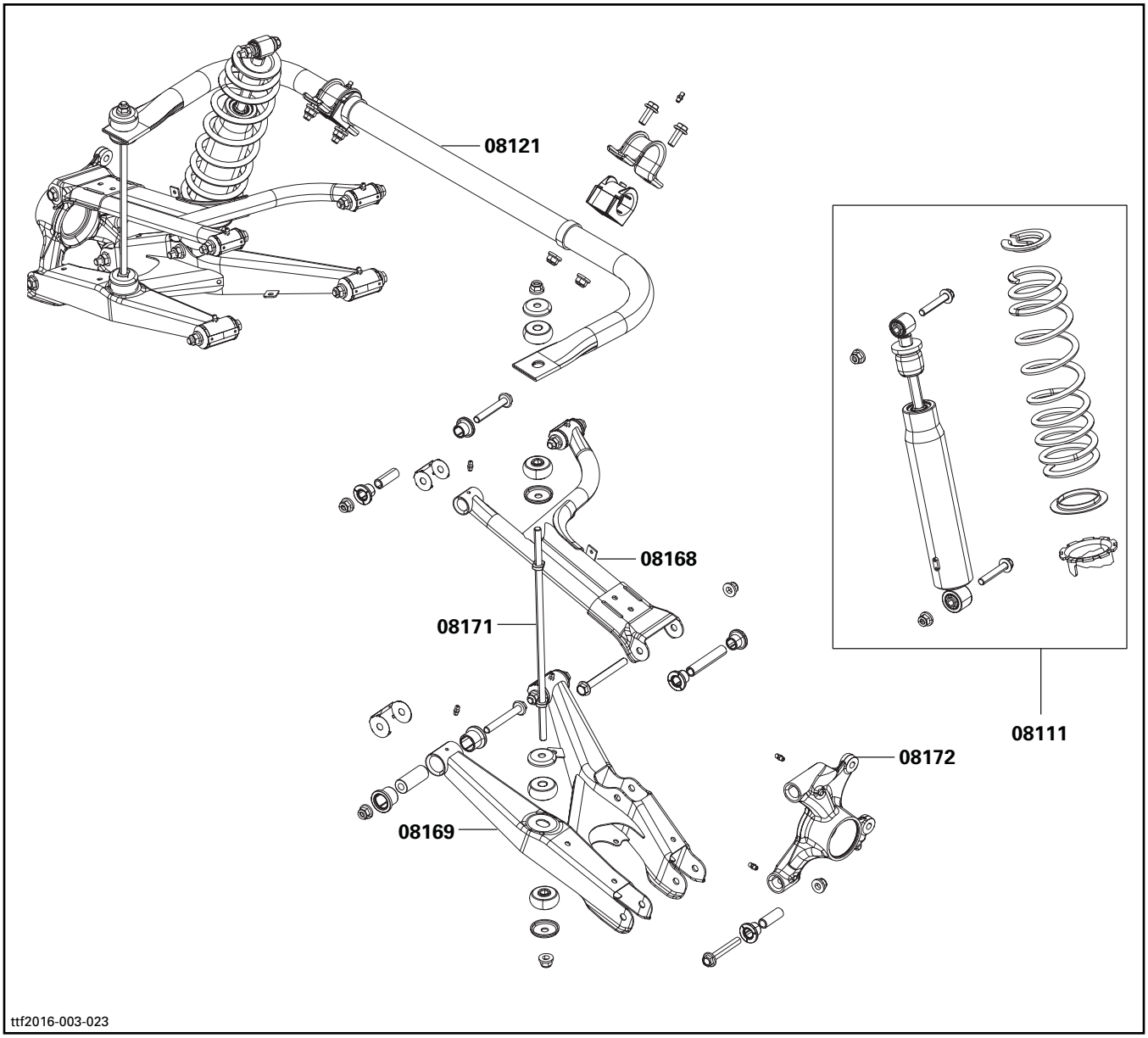
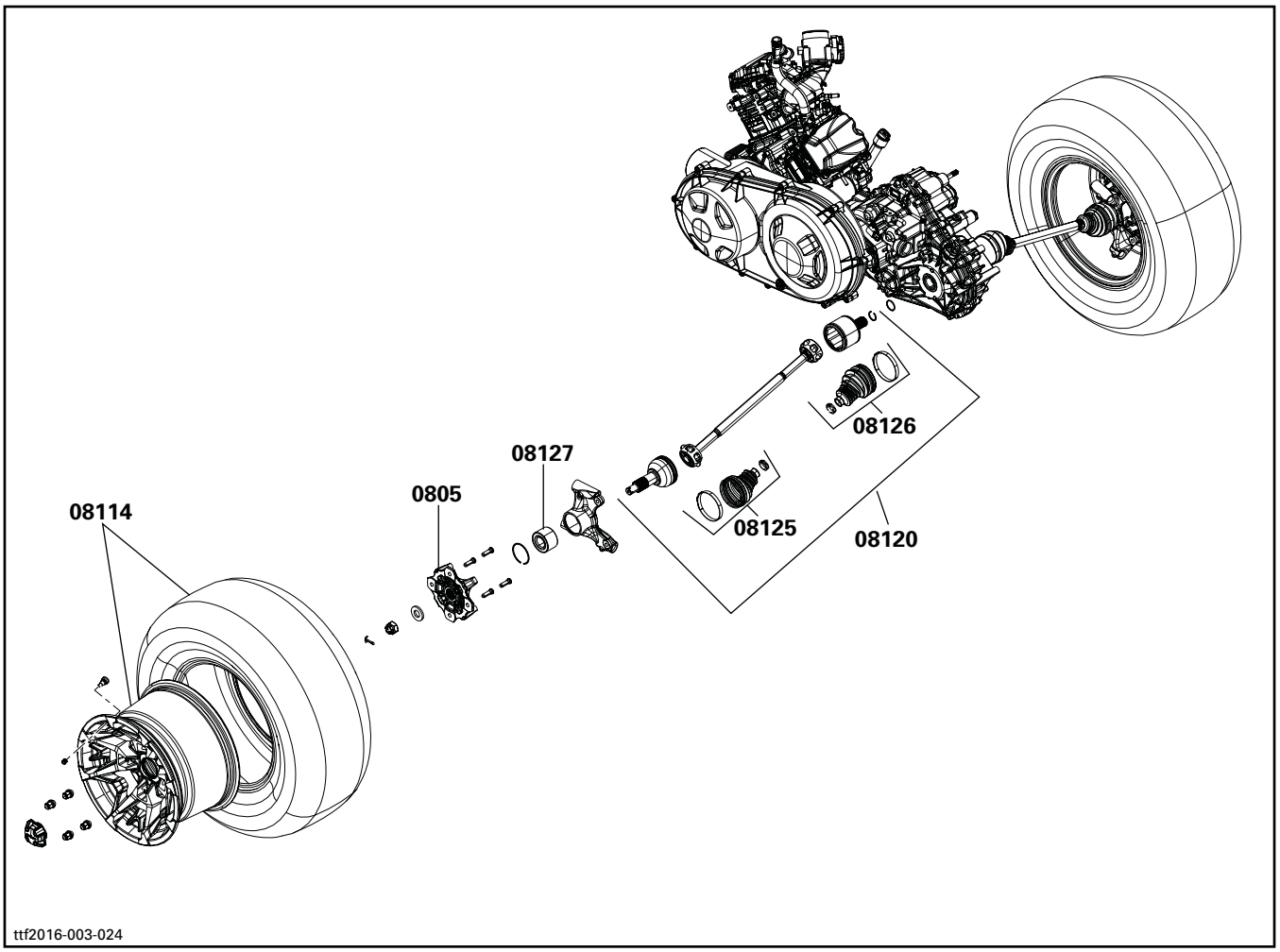
REAR DRIVE SYSTEM AND SUSPENSION
SYSTÈME D'ENTRAÎNEMENT ARRIÈRE ET SUSPENSION

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
08	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
08	05	REAR WHEEL HUB (RH) MOYEU DE ROUE ARRIÈRE (DROIT)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
08	107	DRIVE AXLE AND/OR HUB ARBRE ENTRAINEMENT ET/OU MOYEU	1.8						
08	109	REAR WHEEL HUB (LH) MOYEU DE ROUE ARRIÈRE (GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
08	111	REAR SHOCK (RH OR LH) AMORTISSEUR ARRIÈRE (DROIT OU GAUCHE)	0.4	0.4	0.4	0.4	0.4	0.4	0.4
08	114	REAR RIM AND/OR TIRE JANTE ARRIÈRE ET/OU PNEU	0.4	0.4	0.4	0.4	0.4	0.4	0.4
08	120	CV JOINT (RH OR LH) JOINT HOMOCINÉTIQUE (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7
08	121	STABILIZER BAR BARRE STABILISATRICE	0.4	0.4	0.4	0.4	0.4	0.4	0.4
08	122	RING GEAR AND/OR SHIM COURONNE LANCEMENT ET/OU CALE	2.8						
08	123	RING GEAR DRIVE AND/OR SHIM AND/OR SEAL AND/OR BEARING PIGNION ET/OU CALE ET/OU JOINT ET/OU ROULEMENT A BILLE	2.8						
08	124	COVER AND/OR PINION COVER AND/OR SEAL AND/OR BEAR COUVERCLE ET/OU COUVERCLE PIGNION ET/OU JOINT ET/OU ROULEMENT	2.9						
08	125	BOOT WHEEL KIT AND/OR CV JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE ROUE ET/OU JOINT CV (DROIT OU GAUCHE)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
08	126	BOOT DIFFERENTIAL KIT AND/OR PLUNGING JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE DIFFÉRENTIEL ET/OU JOINT PLONGENT (DROIT OU GAUCHE)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
08	127	RADIAL BALL BEARINGS ROULEMENTS À BILLE RADIALES	0.7	0.7	0.7	0.7	0.7	0.7	0.7
08	128	UNIT PACK KIT ENSSEMBLE JOINT CARDAN	1.8	1.8	1.8	1.8	1.8	1.8	1.8
08	129	UNIT PACKS KIT (2) ENSSEMBLE JOINTS CARDANS (2)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
08	134	DIFFERENTIAL SEAL (ONE) JOINT ETANCHE DU DIFFERENTIEL (UN)	0.8						
08	135	DIFFERENTIAL SEALS (TWO) JOINT ETANCHE DU DIFFERENTIEL (DEUX)	1.4						
08	148	DIFFERENTIAL OIL SEAL ANNEAU D'ÉTANCHÉITÉ DU DIFFERENTIEL	2.5						
08	158	HOSE (DIFFERENTIAL VENT) BOYAU (VENTILATION DU DIFFÉRENTIEL)	0.3	0.3	0.3	0.3	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
08	168	REAR UPPER ARM AND/OR RADIAL JOINT BRAS SUPERIEUR ARRIERE ET/OU ROTULE RADIALE	0.7	0.7	0.7	0.7	0.7	0.7	0.7
08	169	REAR LOWER ARM AND/OR RADIAL JOINT BRAS INFERIEUR ARRIERE ET/OU ROTULE RADIALE	0.7	0.7	0.7	0.7	0.7	0.7	0.7
08	171	SWAY BAR LEVER LEVIER BARRE STABILISATRICE	0.4	0.4	0.4	0.4	0.4	0.4	0.4
08	172	KNUCKLE (RIGHT OR LEFT) PORTE FUSEE (DROIT OU GAUCHE)	0.7	0.7	0.7	0.7	0.7	0.7	0.7

REAR DRIVE SYSTEM AND SUSPENSION
SYSTÈME D'ENTRAÎNEMENT ARRIÈRE ET SUSPENSION

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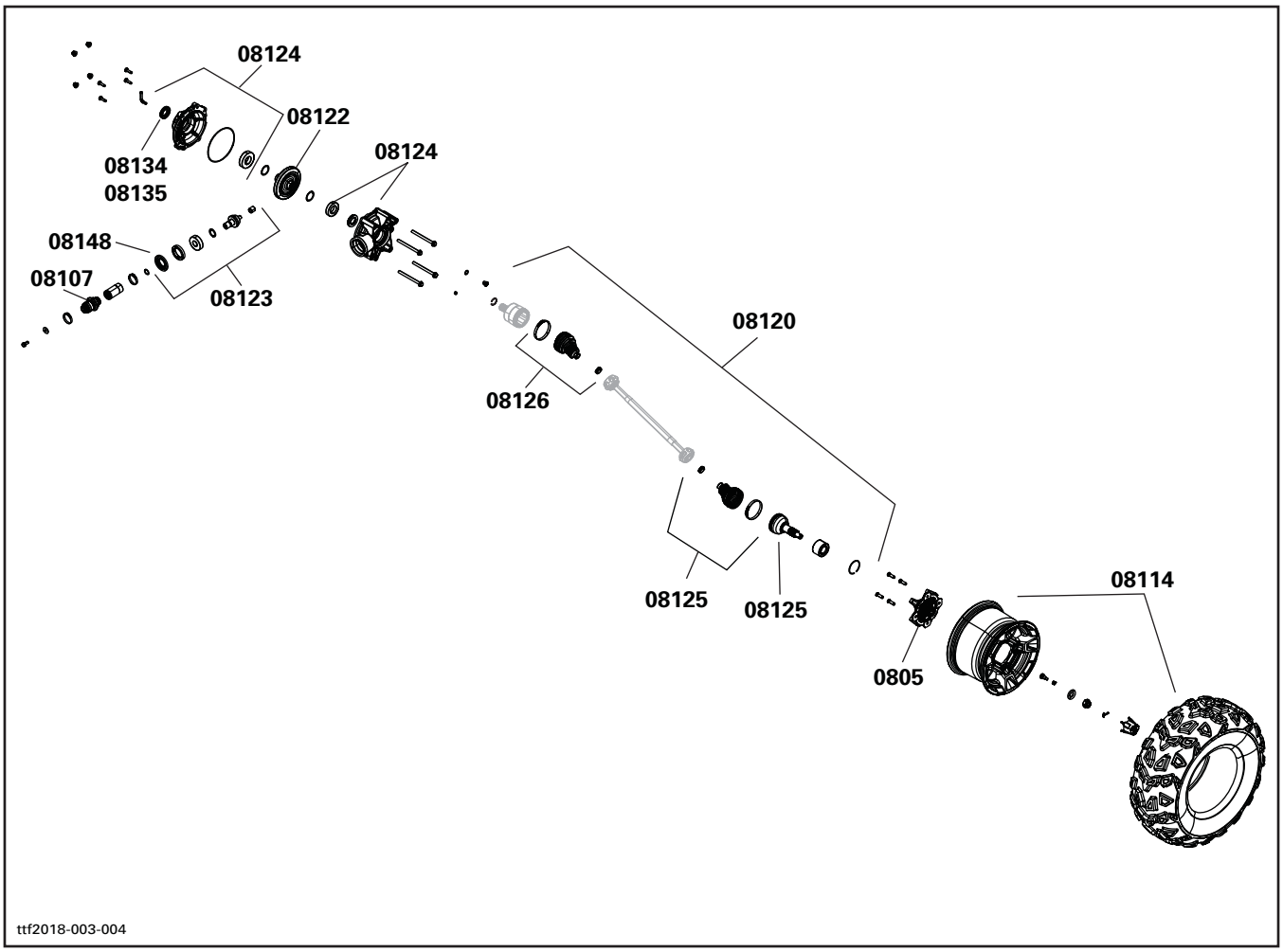
REAR DRIVE SYSTEM AND SUSPENSION
SYSTÈME D'ENTRAÎNEMENT ARRIÈRE ET SUSPENSION



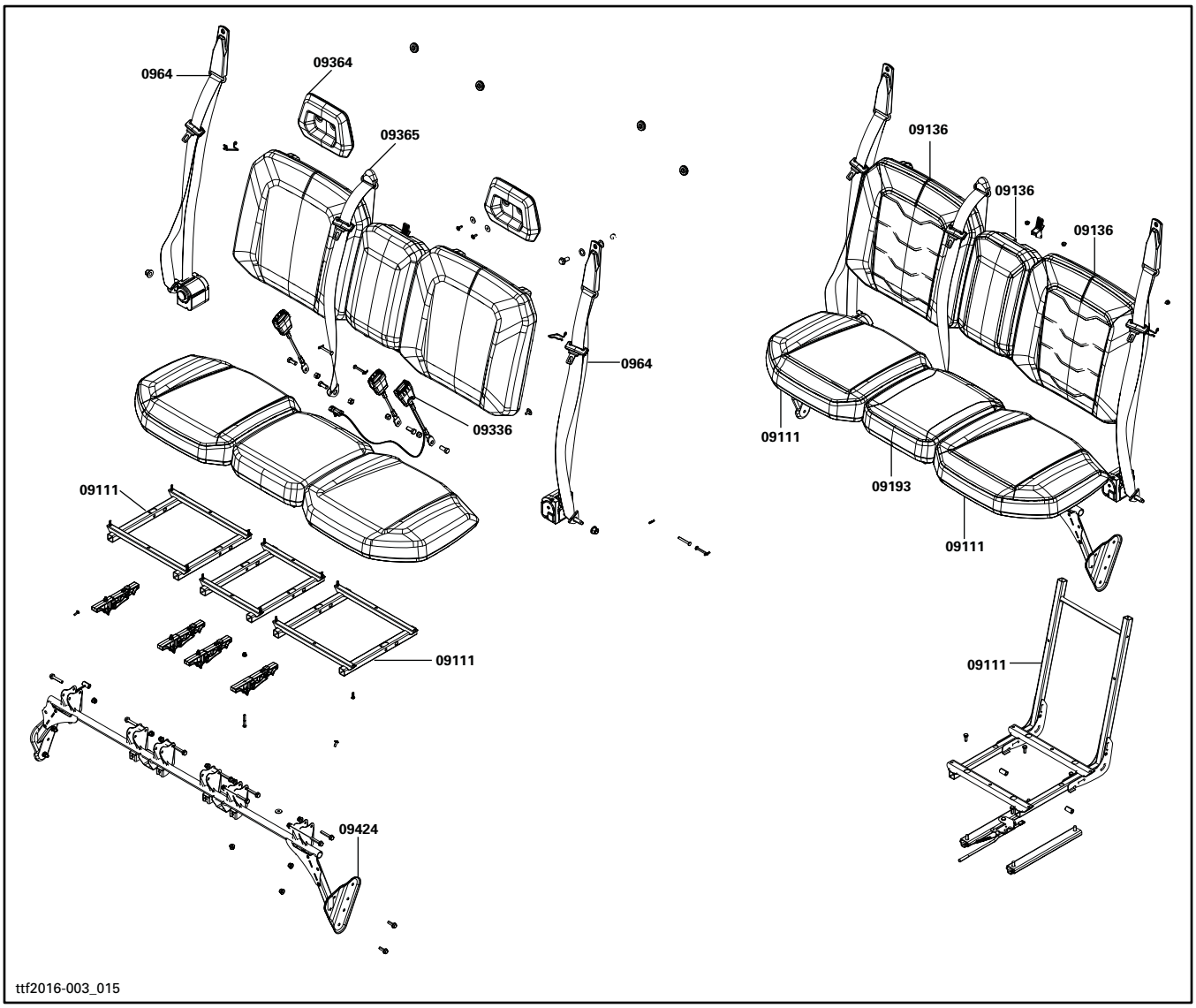
SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
09	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE IMPLIQUÉE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
09	09	WINDSHIELD PARE-BRISE			0.6		0.6		
09	26	FRONT BUMPER PARE-CHOCS AVANT	0.8	0.9	0.9	0.9	0.9	1.1	1.1
09	28	FRONT FASCIA FASCIA AVANT	0.5	0.5	0.5	0.5	0.5	0.5	0.5
09	49	FRAME CHÄSSIS	24.5	25.5	27.6	28.5	31	27	29.5
09	82	CABLE RETAINER CÂBLE DE RETENUE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	93	PROTECTION PLATE PLAQUE DE PROTECTION	0.4	0.4	0.4	0.4	0.4	0.4	0.4
09	95	EACH DECAL (1) CHAQUE AUTOCOLLANT (1)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	97	SHOCK GAZ (REAR CARGO BOX) AMORTISSEUR (BOÎTE DE RANGEMENT)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	102	PIVOT SUPPORT SUPPORT DE PIVOT	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	106	WINDSCREEN HINGE CHARNIÈRE DE PARE-BRISE			0.3		0.3		
09	111	SEAT BASE ASS'Y (DRIVER OR CO-PILOT) BASE DE SIÈGE COMPLET (CONDUCTEUR OU COPILOTE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	134	CARGO BOX LEVER AND/OR RINGS AND/OR CLAMP LEVIER BENNE ET/OU BAGUES ET/OU BRIDE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	136	BACKREST ASS'Y DOSSIER ASS.	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	162	FRONT BUMPER (XT,XMR OR XTP) PARE-CHOC AVANT (XT, XMR OU XTP)		0.3	0.3	0.3	0.3	0.3	0.3
09	168	FRONT GRILL GRILLE FRONTALE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	193	CENTRAL SEAT SIÈGE CENTRAL	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	223	GAZ SHOCK AMORTISSEUR À GAZ			0.3		0.3		
09	226	LOWER CONSOLE CONSOLE INFÉRIEURE			0.3		0.3		
09	227	SERVICE COVER COUVERCLE DE SERVICE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	231	REAR PANEL (LEFT OR RIGHT) PANNEAU ARRIÈRE (GAUCHE OU DROIT)	0.3	0.3	0.3	0.3	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
09	233	UPPER SIDE PANEL (RIGHT OR LEFT) PANNEAU LATERAL SUPERIEUR (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	239	MIDDLE SIDE PANEL (LEFT OR RIGHT) PANNEAU LATÉRAL CENTRAL (GAUCHE OU DROIT)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
09	243	DELECTOR PANEL (RIGHT OR LEFT) PANNEAU DEFLECTEUR (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	246	CENTER PANEL PANNEAU CENTRAL				0.5	0.5		0.5
09	282	LATCH AND/OR BASE (RIGHT OR LEFT) LOQUET ET/OU BASE (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	289	GLOVES BOX BOÎTE À GANTS	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	297	TOP STORAGE COMPARTMENT COMPARTIMENT DE RANGEMENT SUPÉRIEUR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	306	REAR SIDE PANEL (RIGHT OR LEFT) PANNEAU LATÉRAL ARRIÈRE (DROIT OU GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	308	BOTTOM FRONT SIDE PANEL (RH OR LH) PANNEAU LATÉRAL AVANT BAS (DROIT OU GAUCHE)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
09	336	CENTRAL SKID PLATE PLAQUE DE PROTECTION CENTRALE	0.6	0.6	0.6	0.6	0.6	0.6	0.6
09	337	REAR SKID PLATE PLAQUE DE PROTECTION ARRIÈRE	0.6	0.6	0.6	0.6	0.6	0.6	0.6
09	349	LEVER INDICATOR INDICATEUR DE VITESSE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	358	CARGO BOX FRAME CHÂSSIS DE LA BENNE	1.4	1.4	1.4	1.4	1.4	1.4	1.4
09	360	UPPER TAIL GATE PANEL PANNEAU DU HAYON SUPÉRIEUR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	363	LOWER TAIL GATE HAYON INFÉRIEUR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	364	HEAD REST APPUI-TÊTE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	365	SAFETY BELT CEINTURE DE SÉCURITÉ	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	366	BUCKLE BELT VERROU CEINTURE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	367	LOCK VERROU	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	369	CAGE (FRONT) CAGE (AVANT)	0.4	0.4	0.8	0.4	0.8	0.4	0.4
09	370	CAGE (REAR) CAGE (ARRIERE)	0.6	0.7	1.2	0.7	1.2	0.8	0.8

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
09	371	ROCK SLIDER (LEFT OR RIGHT) GLISSIERE DE PROTECTION (GAUCHE OU DROITE)		0.6				0.6	0.8
09	372	SHOULDER GUARD (LEFT AND/OR RIGHT) PROTECTEUR D'ÉPAULE (GAUCHE ET/OU DROIT)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	374	LATERAL NET (LEFT OR RIGHT) FILET LATÉRAL (GAUCHE OU DROIT)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	386	ROOF TOIT		0.3	0.6	0.6	0.6	0.6	0.6
09	388	REAR NET FILET ARRIERE				0.3	0.3		0.3
09	427	BATTERY COVER COUVERCLE DE BATTERIE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	434	CENTER CAGE KIT ENSEMBLE DE CAGE CENTRAL				0.8	1.0		0.8
09	438	FRONT FENDER AILE AVANT	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	444	CLUSTER BEZEL AND/OR HOLDER ENJOLIVEUR ET/OU BOITIER DU COMBINE D'INSTRUMENTATION	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	466	HANDLE POIGNÉE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	470	REAR ROOF TOIT ARRIERE				0.4	0.4		0.4
09	480	FRONT LATERAL PANEL PANNEAU LATÉRAL AVANT	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	481	UPPER DASH TABLEAU DE BORD SUPÉRIEUR	2.0	2.0	2.5	2.5	2.5	2.5	2.5
09	482	SWITCHES PANEL PANNEAU D'INTÉRRUPTEURS	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	483	LOWER DASH (RIGHT) TABLEAU DE BORD INFERIEUR (DROIT)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	484	LOWER DASH (LEFT) TABLEAU DE BORD INFERIEUR (GAUCHE)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	485	FRONT BULKHEAD COVER COUVERCLE DE CLOISON AVANT	1.0	1.0	1.0	1.0	1.0	1.0	1.0
09	486	STORAGE BOX BOITE DE RANGEMENT		0.3	0.3	0.3	0.3	0.3	0.3
09	487	REAR LOWER BULKHEAD CLOISON INFÉRIEUR ARRIÈRE	2.2	2.2	2.8	2.8	2.8	2.8	2.8
09	488	REAR UPPER BULKHEAD CLOISON SUPÉRIEUR ARRIÈRE	1.0	1.0	1.0	1.0	1.0	1.0	1.0

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
09	489	ENGINE SERVICE COVER COUVERCLE D'ENTRETIEN DU MOTEUR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	490	REAR SERVICE COVER COUVERCLE DE SERVICE ARRIÈRE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	491	FLOOR COVER COUVERCLE DE PLANCHER	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	492	SHIFTING MODULE SUPPORT SUPPORT MODULE D'EMBRAYAGE	0.5	0.5	0.8	0.8			
09	493	DPS MODULE SUPPORT SUPPORT MODULE DU DPS	0.5	0.5	0.5	0.5	0.5	0.5	0.5
09	494	BRAKE MODULE SUPPORT SUPPORT MODULE DE FREIN	1.3	1.3	1.3	1.3	1.3	1.3	1.3
09	495	FLOOR PLANCHER	4.0	4.0	4.0	4.0	4.0	4.0	4.0
09	496	UPPER FRONT DEFLECTOR DEFLECTEUR AVANT SUPÉRIEUR	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	497	FRONT BULKHEAD CLOISON AVANT	6.5	6.5	7.0	6.5	7.0	6.5	6.5
09	498	DRAWER TIROIR		0.3	0.3	0.3	0.3	0.3	0.3
09	499	SIDE SKID PLATE (RIGHT OR LEFT) PLAQUE DE PROTECTION LATÉRALE (DROITE OU GAUCHE)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
09	500	SERVICE CENTER CENTRE DE SERVICE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
09	501	ROOF LINER DOUBLURE DE TOIT			0.3		0.5		
09	502	ACCESSORIES COVER COUVERCLE D'ACCESSOIRES			0.3		0.3		
09	503	WIPER COVER COUVERCLE D'ESSUI-GLACE			0.4		0.4		
09	504	WINDSHIELD WASHER TANK RESERVOIR LAVE-GLACE			0.3		0.3		
09	505	WINDSHIELD HANDLE POIGNEE DE PARE-BRISE			0.3		0.3		
09	506	OUTSITE DOOR PANEL PANNEAU DE PORTE EXTERIEUR			0.8		0.8		
09	507	WINDOW VITRE			1.0		1.0		
09	508	FIX WINDOW VITRE FIXE			1.0		1.0		
09	509	DOOR HANDLE POIGNEE DE PORTE			0.8		0.8		

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
09	510	WINDOW ACTUATOR (ASS'Y) ACTUATEUR DE VITRE (COMPLET)			1.0		1.0		
09	511	DOOR FRAME (ASS'Y) CHASSIS DE PORTE (COMPLET)			1.4		1.4		
09	512	DOOR HINGE (ONE OR ALL) CHARNIÈRE DE PORTE (UNE OU TOUS)			0.3		0.3		
09	513	DOOR SEAL JOINT ÉTANCHE DE PORTE			0.3		0.3		
09	514	REAR WINDOW LUNETTE ARRIÈRE			0.3		0.3		
09	515	CARGO BOX BOITE DE CHARGEMENT	0.7	0.7	0.7	0.7	0.7	0.7	0.7
09	516	HEATING SYSTEM CONSOLE CONSOLE DU SYSTÈME DE CHAUFFAGE			0.3		0.3		
09	517	REAR CENTRAL SKID PLAT PLAQUE DE PROTECTION CENTRAL ARREIRE			0.6	0.6	0.6		0.6
09	518	REAR SIDE SKID PLATE (RIGHT OR LEFT) PLAQUE DE PROTECTION LATERALE ARRIERE (DROITE OU GAUCHE)				0.6	0.6		0.6
09	519	CAGE EXTENTION EXTENTION DE CAGE				0.3	0.3		0.3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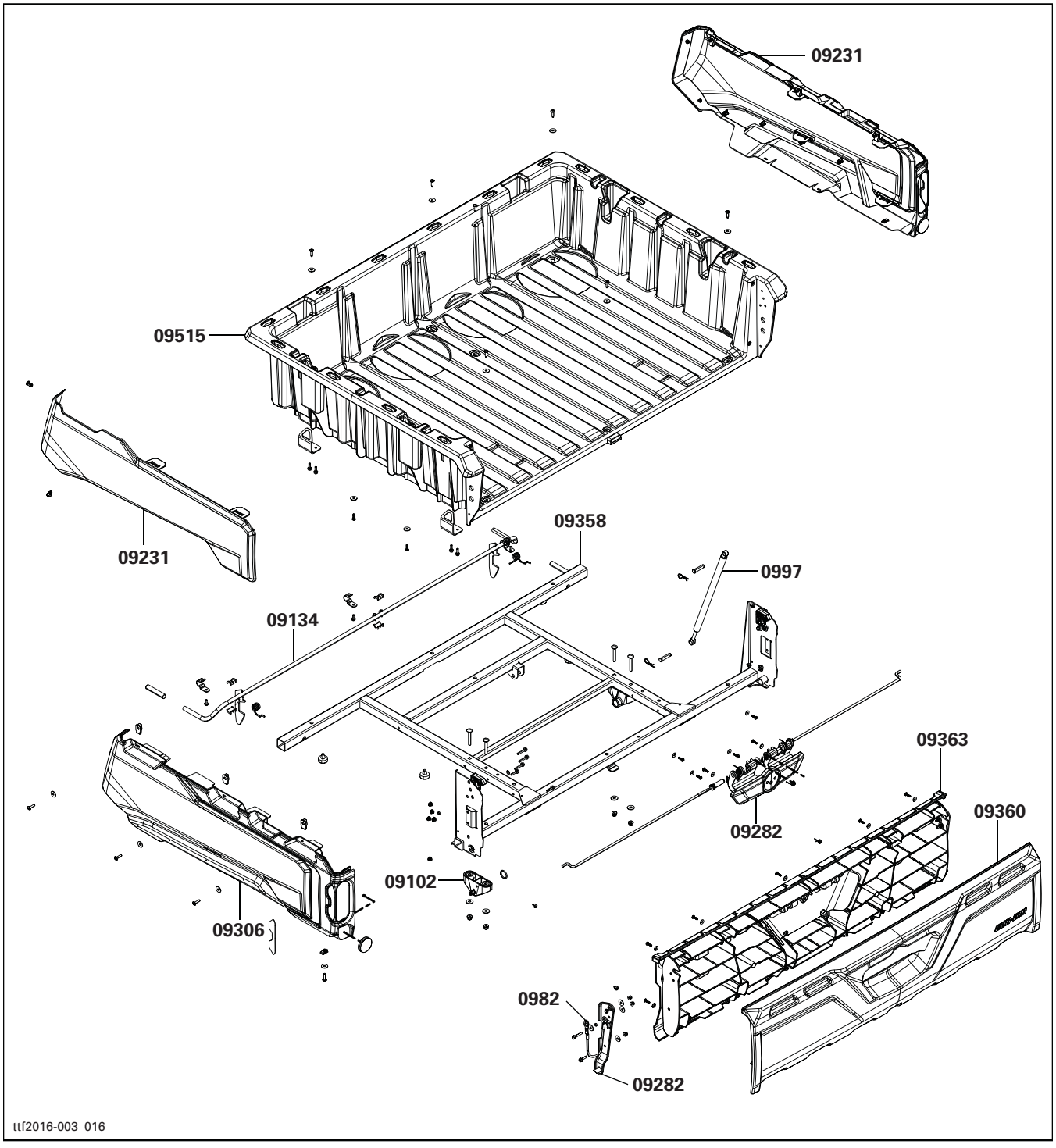
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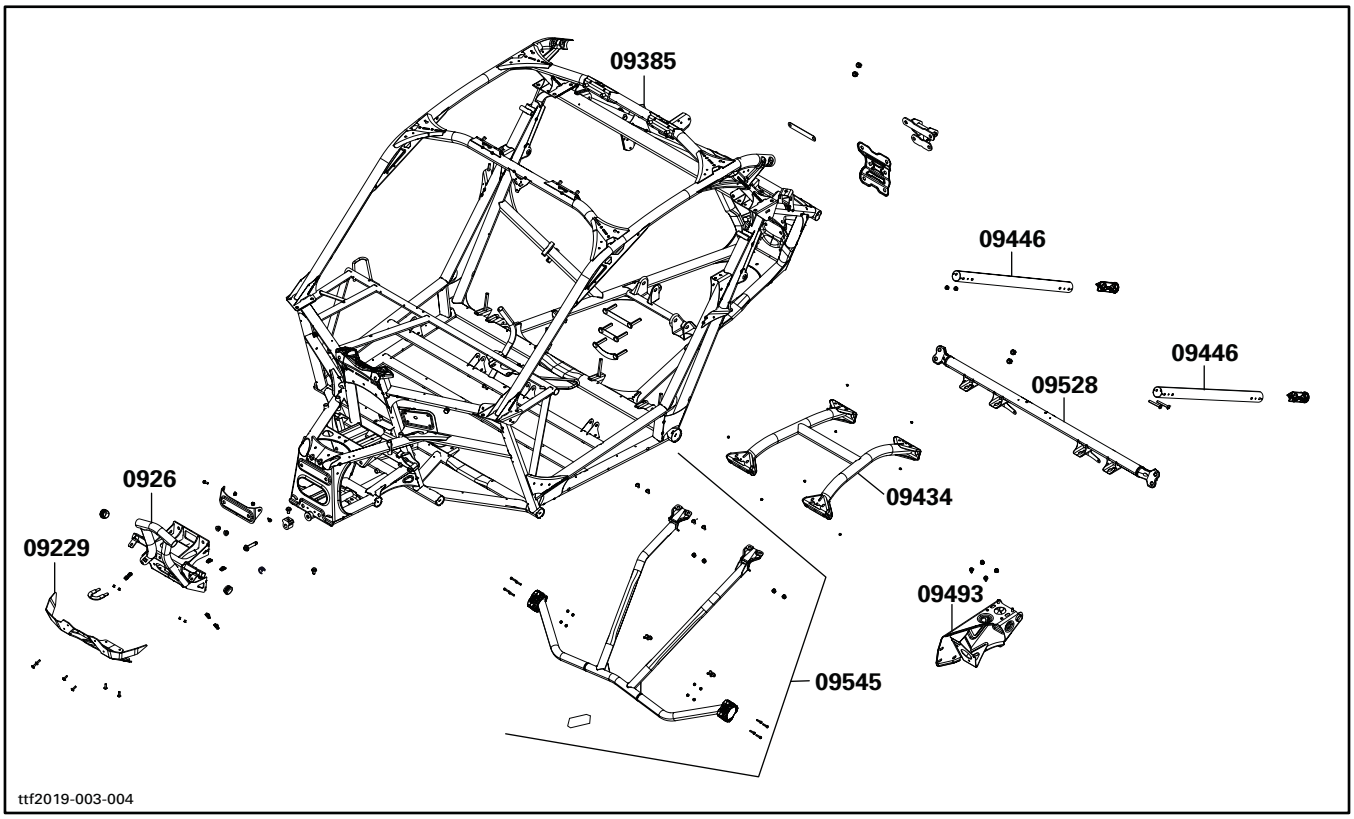
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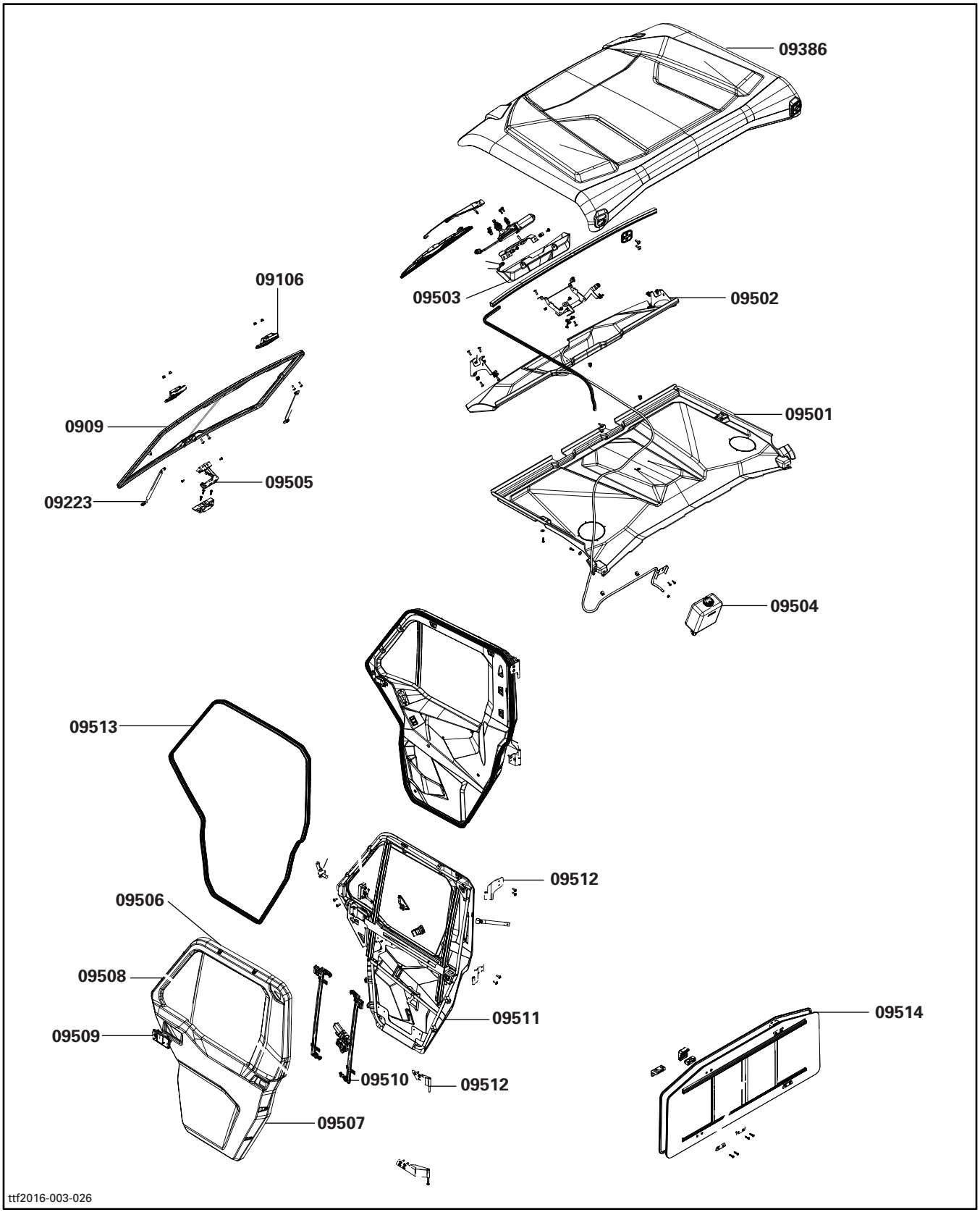
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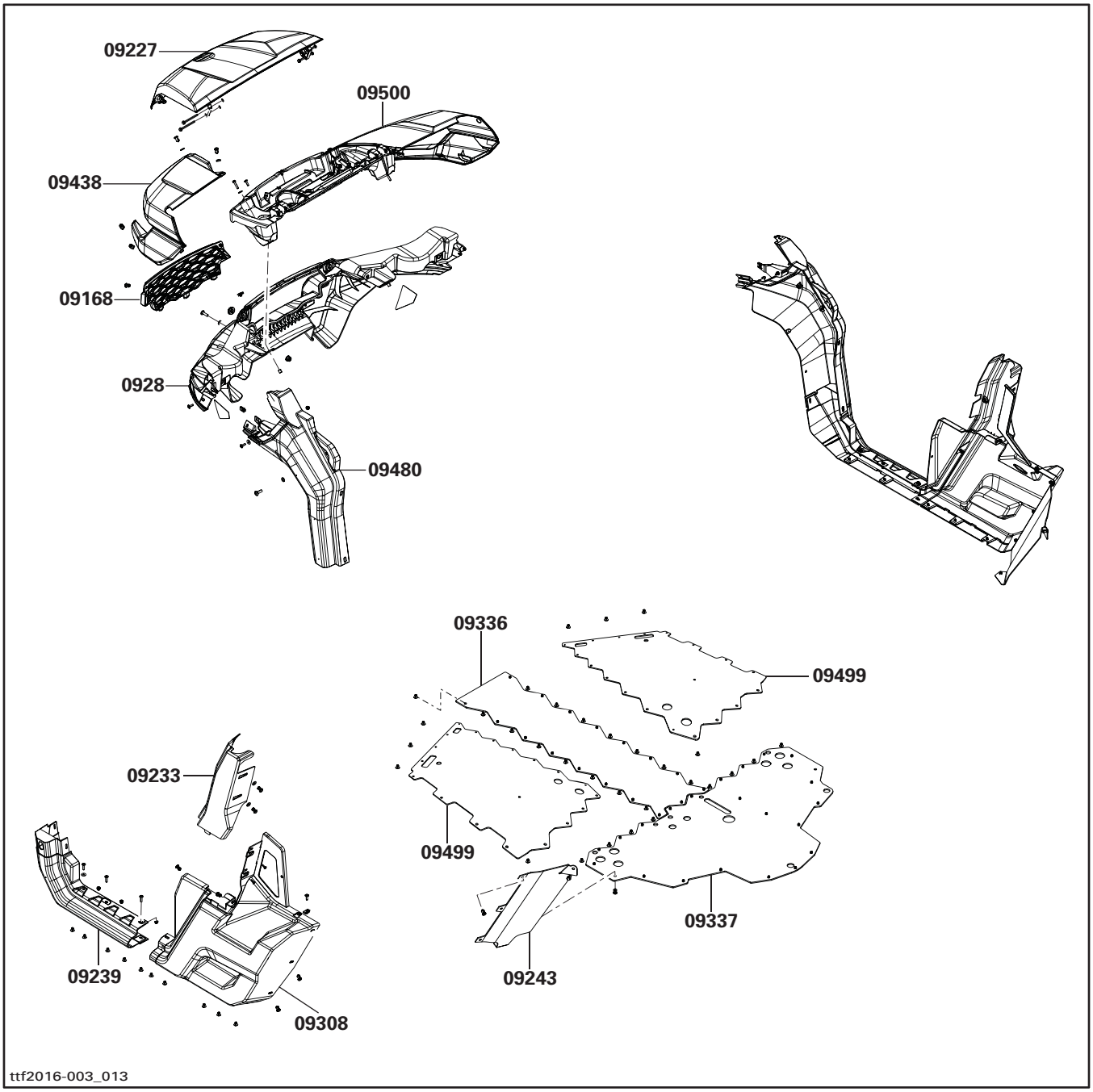
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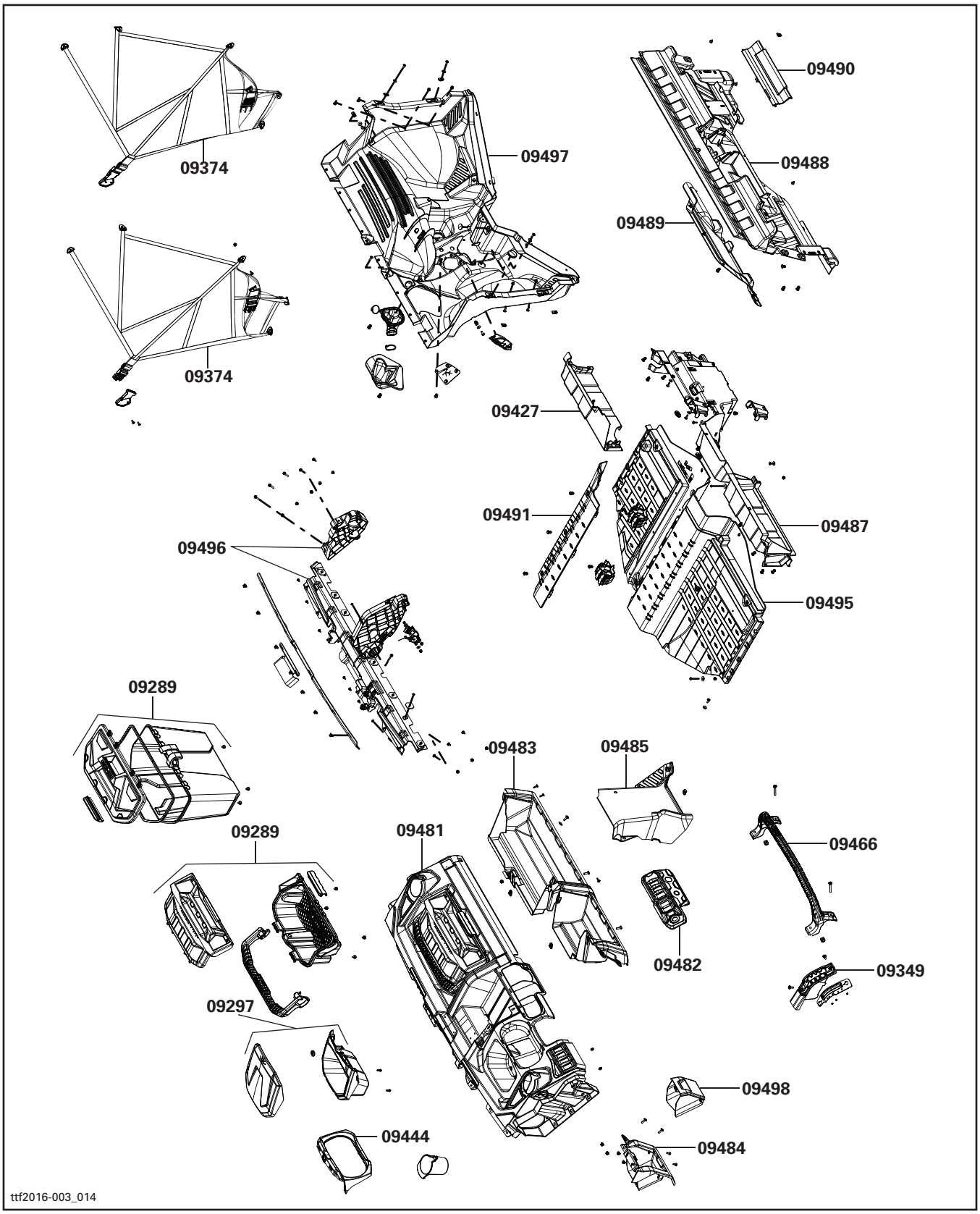
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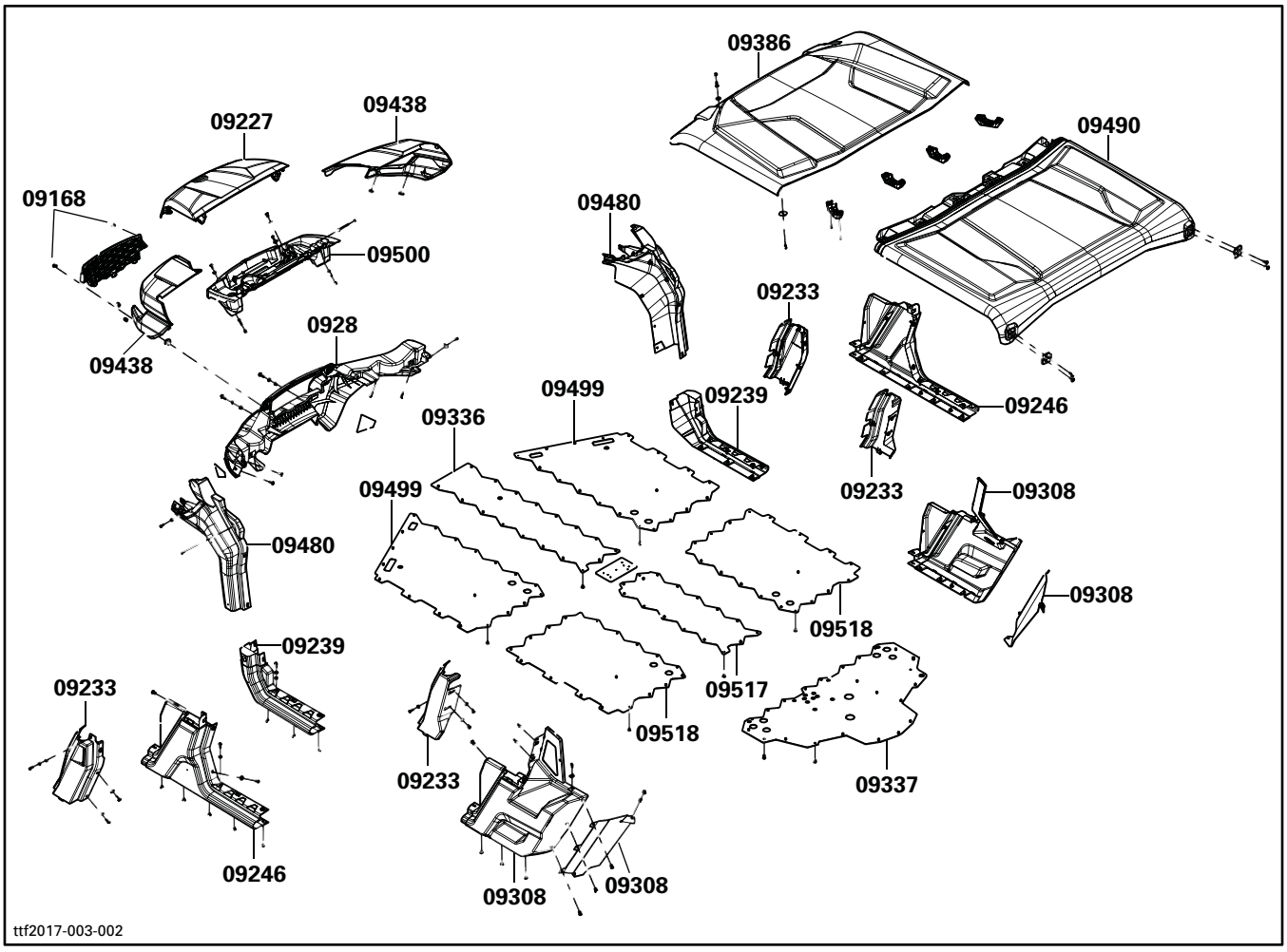
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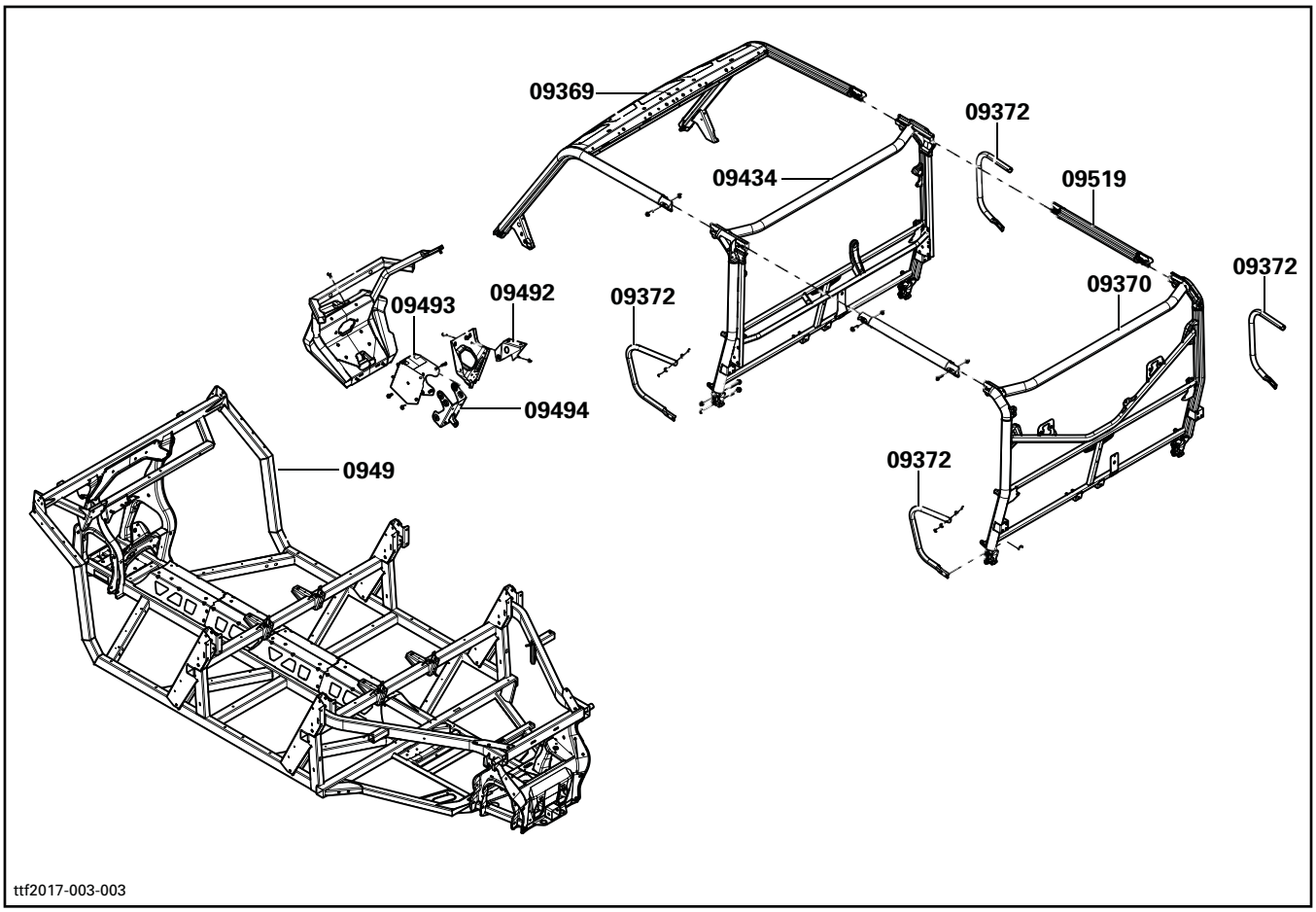
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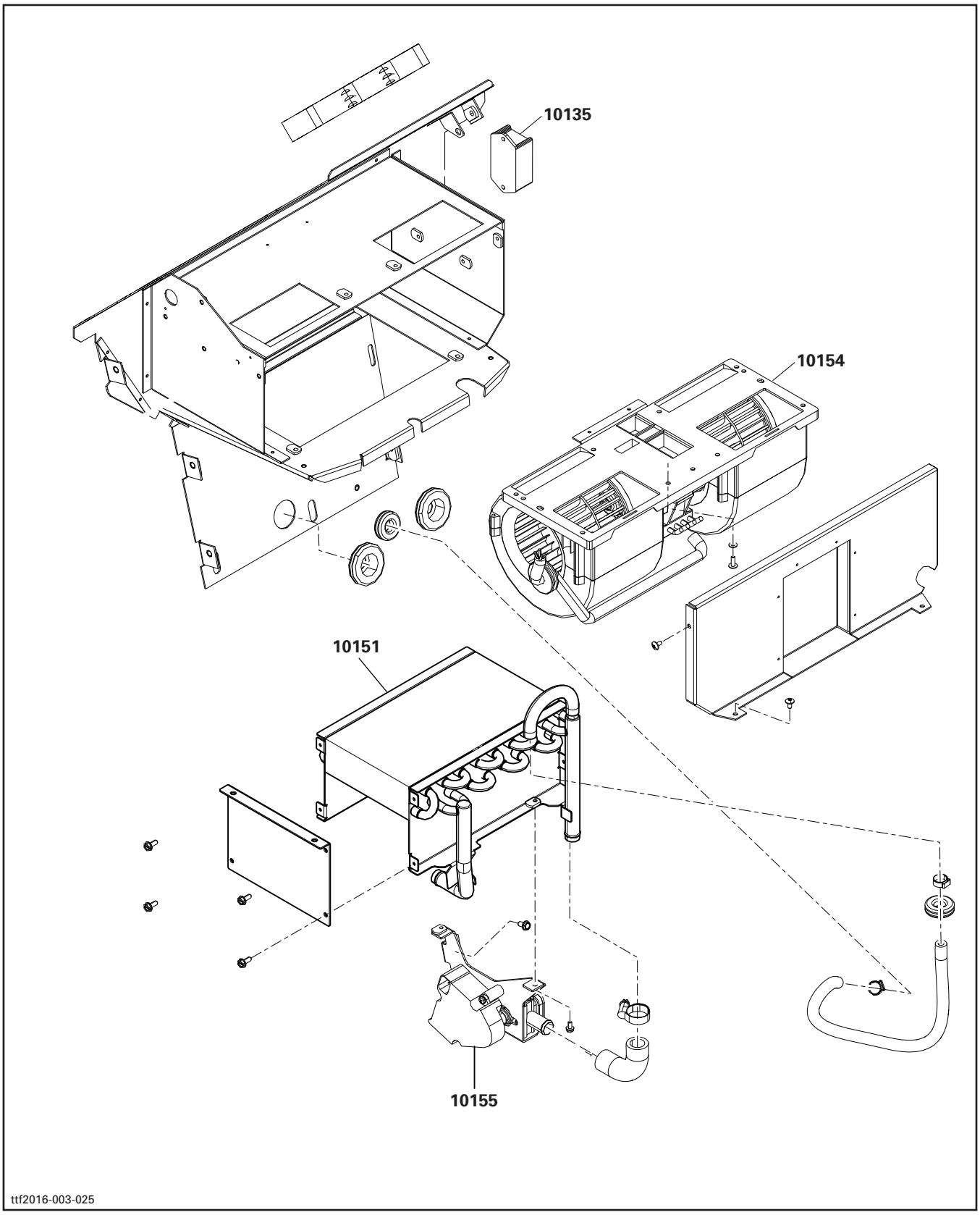
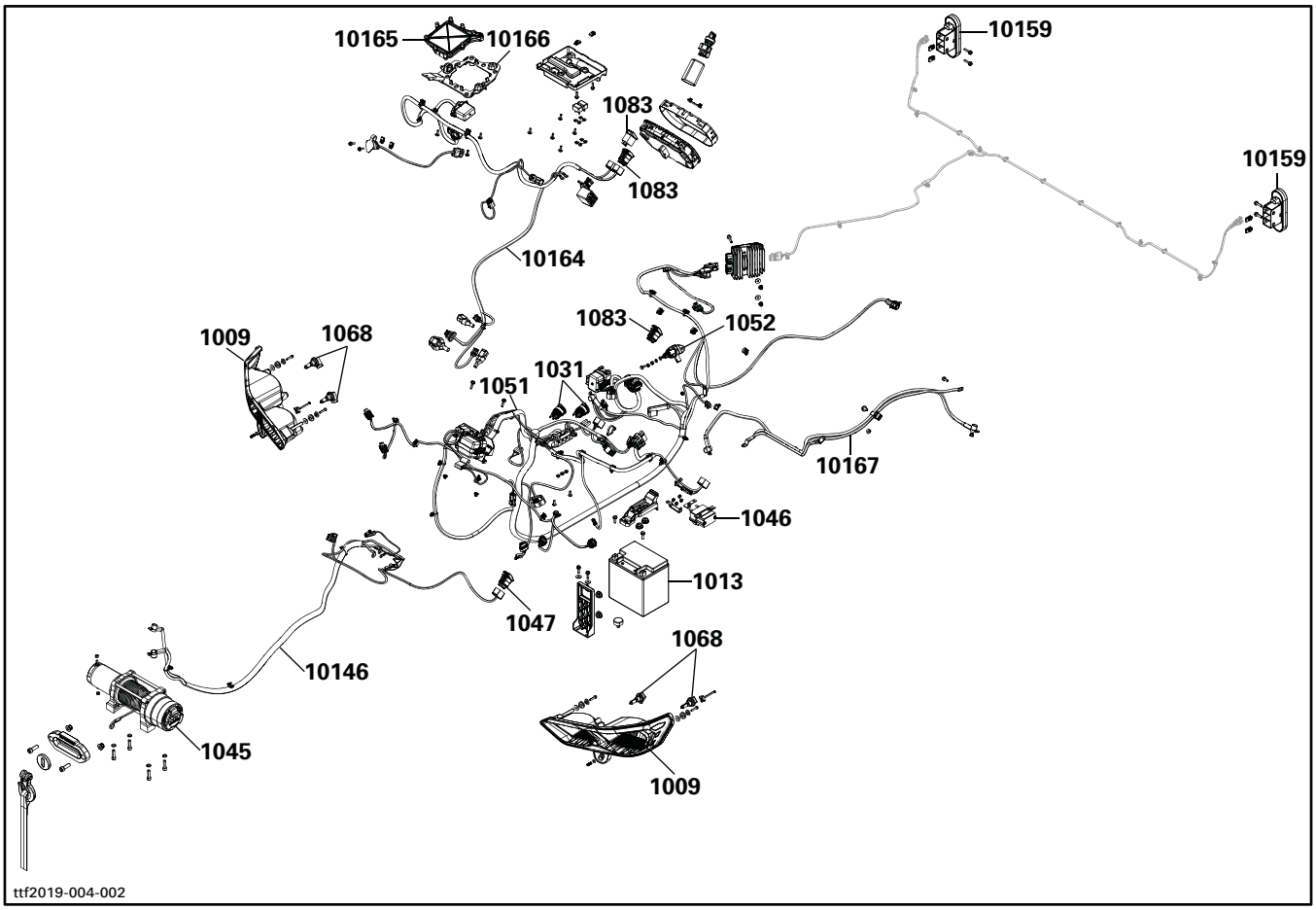
SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
10	**00**	**NO LABOR INVOLVED AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
10	01	IGNITION SWITCH INTERRUPTEUR D'ALLUMAGE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	04	HEADLIGHT SWITCH INTERRUPTEUR DE PHARE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	09	HEADLAMP AND/OR HEADLAMP SUPPORT (ASS'Y) (RH OR LH) PHARE AVANT ET/OU SUPPORT (COMPLET) (DROIT OU GAUCHE)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
10	10	VOLTAGE REGULATOR RÉGULATEUR DE TENSION	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	13	BATTERY BATTERIE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	29	TAIL LAMP HOUSING (ASS'Y) BOÎTIER DE FEU ARRIÈRE (COMPLET)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	31	DC OUTLET PLUG PRISE D'ACCESSOIRE DC	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	34	ELECTRONIC MODULE MODULE ÉLECTRONIQUE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	41	ENGINE HARNESS CÂBLAGE MOTEUR	1.2	1.2	1.2	1.2	1.2	1.2	1.2
10	45	WINCH (ASS'Y) (XT) TREUIL (COMPLET) (XT)		0.3	0.3	0.3	0.3	0.3	0.3
10	46	WINCH SOLENOID (XT) SOLÉNOÏDE DE TREUIL (XT)		0.3	0.4	0.4	0.4	0.4	0.4
10	47	WINCH SWITCH (XT) INTERRUPTEUR DE TREUIL (XT)		0.3	0.3	0.3	0.3	0.3	0.3
10	49	MULTIFUNCTION GAUGE CADRAN MULTIFONCTION	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	51	MAIN WIRE HARNESS CÂBLAGE PRINCIPAL	2.5	2.5	2.5	3.0	3.0	3.0	3.0
10	52	STARTING RELAY RELAIS DE DÉMARRAGE	0.4	0.4	0.4	0.4	0.4	0.4	0.4
10	67	RELAY RELAIS	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	68	ANY BULBS TOUTES LES AMPOULES	0.4	0.4	0.4	0.4	0.4	0.4	0.4
10	71	LICENSE LIGHT (ASS'Y) LUMIÈRE D'IMMATRICULATION (COMPLET)	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	75	REAR HARNESS CÂBAGLE ARRIÈRE	0.5	0.5	0.5	0.5	0.5	0.5	0.5
10	83	SWITCH INTERRUPTEUR		0.3	0.3	0.3	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	DEFENDER HD5	DEFENDER HD8 / HD10	DEFENDER CAB	DEFENDER MAX	DEFEBDER NAX CAN	DEFENDER XMR	DEFENDER MAX XMR
			18	19/20	21/22	23/24	25	26	27
10	113	REMOTE CONTROL COMMANDE À DISTANCE	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	114	WINCH CONNECTOR CONNECTEUR DE TREUIL		0.3	0.3	0.3	0.3	0.3	0.3
10	135	FUSES BOX BOITIER À FUSIBLES			0.4		0.4		
10	145	DIFFERENTIAL LOCK SWITCH INTERRUPTEUR DIFFERENTIEL		0.3	0.3	0.3	0.3	0.3	0.3
10	146	WINCH HARNESS HARNAIS DU TREUIL		0.4	0.4	0.4	0.4	0.4	0.4
10	147	ROOF HARNESS HARNAIS DU TOIT			0.6		0.6		
10	148	WIPER HARNESS HARNAIS D'ESSUI-GLACE			0.4		0.4		
10	149	WINDSHIELD WASHER HARNESS HARNAIS LAVE-GLACE			0.7		1.0		
10	150	ROOF ACCESSOIRIES HARNESS HARNAIS ACCESSOIRE DU TOIT			0.5		0.5		
10	151	HEATER RADIATOR RADIATEUR DE CHAUFFAGE			1.5		1.5		
10	152	FAN SWITCH INTERRUPTEUR DU VENTILATEUR			0.3		0.3		
10	153	POTENTIOMETER POTENTIOMETRE			0.3		0.3		
10	154	FAN VENTILATEUR			1.2		1.2		
10	155	HEATER CONTROL VALVE ACTUATOR ACTUATEUR DE SOUPAPE DU CONTRÔLE DE CHAUFFAGE			1.1		1.1		
10	164	FRONT DIFFERENTIAL HARNESS HARNAIS DU DIFFERENTIEL AVANT		0.6				0.6	0.6
10	165	FRONT DRIVE MODULE (FDM) MODULE ENTRAINEMENT AVANT (FDM)		0.3				0.3	0.3
10	166	FDM SUPPORT SUPPORT FDM		0.3				0.3	0.3
10	167	STARTER HARNESS HARNAIS DU DEMARREUR	0.8	0.8	0.8	0.8	0.8	0.8	0.8

ELECTRICAL SYSTEM
SYSTÈME ÉLECTRIQUE

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ttf2019-004-002

Flat rate times are what the manufacturer pays the authorized dealer for warranty work, the times listed are usually unrealistic for even the most experienced mechanic and will take longer to actually complete.

Because of this dealers will usually charge more than the times posted.

I cannot be held responsible for any errors BRP has made in these service flat rate or parts manuals.

If you bought this manual from any other seller, they could be reselling my work.

Please leave them negative feedback & email me at bestshopmanuals@gmail.com .

Our goal is to be one of the BEST sellers on the internet by providing you with the BEST customer service and the BEST manuals on the market.

Thank you for choosing us.

INTRODUCTION

This publication governs all warranty labor allowances for 2019 BRP SSV

1. HOW DOES IT WORK

We follow the procedures detailed in the BRP *SSV Shop Manual*. The flat rate time is the maximum time allowed for a repair involving any given part. FLAT RATE TIME IS NOT CUMULATIVE. You must use the flat rate time given for the longest lasting operation.

NOTE: The *Flat Rate Time Schedule* was prepared by skilled mechanics using the hand tool usually found in workshops and all the special tools mentioned in the *Shop Manual*.

2. COMPILATION

The *Flat Rate Time Schedule* is compiled as follows:

The actual required time to perform the repair plus (+) 30% correction factor up to 3.0 hours or (+) 15% over 3.0 hours time to take into account, among others:

- Vehicle handling
- Obtaining the parts
- Diagnosis
- Cleaning
- Special compensation (rusted bolts).

3. HOW TO USE IT

Refer to the system you need, locate part of series of parts replaced. List JOB CODE in the appropriate column on claim.

SYSTEM		PAGE
01	ENGINE	04
02	CARBURETOR AND FUEL SYSTEM	24
03	IGNITION SYSTEM	28
04	STARTER	31
05	TRANSMISSION SYSTEM	32
06	BRAKE SYSTEM	41
07	STEERING SYSTEM AND FRONT SUSPENSION	43
08	REAR SUSPENSION SYSTEM AND TRACK	48
09	BODY	53
10	ELECTRICAL SYSTEM	64

NOTE: Unless otherwise specified, dismantling order is: top to bottom, exterior to interior, front to rear.

All fractions of hours are in tenths:

0.1 = 6 minutes
0.2 = 12 minutes, and so on

LEGEND:

* REQUIRES PRIOR AUTHORIZATION BY DISTRIBUTOR.
** INDICATE LABOUR TIME ON LINE “LABOUR ONLY“ OF CLAIM.
*** INDICATE $$$ AMOUNT ON “SUB-CONTRACTED LABOUR“ OF CLAIM.

IMPORTANT: Always use the longest flat rate time applicable to the repair performed.

4. JOB REQUIREMENTS

All the flat rate times mentioned in the following pages include the required operations such as: engine timing (rotary valve and ignition), connecting rod(s) alignment, cylinder head(s) torque or use of parallel bar, use of ignition tester, piston clearance/ring end gap measurement, crankshaft to crankcase measurement, cylinder honing, engine leak test.

5. ILLUSTRATIONS

The illustrations contained in this manual do not necessarily show every components of a given system as *Parts Catalog* do. Their purpose is to facilitate recognition of parts related to a flat rate time. Item numbers on illustrations correspond to the four digit Job Code.

6. FLAT RATE TIME SUGGESTION

SEND A WARRANTY CASE ON BOSSWeb INFO CENTER

In the case, you must provide the following information:

Section *Subject*:

- Flat rate time suggestion

Section *Your Question*:

- Model year;
- Model description;
- Description job code;
- Job code;
- Present flat rate;
- Suggested flat rate;
- Detailed repair procedure;

To ensure that your case will be promptly and efficiently processed please indicate the step by step repair procedure you performed.

INTRODUCTION

Cette publication détermine le temps de main-d'oeuvre couvert par la garantie pour les VCC BRP 2019.

1. UTILISATION DU MANUEL

En procédant de la façon indiquée dans le *Manuel de réparation VCC* BRP, chaque temps donné représente le maximum permis pour une réparation portant sur cette pièce. LES TEMPS NE SONT PAS CUMULATIFS. On doit inscrire le temps donné pour l'opération qui prend le plus de temps.

REMARQUE: Le *Barème de temps à taux fixe* a été préparé par des mécaniciens compétents utilisant les outils que l'on retrouve normalement dans les ateliers de réparation, en plus de tous les outils spéciaux mentionnés dans le *Manuel de réparation*.

2. COMPILATION

Le *Barème de temps à taux fixe* a été établi en compilant le temps nécessaire pour faire la réparation plus (+) un facteur de correction de 30% lorsqu'un travail dure 3.0 heures et moins, ou (+) 15% lorsqu'un travail dure plus de 3.0 heures. Cette compilation comprend, entre autres, les étapes suivantes:

- Manutention du véhicule
- Nettoyage
- Aller chercher les pièces, essais physiques
- Compensation spéciale (boulons rouillés)
- Diagnostic.

3. UTILISATION DU BARÈME

Se reporter à la section désirée, repérer la pièce ou l'ensemble de pièces remplacées et inscrire le CODE DE TRAVAIL dans la colonne appropriée sur la formule de réclamation.

SYSTÈME		PAGE
01	MOTEUR	04
02	CARBURATEUR ET SYSTÈME D'ALIMENTATION D'ESSENCE	24
03	SYSTÈME D'ALLUMAGE	28
04	DÉMARREUR	31
05	SYSTÈME DE TRANSMISSION	32
06	SYSTÈME DE FREIN	41
07	SYSTÈME DE DIRECTION ET SUSPENSION AVANT	43
08	SYSTÈME DE SUSPENSION ARRIÈRE ET CHENILLE	48
09	CARROSSERIE	53
54	SYSTÈME ÉLECTRIQUE	64

REMARQUE: Sauf indication contraire, le démontage doit s'effectuer de haut en bas, de l'extérieur vers l'intérieur, de l'avant vers l'arrière.

Toutes les fractions d'heures sont exprimées en dixièmes:

0.1 = 6 minutes
0.2 = 12 minutes, et ainsi de suite

LÉGENDE:

* AUTORISATION REQUISE AVANT LE REMPLACEMENT.
** INSCRIRE LE TEMPS À LA LIGNE «MAIN-D'OEUVRE SEULEMENT».
*** INSCRIRE LE MONTANT $$$ À LA LIGNE «OUVRAGE SOUS-CONTRACTÉ».

IMPORTANT: Toujours utiliser le temps donné à l'opération qui nécessite le plus de temps.

4. TRAVAUX REQUIS

Tous les temps mentionnés dans les pages suivantes incluent les opérations telles que: réglage du moteur (valve rotative et allumage), alignement de la ou des bielles, couple de serrage de la ou des culasses ou l'utilisation de barres parallèles, utilisation du vérificateur d'allumage, mesure du jet des pistons/jeu en bout des segments, mesure de l'écart entre le vilebrequin et le carter, rectification du cylindre, vérification de fuite du moteur.

5. ILLUSTRATIONS

Contrairement aux *Catalogues de pièces*, les illustrations de ce manuel ne montrent pas nécessairement chacune des pièces qu'elles représentent, leur raison d'être étant plutôt de faciliter la reconnaissance des pièces reliées à un barème de temps à taux fixe. **Les numéros d'items sur les illustrations correspondent aux quatre derniers chiffres du code de travail.**

6. SUGGESTION DE BARÈME DE TEMPS À TAUX FIXE

ENVOYEZ UNE REQUÊTE GARANTIE BOSSWeb DEPUIS LA SECTION INFO CENTRE

Dans cette requête, vous devez fournir les informations suivantes:

Section *Objet*:

- Suggestion de barème de temps à taux fixe

Section *Votre Question*:

- L'année modèle;
- Description du modèle;
- Description du code de travail;
- Code de travail;
- Temps actuel;
- Temps suggéré;
- Détails de la marche à suivre;

Pour s'assurer que votre demande sera traitée dans les plus brefs délais et efficacement, s.v.p. nous fournir toutes les étapes de réparation dans les détails de la marche à suivre.

2019

SSV/ VCC

TABLE	DESCRIPTION	MODEL/MODÈLE	ENGINE TYPE/ TYPE DE MOTEUR
28	TRAXTER HD5	6XKD	427 CVT
29	TRAXTER HD8	8DKD	800 CVT
	TRAXTER DPS HD8	8EKL	
30	TRAXTER PRO HD10	6RKA	1000 CVT
	TRAXTER XT HD10	8CKF	
31	TRAXTER MAX XT HD8	8RKJ	800 CVT

ENGINE SYSTEM
SYSTÈME MOTEUR

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
01	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**
01 *	01	REMOVE AND REPLACE ENGINE (ASS'Y) REMPLACEMENT DU MOTEUR (COMPLET)	4.0	4.5	4.5
01	03	OIL PRESSURE SWITCH INTERRUPTEUR DE PRESSION D'HUILE	0.3	0.3	0.3
01	08	FAN AND/OR FAN SUPPORT VENTILATEUR ET/OU SUPPORT DE VENTILATEUR	1.1	1.1	1.1
01	18	SENDER TEMPERATURE (ENGINE) CAPTEUR DE TEMPÉRATURE (MOTEUR)	0.4	0.4	0.4
01	19	THERMOSTAT THERMOSTAT	0.5	1.2	1.2
01	21	COOLANT HOSE T-FITTING (ONE OR TWO) BOYAU DE LIQUIDE DE REFROIDISSEMENT RACCORD EN T (1 OU 2)	0.7	0.7	0.7
01	37	RADIATOR INLET HOSE BOYAU D'ENTRÉE DU RADIATEUR	0.7	0.7	0.7
01	38	WATER PUMP SHAFT (ALL PARTS) ARBRE DE POMPE À L'EAU (TOUTES LES PIÈCES)	4.8	3.5	3.5
01	45	ENGINE DAMPERS (1 OR ALL) TAMPONS ANTI-VIBRATION (1 OU TOUS)	3.0	4.6	4.6
01	46	RADIATOR AND/OR GROMMMET RADIATEUR ET/OU PASSE-FILS	1.2	1.2	1.2
01	50	CRANKSHAFT AND/OR BEARINGS (FRONT/REAR) VILEBREQUIN ET/OU ROULEMENTS (AVANT/ARRIÈRE)		6.5	6.5
01	56	CRANKCASE COVER GASKET JOINT DE COUVERCLE DE CARTER		2.0	2.0
01	57	PTO CRANKCASE COVER COUVERCLE DE CARTER PDM		2.0	2.0
01	58	INTAKE OR EXHAUST VALVE GUIDE (1) GUIDE DE SOUPAPE ADMISSION OU ECHAPPEMENT (1)	2.3		
01	59	INTAKE OR EXHAUST VALVE GUIDES (2) GUIDES DE SOUPAPE ADMISSION OU ECHAPPEMENT (2)	2.4		
01	70	MUFFLER AND/OR EXHAUST GASKET AND/OR CLAMP SILENCIEUX D'ÉCHAPPEMENT ET/OU JOINT D'ÉCHAPPEMENT ET/OU BRIDE DE SERRAGE	0.7	1.0	1.0
01	73	EXHAUST MANIFOLD (REAR) CONNECTEUR D'ÉCHAPPEMENT (ARRIÈRE)		2.1	2.1
01	83	EXHAUST MANIFOLD (FRONT) CONNECTEUR D'ÉCHAPPEMENT (AVANT)	0.8	6.2	6.2
01	84	TUNE PIPE SHIELD (1) COQUILLE TUYAU D'ECHAPPEMENT (1)	0.3	0.3	0.3
01	85	TUNE PIPE SHIELD (2) COQUILLE TUYAU D'ÉCHAPPEMENT (2)		0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
01	86	TUNE PIPE SHIELD (3) COQUILLE TUYAU D'ÉCHAPPEMENT (3)		0.3	0.3
01	87	MUFFLER SUPPORT SUPPORT DU SILENCIEUX	1.1	1.1	1.1
01	90	ENGINE OIL FILTER FILTRE À HUILE DU MOTEUR	0.4	0.4	0.4
01	96	OIL SIEVE AND/OR O-RING AND/OR COLLECTOR AND/OR RUBBER RING AND/OR COVER CRIBLE D'HUILE ET/OU JOINT TORIQUE ET/OU COLLECTEUR ET/OU ANNEAU DE CAOUTCHOUC ET/OU COUVERCLE	2.0	6.5	6.5
01	98	COOLING RESERVOIR RÉSERVOIR D'ANTIGEL	0.4	0.4	0.4
01	100	RADIATOR OUTLET HOSE BOYAU DE SORTIE DU RADIATEUR	0.7	0.7	0.7
01	101	PISTON, BEARING, PIN (1 PISTON) PISTON, ROULEMENT, AXE (1 PISTON)	3.0		
01	109	VALVE COVER AND/OR GASKET COUVERCLE DE SOUPAPE ET/OU JOINT D'ÉTANCHÉITÉ	0.3	0.3	0.3
01	111	TIMING GEAR PIGNON DE DISTRIBUTION	1.0	1.5	4.5
01	113	ROCKER ARM AND/OR PUSH ROD AND/OR ROCKER ARM SHAFT CULBUTEUR ET/OU TIGE POUSSOIR ET/OU ARBRE DE CULBUTEUR	1.1	1.6	1.6
01	114	CYLINDER HEAD A/O GASKET CULASSE E/O JOINT ÉTANCHE	3.5		
01	116	EXHAUST/INLET VALVE A/O SPRING A/O SEAL VALVE ADMISSON/ÉCHAPPEMENT E/O RESSORT E/O ANNEAU	2.7		
01	117	CYLINDER A/O GASKET CYLINDRE E/O JOINT ÉTANCHE	2.8		
01	119	WATER PUMP HOUSING AND/OR IMPELLER CARTER DE LA POMPE À EAU ET/OU ROUE À AILETTES	0.4	0.7	0.7
01	122	SHIFT SHAFT ASS'Y ARBRE D'EMBRAYAGE COMPLET	4.8		
01	132	OIL PUMP GEAR ENGRENAGE DE LA POMPE À L'HUILE	4.4	2.0	2.0
01	133	OIL PIPE TUYAU À L'HUILE		0.3	0.3
01	134	CAMSHAFT ARBRE À CAME	2.0	2.6	2.6
01	137	OIL PUMP COVER AND/OR SHAFT AND/OR ROTOR COUVERCLE DE LA POMPE À HUILE ET/OU ARBRE ET/OU ROTOR	4.5	2.1	2.1
01	138	CRANKCASE RESEAL OR GASKET RECELLEMENT DU CARTER ET/OU JOINT D'ÉTANCHÉITÉ	5.3	7.0	7.0

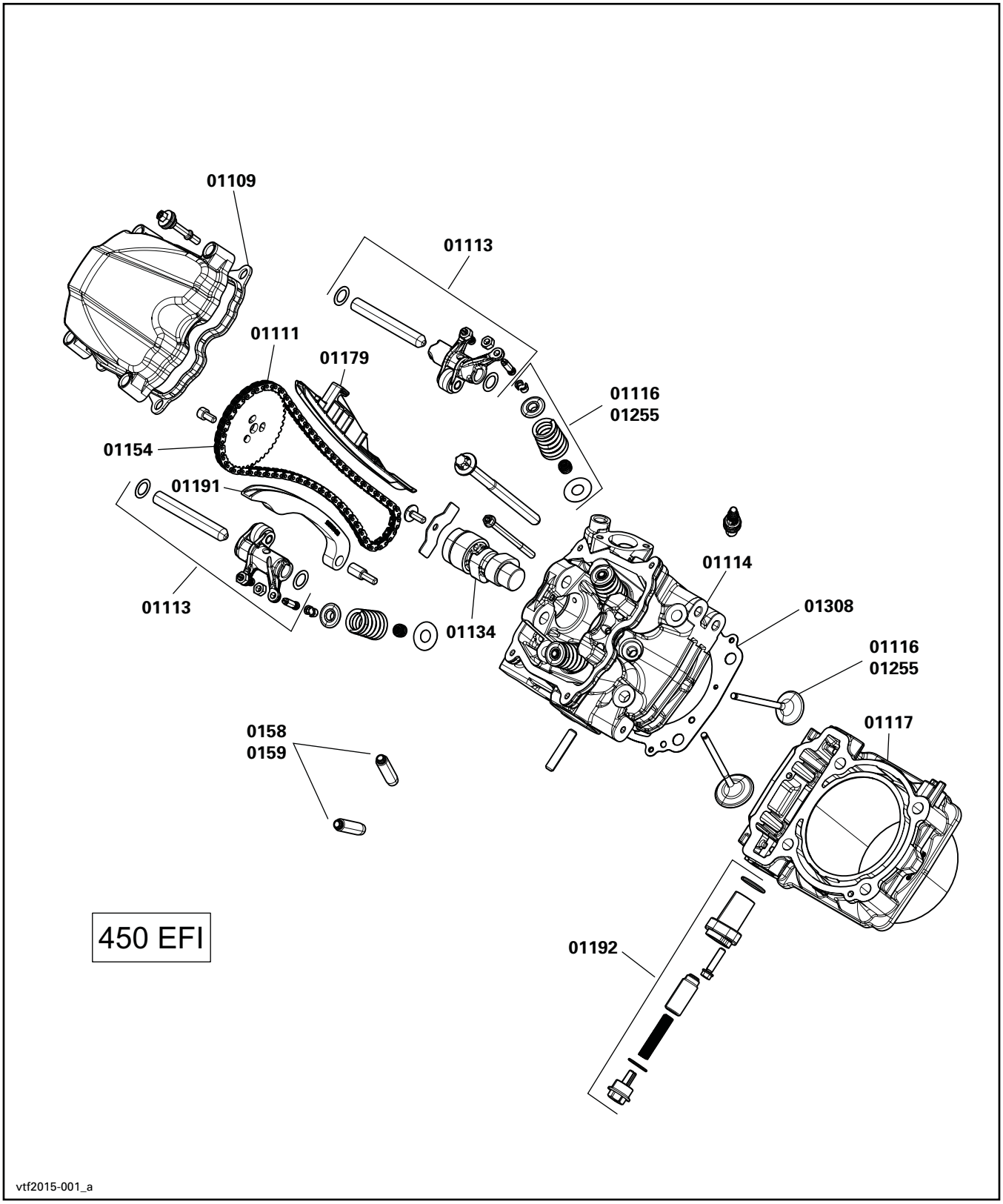
ENGINE SYSTEM
SYSTÈME MOTEUR

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
01	139	CRANKCASE REPLACEMENT REMPLACEMENT DU CARTER	5.9	7.5	7.5
01	140	CRANKSHAFT A/O BALANCE SHAFT VILEBREQUIN E/O ARBRE D'ÉQUILIBRAGE	5.6		
01	152	DRIVE SHAFT AND/OR BEARINGS AND/OR SEALS ARBRE D'ENTRAÎNEMENT ET/OU ROULEMENT À BILLES ET/OU ANNEAUX D'ÉTANCHÉITÉ	4.4	6.0	6.0
01	153	GEARS BOX ASS'Y / MAIN SHAFT BOITE D'ENGRENAGE COMPLET / ARBRE PRINCIPAL	6.0		
01	154	TIMING CHAIN CHAÎNE D'ENGRENAGE	3.7	3.4	3.4
01	155	OUTPUT SHAFT ARBRE DE SORTIE	6.0		
01	172	SHIFT DRUM TAMBOUR D'EMBRAYAGE	6.0		
01	179	CHAIN GUIDE GUIDE DE CHAÎNE	1.0	1.4	1.4
01	182	OIL RADIATOR AND/OR O-RING RADIATEUR D'HUILE ET/OU JOINT D'ÉTANCHÉITÉ		2.5	2.5
01	191	CHAIN TENSION GUIDE GUIDE DE TENSION DE CHAÎNE	2.9	3.4	3.4
01	192	CHAIN TENSIONER (ASS'Y) TENDEUR DE CHAÎNE (COMPLET)	0.3	0.3	0.3
01	200	WATER PUMP GEAR ENGREANGE POMPE A EAU	4.3	2.0	2.0
01	201	PLUG, COMPRESSION SPRING, PRESSURE RETAINER AND BALL VIS, RESSORT DE COMPRESSION, SOUPAPE DE RETENUE ET BILLE		2.0	2.0
01	205	REAR OUTPUT SHAFT SEAL ANNEAU D'ÉTANCHÉITÉ DE L'ARBRE DE SORTIE ARRIÈRE	3.0	5.0	5.0
01	209	OUTPUT CRANKSHAFT SEAL (REWIND SIDE) ANN. ETANCH. SORTIE VILBR. (COTE DEMARR.)	0.8		
01	210	MAIN SHAFT SEAL JOINT D'ÉTANCHÉITÉ DE L'ARBRE PRINCIPAL	0.8		
01	215	OIL DIPSTICK JAUGE À HUILE	0.3	0.3	0.3
01	216	PRESSURE CAP BOUCHON À PRESSION	0.3	0.3	0.3
01	220	MAIN DRIVE GEAR AND/OR PIN ROUAGE D'ENTRAÎNEMENT PRINCIPALE ET/OU GOUPILLE	4.4	2.1	2.1
01	221	INTERMEDIATE GEAR AND/OR PIN AND/OR THRUST WASHER ROUAGE INTERMEDIAIRE ET/OU GOUPILLE ET/OU RONDELLE D'APPUI	4.4	2.1	2.1
01	223	FRONT OUTPUT SHAFT SEAL ANNEAU ÉTANCHÉITÉ ARBRE SORTIE AVANT		4.7	4.7

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
01	245	OUTPUT CRANKSHAFT SEAL (PTO SIDE) ANNEAU ÉTANCHÉITÉ SORTIE VILEBREQUIN (CÔTÉ PDM)	1.0	1.3	1.3
01	246	WATER PUMP GEAR AND/OR SEAL ARBRE POMPE À EAU ET/OU JOINT ÉTANCHÉITÉ	4.3	5.9	5.9
01	247	REED VALVE AND/OR STOPPER SOUPAPE À CLAPET ET/OU BUTOIR		2.1	2.1
01	248	BREATHER GEAR AND/OR V-RING RENIFLARD ET/OU ANNEAU ÉTANCHÉITÉ EN «V»		2.1	2.1
01	250	CRANKSHAFT POSITION SENSOR (CPS) CAPTEUR POSITION DU VILEBREQUIN (CPV)	0.3		
01	255	EXHAUST/INLET VALVES A/O SPRINGS A/O SEALS (4) VALVES ADMISSION/ÉCHAPPEMENT E/O RESSORTS E/O ANNEAUX (4)	3.3		
01	256	EXHAUST AND/OR INLET VALVES AND/OR SPRINGS AND/OR SEALS (8) ÉCHAPPEMENT ET/OU VALVES ADMISSION ET/OU RESSORTS ET/OU ANNEAUX D'ÉTANCHÉITÉ (8)		5.2	5.2
01	261	TIMING CHAIN (MAG SIDE) CHAÎNE D'ENGRENAGE (CÔTÉ MAG)	2.6	3.2	3.2
01	264	LONG BLOCK ENSEMBLE CARTER - CYLINDRE - CULASSE	5.2	6.9	6.9
01	290	REAR ENGINE SUPPORT (PTO SIDE) SUPPORT MOTEUR ARRIERE (COTE PDM)	0.8		
01	292	REAR ENGINE SUPPORT (MAG SIDE) SUPPORT MOTEUR ARRIERE (COTE MAG)	0.5		
01	301	WATER PUMP DYNAMIC SEAL AND/OR OIL SEAL ANNEAU D'ÉTANCHÉITÉ DYNAMIQUE DE LA POMPE À EAU		2.5	2.5
01	303	TIMING CHAINS (ALL) CHAÎNES D'ENGRENAGE (TOUTES)		5.5	5.5
01	304	CHAINS TENSION GUIDE (ALL) GUIDE DE TENSION DE CHAÎNES (TOUS)		5.5	5.5
01	305	CHAINS GUIDE (ALL) GUIDE DE CHAÎNES (TOUS)		2.1	2.1
01	307	VALVE COVERS AND/OR GASKETS (2) COUVERCLES SOUPAPE ET/OU JOINTS D'ÉTANCHÉITÉ (2)		0.5	0.5
01	308	CYLINDER HEAD GASKET JOINT D'ÉTANCHÉITÉ DE LA CULASSE	1.4		
01	316	MUFFLER END CAP EMBOUT DE SILENCIEUX	0.3	0.3	0.3
01	320	THROTTLE PEDAL PÉDALE D'ACCÉLÉRATEUR	0.4	0.4	0.4
01	329	INJECTOR (1) INJECTEUR (1)	0.4		

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
01	335	COOLANT HOSE (WATER PUMP) BOYAU DE REFROIDISSEMENT (POMPE À EAU)	0.7	0.7	0.7
01	337	RECIRCULATION HOSE BOYAU DE RECIRCULATION		0.7	0.7
01	338	INTERMEDIATE HOSE BOYAU INTERMÉDIAIRE	0.7	0.7	0.7
01	340	PLUG SCREW BOUCHON FILETÉ		0.7	0.7
01	352	OXYGEN SENSOR CAPTEUR D'OXYGEN		0.3	0.3
01	353	INJECTORS (ALL) INJECTEURS (TOUS)		0.4	0.4
01	374	HEAT SHIELD SUPPORT SUPPORT DE DEFLECTEUR DE CHALEUR		0.3	0.3
01	375	FRONT HEAT SHIELD DEFLECTEUR DE CHALEUR AVANT	0.5	1.0	1.0
01	376	FRONT PIPE HEAT SHEILD (LEFT) DEFLECTEUR DE CHALEUR TUYAU AVANT (GAUCHE)		0.4	0.4
01	377	FRONT PIPE HEAT SHEILD (RIGHT) DEFLECTEUR DE CHALEUR TUYAU AVANT (DROIT)		6.2	6.2
01	378	FRONT PIPE HEAT SHEILD (MUFFLER) DEFLECTEUR DE CHALEUR TUYAU AVANT (SILENCIEUX)	0.3	0.3	0.3
01	379	REAR HEAT SHEILD (MUFFLER) DEFLECTEUR DE CHALEUR ARRIERE (SILENCIEUX)	0.3	0.6	0.6
01	380	INLET HOSE (HEATER UNIT) BOYAU D'ENTRE (UNITE CHAUFFAGE)		1.7	1.7
01	381	OUTLET HOSE (HEATER UNIT) BOYAU DE SORTIE (UNITE CHAUFFAGE)		2.0	2.0
01	382	THERMOSTAT HOSE BOYAU DU THERMOSTAT		0.7	0.7
01	383	BLEEDING HOSE BOYAU DE PURGE	1.0	1.0	1.0
01	384	FRONT CYLINDER HEAD AND/OR GASKET CULASSE AVANT ET/OU JOINT D'ÉTANCHEITE		6.3	6.3
01	385	REAR CYLINDER HEAD AND/OR GASKET CULASSE ARRIERE ET/OU JOINT D'ÉTANCHEITÉ		3.5	3.5
01	386	FRONT CYLINDER AND/OR GASKET CYLINDRE AVANT ET/OU JOINT D'ÉTANCHEITE		5.5	5.5
01	387	REAR CYLINDER AND/OR GASKET CYLINDRE ARRIERE ET/OU JOINT D'ÉTANCHÉITÉ		2.7	2.7
01	388	EXHAUST/INLET VALVE AND/OR SPRING AND/OR SEAL (FRONT CYLINDER HEAD) VALVE ADMISSION/ÉCHAPPEMENT ET/OU RESSORT ET/OU ANNEAU (CULASSE AVANT)		5.5	5.5

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
01	389	EXHAUST/INLET VALVE AND/OR SPRING AND/OR SEAL (REAR CYLINDER HEAD) VALVE ADMISSION/ÉCHAPPEMENT ET/OU RESSORT ET/OU ANNEAU (CULASSE ARRIÈRE)(TOUS)		2.7	2.7
01	390	EXHAUST/INLET VALVES AND/OR SPRINGS AND/OR SEALS (FRONT CYLINDER HEAD) (ALL) VALVES ADMISSION/ECHAPPEMENT ET/OU RESSORTS ET/OU ANNEAUX (CULASSE AVANT) (TOUS)		6.1	6.1
01	391	EXHAUST/INLET VALVES AND/OR SPRINGS AND/OR SEALS (REAR CYLINDER HEAD) (ALL) VALVES ADMISSION/ECHAPPEMENT ET/OU RESSORTS ET/OU ANNEAUX (CULASSE ARRIERE) (TOUS)		3.3	3.3
01	392	FRONT PISTON, PIN, CIRCLIP ET RINGS PISTON AVANT, GOUPILLE, CIRCLIP ET SEGMENTS		5.6	5.6
01	393	REAR PISTON, PIN, CIRCLIP ET RINGS PISTON ARRIÈRE, GOUPILLE, CIRCLIP ET SEGEMENTS		2.8	2.8
01	394	OIL SEAL ANNEAU D'ÉTANCHÉITÉ D'HUILE	4.8		
01	404	REAR ENGINE SUPPORT (LEFT SIDE) SUPPORT MOTEUR ARRIÈRE (COTÉ DROIT)	2.0		
01	405	REAR ENGINE SUPPORT (RIGHT SIDE) SUPPORT MOTEUR ARRIÈRE (COTÉ GAUCHE)	2.0		
01	406	LINK BRACKET LIEN DE SUPPORT	1.2		
01	407	RUBBER MOUNT TAMPON D'ANCRAGE	0.5		
01	412	REAR ENGINE MOUNTS TAMPONS ANCRAGE MOTEUR ARRIÈRE	1.4		
01	413	SHIFTING UNIT (ASS'Y) UNITÉ D'EMBRAYAGE (COMPLET)	3.0		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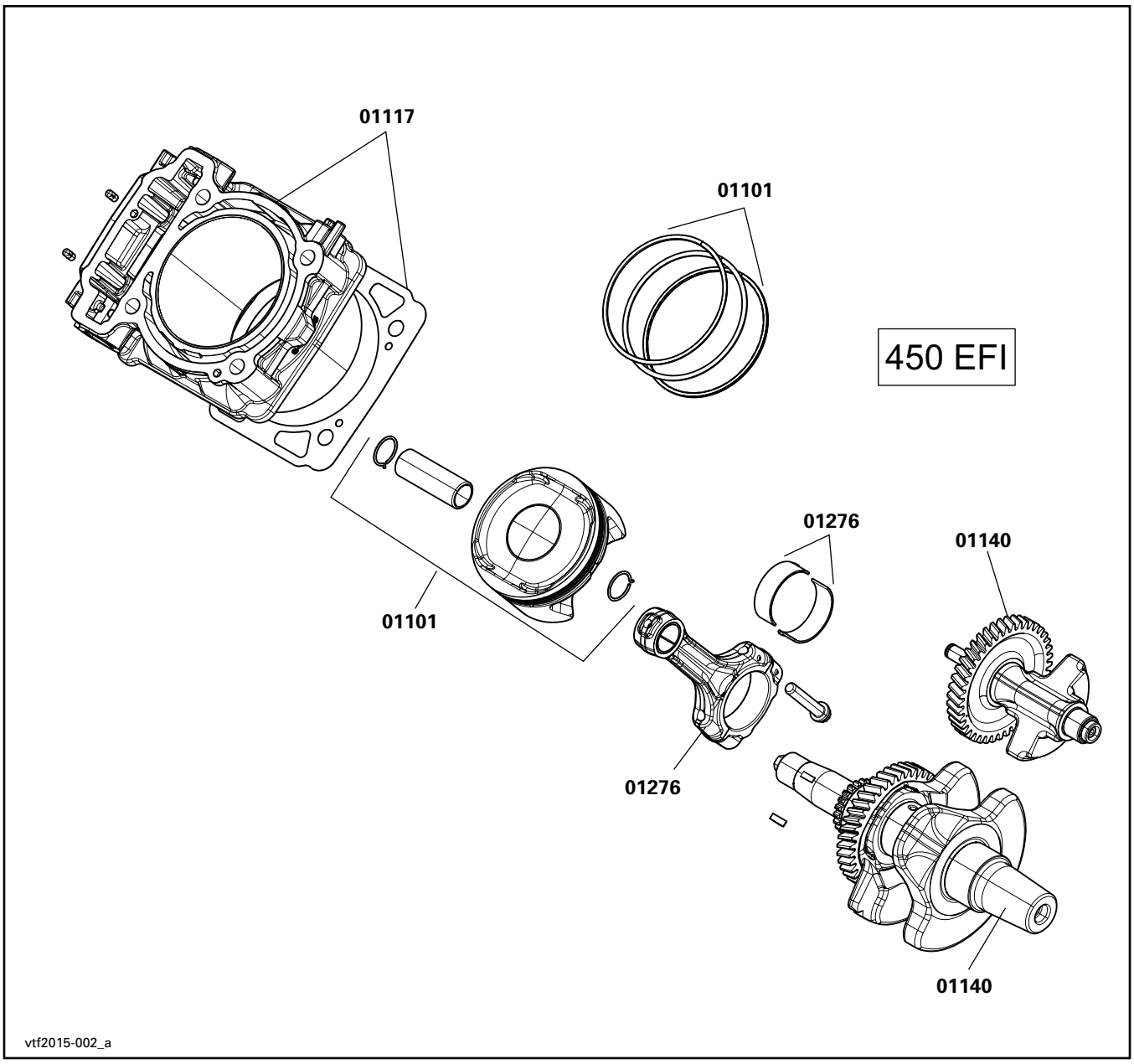
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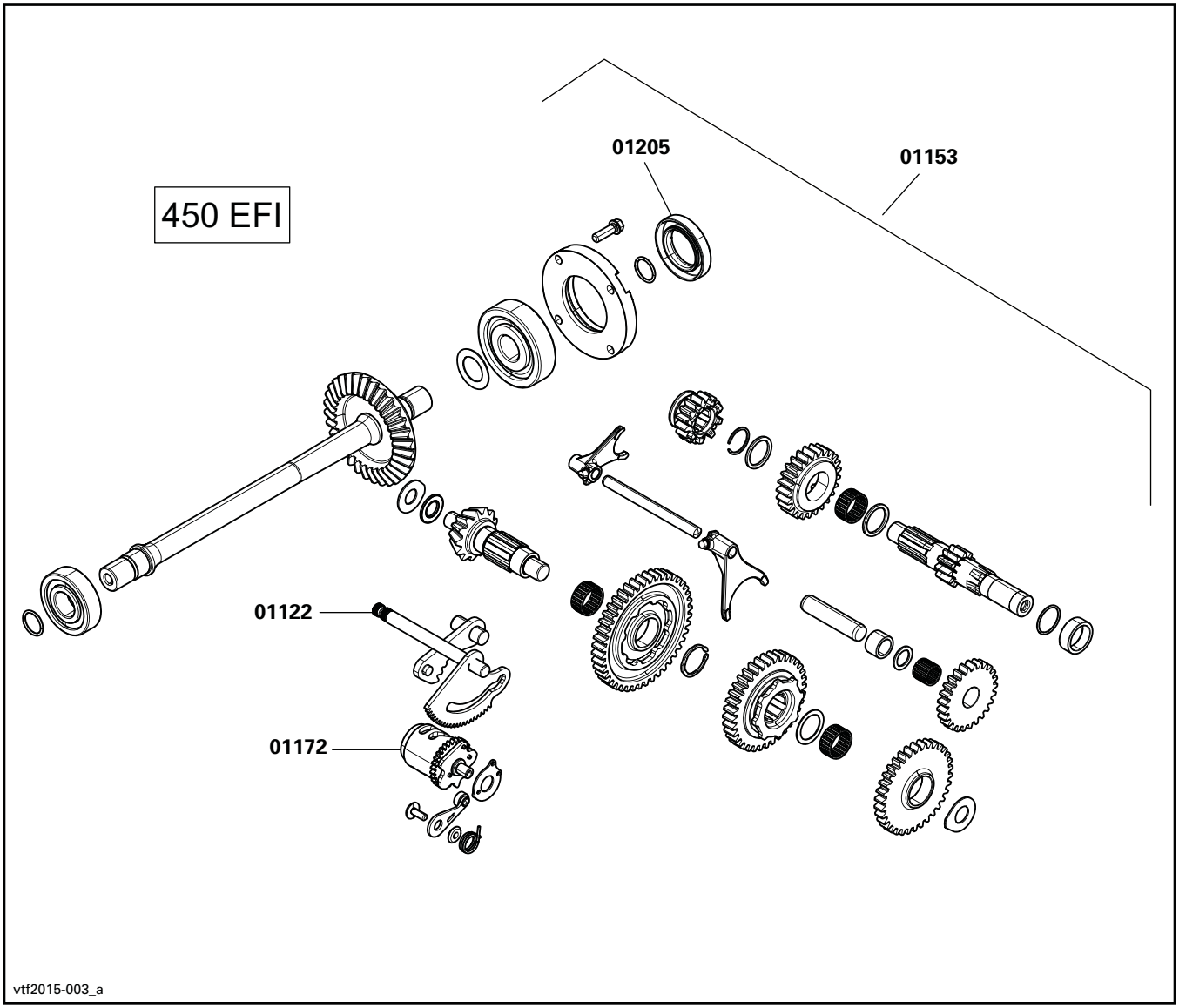
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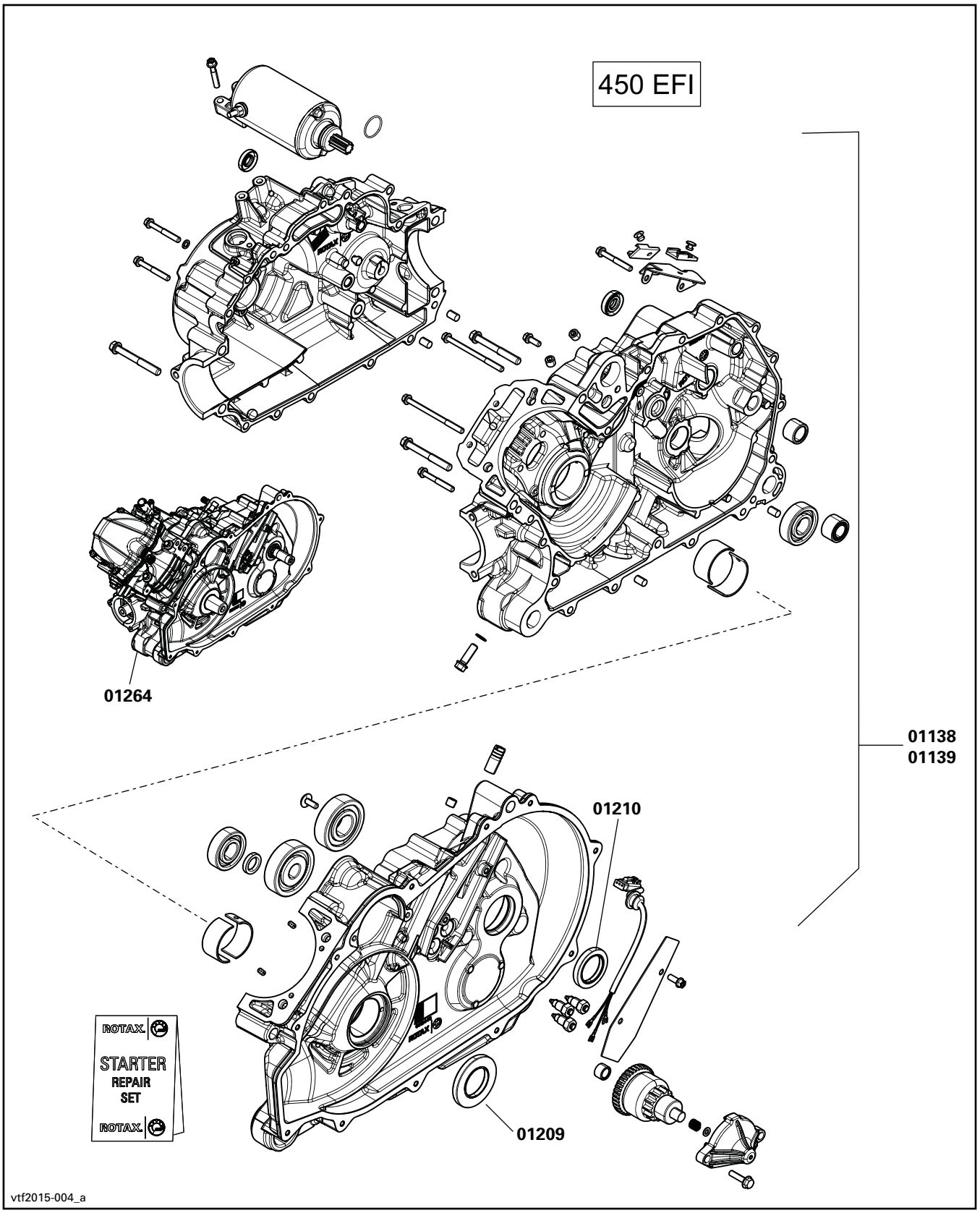
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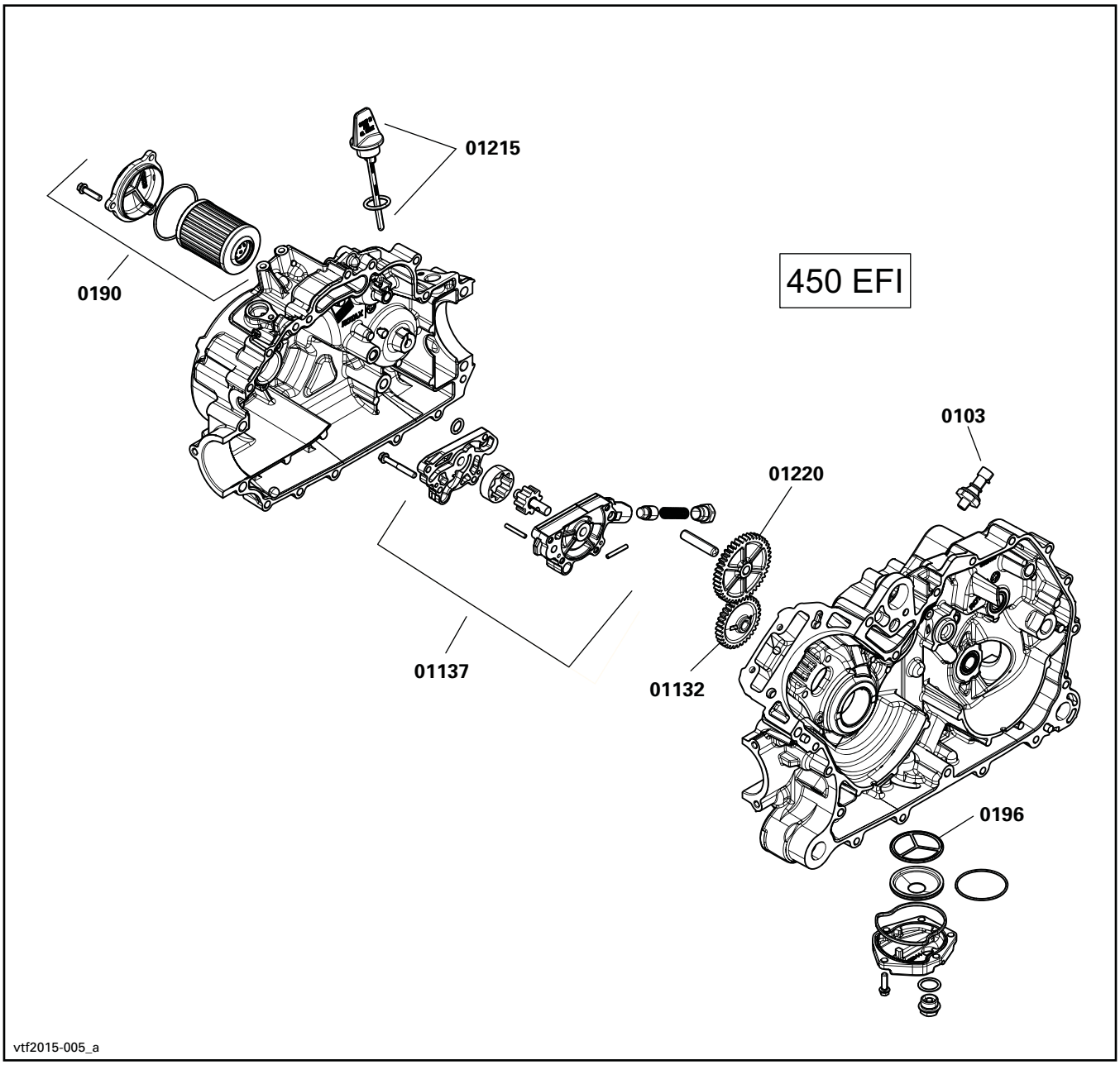
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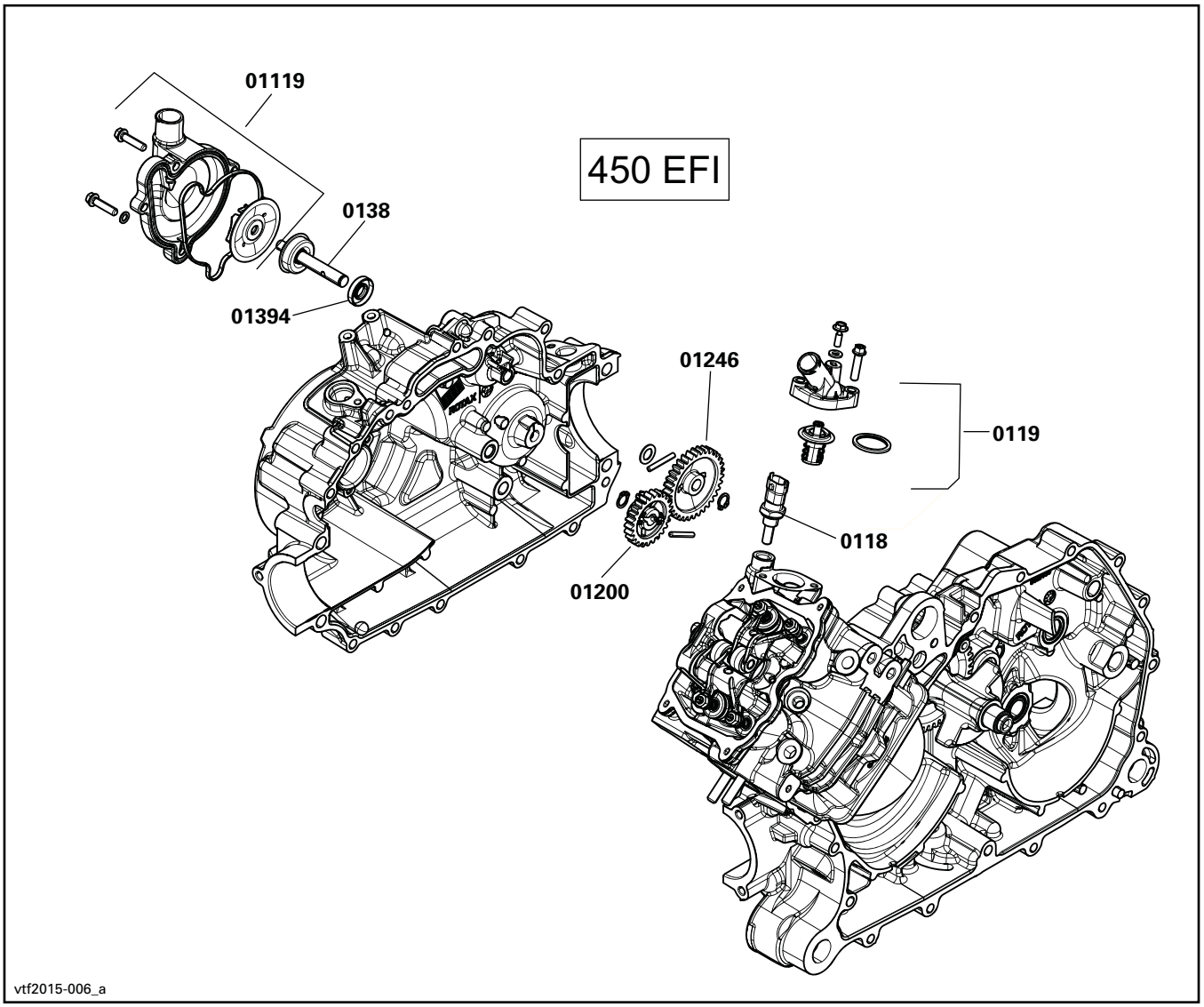
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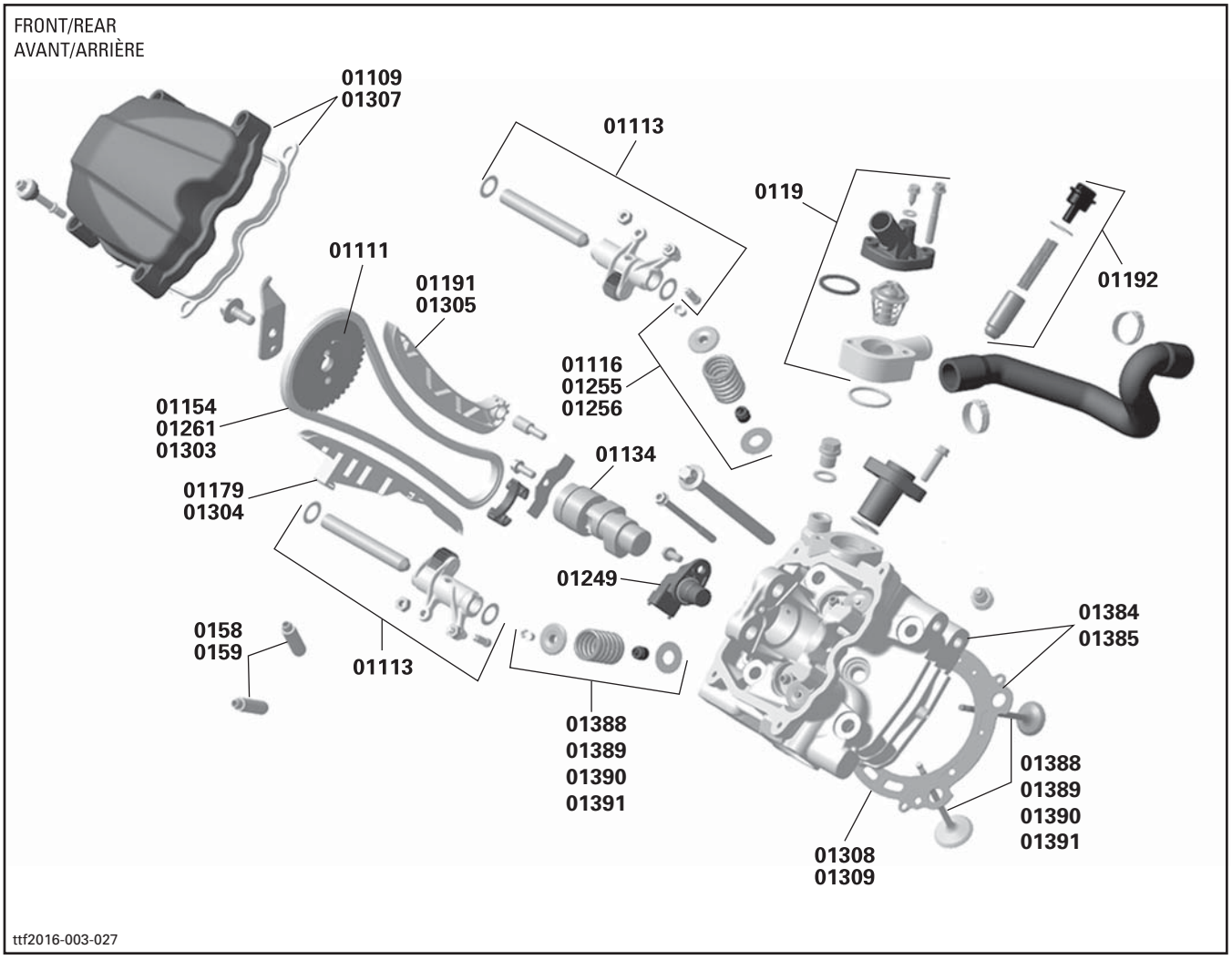
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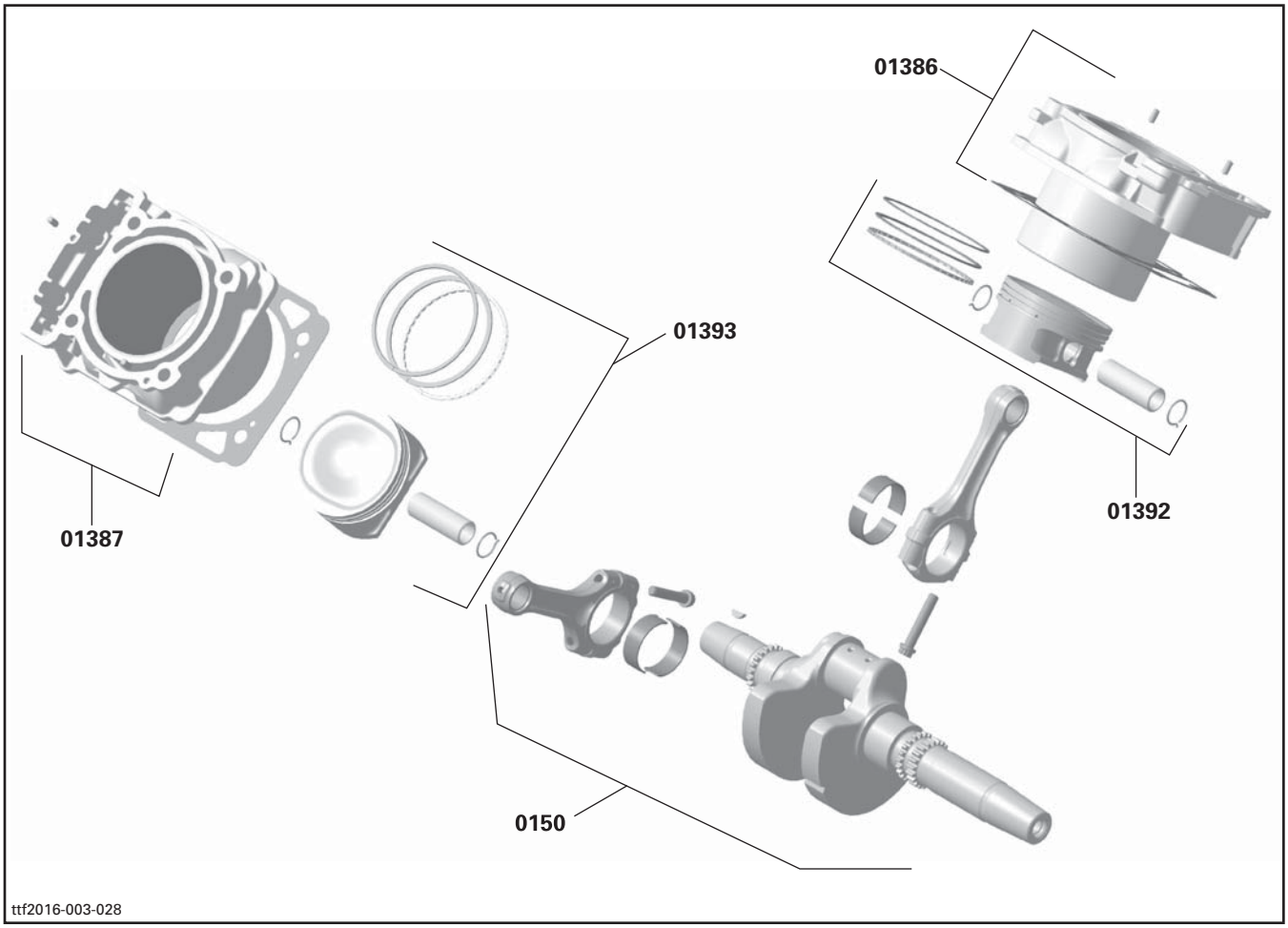

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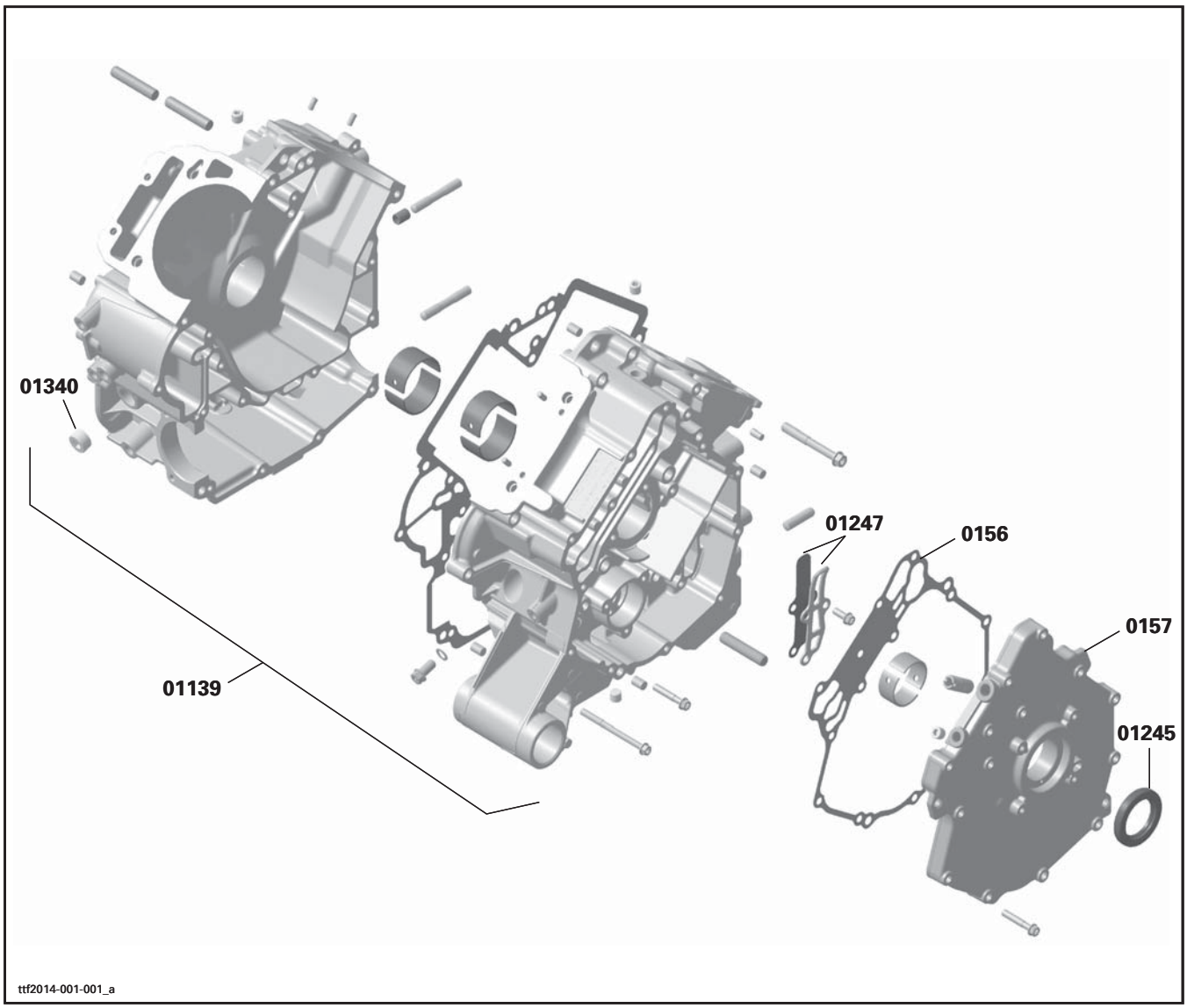

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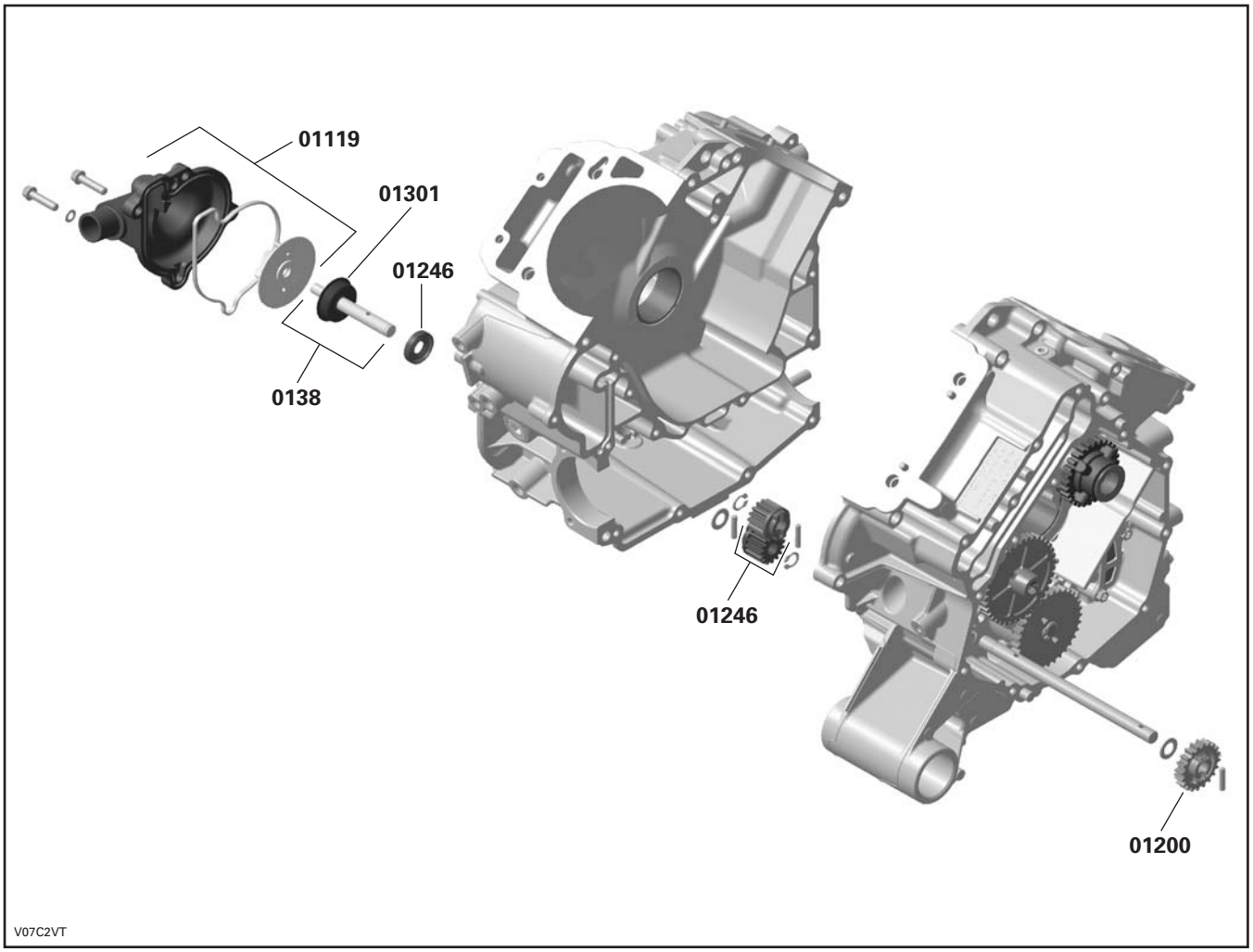

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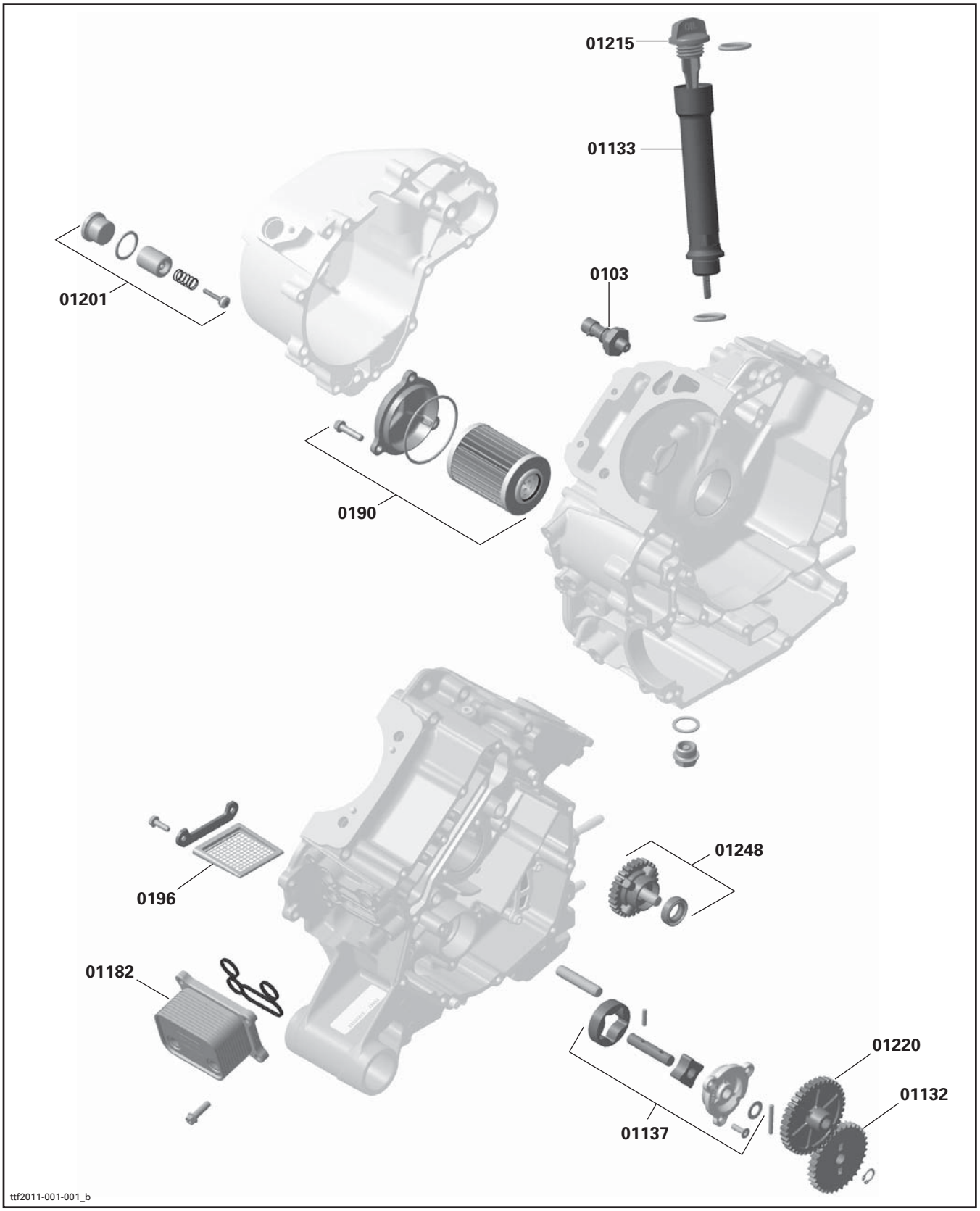
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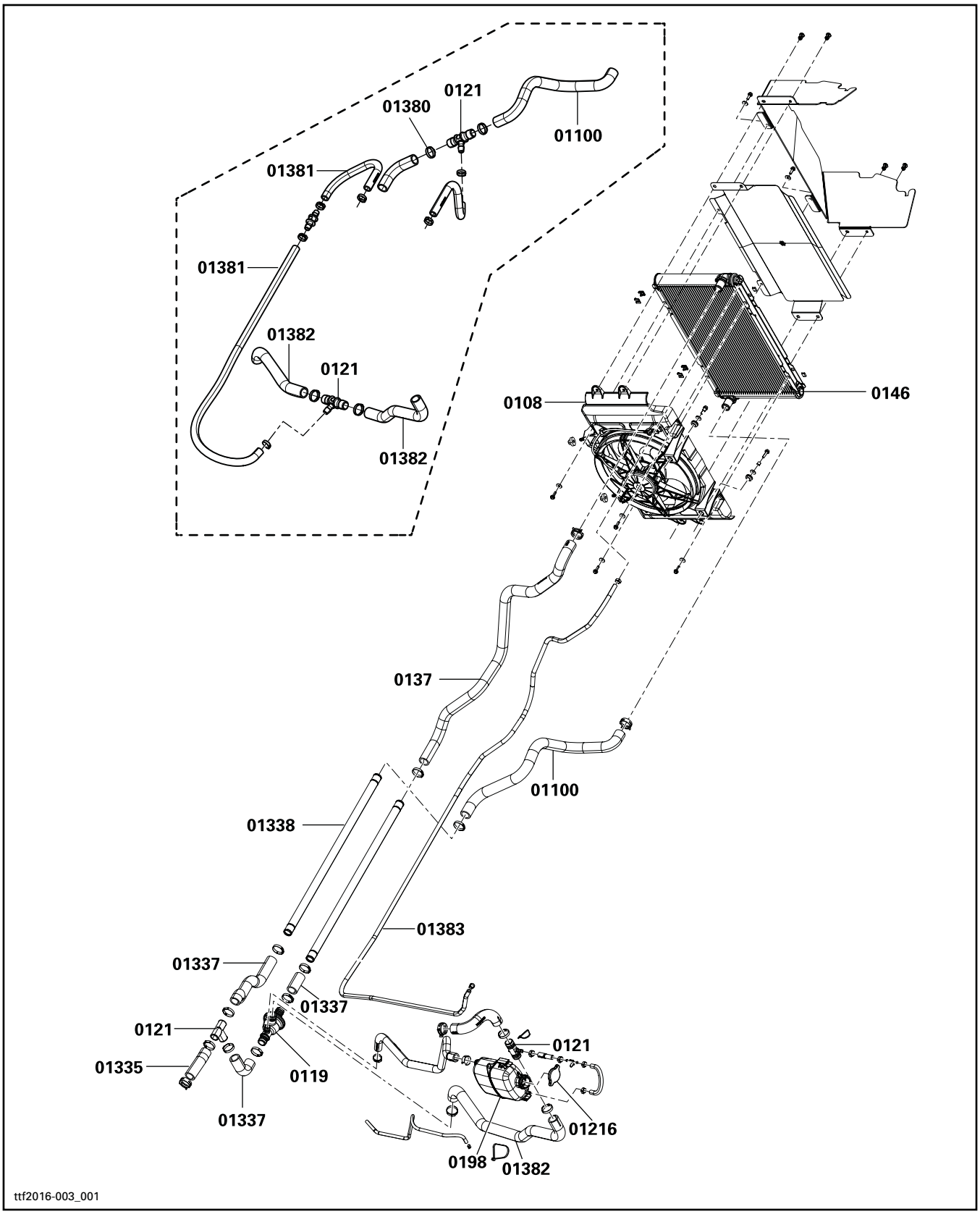
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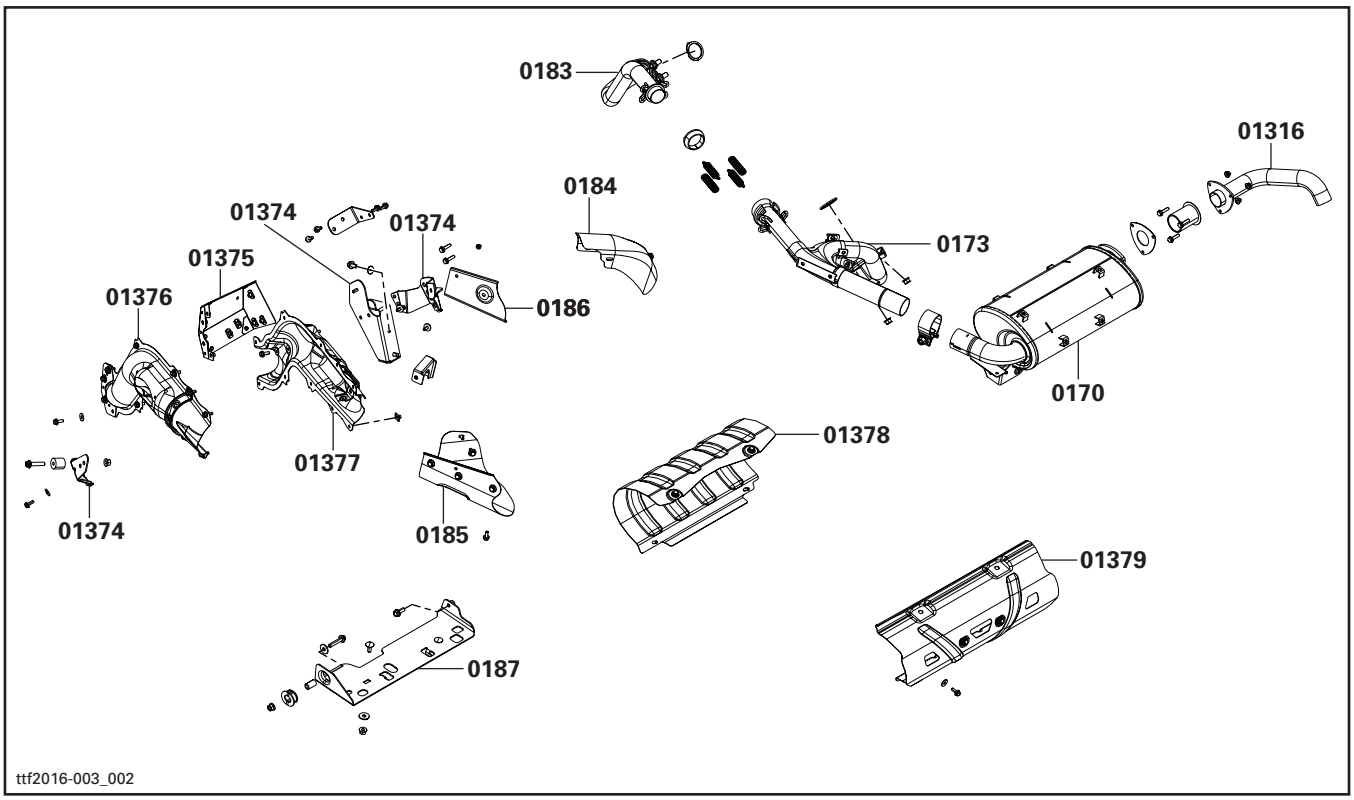
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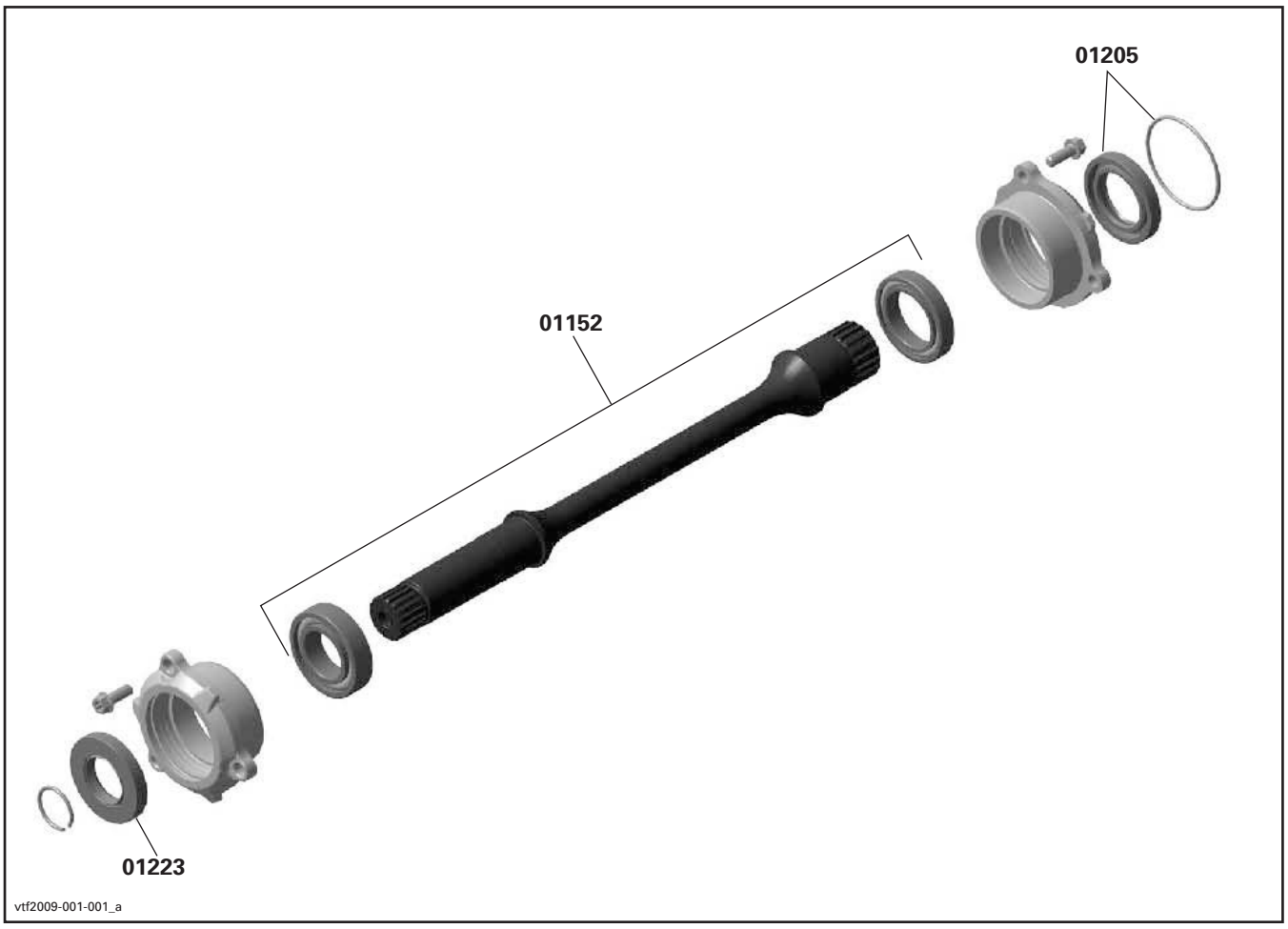
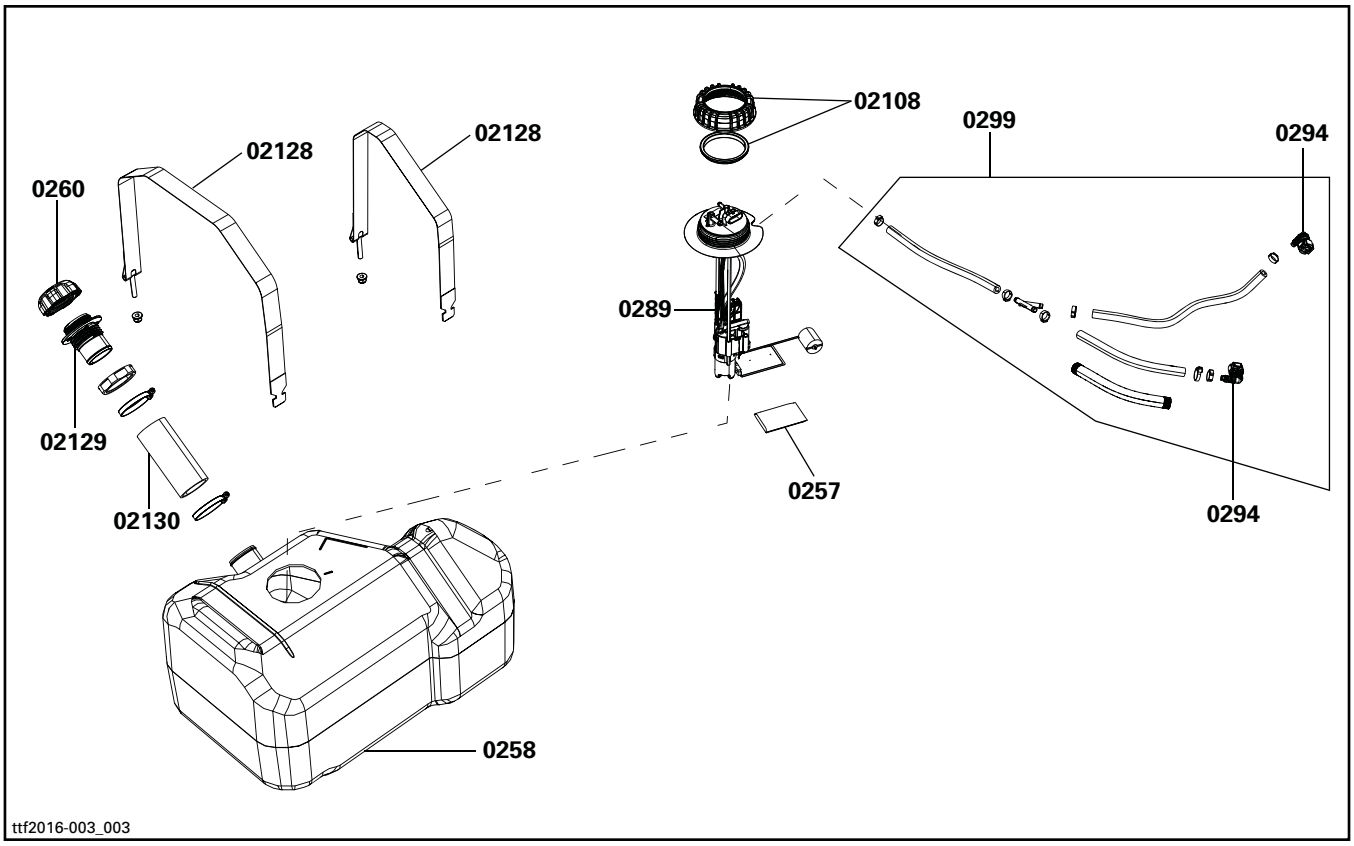


INTAKE AND FUEL SYSTEM
ADMISSION ET SYSTÈME D'ALIMENTATION D'ESSENCE

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
02	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**
02	01	AIR INTAKE SILENCER (ASS'Y) SILENCIEUX D'ADMISSION D'AIR (COMPLET)	0.3	0.3	0.3
02	19	AIR INTAKE TUBE TUYAU D'ADMISSION D'AIR	0.3	0.3	0.3
02	23	REAR AIR INTAKE TUBE AND/OR SLEEVE TUYAU D'ADMISSION D'AIR ARRIÈRE ET/OU DOUILLE	0.3	0.3	0.3
02	46	AIR TEMPERATURE SENSOR CAPTEUR DE TEMPÉRATURE D'AIR	0.3	0.3	0.3
02	57	FUEL FILTER FILTRE À ESSENCE	0.3	0.3	0.3
02	58	FUEL TANK RÉSERVOIR D'ESSENCE	0.5	0.5	0.5
02	60	FUEL CAP BOUCHON DU RÉSERVOIR À ESSENCE	0.3	0.3	0.3
02	69	AIR FILTER FILTRE À AIR	0.3	0.3	0.3
02	72	INTAKE MANIFOLD CONNECTEUR D'ADMISSION		0.4	0.4
02	79	FUEL RAIL (1 OR 2) RAMPE D'ESSENCE (1 OU 2)	0.4	0.4	0.4
02	81	THROTTLE BODY (ASS'Y) CARTER ACCÉLÉRATEUR (COMPLET)	0.3	0.3	0.3
02	89	FUEL PUMP MODULE MODULE POMPE À ESSENCE	0.3	0.3	0.3
02	94	FEMALE QUICK FITTING CONNECTEUR RAPIDE FEMELLE	0.3	0.3	0.3
02	99	FUEL INJECTION HOSE (ASS'Y) BOYAU À INJECTION D'ESSENCE (COMPLET)	0.3	0.3	0.3
02	108	FUEL PUMP NUT AND/OR GASKET ECROU DE LA POMPE A ESSENCE ET/OU JOINT D'ETANCHEITE	0.3	0.3	0.3
02	115	PLENUM CHAMBRE D'AIR	0.3	0.3	0.3
02	119	CHECK VALVE SOUPAPE DE RETENUE	0.3	0.3	0.3
02	128	FUEL TANK STRAP (ONE OR TWO) SANGLE DE RESERVOIR D'ESSENCE (UNE OU DEUX)	0.3	0.3	0.3
02	129	FILLER NECK GOULOT DE REMPLISSAGE	0.4	0.4	0.4
02	130	FILLER HOSE BOYAU DE REMPLISSAGE	0.3	0.3	0.3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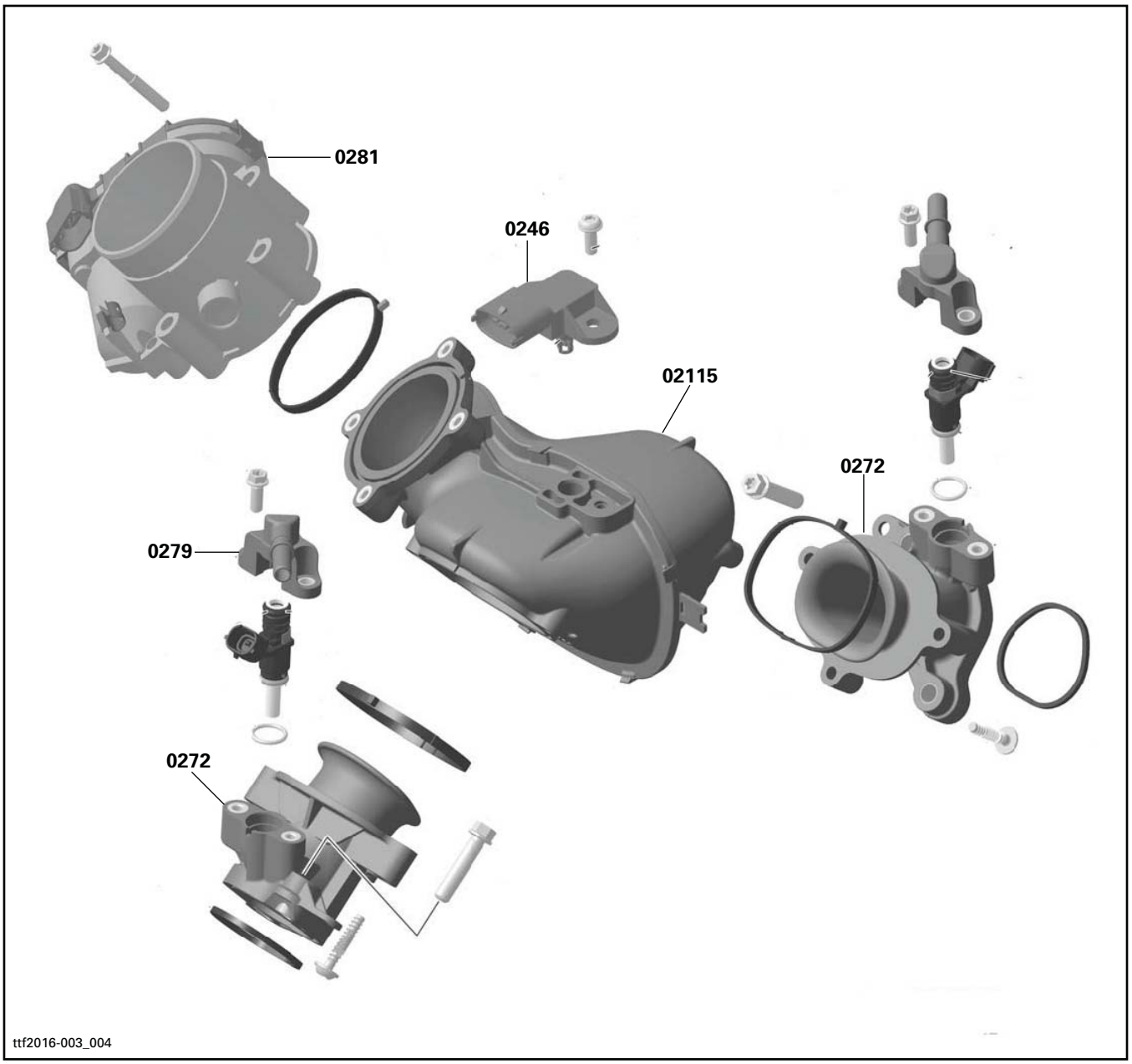
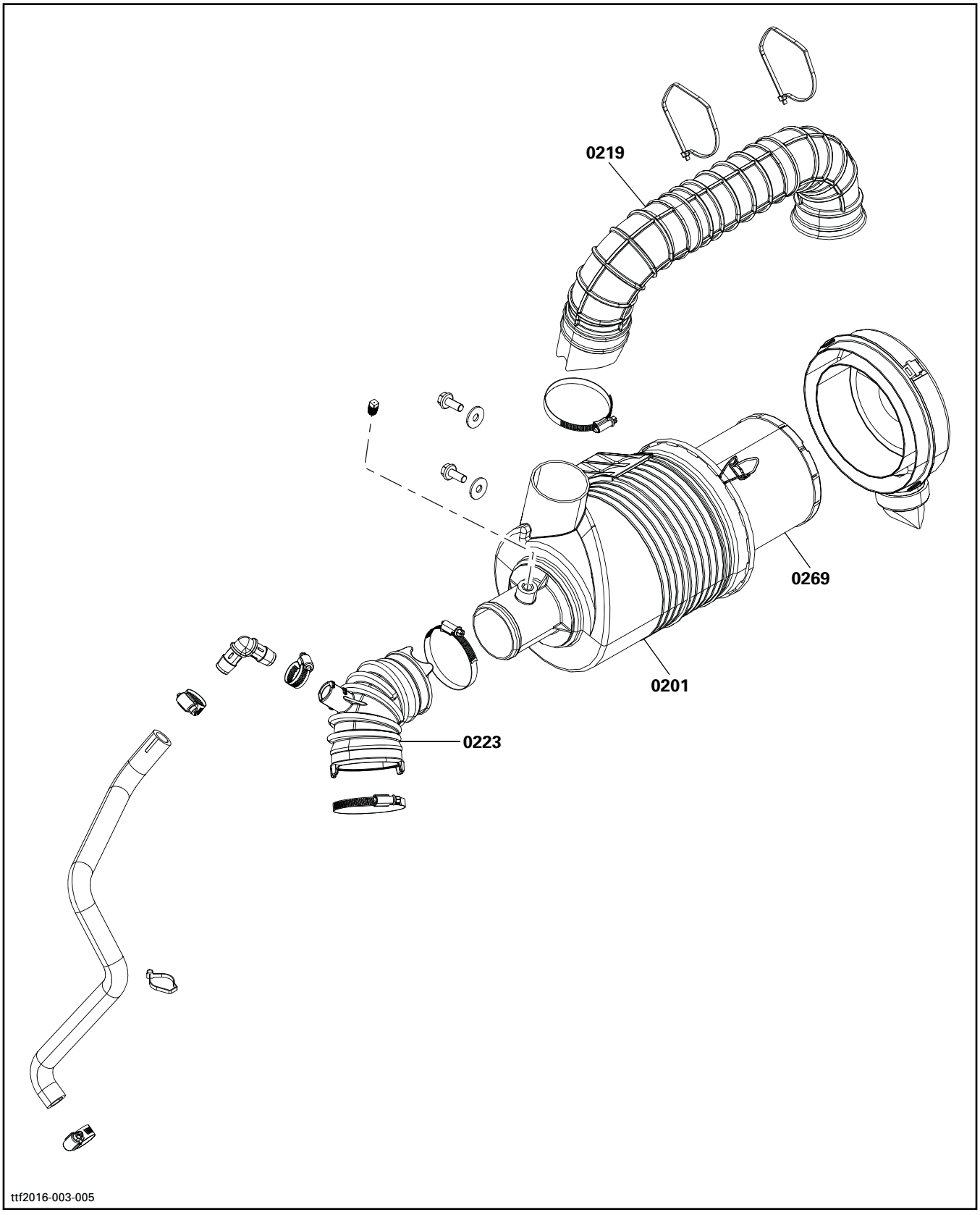
INTAKE AND FUEL SYSTEM
ADMISSION ET SYSTÈME D'ALIMENTATION D'ESSENCE

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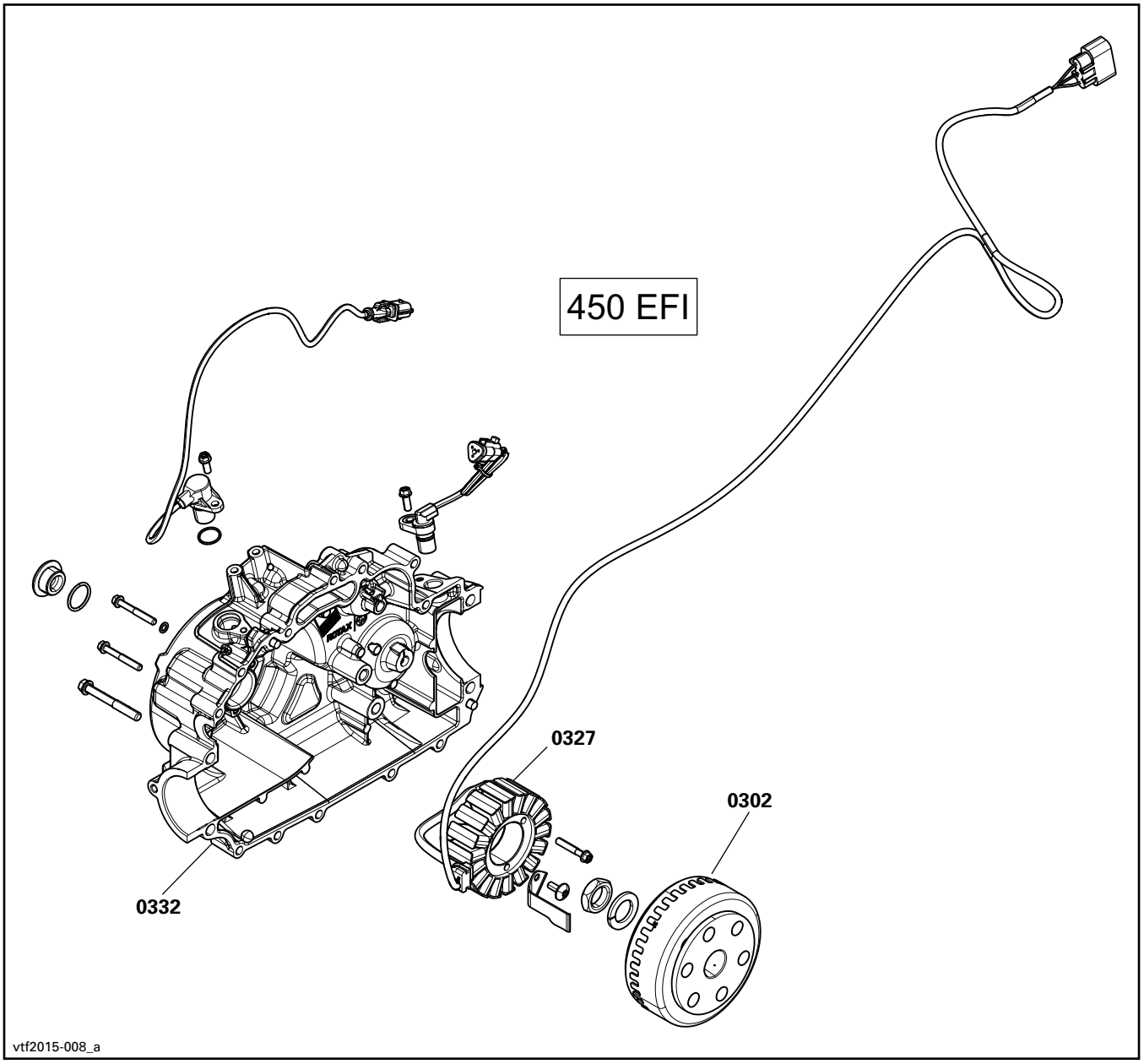
SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
03	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**
03	02	MAGNETO (ASS'Y) MAGNÉTO (COMPLET)	3.9	2.3	2.3
03	08	IGNITION COIL (EACH) BOBINE D'ALLUMAGE (CHAQUE)	0.3	0.3	0.3
03	10	IGNITION CABLE CÂBLE D'ALLUMAGE	0.3	0.3	0.3
03	27	STATOR (ASS'Y) STATOR (COMPLET)	3.7	2.1	2.1
03	32	MAGNETO COVER COUVERCLE DE MAGNETO	3.7	2.1	2.1
03	33	MAGNETO GASKET COVER JOINT D'ÉTANCHÉITÉ DU COUVERCLE DE MAGNETO		2.0	2.0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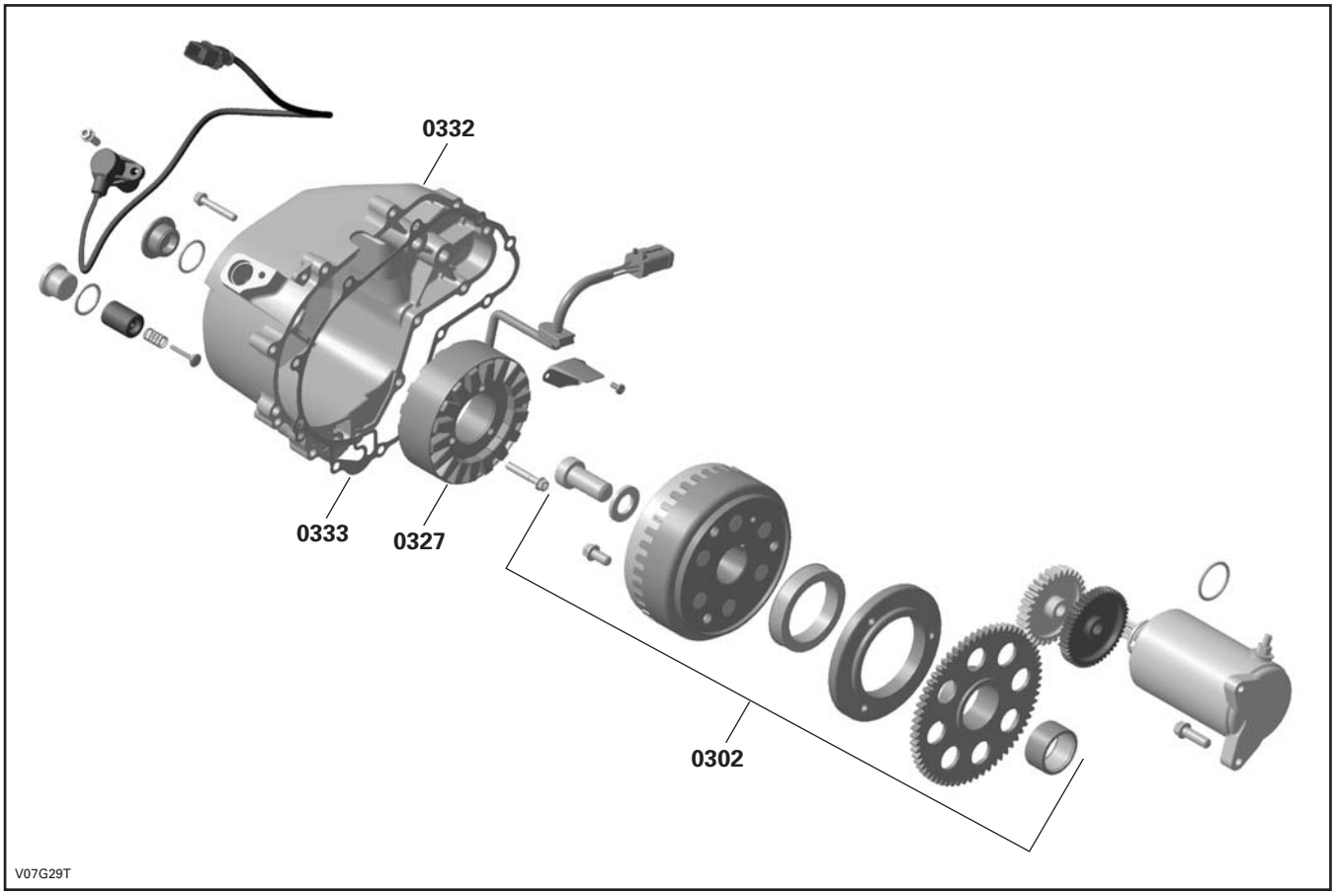
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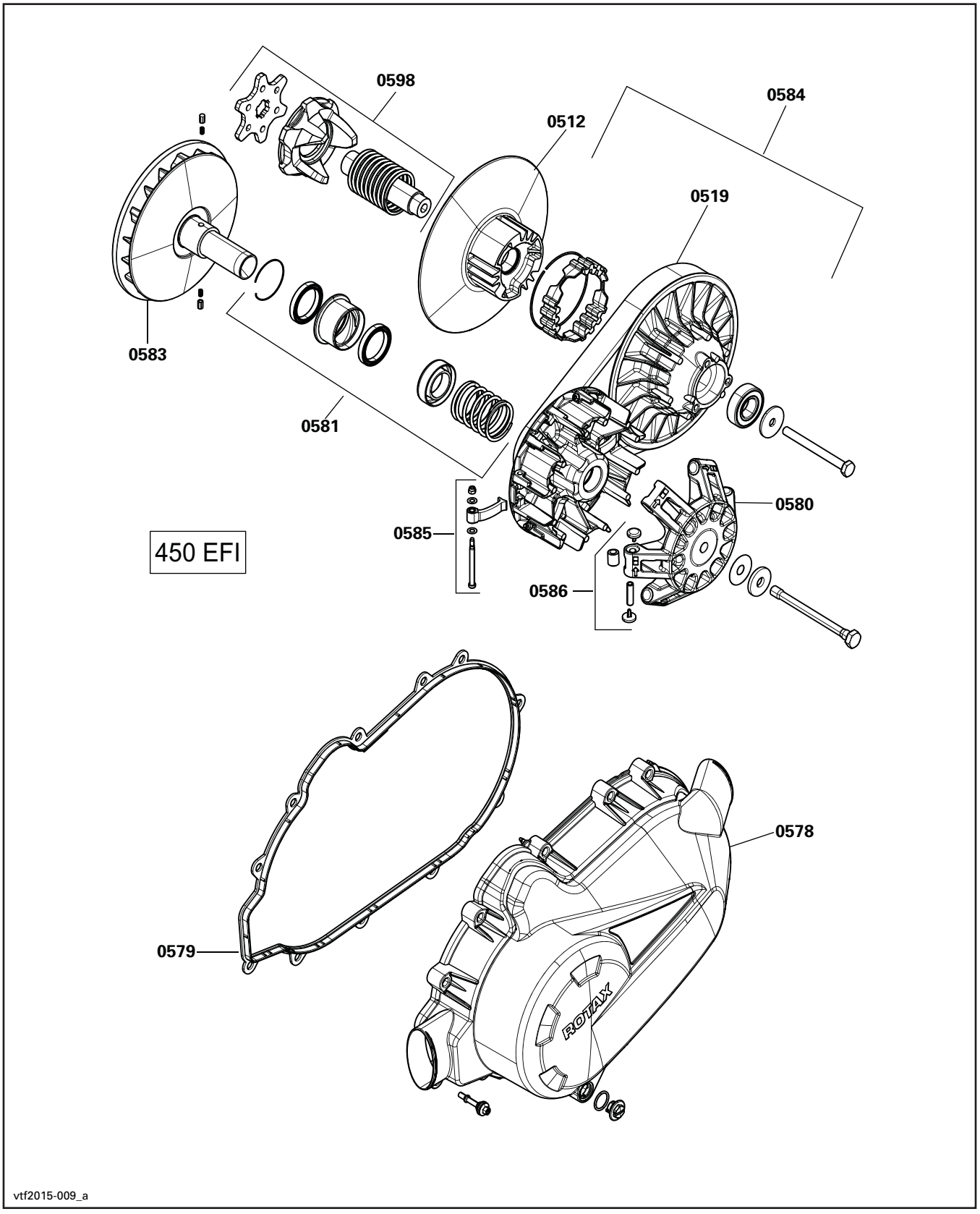
SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
04	**00**	**NO LABOUR INVOLVED AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**
04	02	ELECTRIC STARTER (ASS'Y) DÉMARREUR (COMPLET)	0.3	1.3	1.3
04	03	STARTER RELAY SOLÉNOÏDE DE DÉMARRAGE	0.3	0.3	0.3
04	19	STARTER DRIVE LANCEUR DÉMARREUR	0.7	2.3	2.3

TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
05	**00**	**NO LABOR INVOLVED AUCUNE MAIN-D'OEUVRE IMPLIQUÉE**	**0**	**0**	**0**
05	12	DRIVEN PULLEY SLIDING HALF DEMI-POULIE MENEE COULISSANTE	0.5		
05	19	BELT COURROIE	0.4	0.4	0.4
05	55	LEVER BUTTON BOUTON DE LEVIER	0.3	0.3	0.3
05	56	LEVER (ASS'Y) AND/OR LEVER SPRING LEVIER (COMPLET) ET/OU RESSORT DE LEVIER	0.5	0.5	0.5
05	59	SPEED SENSOR CAPTEUR DE VITESSE	0.3	0.3	0.3
05	63	SOLENOID VALVE (SHIFTING VALVE) SOUPAPE SOLENOIDE (VALVE D'EMBRAYAGE)		0.3	0.3
05	66	GEARSHIFT LEVER LEVIER D'EMBRAYAGE	0.3	0.3	0.3
05	77	LEVER BRAS DE LEVIER	0.7		
05	78	CVT COVER COUVERCLE CVC	0.3	0.3	0.3
05	79	GASKET JOINT D'ÉTANCHÉITÉ	0.3	0.3	0.3
05	80	GOVERNOR CUP COUPOLE RÉGULATEUR	0.7	0.7	0.7
05	81	ONE WAY CLUTCH, FLANGE, RING, SPRING EMBRAYAGE À ROUE LIBRE, FLASQUE, ANNEAU, RESSORT	0.7	0.7	0.7
05	82	DRIVE PULLEY (ASS'Y) POULIE MOTRICE (COMPLET)	0.6	0.6	0.6
05	83	DRIVE PULLEY FIXED HALF POULIE MOTRICE FIXE	0.6	0.6	0.6
05	84	DRIVEN PULLEY OUTER CAM A/O SPRING CAME POULI MENEE EXT ET/OU RESSORT	0.5		
05	85	CENTRIFUGAL LEVER LEVIER CENTRIFUGE	1.0	1.0	1.0
05	86	SLIDER SHOES GLISSIÈRES	0.7	0.7	0.7
05	89	REMOVE AND REPLACE TRANSMISSION ASS'Y REMPLACEMENT DE LA TRANSMISSION (COMPLET)		5.1	5.1
05	95	AIR INTAKE (CVT) ENTRÉE D'AIR (CVC)	0.3	0.3	0.3
05	96	AIR OUTLET (CVT) SORTIE D'AIR (CVC)	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
05	97	FLEXIBLE ADAPTOR ADAPTATEUR FLEXIBLE	0.3	0.3	0.3
05	98	CAM, PLATE, DRIVEN SHAFT, SPRING CAME, PLAQUE, ARBRE POULIE MENNÉE, RESSORT	0.5		
05	99	OUTPUT SHAFT ARBRE DE SORTIE		5.9	5.9
05	100	REAR OUTPUT SHAFT SEALS ANNEAUX ÉTANCHÉITÉ DE L'ARBRE DE SORTIE ARRIÈRE		5.3	5.3
05	101	GEARS BOX (ASS'Y)/MAIN SHAFT BOÎTE D'ENGRENAGE (COMPLET)/ARBRE PRINCIPAL		6.0	6.0
05	102	SHIFT SHAFT (ASS'Y) ARBRE D'EMBRAYAGE (COMPLET)		6.0	6.0
05	103	SHIFT DRUM TAMBOUR D'EMBRAYAGE		6.0	6.0
05	104	INDEX LEVER (ASS'Y) LEVIER D'INDEXATION (COMPLET)		1.5	1.5
05	105	MAIN SHAFT SEAL JOINT D'ÉTANCHÉITÉ DE L'ARBRE PRINCIPAL		1.3	1.3
05	108	ACTUATOR AND/OR FORK AND/OR SEAL ACTUATEUR ET/OU FOURCHETTE ET/OU JOINT D'ÉTANCHÉITÉ	0.3	0.3	0.3
05	109	FORK AND/OR PIN FOURCHETTE ET/OU GOUPILLE	6.0	6.0	6.0
05	113	SHIFTING SWITCH INTERRUPTEUR D'EMBRAYAGE	0.3	0.3	0.3
05	114	SHIFT SHAFT SEAL ANNEAU ET ANCHE DE L'ARBRE D'EMBRAYAGE		0.4	0.4
05	115	CVT AIR GUIDE AND/OR O-RINGS GUIDE D'AÉRATION ET/OU JOINT D'ÉTANCHÉITÉ		1.1	1.1
05	120	GEARBOX POSITION SENSOR CAPTEUR DE POSITION D'ENGRENAGE	0.3	0.3	0.3
05	159	PRIMARY INLET AND/OR ADAPTER ENTRÉE PRIMAIRE ET/OU ADAPTATEUR		0.3	0.3
05	160	FILTER FILTRE	0.3	0.3	0.3
05	161	SHIFTING CABLE CÂBLE D'EMBRAYAGE	1.0	1.0	1.0
05	165	DRAIN PLUG (CVT) BOUCHON DE VIDANGE (CVC)	0.3	0.3	0.3
05	188	GEAR HOUSING AND/OR BEARINGS BOITIER D'ENGRENAGE ET/OU ROULEMENTS A BILLES		6.5	6.5
05	189	GEARBOX COVER AND GASKET COUVERCLE DE LA TRANSMISSION ET JOINT ETANCHE		1.2	1.2

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
05	190	BEARING COVER COUVERCLE DE ROULEMENT A BILLE		2.2	2.2
05	191	DIFFERENCIAL SEAL (1) JOINT D'ETANCHEITE DU DIFFERENTIEL (1)		0.5	0.5
05	192	DIFFERENTIAL SEALS (2) JOINTS D'ETANCHEITE DU DIFFERENTIEL (2)		0.9	0.9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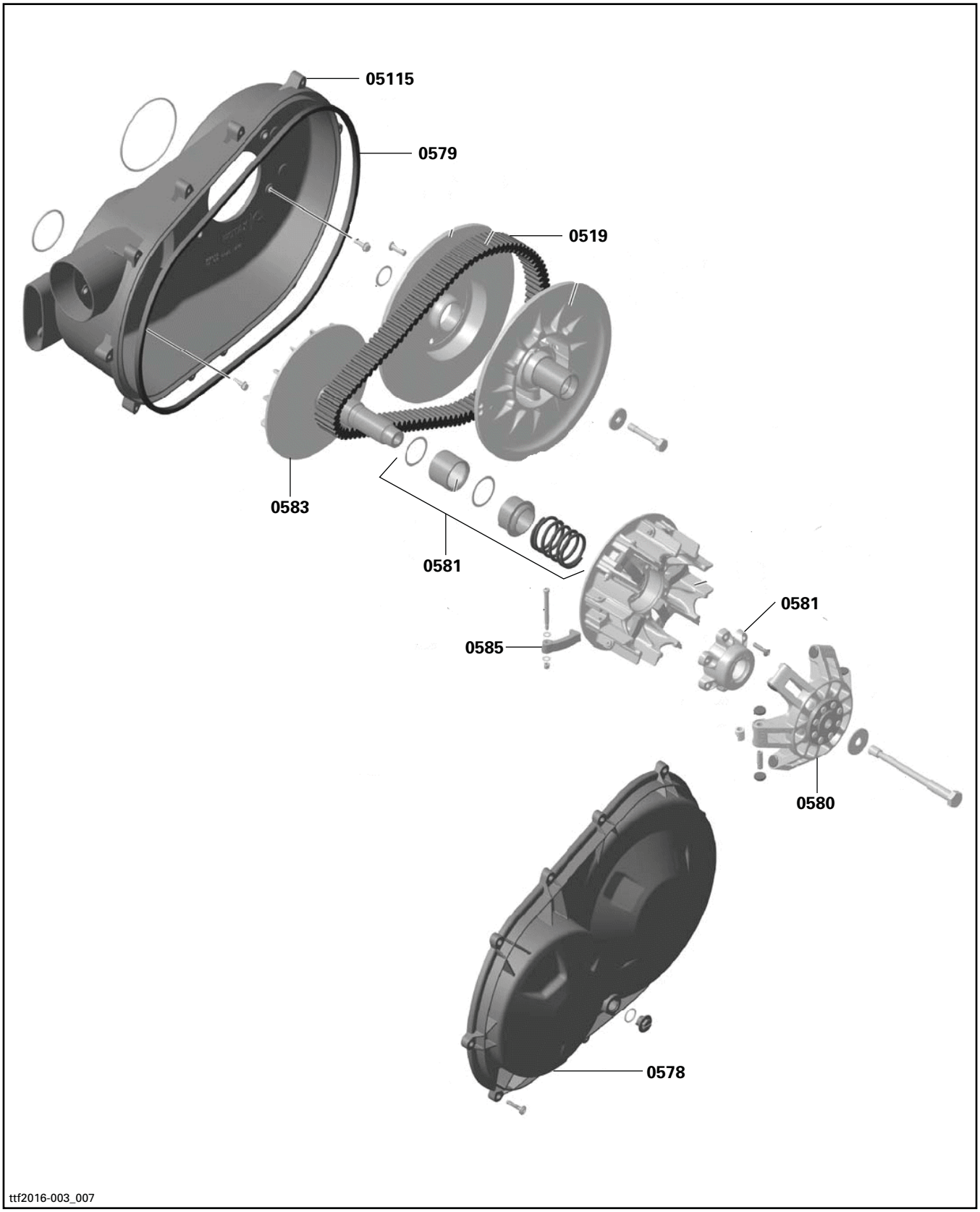
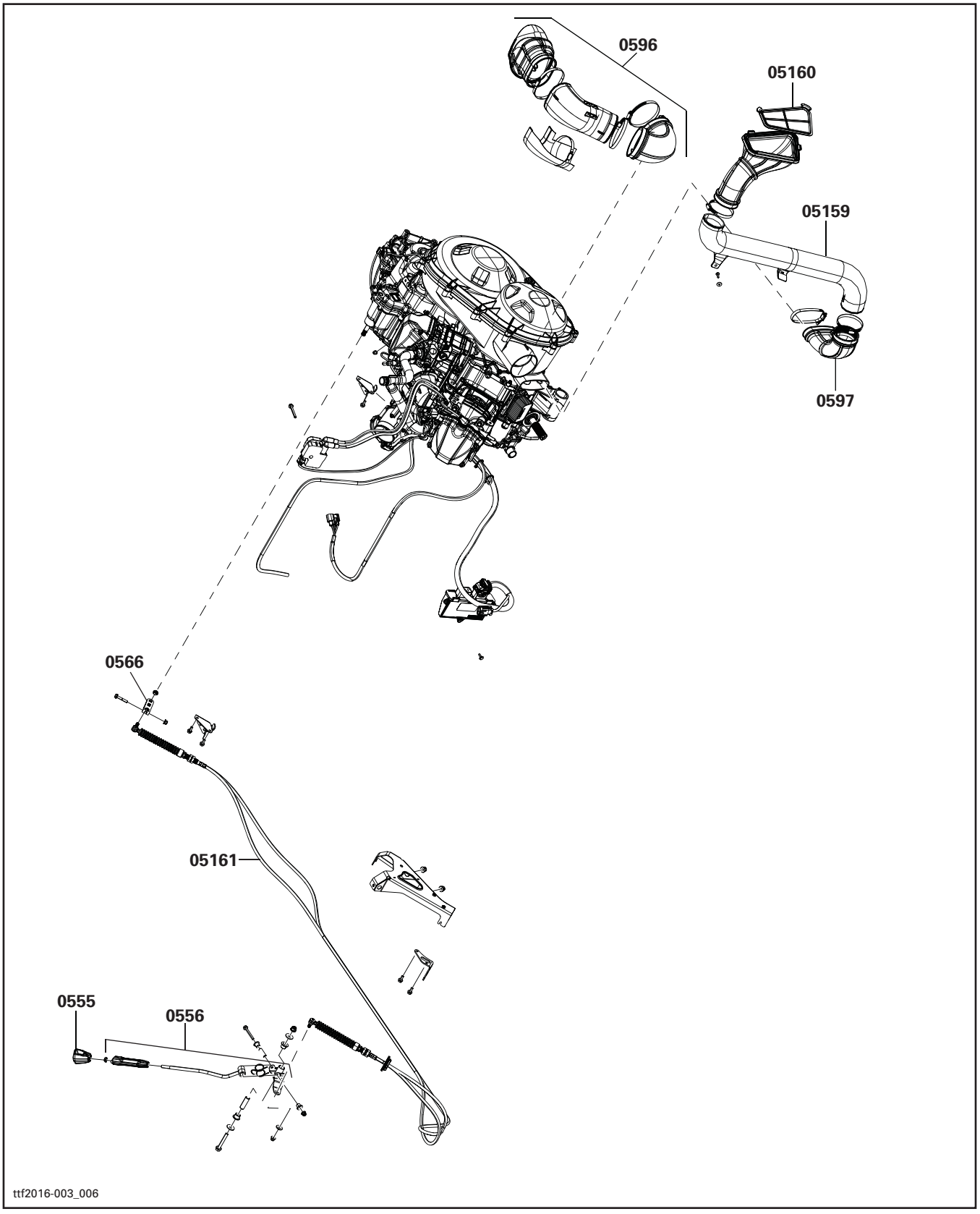
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

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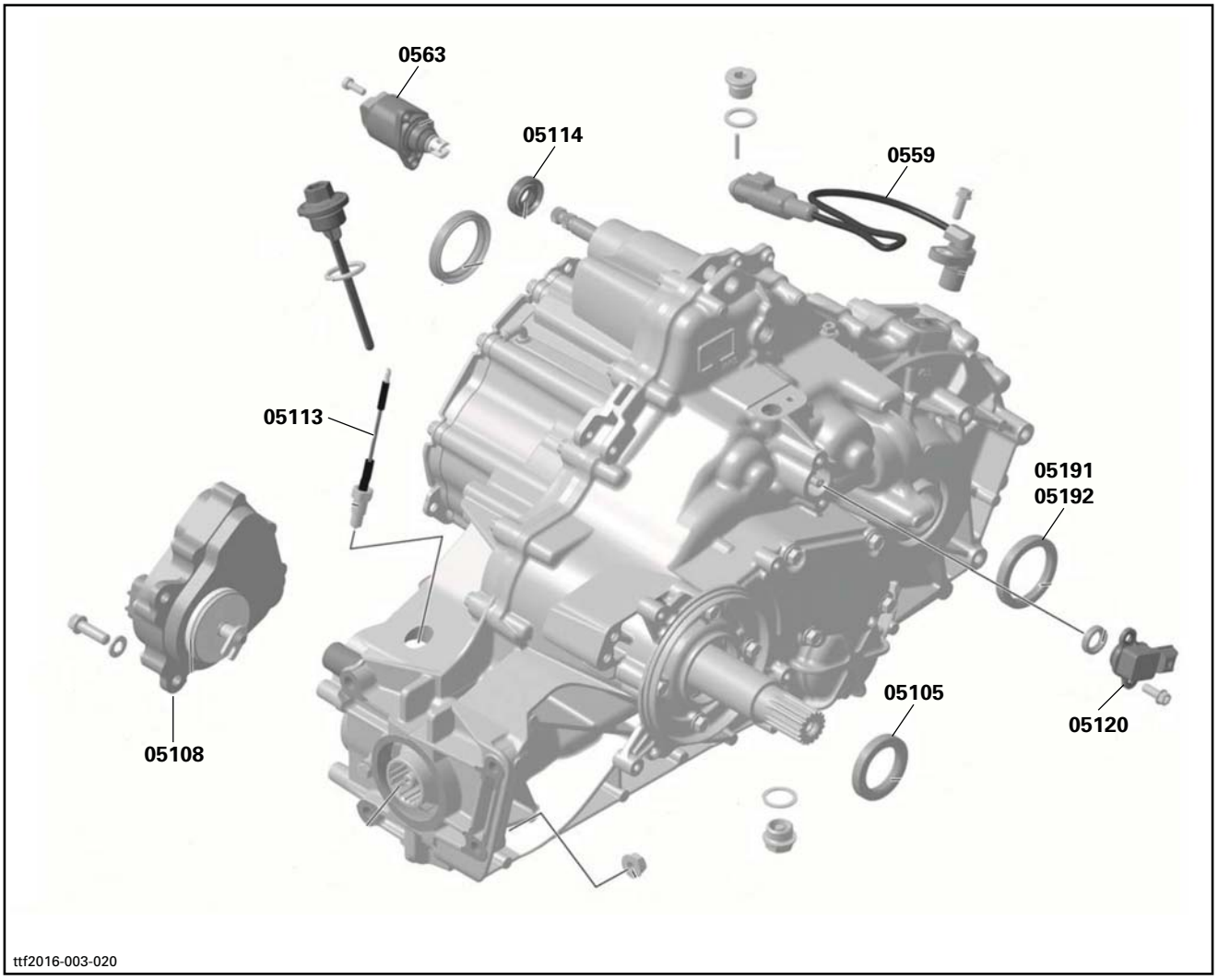
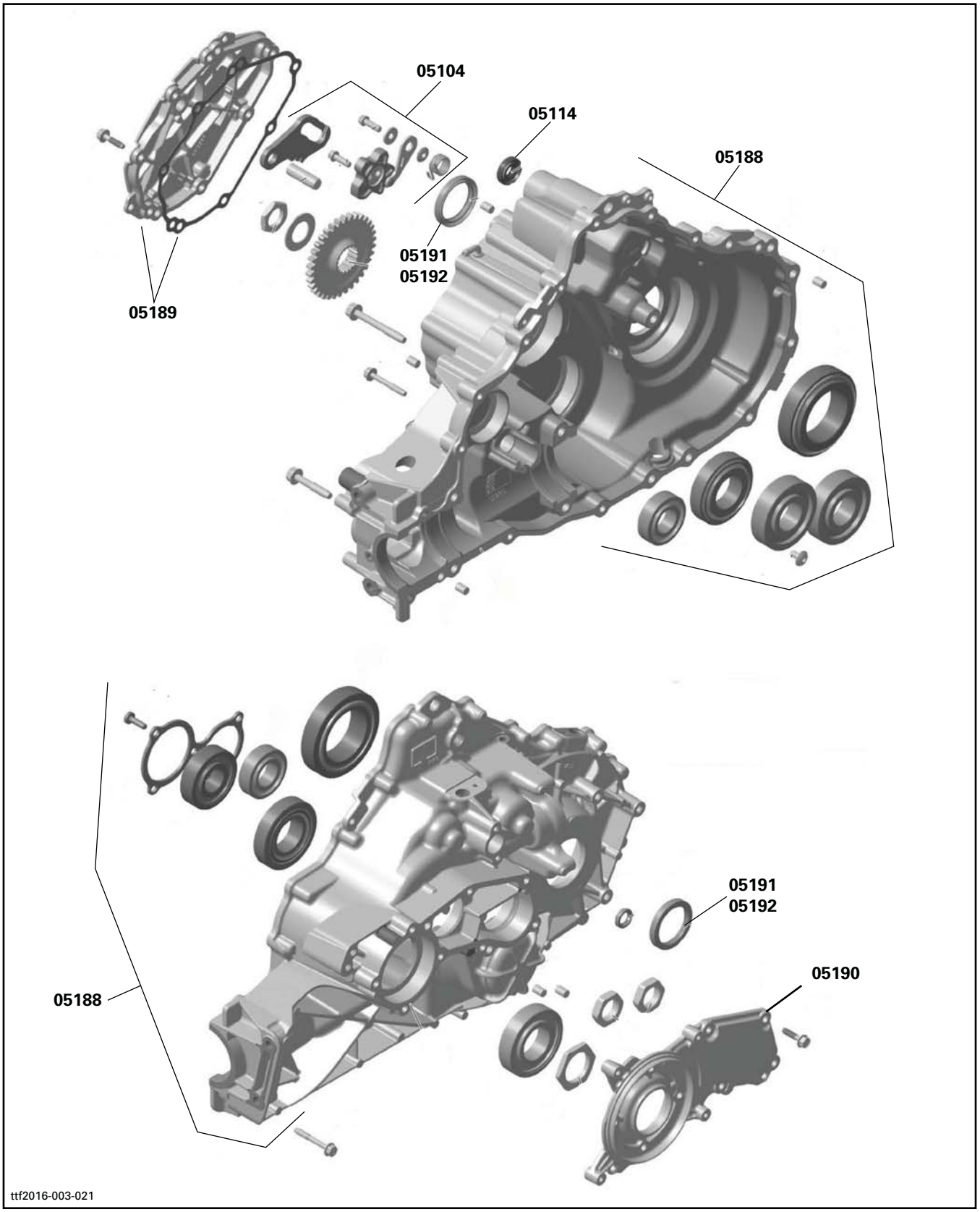
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE

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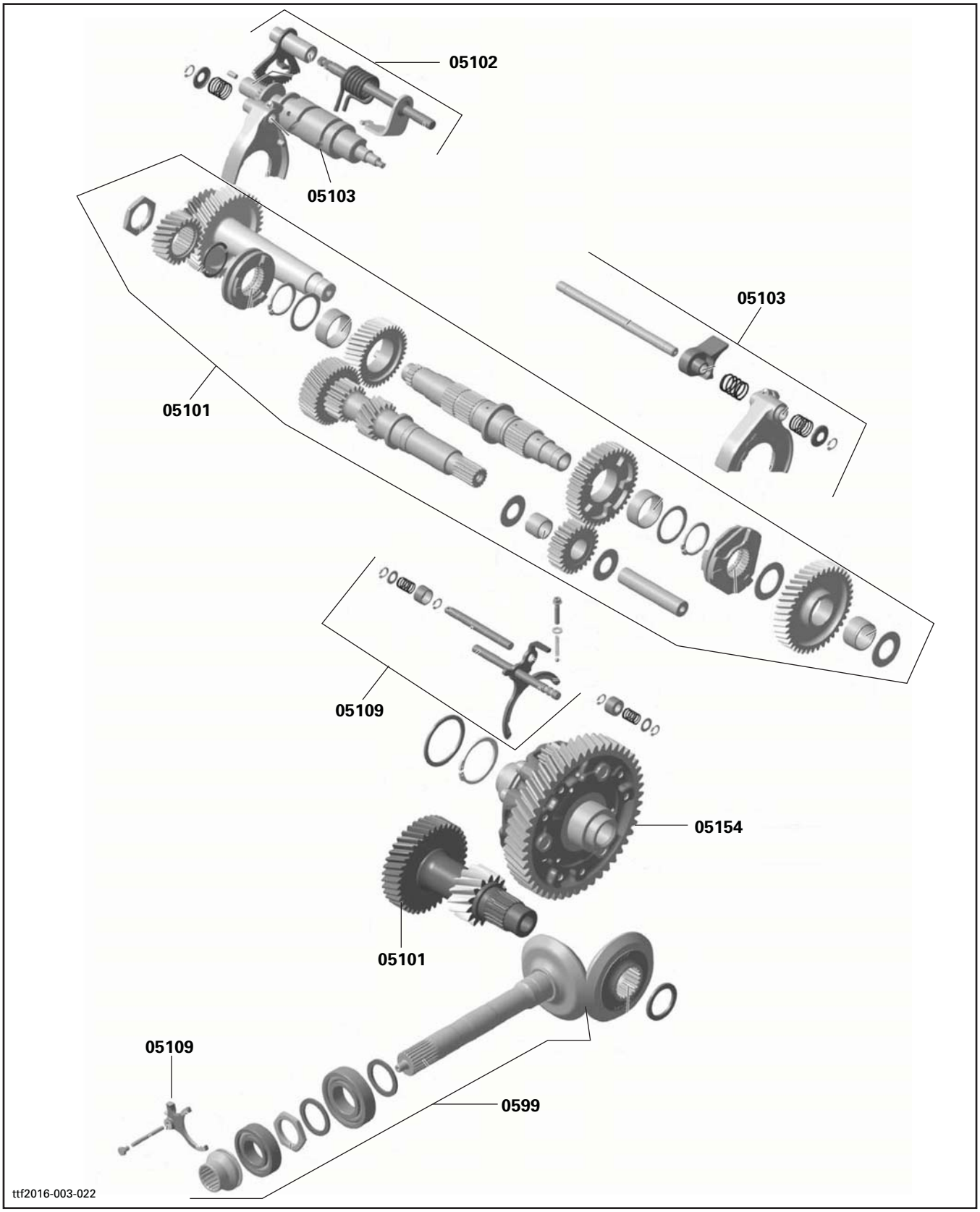
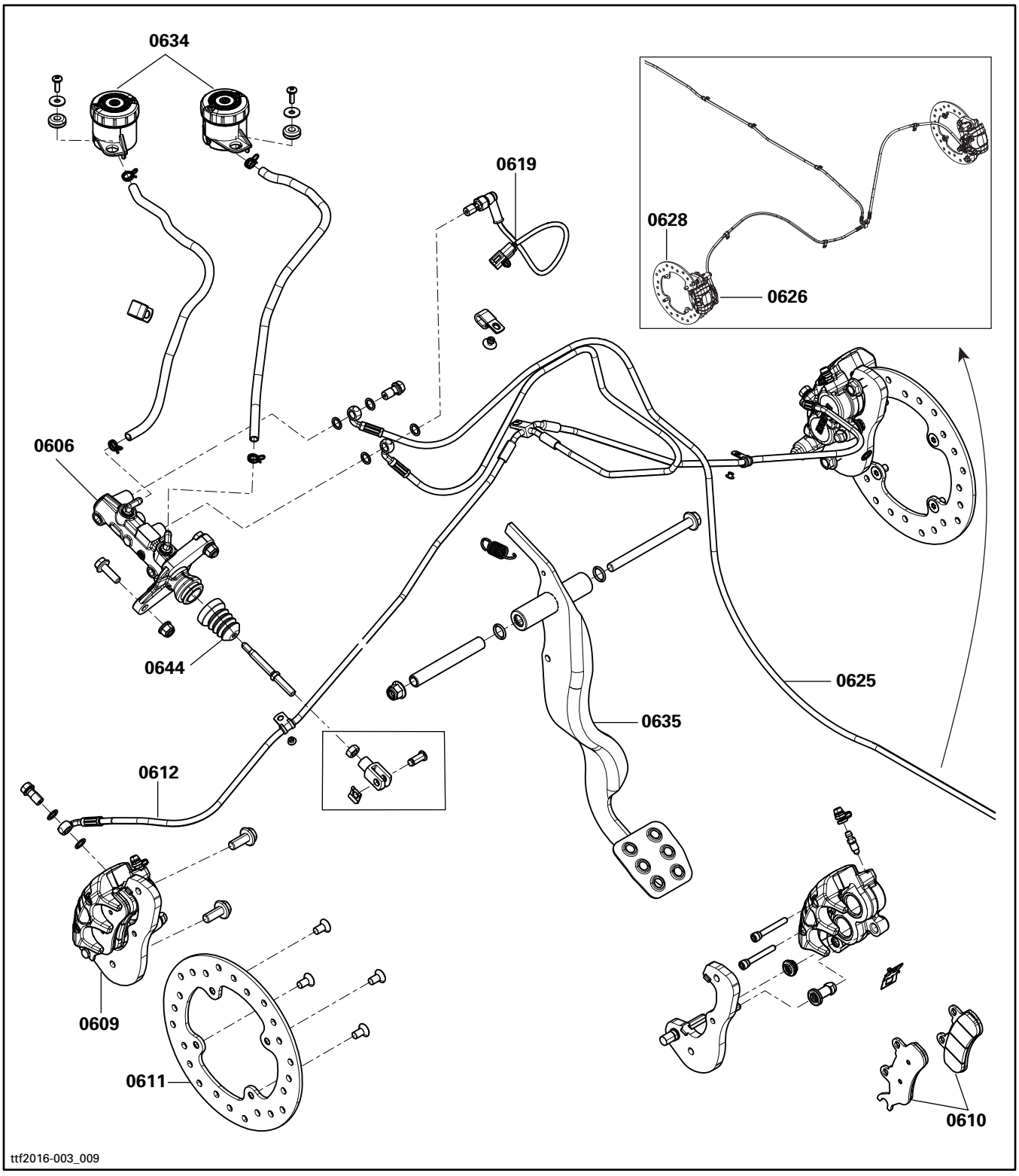
TRANSMISSION AND LINKAGE SYSTEM
SYSTÈME DE TRANSMISSION ET DE TRINGLERIE



SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
06	**00**	**NO LABOR INVOLVED AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**
06	06	MASTER CYLINDER MAÎTRE-CYLINDRE	1.0	1.0	1.0
06	09	FRONT CALIPER (RH OR LH) ÉTRIER AVANT (DROIT OU GAUCHE)	0.5	0.5	0.5
06	10	FRONT BRAKE PAD (RH OR LH) PLAQUETTE DE FREIN AVANT (DROIT OU GAUCHE)	0.3	0.3	0.3
06	11	FRONT BRAKE DISC (RH OR LH) DISQUE DE FREIN AVANT (DROIT OU GAUCHE)	0.7	0.7	0.7
06	12	FRONT FLEXIBLE BRAKE HOSE BOYAU FLEXIBLE DE FREIN AVANT	1.0	1.0	1.0
06	19	BRAKE SWITCH INTERRUPTEUR DE FREIN	0.3	0.3	0.3
06	25	REAR BRAKE HOSE BOYAU DE FREIN ARRIÈRE	1.2	1.2	1.5
06	26	REAR CALIPER ÉTRIER ARRIÈRE	0.5	0.5	0.5
06	27	REAR BRAKE PAD PLAQUETTE DE FREIN ARRIÈRE	0.3	0.3	0.3
06	28	REAR BRAKE DISC DISQUE DE FREIN ARRIÈRE	0.7	0.7	0.7
06	34	MASTER CYLINDER RESERVOIR RÉSERVOIR DU MAÎTRE-CYLINDRE	0.5	0.5	0.5
06	35	BRAKE PEDAL PÉDALE DE FREIN	0.5	0.5	0.5
06	44	MASTER CYLINDER ROD TIGE DU MAÎTRE-CYLINDRE	0.4	0.4	0.4

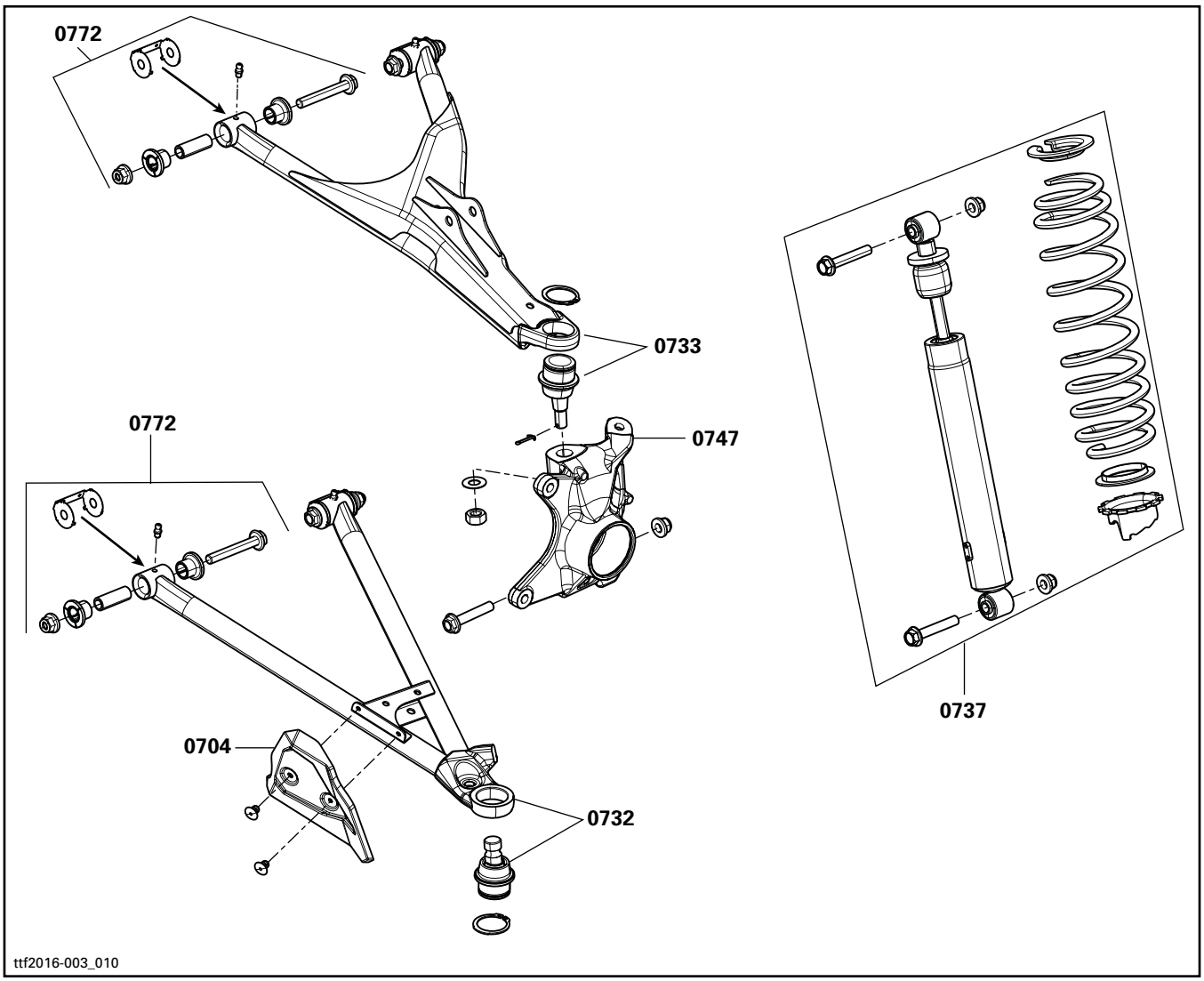
BRAKE SYSTEM
SYSTÈME DE FREIN



SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
07	**00**	**NO LABOR INVOLVED** **AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**
07	04	ARM PROTECTOR (RH OR LH) PROTECTEUR DE BRAS (DROIT OU GAUCHE)	0.3	0.3	0.3
07	13	EXTERNAL BALL JOINT (RH OR LH) JOINT À ROTULE EXTERNE (DROIT OU GAUCHE)	0.8	0.8	0.8
07	24	MAIN TUBE TUBE PRINCIPAL	1.0	1.0	1.0
07	27	STEERING COVER COUVRE-GUIDON	0.3	0.3	0.3
07	32	LOWER ARM AND/OR BALL JOINT (RH OR LH) BRAS INFÉRIEUR ET/OU JOINT À ROTULE (DROIT OU GAUCHE)	0.7	0.7	0.7
07	33	UPPER ARM (RH OR LH) BRAS DE SUSPENSION SUPÉRIEUR (DROIT OU GAUCHE)	0.7	0.7	0.7
07	37	FRONT SHOCK AND/OR SPRING AND/OR STOPPER AND/OR PROTECTOR AND/OR SEAT (RH OR LH) AMORTISSEUR AVANT ET/OU RESSORT ET/OU BUTÉE ET/OU SIÈGE ET/OU PROTECTEUR (DROIT OU GAUCHE)	0.4	0.4	0.4
07	40	FRONT DIFFERENTIEL (ASS'Y) DIFFÉRENTIEL AVANT (COMPLET)	2.4	2.4	2.4
07	42	FRONT PROPELLER SHAFT (ASS'Y) ARBRE DE PROPULSION AVANT (COMPLET)	2.0	2.0	2.0
07	45	CV JOINT (RH OR LH) JOINT HOMOCINÉTIQUE (DROIT OU GAUCHE)	0.7	0.7	0.7
07	46	FRONT WHEEL HUB (SEAL AND/OR BEARING) (RH OR LH) MOYEU DE ROUE AVANT (JOINT ET/OU ROULEMENT) (DROIT OU GAUCHE)	0.3	0.3	0.3
07	47	KNUCKLE (RH OR LH) PORTE-FUSÉE (DROIT OU GAUCHE)	0.7	0.7	0.7
07	50	FRONT RIM AND/OR TIRE JANTE AVANT ET/OU PNEU	0.4	0.4	0.4
07	64	DOUBLE BALL JOINT JOINT À ROTULE DOUBLE		0.3	0.3
07	72	INTERNAL BUSHING AND/OR CUSHION (LOWER AND/OR UPPER ARM) (RH OR LH) DOUILLE INTERNE ET/OU COUSSIN (BRAS INFÉRIEUR ET/OU SUPÉRIEUR) (DROIT OU GAUCHE)	0.4	0.4	0.4
07	82	BALL BEARING ROULEMENT À BILLE			2.2
07	85	RING GEAR AND/OR CARRIER AND/OR SHIM COURONNE DE LANCEMENT ET/OU SUPPORT ET/OU CALE	2.9	2.9	2.9
07	88	RING GEAR DRIVE GEAR AND/OR BEARING AND/OR SHIM PIGNON DE COMMANDE DE LA COURONNE ET/OU ROULEMENT À BILLE ET/OU CALE	2.9	2.9	2.9
07	89	COVER AND/OR PINION COVER AND/OR SEAL AND/OR BEARING COUVERCLE ET/OU COUVERCLE DE PIGNON ET/OU JOINT D'ÉTANCHÉITÉ ET/OU ROULEMENT À BILLE	3.2	3.2	3.2

STEERING - FRONT DRIVE SYSTEM AND SUSPENSION
DIRECTION - SYSTÈME D'ENTRAÎNEMENT AVANT ET SUSPENSION

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
07	90	BOOT WHEEL KIT AND/OR CV JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE ROUE ET/OU JOINT CV (DROIT OU GAUCHE)	0.8	0.8	0.8
07	91	BOOT DIFFERENTIAL KIT AND/OR PLUNGING JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE DIFFÉRENTIEL ET/OU JOINT PLONGEANT (DROIT OU GAUCHE)	0.8	0.8	0.8
07	94	UNIT PACK KIT ENSSEMBLE JOINT CARDAN	2.3	2.3	2.3
07	95	UNIT PACKS KIT (2) ENSSEMBLE JOINTS CARDANS (2)	2.5	2.5	2.5
07	99	POWER STEERING (DPS) SERVODIRECTION (DPS)		1.6	1.6
07	103	DIFFERENTIAL SEAL (1) JOINT D'ÉTANCHÉITÉ DU DIFFÉRENTIEL (1)	0.7	0.7	0.7
07	104	DIFFERENTIAL SEALS (2) JOINTS D'ÉTANCHÉITÉ DU DIFFÉRENTIEL (2)	1.4	1.4	1.4
07	106	STEERING COLUMN SUPPORT AND/OR BUSHINGS SUPPORT DE COLONNE DE DIRECTION ET/OU COUSSINETS	0.7	0.7	0.7
07	115	RACK AND PINION STEERING DIRECTION À CRÉMAILLÈRE	1.8	1.8	1.8
07	117	ADJUSTMENT CYLINDER CYLINDRE D'AJUSTEMENT	0.3	0.3	0.3
07	118	STEERING WHEEL VOLANT	0.3	0.3	0.3
07	120	DIFFERENTIAL OIL SEAL ANNEAU D'ÉTANCHÉITÉ DU DIFFÉRENTIEL	2.6	2.6	2.6
07	121	COUPLING MANCHON	1.6	1.6	1.6
07	122	HOSE (DIFFERENTIAL HOSE) BOYAU (BOYAU DU DIFFÉRENTIEL)	0.3	0.3	0.3
07	130	PROPELLER SHAFT EXTENSION (ASS'Y) EXTENTION D'ARBRE DE PROPULSION (COMPLET)			2.2
07	134	EXTERNAL BALL JOINTS (ALL) JOINTS À ROTULE EXTERNE (TOUS)	1.1	1.1	1.1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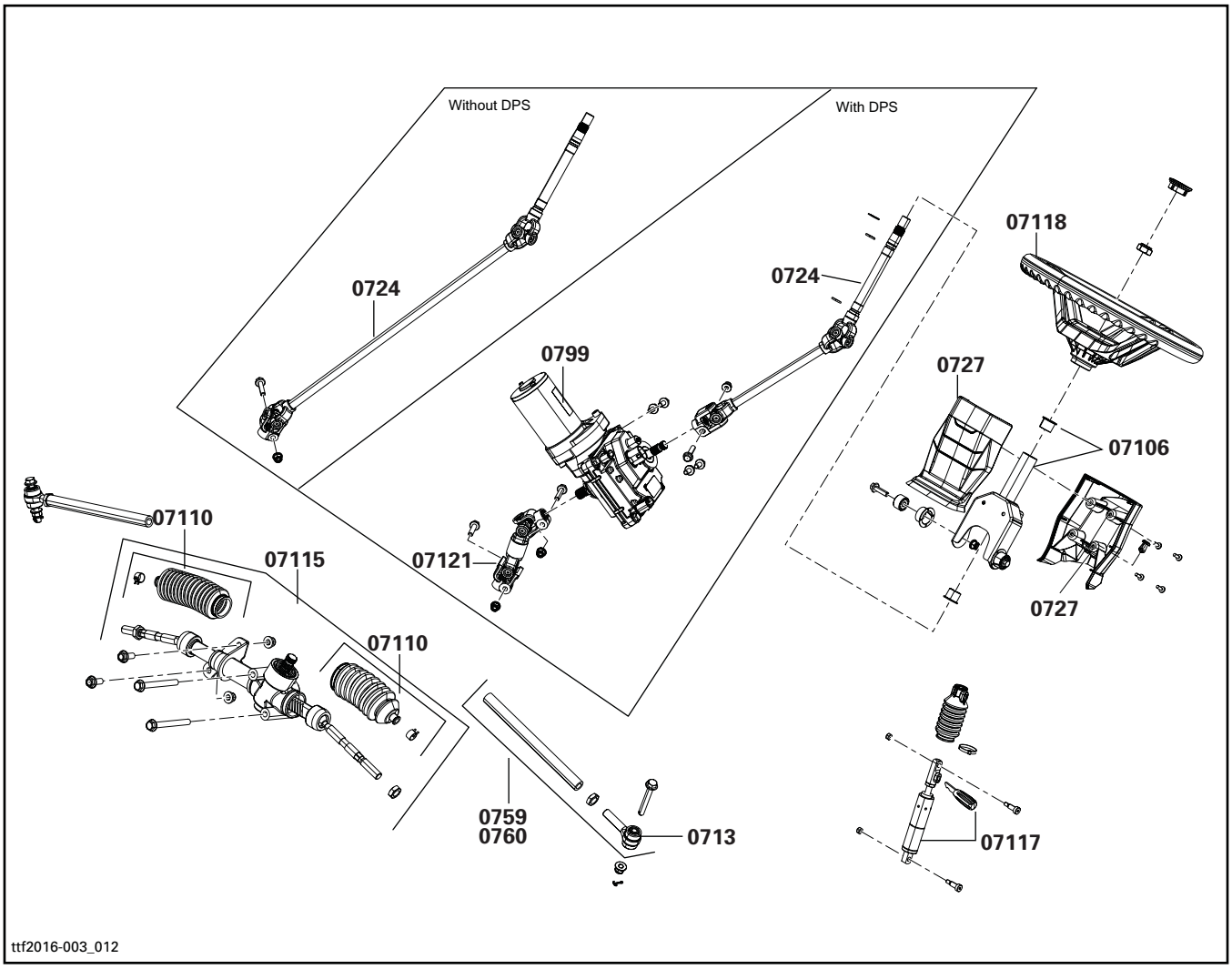
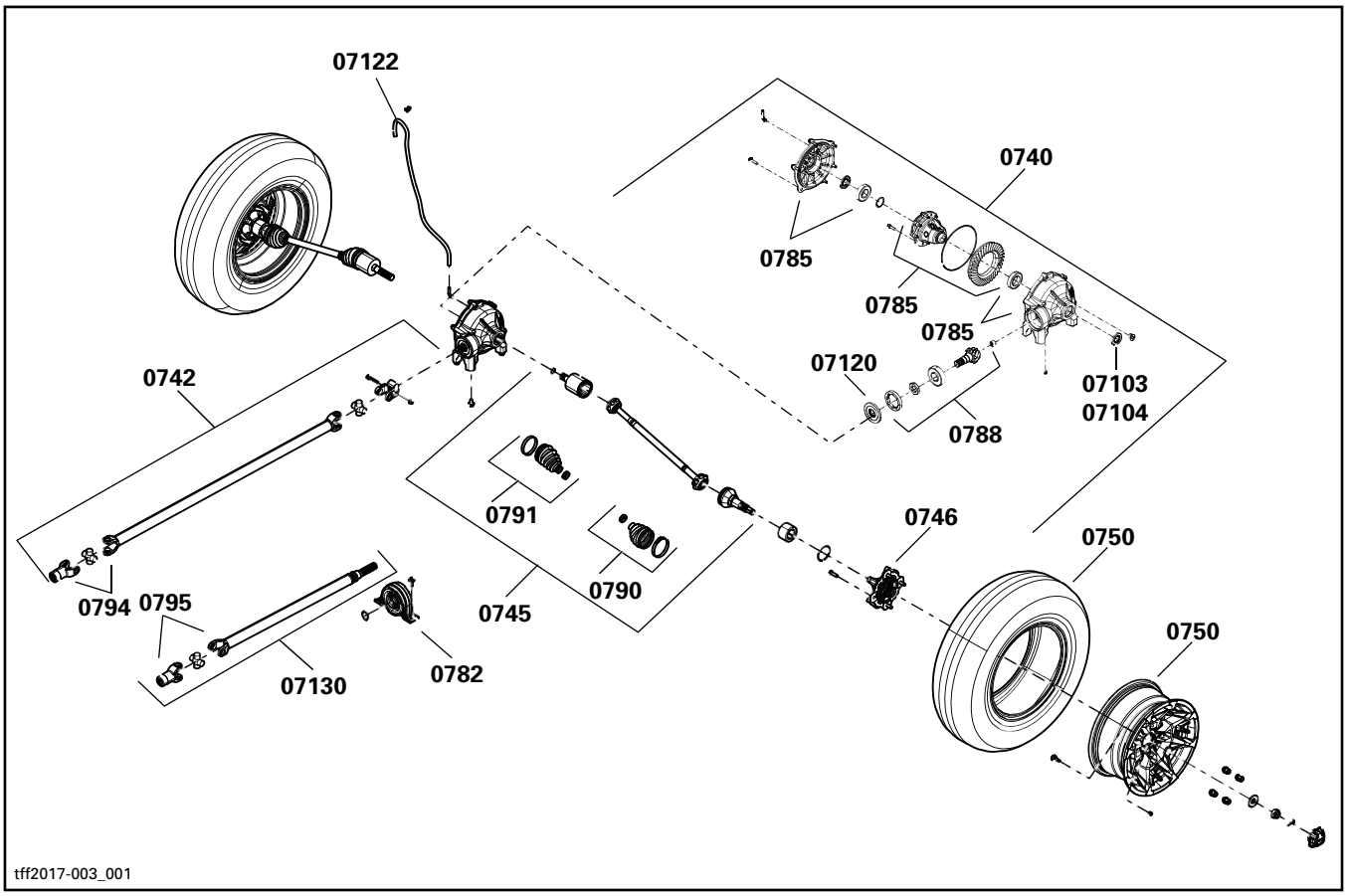
STEERING - FRONT DRIVE SYSTEM AND SUSPENSION
DIRECTION - SYSTÈME D'ENTRAÎNEMENT AVANT ET SUSPENSION

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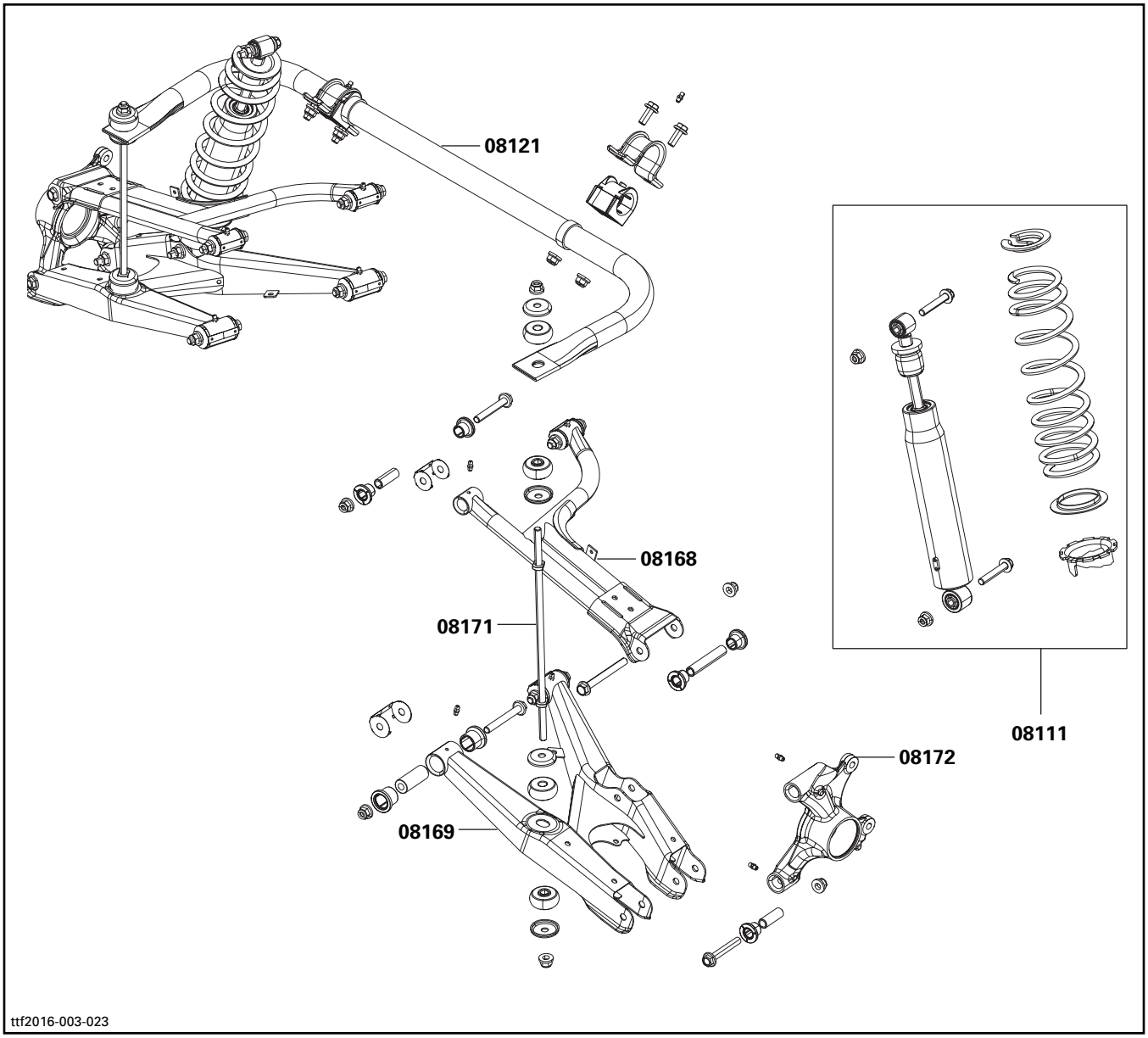
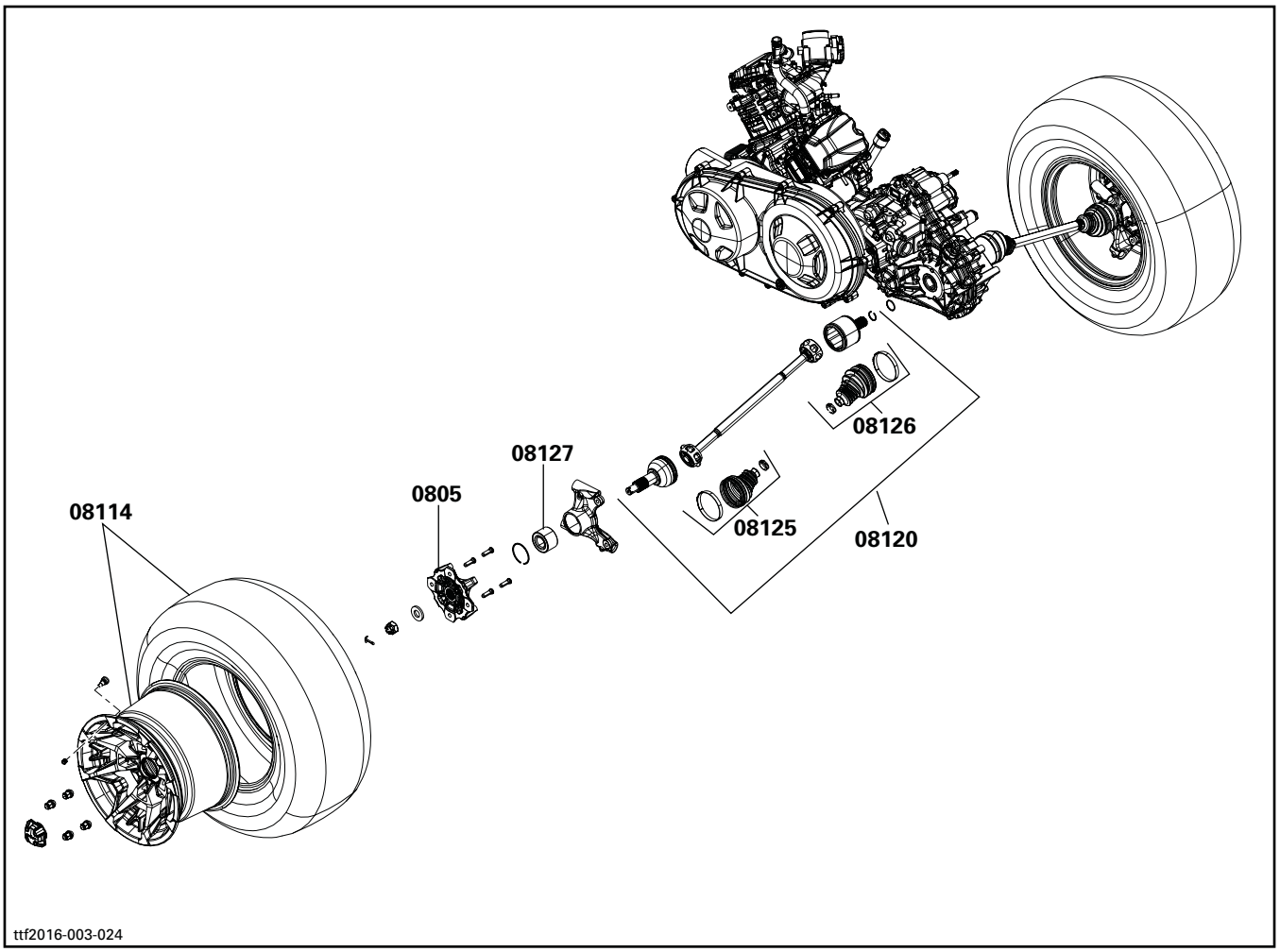
REAR DRIVE SYSTEM AND SUSPENSION
SYSTÈME D'ENTRAÎNEMENT ARRIÈRE ET SUSPENSION

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
08	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE**	**0**	**0**	**0**
08	05	REAR WHEEL HUB (RH) MOYEU DE ROUE ARRIÈRE (DROIT)	0.3	0.3	0.3
08	107	DRIVE AXLE AND/OR HUB ARBRE ENTRAINEMENT ET/OU MOYEU	1.8		
08	109	REAR WHEEL HUB (LH) MOYEU DE ROUE ARRIÈRE (GAUCHE)	0.3	0.3	0.3
08	111	REAR SHOCK (RH OR LH) AMORTISSEUR ARRIÈRE (DROIT OU GAUCHE)	0.4	0.4	0.4
08	114	REAR RIM AND/OR TIRE JANTE ARRIÈRE ET/OU PNEU	0.4	0.4	0.4
08	120	CV JOINT (RH OR LH) JOINT HOMOCINÉTIQUE (DROIT OU GAUCHE)	0.7	0.7	0.7
08	121	STABILIZER BAR BARRE STABILISATRICE	0.4	0.4	0.4
08	122	RING GEAR AND/OR SHIM COURONNE LANCEMENT ET/OU CALE	2.8		
08	123	RING GEAR DRIVE AND/OR SHIM AND/OR SEAL AND/OR BEARING PIGNION ET/OU CALE ET/OU JOINT ET/OU ROULEMENT A BILLE	2.8		
08	124	COVER AND/OR PINION COVER AND/OR SEAL AND/OR BEAR COUVERCLE ET/OU COUVERCLE PIGNION ET/OU JOINT ET/OU ROULEMENT	2.9		
08	125	BOOT WHEEL KIT AND/OR CV JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE ROUE ET/OU JOINT CV (DROIT OU GAUCHE)	0.8	0.8	0.8
08	126	BOOT DIFFERENTIAL KIT AND/OR PLUNGING JOINT (RH OR LH) ENSEMBLE DE SOUFFLET DE DIFFÉRENTIEL ET/OU JOINT PLONGENT (DROIT OU GAUCHE)	0.8	0.8	0.8
08	127	RADIAL BALL BEARINGS ROULEMENTS À BILLE RADIALES	0.7	0.7	0.7
08	128	UNIT PACK KIT ENSSEMBLE JOINT CARDAN	1.8	1.8	1.8
08	129	UNIT PACKS KIT (2) ENSSEMBLE JOINTS CARDANS (2)	2.0	2.0	2.0
08	134	DIFFERENTIAL SEAL (ONE) JOINT ETANCHE DU DIFFERENTIEL (UN)	0.8		
08	135	DIFFERENTIAL SEALS (TWO) JOINT ETANCHE DU DIFFERENTIEL (DEUX)	1.4		
08	148	DIFFERENTIAL OIL SEAL ANNEAU D'ÉTANCHÉITÉ DU DIFFERENTIEL	2.5		
08	158	HOSE (DIFFERENTIAL VENT) BOYAU (VENTILATION DU DIFFÉRENTIEL)	0.3	0.3	0.3
08	168	REAR UPPER ARM AND/OR RADIAL JOINT BRAS SUPERIEUR ARRIERE ET/OU ROTULE RADIALE	0.7	0.7	0.7
08	169	REAR LOWER ARM AND/OR RADIAL JOINT BRAS INFERIEUR ARRIERE ET/OU ROTULE RADIALE	0.7	0.7	0.7

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
08	171	SWAY BAR LEVER LEVIER BARRE STABILISATRICE	0.4	0.4	0.4
08	172	KNUCKLE (RIGHT OR LEFT) PORTE FUSEE (DROIT OU GAUCHE)	0.7	0.7	0.7

REAR DRIVE SYSTEM AND SUSPENSION
SYSTÈME D'ENTRAÎNEMENT ARRIÈRE ET SUSPENSION

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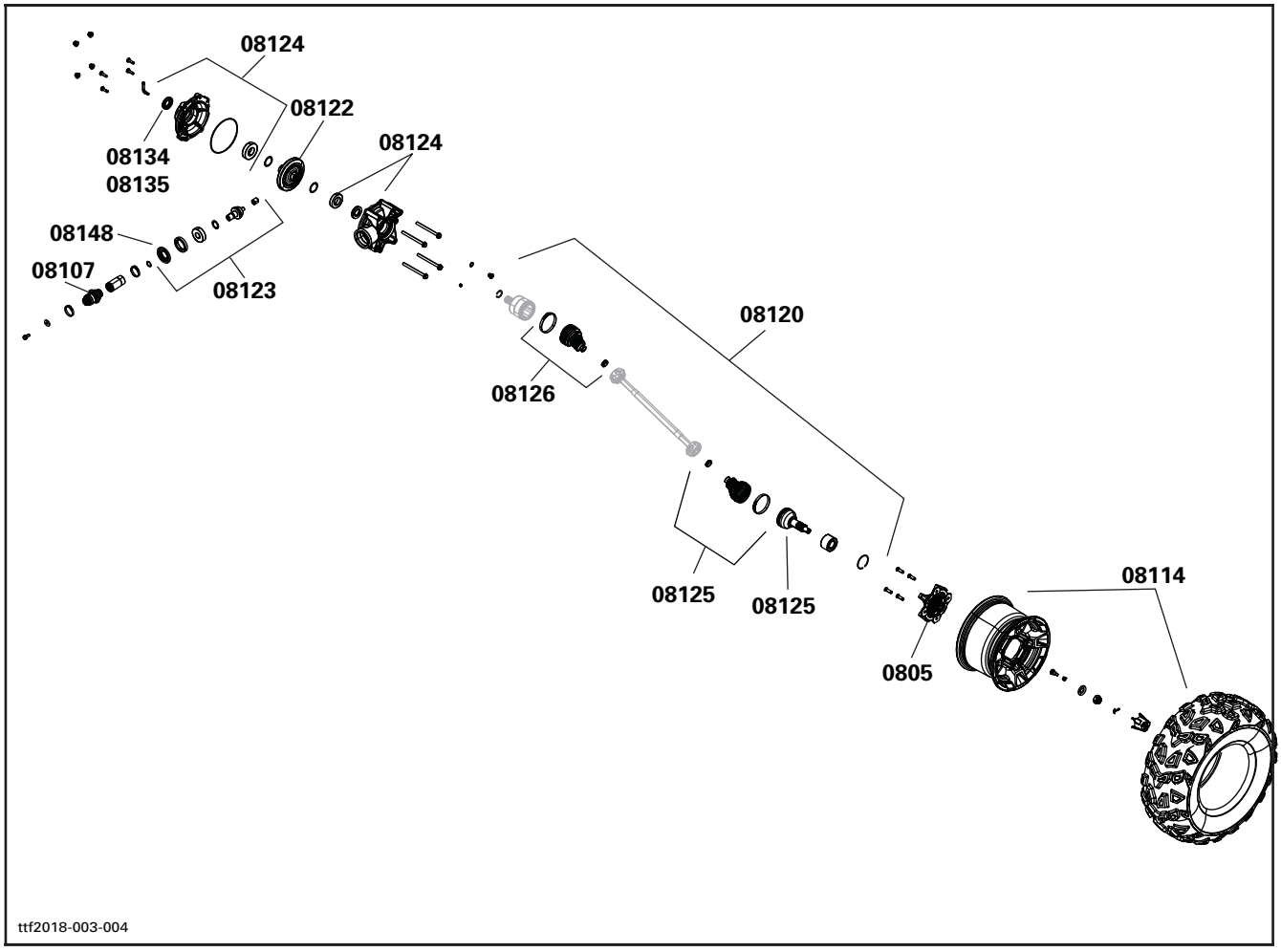
REAR DRIVE SYSTEM AND SUSPENSION
SYSTÈME D'ENTRAÎNEMENT ARRIÈRE ET SUSPENSION

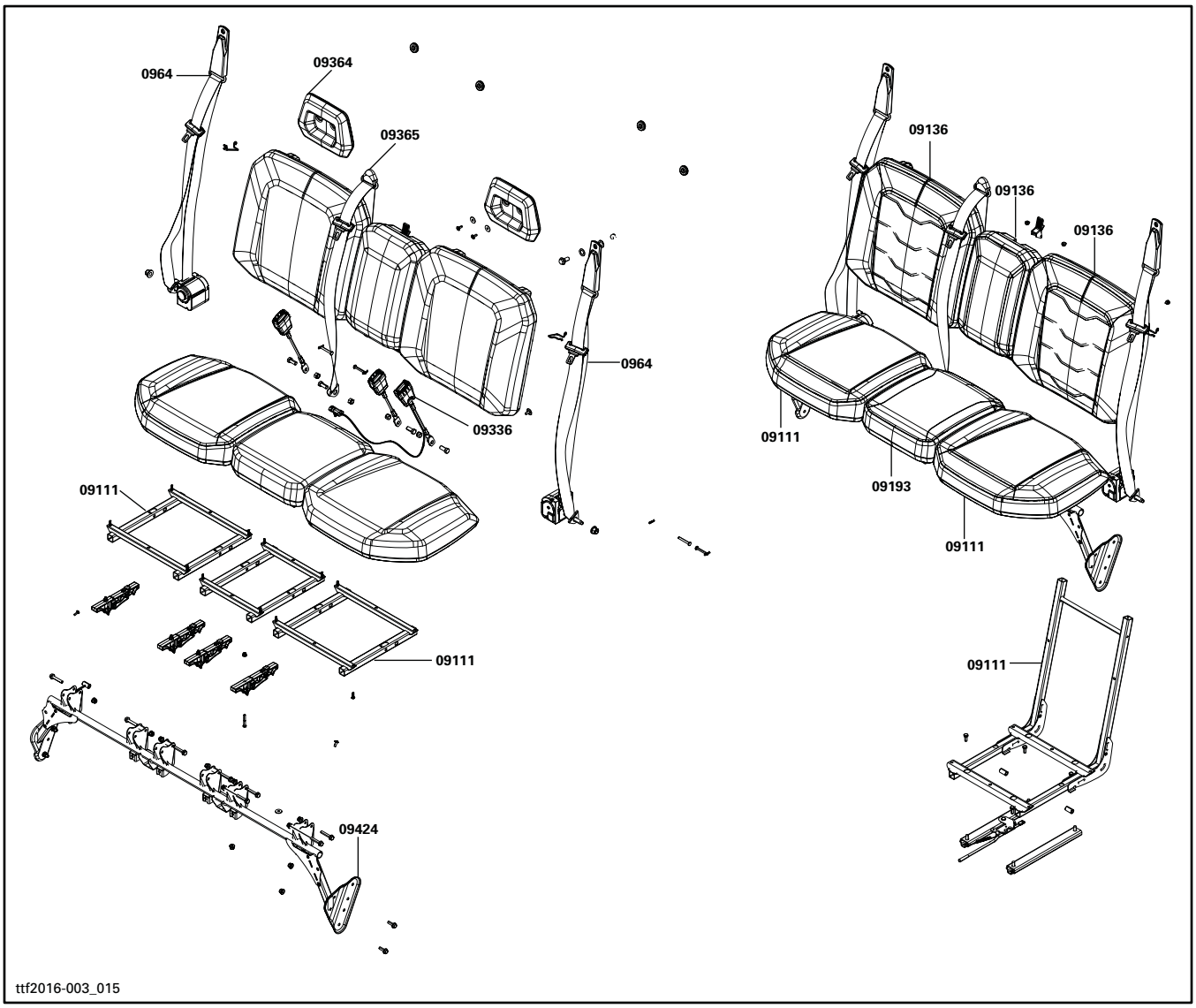


SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
09	**00**	**NO LABOR INVOLVED AUCUNE MAIN D'OEUVRE IMPLIQUÉE**	**0**	**0**	**0**
09	26	FRONT BUMPER PARE-CHOCS AVANT	0.8	0.9	0.9
09	28	FRONT FASCIA FASCIA AVANT	0.5	0.5	0.5
09	49	FRAME CHASSIS	24.5	25.5	28.5
09	82	CABLE RETAINER CÂBLE DE RETENUE	0.3	0.3	0.3
09	93	PROTECTION PLATE PLAQUE DE PROTECTION	0.4	0.4	0.4
09	95	EACH DECAL (1) CHAQUE AUTOCOLLANT (1)	0.3	0.3	0.3
09	97	SHOCK GAZ (REAR CARGO BOX) AMORTISSEUR (BOÎTE DE RANGEMENT)	0.3	0.3	0.3
09	102	PIVOT SUPPORT SUPPORT DE PIVOT	0.3	0.3	0.3
09	111	SEAT BASE ASS'Y (DRIVER OR CO-PILOT) BASE DE SIÈGE COMPLET (CONDUCTEUR OU COPILOTE)	0.3	0.3	0.3
09	134	CARGO BOX LEVER AND/OR RINGS AND/OR CLAMP LEVIER BENNE ET/OU BAGUES ET/OU BRIDE	0.3	0.3	0.3
09	136	BACKREST ASS'Y DOSSIER ASS.	0.3	0.3	0.3
09	168	FRONT GRILL GRILLE FRONTALE	0.3	0.3	0.3
09	193	CENTRAL SEAT SIÈGE CENTRAL	0.3	0.3	0.3
09	227	SERVICE COVER COUVERCLE DE SERVICE	0.3	0.3	0.3
09	231	REAR PANEL (LEFT OR RIGHT) PANNEAU ARRIÈRE (GAUCHE OU DROIT)	0.3	0.3	0.3
09	233	UPPER SIDE PANEL (RIGHT OR LEFT) PANNEAU LATERAL SUPERIEUR (DROIT OU GAUCHE)	0.3	0.3	0.3
09	239	MIDDLE SIDE PANEL (LEFT OR RIGHT) PANNEAU LATÉRAL CENTRAL (GAUCHE OU DROIT)	0.5	0.5	0.5
09	243	DELECTOR PANEL (RIGHT OR LEFT) PANNEAU DEFLECTEUR (DROIT OU GAUCHE)	0.3	0.3	0.3
09	246	CENTER PANEL PANNEAU CENTRAL			0.5
09	282	LATCH AND/OR BASE (RIGHT OR LEFT) LOQUET ET/OU BASE (DROIT OU GAUCHE)	0.3	0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
09	289	GLOVES BOX BOÎTE À GANTS	0.3	0.3	0.3
09	297	TOP STORAGE COMPARTMENT COMPARTIMENT DE RANGEMENT SUPÉRIEUR	0.3	0.3	0.3
09	306	REAR SIDE PANEL (RIGHT OR LEFT) PANNEAU LATÉRAL ARRIÈRE (DROIT OU GAUCHE)	0.3	0.3	0.3
09	308	BOTTOM FRONT SIDE PANEL (RH OR LH) PANNEAU LATÉRAL AVANT BAS (DROIT OU GAUCHE)	0.5	0.5	0.5
09	336	CENTRAL SKID PLATE PLAQUE DE PROTECTION CENTRALE	0.6	0.6	0.6
09	337	REAR SKID PLATE PLAQUE DE PROTECTION ARRIÈRE	0.6	0.6	0.6
09	349	LEVER INDICATOR INDICATEUR DE VITESSE	0.3	0.3	0.3
09	358	CARGO BOX FRAME CHÂSSIS DE LA BENNE	1.4	1.4	1.4
09	360	UPPER TAIL GATE PANEL PANNEAU DU HAYON SUPÉRIEUR	0.3	0.3	0.3
09	363	LOWER TAIL GATE HAYON INFÉRIEUR	0.3	0.3	0.3
09	364	HEAD REST APPUI-TÊTE	0.3	0.3	0.3
09	365	SAFETY BELT CEINTURE DE SÉCURITÉ	0.3	0.3	0.3
09	366	BUCKLE BELT VERROU CEINTURE	0.3	0.3	0.3
09	367	LOCK VERROU	0.3	0.3	0.3
09	369	CAGE (FRONT) CAGE (AVANT)	0.4	0.4	0.4
09	370	CAGE (REAR) CAGE (ARRIERE)	0.6	0.7	0.7
09	371	ROCK SLIDER (LEFT OR RIGHT) GLISSIERE DE PROTECTION (GAUCHE OU DROITE)		0.6	
09	372	SHOULDER GUARD (LEFT AND/OR RIGHT) PROTECTEUR D'ÉPAULE (GAUCHE ET/OU DROIT)	0.3	0.3	0.3
09	374	LATERAL NET (LEFT OR RIGHT) FILET LATÉRAL (GAUCHE OU DROIT)	0.3	0.3	0.3
09	386	ROOF TOIT		0.3	0.6
09	388	REAR NET FILET ARRIERE			0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
09	427	BATTERY COVER COUVERCLE DE BATTERIE	0.3	0.3	0.3
09	434	CENTER CAGE KIT ENSEMBLE DE CAGE CENTRAL			0.8
09	438	FRONT FENDER AILE AVANT	0.3	0.3	0.3
09	444	CLUSTER BEZEL AND/OR HOLDER ENJOLIVEUR ET/OU BOITIER DU COMBINE D'INSTRUMENTATION	0.3	0.3	0.3
09	466	HANDLE POIGNÉE	0.3	0.3	0.3
09	470	REAR ROOF TOIT ARRIERE			0.4
09	480	FRONT LATERAL PANEL PANNEAU LATÉRAL AVANT	0.3	0.3	0.3
09	481	UPPER DASH TABLEAU DE BORD SUPÉRIEUR	2.0	2.0	2.5
09	482	SWITCHES PANEL PANNEAU D'INTÉRRUPTEURS	0.3	0.3	0.3
09	483	LOWER DASH (RIGHT) TABLEAU DE BORD INFERIEUR (DROIT)	0.3	0.3	0.3
09	484	LOWER DASH (LEFT) TABLEAU DE BORD INFERIEUR (GAUCHE)	0.3	0.3	0.3
09	485	FRONT BULKHEAD COVER COUVERCLE DE CLOISON AVANT	1.0	1.0	1.0
09	486	STORAGE BOX BOITE DE RANGEMENT		0.3	0.3
09	487	REAR LOWER BULKHEAD CLOISON INFÉRIEUR ARRIÈRE	2.2	2.2	2.8
09	488	REAR UPPER BULKHEAD CLOISON SUPÉRIEUR ARRIÈRE	1.0	1.0	1.0
09	489	ENGINE SERVICE COVER COUVERCLE D'ENTRETIEN DU MOTEUR	0.3	0.3	0.3
09	490	REAR SERVICE COVER COUVERCLE DE SERVICE ARRIÈRE	0.3	0.3	0.3
09	491	FLOOR COVER COUVERCLE DE PLANCHER	0.3	0.3	0.3
09	492	SHIFTING MODULE SUPPORT SUPPORT MODULE D'EMBRAYAGE	0.5	0.5	0.8
09	493	DPS MODULE SUPPORT SUPPORT MODULE DU DPS	0.5	0.5	0.5
09	494	BRAKE MODULE SUPPORT SUPPORT MODULE DE FREIN	1.3	1.3	1.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
09	495	FLOOR PLANCHER	4.0	4.0	4.0
09	496	UPPER FRONT DEFLECTOR DEFLECTEUR AVANT SUPÉRIEUR	0.3	0.3	0.3
09	497	FRONT BULKHEAD CLOISON AVANT	6.0	6.5	6.5
09	498	DRAWER TIROIR		0.3	0.3
09	499	SIDE SKID PLATE (RIGHT OR LEFT) PLAQUE DE PROTECTION LATÉRALE (DROITE OU GAUCHE)	0.5	0.5	0.5
09	500	SERVICE CENTER CENTRE DE SERVICE	0.3	0.3	0.3
09	515	CARGO BOX BOITE DE CHARGEMENT	0.7	0.7	0.7
09	517	REAR CENTRAL SKID PLAT PLAQUE DE PROTECTION CENTRAL ARRIÈRE			0.6
09	518	REAR SIDE SKID PLATE (RIGHT OR LEFT) PLAQUE DE PROTECTION LATERALE ARRIERE (DROITE OU GAUCHE)			0.6
09	519	CAGE EXTENTION EXTENTION DE CAGE			0.3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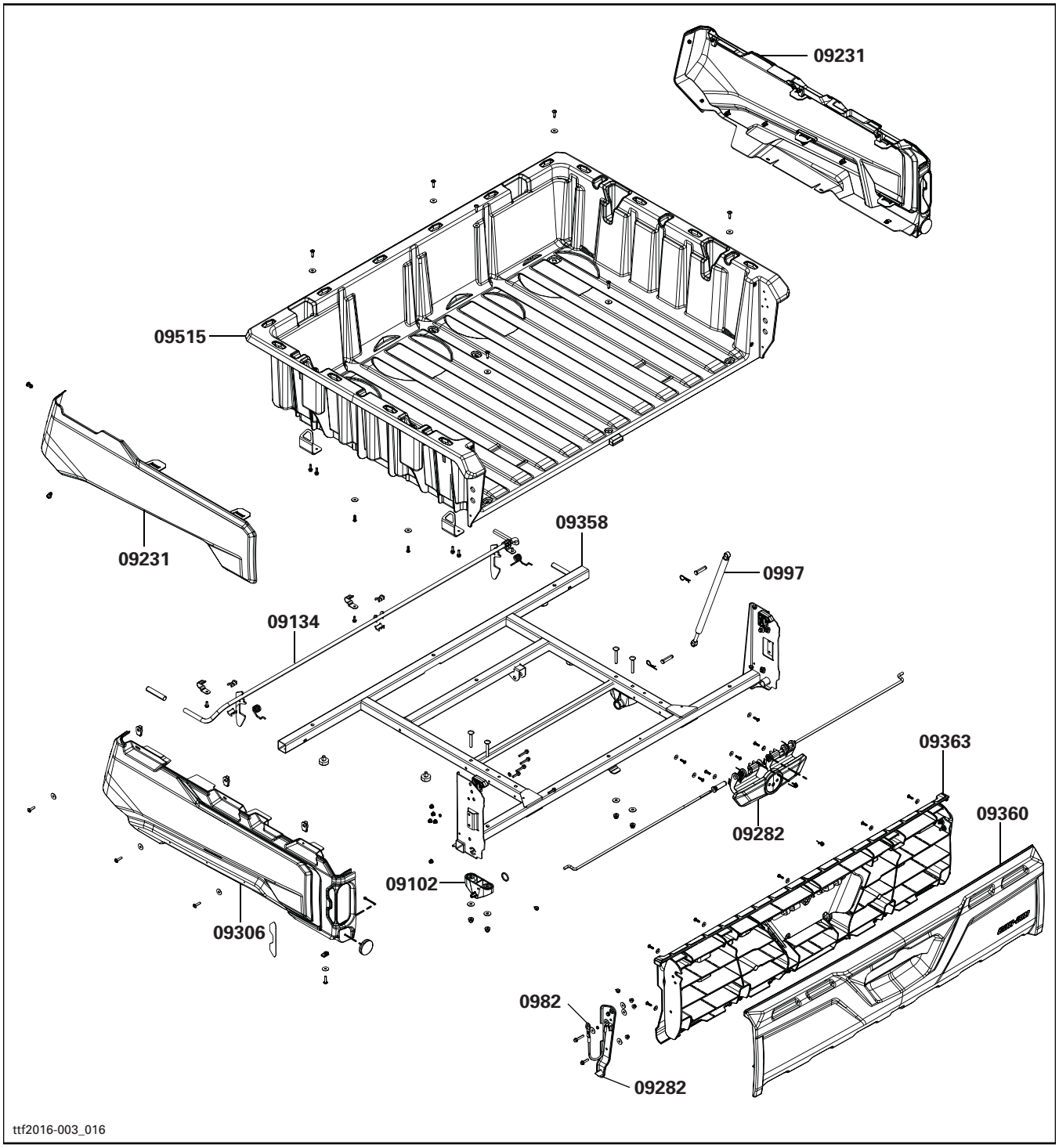
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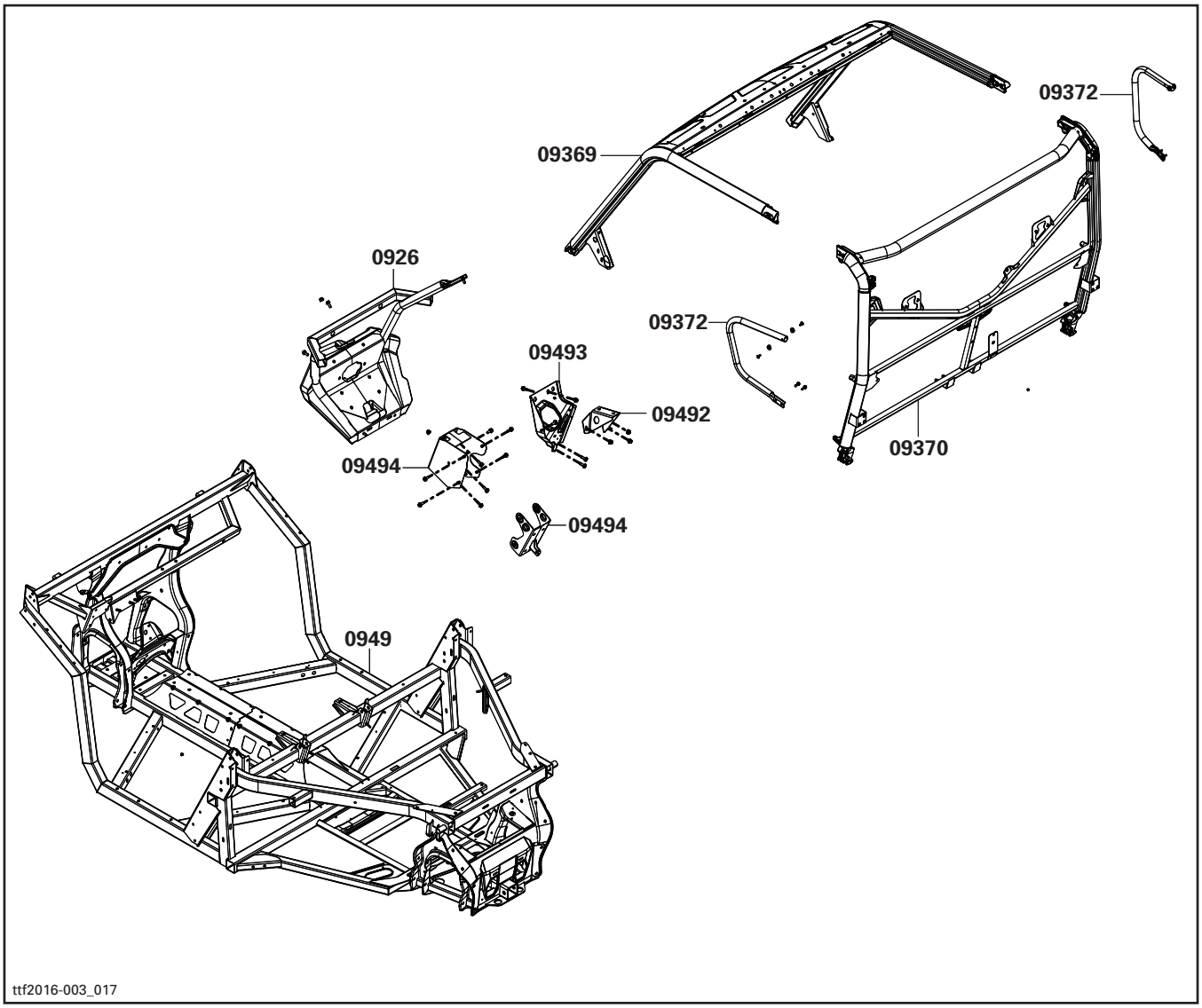
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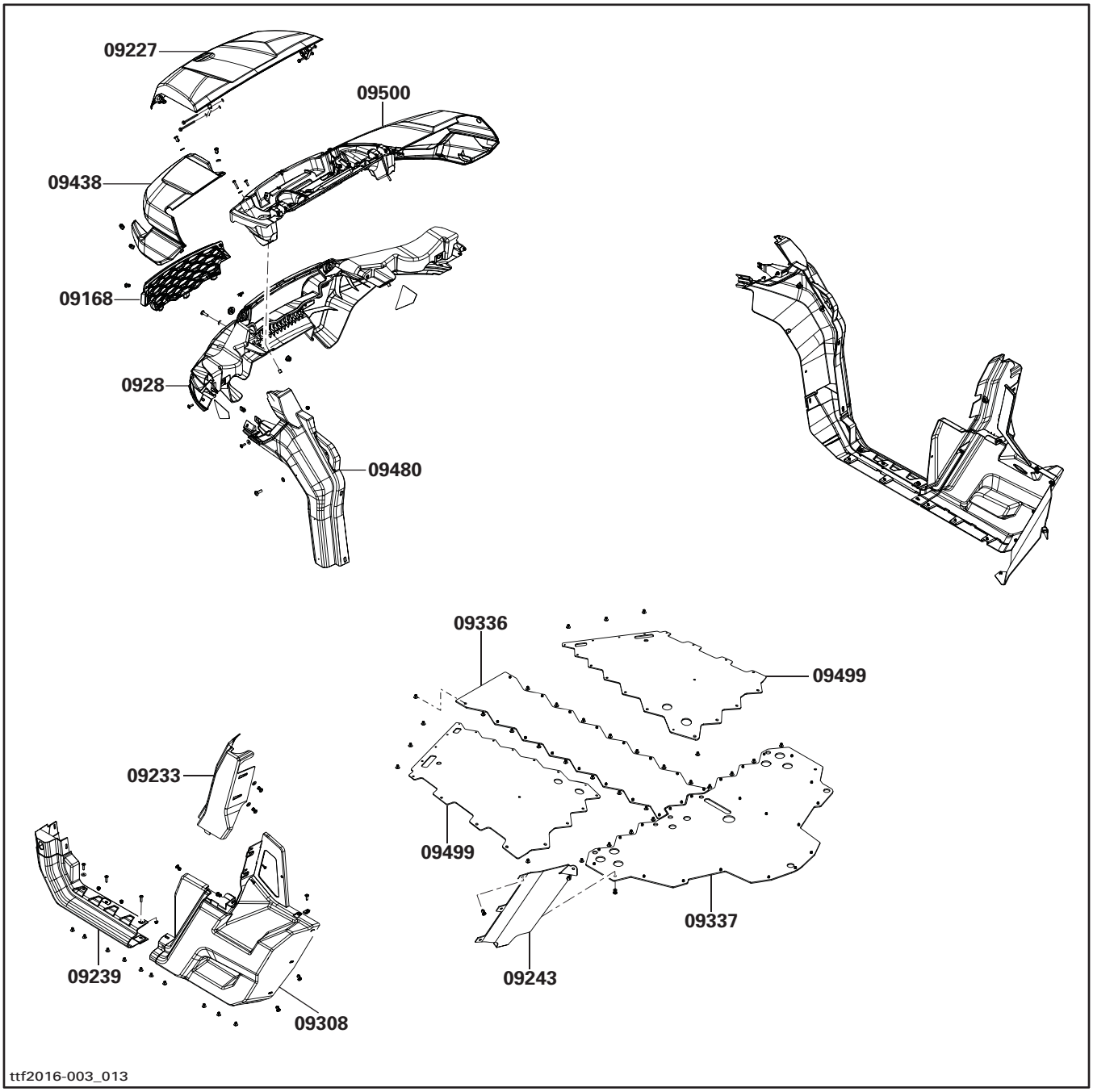
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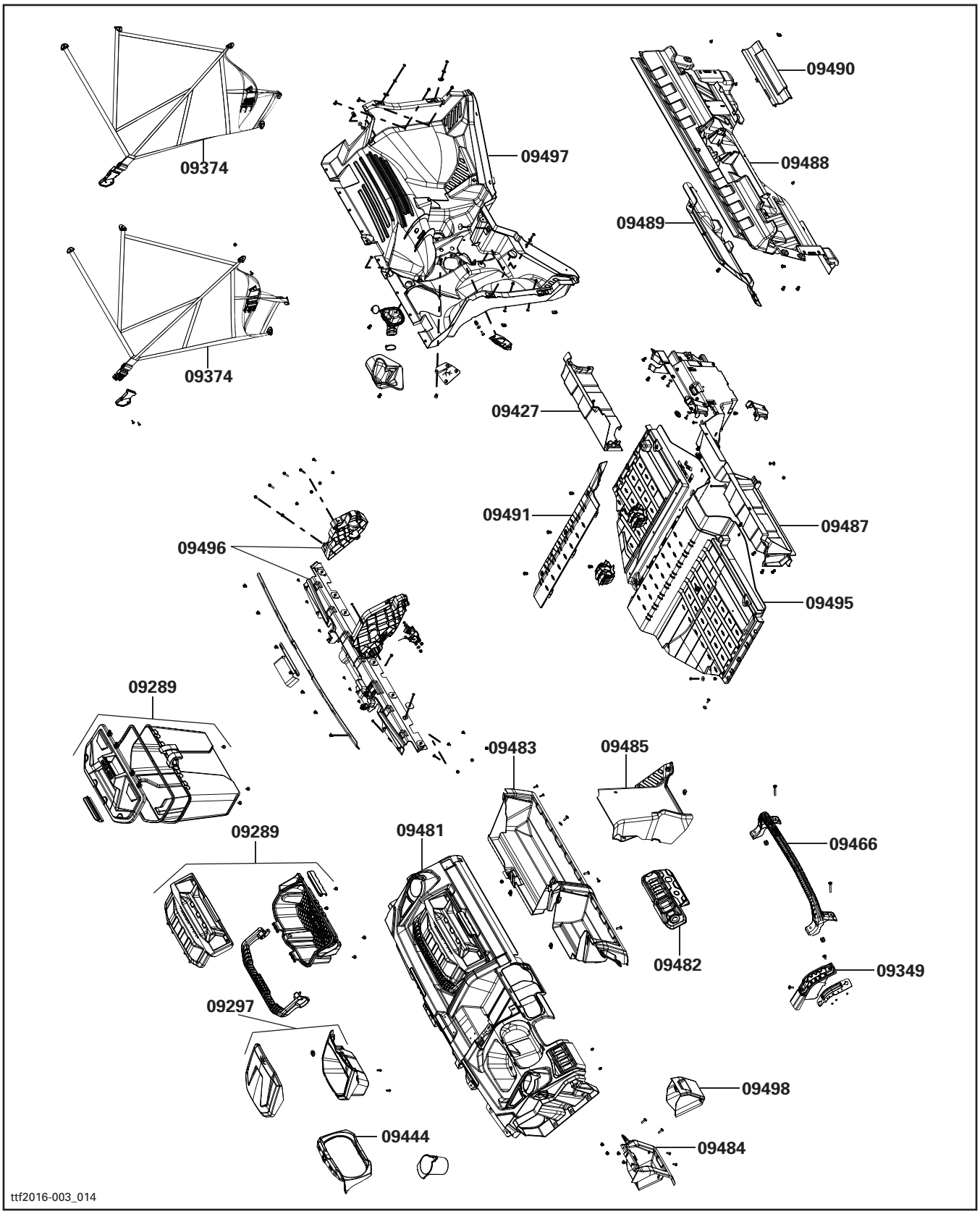
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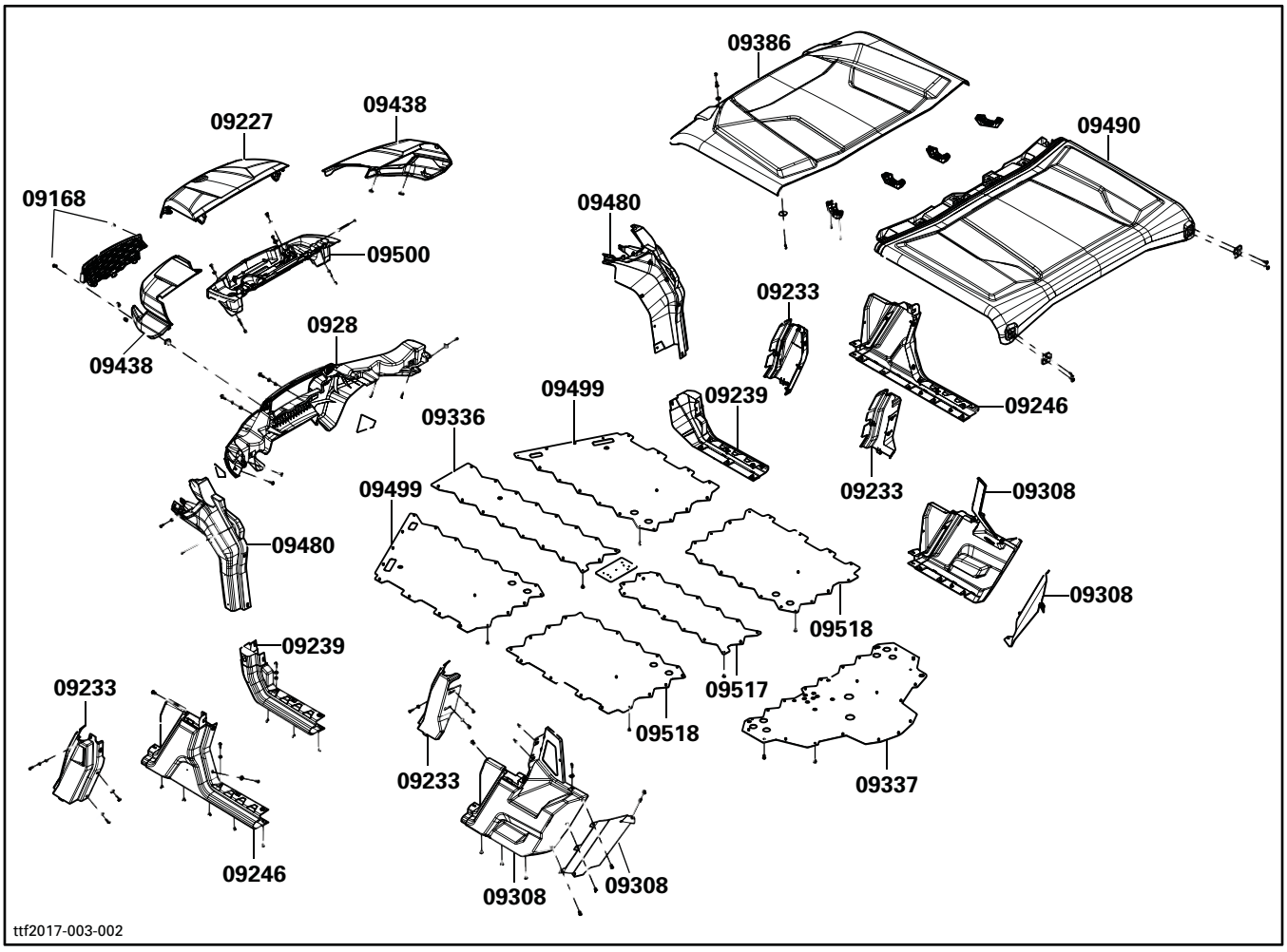

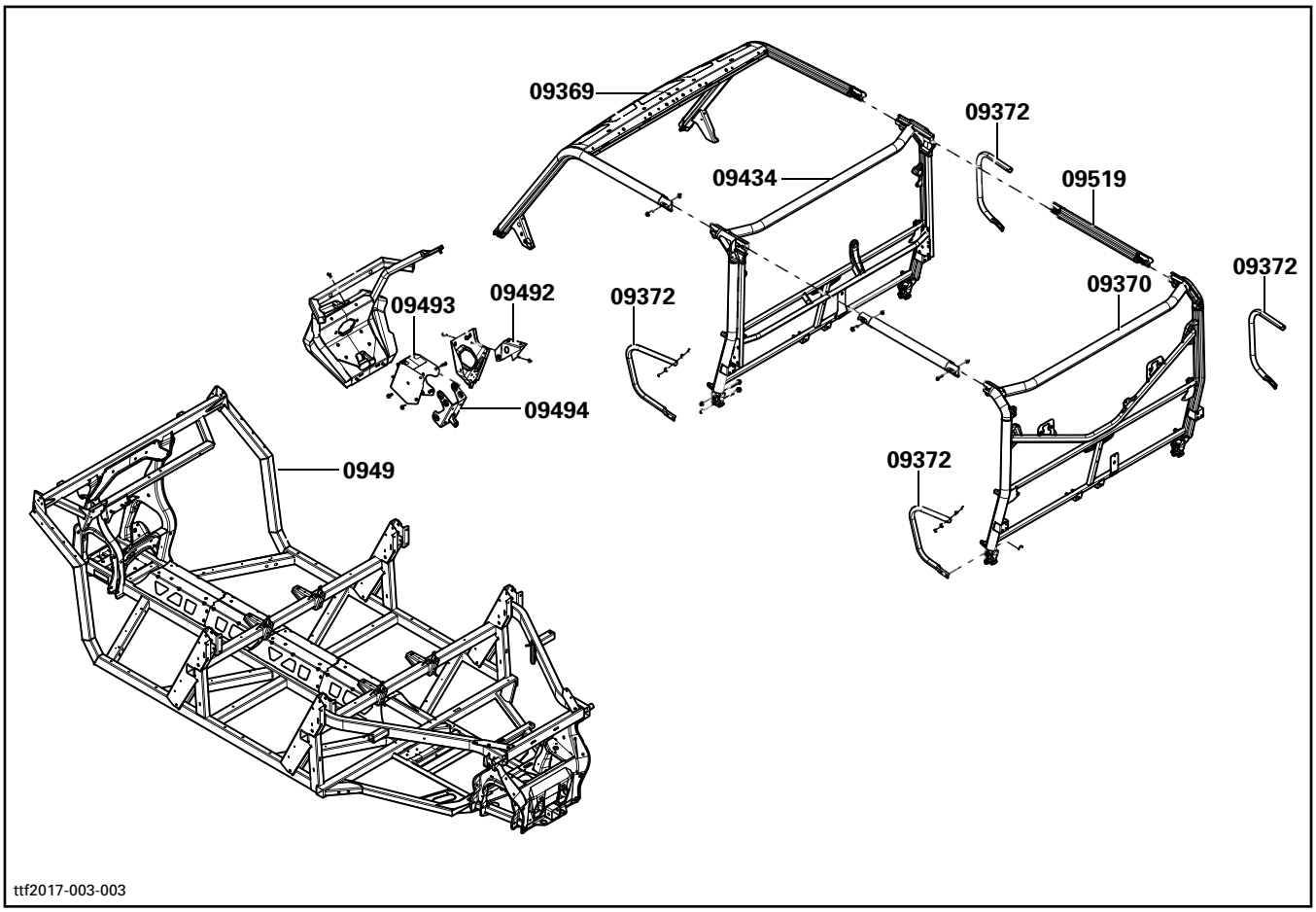
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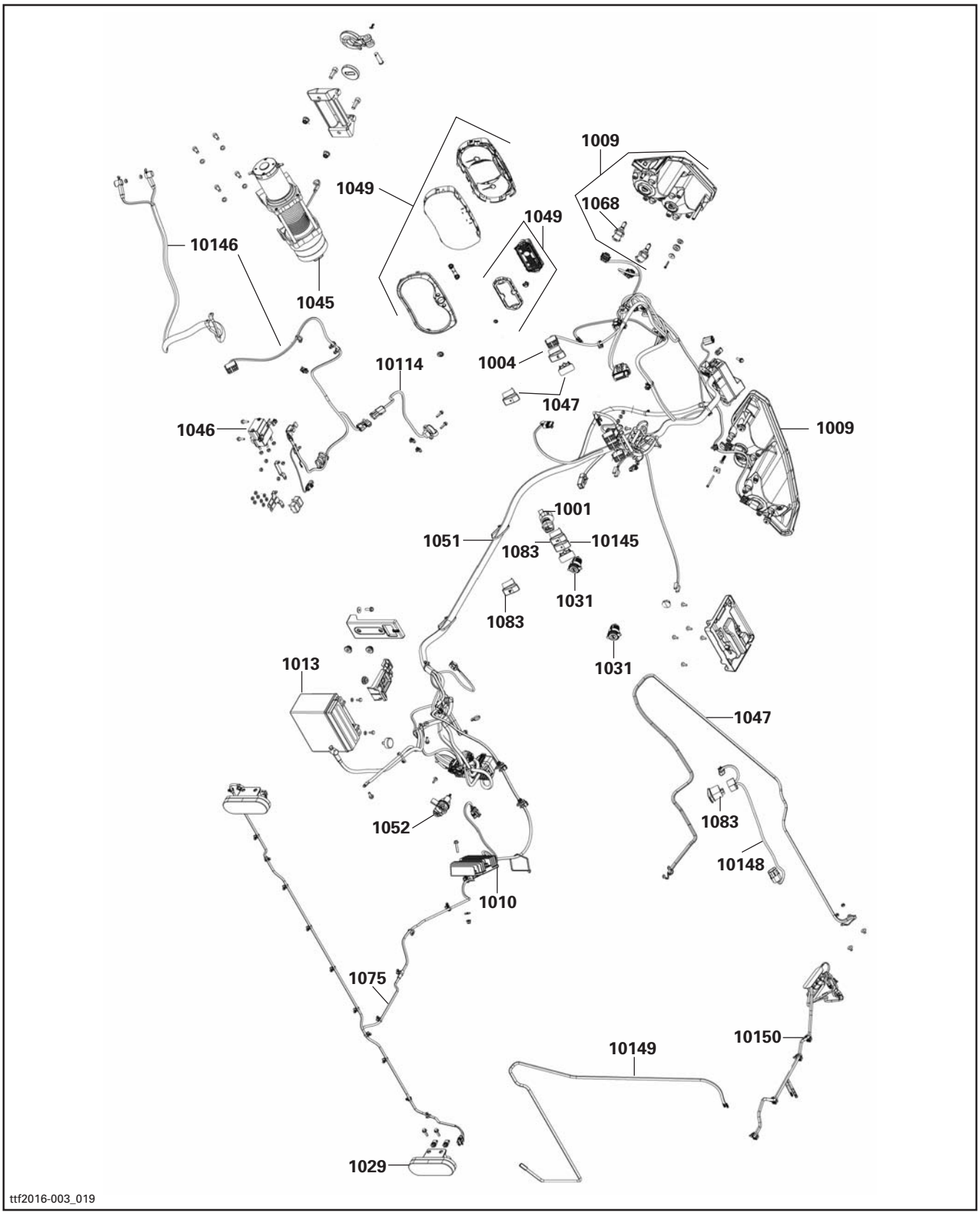
SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
10	**00**	**NO LABOR INVOLVED AUCUNE MAIN-D'OEUVRE**	**0**	**0**	**0**
10	01	IGNITION SWITCH INTERRUPTEUR D'ALLUMAGE	0.3	0.3	0.3
10	04	HEADLIGHT SWITCH INTERRUPTEUR DE PHARE	0.3	0.3	0.3
10	09	HEADLAMP AND/OR HEADLAMP SUPPORT (ASS'Y) (RH OR LH) PHARE AVANT ET/OU SUPPORT (COMPLET) (DROIT OU GAUCHE)	0.5	0.5	0.5
10	10	VOLTAGE REGULATOR RÉGULATEUR DE TENSION	0.3	0.3	0.3
10	13	BATTERY BATTERIE	0.3	0.3	0.3
10	29	TAIL LAMP HOUSING (ASS'Y) BOÎTIER DE FEU ARRIÈRE (COMPLET)	0.3	0.3	0.3
10	31	DC OUTLET PLUG PRISE D'ACCESSOIRE DC	0.3	0.3	0.3
10	34	ELECTRONIC MODULE MODULE ÉLECTRONIQUE	0.3	0.3	0.3
10	41	ENGINE HARNESS CÂBLAGE MOTEUR	1.2	1.2	1.2
10	45	WINCH (ASS'Y) (XT) TREUIL (COMPLET) (XT)		0.3	0.3
10	46	WINCH SOLENOID (XT) SOLÉNOÏDE DE TREUIL (XT)		0.4	0.4
10	47	WINCH SWITCH (XT) INTERRUPTEUR DE TREUIL (XT)		0.3	0.3
10	49	MULTIFUNCTION GAUGE CADRAN MULTIFONCTION	0.3	0.3	0.3
10	51	MAIN WIRE HARNESS CÂBLAGE PRINCIPAL	2.5	2.5	3.0
10	52	STARTING RELAY RELAIS DE DÉMARRAGE	0.4	0.4	0.4
10	67	RELAY RELAIS	0.3	0.3	0.3
10	68	ANY BULBS TOUTES LES AMPOULES	0.4	0.4	0.4
10	71	LICENSE LIGHT (ASS'Y) LUMIÈRE D'IMMATRICULATION (COMPLET)	0.3	0.3	0.3
10	75	REAR HARNESS CÂBAGLE ARRIÈRE	0.5	0.5	0.5
10	83	SWITCH INTERRUPTEUR		0.3	0.3

SYSTEM SYSTÈME	CODE	DESCRIPTION	TRAXTER HD5	TRAXTER PRO/XT	TRAXTER MAX
			28	29/30	31
10	113	REMOTE CONTROL COMMANDE À DISTANCE		0.3	0.3
10	114	WINCH CONNECTOR CONNECTEUR DE TREUIL		0.3	0.3
10	145	DIFFERENTIAL LOCK SWITCH INTERRUPTEUR DIFFERENTIEL		0.3	0.3
10	146	WINCH HARNESS HARNAIS DU TREUIL		0.4	0.4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ttf2016-003_019

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

MAVERICK SPORT

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER

709000330

3 AIR FILTER

715900394

4 CVT INTAKE FILTER

706600281

5 DRIVE BELT

422280654

6 BRAKE PADS

715900379 - FRONT LEFT
715900386 - REAR LEFT
715900380 - FRONT RIGHT
715900387 - REAR RIGHT

7 HALF SHAFTS

BASE AND DPS MODELS
705402031 - FRONT LEFT
705402030 - FRONT RIGHT
705502552 - REAR

ABS MODELS
705402443 - FRONT LEFT
705402443 - FRONT RIGHT
705502756 - REAR

8 CV BOOT KITS

705401354 - FRONT WHEEL SIDE
705401345 - FRONT WHEEL SIDE (NO ABS)
705401355 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

9 WHEEL BEARINGS

293350118

10 A-ARM BUSHINGS

703500875

11 BALL JOINTS

706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG

707000246

13 BATTERY

410301203

*Refer to periodic maintenance chart for proper intervals.

can-am BRP

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

MAVERICK TRAIL

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER
709000330

3 AIR FILTER
715900394

4 CVT INTAKE FILTER
706600281

5 DRIVE BELT
422280654

6 BRAKE PADS
715900379 - FRONT LEFT
715900386 - REAR LEFT
715900380 - FRONT RIGHT
715900387 - REAR RIGHT

7 HALF SHAFTS
705402008 - FRONT LEFT
705402007 - FRONT RIGHT
705502541 - REAR

8 CV BOOT KITS
705401345 - FRONT WHEEL SIDE
705401355 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

9 WHEEL BEARINGS
293350129

10 A-ARM BUSHINGS
703500875

11 BALL JOINTS
706203084 - UPPER
706202045 - LOWER

12 SPARK PLUG
707000246

13 BATTERY
410301203

*Refer to periodic maintenance chart for proper intervals.

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

MAVERICK X3 & MAVERICK X3 MAX

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX 900 ACE ENGINES
779260

10W-50 SYNTHETIC FOR ROTAX 900 ACE ENGINES
779261

2 FUEL FILTER

709000330

3 AIR FILTER

715900422

4 CVT INTAKE FILTER

706600148

5 DRIVE BELT

422280651 - MAVERICK X3 TURBO
422280652 - MAVERICK X3 TURBO R

6 BRAKE PADS

715900379 - FRONT LEFT
715900380 - FRONT RIGHT
715900386 - REAR LEFT
715900387 - REAR RIGHT

7 HALF SHAFTS

XMR, XRC, XRS (SMART LOK) - TURBO R
705402048 - FRONT LEFT & RIGHT
705502362 - REAR

XRS, XRS MAX - TURBO R
705402099 - FRONT LEFT
705402100 - FRONT RIGHT
705502362 - REAR

XMR, XRC (SMART LOK) - TURBO
705401634 - FRONT LEFT & RIGHT
705502154 - REAR

XRS DPS - TURBO
705402048 - FRONT LEFT & RIGHT
705502154 - REAR

900 HO
705402097 - FRONT LEFT
705402098 - FRONT RIGHT
705502154 - REAR

ALL 64" MODELS (2017-2018)
705402098 - FRONT LEFT
705402097 - FRONT RIGHT
705502154 - REAR

8 CV BOOT KITS

705401354 - FRONT
715900450 - REAR WHEEL SIDE
715900451 - REAR DIFFERENTIAL SIDE

9 WHEEL BEARINGS

293350129

10 A-ARM BUSHINGS

703500875

11 BALL JOINTS

706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG

715900492

13 BATTERY

410301203

*Refer to periodic maintenance chart for proper intervals.

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

MAVERICK & MAVERICK MAX

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER

709000330

3 AIR FILTER

707800327

4 CVT INTAKE FILTER

707001344

5 DRIVE BELT

422280364

6 BRAKE PADS

MAVERICK (EXCEPT MAX & X MR MODELS)
715500335 - FRONT LEFT
715500336 - FRONT RIGHT

MAVERICK MAX, MAVERICK X MR
705601149 - FRONT LEFT
705601150 - FRONT RIGHT

ALL MAVERICK MODELS
705600398 - REAR LEFT
705601147 - REAR RIGHT

7 HALF SHAFTS

DPS, MAX DPS MODELS
705401873 - FRONT LEFT
705401874 - FRONT RIGHT
705502413 - REAR

XC, XC DPS, X XC MODELS
705401875 - FRONT LEFT
705401876 - FRONT RIGHT
705502415 - REAR

X MR, MAX X MR MODELS
705401877 - FRONT LEFT
705401878 - FRONT RIGHT
705502414 - REAR

8 CV BOOT KITS

MAVERICK, MAVERICK MAX (EXCEPT X MR MODELS)
705401345 - FRONT WHEEL SIDE
705401346 - FRONT DIFFERENTIAL SIDE

MAVERICK X MR, MAVERICK MAX X MR
705401354 - FRONT WHEEL SIDE
705401355 - FRONT DIFFERENTIAL SIDE

MAVERICK, MAVERICK MAX
705501864 - REAR

9 WHEEL BEARINGS

293350118

10 A-ARM BUSHINGS

703500875

11 BALL JOINTS

706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG

715900244 - MAVERICK
715900357 - MAVERICK TURBO

13 BATTERY

410301203

*Refer to periodic maintenance chart for proper intervals.

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

DEFENDER & DEFENDER MAX

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX ENGINES OF 450 CC OR LESS
779256

0W-40 SYNTHETIC FOR ROTAX ENGINES OF 450 CC OR LESS
779257

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER

709000330

3 AIR FILTER

715900394

4 CVT INTAKE FILTER

706600156

5 DRIVE BELT

422280654 - HD8, HD10
422280280 - HD5

6 BRAKE PADS

HD10, HD8, HD5
715900379 - FRONT LEFT
715900380 - FRONT RIGHT
715900380 - REAR RIGHT (HD5 ONLY)

HD8, HD10
715900381 - REAR LEFT
715900382 - REAR RIGHT

HD8 MAX, HD10 MAX
715900386 - REAR LEFT
715900387 - REAR RIGHT

7 HALF SHAFTS

HD10, HD8, HD5
705401937 - FRONT LEFT
705401936 - FRONT RIGHT

XTP MODELS
705402353 - FRONT

HD5
705502478 - REAR LEFT
705502479 - REAR RIGHT

HD10, HD8 (INCLUDING XTP)
705502451 - REAR

XMR
705402420 - FRONT
705502594 - REAR

8 CV BOOT KITS

705401345 - FRONT WHEEL SIDE
705401355 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

9 WHEEL BEARINGS

293350118

10 A-ARM BUSHINGS

703500875

11 BALL JOINTS

706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG

707000246

13 BATTERY

410301203

*Refer to periodic maintenance chart for proper intervals.

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

COMMANDER & COMMANDER MAX

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER
709000330

3 AIR FILTER
707800327

4 CVT INTAKE FILTER
707001344

5 DRIVE BELT
422280360

6 BRAKE PADS
715500335 - FRONT LEFT
715500336 - FRONT RIGHT & REAR
705601149 - FRONT LEFT - MAX
705601150 - FRONT RIGHT - MAX
705600398 - REAR LEFT - MAX
705601147 - REAR RIGHT - MAX

7 HALF SHAFTS
705401872 - FRONT RIGHT
705401871 - FRONT LEFT
705502411 - REAR

8 CV BOOT KITS
705401345 - FRONT WHEEL SIDE
705401346 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

9 WHEEL BEARINGS
293350118

10 A-ARM BUSHINGS
703500875

11 BALL JOINTS
706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG
707000246

13 BATTERY
410301203

*Refer to periodic maintenance chart for proper intervals.

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

OUTLANDER & OUTLANDER MAX

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX ENGINES OF 450 CC OR LESS
779256

0W-40 SYNTHETIC FOR ROTAX ENGINES OF 450 CC OR LESS
779257

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER

709000330

3 AIR FILTER

707800371

4 CVT INTAKE FILTER

707001130

5 DRIVE BELT

422280360 - 500 CC & MORE
715900024 - 450 CC & LESS

6 BRAKE PADS

ORGANIC
705601014 - FRONT & REAR RIGHT
705601015 - FRONT LEFT

METALLIC
705600350 - FRONT RIGHT
705600349 - FRONT LEFT
705600398 - REAR LEFT

METALLIC
X MR, MAX X-TP, MAX XT, MAX PRO, MAX LTD
715900248 - FRONT & REAR RIGHT
715900249 - FRONT LEFT

7 HALF SHAFTS

ALL MODELS (EXCEPT X MR, 570 ENGINE)
705401115 - FRONT LEFT
705401116 - FRONT RIGHT

ALL MODELS (EXCEPT X MR)
705501485 - REAR LEFT
705501486 - REAR RIGHT

570 ENGINES
705401429 - FRONT RIGHT
705401428 - FRONT LEFT

XMR
705401704 - FRONT LEFT
705401703 - FRONT RIGHT
705501847 - REAR LEFT
705501848 - REAR RIGHT

8 CV BOOT KITS

X MR
715900298 - FRONT WHEEL SIDE
715900299 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

ALL MODELS (EXCEPT X MR)
705401345 - FRONT WHEEL SIDE
705401346 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

9 WHEEL BEARINGS

293350118

10 A-ARM BUSHINGS

703500875

11 BALL JOINTS

706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG

715900352 - 500, 570, 650 ENGINES
707000246 - ALL EXCEPT 500, 570, 650 ENGINES

13 BATTERY

410301203

*Refer to periodic maintenance chart for proper intervals.

GENUINE PARTS THAT SET THE STANDARD

1 YEAR WARRANTY ON ALL GENUINE CAN-AM PARTS

Precisely engineered. Rigorously tested. Proven reliability.
The ultimate off-road experience continues with the genuine Can-Am parts.

RENEGADE

MAKE SURE YOUR VEHICLE'S PERFORMANCE STAYS AT ITS PEAK BY KEEPING AN EYE ON THESE COMPONENTS.*

1 OIL CHANGE KIT XPS

5W-40 SYNTHETIC BLEND FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779258

0W-40 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779259

10W-50 SYNTHETIC FOR ROTAX V-TWIN ENGINES OF 500 CC OR MORE
779252

2 FUEL FILTER

709000330

3 AIR FILTER

707800371

4 CVT INTAKE FILTER

707001786

5 DRIVE BELT

422280360 - 500 CC & MORE
715900024 - 450 CC & LESS

6 BRAKE PADS

ORGANIC
705601014 - FRONT & REAR RIGHT
705601015 - FRONT & REAR LEFT

METALLIC
705600350 - FRONT RIGHT
705600349 - FRONT LEFT
705600398 - REAR LEFT

METALLIC - X MR MODELS
715900248 - FRONT & REAR RIGHT
715900249 - FRONT LEFT

7 HALF SHAFTS

ALL MODELS (EXCEPT X MR, 570 ENGINE)
705401115 - FRONT LEFT
705401116 - FRONT RIGHT

ALL MODELS (EXCEPT X MR)
705501485 - REAR LEFT
705501486 - REAR RIGHT

570 ENGINES
705401429 - FRONT RIGHT
705401428 - FRONT LEFT

XMR
705401704 - FRONT LEFT
705401703 - FRONT RIGHT
705501847 - REAR LEFT
705501848 - REAR RIGHT

8 CV BOOT KITS

X MR
715900298 - FRONT WHEEL SIDE
715900299 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

ALL MODELS (EXCEPT X MR)
705401345 - FRONT WHEEL SIDE
705401346 - FRONT DIFFERENTIAL SIDE
705501864 - REAR

9 WHEEL BEARINGS

293350118

10 A-ARM BUSHINGS

703500875

11 BALL JOINTS

706202044 - UPPER
706202045 - LOWER

12 SPARK PLUG

707000246 - ALL MODELS EXCEPT 500, 570, 650 ENGINES
715900352 - 500, 570, 650 ENGINES

13 BATTERY

410301203

*Refer to periodic maintenance chart for proper intervals.

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WE'RE BUILT FOR THIS

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WE'RE BUILT FOR ADVENTURE

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FULL PRODUCT DETAILS

DRIVEN BY RIDERS

THE 2019 CAN-AM LINE-UP
OUR MOST CAPABLE LINE-UP YET

YOU'LL FIND US AT THE OUTER LIMITS, OUT OF SIGNAL RANGE,
IN THE THICK OF IT, OUR EYES TOWARD THE HORIZON.
RACING, TUGGING, SLIDING, POWERING ACROSS THIS EARTH,
UNTIL WE'RE ABOVE IT. PAST IT. BROKEN THROUGH. FINISHED.
SOME CALL IT A CHALLENGE, THE JOURNEY, A THRILL:
WE CALL IT REALITY. WE'RE BUILT FOR THIS.

WE'RE BUILT FOR HARD WORK

WHEN YOU LIVE AND WORK OFF THE BEATEN PATH, TRUST IS EARNED. EARNED THROUGH ENDURANCE. EARNED THROUGH CAPABILITY. AND EARNED THROUGH ALL-DAY COMFORT. THAT'S WHY WE BUILD OFF-ROAD VEHICLES TO PERFORM WITH YOU, NOT AGAINST.

DEFENDER

OUTLANDER 450/570

DEFENDER

FROM TOP TO BOTTOM, CAN-AM DEFENDER SIDE-BY-SIDES HAVE BEEN ENGINEERED TO OVERCOME OBSTACLES AND MAXIMIZE A HARD DAY'S WORK.

TOUGH

Designed from the core to stop, steer, and perform with confidence, the Can-Am Defender is equipped to never quit. With one of our heavy-duty Rotax® engines, not only will it take on your never-ending to-do list, it'll ask for more.

CAPABLE

Built with Can-Am's legendary reliability, Defender thrives on a hard day's work. If you can think it, chances are the Defender can do it.

CLEVER

When you sweat the details, you'll relish in your results. Engineered to adapt to its rider's needs, the Can-Am Defender can conquer anything you throw at it: from the farm, to the ranch, to the hunt, to a ride with family and friends. It does it all. And with smart solutions like cockpit storage and a cargo box, you'll be able to store whatever you need for whatever you're doing.

ACCESSORY LIST

This Vehicle: Defender XT HD10

1. Headache rack
2. Bed wall extender
3. Rear bumper, rear body side protectors
4. Flip glass windshield
5. Rear hitch drawbar

1 YEAR DEFENDER LIMITED WARRANTY

PEACE OF MIND COMES STANDARD

DEFENDER

HARD ON WORK. EASY ON YOUR WALLET.

KEY FEATURES
Rotax engine options: HD5/HD8
Engine Power: 38 hp/50 hp
- Integrated front steel bumper
- VERSA-PRO bench seat
- Central HMW skid plate

COLOR

DEFENDER DPS™

A MACHINE THAT GOES WHERE YOU TELL IT TO EVERY STEP OF THE WAY.

KEY FEATURES
Rotax engine options: HD5/HD8/HD10
Engine Power: 38 hp/50 hp/72 hp
- Dynamic Power Steering (DPS)
- Visco-Lok† QE
- Aluminum wheels

COLOR/ENGINE
- (HD8 only)
- (HD10 only)
- (HD5 & HD8 only)

Also available in 6-passenger MAX configuration (HD8 & HD10)

DEFENDER XT

CAPABILITY, VERSATILITY, AND RELIABILITY HAVE NEVER LOOKED THIS GOOD.

KEY FEATURES
Rotax engine options: HD8/HD10
Engine Power: 50 hp/72 hp
- XT Front bumper
- Full hard top, full skid plate
- 4,500 lb (2,041 kg) winch

COLOR

Available in 6-passenger MAX configuration

DEFENDER XT CAB

WHO EVER SAID ROCKS, RUTS, AND ROUGH WEATHER CAN'T BE COMFORTABLE.

KEY FEATURES
Rotax engine options: HD8/HD10
Engine Power: 50 hp/72 hp
- Full cab enclosure
- Integrated heater kit
- Full hard roof with liner and interior dome light

COLOR
- (HD10 only)

Available in 6-passenger MAX configuration (HD10 only)

^1-YEAR MANUFACTURER LIMITED WARRANTY: Effective as of June 1st, 2018. Eligible units are new and unused 2019 Can-Am Defender models. Subject to the exclusions, limitations of liabilities and all other terms and conditions of BRP's limited warranty.

DEFENDER MOSSY OAK® HUNTING EDITION

THE PERFECT COMPANION FOR WHEN YOU'RE ON THE HUNT.

KEY FEATURES
Rotax HD10 engine
Engine Power: 72 hp
- Double Kolpin Stronghold Gun Boots
- Heavy-duty front steel bumper with front aluminum pre-runner skid plate and rock sliders
- 4,500 lb (2,041kg) winch

COLOR

DEFENDER XT-P

THE PERFORMANCE AND CAPABILITY TO GO WHERE YOU WANT, WHEN YOU WANT.

KEY FEATURES
Rotax HD10 engine
Engine Power: 72 hp
- Sporty look
- FOX® PODIUM 2.0 shocks
- Smart-Lok™* (Trail mode)
- Rock sliders and heavy-duty bumper

COLOR

DEFENDER MAX LONE STAR

THE CLOSEST YOU'LL GET TO A LUXURY VEHICLE IN THE BACKCOUNTRY.

KEY FEATURES
Rotax HD10 engine
Engine Power: 72 hp
- Heavy-duty front steel bumper and aluminum rock slider
- Unique Lone Star color and trim
- 4,500 lb winch
- Arched front A-arms

COLOR

DEFENDER X mr

MUD DOESN'T STAND A CHANCE.

KEY FEATURES
Rotax HD10 engine
Engine Power: 72 hp
- Snorkeled CVT and relocated engine air intake
- Smart-Lok (Mud mode)
- Relocated 4,500 lb winch with synthetic rope
- Rock sliders and heavy-duty bumper
- Arched front A-arms

COLOR

ACCESSORY LIST

This Vehicle: Defender XT-P

1. Half windshield
2. Sport Roof
3. Half Doors

1 YEAR DEFENDER LIMITED WARRANTY

PEACE OF MIND COMES STANDARD

FOR MORE INFORMATION AND A COMPLETE LIST OF ACCESSORIES VISIT **CAN-AMOFFROAD.COM**

*SMART-LOK WAS DEVELOPED IN CONJUNCTION WITH TEAM INDUSTRIES, A MARKET LEADER IN THE DRIVETRAIN INDUSTRY.

OUTLANDER 450/570

THE 2019 OUTLANDER 450/570 ARE TWO OF THE TOUGHEST AND MOST ROBUST VEHICLES OUT THERE. THEY AREN'T JUST CAPABLE OF HARD WORK, THEY CRAVE IT.

TOUGH

Tough and reliable, the Can-Am Outlander is a workhorse that's just as durable as you are.

CAPABLE

Enjoy the confidence that comes with a heavy-duty vehicle capable of keeping up with your toughest days.

DESIGN

Outlander is built from the rider down, so it offers a comfortable ride with no compromise on performance.

WE'RE BUILT FOR HARD WORK
OUTLANDER

OUTLANDER 450/570

UNREASONABLE ENGINEERING. REASONABLE PRICE TAG.

KEY FEATURES
Rotax engine options: 450/570
Engine Power: 38 hp/48 hp
- Torsional Trailing arm Independent (TTI) rear suspension
- 1,300 lb (590 kg) towing capacity

COLOR

***Also available in 2-passenger MAX configuration**

OUTLANDER DPS 450/570

EXPLORE WITH COMFORT AND CONFIDENCE.

KEY FEATURES
Rotax engine options: 450/570
Engine Power: 38 hp/48 hp
- Tri-Mode Dynamic Power Steering (DPS)
- Torsional Trailing arm Independent (TTI) rear suspension
- 12 in. cast-aluminum wheels

COLOR

***Also available in 2-passenger MAX configuration**

OUTLANDER XT 570

WELL-EQUIPPED FOR WHEREVER. WELL-MADE FOR WHATEVER.

KEY FEATURES
Rotax 570 engine
Engine Power: 48 hp
- 3,000 lb (1,361 kg) WARN† winch with roller fairlead
- Front and rear bumpers
- Painted plastics for premium look

COLOR

***Also available in 2-passenger MAX configuration**

OUTLANDER MOSSY OAK HUNTING EDITION 450/570

YOUR READY-FOR-ANYTHING HUNTING COMPANION.

KEY FEATURES
Rotax engine options: 450/570
Engine Power: 38 hp/48 hp
- 3,000 lb (1,361 kg) WARN winch with roller fairlead
- 26 in. Carlisle† ACT HD 6-ply tires on 12 in. aluminum wheels
- Full underbody aluminum skid plate

COLOR

OUTLANDER X mr 570

MUD DOESN'T STAND A CHANCE.

KEY FEATURES
Rotax 570 engine
Engine Power: 48 hp
- Rotax snorkeled V-Twin engine with relocated CVT intake and outlet
- Relocated radiator
- 28 in. ITP Mega Mayhem† tires on 12 in. cast-aluminum wheels
- Tri-Mode Dynamic Power Steering (DPS)

COLOR

ACCESSORY LIST

This vehicle: Outlander DPS 450/570

1. Can-Am Terra Winch 25 by SUPERWINCH†
2. XT Front Bumper, Extreme Front Bumper
3. Heavy-duty basket
4. Rear bumper, rear receiver hitch

WE'RE BUILT FOR PERFORMANCE

RACE EXPERIENCE BREEDS CAPABILITY, AND CAPABILITY BREEDS BETTER RIDING EXPERIENCES.

MAVERICK X3

MAVERICK SPORT

RENEGADE

MAVERICK X3

THE X3 WASN'T BUILT FOR LEISURELY DRIVES IN THE COUNTRYSIDE. IT WAS BUILT TO MAKE YOUR EYEBALLS RATTLE IN YOUR HEAD. FROM ITS AGGRESSIVE FUTURE-FORWARD DESIGN TO ITS ERGO-LOK COCKPIT THAT PUTS THE DRIVER AT THE HEART OF THE VEHICLE, IT'S ENGINEERED TO FEAST ON ANY TERRAIN WITH UP TO 172 TURBOCHARGED HORSES.

DEFIANT

The X3 is unlike any other side-by-side. It doesn't see dunes, trails, and rocks as terrain. It sees them as one big playground.

POWERFUL

0–60 MPH in 4.4 seconds. Need we say more? Okay: 172 turbocharged horses, and 125 lb-ft of torque at 6,500 RPM. Let 'er rip!

PRECISE

Out there, you're going to want a vehicle that goes exactly where you tell it to. With a lightweight chassis and sport-tuned suspension, the X3 is just that vehicle.

MAVERICK X3 TURBO

YOUR FIRST STEP TOWARDS OFF-ROAD DOMINANCE.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine
Engine Power: 120 hp
- FOX 2.5 PODIUM shocks
- Front and rear 20 in. suspension travel
- 14 in. aluminum wheels

COLOR

***Also available in 4-passenger MAX configuration**

MAVERICK X3 TURBO R

AN EVEN MORE POWERFUL STEP TOWARDS OFF-ROAD DOMINANCE.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine with integrated intercooler
Engine Power: 172 hp
- FOX 2.5 PODIUM shocks
- 14 in. aluminum wheels
- 20 in. front and rear suspension travel

COLOR

***Also available in 4-passenger MAX configuration**

MAVERICK X3 X ds TURBO R

CONQUER IT ALL WITH UNQUESTIONABLE X3 CAPABILITY.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine with integrated intercooler
Engine Power: 172 hp
- FOX 2.5 PODIUM RC2 shocks
- 14 in. aluminum beadlock wheels
- Smart-Lok (Trail Activ)
- 20 in. front and rear suspension travel

COLOR

***Also available in 4-passenger MAX configuration**

MAVERICK X3 X rs TURBO

DESERTS, DUNES, DUST… IT DOES IT ALL. EASILY.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine with integrated intercooler
Engine Power: 172 hp
- Fully adjustable FOX front 2.5/ rear 3.0 PODIUM RC2 Piggyback/ remote reservoir shocks with bypass
- Full roof, heavy-duty HMW skid plate, and 4-point harness
- 14 in. aluminum beadlock wheels
- Smart-Lok (Trail Activ)
- 22 in. front and 24 in. rear suspension travel

COLOR

***Also available in 4-passenger MAX configuration**

ACCESSORY LIST

This vehicle: Maverick X3 TURBO R

1. Half windshield
2. Baja Designs XL Sport LED lights, light support bar
3. Bimini roof
4. Lighted whip flag, rear windscreen
5. LinQ 8 gal cooler box

MAVERICK X3 X rc TURBO

THE ROCKS WILL NEVER KNOW WHAT HIT 'EM.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine
Engine Power: 120 hp
- SUPERWINCH 4,500 lb (2,041 kg) with synthetic rope
- Smart-Lok (Rock mode)
- FOX 2.5 PODIUM QS3† shocks
- 14 in. aluminum wheels with 30 in. Maxxis Liberty tires
- Rock sliders and tow hooks

COLOR

MAVERICK X3 X rc TURBO R

HIT THE ROCKS WITH EVEN MORE POWER.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine with integrated intercooler
Engine Power: 172 hp
- Fully adjustable FOX front 2.5/ rear 3.0 PODIUM RC2 Piggyback/ remote reservoir shocks with bypass
- Full aluminum roof
- Smart-Lok (Rock mode)
- SUPERWINCH 4,500 lb (2,041 kg) with synthetic rope
- 14 in. aluminum beadlock wheels with 30 in. Maxxis Liberty tires
- 22 in. front and 24 in. rear suspension travel
- Aluminum roof, rock sliders, intrusion bar and tow hooks

COLOR

SMART LOK™ TECHNOLOGY

A UNIQUE FRONT DIFFERENTIAL:
SMART-LOK IS A FULLY LOCKABLE ON-THE-FLY FRONT DIFFERENTIAL WITH ELECTRONICALLY-CONTROLLED AUTOMATIC MODES THAT WILL ALWAYS PROVIDE MAXIMUM TRACTION IN EVERY CONDITION.

FULLY LOCKABLE **MULTI-MODE** **ON-THE-FLY**

MAVERICK X3 X mr TURBO

DO YOUR WORST, MUD. WE'VE DONE OURS.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine
Engine Power: 120 hp
- Snorkeled CVT and relocated engine air intake
- SUPERWINCH 4,500 lb (2,041 kg) with synthetic rope
- Smart-Lok (Mud mode)
- 14 in. aluminum wheels with 30 in. ITP Cryptid tires
- FOX 2.5 PODIUM QS3 shocks

COLOR

MAVERICK X3 X mr TURBO R

GIVE MUD WHAT IT DESERVES WITH EVEN MORE POWER.

KEY FEATURES
Rotax ACE turbocharged triple-cylinder engine with integrated intercooler
Engine Power: 172 hp
- Snorkeled CVT and relocated engine air intake
- SUPERWINCH 4,500 lb (2,041 kg) with synthetic rope
- Smart-Lok (Mud mode)
- FOX 2.5 PODIUM QS3 shocks
- 22 in. front and 24 in. rear suspension travel
- 14 in. aluminum beadlock wheels with 30 in. ITP Cryptid tires

COLOR

ACCESSORY LIST

This vehicle: Maverick X3 X rs

1. Front and rear pre-runner bumper
2. 40 in. Baja Designs ONX6 Arc LED Light Bar

FOR MORE INFORMATION AND A COMPLETE LIST OF ACCESSORIES VISIT **CAN-AMOFFROAD.COM**

*SMART-LOK WAS DEVELOPED IN CONJUNCTION WITH TEAM INDUSTRIES, A MARKET LEADER IN THE DRIVETRAIN INDUSTRY.

NEW MAVERICK SPORT

MAVERICKS, MEET THE MAVERICK SPORT, OUR MOST VERSATILE MAVERICK YET. AT 60 INCHES WIDE AND WITH TWO 1000 CC ROTAX ENGINES TO CHOOSE FROM, YOU CAN GO FROM THE TRAILS TO THE DESERT TO ROCKS ALL IN THE SAME RIDE. WE'VE PUSHED ITS LIMITS. NOW IT'S YOUR TURN.

DARING

When you put X3 DNA into a 60-inch frame, you don't just get a Maverick Sport, you get a way of life. You get power, precision, and the unmatched ability to go from the trails to the desert to the rocks and back again.

PRECISE

Precision is a word that gets tossed around a lot. But when you extend your wheelbase to be longer than the competition, and then add a sport-tuned suspension, precision is exactly what you get. What does that mean, exactly? You point. It goes.

CONFIDENT

Stability, capability, driveability – they're all the building blocks of confidence. It's what you want in a vehicle, so it's precisely what we put into the Maverick Sport.

MAVERICK SPORT NEW

PERFORMANCE THAT WON'T BREAK THE BANK.

KEY FEATURES
Rotax 1000 V-Twin engine
Engine Power: 75 hp
- FOX 2.0 PODIUM shocks
- 12 in. cast-aluminum wheels with Maxxis Bighorn 2.0† tires
- Premium half door

COLOR

MAVERICK SPORT DPS NEW

THE EASY-HANDLING, DO-IT-ALL WEEKEND WARRIOR.

KEY FEATURES
Rotax engine options: 1000 V-Twin/ 1000R V-Twin
Engine Power: 75 hp / 100 hp
- Dynamic Power Steering (DPS)
- 12 in. cast-aluminum wheels with Maxxis Bighorn 2.0 tires
- Can-Am LED Signature Light
- Premium half door
- Painted plastics for premium look

COLOR

ACCESSORY LIST

This vehicle: Maverick Sport DPS 1000R

1. Lonestar Racing aluminum roof, 39 in. (99 cm), double stacked LED light bar (270 watts), Lonestar Racing mounts for 39 in. (99 cm) double stacked LED light bar
2. Lonestar Racing front & rear intrusion bars
3. Beard suspension seats
4. Lonestar Racing rock sliders

RENEGADE

IT ISN'T EASY TO EXCEED RIDERS' EXPECTATIONS. IT TAKES YEARS OF RACE EXPERIENCE AND ENGINEERING. BUT WE DID IT, AND IT LED TO THE MOST POWERFUL ATV ON THE MARKET. WHETHER YOU CHOOSE THE STANDARD MODEL OR THE MUD-CONQUERING X mr 1000R, THERE'S A NEWLY REIMAGINED RENEGADE THAT'S BUILT FOR YOU.

PERFORMANCE

Tackle any trail, maneuver in any mud pit, and champion any challenge. The all-powerful Renegade does it all, and its V-Twin engine gives you the perfect soundtrack to do it to.

DESIGN

Whether it's for aggressive trail riding or hitting the nastiest mud hole you can find, you can rest assured you'll be doing it with the meanest-looking ATV on the market – scratch that, the all-around meanest ATV on the market.

HANDLING

These machines are race ready, so do your worst. Its FOX shocks and rigid chassis will keep you planted in perfect position and riding in style.

RENEGADE

OUR MOST ATTAINABLE ALL-OUT PERFORMANCE MACHINE.

KEY FEATURES
Rotax engine options: 570/850/1000R
Engine Power: 48 hp/78 hp/91 hp
- NEW 48 in. wide Torsional Trailing arm Independent (TTI) rear suspension
- FOX PODIUM 1.5 shocks (850 and 1000R)

COLOR

RENEGADE X xc

EXPERTLY ENGINEERED FOUR-WHEELED FURY.

KEY FEATURES
Rotax engine options: 850/1000R
Engine Power: 78 hp/91 hp
- FOX PODIUM 1.5 RC2 shocks
- 12 in. cast-aluminum beadlock wheels
- Tri-Mode Dynamic Power Steering (DPS)

COLOR
(1000R only)

RENEGADE X mr 570

BE WARNED, MUD. BE WARNED.

KEY FEATURES
Rotax 570 engine
Engine Power: 48 hp
- Rotax snorkeled V-Twin engine with relocated CVT intake and outlet
- Mud performance tires on beadlock wheels
- FOX PODIUM 1.5 shocks

COLOR

RENEGADE X mr 1000R

MORE POWER MEANS MORE MUD CONQUERING.

KEY FEATURES
Rotax 1000R engine
Engine Power: 91 hp
- Rotax snorkeled V-Twin engine with relocated CVT intake and outlet
- Mud performance tires on beadlock wheels
- FOX PODIUM 1.5 QS3 shocks

COLOR

WE'RE BUILT FOR ADVENTURE

OFF THE MAP AND ON THE GAS: THAT'S THE SPIRIT OF EVERY OFF-ROAD VEHICLE WE MAKE.

OUTLANDER

COMMANDER

MAVERICK TRAIL

YOUTH

OUTLANDER

INTRODUCING THE *NEW* 2019 OUTLANDER: RE-IMAGINED FROM RIDER DOWN.

THE MOST CAPABLE, READY-FOR-ANYTHING OUTLANDER EVER. WITH IMPROVED HANDLING, INCREASED STABILITY, BETTER PERFORMANCE, AND A NEW LOOK, THE 2019 OUTLANDER TRULY IS BUILT FOR WHATEVER YOU THROW AT IT.

PERFORMANCE

Built to last and ready for a blast, Can-Am Outlanders are reimagining what it means to get out there and give 'er.

HANDLING

Corrective steering is a thing of the past. The Can-Am Outlanders are built for stability and precision, so they go where you tell them to, no questions asked.

DESIGN

Form, function, and fun. That's the DNA of the Outlander family, and that's what goes into the design of each and every vehicle. What does that mean for you? It means riding in comfort and looking good wherever you go.

OUTLANDER

A WHOLE LOT OF GO FOR A LOT LESS DOUGH.

KEY FEATURES
Rotax engine options: 650/850
Engine Power: 62 hp/78 hp
- NEW 48 in. wide Torsional Trailing arm Independent (TTI) rear suspension
- 1,650 lb (750 kg) towing capacity

COLOR

OUTLANDER DPS

ENJOY LONGER RIDES WITH COMFORT AND CONFIDENCE.

KEY FEATURES
Rotax engine options: 650/850/1000R
Engine Power: 62 hp/78 hp/91 hp
- Tri-Mode Dynamic Power Steering (DPS)
- NEW 48 in. wide Torsional Trailing arm Independent (TTI) rear suspension

COLOR

***Also available in 2-passenger MAX configuration (650 only)**

OUTLANDER XT

STYLE, COMFORT AND CAPABILITY ON FOUR WHEELS.

KEY FEATURES
Rotax engine options: 650/850/1000R
Engine Power: 62 hp/78 hp/91 hp
- 3,000 lb (1,361 kg) WARN winch with roller fairlead
- Front and rear bumpers
- Painted plastics for premium look

COLOR/ENGINE

(650, 850 only)

***Also available in 2-passenger MAX configuration**

OUTLANDER XT-P

THE PERFORMANCE YOU NEED TO EXPAND YOUR OFF-ROAD CAPABILITIES.

KEY FEATURES
Rotax engine options: 850/1000R
Engine Power: 78 hp/91 hp
- FOX PODIUM 1.5 QS3 shocks
- 14 in. cast-aluminum beadlock wheels
- Front and rear bumpers

COLOR

***Also available in 2-passenger MAX configuration**

ACCESSORY LIST

This vehicle: Outlander MAX XT

1. LinQ 32 gal (124 L) trunk box, trunk box panels

OUTLANDER MOSSY OAK HUNTING EDITION 1000R

TAILOR MADE FOR OFF-ROAD, ON-THE-HUNT RIDING.

KEY FEATURES
Rotax 1000R engine
Engine Power: 91 hp
- 3,000 lb (1,361 kg) WARN winch with roller fairlead
- 26 in. Carlisle ACT HD 6-ply tires on 12 in. aluminum wheels
- Full underbody aluminum skid plate

COLOR

OUTLANDER NORTH EDITION

COLD WEATHER CAPABLE FOR YEAR-ROUND RIDING.

KEY FEATURES
Rotax engine options: 650/850
Engine Power: 62 hp/78 hp
- 3,000 lb (1,361 kg) WARN winch with roller fairlead
- Heated grips and visor outlet
- CVT with extra low L-gear

COLOR

***Also available in 2-passenger MAX configuration**

OUTLANDER X mr 650

BEST-IN-CLASS POWER FOR BEST-IN-MUD CAPABILITIES.

KEY FEATURES
Rotax 650 engine
Engine Power: 62 hp
- Rotax snorkeled V-Twin engine with relocated CVT intake and outlet
- Relocated radiator

COLOR

OUTLANDER X mr 850

AN EXTRA JOLT OF POWER FOR THE MUD.

KEY FEATURES
Rotax 850 engine
Engine Power: 78 hp
- Rotax snorkeled V-Twin engine with relocated CVT intake and outlet
- Relocated radiator
- FOX PODIUM 1.5 shocks

COLOR

OUTLANDER X mr 1000R

MAXIMIZE YOUR POWER IN THE MUD.

KEY FEATURES
Rotax 1000R engine
Engine Power: 91 hp
- Rotax snorkeled V-Twin engine with relocated CVT intake and outlet
- Relocated radiator
- FOX PODIUM 1.5 QS3 shocks
- 59 in. wheelbase

COLOR

OUTLANDER X xc 1000R

FINE-TUNED, ENGINEERED ADRENALINE.

KEY FEATURES
Rotax 1000R engine
Engine Power: 91 hp
- FOX PODIUM 1.5 RC2 shocks
- 14 in. cast-aluminum beadlock wheels
- Intelligent Throttle Control (iTC™) with riding modes

COLOR

OUTLANDER MAX LIMITED 1000R

TRAILS HAVE NEVER FELT SO LUXURIOUS.

KEY FEATURES
Rotax 1000R engine
Engine Power: 91 hp
- Air Control Suspension (ACS) with FOX Air Assist
- Garmin† Montana† 650t touchscreen GPS
- Intelligent Throttle Control (iTC) with riding modes

COLOR

OUTLANDER MAX 6X6 DPS 1000

YOUR BEST ALLY FOR WORK.

KEY FEATURES
Rotax 650 engine
Engine Power: 62 hp
- 700 lb (318 kg) capacity Dual-Level™ cargo box with modular accessories
- Selectable 4W/6WD with Visco-Lok QE auto-locking front differential
- Tri-Mode Dynamic Power Steering (DPS)

COLOR

OUTLANDER MAX 6X6 XT 1000

WORK BETTER WITH MORE FEATURES.

KEY FEATURES
Rotax 1000 engine
Engine Power: 82 hp
- Intelligent Throttle Control (iTC) with riding modes
- 3,000 lb (1,361 kg) WARN winch with roller fairlead
- Continuously Variable Transmission (CVT) with extra low L-gear

COLOR

MAVERICK TRAIL

ADVENTURE WOULDN'T EXIST WITHOUT A MEANS TO EXPLORE. THAT'S WHY WE CREATED THE MAVERICK TRAIL. BUILT WITH A CAN-AM SOUL AND A ROBUST ROTAX ENGINE, IT'S PRIMED TO TAKE YOU WHEREVER YOUR HEART LEADS IT.

AGILE

At just 50 inches wide, the Maverick Trail is built for almost every trail system out there. Combine that with unmatched comfort, precise handling, and industry-leading stability and you might never want to come home.

ADVENTUROUS

The Maverick Trail was engineered with three simple words in mind: "Let's keep going." And with the comfort and capacity of Ergo-Lok technology, going farther has never been easier.

CONFIDENT

Capability is the foundation of confidence. So when you combine Can-Am DNA with a robust 50-inch stance and enhanced protection, you inspire the courage to push every boundary ahead of you.

MAVERICK TRAIL

YOUR FIRST STEP TOWARDS THE TRAILS.

KEY FEATURES
Rotax engine options: 800 V-Twin/1000 V-Twin
Engine Power: 51 hp/75 hp
- 12 in. (30.5 cm) steel wheels
- Ergoprint seats

COLOR

MAVERICK TRAIL DPS

YOUR SENSE OF ADVENTURE IS ITS ONLY LIMITATION.

KEY FEATURES
Rotax engine options: 800 V-Twin/1000 V-Twin
Engine Power: 51 hp/75 hp
- Dynamic Power Steering (DPS)
- 12 in. cast-aluminum wheels
- Can-Am LED Signature
- Half Door (1000 V-Twin)
- Lockable rear differential
- Painted plastic for a premium look

COLOR

ACCESSORY LIST

This vehicle: Maverick Trail DPS

1. DragonFire aluminum roof
2. DragonFire front intrusion bar
3. DragonFire front bumper
4. DragonFire rock sliders
5. Beard suspension seats

COMMANDER

IT'S A LIBERATING FEELING WHEN YOU KNOW YOU CAN GO WHEREVER, WHENEVER ON A MOMENT'S NOTICE. CAN-AM COMMANDERS COME BUILT TO HANDLE ANY TERRAIN, SO EMBRACE THE SPIRIT OF ADVENTURE AND GET OUT THERE.

PERFORMANCE

Often described as the most versatile side-by-side on the market, Commander is built to tackle any task thrown its way. Whether you use it for recreation, utility, or anything else, Commander is engineered from the ground up to excel at any task given to it.

RIDER-FOCUSED DESIGN

Whatever is riding with you, gear or your buddies, Commander has you covered. Rider-focused design mixed with industry exclusive storage solutions means everything, including you, is kept comfortable and secure.

HANDLING

Commander is built fully equipped with the tools needed to dominate any terrain that you ride or work on. Over, under, or through, Commander has got your back.

COMMANDER

VERSATILITY MEETS VALUE.

KEY FEATURES
Rotax 800R V-Twin engine
Engine Power: 71 hp
- Torsional Trailing arm Independent (TTI) rear suspension with external sway bar
- Industry's exclusive Dual-Level cargo box
- 27 in. Maxxis Bighorn 2.0 tires
- Adjustable driver's seat and tilt steering

COLOR

COMMANDER DPS

EXPLORE WITH COMFORT AND CONFIDENCE.

KEY FEATURES
Rotax engine options:
800R V-Twin/1000R V-Twin
Engine Power: 71 hp/92 hp
- Tri-mode Dynamic Power Steering (DPS)
- Visco-Lok QE
- 14 in. cast-aluminum wheels with Maxxis Bighorn 2.0 tires

COLOR

***Also available in 4-passenger MAX configuration**

COMMANDER XT

THE STYLE YOU WANT WITH THE VERSATILITY AND PEACE OF MIND YOU NEED.

KEY FEATURES
Rotax engine options:
800R V-Twin/1000R V-Twin
Engine Power: 71 hp/92 hp
- Heavy-duty front bumper and rugged bed rails
- 4,500 lb (2,041 kg) winch
- Mud guard

COLOR
(1000R only)

***Also available in 4-passenger MAX configuration**

COMMANDER LIMITED

THE UPPER ECHELON OF OFF-ROAD CAPABILITY.

KEY FEATURES
Rotax 1000R V-Twin engine
Engine Power: 92 hp
- FOX 2.0 PODIUM QS3
- Sound system
- Garmin Montana 650t touchscreen GPS
- 2 piece full hard roof, half windshield and rear net
- Limited seat trims

COLOR

***Also available in 4-passenger MAX configuration**

ACCESSORY LIST

This vehicle: Commander Limited

1. Half doors
2. Rock sliders

YOUTH

WE LIVE TO BUILD THE BEST OFF-ROAD MACHINES, AND THAT STARTS WITH THE CAN-AM YOUTH ATVS. THEY COMBINE ALL OF THE PERFORMANCE, PRECISION, AND DURABILITY YOU'D EXPECT FROM A CAN-AM VEHICLE WITH THE SAFETY AND INTUITIVE OPERATION YOU'D HOPE FOR IN YOUTH ATVS. THE NEXT GENERATION OF RIDER IS GEARING UP TO GO. GET 'EM ON A PROPER VEHICLE.

INTUITIVE

The Can-Am DS is tailor-made for first-time riders. With a 4-stroke engine with an electric starter, getting started couldn't be easier. And because its CVT transmission doesn't require shifting, your little ones can give all of their focus to the trail ahead. There's even a speed limiter if they start to get ahead of themselves.

COOL

Badass looks meets Can-Am capabilities. And for aspiring racers, the X package (performance shocks, brakes, exhaust) dials up the cool factor even more.

CAMARADERIE

Bring your little ones into the world of riding. Share quality time outdoors, and create memories that will make them the envy of all their friends.

DS 70™

KEY FEATURES
- Starting driving age: 6 years old
- 4-stroke engine
- CVT transmission
- Starting system: Electric with backup kick start

COLOR

DS 90™

KEY FEATURES
- Starting driving age: 10 years old
- 4-stroke engine
- CVT transmission
- Starting system: Electric with backup kick start

COLOR

DS 90X

KEY FEATURES
- Starting driving age: 10 years old
- 4-stroke engine
- CVT transmission
- Starting system: Electric with backup kick start

COLOR

DS 250

KEY FEATURES
- Starting driving age: 14 years old
- 4-stroke engine
- CVT transmission
- Starting system: Electric

COLOR

OUTLANDER

KEY FEATURES	BASE		DPS			XT			NORTH EDITION	
Rotax engine options	650	850	650	850	1000R	650	850	1000R	650	850
Engine power	62 hp	78 hp	62 hp	78 hp	91 hp	62 hp	78 hp	91 hp	62 hp	78 hp
Engine type	V-Twin		V-Twin			V-Twin			V-Twin	
Intelligent Throttle Control (iTC) with riding modes					x			x		
Tri-Mode Dynamic Power Steering (DPS)			x			x			x	
Shocks	Oil		Oil			Oil			Oil	
Wheels	12 in. steel		14 in. cast-aluminum			14 in. cast-aluminum			14 in. cast-aluminum	
3,000 lb (1,361 kg) WARN winch with roller fairlead						x			x	
Bumpers						Front and rear				
Package extras									Heated grips, throttle and visor outlet, windshield, mudguards	
Available in 2-passenger MAX configuration*			x			x			x	
Color options*	Viper Red		Orange			Black & Can-Am Red Intense Red Mossy Oak Break-Up Country Camo† (650, 850)		Black & Can-Am Red Intense Red	White	

MOSSY OAK HUNTING EDITION	XT-P		X xc	X mr			MAX LIMITED
1000R	850	1000R	1000R	650	850	1000R	1000R
91 hp	78 hp	91 hp	91 hp	62 hp	78 hp	91 hp	91 hp
V-Twin	V-Twin		V-Twin	V-Twin			V-Twin
x		x	x			x	x
x	x		x	x			x
Oil	FOX PODIUM 1.5 QS3		FOX PODIUM 1.5 RC2	Oil	FOX PODIUM 1.5	FOX PODIUM 1.5 QS3	Air Control Suspension (ACS) with FOX Air Assist
12 in. cast-aluminum	14 in. cast-aluminum beadlock		14 in. cast-aluminum beadlock	12 in. cast-aluminum with LIMITED finish	14 in.cast-aluminum		14 in. cast-aluminum with LIMITED finish
x	x				x	x	x
Front and rear	Front and rear		Front sport with pre-runner	Front		Front and rear	Front and rear
Kolpin 6.0 Impact gun boot, full underbody aluminum skid plate, heated grips and throttle, reinforced seat skin				Mud performance tires, relocated radiator, mud-riding footrests, X-package coloration, graphics and seat cover			Garmin Montana 650t touchscreen GPS, mudguards, comfort grips
	x						x
Mossy Oak Break-Up Country Camo	Carbon Black & Sunburst Yellow		Black, Hyper Silver & Sunburst Yellow	Sunburst Yellow		Sunburst Yellow Gold, Black & Can-Am Red	Boreal Green

*Some colors or engine options may not be available with the 2-passenger configuration.

OUTLANDER 450/570

KEY FEATURES	BASE		DPS		XT	MOSSY OAK HUNTING EDITION		X mr
Rotax engine options	450	570	450	570	570	450	570	570
Engine power	38 hp	48 hp	38 hp	48 hp	48 hp	38 hp	48 hp	48 hp
Engine type	Single cylinder	V-Twin	Single cylinder	V-Twin	V-Twin	Single cylinder	V-Twin	V-Twin
Tri-Mode Dynamic Power Steering (DPS)			x		x	x		x
Torsional Trailing arm Independent (TTI) rear suspension	x		x		x	x		x
Wheels	12 in. steel		12 in. cast-aluminum		12 in. cast-aluminum	12 in. cast-aluminum		12 in. cast-aluminum
3,000 lb (1,361 kg) WARN winch with roller fairlead					x	x		
Bumpers					Front and rear	Front and rear		Front
Package extras						Kolpin 6.0 Impact gun boot, full under body aluminum skid plate, heated grips and throttle, reinforced seat skin		Mud performance tires, relocated radiator, mud-riding footrests, X-package coloration, graphics and seat cover
Available in 2-passenger MAX configuration*	x		x		x			
Color options*	Viper Red Green		Orange Green Mossy Oak Break-Up Country Camo		Hyper Silver Intense Red	Mossy Oak Break-Up Country Camo		Sunburst Yellow

OUTLANDER MAX 6X6

KEY FEATURES	DPS	XT
Rotax engine options	650	1000
Engine power	62 hp	82 hp
Engine type	V-Twin	V-Twin
Intelligent Throttle Control (iTC) with riding modes		x
Tri-Mode Dynamic Power Steering (DPS)	x	x
Continuously Variable Transmission (CVT) with Extra Low L-gear	x	x
Shocks	Oil	Oil
Wheels	12 in. cast aluminum	12 in. cast aluminum
700 lb (318 kg) capacity Dual-Level cargo box with modular accessories	x	x
3,000 lb (1,361 kg) WARN winch with roller fairlead		x
Front bumpers		x
Color options*	Green	Pure Magnesium Metallic

RENEGADE

KEY FEATURES	BASE			X xc		X mr	
Rotax engine options	570	850	1000R	850	1000R	570	1000R
Engine power	48 hp	78 hp	91 hp	78 hp	91 hp	48 hp	91 hp
Engine type	V-Twin			V-Twin		V-Twin	
Intelligent Throttle Control (iTC) with riding modes			x		x		x
Tri-Mode Dynamic Power Steering (DPS)				x		x	
Shocks	Oil	FOX Podium 1.5		FOX Podium 1.5 RC2		FOX Podium 1.5	FOX Podium 1.5 QS3
Tires	25 in. ITP Holeshot† ATR			25 in. ITP Holeshot ATR		28 in. ITP Mega Mayhem	30 in. ITP Cryptid
Wheels	12 in. cast-aluminum			12 in. cast-aluminum beadlock		12 in. cast-aluminum beadlock	14 in. cast-aluminum beadlock
Bumpers	Front			Front		Front and rear	
Aluminum skid plate				Center		Front, Center	
Package extras						Snorkel with relocated CVT intake and outlet, mudguards, X-package coloration, graphics and seat cover, 3,000 lb (1,361 kg) WARN winch with roller fairlead	
Color options*	Sunburst Yellow			Black, Grey & Sunburst Yellow	Black, Grey & Sunburst Yellow Triple Black	Black, Grey & Sunburst Yellow	Carbon Black & Sunburst Yellow Gold, Black & Can-Am Red

MAVERICK X3

KEY FEATURES	MAVERICK X3 TURBO		MAVERICK X3 X ds TURBO R	MAVERICK X3 X rs TURBO R	MAVERICK X3 X rc		MAVERICK X3 X mr	
Rotax Triple-cylinder engine options	TURBO	TURBO R	TURBO R	TURBO R	TURBO	TURBO R	TURBO	TURBO R
Horsepower	120 hp	172 hp	172 hp	172 hp	120 hp	172 hp	120 hp	172 hp
Fully integrated intercooler		x	x	x		x		x
Quick Response System X (QRS-X) CVT with high airflow	x		x	x	x	x	x	x
Double A-arm front suspension with sway bar and 4-link Torsional Trailing-arm X (TTX) with sway bar	x		x	x	x	x	x	x
Industry leading front and rear suspension travel	20 in./20 in.		20 in./20 in.	22 in./24 in.	18 in./18in.	22 in./24 in.	18 in./18in.	22 in./24 in.
Low seating position	x		x	x	x	x	x	x
Ergo-Lok cockpit with four way adjustable seats and multifunction analog/digital gauge	x		x	x	x	x	x	x
Ultra efficient and lightweight chassis	x		x	x	x	x	x	x
High torque Tri-Mode Dynamic Power Steering (DPS)	x		x	x	x	x	x	x
RF Digitally Encoded Security System (D.E.S.S.™) with Start/Stop button	x		x	x	x	x	x	x
LED headlights and tail lights with unique Can-Am LED signature	x		x	x	x	x	x	x
Integrated front bumper, full High Molecular Weight (HMW), quarter-door	x		x	x	x			
Smart-Lok* Full lockable on-the-fly front differential with electronically-controlled automatic modes			Smart-Lok with TRAIL and TRAIL ACTIV modes.	Smart-Lok with TRAIL and TRAIL ACTIV modes.	Smart-Lok with TRAIL and ROCK modes.		Smart-Lok with TRAIL and MUD modes.	
Package extras	14 in. cast-aluminum wheels, FOX 2.5 PODIUM Piggyback shocks		14 in. cast-aluminum wheels with 29 in. Maxxis Bighorn 2.0 tires and fully adjustable FOX 2.5 PODIUM RC2 Piggyback shocks	14 in. cast-aluminum wheels with 30 in. Maxxis Bighorn 2.0 tires, fully adjustable FOX front 2.5/rear 3.0 PODIUM RC2 Piggyback/remote reservoir shocks with bypass, full roof, heavy-duty HMW skid plate, 4-point harness with shoulder pads and X-package trims and graphics	**X rc general features**: Front bumper, heavy-duty full High Molecular Weight (HMW) skid plate with differential and under bumper skid plates, UHMW rock sliders, front and rear suspension arm HMW protectors. **Turbo specific**: Quarter-doors and FOX 2.5 PODIUM Piggyback shocks with QS3. **Turbo R specific**: Half-doors, fully adjustable FOX front 2.5/rear 3.0 PODIUM RC2 Piggyback/remote reservoir shocks with bypass, full aluminum roof, 4-point harness with shoulder pads and intrusion bar		FOX 2.5 PODIUM Piggyback with QS3, front bumper, full High Molecular Weight (HMW) skid plate, half-doors, front and rear tow hook, 4,500 lb (2,041kg) winch with synthetic rope, 14 in. Cast-aluminum wheels with 30 in. ITP Cryptid tires	
Available in 4-passenger MAX configuration	x		x	x				
Color options	White Hyper Silver & Sunburst Yellow	White	Platinum Satin Phoenix Orange Triple Black	Platinum Satin Triple Black Gold, Can-Am Red & Hyper Silver	Carbon Black & Octane Blue with black cage	Carbon Black & Octane Blue with blue cage	Carbon Black & Sunburst Yellow with black cage	Carbon Black & Sunburst Yellow with yellow cage

*Some colors or engine options may not be available with the 4-passenger configuration.

MAVERICK SPORT

KEY FEATURES	MAVERICK SPORT		MAVERICK SPORT DPS	
Rotax engine option	1000 V-Twin		1000 V-Twin	1000R V-Twin
Horsepower	75 hp		75 hp	100 hp
Ground Clearance	12 in. (30.5 cm)			
Double A-arm with sway bar front suspension	x		x	x
TTA rear suspension with sway bar	x		x	x
Shocks	FOX 2.0 PODIUM			
Quick response system (QRS) CTV with high airflow ventilation and Electronic Drive Belt Protection	x		x	x
Electronic Hill Descent Control	x		x	x
Adjustable driver's seat and tilt steering	x		x	x
12 in. (30.5 cm) cast-aluminum wheels with 27 in. (68.6 cm) Maxxis Bighorn 2.0 Tires	x		x	x
Class-leading 5.3 gal (20.2 L) of storage capacity	x		x	x
Integrated front steel bumper and full skid plates	x		x	x
Ergoprint seats with color accents			x	x
Premium Half-doors	x		x	x
Dynamic Power Steering			x	x
True 4-mode traction system with Visco-Lok QE			x	x
SPORT/ECO™ modes			x	x
Unique Can-Am LED Signature Lights			x	x
1-year maintenance free and easy access to key maintenance components*	x		x	x
Color options	White		Can-Am Red	Can-Am Red Sunburst Yellow

MAVERICK TRAIL

KEY FEATURES	MAVERICK TRAIL		MAVERICK TRAIL DPS	
Rotax engine option	800 V-Twin	1000 V-Twin	800 V-Twin	1000 V-Twin
Horsepower	51 hp	75 hp	51 hp	75 hp
L x W x H	300.5 x 127 x 175.5 cm (118 x 50 x 69.1 in.)			
Ground Clearance	10 in. (25.4 cm)			
Double A-arm with sway bar front suspension	x	x	x	x
TTA with sway bar rear suspension	x	x	x	x
Quick response system (QRS) CTV with high airflow ventilation and Electronic Drive Belt Protection	x	x	x	x
Electronic Hill Descent Control	x	x	x	x
Adjustable driver's seat and tilt steering	x	x	x	x
12 in. (30.5cm) wheels with 26 in. (66cm) Carlisle ACT Tires	x	x	x	x
Class-leading 5.3 gal (20.2 L) of storage capacity	x	x	x	x
Integrated front steel bumper and full skid plates	x	x	x	x
Ergoprint seats with color accents			x	x
Half-doors		x		x
Dynamic Power Steering			x	x
True 4-mode traction system with Visco-Lok QE			x	x
SPORT/ECO modes			x	x
Cast aluminum wheels			x	x
Unique Can-Am LED Signature Lights			x	x
1-year maintenance free and easy access to key maintenance components*	x	x	x	x
Color options*	White		Can-Am Red	Can-Am Red Sunburst Yellow Mossy Oak Break-Up Country Camo

DEFENDER

KEY FEATURES	DEFENDER		DEFENDER DPS			DEFENDER XT		DEFENDER XT CAB	
Rotax engine options	HD5	HD8	HD5	HD8	HD10	HD8	HD10	HD8	HD10
Horsepower	38 hp	50 hp	38 hp	50 hp	72 hp	50 hp	72 hp	50 hp	72 hp
Double A-arm front suspension and TTA rear suspension with sway bar	x	x	x			x		Arched A-arm front suspension and TTA rear suspension with sway bar	
VERSA-PRO bench seat with passenger seats flipping up, underside hooks and contoured bench/Adjustable tilt steering	x	x	x			x		x	
Multifunction cargo box with sturdy tailgate and 2 in. hitch receiver	x	x	x			x		x	
PRO-TORQ Transmission with Quick Response System (QRS), high airflow ventilation, Electronic Drive Belt Protection and extra low L-gear		x	Electronic Drive Belt Protection	x		x		x	
Lockable rear differential, 27 in. Maxxis Bighorn 2.0 tires and additonal storage (water-resistant toolbox and complete under dash storage)		x (except additional storage)		x		x		x	
Dynamic Power Steering (DPS) and Visco-Lok QE			x			x		x	
1,000 lb (454 kg) of cargo box capacity**/ 2,500 lb (1134 kg) of towing capacity	600 lb (272.2 kg)/ 1,500 lb (680 kg)	x	600 lb (272.2 kg)/ 1,500 lb (680 kg)	x		x		x	
Package extras						XT front bumper, full HMW skid plate, reinforced XT seat skin, full hard roof, 4,500 lb (2,041 kg) winch with roller fairlead, ECO/Work/Normal driving modes and multifunction analog/digital gauge		XT front bumper, 4,500 lb (2,041 kg) winch with roller fairlead, arched A-arms, full HMW skid plate, full hard roof with liner and interior dome light, full black doors with electric opening windows, 3-position full glass tilt up windshield with wiper/washer kit, rear glass with sliding opening	
10.6 gal (40 L) of fuel capacity	x		x			x		x	
1-year maintenance free and easy access to key maintenance components	x		x			x		x	
Available in 6-passenger MAX configuration*		x		x		x			x
Color options*	Green		Green Mossy Oak Break-Up Country Camo	Green Intense Red Mossy Oak Break-Up Country Camo	Green Hyper Silver	Hyper Silver Intense Red Mossy Oak Break-Up Country Camo		Hyper Silver	Hyper Silver Mossy Oak Break-Up Country Camo

DEFENDER MOSSY OAK HUNTING EDITION	DEFENDER XT-P	DEFENDER X mr	DEFENDER MAX LONESTAR
HD10	HD10	HD10	HD10
72 hp	72 hp	72 hp	72 hp
x	x	Arched A-arm front suspension and TTA rear suspension with arched lower arms and sway bar	Arched A-arm front suspension and TTA rear suspension with arched lower arms and sway bar
x	x	x	x
x	x	x	x
x	x	x	x
x	x	Lockable rear differential, ITP Cryptid 30 in. tires and additional storage	28 in. Maxxis Bighorn 2.0 tires
x	DPS only	x	x
x	600 lb (272.2 kg)/2,500 lb (1,134 kg)	x	x
Heavy-duty front steel bumper, 4,500 lb (2,041 kg) winch with roller fairlead full HMW underbody skid plate with front aluminum pre-runner skid plate, full hard roof, half windshield, headache rack with LinQ quick-attach system, double Kolpin Stronghold gun boots - impact & tool holders, aluminum rock sliders and side mirror , ECO/Normal/Work modes, Multifunction Analog/Digital	FOX 2.0 PODIUM shocks, Smart-Lok* Full lockable on-the-fly front differential with electronically-controlled automatic modes, heavy-duty front steel bumper, full HMW skid plate, aluminum rock sliders, 14 in. (35.6 cm) cast-aluminum wheels, central mirror and X-package trims and graphics	Smart-Lok* Full lockable on-the-fly front differential with electronically-controlled automatic modes, a strategically positioned engine air intake and CVT inlet/outlet, ECO/Work/Normal driving modes, heavy-duty front steel bumper, relocated 4,500 lb (2,041 kg) winch with synthetic rope, aluminum rock sliders, mudguards, central mirror, 14 in. (35.6 cm) cast-aluminum wheels	4,500 lb (2,014 kg) winch, heavy-duty front steel bumper, full hard roof, aluminum rock sliders, arched front and rear arms, LONE STAR unique package trims and 14 in. (35.6 cm) cast-aluminum wheels in Hyper Silver coloration
x	x	x	x
x	x	x	x
			Only in MAX version
Mossy Oak Break-Up Country Camo	Carbon Black & Can-Am Red	Carbon Black & Sunburst Yellow Mossy Oak Break-Up Country Camo	Timeless Black

*Some colors or engine options may not be available with the 6-passenger configuration.
**California only: 600 lb (272.2 kg)

COMMANDER

KEY FEATURES	COMMANDER	COMMANDER DPS		COMMANDER XT		COMMANDER LIMITED
Rotax V-Twin engine options	800R	800R	1000R	800R	1000R	1000R
Horsepower	71 hp	71 hp	92 hp	71 hp	92 hp	92 hp
Double A-arm front suspension with sway bar and Torsional Trailing arm Independent (TTI) rear suspension with sway bar	x	x		x		x
Industry's exclusive Dual-Level cargo box	x	x		x		x
Adjustable driver's seat and tilt steering	x	x		x		x
27 in. Maxxis Bighorn 2.0 tires	x	x		x		x
14 in. cast-aluminum wheels		x		x		x
Tri-Mode Dynamic Power Steering (DPS) and Visco-Lok QE		x		x		x
Package extras		Intelligent Throttle control (iTC)		Intelligent Throttle Control (iTC), Heavy-duty front bumper, 4500 lb (2,041 kg) winch, Rugged bed rails, Mudguards, Analog/Digital gauge		Garmin Montana 650t touchscreen GPS, bluetooth ready sound system with four integrated speakers, iPod† - iPhone† connector with gauge controls, USB port and auxiliary input, 4,500 lb (2,041 kg) winch, heavy-duty front bumper, rugged bed rails, mudguards, 2-piece full hard roof, half windshield and rear net, analog/digital gauge, limited seat trim
Available in 4-passenger MAX configuration*		x		x		x
Color options*	White	Green		Boreal Green Black & Octane Blue	Boreal Green Black & Octane Blue Mossy Oak Break-Up Country Camo	Triple Black

*Some colors or engine options may not be available with the 4-passenger configuration.

COLOR LEGEND

- Boreal Green
- Can-Am Red
- Green
- Hyper Silver
- Intense Red
- Mossy Oak Break-Up Country Camo
- Orange
- Phoenix Orange
- Platinum Satin
- Pure Magnesium Metallic
- Sunburst Yellow
- Timeless Black
- Triple Black
- Viper Red
- White
- Yellow
- Black & Can-Am Red
- Black, Grey & Sunburst Yellow
- Black, Hyper Silver & Sunburst Yellow
- Carbon Black & Can-Am Red
- Carbon Black & Octane Blue
- Carbon Black & Sunburst Yellow
- Gold, Black & Can-Am Red
- Gold, Can-Am Red & Hyper Silver
- Hyper Silver & Sunburst Yellow

VISIT CAN-AMOFFROAD.COM

ski-doo LYNX SEA-DOO EVINRUDE ROTAX can-am

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can-am BRP

P/N: 716001600

can-am

2019

Operator's Guide

Includes
Safety, Vehicle
and Maintenance Information

DEFENDER™ Series
(excluding European Union)
TRAXTER® Series

⚠ WARNING

Read this guide thoroughly. It contains important safety information.
Minimum age: Operator: 16 or older with a valid driver's license. Keep this Operator's Guide in the vehicle.
The removal or modification of evaporative emission-related parts on this OHRV is illegal.
Violators may be subject to civil and/or criminal penalties under California and federal law.

2 1 9 0 0 1 9 5 3 **Original Instructions**

⚠ WARNING

YOUR VEHICLE CAN BE HAZARDOUS TO OPERATE. A collision or rollover can occur quickly, if you fail to take proper precautions, even during routine maneuvers such as turning and driving on hills or over obstacles.
For your safety, understand and follow all the warnings contained in this Operator's Guide and on the labels on your vehicle. **Failure to follow these warnings can result in SEVERE INJURY OR DEATH!**
Keep this Operator's Guide with the vehicle at all times.

⚠ WARNING

Disregarding any of the safety precautions and instructions contained in this Operator's Guide, *SAFETY VIDEO* and on-product safety labels could result in severe injury including the possibility of death!

⚠ WARNING

This vehicle may exceed the performance of other vehicles you may have ridden in the past. Take time to familiarize yourself with your new vehicle.

CALIFORNIA PROPOSITION 65 WARNING

⚠ **WARNING:** Operating, servicing and maintaining an off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to www.p65warnings.ca.gov/products/passenger-vehicle.

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– VELCRO® is a registered trademark of Velcro Industries B. V

– † Visco-Lok is a trademark of GKN Viscodrive GmbH.

FOREWORD

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日本語	このガイドは、言語によって翻訳版が用意されています。. ディーラーに問い合わせるか、次のアドレスでご確認ください： www.operatorsguides.brp.com
Nederlands	Deze handleiding kan beschikbaar zijn in uw taal. Vraag het aan uw dealer of ga naar: www.operatorsguides.brp.com
Norsk	Denne boken kan finnes tilgjengelig på ditt eget språk. Kontakt din forhandler eller gå til: www.operatorsguides.brp.com
Português	Este manual pode estar disponível em seu idioma. Fale com sua concessionária ou visite o site: www.operatorsguides.brp.com
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Svenska	Denna bok kan finnas tillgänglig på ditt språk. Kontakta din återförsäljare eller gå till: www.operatorsguides.brp.com

Congratulations on your purchase of a new Can-Am® side-by-side vehicle. It's backed by the BRP limited warranty and a network of authorized Can-Am dealers ready to provide the parts, accessories or service you may require.

At delivery, you were informed of the warranty coverage and signed the *PREDELIVERY CHECK LIST* to ensure your new vehicle was prepared to your entire satisfaction.

Your dealer is committed to your satisfaction. If you need more information, please ask your dealer.

Know Before you Go

To learn how to reduce the risk of accident for you or bystanders, read this Operator's Guide before you operate the vehicle.

Also, read all safety labels on your vehicle and watch the *SAFETY VIDEO* located at https://can-am.brp.com/off-road/safety.

Failure to follow the warnings contained in this Operator's Guide can result in SERIOUS INJURY or DEATH.

Safety Messages

The types of safety messages, what they look like and how they are used in this guide are explained as follows:

The safety alert symbol ⚠ indicates a potential injury hazard.

⚠ WARNING

Indicates a potential hazard which, if not avoided, could result in serious injury or death.

⚠ CAUTION Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE Indicates an instruction which, if not followed, could result in severely damaged vehicle components or other property.

About this Operator's Guide

This Operator's Guide has been prepared to acquaint the owner/operator of a new vehicle with the various vehicle controls, maintenance and safe operating instructions. It is indispensable for the proper use of the product.

Keep this Operator's Guide in the vehicle as you can refer to it for things such as maintenance, troubleshooting and instructing others.

Note that this guide is available in several languages. In the event of any discrepancy, the English version shall prevail.

If you want to view and/or print an extra copy of your Operator's Guide, simply visit the following website **www.operatorsguides.brp.com**.

The information contained in this document is correct at the time of publication. BRP, however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured. Due to late changes, some differences between the manufactured product and the descriptions and/or specifications in this guide may occur. BRP reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring any obligation upon itself.

This Operator's Guide should remain with the vehicle when it is sold.

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SAFETY INFORMATION

Avoid Carbon Monoxide Poisoning

All engine exhaust contains carbon monoxide, a deadly gas. Breathing carbon monoxide can cause headaches, dizziness, drowsiness, nausea, confusion and eventually death.

Carbon monoxide is a colorless, odorless, tasteless gas that may be present even if you do not see or smell any engine exhaust. Deadly levels of carbon monoxide can collect rapidly, and you can quickly be overcome and unable to save yourself. Also, deadly levels of carbon monoxide can linger for hours or days in enclosed or poorly ventilated areas. If you experience any symptoms of carbon monoxide poisoning, leave the area immediately, get fresh air and seek medical treatment.

To prevent serious injury or death from carbon monoxide:

– Never run the vehicle in poorly ventilated or partially enclosed areas such as garages, carports or barns. Even if you try to ventilate engine exhaust with fans or open windows and doors, carbon monoxide can rapidly reach dangerous levels.
– Never run the vehicle outdoors where engine exhaust can be drawn into a building through openings such as windows and doors.

Avoid Gasoline Fires and Other Hazards

Gasoline is extremely flammable and highly explosive. Fuel vapors can spread and be ignited by a spark or flame many feet away from the engine. To reduce the risk of fire or explosion, follow these instructions:

– Use only an approved gasoline container to store fuel.
– Never fill the gasoline container in the vehicle cargo box or on the vehicle - an electrical static discharge may ignite the fuel.
– Strictly adhere to instructions in *VEHICLE FUELING PROCEDURE*.
– Never start or operate the engine if the fuel cap is not properly installed.

Gasoline is poisonous and can cause injury or death.

– Never siphon gasoline by mouth.
– If you swallow gasoline, get any in your eye(s), or inhale gasoline vapor, see a doctor immediately.

If gasoline spills on you, wash with soap and water and change your clothes.

Avoid Burns from Hot Parts

Certain components become hot during operation. Avoid contact with those parts during and shortly after operation to avoid burns.

Accessories and Modifications

Any modifications or addition of accessories may affect the handling of your vehicle. It is important to take the time to get familiar with the vehicle once modifications are made to understand how to adapt your driving behavior accordingly.

Do not temper with unauthorized modifications or install equipment not specifically certified by BRP for the vehicle. These modifications have not been tested by BRP and they may increase the risk of injury or loss of control, or render the vehicle illegal to ride. As an example, tempering with tire specifications may affect the behavior of the vehicle and increase the risk of a loss of control.

Ask your authorized BRP dealer for suitable available accessories for your vehicle.

SAFE OPERATION - RESPONSIBILITIES

This is a high performance off-road vehicle. Operators must be responsible and use care to avoid rollovers, tipovers, collisions, and other accidents. Even with vehicle safety features (such as protective structure, seat belts, side nets, doors) and protective gear (such as a helmet), there is always a risk of injury or death in these accidents. To reduce the risk of serious injury or death, follow the rules in this section.

Owner - Be Responsible

Read this Operator's Guide and watch the *SAFETY VIDEO*. Refer to the link at the beginning of the Operator's Guide.

Always inspect and confirm the safe operating condition of your vehicle prior to ride. Always follow the maintenance schedule described in this Operator's Guide.

Never allow anyone to operate your vehicle unless they are responsible and can be trusted with a high performance vehicle. Consider supervising new or young operators and setting rules and limits (e.g., whether they can carry passengers, what they may do with the vehicle, where they may ride, etc.) for anyone using your vehicle.

If equipped with optional D.E.S.S. keys, select the appropriate key (see *IGNITION SWITCH AND KEYS*) based on the operator's experience, vehicle use and environment.

Discuss the safety information with anyone who will be using the vehicle. Be sure that all operators and passengers meet the qualifications below and agree to follow the safety information. Help users become familiar with the vehicle.

We encourage you to have an Annual Safety Inspection of your vehicle. Please contact an authorized BRP dealer for further details. Though not required, it is recommended that an authorized BRP dealer performs the preseason preparation of your vehicle. Each visit to your authorized BRP dealer is a great opportunity for your dealer to verify if your vehicle is included in any safety campaign. We also urge you to visit your authorized BRP dealer in a timely manner if you become aware of any safety related campaigns.

See an authorized BRP dealer for available accessories you may require.

Operator - Be Qualified and Responsible

Read this Operator's Guide and watch the *SAFETY VIDEO*. Refer to the link at the beginning of the Operator's Guide.

Become completely familiar with the operational controls and the general operation of the vehicle.

Take a training course if available (contact an authorized Can-Am dealer to find out about training course availability as well as on the internet at http://www.rohva.org/), and perform the practice exercises in *PRACTICE EXERCISES* section. Practice driving in a suitable area free of hazards and feel the response of each control. Drive at low speeds. Higher speeds require greater experience, knowledge and suitable riding conditions.

Be at least 16 years of age.

Be tall enough to be properly seated: back against the backrest with the seat belt fastened, to hold the steering wheel with both hands and still be able to reach the full stroke of brake and accelerator pedals with the right foot and to firmly plant left foot on the footrest.

Have a proper driver's license in accordance with local laws.

Never use this vehicle with drugs or alcohol, or if tired or ill. These slow reaction time and impair judgment.

Carrying Passengers

Only carry a maximum of two passengers. The passengers must be properly seated in the cockpit.

The passengers must be tall enough to always be properly seated: back against the backrest with seat belt fastened, holding the handhold, and feet firmly planted - for the RH passenger, with right foot on the footrest and the left foot on the vehicle floor and for the central passenger, with both feet firmly planted on the floor.

Never carry passengers who have used drugs or alcohol, or are tired or ill. These slow reaction time and impair judgment.

Instruct the passengers to read the vehicle's safety labels.

Never carry passengers if you judge their ability or judgement insufficient to concentrate on the terrain conditions and adapt accordingly. More specifically for side-by-side vehicles, the passenger must also pay constant attention to the terrain ahead and be able to brace for bumps.

Riding Carefully

- This vehicle handles differently from other vehicles. A collision or rollover can occur quickly, during abrupt maneuvers such as doing sharp turns, acceleration or deceleration and driving on hills or over obstacles, if you fail to take proper precautions.
- Never operate at excessive speeds. Always go at a speed that is proper for the terrain, visibility, and operating conditions, and your experience.
- Never attempt jumps, side slides, donuts or any other stunts.
- Never attempt rapid acceleration or deceleration when performing a sharp turn. This may result in a roll over.
- Never attempt skidding or sliding. If vehicle starts to skid or slide, counter steer in the direction of skidding or sliding. On extremely slippery surfaces, such as ice, go slowly and be very cautious in order to reduce the chance of skidding out of control.
- Always be sure there are no obstacles or people behind the vehicle when you operate in reverse. Pay attention to blind spots. When it is safe to proceed in reverse, go slowly.
- Never exceed the stated load limits for this vehicle. Cargo must be properly secured. Reduce speed, allow for greater braking distance and follow other instructions in *MOVING LOADS AND DOING WORK*.
- Always remember that this vehicle is heavy! Its pure weight alone may entrap you should it tip or rollover.

Occupant Restraint System

- This vehicle is designed to carry one driver and up to two passengers, all wearing proper protective gears (refer to *RIDING GEAR* in this section).
- The driver and passengers must latch the side nets or close the full doors and wear the seat belts at all times when riding.

Terrain Condition

- This vehicle is not designed to ride on paved surfaces; if you must shortly use the vehicle on such surfaces, avoid abrupt inputs to steering wheel, accelerator and brake pedals.
- Always go slowly and be extra careful when operating on unfamiliar terrain. Always be alert to changing terrain conditions when operating this vehicle. Take the time to learn how the vehicle performs in different environments.

– Never operate on excessively rough, slippery or loose terrain until you have learned and practiced the skills necessary to control this vehicle on such terrain. Always be especially cautious on these kinds of terrain.
– Never operate this vehicle on hills too steep for the vehicle or your abilities. Practice on small inclines.
– Always follow proper procedures for climbing or going down hills as described in *RIDING YOUR VEHICLE*. Check the terrain carefully before you start up or down any hill. Never climb or descend hills with excessively slippery or loose surfaces. Never go over the top of any hill at high speed.
– Never attempt steep hills or side hilling when pulling a trailer.
– Always check for obstacles before operating in a new area. Always follow proper procedures when operating over obstacles as described in *RIDING YOUR VEHICLE*.
– Never operate this vehicle in fast flowing water or in water deeper than specified in *RIDING YOUR VEHICLE*. Remember that wet brakes may have reduced stopping ability. Test your brakes after leaving water. If necessary, apply them several times to let friction dry out the brakes.
– Always ensure to properly park the vehicle on the flattest terrain section available. Put shift lever in PARK, stop engine and remove key before leaving the vehicle.
– Never assume that the vehicle will go everywhere safely. Sudden changes in terrain caused by holes, depressions, banks, softer or harder "ground" or other irregularities may cause the vehicle to topple or become unstable. To avoid this, slow down and always observe the terrain ahead. If the vehicle does begin to topple or rollover, the best advice is to immediately steer in the direction of the rollover! Never attempt to prevent a rollover with your arms or legs. You should keep your limbs inside the cage or ROPS (rollover protective structure).

PRE-RIDE INSPECTION

Always inspect and confirm the safe operating condition of your vehicle prior to ride. Always follow the maintenance schedule described in this Operator's Guide.

⚠ WARNING

Perform a pre-ride inspection before each ride to detect any potential problem that could occur during operation. The pre-ride inspection can help you monitor component wear and deterioration before they become a problem. Correct any problem that you discover to reduce the risk of a breakdown or crash.

Before using this vehicle, the operator should always perform the following pre-ride inspection check list.

Refer to *MAINTENANCE PROCEDURES* for details.

Pre-Ride Inspection Check List

What to Do Before Starting the Engine (Key OFF)

ITEMS TO BE INSPECTED	INSPECTION TO PERFORM	✔
Tires	Check tire pressure and condition. Refer to *SPECIFICATIONS* and adjust according to load.	
Wheels	Check wheels for damage and for abnormal play. Make sure that lug nuts are tightened. Refer to *WHEELS AND TIRES* in *MAINTENANCE PROCEDURES* for torque specification.	
Radiator	Check cleanliness of the radiator.	
Front grill kit	Inspect front grill kit for cleanliness.	
Engine oil	Check engine oil level.	
Coolant	Check coolant level.	
Brake fluid	Check brake fluid level.	
Engine air filter	Inspect the engine air filter, clean or replace if needed (service more often when riding in dusty conditions).	
CVT air filter	Inspect and clean the CVT air filter (when riding in dusty conditions).	
Drive shaft boots	Check drive shaft boots and protectors condition.	

ITEMS TO BE INSPECTED	INSPECTION TO PERFORM	✔
Cargo and load	**Cargo Load:** If you transport a cargo, respect the maximum loading capacity. Refer to *LOADING THE CARGO BOX*. Ensure cargo is properly secured to the rear cargo box. **Vehicle Load:** Ensure that total load on the vehicle (including operator, passengers, cargo, tongue weight and added accessories) does not exceed specifications. Refer to *CARRYING LOADS*	
	If you are pulling a trailer or another equipment: – Check hitch and trailer ball condition. – Respect the tongue capacity and towing capacity as indicated on the label affixed to the hitch or refer to *SPECIFICATIONS*. – Ensure trailer is properly secured to hitch.	
Rear cargo box	Check if the cargo box is properly latched.	
	Check if tailgate is properly latched.	
Chassis and suspension	Check underneath vehicle for any debris on chassis or suspension and clean them properly.	
Heater air filters (XT models with Cab)	Inspect heater air filters, clean if needed (service more often when riding in dusty conditions).	
Brake Holding Mechanism (If equipped)	Apply brake holding mechanism and check if it operates properly.	

What to Do Before Starting the Engine (Key ON)

ITEMS TO BE INSPECTED	INSPECTION TO PERFORM	✔
Gauge	Check operation of indicator lamps in gauge (during first few seconds of key ON).	
	Check for messages in gauge.	
Lights	Check operation and cleanliness of headlights and taillights.	
	Check operation of high and low beam.	
	Check operation of brake lights.	

ITEMS TO BE INSPECTED	INSPECTION TO PERFORM	✔
Seats, side nets and seat belts	Check if seats are properly latched.	
	Check side nets for any damage. Have the nets replaced if any damage is found. Fasten both side nets and confirm that they latch securely. Use the adjustment strap to tighten the net as required.	
	Check seat belts for any damage. Fasten seat belts and confirm that they latch securely.	
Accelerator pedal	Press on the accelerator pedal a few times to ensure it operates freely and it returns to the rest position when released.	
Brake pedal	Press down on the brake pedal and make sure you feel firm resistance and that it fully returns to position when released.	
Fuel level	Check the fuel level.	
Mirror(s)	Adjust mirror(s) to your preferences.	
Heater fan (XT models with Cab)	Check operation of heater fan. Check air flows out of every louver (dash-mounted and heater-mounted).	

What to Do After the Engine is Started

ITEMS TO BE INSPECTED	INSPECTION TO PERFORM	✔
Steering	Check if steering wheel operates freely by completely turning it from side to side.	
Ignition switch	Turn the ignition switch to OFF to verify if engine will shut down. Restart engine.	
Shift lever	Check operation of shift lever (P, R, N, H and L).	
2WD/4WD selector	Check operation of 2WD/4WD selector.	
Brakes	Drive forward slowly a few feet and apply brakes. The brake pedal must feel firm when applied. The pedal must return to rest position when released. The brakes must respond adequately to the driver's input.	

Before you Ride

Perform pre-ride inspection to confirm the safe operating condition of your vehicle. Refer to *PRE-RIDE INSPECTION*.

Driver and passengers must:

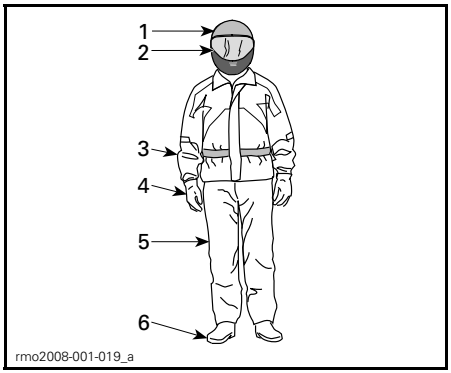
– Be properly seated.
– Latch both side nets or close the full doors and fasten seat belt.
– Wear appropriate riding gear. (Refer to *RIDING GEAR*).

Riding Gear

It is important that the operator and passengers always wears appropriate protective clothing and apparel, including:

– An approved helmet
– Eye protection
– Boots
– Gloves
– A long sleeved shirt or jacket
– Long pants.

Depending on conditions, anti-fogging goggles may be required.



RIDING GEAR
1. *Approved helmet*
2. *Eye and face protection*
3. *Long sleeves shirt or jacket*
4. *Gloves*
5. *Long pants*
6. *Boots (over-the-ankle footwear)*

Weather conditions should help you decide how to dress. To maximize comfort and avoid frostbites in winter, dress for the coldest weather expected. Thermal underwear next to the skin also provides good insulation.

Never wear any loose clothing that may get entangled in the vehicle or on tree branches and shrubs.

Helmets and Eye Protection

Helmets protect the head and brain from injury. Even with the vehicle's cage and side nets, objects can enter the cockpit and strike the head, or the head can strike the cage itself or objects outside the vehicle. Even the best helmet is no guarantee against injury, but statistics indicate that helmet use significantly reduces the risk of brain injury. So, be safe and always wear a helmet while riding.

Choosing a Helmet

Helmets should be manufactured to meet the appropriate standard in your state, province or country and should fit properly.

A helmet with face protection is a better choice as it protects also against frontal impacts. It can also protect against debris, stones, insects, the elements, etc.

An open-face helmet does not offer the same protection for the face and chin. If you wear an open-face helmet, you should use a snap-on face shield and/or a pair of goggles. Ordinary glasses or sunglasses are not sufficient eye protection for riders. They can shatter or fly off, and they allow wind and airborne objects to reach the eyes.

For winter riding conditions, a stocking type cap, balaclava and face mask should always be carried or worn.

Use tinted face shields or goggles in the daytime only; do not use them at night or in poor illumination. Do not use them if they impair your ability to discern color.

Other Riding Gear

Footwear

Always wear closed toe footwear. Sturdy over-the-ankle boots with non-slip soles offer more protection and allow you to plant your foot properly on footrest.

Avoid long shoelaces that can be tangled in the accelerator or brake pedals.

For winter riding conditions, rubber soled boots with either a nylon or leather uppers, with removable felt liners are best suited.

Avoid rubber boots. Rubber boots may get trapped behind or between pedals, impairing the proper operation of brake and accelerator pedals.

Gloves

Full-fingered gloves protect hands from the wind, sun, heat, cold and flying objects. Gloves that fit snugly will improve grip on the steering wheel and help reduce hand fatigue. Sturdy, reinforced motorcycle or ATV gloves help protect hands better in the event of an accident or a rollover. If gloves are too bulky, it may be difficult to operate the controls.

For winter riding conditions, hands should be protected by a pair of snowmobile gloves which have sufficient insulation and allow use of thumbs and fingers for operation of controls.

Jackets, Pants and Riding Suits

Wear a jacket or a long sleeved shirt and long pants, or a full riding suit. Quality ATV-type protective gear will provide comfort, and it can help you avoid being distracted by adverse environmental elements. In case of a crash, good quality protective gear made of sturdy material may prevent or reduce injury.

In cool-weather riding, protect yourself against hypothermia. Hypothermia, a condition of low body temperature, can cause loss of concentration, slowed reactions and loss of smooth, precise muscle movement. In cool conditions, proper protective gear like a windproof jacket and insulated layers of clothing are essential. Even while riding at moderate temperatures, you can feel very cold due to the wind.

Protective gear that is appropriate for cold-weather riding may be too hot when stopped. Dress in layers so that clothing can be removed as desired. Topping the protective gear with a windproof outer layer can prevent cold air from reaching the skin.

Rain Gear

If you must ride in wet weather, a rain suit or a waterproof riding suit is recommended. On long rides, it is a good idea to carry rain gear. A dry rider will be much more comfortable and alert.

Hearing Protection

Long-term exposure to wind and engine noise when riding can cause permanent hearing loss. Properly worn hearing protective devices such as earplugs can help prevent hearing loss. Check local laws before using any hearing protective devices.

Avoid Rollovers and Tipovers

Side-by-side vehicles handle differently from other vehicles. Side-by-side vehicles are designed to handle off-road terrain (for example, their wheel base and track width, ground clearance, suspension, drivetrain, tires, etc.), and, as a result, can overturn in situations where vehicles designed for use primarily on paved or smooth terrain may not.

A rollover or other accident can occur quickly during abrupt maneuvers such as sharp turns or hard acceleration or deceleration when turning, or when driving on hills or over obstacles. Abrupt maneuvers or aggressive driving can cause rollovers or loss of control even in flat open areas. If the vehicle rolls over, any part of your body (such as arms, legs, or head) outside of the cockpit can be crushed and trapped by the cage or ROPS or other parts of the vehicle. You can also be injured by impact with the ground, cockpit or other objects.

To reduce the risk of rollovers:

– Use care when turning.
  - Do not turn the steering wheel too far or too fast for your speed and environment. Adjust steering inputs according to your speed and environment.
  - Slow down before entering a turn. Avoid hard braking during a turn.
  - Avoid sudden or hard acceleration when turning, even from a stop or low speed.
– Never attempt donuts, skids, slides, fishtails, jumps, or other stunts. If vehicle starts to skid or slide, steer in the direction of the skid or slide. Never slam the brakes and lock the wheels.
– Avoid paved surfaces. This vehicle is not designed to operate on paved surfaces and is more likely to roll over. If you must drive on pavement, turn gradually, go slowly, and avoid abrupt acceleration and braking.

This vehicle can roll over sideways or tip over forward or backwards on slopes or uneven terrain.

– Avoid side hilling (driving along the slope rather than up or down a hill). When possible, drive straight up and down inclines rather than across them. If you must side hill, use extreme caution and avoid slippery surfaces, objects, or depressions. If you feel the vehicle start to rollover or slide sideways, steer downhill if possible.
– Avoid steep hills and follow procedures in this guide for climbing and descending hills.
– Sudden changes in terrain such as holes, depressions, banks, softer or harder ground or other irregularities may cause the vehicle to tip or become unstable. Observe the terrain ahead and slow down in areas of uneven terrain.

This vehicle will handle differently when carrying or pulling a load.

– Reduce speed and follow instructions in this manual for carrying cargo or pulling a trailer.
– Avoid hills and rough terrain.
– Allow more distance to stop.

Be Prepared in Case of Rollover

– Fasten side nets or close the full doors and fasten seat belt to help you avoid sticking out arms or legs.

– Never grab the cage or ROPS while riding. Hands can be crushed between the cage or ROPS and the ground in a rollover. Keep hands on the steering wheel or handholds.
– Never try to stop a rollover using your arms or legs. If you think that the vehicle may tip or roll, the driver should keep both hands on the steering wheel and the left foot firmly planted on the footrest. The passengers should keep both hands on the handhold and both feet firmly planted on the floor.

Avoid Collisions

This vehicle can reach high speeds. At higher speeds, there is an increased risk of losing control, particularly in challenging off-road conditions, and the risk of injury in a collision is greater. Never operate at excessive speeds. Always go at a speed that is proper for the terrain, visibility, and operating conditions, and your experience. Consider reserving use of the performance key for situations in which full speed and acceleration capability are appropriate.

Never operate this vehicle on any public street, road or highway, even dirt or gravel ones. Riding your vehicle on roads or highways could result in a collision with another vehicle. This vehicle is not designed for operation on roads. For example, it does not meet motor vehicle safety standards that apply to automobiles. In many jurisdictions it is not legal to operate this vehicle on public roads.

This vehicle does not have the same kind of protection for collisions as a car; for example, there are no air bags, the cockpit is not fully enclosed, and it is not designed for collisions with other vehicles. Therefore, it is particularly important to fasten seat belts and side nets close the full doors and wear an approved helmet.

Practice Exercises

Before you go out for a ride, it is very important to familiarize yourself with the handling of your vehicle by practicing in a controlled environment. If possible, it is also a very good idea to take a more formal training course to sharpen your skills and increase your knowledge of the vehicle.

Find a suitable area to practice and perform the following exercises. It should be at least 45 m (150 ft) by 45 m (150 ft) free of obstacles like trees and rocks. Once you've selected a suitable permitted location, proceed with the following exercises.

Turning Exercises

Turning is one of the most frequent causes of accidents. It is easier for the vehicle to lose traction or rollover if you turn too sharply, or go too fast. Slow down when you approach a turn.

- First learn how to perform slight right turns at very low speeds. Release the throttle before turning and slowly reapply the throttle when turning.
- Repeat turning exercise but this time maintain the throttle at the level while turning.
- Finally, repeat turning exercise while accelerating slowly.
- Practice exercises turning on the other side.

Note how your vehicle reacts in these different exercises. We recommend releasing the throttle before entering a turn to help initiate directional change. You will feel the lateral force increasing with the speed and with your steering input. The lateral force should be maintained as low as possible to make sure it does not cause the vehicle to roll over.

U Turn Exercises

Practice doing U turns.

- Accelerate slowly and while remaining at low speed, then gradually turn the steering wheel to the right until you have completed the U turn.
- Repeat U turn exercise with different steering inputs and always at a very low speed.
- Repeat U turn exercise on the other side.

As mentioned before in this guide, do not ride on paved surfaces as the vehicle behavior will not be the same, increasing the risk of rollover.

Braking Exercises

Practice braking to get familiar with the brake response.

- Do it at low speed first, then increase the speed.
- Practice braking in straight line at different speeds and different braking force.
- Practice emergency braking; optimal braking is obtained in straight line, with high force applied, without locking the wheels.

Remember, braking distance depends on vehicle speed, load and the type of surface. Also, the tires and brakes conditions play a major role.

Reverse Exercises

The next step involves using the reverse.

- Install 1 cone marker on both sides of the vehicle beside each rear wheel. Move the vehicle forward until you can see the cone markers, then stop the vehicle. Acknowledge the distance required to see obstacles behind you.
- Learn how the vehicle handles itself in reverse and reacts with steering inputs.
- Always perform this reverse exercise at slow speeds.

Emergency Engine Stopping Exercise

Learn how to stop your engine quickly in an emergency situation.

– While running at low speed, simply turn the key to the off position.

This is to familiarize you with the vehicle's reaction when the engine is turned off while driving and to develop this reflex.

It is also important to be able to stop and exit the vehicle quickly.

– Immobilize the vehicle.
– Detach the seat belt and the net (or open the door) to exit the vehicle.

Off-Road Operation

The very nature of off-road operation is dangerous. Any terrain, which has not been specially prepared to carry vehicles, presents an inherent danger where terrain substance, shape and steepness are unpredictable. The terrain itself presents a continual element of danger, which must be knowingly accepted by anyone venturing over it.

An operator who takes a vehicle off-road should always exercise the utmost care in selecting the safest path and keeping close watch on the terrain ahead of him. The vehicle should never be operated by anyone who is not completely familiar with the driving instructions applicable to the vehicle, nor should it be operated on steep or treacherous terrain.

General Riding Techniques

General Driving Tips

Care, caution, experience and driving skill are the best precautions against the hazards of vehicle operation.

Whenever there is the slightest doubt that the vehicle can safely negotiate an obstacle or a particular piece of terrain, always choose an alternate route.

In off-road operation, power and traction, not speed, are important. Never drive faster than visibility and your own ability to select a safe route permit. Always go slowly and be extra careful when operating on unfamiliar terrain. Always be alert to changing terrain conditions when operating this vehicle. Be especially cautious on excessively rough, slippery, icy or loose terrain.

Constantly watch the terrain ahead for sudden changes in slopes or obstacles, such as rocks or stumps, that may cause loss of stability, resulting in tip over or rollover.

Never operate the vehicle if the controls do not function normally. See an authorized Can-Am dealer.

To maintain proper control it is strongly advised that you keep your hands on the steering wheel and within easy reach of all controls. The same holds true for your feet. To minimize the possibility of any leg or foot injury, keep your left foot on the footrest and right foot on the floor at all times. Staying completely within the cockpit will also help keep you from striking objects outside the vehicle.

Watch for and avoid branches and other objects that could enter the passenger compartment and strike you or your passengers.

Operating in Reverse

When operating in reverse, check that the path behind the vehicle is free of people or obstacles. Pay attention to blind spots. When it is safe to proceed in reverse, go slowly and avoid sharp turns.

⚠ WARNING

Steering inputs in reverse operation increase the risk of rollover.

NOTE: In reverse operation, the engine RPM is limited thus limiting the vehicle reverse speed.

⚠ WARNING

When driving downhill in reverse, gravity can increase the vehicle speed above safe reverse speed.

Crossing Roads

If you have to cross a road, ensure to have complete visibility on both sides for incoming traffic and decide on exit point on other side of road. Drive in a straight line toward that point. Do not make sharp direction changes or abrupt accelerations as it may result in a rollover situation. Do not travel on sidewalks or bicycle trails as they are designated specifically for those uses.

Riding on Paved Surfaces

Avoid paved surfaces. This vehicle is not designed to operate on paved surfaces and is more likely to roll over. If you must drive on pavement, turn gradually, go slowly, and avoid abrupt acceleration and braking.

Shallow Water Crossing

Water can be a unique hazard. If it is too deep the vehicle may "float" and topple. Check the water depth and current before you attempt to cross any water. Water depth should not exceed 30 cm (12 in) for vehicle to safely cross the obstacle. Beware of slippery surfaces such as rocks, grass, logs, etc., both in the water and on its banks. A loss of traction may occur. Do not attempt to enter the water at high speed.

Water will affect the braking ability of your vehicle. Make sure you dry the brakes by applying them several times after the vehicle leaves the water.

Mud or marsh lands may be encountered near water. Be prepared for sudden "holes" or changes in depth. Similarly so, be watchful of hazards such as rocks, logs, etc., partially covered by vegetation.

Riding on Snow or Ice

When performing pre-ride inspection, pay special attention to locations on the vehicle where snow and/or ice accumulations may obstruct visibility of the tail lamp, clog ventilation openings, block the radiator and fan, and interfere with the movement of controls. Before starting with your vehicle, check the steering, accelerator and brake pedals for interference free operation.

Whenever this vehicle is ridden on a snow covered drive path, the tire grip is generally reduced causing the vehicle to react differently to control inputs from the operator. On low grip surfaces, the steering responses are not as crisp and precise, stopping distances are lengthened and acceleration is also affected. Slow down and do not "gun" the accelerator. This will only result in spinning of the tires and possibly in an over steering slide of the vehicle. Avoid hard braking. This will possibly result in a straight line slide of the vehicle. Again, the best advice is to safely reduce speed in anticipation of a maneuver to give yourself time and distance in order to keep control of the vehicle.

As you drive your vehicle over a loose snow covered surface, snow dust will be picked up in the wake turbulence of the moving vehicle and transported to contact and accumulate or melt on some exposed components including rotating parts like brake discs. Water, snow or ice may affect the response time of the brake system of your vehicle. Even when not required to reduce vehicle speed apply brakes frequently to prevent ice or snow accumulation and to dry brake pads and discs. While doing so in low risk driving situations you will test for grip level and keep yourself alerted to how the vehicle reacts to your control inputs. Always keep brake and accelerator pedals and floor boards free of snow and ice. Frequently wipe snow off seat, steering wheel, headlights and tail lamps.

The depth of the snow cover may hide rocks, tree stumps or other objects and if it is wet may totally impede the drivability as the vehicle becomes bogged down or completely looses traction in slushy snow. Look far ahead and always be watchful of any visible clues that might indicate the presence of such obstacles. In doubt steer clear. Avoid driving on any frozen waterways before checking that the ice will safely support the vehicle, its riders and its load of cargo.

At the end of each ride it is a good practice to clean the vehicle and all moving components (brakes, steering components, drivelines, controls, radiator fan etc.) from any snow or ice accumulations. Wet snow will turn to ice during the shut down period and become more difficult to remove at the next pre-ride inspection.

Riding on Sand

Sand and riding on sand dunes is another unique experience but there are some basic precautions that should be observed. Wet, deep or fine sand may create a loss of traction and cause the vehicle to slide, drop off or become "bogged" down. If this occurs look for a firmer base. Again, the best advice is to slow down and be watchful of the conditions.

When riding in sand dunes it is advisable to equip the vehicle with an antenna type safety flag. This will help make your location more visible to others over the next sand dune. Proceed carefully should you see another safety flag ahead.

Riding on Gravel, Loose Stones or Other Slippery Surfaces

Riding on loose stones or gravel is very similar to riding on ice. They will affect the steering of vehicle, possibly causing it to slide and tip over especially at high speeds. In addition, braking distance may be affected. Remember that "gunning" the throttle or sliding may cause loose stones to be ejected rearwards into the path of another rider's way. Never do it deliberately.

If you do get into a slide or skid, it may help to turn the steering wheel into the direction of the skid until you regain control. Never jam the brakes and lock the wheels.

Crossing Obstacles

Use the low range (L) for crossing obstacles.

Obstacles on the "trail" should be traversed with caution. This includes rocks, fallen trees, and depressions. You should avoid them whenever possible. Remember that some obstacles are too large or dangerous to cross and should be avoided. As a guideline, never attempt to cross an obstacle higher than the ground clearance of the vehicle. Small rocks or small fallen trees may be safely crossed - approach obstacle at low speed and as much as possible at a right angle. Adjust speed without losing momentum and do not accelerate abruptly. Passengers must grasp handhold firmly and brace feet on the floor. Hold steering firmly without closing your fists around it and proceed. Be aware that the obstacle may be slippery or may move while crossing.

Hill Driving Conditions

When driving on hills or slopes, two things are highly important: be prepared for slippery surfaces or terrain variations and obstacles and brace yourself properly inside vehicle. If you climb or descend a hill that is too slippery or has too loose a surface, you can lose control. If you go over the top of a hill at high speed, you may not have time to prepare for the terrain on the other side. Avoid parking on a slope. Always put the shift lever in PARK when stopped or parked, especially on an incline, to avoid rolling. If you must park on a steep incline, block the wheels using rocks or bricks.

Uphill Driving

Use the low range (L) for uphill driving.

Due to its configuration, this vehicle has very good traction even while climbing, so much so that tip over is possible before traction is lost. For example, it is common to encounter terrain situations where the top of the hill has eroded to a point that the hill peak rises very sharply. This vehicle is not designed to negotiate such a condition. Take an alternate route.

It is also wise to know the terrain condition on the other side of the hill or bank. All too often there exists a sharp drop-off that is impossible to negotiate or descend.

If you feel that the slope is getting too steep to climb, apply brakes to immobilize vehicle. Put shift lever in reverse (R), and back down the hill, barely releasing brakes to remain at low speed. Do not attempt to turn around. Never coast down hill while vehicle is in neutral. Do not perform hard braking as it increases the risk of tipover.

Downhill Driving

This vehicle can climb steeper slopes than it can descend safely. Therefore, it is essential to assure that a safe route exists to descend a slope before you climb it.

Decelerating while negotiating a slippery downhill slope could "toboggan" the vehicle, causing it to slide. Maintain steady speed and/or accelerate slightly to regain control. Never slam brakes and lock the wheels.

Side Hilling

Whenever possible, side hilling (driving across a slope rather than up or down it) should be avoided. If necessary, do so with extreme caution. Side hilling on steep inclines could result in rollover. In addition, slippery or unfirm surfaces could result in uncontrollable side sliding. Avoid all objects or depressions that will intensify the raising of one side of the vehicle higher than the other, thus causing rollover. If you feel the vehicle start to rollover or slide sideways, steer downhill if possible.

⚠ WARNING

Be careful when loading and transporting liquid reservoirs. They can affect vehicle stability when side hilling by pulling downhill and increasing the risk of a roll over.

Drop-Offs

This vehicle is not designed to negotiate drop-offs. It will "bottom-out" and usually stop if either the front or rear wheels are driven over a drop-off. If the drop is sharp or deep, the vehicle will nose dive and tip over.

Avoid negotiating drop-offs. Reverse and select an alternate route.

Recreational, Group and Distance Riding

Respect the rights and limitations of others. Stay away from areas designated for other types of off road use. This includes snowmobile trails, equestrian trails, cross country ski trails, mountain bike trails, etc. Never assume there are no other users on the trail. Always stay to the right of the trail and do not zig zag to one side of the trail then the other. Be prepared to stop or pull off to the side if another trail user appears in front of you.

Join a local side-by-side vehicle club. It will provide you with a map and advice or inform you where you can ride. If a club does not exist in your area, help to start one. Group riding and club activities provide a pleasurable, social experience. Never use this vehicle with drugs or alcohol, or tired or ill.

Always keep a safe distance from other riders. Your judgment of speed, terrain conditions, weather, mechanical condition of your vehicle and the "trust in judgment" you have in others

around you will help you make a better choice of appropriate safe distance. This vehicle, like any other motorized vehicle, cannot stop "on a dime".

Before you ride, tell someone where you are planning to travel and your expected time of return.

Depending on the length of your ride, carry additional tools or emergency equipment. Find out where you can get additional gasoline. Be prepared for the possible conditions you may encounter. An emergency first aid kit should always be a consideration.

Environment

One of the benefits of this vehicle is that it can take you off the beaten path away from most communities. However, you should always respect nature and the rights of others to enjoy it. Do not ride in environmentally sensitive areas. Do not drive over forest crops or shrubs, nor cut down trees or take down fencing, nor spin your wheels and destroy the terrain. "Tread Lightly".

This vehicle can cause OHV wildfires if debris builds up near the exhaust or other engine hot spots and ignites then falls off into dry grass. Avoid riding in wet areas, through muskeg or tall grass, where debris can build up. Should you ride in those areas, inspect and remove all debris from your engine and hot spots. Refer to *VEHICLE CARE* for details.

Chasing wildlife is in many areas illegal. Wildlife can die of exhaustion after being chased by a motorized vehicle. If you encounter animals on the trail, stop and observe quietly and with caution. It will be one of the better memories of your life.

Observe the rule "what you take in, carry out". Do not litter. Do not start campfires unless you have permission to do so, and then only away from dry areas. The hazards you may create on the trail may cause injury to others or yourself, even at a later date.

Respect farm lands. Always obtain the permission of the landowner before riding on private land. Respect crops, farm animals and property lines.

Finally, do not pollute streams, lakes or rivers and do not modify the engine or exhaust system, or remove any of its components as it will alter the vehicle emissions.

MOVING LOADS AND DOING WORK

Working with your Vehicle

Your vehicle can help you perform a number of different LIGHT tasks ranging from snow removal to pulling wood or carrying cargo. A variety of accessories are available from your authorized Can-Am dealer. To prevent possible injury, follow the instructions and warnings that accompany the accessory. Always respect the load limits of the vehicle. Overloading the vehicle can overstress the components and cause failure. Avoid overexerting yourself if you lift or pull heavy loads or manually push the vehicle.

Carrying Loads

Any load carried on the vehicle will affect the handling, stability and braking distance of the vehicle. Do not exceed the load limits of the vehicle, including the weight of operator, passengers, cargo, accessories and trailer tongue weight.

Always be aware that the "load" may slide or fall off and cause an accident.

Must use low gear if total payload is greater than 227 kg (500 lb).

LOAD LIMIT OF THE VEHICLE		
HD5	545 kg (1,200 lb)	Includes occupants, cargo, tongue weight and added accessories
HD8 and HD10 Without a cab except XT-P	**680 kg (1,500 lb)**	
HD8 and HD10 With a cab	545 kg (1,200 lb)	
HD8 and HD10 California models	545 kg (1,200 lb)	
HD10 XT-P	499 kg (1,100 lb)	

The following is an example of suitable total vehicle load distribution:

EXAMPLE OF SUITABLE LOADS MODELS WITH A 680 KG (1,500 LB) LOAD LIMIT, ADJUST ACCORDING TO YOUR MODEL LOAD LIMIT.				
OPERATOR AND PASSENGERS	CARGO BOX LOAD	ACCESSORIES	TONGUE WEIGHT	TOTAL VEHICLE LOAD
226 kg (500 lb)	346 kg (762 lb)	40 kg (88 lb)	68 kg (150 lb)	680 kg (1,500 lb)

To reduce the risk to lose control or the load carried, follow these recommendations.

Vehicle Settings When Carrying Load

NOTE: When carrying heavy loads or passengers readjust suspension accordingly.

NOTE: When carrying heavy loads in cargo box or pulling a loaded trailer, operate with the shift lever in L (low range).

⚠ WARNING

Must use LOW GEAR if total payload is greater than 226 kg (500 lb).

Loading the Cargo Box

NOTICE When loading or unloading, do not exceed the maximum cargo capacity on tailgate. Always close tailgate before operating to reduce the risk of loss of load.

Load cargo as low as possible – a higher load can raise the vehicle's center of gravity, which can reduce stability. Position cargo toward the front and center of the cargo box and as evenly distributed as possible.

Secure the load to the tie down hooks inside cargo box. Use only the tie down hooks on the bottom of the cargo box; do not secure cargo to the cage or other part of the vehicle. If it is not properly secured, a load may slide or fall off, possibly striking occupants or bystanders; or it may shift during riding, affecting the handling of the vehicle.

Objects that are higher than the walls of the cargo bed may affect visibility for the driver and may act as projectiles in case of an accident. Loads that protrude sideways can get snagged or caught in bush, branches or other obstacles. Avoid covering and obstructing the brake lights with the cargo. Ensure no cargo protrudes outside the box and that cargo will not interfere with your visibility or control of the vehicle.

Do not overload cargo box.

Close tailgate before operating.

⚠ WARNING

Never operate the vehicle with an open tailgate.

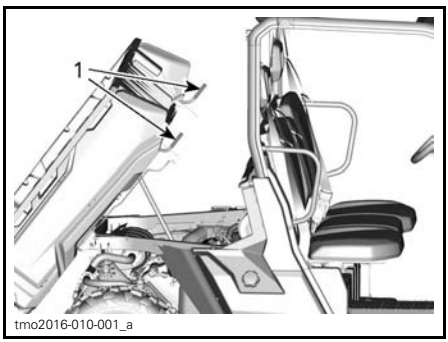
MODEL	MAXIMUM CARGO BOX LOADS		
HD5	CARGO BOX	272 kg (600 lb)	Evenly distributed and safely secured. Loaded as low as possible to reduce height of center of gravity.
HD8 AND HD10 EXCEPT CALIFORNIA MODELS AND XT-P		454 kg (1,000 lb)	
HD8 AND HD10 CALIFORNIA MODELS AND XT-P		272 kg (600 lb)	
ALL MODELS	TAILGATE	113.4 kg (250 lb)	Only while loading cargo into cargo box. Never operate with tailgate open.

Operating While Carrying a Loads

Reduce your speed when carrying cargo and turn gradually. Avoid hills and rough terrain. Allow more distance for braking. This vehicle may require additional stopping distance if carrying heavy loads, especially on inclined surfaces.

Tilting the Cargo Box

The cargo box can be tilted to ease unloading. Use release handles on either side of cargo box.



VIEWED FROM RH SIDE OF VEHICLE
1. Release handles

NOTICE Always turn off engine when tilting the cargo box.

⚠ WARNING

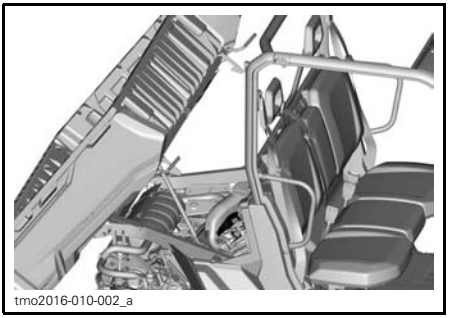
- Always ensure no one is standing behind the cargo box before you actuate the release handle.
- The load weight may affect the operation of the cargo box tilting feature (tilting or lowering).

Be very careful with the operation of the tailgate and the cargo box as the load may have moved during transport.

To lower the cargo box, simply push it down into place.

⚠ WARNING

- Keep yourself and others clear of the cargo box and vehicle frame junction when lowering cargo box.
- Ensure to properly latch the cargo box and the tailgate before riding.
- Make sure you do not leave objects between lifted cargo box and vehicle frame to ensure proper latching of the cargo box when lowered.



FRONT SECTION OF INCLINED CARGO BOX FREE OF ANY OBJECTS

Hauling a Load

Never pull a load by attaching it to the cage or other accessories; this can cause the vehicle to tip over. Use only the trailer hitch or winch (if installed) to pull a load.

When pulling loads with a chain or cable, ensure that there is no slack before starting and maintain tension while pulling.

When pulling loads with a chain or cable, be sure to brake progressively. The inertia of the load could lead to an impact.

When hauling a load, respect the maximum hauling capacity. Refer to *PULLING A TRAILER*.

⚠ WARNING

A slack can cause the chain or cable to break and snap back.

When pulling another vehicle, be sure that someone is controlling the pulled vehicle. They must brake and steer to prevent the vehicle from going out of control.

Before pulling loads with a winch, refer to the winch manufacturer's instructions.

Reduce your speed when hauling a load and turn gradually. Avoid hills and rough terrain. Never attempt steep hills. Allow more distance for braking, especially on inclined surfaces and when passengers are on board. Be careful not to skid or slide.

Pulling a Trailer

Riding this vehicle with a trailer substantially increases the risk of toppling, especially on inclined slopes. If a trailer is used behind the vehicle make sure that its hitch is compatible with the one on the vehicle. Make sure the trailer is horizontal with the vehicle. (In some instances a special extension may have to be installed on the vehicle hitch). Use security chains or cables to secure the trailer to the vehicle.

Reduce your speed when pulling a trailer and turn gradually. Avoid hills and rough terrain. Never attempt steep hills. Allow more distance for braking, especially on inclined surfaces and when passengers are on board. Be careful not to skid or slide.

Improperly loading a trailer may cause loss of control.

Always make sure load is evenly distributed and safely secured on the trailer; an evenly balanced trailer is easier to control.

Always put the shift lever to L (low range) for hauling a trailer – in addition to providing more torque, operating in low range helps account for the increased load on the rear tires.

When stopped or parked, block the vehicle and trailer wheels from possible movement.

Use caution when disconnecting a loaded trailer; it or its load may topple on you or others.

When hauling a trailer, respect the maximum tongue weight and towing capacity indicated on the label affixed to the hitch.

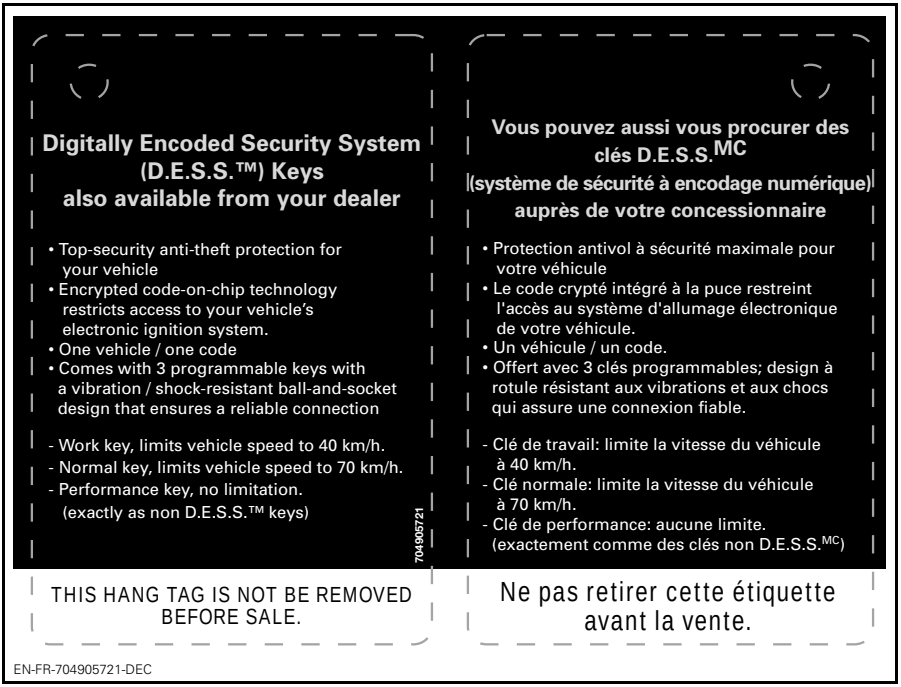
Make sure there is at least some weight on the tongue.

IMPORTANT ON-PRODUCT LABELS

Hang Tag

This vehicle comes with a hang tag and labels containing important safety information.

Any person who rides this vehicle should read and understand this information before riding.



TYPICAL - D.E.S.S. KEY OPTIONAL: NO D.E.S.S. KEY DELIVERED WITH THE VEHICLE

⚠ WARNING

THIS VEHICLE IS INTENDED FOR RECREATIONAL USE AND SECONDARY GENERAL UTILITY APPLICATIONS
NO OPERATOR UNDER AGE 16

TRAINING COURSES TO TEACH ROV DRIVING ARE AVAILABLE. FOR INFORMATION CONTACT YOUR DEALER.
Read the Operator's Guide and Safety Labels and Watch the Safety Video.
Follow All Instructions and Warnings.

CHECK WITH YOUR DEALER TO FIND OUT ABOUT STATE OR LOCAL LAWS REGARDING ROV OPERATION.

Improper Use of Off-Highway Vehicles Can Cause Severe Injury or Death

Be Prepared
- Fasten seat belts and make sure nets or doors are securely latched in place.
- Wear an approved helmet and protective gear.
- Each rider must be able to sit with back against seat, foot flat on the floor or on footrest, and hands on steering wheel or handholds. Stay completely inside the vehicle.

Drive Responsibly
Avoid loss of control and rollovers:
- Avoid abrupt maneuvers, sideways sliding, skidding or fishtailing, and never do donuts.
- Avoid hard acceleration when turning, even from a stop.
- Slow down before entering a turn.
- Plan for hills, rough terrain, ruts, and other changes in traction and terrain. Avoid paved surfaces.
- Avoid side hilling (riding across slopes).

Rollovers have caused severe injuries and death, even on flat, open areas.

Be Sure Riders Pay Attention and Plan Ahead
If you think or feel the vehicle may tip or roll, reduce your risk of injury :
- Keep a firm grip on the steering wheel or handholds and brace yourself.
- Do not put any part of your body outside of the vehicle for any reason.

Require Proper Use of Your Vehicle
– Do your part to prevent injuries:
- Do not allow careless or reckless driving.
- Make sure operators are 16 or older with a valid driver's license.
- Do not let people drive or ride after using alcohol or drugs.
- Do not allow operation on public roads (unless designated for off-highway vehicle access) – collisions with cars and trucks can occur.
- Do not exceed seating capacity: see information on back side of this card

THIS HANG TAG CAN'T BE REMOVED BEFORE SALE.

Tilt Table Test Result

Bombardier Recreational Products inc.
Vehicle Model: XXXX

XX.X

Measurement of lateral stability, in degrees, of a sample, standard condition vehicle (with an operator and a passenger load - 430 pounds) as measured by the manufacturer in accordance with the tilt table lateral stability test in the ANSI/ROHVA standard for Recreational Off-Highway Vehicles. Vehicle modification, accessories, and loading can affect lateral stability.

Training courses to teach ROV driving are available. For information contact your dealer and/or rohva.org.

Check with your dealer to find out about state or local laws regarding ROV operation.

THIS HANG TAG IS NOT TO BE REMOVED BEFORE SALE.

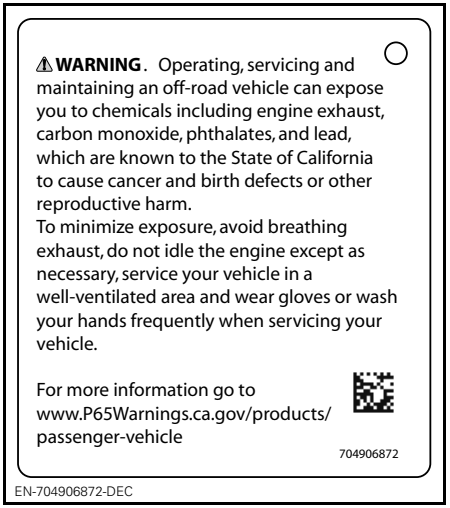
VEHICLE ENGINE DESCRIPTION:
XXXXXX

EPA CERTIFIED

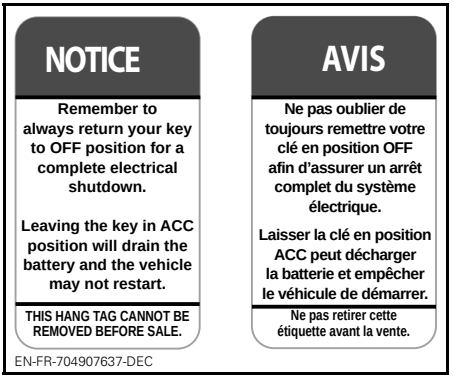
NER (NORMALIZED EMISSION RATE)= XX
ON A 0 TO 10 SCALE, 0 BEING THE CLEANEST

Vehicle seating capacity: ☐ **Occupants**

EN-704906754A-DEC



TYPICAL: APPLICABLE FOR ALL MODELS IN CANADA AND UNITED STATES, APPLICABLE FOR MODELS EVERYWHERE EXCEPT CANADA AND UNITED STATES WHEN EQUIVALENT TO A MODEL CERTIFIED TO US. EPA STANDARDS



TYPICAL - DO NOT LEAVE KEY IN ACC POSITION

Safety Labels

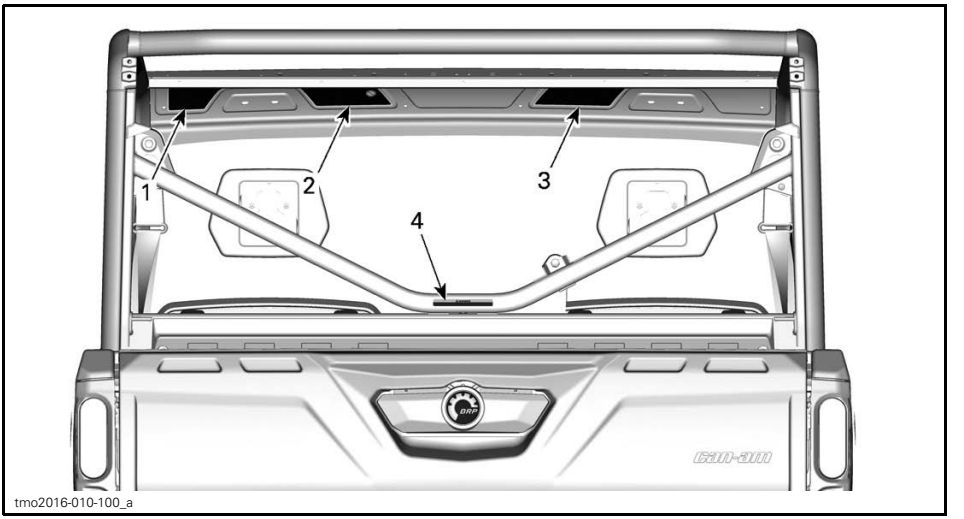
Read and understand all the safety labels on your vehicle.

These labels are affixed to the vehicle for the safety of the operator, passengers or bystanders.

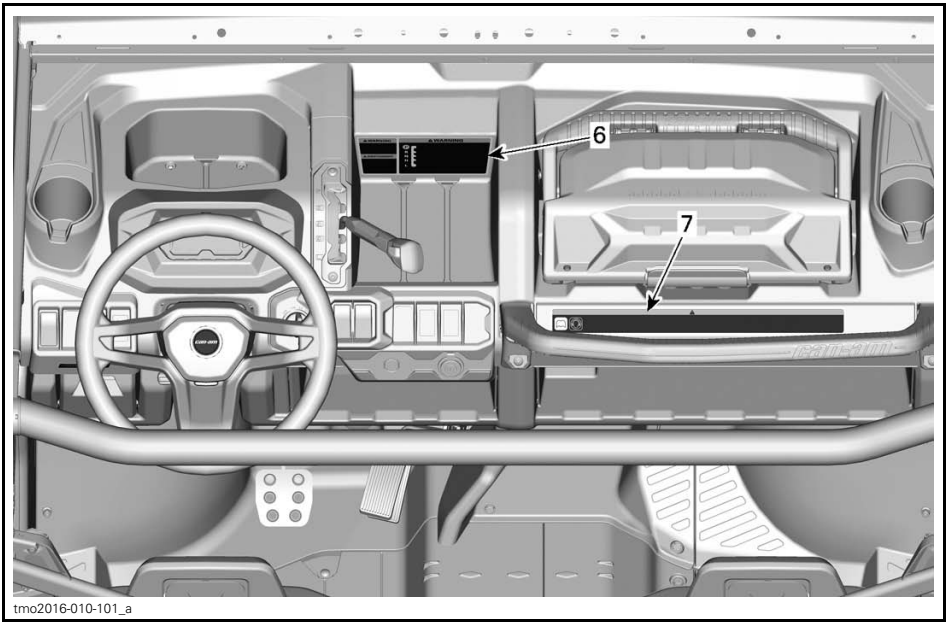
The following labels are on your vehicle, and they should be considered permanent parts of the vehicle. They need to be clean and visible at all times. If missing or damaged, they need to be replaced. Safety labels are free of charge. See an authorized Can-Am dealer.

Upon replacement of parts that have warnings on them, make sure to order (free of charge) the applicable safety warnings if not already installed on the replacement part.

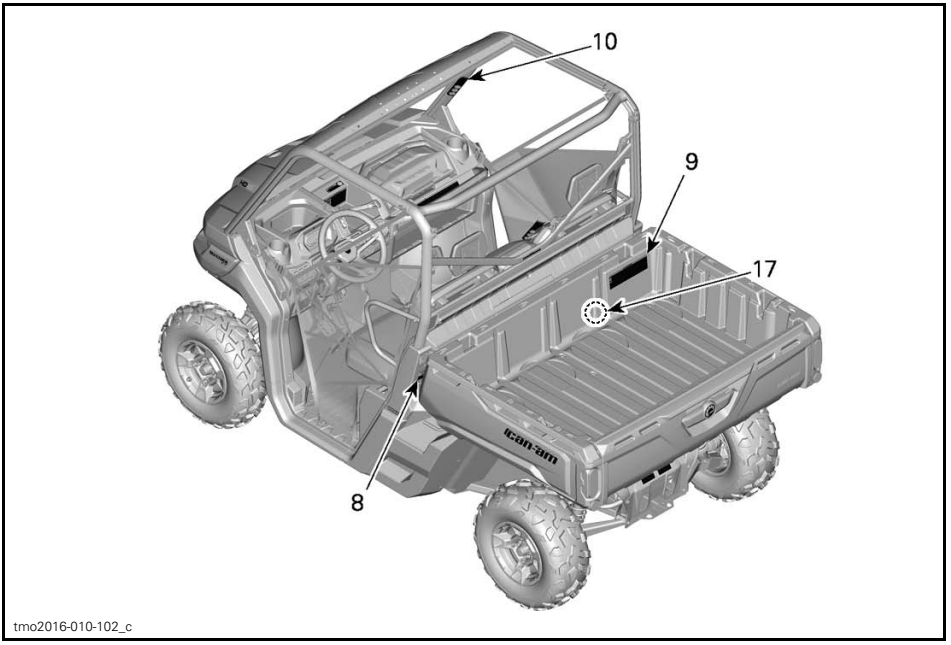
NOTE: In the event of any discrepancy between this guide and the vehicle, the safety labels on the vehicle have precedence over the labels in this guide.



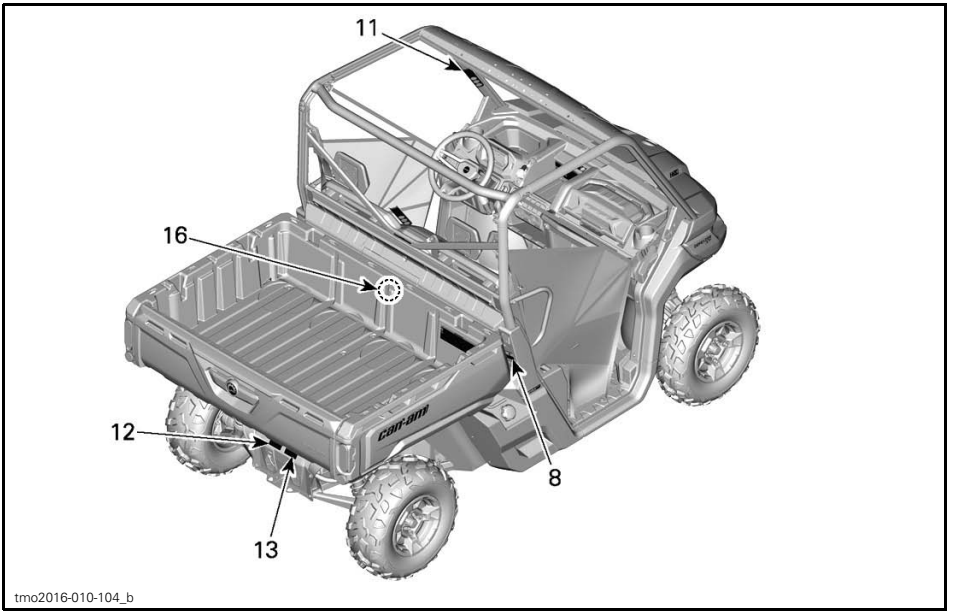
TYPICAL



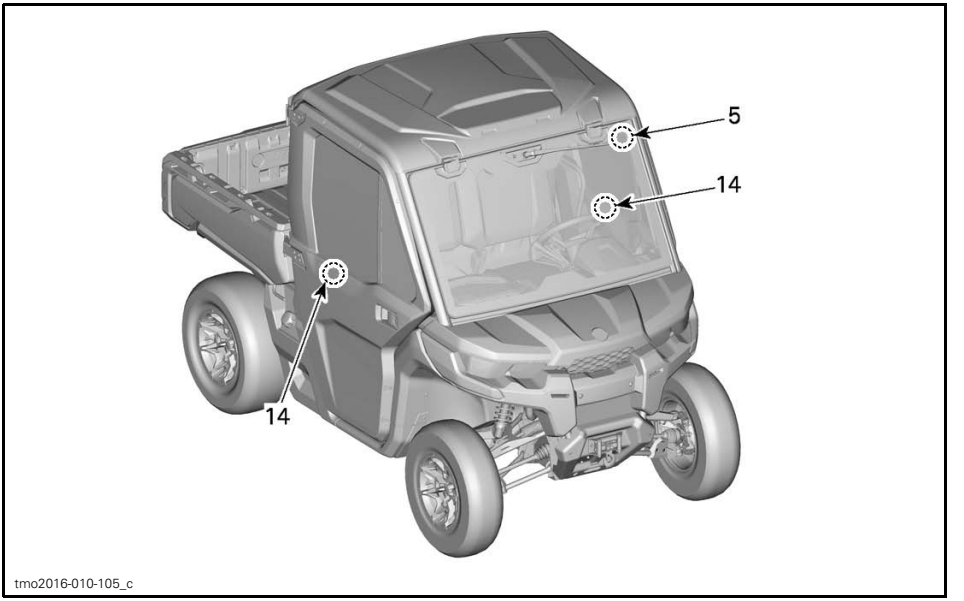
TYPICAL

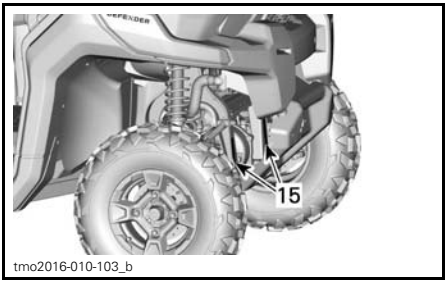


TYPICAL

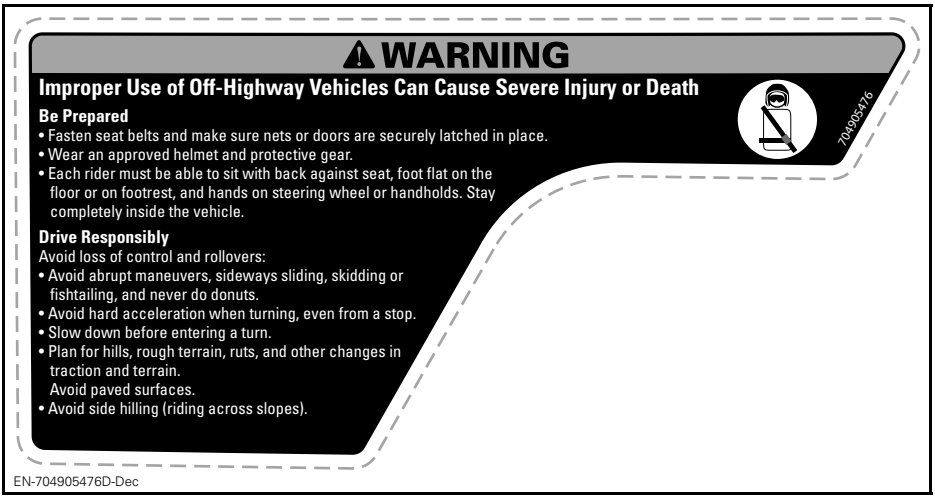


TYPICAL

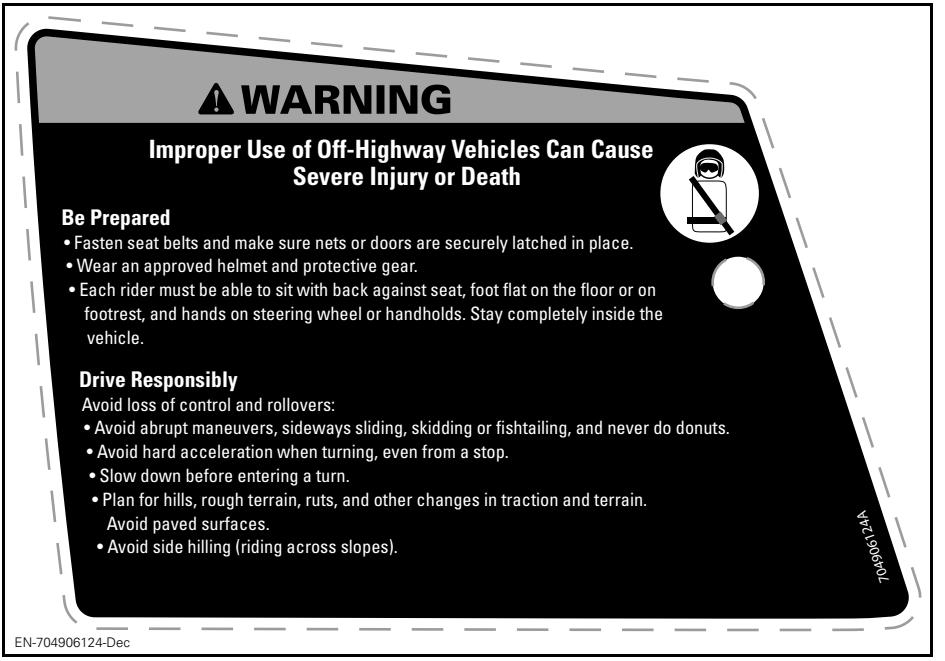




TYPICAL

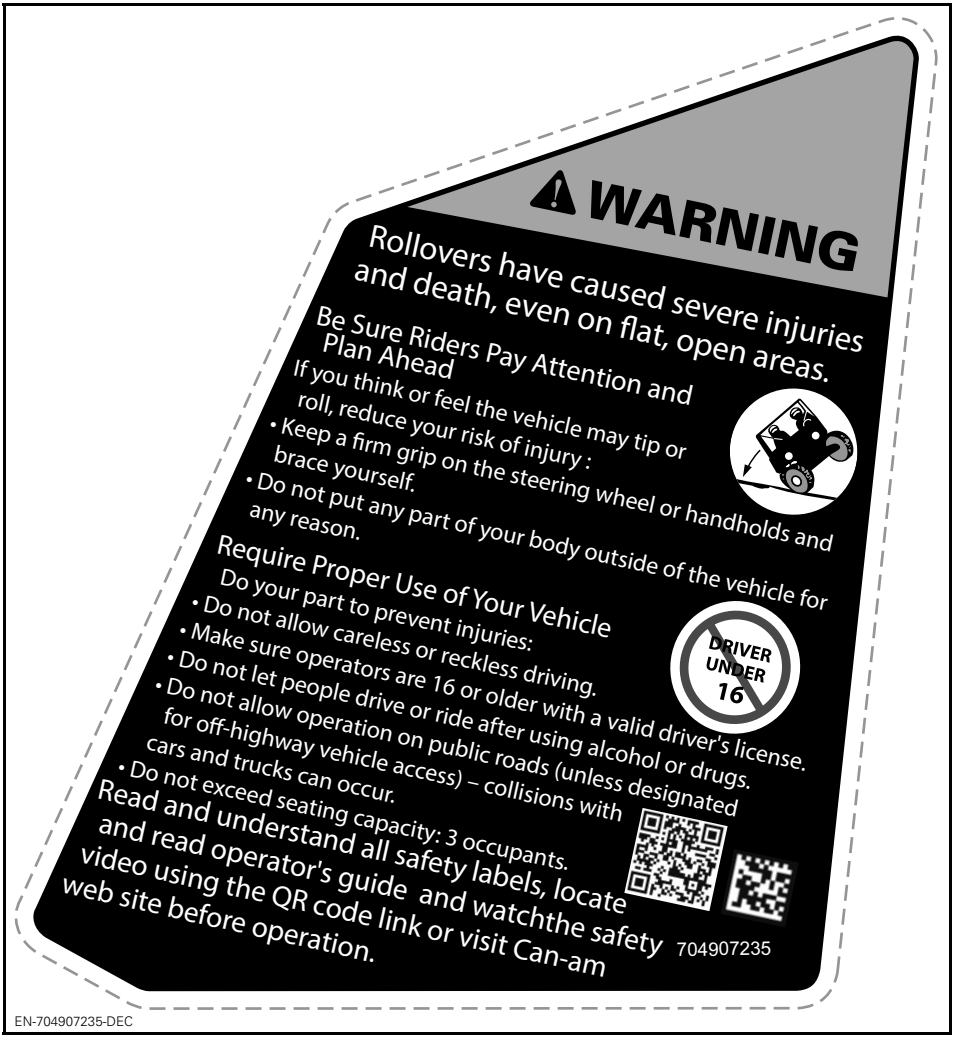


LABEL 1 - MODELS WITHOUT A CAB

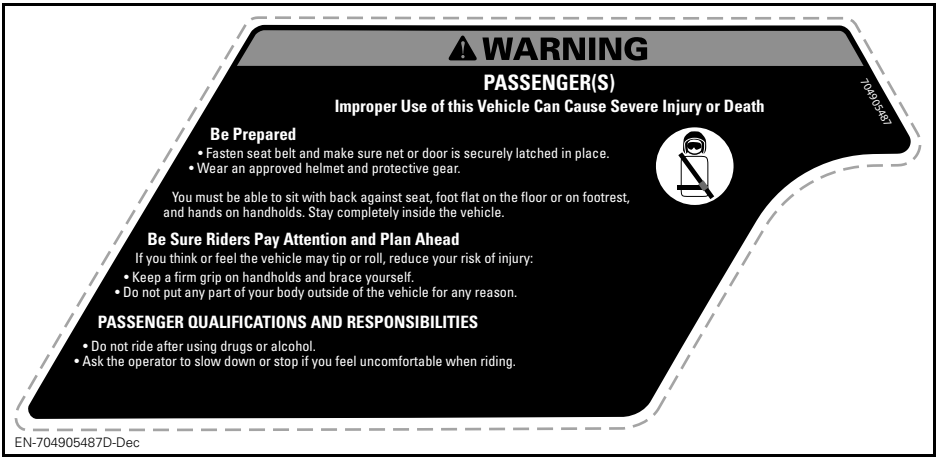


LABEL 1- MODELS WITH A CAB

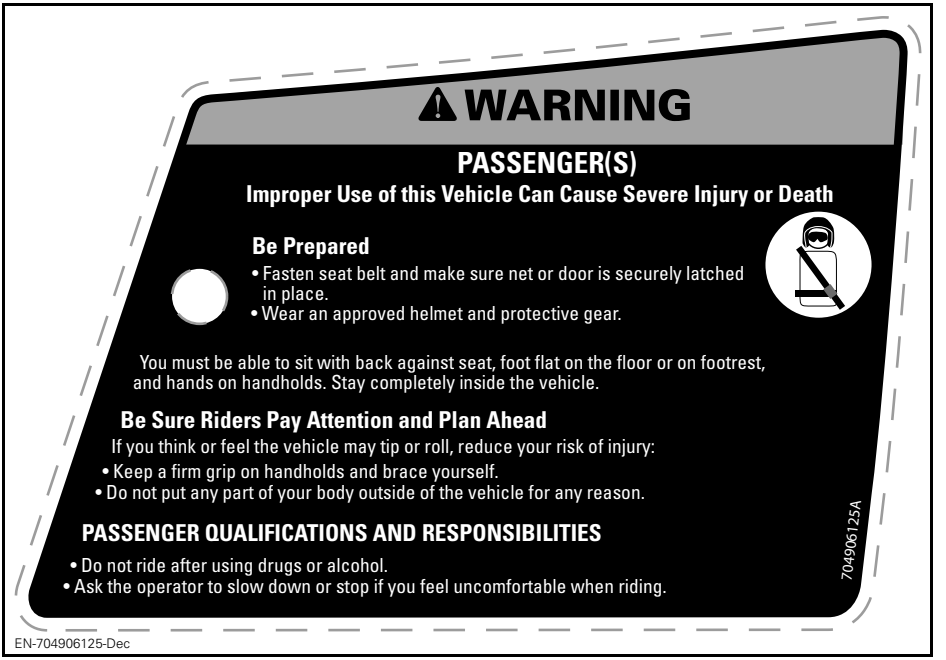
LABEL 2 - MODELS WITHOUT A CAB



LABEL 2 - MODELS WITH A CAB



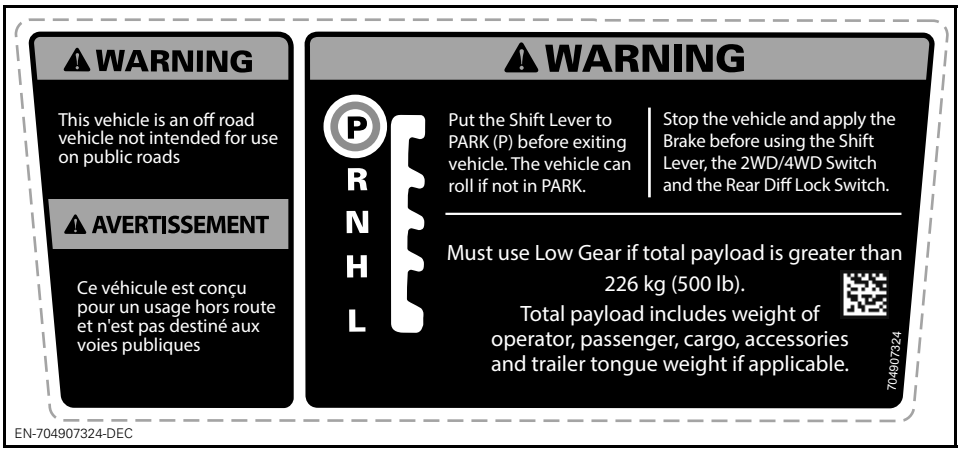
LABEL 3 - MODELS WITHOUT A CAB



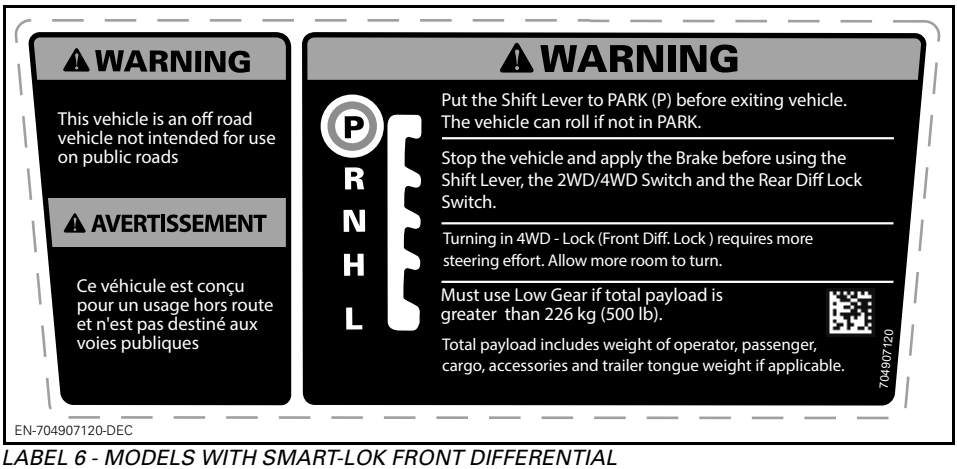
LABEL 3 - MODELS WITH A CAB

LABEL 4

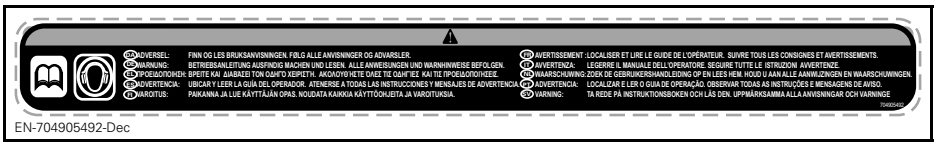
LABEL 5 - MODELS WITH A WINDSHIELD



LABEL 6 - MODELS WITH VISCO-LOK FRONT DIFFERENTIAL

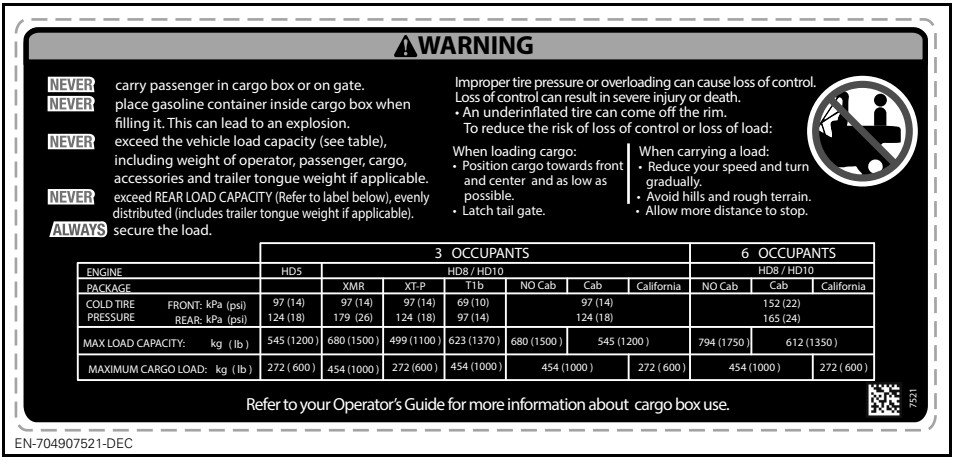


LABEL 6 - MODELS WITH SMART-LOK FRONT DIFFERENTIAL



LABEL 7- OUTSIDE NORTH AMERICA

LABEL 8



LABEL 9

LABEL 10

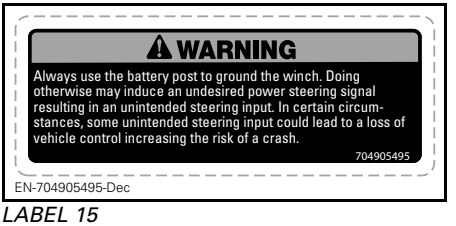
LABEL 11

LABEL 12

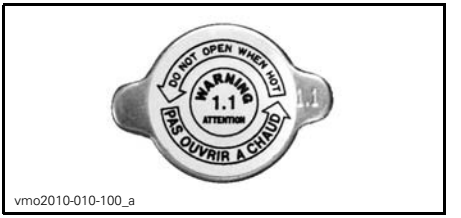
LABEL 13 - HD5

LABEL 13 HD8 AND HD10

LABEL 14 - MODELS WITH A CAB



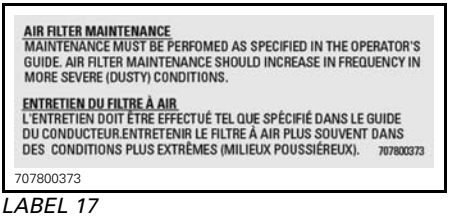
LABEL 15



LABEL 16

Molded Safety Pictogram

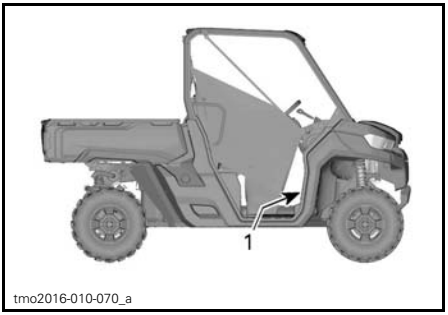
Technical Information Label



LABEL 17

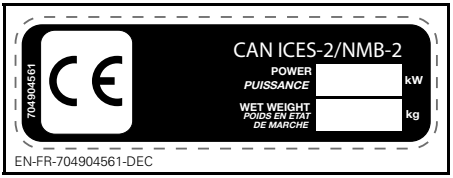
Compliance Labels

These labels indicate vehicle's compliance.



TYPICAL

1. *Compliance labels located under storage compartment*



TYPICAL:MODELS OUTSIDE OF CALIFORNIA, COMPLIANT TO THE US EPA STANDARDS, OR EQUIVALENT MODELS.

TYPICAL
California models with evaporative emission control system

TYPICAL
California models without evaporative emission control system

EN-FR-704906981-DEC

LOCATED ON TOP LH BAR OF CAGE FACING THE INSIDE OF VEHICLE

704907278-DEC

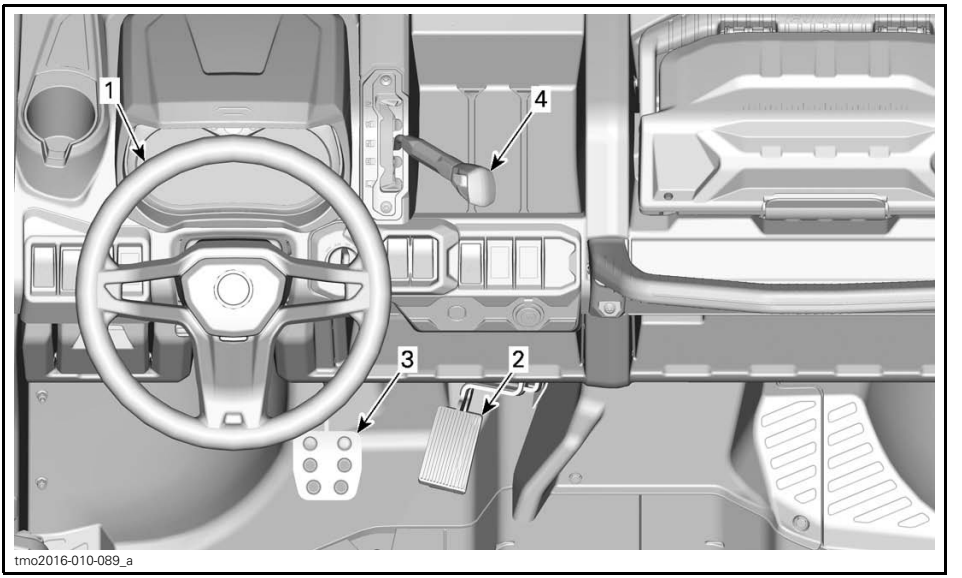
LOCATED NEAR GAS CAP

VEHICLE INFORMATION

PRIMARY CONTROLS

It is important to know the location and operation of all controls, and to develop and practice smooth and coordinated use of them.

NOTE: Some vehicle safety labels are not shown on illustrations. For information on vehicle safety labels, refer to *IMPORTANT ON-PRODUCT LABELS*.



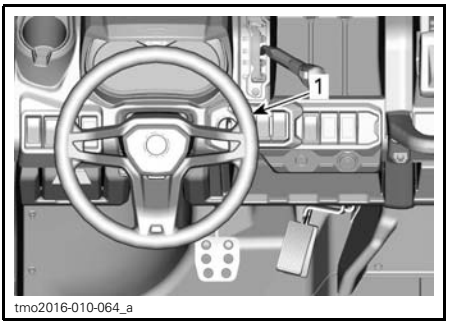
TYPICAL - PRIMARY CONTROLS

1) Steering Wheel

The steering wheel is located in front of the driver's seat.

The steering wheel steers the vehicle to the left or right.

Turn the steering wheel in the direction you want to go.



TYPICAL
1. Steering wheel

Grip the steering wheel with both hands, without having thumbs rolled around the steering wheel.

⚠ CAUTION Under rough trail conditions or when crossing an obstacle, the steering wheel could suddenly jerk on one side, causing hand or wrist injuries if the thumbs are rolled around the steering wheel.

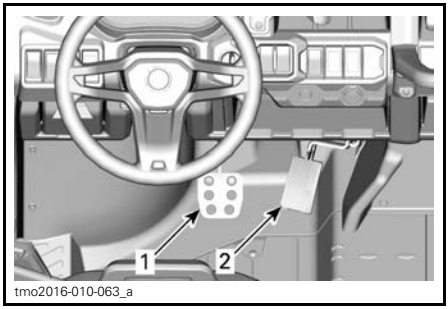
Models with DPS

The DPS (Dynamic Power Steering) reduces the effort to turn the steering wheel.

2) Accelerator Pedal

The accelerator pedal is located on the right side of the brake pedal.

The accelerator pedal controls the engine speed.



1. Brake pedal
2. Accelerator pedal

To increase or maintain vehicle speed, press on the accelerator pedal with your right foot.

To decrease vehicle speed, release the accelerator pedal.

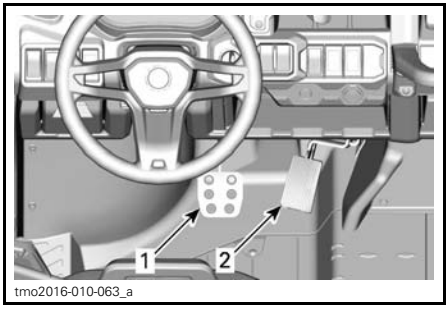
The accelerator pedal is spring loaded and should return to rest position (idle) when not pressed.

NOTE: The accelerator pedal should never be disassembled.

3) Brake Pedal

The brake pedal is located on the left side of the accelerator pedal.

The brake pedal function is to slow down or stop the vehicle.



1. Brake pedal
2. Accelerator pedal

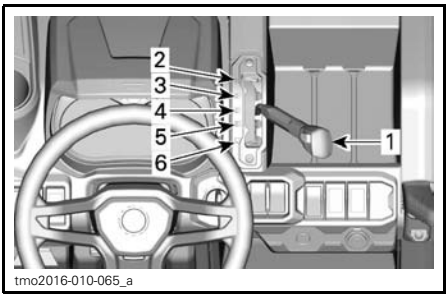
To decrease vehicle speed or to stop vehicle, press down the brake pedal with your right foot.

The brake pedal is spring loaded and should return to rest position when not pressed.

4) Shift Lever

The shift lever is located on the upper console to the right of steering wheel.

The shift lever is used to change the gearbox position.



1. Shift lever
2. Park
3. Reverse
4. Neutral
5. High range (forward)
6. Low range (forward)

The vehicle must be stopped and brakes applied prior to selecting any gear.

⚠ WARNING

This gearbox is not designed to shift while vehicle is moving.

Park

The park position locks the gearbox to help prevent vehicle movement.

⚠ WARNING

Always use the PARK (P) position when the vehicle is not in operation. The vehicle can roll if the shift lever is not set to P (PARK).

Reverse

The reverse position allows the vehicle to go backwards.

NOTE: In reverse operation, the engine's RPM is limited, thus limiting the vehicle reverse speed.

⚠ WARNING

When driving downhill in reverse, gravity can increase the vehicle speed above the set limited reverse speed.

Neutral

The neutral position disengages the gearbox.

High Range (Forward)

This position selects the high speed range of the gearbox. It is the normal driving speed range. It allows the vehicle to reach its maximum speed.

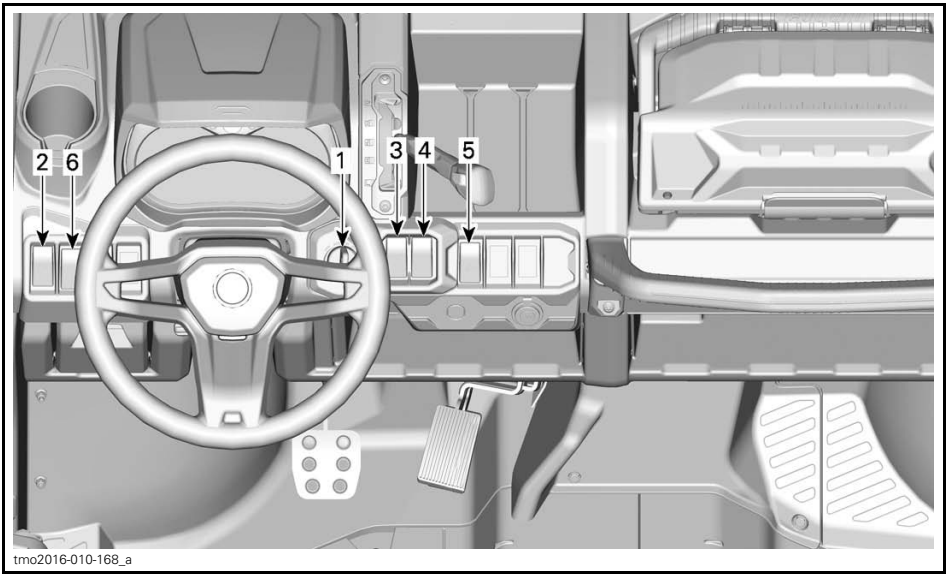
Low Range (Forward)

This position selects the low speed range of the gearbox. It allows the vehicle to move slowly with maximum torque at the wheels.

NOTICE Use the low speed range to pull a trailer, carry heavy cargo, go over obstacles or drive uphill and downhill.

SECONDARY CONTROLS

NOTE: Some vehicle safety labels are not shown on illustrations. For information on vehicle safety labels, refer to *IMPORTANT ON-PRODUCT LABELS*.

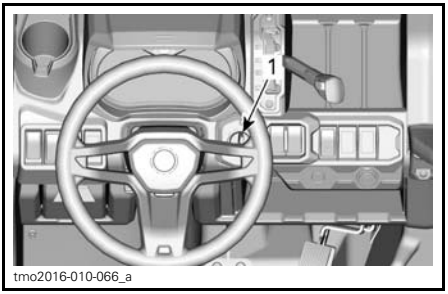


TYPICAL - SECONDARY CONTROLS

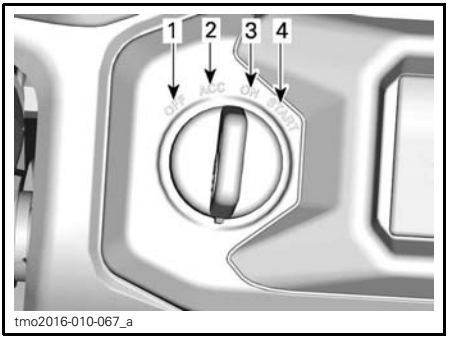
1) Ignition Switch and Keys

Ignition Switch

The ignition switch is located on the upper console area.



1. Ignition switch



IGNITION SWITCH POSITION
1. OFF
2. ACC
3. ON
4. START

OFF

The key can be inserted or removed in this position only.

In OFF position, the electrical system of the vehicle is disabled.

The engine is shut down by turning the ignition switch to OFF position.

ACC

Only accessories such as the heater, wiper or radio are powered up.

NOTE: The ACC position also shuts down the engine

NOTICE **Remember to always return your key to the OFF position for a complete electrical shutdown. Leaving the key in ACC will drain the battery and the vehicle may not restart.**

ON

When the key is turned in this position, the electrical system of the vehicle is activated.

The gauge should wake-up.

The vehicle lights are turned on.

The engine can be started.

START

This position starts the engine.

NOTE: If the ignition switch is left ON for more than 30 minutes, engine will not start unless ignition switch is turned OFF, then ON again.

Keys

Basic Key

The vehicle is delivered with 2 basic key. one with a rubber booth and one without.

For all D.E.S.S. related option, see an authorized Can-Am dealer for information.

Digitally Encoded Security System (D.E.S.S.) (Available as an Option)

The keys contain an electronic circuit that gives it a unique electronic serial number.

The D.E.S.S. system reads the key code and allows engine starting for keys it recognizes.

Types of Keys

This vehicle can be operated using 3 different types of keys:

- Work key (orange): limits vehicle speed to 40 km/h (25 MPH) but does not limit engine torque.
- Normal key (green): limits vehicle speed to 70 km/h (44 MPH) and 10% torque reduction.
- Performance key (grey): no restriction

The key type is differentiated by its color.

⚠ WARNING

Rollovers, tipovers, collisions and loss of control resulting in serious injury or death are possible with the performance, normal or optional work keys. Using the work key or normal key is not a substitute for the operator being prepared, qualified, and operating with care.

Optional Performance D.E.S.S. Key

A performance key is also available at your dealership.

NOTE: This key is the equivalent of the basic key.

The performance key, allows the user to access the full torque of the engine as well as the top speed of the vehicle.

This may be useful for riders who prefer greater acceleration, and for environments where higher speeds and greater acceleration are appropriate. For example, in wide-open, straight trails, operators may prefer the performance key.

Optional D.E.S.S. Normal Key

A normal key is also available at your dealership.

The normal key limits the overall performance to 90% of maximum engine torque and vehicle speed to 70 km/h (44 MPH).

⚠ WARNING

On steep downhills, the engine speed limiter may not prevent the vehicle from accelerating beyond this speed.

This key may be useful for riders who prefer more gradual acceleration, or for riding in environments where full speed and high acceleration are not desirable. For example, in narrow, winding trails, operators may prefer the normal key.

Optional D.E.S.S. Work Key

A work key is also available at your dealership.

The work key allows for usage of 100% of maximum engine torque but limits vehicle speed to 40 km/h (25 MPH).

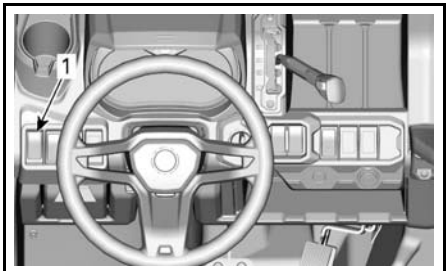
⚠ WARNING

On steep downhills, the engine speed limiter may not prevent the vehicle from accelerating beyond this speed.

This may be useful for riders who use this vehicle in a workplace environment where lower speeds and acceleration are a requirement.

2) Headlight Dimmer Switch

The headlight dimmer switch is located on the upper console.

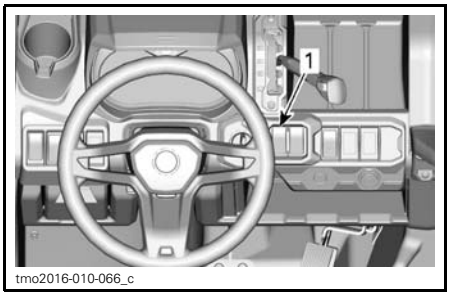


1. Headlight dimmer switch

This switch is used to select either the headlights OFF position, low or high beams.

3) 2WD/4WD/Front Diff Lock (If equipped) Switch

The 2WD/4WD/Front Diff Lock (If equipped) switch is located on the upper console.



1. 2WD/4WD switch

This switch selects 2 wheel drive or 4 wheel drive mode when the vehicle is stopped and the engine is running.

The front diff. lock can be activated on the fly, no need to stop the vehicle to engage. To deactivate, push again on the switch. When the vehicle is turned off, the front diff lock will be deactivated.

NOTICE **The vehicle must be stopped to engage or disengage the 2WD/4WD switch. Mechanical damage may occur if switch is engaged or disengaged while driving. Always unlock the front diff. before disengaging 4WD.**

The front differential is fully locked when the switch is pushed upward. It's a momentary position. When the front diff is locked, the switch light will illuminate and a message will appear in the cluster for 2 seconds to say "DIFFLOCK". The light will turn off when the differential is unlocked and a message in the cluster will appear and show "SMARTLOK", meaning that you are back in the automatic mode.

When the front differential is locked, the effort to turn the steering wheel might be higher and the response might be slower.

⚠ WARNING

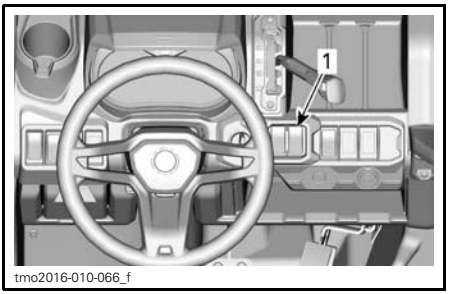
Abruptly changing direction can cause loss of control or injury. Never engage Front Diff Lock before entering a turn or when turning.

The 4WD mode is engaged when the switch is in the middle position.

The 2WD mode is engaged when the switch is pushed downwards. The vehicle is then rear wheel drive only.

4) Rear Differential Switch (If Equipped)

The Differential switch is located on the console.



1. Differential switch

The differential switch enables locking of rear differential.

NOTICE **The vehicle must be stopped to engage or disengage the differential switch. Mechanical damage may occur if switch is engaged or disengaged while driving.**

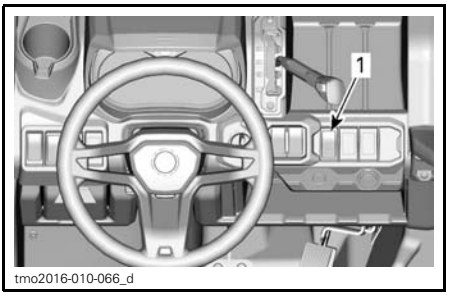
The rear differential is locked when the switch is pushed upwards. The rear differential is unlocked when the switch is pushed downwards.

5) ECO/Normal/Work Mode Switch (If Equipped)

The ECO/normal/work mode switch is located on the upper console.

It is used to select the ECO, normal or work mode.

NOTE: The cluster will show the selected driving mode.



1. ECO/normal/work mode switch

The ECO (fuel economy mode) setting reduces fuel consumption by limiting throttle response and maximum throttle opening to maintain an optimal cruising setting.

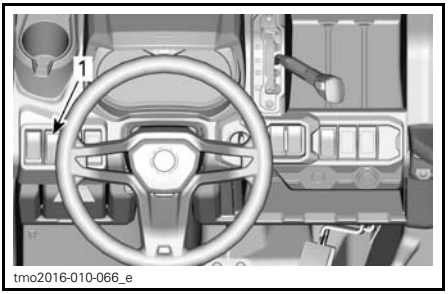
NOTE: Use ECO mode on bumpy trails to provide smoother ride conditions.

The normal mode offers no engine torque reduction as well as a sportier driving experience

The work mode is optimized to be able to work with high loads in a smooth way but still with the full engine torque available. This mode is also effective for getting over obstacles and rough terrain.

6) Winch Switch (If Equipped)

The winch can be controlled from inside and outside the vehicle with the winch control switch located in the upper console.



1. Winch switch

Refer to your winch *GUIDE* included with your vehicle for proper winch operation.

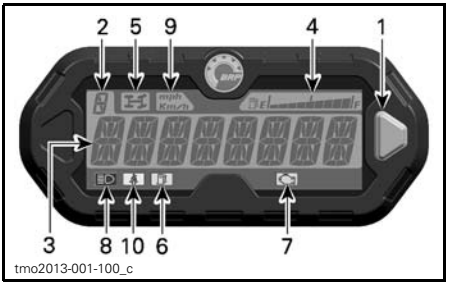
MULTIFUNCTION GAUGE (LCD)

The multifunction gauge (LCD) is located on the upper console.

⚠ WARNING

Do not adjust the display while riding . You could lose control.

Multifunction Gauge Description



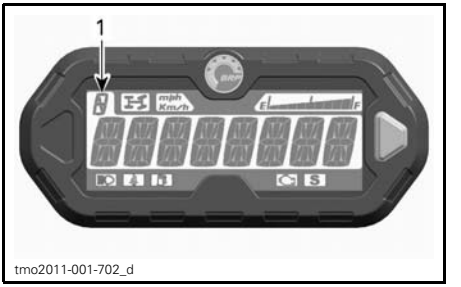
1. *Selector button*
2. *Gearbox position display*
3. *Main screen*
4. *Fuel level display*
5. *4WD indicator lamp*
6. *Low fuel level indicator lamp*
7. *Check engine indicator lamp*
8. *High beam indicator lamp*
9. *MPH and KM/H indicator lamp*
10. *Seat belt indicator lamp*

1) Selector Button

The selector button is used to navigate or change settings in the multifunction gauge.

2) Gearbox Position Display

This display will show gearbox position.



1. *Gearbox position*

DISPLAY	FUNCTION
P	Park
R	Reverse
N	Neutral
H	High range
L	Low range
-	Indicated in-between gear

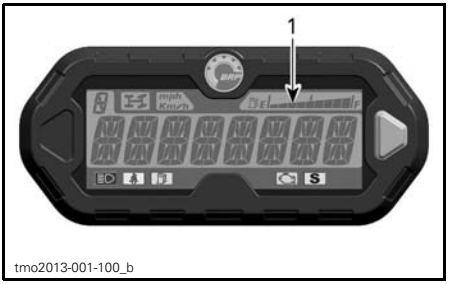
3) Main Screen

The main screen is used to display numerous functions of the multifunction gauge.

Refer to *MULTIFUNCTION GAUGE MODES* for the different available modes:

4) Fuel Level Display

Bar gauge continuously indicates the level of fuel in the fuel tank while riding.



1. *Fuel level display*

5) 4WD Indicator Lamp

When this indicator is ON, it indicates the 4WD system is activated.

6) Low Fuel Level Indicator Lamp

When this indicator is ON, it indicates that there is approximately 8.5 L (2.2 U.S. gal.)of fuel left in fuel tank.

7) Check Engine Indicator Lamp

When this indicator is ON, it indicates an engine fault code, look for a message at the LCD display.

When this indicator blinks, it indicates that the LIMP HOME mode is activated.

Refer to *TROUBLESHOOTING* section for more details.

8) High Beam Indicator Lamp

When this indicator is ON, it indicates that high beam is selected on the headlights.

9) KM/H or MPH Indicator Lamp

mph
Km/h

The proper lamp turns on to indicate the unit the speedometer uses.

10) Seat Belt Indicator Lamp

When this indicator is ON, the driver's seat belt is not buckled.

Multifunction Gauge Modes

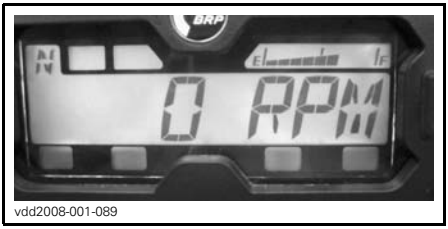
Speed Mode

In this mode, the main screen shows the speed of the vehicle either in km/h or in MPH.

vdd2008-001-084

RPM Mode

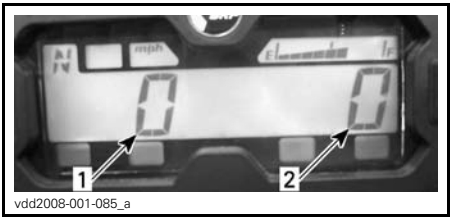
In this mode, the main screen shows the engine RPM.



vdd2008-001-089

Combined Mode

In this mode, the main screen shows the speed of the vehicle and the engine RPM.



vdd2008-001-085_a

1. *Vehicle speed*
2. *Engine RPM*

Odometer (OD)

Odometer records the total distance travelled either in miles or kilometers.

vsi2009-018-030

Clock

Shows current time.

vmo2011-008-001

Refer to *GAUGE SETUP* to set current time.

Trip Meter (TP)

The trip meter records the travelled distance since it has been reset. Distance travelled is displayed either in kilometers or miles.

vsi2009-018-031

It can be used to establish a fuel tank range or distance between 2 way points.

Press and HOLD the selector button for 2 seconds to reset the trip meter.

Trip Hour Meter (TH)

The trip hour meter records vehicle running time when the electrical system is activated. It can be used to establish traveling time between 2 way points .

vsi2009-018-032

Press and HOLD the selector button for 2 seconds to reset the hour meter.

Engine Hour Meter (EH)

The engine hour meter records engine running time.

vsi2009-018-033

Message Display Mode

Important messages can be displayed in the main screen. Refer to table below.

If an abnormal engine condition occurs, a message may scroll across the main screen in conjunction with a pilot lamp. Refer to *TROUBLESHOOTING* section for details.

MESSAGE (NORMAL OPERATION)	DESCRIPTION
BRAKE	Message displayed when the brakes are applied continuously for 15 seconds. (Speed needs to be higher than 5 km/h (3 MPH))
NORMAL KEY	Displayed at power up when the normal key is used.
WORK KEY	Displayed at power up when the work key is used.
SEAT BELT	When the driver seat belt is not buckled and the vehicle speed is less than 10 km/h (6 MPH), the message is displayed and the pilot lamp will be lit. No engine torque limitation engaged.
ENGINE LIMITATION ENGAGED FASTEN SEAT BELT	When the driver seat belt is not buckled and the vehicle speed is above 10 km/h (6 MPH), the message is displayed and the pilot lamp stays on. The engine management will engage a torque limitation that will limit the vehicle speed to approximately 20 km/h (12 MPH).
WORK MODE ACTIVE	Displayed when work mode is activated.
NORMAL MODE ACTIVE	Displayed when normal mode is activated
ECO MODE ACTIVE	Displayed when ECO mode is activated.
MAINTENANCE REQUIRED (1)	Displayed in gauge when vehicle is due for a maintenance.
LOW GEAR	Displayed when belt protection is active in high gear. (If available and activated on your model)

(1) To erase the MAINTENANCE REQUIRED message, proceed as follows:

1. Select PARK.
2. Turn ignition switch to ON. Do NOT start engine.
3. Set the cluster to odometer display.
4. Press SET button on the multifunction gauge and keep it pressed until step 6.
5. Switch the high beam On-Off three times rapidly.
6. Turn ignition switch to OFF.

NOTE: Steps 4 and 5 must be completed within 5 seconds.

NOTE: Do not turn ignition switch to ON before the multifunction gauge turns off.

Fault Code Mode

At the engine hour menu, press and hold MODE button while switching high and low beam (three cycles) to access diagnostic fault codes.

Navigating in the LCD Gauge

Default Display Mode

After vehicle startup, the default display mode is either:

– Vehicle speed
– Engine revolutions per minute (RPM)
– Both parameters simultaneously (combined mode).

To change from one display to the other, proceed as follows.

1. Turn key to ON to power-up the system up.
2. Wait until the "greeting message" has been displayed.
3. Press and release selector button once to display OD (odometer).
4. Press the selector button again, this time for 2 seconds.

This will change the Mode to either Speed, RPM or Combined.

vdd2008-001-083

5. To select another mode, repeat steps 3 and 4 until the desired mode is displayed.

Temporary Display Mode

In the temporary display mode, the following functions are available:

– Odometer
– Clock
– Trip meter (resettable)
– Trip Hour meter (resettable)
– Engine hour meter.

Press and release selector button to change the default display mode to the temporary mode.

tmo2011-001-702_c

1. Selector button

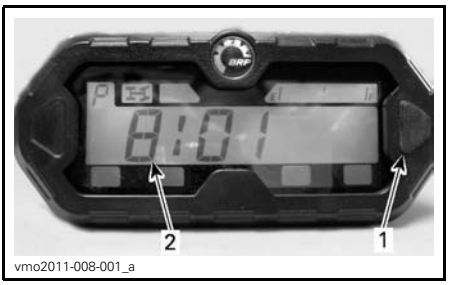
The gauge will display the selected mode for 10 seconds then will return to the normal display mode.

While in a resettable mode, push and HOLD selector button for 2 seconds to reset it.

Gauge Setup

Clock Setting

Once clock display as been selected, use the display selector button to set clock as follows:



vmo2011-008-001_a

1. Selector button
2. Time

1. Press and HOLD button (Display will flash).
2. Choose the 12-hour (12H) or 24-hour (24H) format by pressing button.

3. If the 12-hour format was selected, choose Am ("A") or Pm ("P") by pressing button.
4. Press and HOLD button.
5. Choose hour first digit by pressing button.
6. Press and HOLD button.
7. Choose hour second digit by pressing button.
8. Press and HOLD button.
9. Choose minutes first digit by pressing button.
10. Press and HOLD button.
11. Choose minutes second digit by pressing button.
12. Press button to enter settings (CLOCK will appear on display).

NOTE: The gauge will display the current time for 10 seconds then will return to the normal display mode.

Unit Selection (km/h vs MPH)

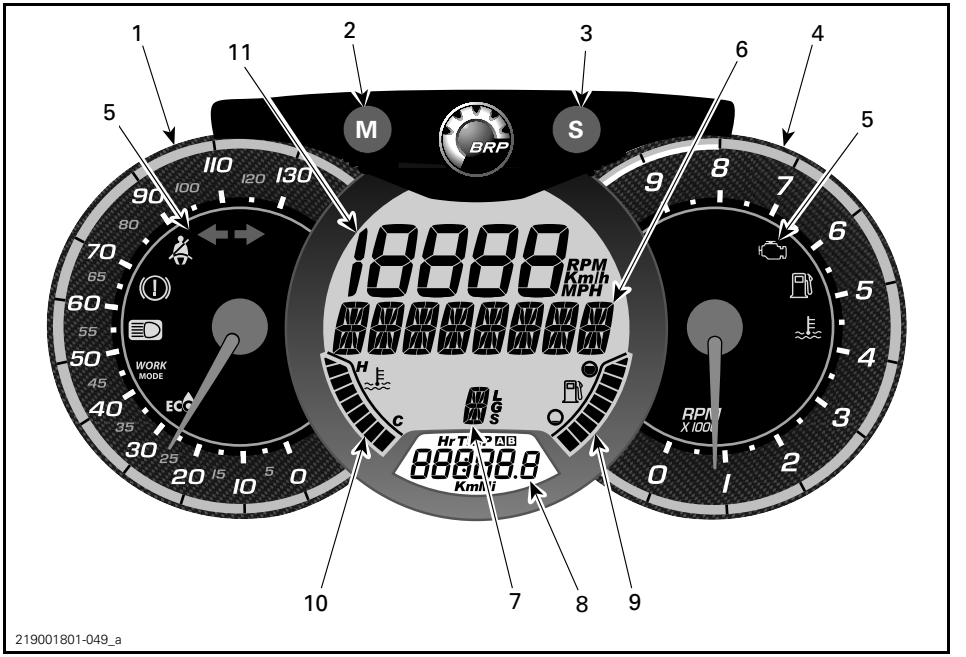
The speedometer, odometer and trip meter are factory preset in **miles** but it is possible to change them to **kilometer** reading. Contact an authorized Can-Am dealer.

Language Selection

The gauge display language can be changed. Refer to an authorized Can-Am dealer for language availability and setup the gauge to your preference.

MULTIFUNCTION GAUGE (ANALOG/DIGITAL)

Multifunction Gauge Features



⚠ WARNING

Do not adjust the display while riding. You could lose control.

1) Analog Speedometer

Indicates vehicle speed in km/h or mph.

2) MODE (M) Button

Pressing the MODE (M) button will scroll through the functions of the main digital display.

FUNCTION SEQUENCE	OPTIONS
Numerical Display is flashing	Press SET (S) to scroll and select desired function and press MODE (M) to confirm
Multifunction display is flashing	Press SET (S) to scroll and select desired function and press MODE (M) to confirm

3) SET (S) Button

Pressing the SET (S) button will scroll through the functions of the secondary digital display.

FUNCTION SEQUENCE	INFORMATION DISPLAYED
Clock	XX:XX (24:00 time base) XX:XX A or P (12:00 AM/PM time base)
Cumulative distance odometer	XXXXX.X km or mi
Trip distance — odometer A (TRIP A)	XXXXX.X km or mi
Trip distance — odometer B (TRIP B)	XXXXX.X km or mi
Engine time chronometer (Hr)	XXXXX.X
Trip time chronometer (HrTRIP)	XXXXX.X

To reset any trip functions, push and hold the SET (S) button for three seconds.

4) Analog Tachometer (RPM)

Indicates engine revolutions per minute (RPM). Multiply by 1000 to obtain actual revolutions.

5) Indicator Lamps

Indicator lamps will inform you of various conditions or problems.

An indicator lamp can flash alone or in combination with another lamp.

INDICATOR LAMP(S)		DESCRIPTION
All indicator lamps	On	All indicator lamps are activated when ignition switch is ON and the engine is not started
	On	Low fuel
	On	Check engine
	On	High engine temperature
	On	Headlights in the HIGH beam position
	On/Flash	Operator seat belt is not properly latched. Engine output will be limited, reducing the speed and operability of the vehicle. Main digital display: FASTEN SEAT BELT
	On	Work mode activated
	On	ECO mode activated

6) Multifunction Display

The vehicle speed or the engine revolutions (RPM) can be displayed. See *MODE (M) BUTTON* in this section.

Important messages can also be displayed. Refer to table below.

If an abnormal engine condition occurs, a message can be combined with a pilot lamp. Refer to *TROUBLESHOOTING* section for details.

MESSAGE	DESCRIPTION
BRAKE	Message displayed when the brakes are applied continuously for 15 seconds. (Speed needs to be higher than 5 km/h (3 MPH))
NORMAL KEY	Displayed at power up when the normal key is used.
WORK KEY	Displayed at power up when the work key is used.
SEAT BELT	When the driver seat belt is not buckled and the vehicle speed is less than 10 km/h (6 MPH), the message is displayed and the pilot lamp will be lit. No engine torque limitation engaged.
ENGINE LIMITATION ENGAGED FASTEN SEAT BELT	When the driver seat belt is not buckled and the vehicle speed is above 10 km/h (6 MPH), the message is displayed and the pilot lamp stays on. The engine management will engage a torque limitation that will limit the vehicle speed to approximately 20 km/h (12 MPH).
WORK MODE ACTIVE	Displayed when work mode is activated.
NORMAL MODE ACTIVE	Displayed when normal mode is activated
ECO MODE ACTIVE	Displayed when ECO mode is activated.
MAINTENANCE REQUIRED(1)	Displayed in gauge when vehicle is due for a maintenance.
LOW GEAR	Displayed when belt protection is active in high gear. (If available and activated on your model)
DIFFLOCK	Displayed for 2 seconds when front differential lock is activated.
SMARTLOK	Displayed for 2 seconds when automatic mode is activated.

(1) To erase the MAINTENANCE REQUIRED message, proceed as follows:

1. Select PARK.
2. Turn ignition switch to ON. Do NOT start engine.
3. Set the cluster to odometer display.
4. Press SET button on the multifunction gauge and keep it pressed until step 6.
5. Switch the high beam On-Off three times rapidly.
6. Turn ignition switch to OFF.

NOTE: Steps 4 and 5 must be completed within 5 seconds.

NOTE: Do not turn ignition switch to ON before the multifunction gauge turns off.

7) Gearbox Position Indicator

Displays the selected gearbox range.

8) Secondary Digital Display

Displays useful real time information to the rider. For display function informations, refer to *SET (S) BUTTON*.

9) Fuel Level Indicator

Bar graph that continuously indicates the level of fuel left in the fuel tank.

10) Engine Temperature Indicator

Bar graph that continuously indicates the engine coolant temperature.

11) Numerical Display

The vehicle speed or the engine revolutions (RPM) can be displayed. See *MODE (M) BUTTON* in this section.

Gauge Setup

Setting Metric/Imperial Units

See a Can-Am dealer for setting.

Setting Clock

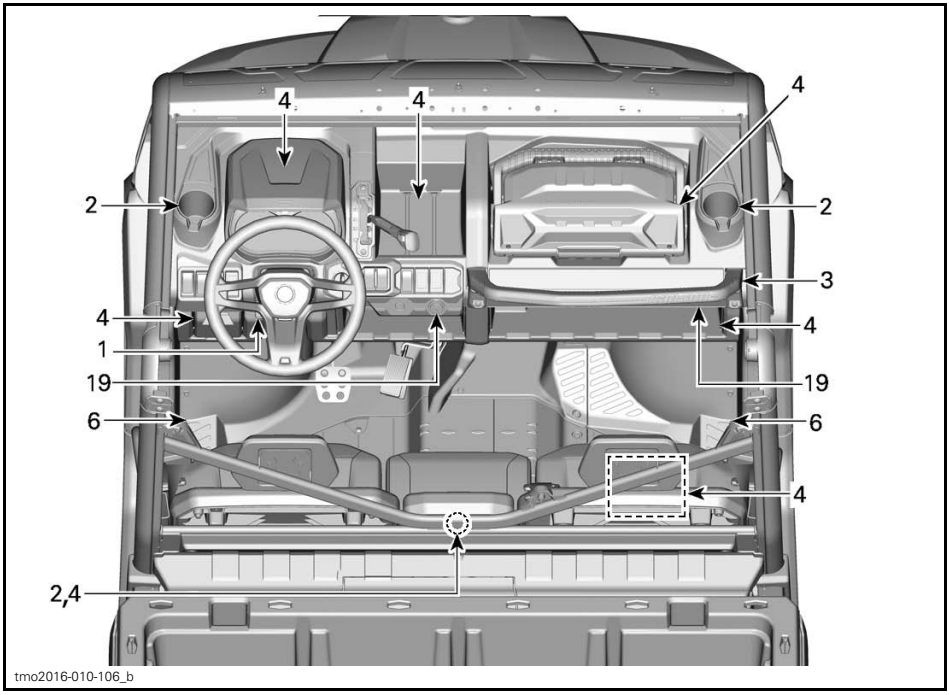
1. Press SET (S) button to select clock display.
2. Push and hold SET (S) button for three seconds.
3. Press SET (S) button to select 12:00 AM PM or 24:00 time base.
4. If 12:00 AM PM time base is selected, A or P flashes. Press SET (S) button to select A (AM) or P (PM).
5. Press SET (S) button to change hours.
6. Press S (S) button to switch to minutes (minutes flash).
7. Press SET (S) button to change minutes.
8. Press S (S) button.

Setting Language

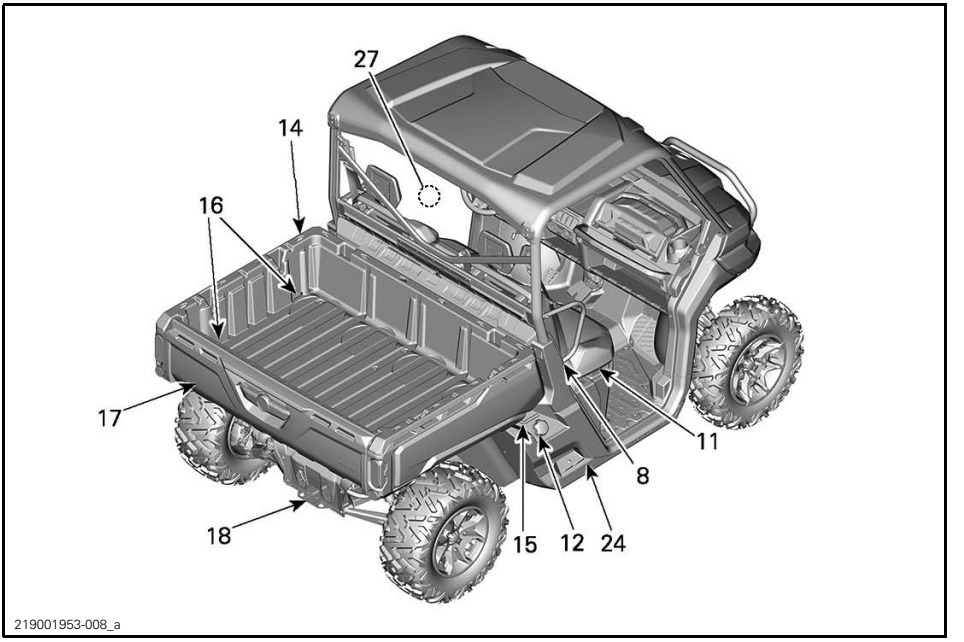
The gauge display language can be changed. Refer to an authorized Can-Am dealer for language availability and setup the gauge to your preference.

EQUIPMENT

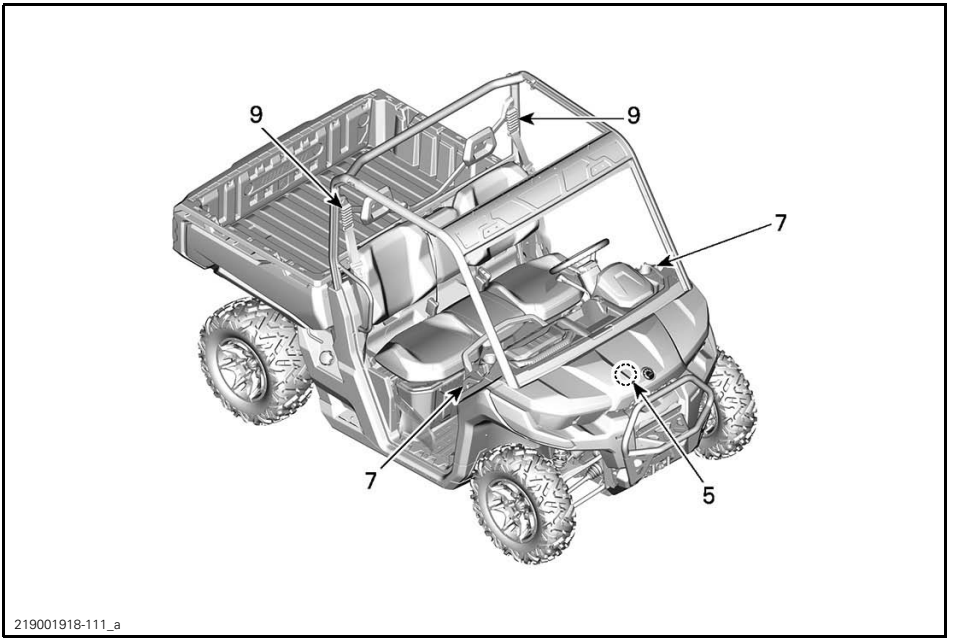
NOTE: Some vehicle safety labels are not shown on illustrations. For information on vehicle safety labels, refer to *IMPORTANT ON-PRODUCT LABELS*.



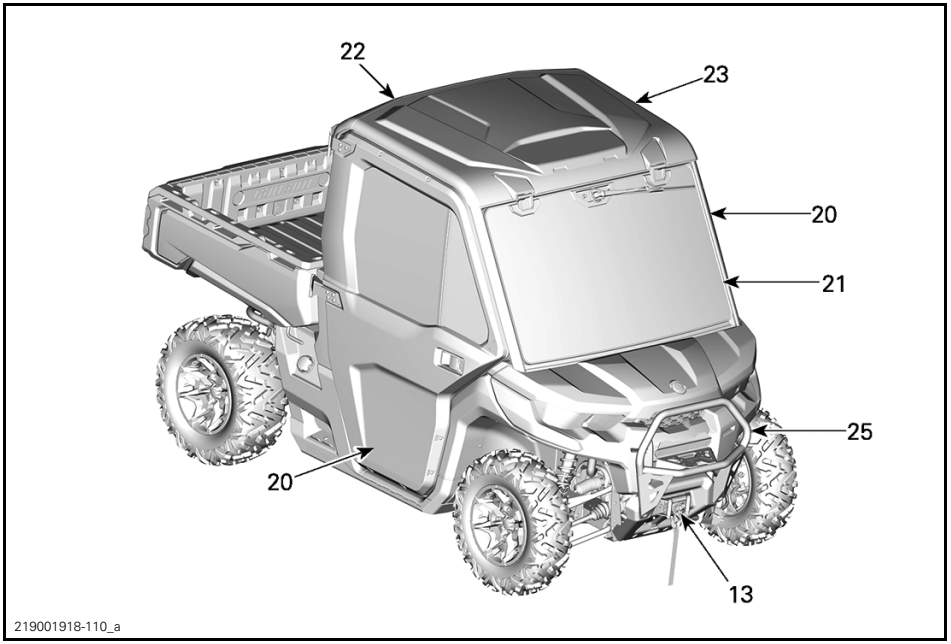
TYPICAL



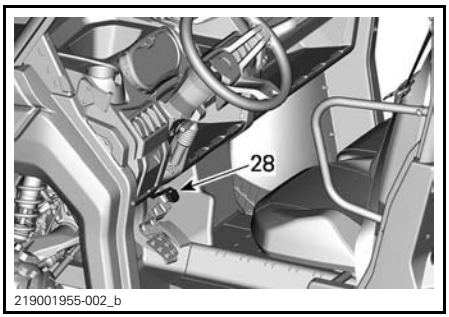
TYPICAL



TYPICAL



TYPICAL



TYPICAL - IF EQUIPPED

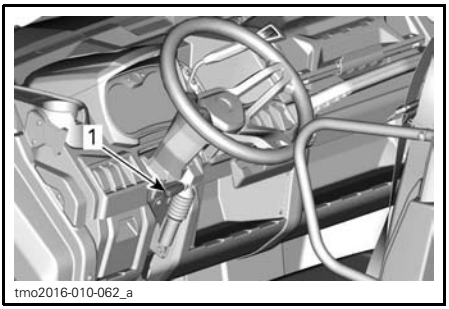
1) Tilt Steering

The steering wheel height is adjustable.

Adjust the steering wheel height to face your chest, not your head.

To adjust steering wheel height:

1. Unlock steering by pulling the tilt lever toward you.
2. Move steering wheel to the desired position.
3. Release tilt lever to lock steering wheel in position.



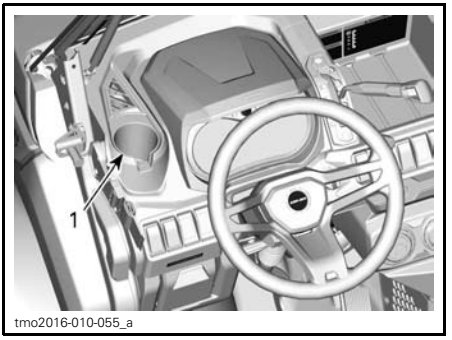
1. Tilt lever

⚠ WARNING

Never adjust the steering wheel height while riding. You may lose control.

2) Cup Holders

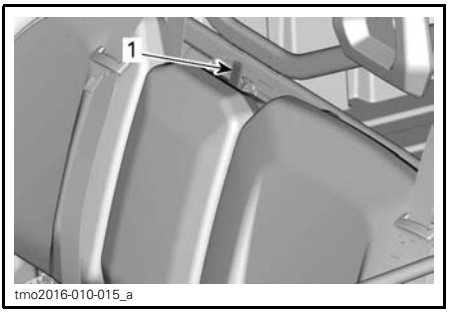
Two cup holders are located on each side of the vehicle near the side nets attachment points.



1. Driver cup holder shown

Two additional cup holders are available on the back of the central passengers seat.

To access it, press the clip locking mechanism and pull seat backrest forward.



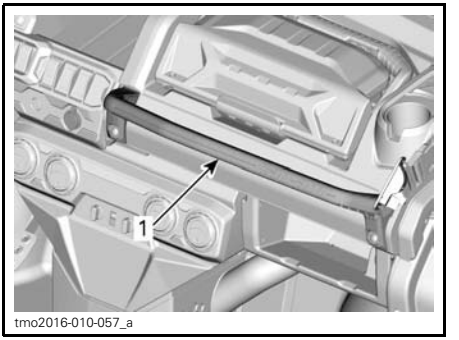
TYPICAL
1. Backrest clip locking mechanism

TYPICAL
1. Central passenger backrest cup holder

NOTE: Do not use cup holders while riding in rough conditions.

3) Passengers Handhold

The passengers have access to a front handhold located ion the console in front of removable tool box.



1. Passengers handhold

Adjust the seat position in order to get a solid and comfortable grip on the handholds. Refer to *PASSENGER SEATS* for adjustment procedure.

Holding the handhold helps the passengers brace against the movement of the vehicle and helps keep hands and body inside the cockpit in the event of a rollover.

⚠ WARNING

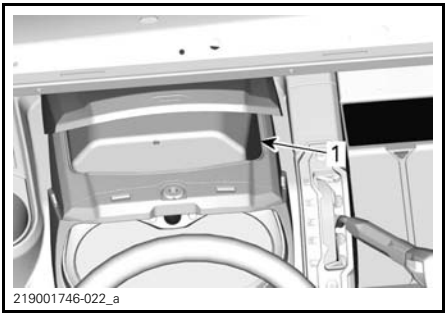
Never use any part of vehicle cage as handholds. Hands can be struck by objects outside the cockpit or crushed in a rollover.

4) Storage Compartments

The vehicle is equipped with storage compartments designed to carry light objects.

Multifunction Gauge Storage Compartment (If Equipped)

A storage compartment is available above the multifunction gauge.

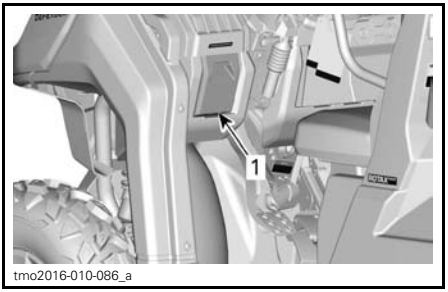


1. Multifunction gauge storage compartment

Driver Storage compartment (If Equipped)

A small storage compartment is available on the driver side.

Pull on handle to rotate it open.



TYPICAL
1. Driver storage compartment

Removable Tool Box (If Equipped)

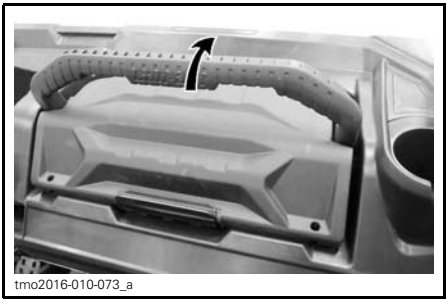
A removable tool box is located on the upper console.

To open tool box, unlock panel and lift lid.

UNLOCKING LID

⚠ WARNING

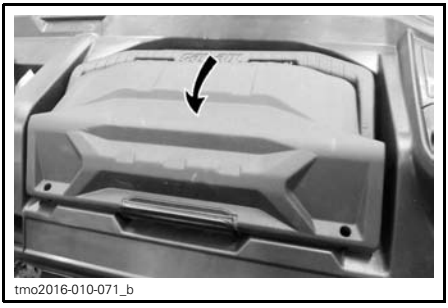
Before riding, always make sure tool box is secured to vehicle and lid is locked.



SECURING TOOL BOX IN PLACE

Removing Tool Box

To remove tool box, unlock it by lifting handle.



UNLOCKING REMOVABLE TOOL BOX

⚠ WARNING

Before riding, always make sure tool box is secured to vehicle and lid is locked.

Under seat Storage Box (If Equipped)

A convenient removable under seat storage box is available.

TYPICAL
1. Under seat storage box

To remove under seat storage box, lift RH passenger seat and remove under seat storage box by pulling it upwards.

TYPICAL

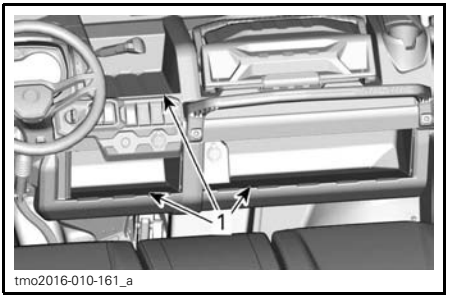
NOTE: When reinstalling under seat storage box, make sure to align it properly with seat tubes and floor emboss so it fits properly under the seat.

Open Storage Compartments

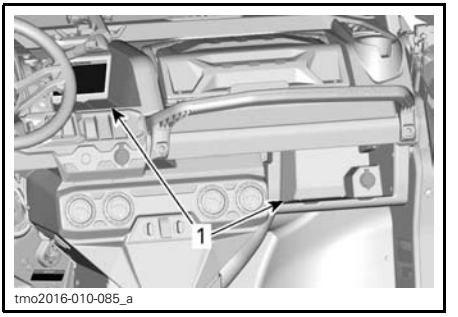
Multiple open storage compartments are available in the console.

⚠ WARNING

When riding vehicle, make sure no object stored in open storage compartments could cause harm in the event of a roll over.



ALL EXCEPT BASE MODELS AND XT MODELS WITH CAB
1. Open storage compartments



XT MODELS WITH CAB
1. Open storage compartments

Central Passenger Backrest Storage Area

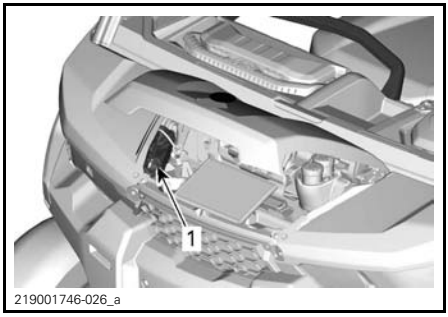
When central passenger seat backrest is pulled down a storage area is available.

NOTE: Always empty storage area before putting central passenger backrest up.

TYPICAL
1. Central passenger backrest storage area

5) Tool Kit

A tool kit with basic tools is provided. It is located in the front service center.



1. Tool kit

6) Footrests

The vehicle is equipped with driver and RH passenger footrests to allow firmly planting feet on vehicle floor, which helps to maintain proper body position while riding.

The footrests help minimize the risk of leg or foot injury.

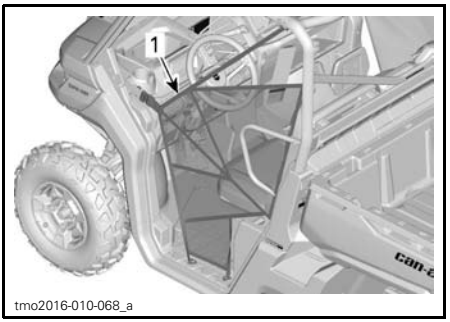
Always wear appropriate footwear. See *RIDING GEAR*.

7) Side Nets

A side net is provided on each side of the cockpit to help arms, legs or shoulders stay inside the vehicle, thus reducing the risk of injuries. Side Nets may also keep bushes or debris out of cockpit.

⚠ WARNING

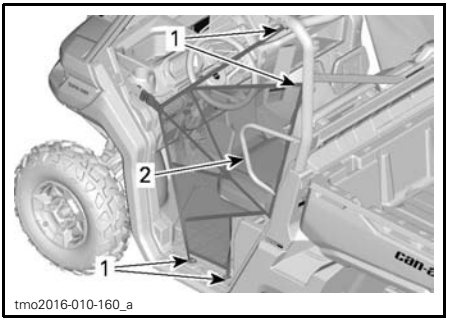
Never operate the vehicle unless both side nets are in place and buckled.



1. Side net

Side nets are adjustable and must be kept as tight as possible. To adjust side nets proceed as follows:

1. Secure side net with buckle.
2. Pull on four adjustment straps to tighten.



1. Side net adjustment locations
2. Shoulder guard

8) Shoulder Guards

The vehicle is equipped with shoulder guards to help restrain the entire body of driver and passengers inside vehicle.

9) Seat Belts

This vehicle is equipped with 3 points seat belts to help protect driver and passengers in the event of a collision, rollover, or tipover. The seat belts can help keep occupants stay in the passenger compartment.

⚠ WARNING

Wear seat belts properly at all times. Seat belts reduce the risk of injury in a crash and help keep limbs inside the cockpit in a rollover or any accidents.

If driver's seat belt is not fastened when:

– The ignition is turn ON, the seat belt indicator lamp will flash.
– The engine is started and shift lever is moved out of PARK, vehicle speed will be limited to a maximum of approximately 20 km/h (12 MPH) on flat ground.

⚠ WARNING

The vehicle may reach higher or lower speed depending on inclines.

To remind you to fasten the seat belt, the multifunction gauge will display the following message: ENGINE LIMITATION ENGAGED FASTEN SEAT BELT.

⚠ WARNING

There is no indicator light or message for the passengers seat belts. The driver is responsible for the passengers safety and should ensure the passengers buckles their seat belts.

Fastening and Adjusting the Seat Belt

The seat belt is equipped with a semi-cinching tab that lock the lap belt when the webbing is under tension.

TYPICAL
1. Semi-cinching tab

To fasten the seat belt, insert the latch plate into the buckle, then pull the belt to ensure it is properly fastened.

Adjust the seat belt tightly against your body by pulling the shoulder belt upwards.

TYPICAL

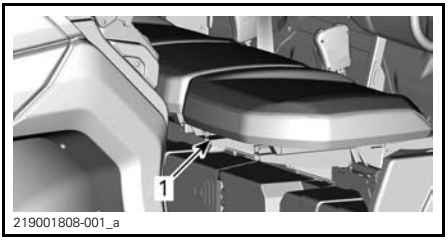
⚠ WARNING

Wear seat belt properly. Make sure it remains securely fastened and tightened against the body. Make sure it is not twisted or defective.

To release the seat belt, push on the red button on the seat belt buckle.

10) Driver's Seat

On applicable models, The driver's seat can be adjusted forward and backward.



TYPICAL
1. Adjustment lever

To adjust seat, move the seat lever to unlock the seat. Release the lever to lock the seat into desired position.

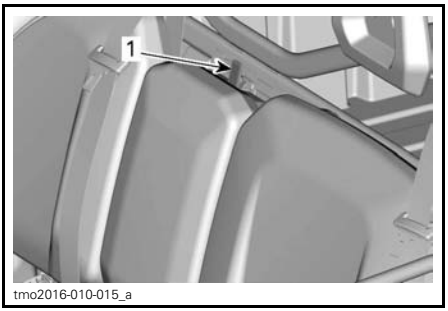
⚠ WARNING

Never adjust the seat position while driving.

11) Passenger Seats

The passenger seats are not adjustable.

The central passenger seat backrest can be tilted forward for access to cup holders by releasing the latch located on top of the backrest.



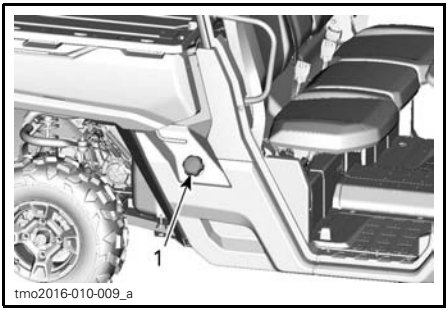
TYPICAL
1. Backrest clip locking mechanism

On applicable models, the seats can be lifted to allow access to removable under seat storage compartment (if equipped).

To lift seat, pull on front of seat to unclip it and lift until it "clips" in the upper position.

12) Fuel Reservoir Cap

The fuel reservoir cap is located on the right hand side of the vehicle cargo box release handle.

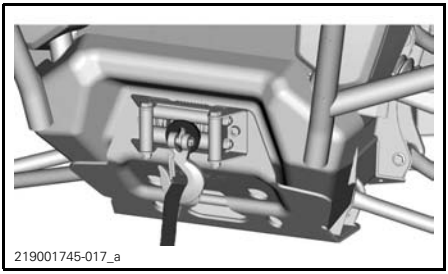


TYPICAL
1. Fuel reservoir cap

Refer to *FUEL* for information on fueling procedure and fuel requirements.

13) Winch (If Equipped)

The winch can be actuated inside the vehicle using the winch control switch on the upper console.



WINCH

NOTE: Using the winch intensively over a long period of time may discharge the battery.

The following tips will help to reduce the risk of discharging the battery:

Always unreel manually: Unlock the cable using the handle then pull on the hook strap to unreel.

It is recommended to let the vehicle run while winching. Do not stop vehicle immediately after winching to let battery recharge.

Also, when winching for more than 30 seconds, it is recommended to increase engine RPM in the range of 3000 RPM to increase charging power to the battery.

NOTE: Make sure vehicle is in NEUTRAL (N) before increasing engine RPM.

Refer to your winch *GUIDE* included with your vehicle for proper winch operation.

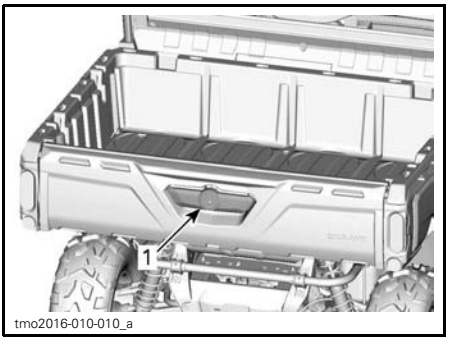
Intensive use of the winch may cause the built-in circuit breakers to momentarily turn OFF. In such a case, wait a moment, then continue winching. the breakers automatically turn ON once they cooled down.

14) Cargo Box

The vehicle is equipped with a an inclinable cargo box. The cargo box may be used for various types of cargo.

⚠ WARNING

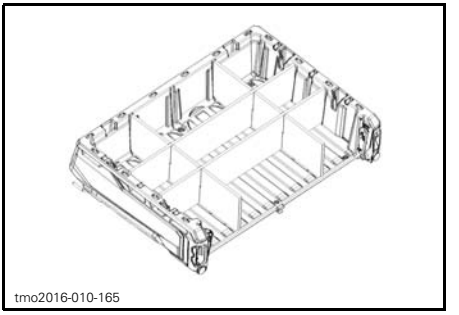
To reduce the risk of loss of control or loss of load, use the cargo box only in accordance with *CARRYING LOADS* in the *SAFETY INFORMATION* section.



1. Cargo box handle

Cargo Box Separations

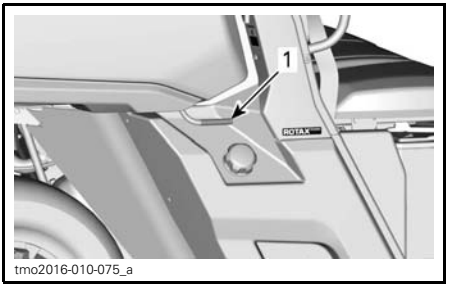
Cargo box can be easily separated into smaller storage compartments to prevent cargo loads from mixing.



EXAMPLE OF CARGO BOX SEPARATIONS

15) Cargo Box Tilt Release Handles

The latching mechanism of the cargo box can be actuated from either side of the vehicle through a release handle.



1. Cargo box release handle

Refer to *CARRYING LOADS*.

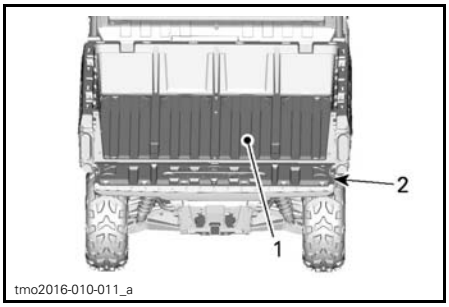
16) Anchoring Hooks

To provide anchoring point in order to secure cargo inside the cargo box, 4 anchoring hooks are located inside the cargo area.

NOTICE **Never lift vehicle using anchoring hooks.**

17) Tailgate

The cargo box can be closed with a tailgate.



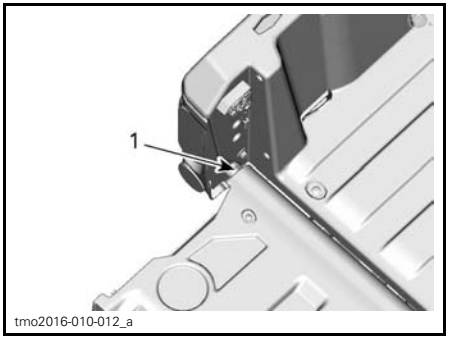
1. Cargo box
2. Tailgate

NOTICE Do not exceed 113.4 kg (250 lb) of weight on the tailgate during loading or unloading. Always close tailgate before operating to reduce the risk of loss of load.

Tailgate Removal

Open tailgate and remove retaining cables.

Position tailgate so as to remove it from pivot points.



1. Tailgate pivot point

18) Trailer Hitch

The vehicle comes equipped with a 50.8 mm (2 in) x 50.8 mm (2 in) box size standard receiver hitch.

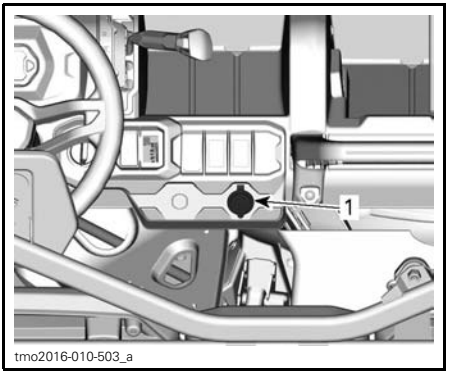
For the proper usage of the hitch support, refer to *MOVING LOADS AND DOING WORK*.

⚠ WARNING

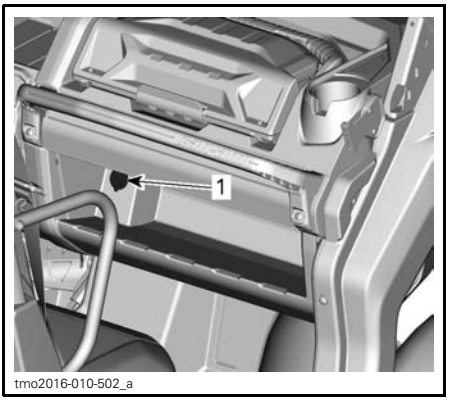
To reduce the risk of loss of control or loss of load, always respect the maximum hauling capacity.

19) 12-Volt Power Outlets

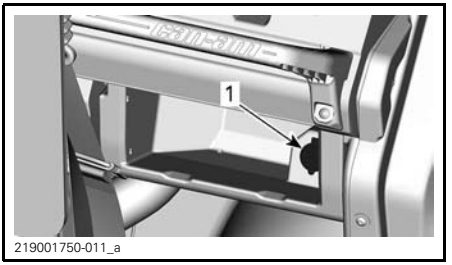
Convenient for handheld spotlight or other portable equipment.



ALL MODELS
1. 12 V power outlets



OPTIONAL ON MODELS WITHOUT A HEATING SYSTEM
1. 12 V power outlets

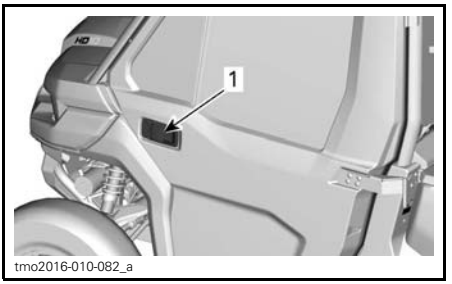


MODELS WITH A HEATING SYSTEM
1. 12 V power outlets

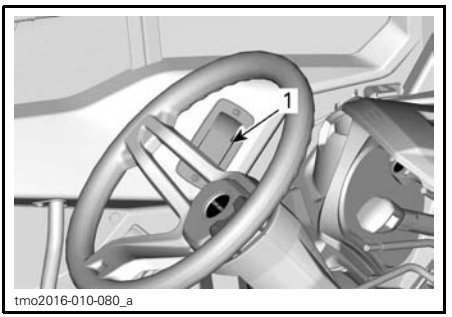
Remove protective cap to use. Always reinstall it after use to protect against weather.

20) Full Doors With Electric Windows (Models with a Cab)

This vehicle comes equipped with full doors and electric windows.



1. Outer door handle



1. Inner door handle

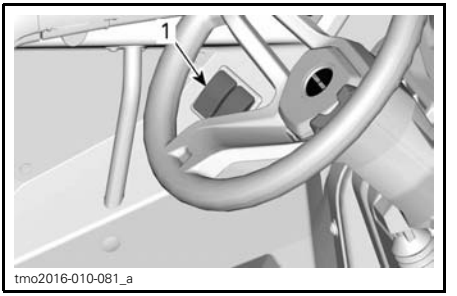
Doors can be removed from vehicle. See an authorized Can-Am dealer for information.

⚠ WARNING

Always install safety nets whenever removing full doors from vehicle. See an authorized Can-am dealer for installation instructions.

Opening Electric Windows

To open electric windows, activate switch.

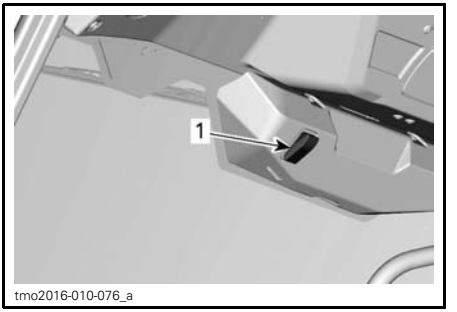


1. Electric window switch

21) Full Glass Windshield with Wiper (If equipped)

This vehicle comes equipped with a full glass windshield and wiper.

To activate wiper, press activation switch.



1. Wiper activation switch

To activate windshield washer, hold activation switch up.

Full glass windshield with wiper can be removed from vehicle. See an authorized Can-Am dealer for information.

Windshield Position

Windshield can be set to 3 different positions.

– Closed
– Partially opened (second position on the handle)
– Fully opened (handle is released)

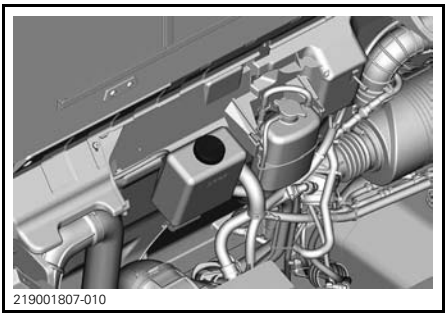
NOTE: When riding the vehicle with the windshield in one of the open position, adjust your speed to the terrain. The glass windshield is not as strong when not seated in its closed position.

To close windshield, pull on handle until it closes.

Filling up Windshield Washer

Open cargo box.

Lift service cover and remove windshield washer bottle cap.

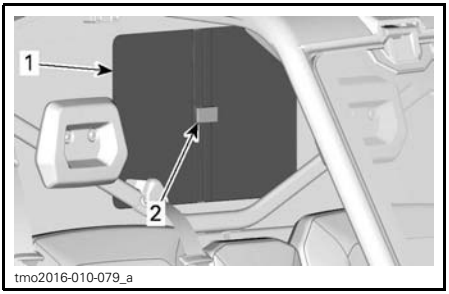


Fill windshield washer bottle.

22) Rear Window With Sliding Opening (Models with a Cab)

This vehicle comes equipped with a rear window.

To unlock rear window, lift side of locking mechanism and slide window.



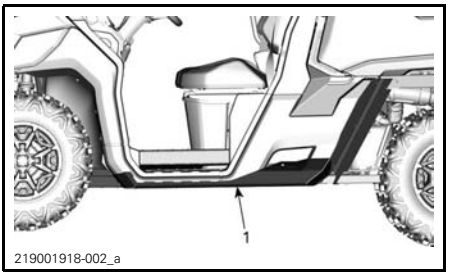
1. Rear window
2. Rear window locking mechanism

23) Roof (If Equipped)

For installation and removal instructions, see an authorized Can-Am dealer.

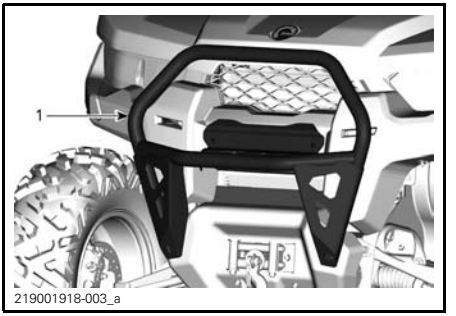
24) Rock Sliders (If Equipped)

Aluminium rock sliders for additional lower body protection.



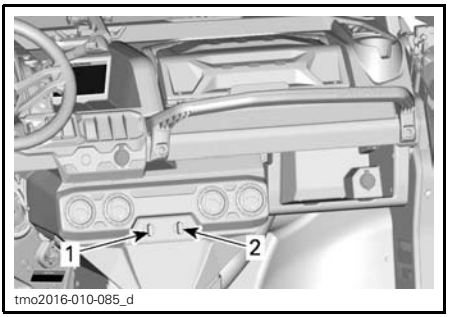
25) Front Bumper (If Equipped)

Steel bumper for additional front body protection.



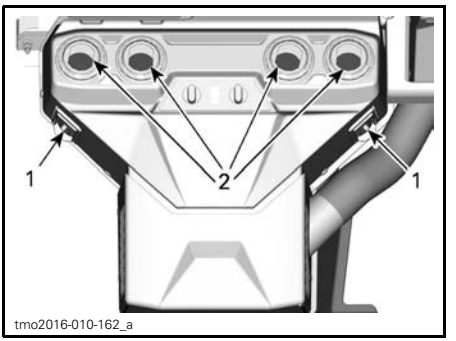
26) Heating System (If Equipped)

This vehicle comes equipped with a heating system.



1. Heater fan speed control button
2. Heating level button

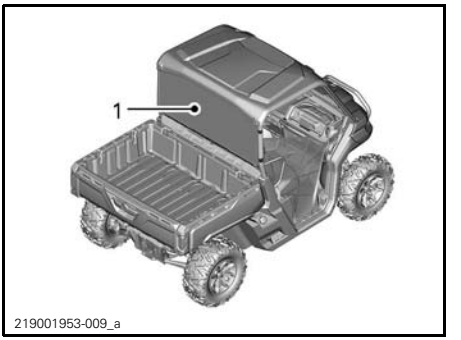
Multiple heating vents are available to control air flow in cab.



1. Heating system side vents
2. Heating system front vents

27) Rear Deflector (If Equipped)

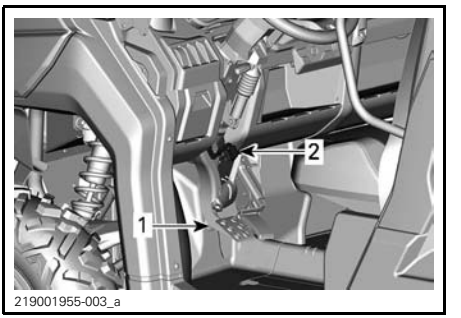
Clear rear deflector to protect from back draft of dust or rain in harsh environments. Velcro straps for quick & easy installation.



1. Rear deflector

28) Brake Holding Mechanism (If equipped)

The brake holding mechanism lever is located on the LH side of the steering wheel, above the brake pedal.



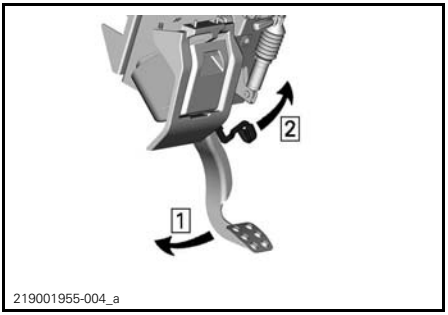
1. Brake pedal
2. Brake holding mechanism lever

The brake holding mechanism function is to maintain brakes to all wheels while shift lever is set to Park.

To engage the brake holding mechanism, proceed as follow:

1. Immobilize vehicle,
2. Apply and hold the brakes,
3. Put shift lever in **Park**,

4. While holding the brakes, lift lever toward the steering wheel,
5. Release the brakes, the pedal should stay lowered.



Step 1: Apply and hold brake pedal
Step 2: Lift lever

NOTE: The brake holding mechanism lever can be set to several positions.

⚠ WARNING

When the brake holding mechanism is applied, make sure the vehicle stays securely in place. Always put the shift lever in Park when using the brake holding mechanism.

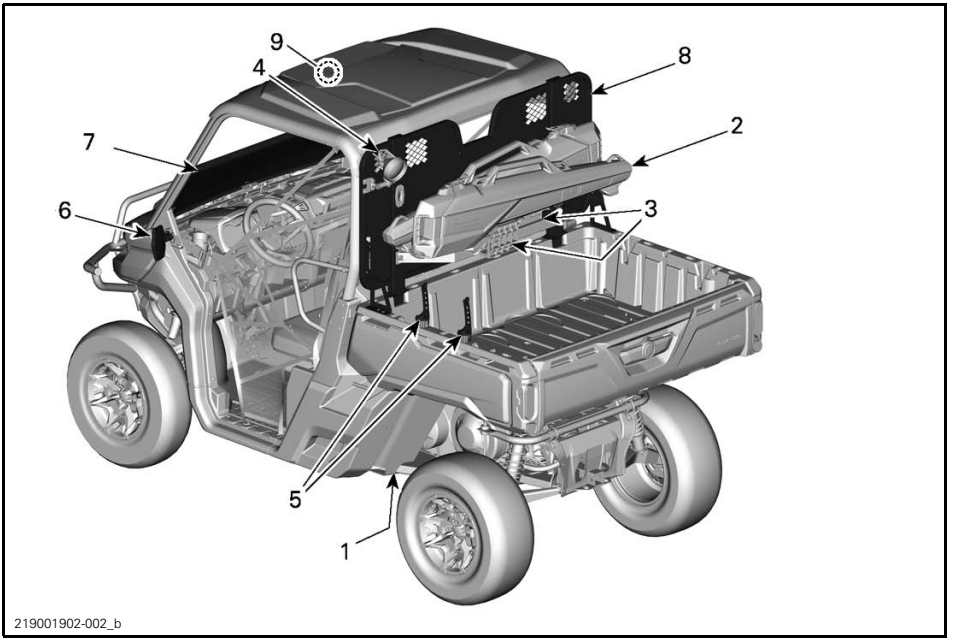
To release the brake holding mechanism, simply apply and hold the brake pedal, put shift lever in gear then release brake pedal. When released it should return to the rest position.

Safe usage of the brake holding mechanism requires the shift lever to be set to the Park position. It is not recommended to use the brake holding mechanism on its own.

⚠ WARNING

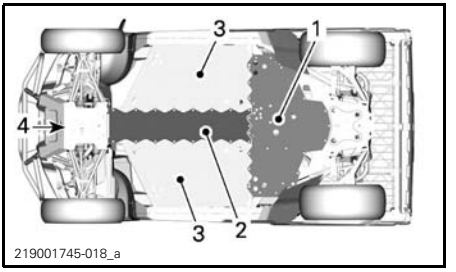
Make sure brake holding mechanism is released before operating the vehicle. If the brake holding mechanism is left ON while riding, it may cause damage to the brake system and lead to loss of braking capacity and/or fire.

OPTIONAL EQUIPMENT (IF AVAILABLE ON YOUR MODEL)



1) Full Underbody Skid Plate

Skid plates provide essential protection.



1. *Rear skid plate*
2. *Central skid plate*
3. *Lateral skid plate*
4. *Front skid plate*

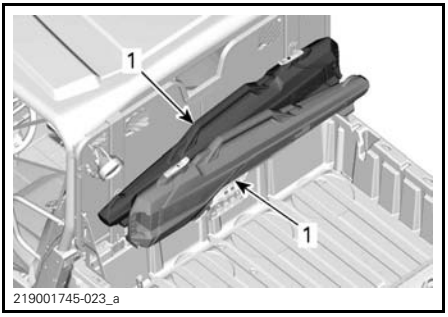
2) Gun Boot

This easy access gun boot is designed to accommodate a variety of rifle and shotguns along with their mods.

⚠ WARNING

Make sure firearm is unloaded and rendered inoperable by means of a secure locking device prior to inserting it in the Gun Boot

NOTE: Before using the Gun Boot to transport firearms, always verify with local law enforcement for specific laws regulating the use and transportation of gun boots and firearms.



1. Gun boot

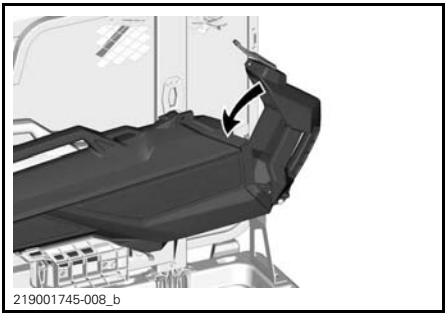
⚠ WARNING

Reduce your speed while firearm case is installed on vehicle.

NOTICE Avoid areas with a lot of branches. If avoiding such areas is impossible, make sure branches do not hit the firearm case.

Mounting Gun Boot Onto Gun Boot Mount

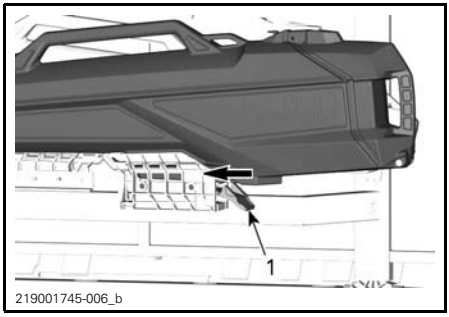
Close rear section of gun boot.



Secure rear section of gun boot using rubber latch.

Slide gun boot into gun boot mount.

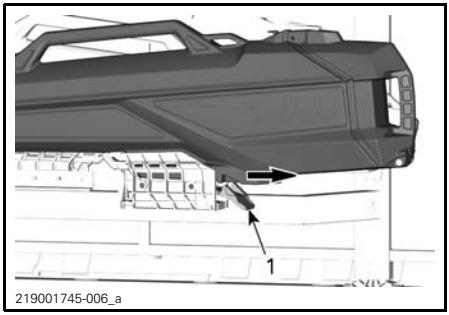
NOTICE Make sure gun boot mount locking tab falls into place and secures gun boots in place.



1. Gun boot mount locking tab

Removing Gun Boot from Gun Boot Mount

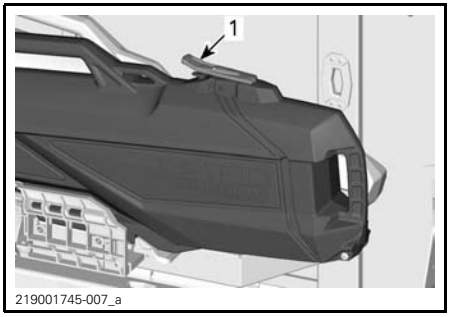
Press on gun boot locking tab to free gun boot and slide gun boot free.



1. Gun boot mount locking tab

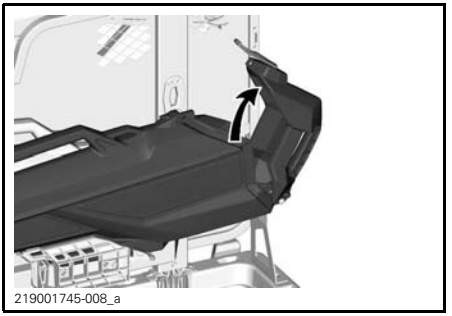
Opening Gun Boot

Unlatch rubber latch.



1. Rubber latch

Open rear section of gun boot.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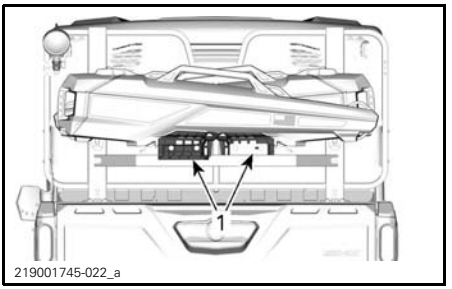
3) Gun Boot Mount

The gun boot mounts allow for easy and secure mounting of the gun boot onto the vehicle.



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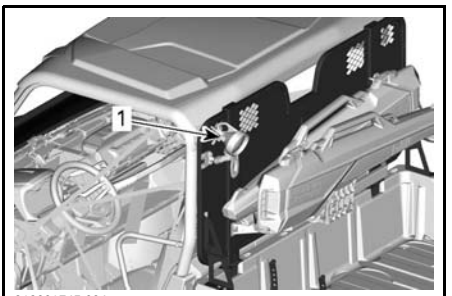
1. Gun boot mount

NOTICE Make sure gun boot is closed and its extremities are inside the vehicle.

4) Portable Light

A convenient 12 V powered spotlight that can easily be moved around to provided additional lighting on the spot.



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1. Portable light

⚠ WARNING

Never drive vehicle with portable light on.

NOTE: In some regions, restrictions may apply to the usage of portable light when gun boot is installed on vehicle. Refer to local laws before using spotlight.

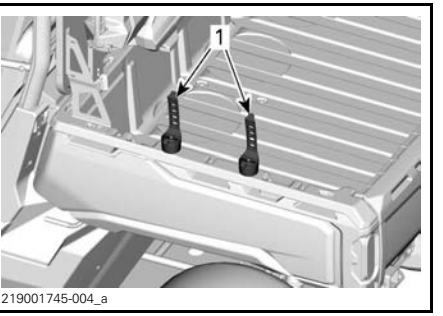
NOTICE Remove portable light and store when transporting vehicle.

⚠ WARNING

Do not operate the vehicle with the spotlight or coil cable obstructing or interfering with the driver and/or the operation of the vehicle control devices. Do not use this light while the vehicle is in motion, as it may blind other vehicles drivers.

5) LinQ Tool Holders

This versatile tool holder system allows you to transport a variety of tools in your everyday rides.



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1. LinQ tool holders

Tool Holder Installation

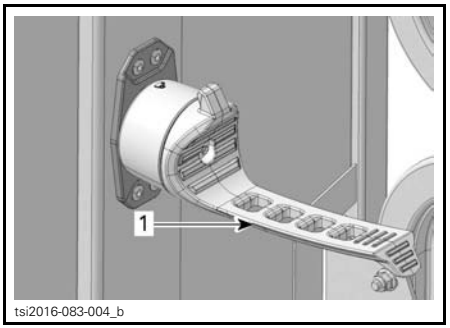
NOTICE Always use tool holders in pair to provide sufficient holding force.

CAUTION Maximum capacity for a pair of tool holders: 5 kg (11 lb).

NOTICE Before each use, make sure LinQ Tool Holder is locked.

Install tool holder into the linQ adaptor. The lock pictogram on the base of the toolholder should face towards the longest side of the linQ adaptor hole.

NOTICE The tool holder should face upwards when installed on a vertical wall.



1. Hook facing upwards

NOTICE Before installing, make sure the surfaces of the tool holders and all surfaces it will be in contact with are free of any snow, ice, mud or any kind of debris.

Improper Setup and Usage

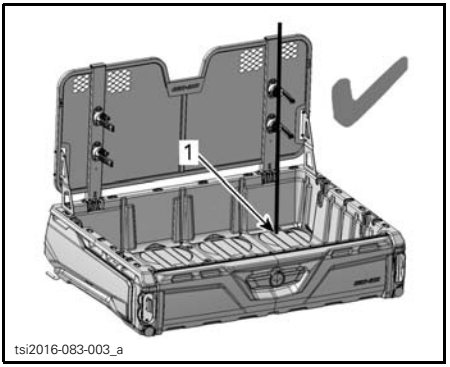
WARNING

Do not use tool holders to support or hold heavy objects. Objects can dislodge from the tool holders when riding fast or in a bumpy trail. Reduce your speed and often verify if holders remain in place. Ensure that the tool holders or the carried object will not contact any bystanders, or trees or any objects. On an ATV, ensure objects loaded do not extend wider than the vehicle width.

NOTICE When mounting objects horizontally, always install the hooks facing upwards.

Proper Setup and Utilization

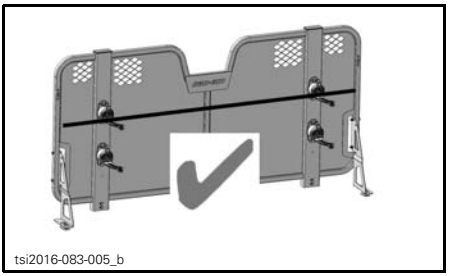
Use both tool holders together to carry an object.



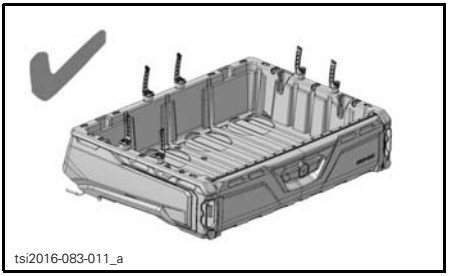
1. Cargo box floor is used as an additional support

NOTICE On vertical mount, always put the heavy end of the object on the box floor. Ensure that the object doesn't protrude outside the vehicle.

Proper setup for the headache rack.



Proper setup in pairs for the cargo box.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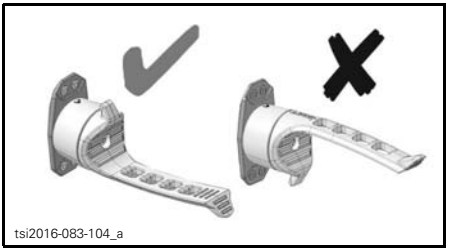
Wrong and Unsafe Setups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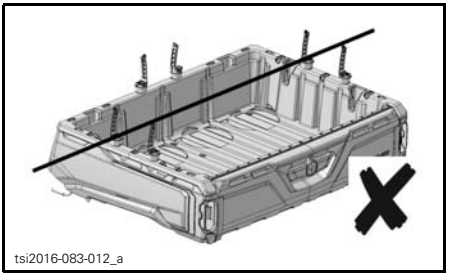
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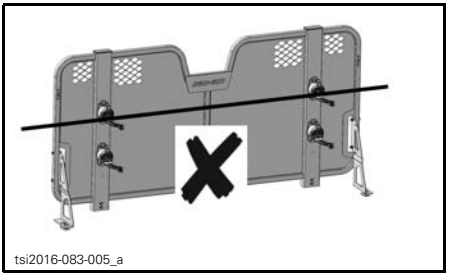
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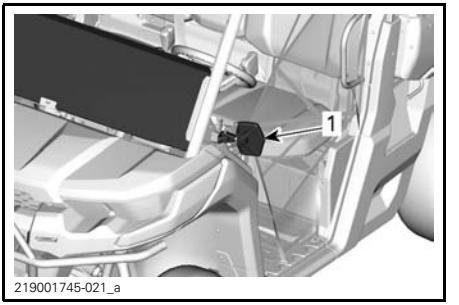
6) LH Side Mirror

The LH side mirror can be adjusted to suit driver's preference.

⚠ WARNING

Do not adjust mirror while riding. You could lose control.



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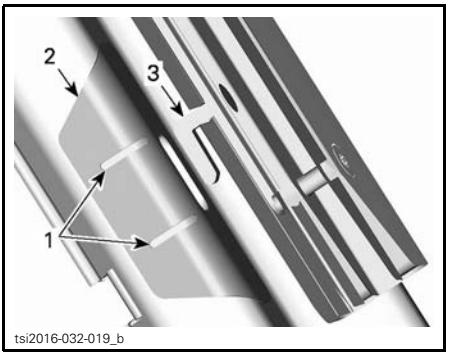
1. LH Side mirror

7) Half Windshield

A high-impact-resistant polycarbonate half windshield that helps protect the driver and passengers from the elements.

Half Windshield Installation

Align hooks between marks on the locator decals.



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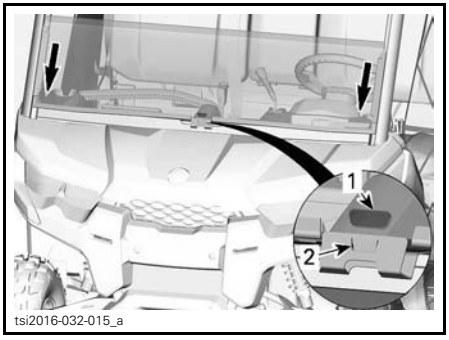
1. Marks
2. Locator decal
3. Hooks



1. Opening in the windshield
2. Clip in the lower support

NOTE: When the bottom of windshield aligns with the top of support, hooks are practically aligned.

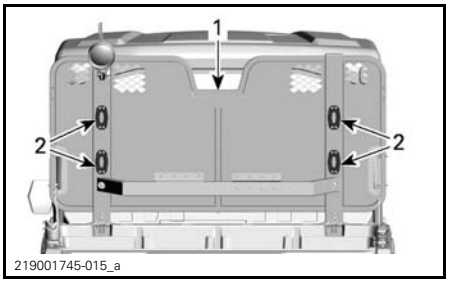
Hand tighten side guide screws.

⚠ WARNING

Make sure windshield is properly secured before driving the vehicle.

8) Headache Rack

A utility rack which protect the cab components from cargo load and allows for the storage and transportation of various items using the LinQ system.



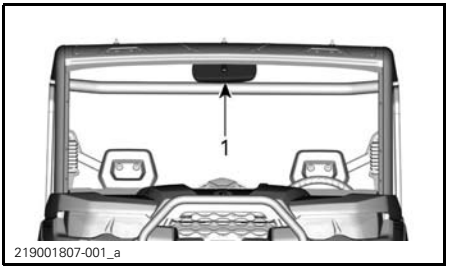
1. Headache rack
2. LinQ system

9) Central Panoramic Mirror

The central mirror can be adjusted to suit driver's preference.

⚠ WARNING

Do not adjust mirror while riding. You could lose control.



1. Central Panoramic Mirror

Suspension Adjustment Guidelines

Your vehicle handling and comfort depend upon suspension adjustments.

⚠ WARNING

Suspension adjustment could affect vehicle handling. Always take time to familiarize yourself with the vehicle's behavior after any suspension adjustment has been made.

Choice of suspension adjustments vary with vehicle load, personal preference, riding speed and terrain condition.

The best way to set up the suspension, is to start from factory settings, then customize each adjustment one at a time.

Front and rear adjustments are interrelated. It may be necessary to readjust the rear shock absorbers after adjusting front shock absorbers for instance.

Test run the vehicle under the same conditions; trail, speed, load, etc. Change one adjustment and retest. Proceed methodically until you are satisfied.

Suspension Factory Settings

All Models except XT-P

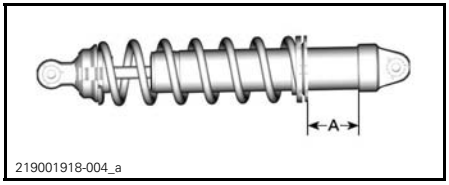
FRONT SUSPENSION FACTORY SETTINGS	
ADJUSTMENT	FACTORY SETTING
Spring preload	Cam position 1 (soft)

REAR SUSPENSION FACTORY SETTINGS	
ADJUSTMENT	FACTORY SETTING
Spring preload	Cam position 1 (soft)

XT-P Models

FRONT SUSPENSION FACTORY SETTINGS	
ADJUSTMENT	FACTORY SETTING
Spring preload	50.7 mm (2 in)

REAR SUSPENSION FACTORY SETTINGS	
ADJUSTMENT	FACTORY SETTING
Spring preload	50.5 mm (1.99 in)



XT-P MODELS
1. Spring Preload

Suspension Adjustments

Spring Preload Adjustment

Shorten the spring for a firmer ride and rough riding condition or when pulling a trailer.

Lengthen the spring for a softer ride and smooth riding condition.

⚠ WARNING

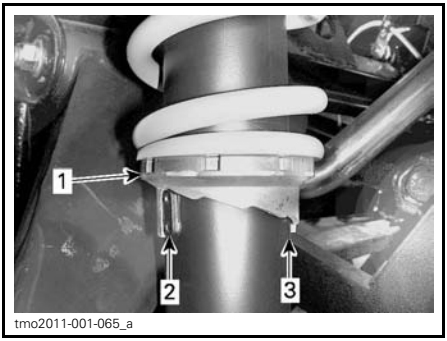
The left and right shock adjustment on front or rear suspension must always be set to the same position. Never adjust one shock only. Uneven adjustment can cause poor handling and loss of stability, which could lead to an accident.

Lift the vehicle. Spring length should be equal on both sides.

NOTE: Spring preload affects ground clearance.

All Models except XT-P

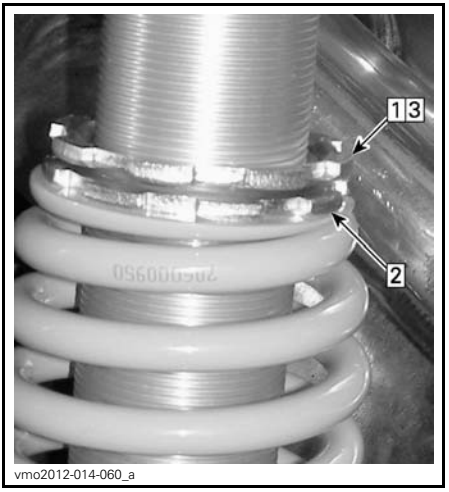
Adjust by turning adjusting cam.



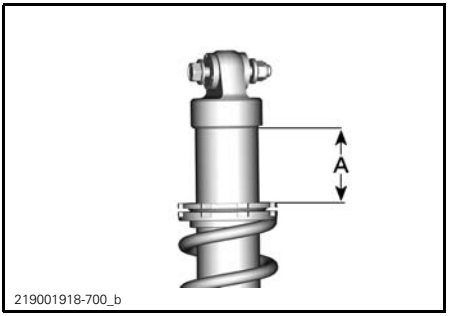
TYPICAL
1. Turn adjusting cams
2. Soft adjustment
3. Hard adjustment

XT-P Models

Adjust spring preload by turning the adjuster ring.



TYPICAL
Step 1: Loosen top locking ring
Step 2: Turn adjusting ring accordingly
Step 3: Tighten top locking ring



A. Distance to measure

DPS Function

The Dynamic Power Steering (DPS) provides a computer controlled, variable power assist, achieved by an electric motor to optimize the amount of steering input required by the rider.

FUEL

Fuel Requirements

NOTICE Always use fresh gasoline. Gasoline will oxidize; the result is loss of octane, volatile compounds, and the production of gum and varnish deposits which can damage the fuel system.

Alcohol fuel blending varies by country and region. Your vehicle has been designed to operate using the recommended fuels, however, be aware of the following:

- Use of fuel containing alcohol above the percentage specified by government regulations is not recommended and can result in the following problems in the fuel system components:
  - Starting and operating difficulties.
  - Deterioration of rubber or plastic parts.
  - Corrosion of metal parts.
  - Damage to internal engine parts.
- Inspect frequently for the presence of fuel leaks or other fuel system abnormalities if you suspect the presence of alcohol in gasoline exceeds the current government regulations.
- Alcohol blended fuels attract and hold moisture which may lead to fuel phase separation and can result in engine performance problems or engine damage.

Recommended Fuel

Use unleaded gasoline containing MAXIMUM 10% ethanol. The gasoline must have the following minimum octane requirements:

MINIMUM OCTANE RATING
AKI (R+M)/2 octane rating of 87, or a RON octane rating of 92

NOTICE Never experiment with other fuels. Engine or fuel system damages may occur with the use of an inadequate fuel.

NOTICE Do NOT use fuel from fuel pumps labeled E85.

Use of fuel labeled E15 is prohibited by U.S. EPA Regulations.

Vehicle Fueling Procedure

⚠ WARNING

- Fuel is flammable and explosive under certain conditions.
- Never use an open flame to check fuel level.
- Never smoke or allow flame or spark in vicinity.
- Always work in a well-ventilated area.

1. Stop engine.

⚠ WARNING

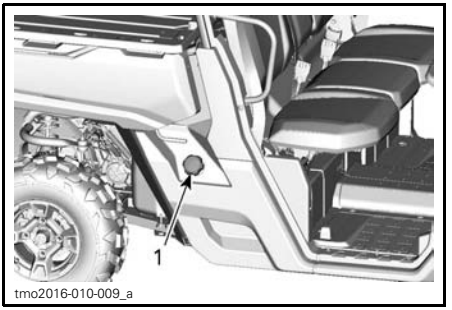
Always stop engine before refueling.

2. Have driver and passengers get out of vehicle.

⚠ WARNING

Do not allow anyone to remain in the vehicle while fueling. If there is a fire or explosion during fueling, a vehicle occupant could be unable to quickly leave the area.

3. Unscrew slowly the fuel reservoir cap counterclockwise to remove it.



TYPICAL
1. Fuel reservoir cap

⚠ WARNING

If a differential pressure condition is noticed (whistling sound heard when loosening fuel reservoir cap) have vehicle inspected and/or repaired before further operation.

4. Insert the spout into the filler neck.
5. Pour fuel slowly so that air can escape from the tank and prevent fuel flow back. Be careful not to spill fuel.
6. Stop filling when the fuel reaches the bottom of filler neck. Do not overfill.

⚠ WARNING

Never top up the fuel tank before placing the vehicle in a warm area. As temperature increases, fuel expands and may overflow.

7. Fully tighten fuel reservoir cap clockwise until ratchet noise is heard.

⚠ WARNING

Always wipe off any fuel spillage from the vehicle.

Fueling a Gasoline Container

⚠ WARNING

- Use only an approved gasoline container to store fuel.
- Never fill the gasoline container in the vehicle cargo box or on-the vehicle - an electrical static discharge may ignite the fuel.

BREAK-IN PERIOD

Operation During Break-In

A break-in period of 10 operating hours or 300 km (200 mi) is required for the vehicle.

Engine

During the break-in period:

- Avoid full throttle operation.
- Avoid pressing accelerator pedal more than 3/4 of the stroke.
- Avoid sustained accelerations.
- Avoid prolonged cruising speeds.

However, brief accelerations and speed variations contribute to a good break-in.

Brakes

⚠ WARNING

New brakes will not operate at their maximum efficiency until their break-in is completed. Braking performance may be reduced, so use extra caution.

Belt

A new belt requires a break in period of 50 km (30 mi).

During the break-in period:

- Avoid strong acceleration and deceleration.
- Avoid pulling a load.
- Avoid high speed cruising.

Starting the Engine

Insert key in ignition switch and turn to the ON position.

Press the brake pedal.

NOTE: If shift lever is not set to PARK (P) or (N) NEUTRAL, the brake pedal must be pressed to allow engine starting.

Turn the key to the start position and hold until the engine starts.

NOTE: Do not press the accelerator pedal. If the accelerator pedal is pressed at least 50%, the engine will not start.

Release the engine start position immediately when the engine has started.

NOTICE If engine does not start after a few seconds, do not hold the start position more than 10 seconds. Refer to *TROUBLESHOOTING*.

Operating the Shift Lever

Apply brakes and select the desired shift lever position.

Release brakes.

NOTICE When changing gear selection, always completely stop the vehicle and apply the brakes prior to shifting. Damage to the gearbox may occur.

Choosing the Correct Range (Low or High)

It is important to limit situations known to make the drive belt slip excessively. The main reason the drive belt will slip is if the gearbox is in high range when it should be in low range.

Pay attention to the following:

Low range

Low range should be used whenever:

– Pulling
– Pushing
– Hauling a load
– 4x4 applications
– Mud holes
– Water holes
– Crossing obstacles
– Climbing onto trailer
– Hill climbing

It is also recommended to use low range if driving for prolonged periods at speeds under 24 km/h (15 MPH)

Please refer to *BREAK-IN PERIOD* for drive belt break-in information.

High range

High is the default riding range.

Electronic Drive Belt Protection (if available and activated on your model)

Some vehicles have the electronic drive belt protection function activated.

Refer to your authorized Can-Am dealer for availability and possible activation.

This function is activated when riding at too slow speed for the high range, such as in the following situations:

– Pulling
– Pushing
– Hauling a load
– 4x4 applications
– Mud holes
– Water holes
– Crossing obstacles
– Climbing onto trailer
– Hill climbing

In the above mentioned situations the electronic drive belt protection will help protect the CVT drive belt from being damaged by activating the engine torque limiter. The gauge will also scroll a *LOW GEAR* message, suggesting the operator to immobilize the vehicle and set to LOW GEAR.

Whenever the electronic drive belt protection is activated, you MUST shift in LOW range. Refer to *OPERATING THE SHIFT LEVER*.

⚠ WARNING

Apply brakes to immobilize vehicle. Put shift lever in reverse (R), and back down the hill, barely releasing brakes to remain at low speed. Do not attempt to turn around. Never coast down hill while vehicle is in neutral. Do not perform hard braking as it increases the risk of tipover.

Stopping the Engine and Parking the Vehicle

⚠ WARNING

Avoid parking on steep slope as the vehicle may roll away.

⚠ WARNING

Always put the vehicle in PARK when stopped or parked to prevent rolling.

⚠ WARNING

Avoid parking in places where hot parts can start a fire.

When stopped or parked always bring shift lever to park position. This is especially important when parking on a slope. On very steep inclines or if the vehicle is carrying a cargo, the wheels should be blocked using rocks or bricks.

Select the flattest terrain available for parking.

Release accelerator pedal and use brakes to completely stop the vehicle.

Set shift lever in PARK position.

Turn key in ignition switch to OFF position.

Remove key from ignition switch.

If you must park on a steep incline or if the vehicle is carrying cargo, block the wheels using rocks or bricks.

Tips for Maximizing Drive Belt Durability

Riding style and conditions have a direct impact on drive belt durability. Your vehicle features a CVT system design that is optimized to offer the best performance. The CVT and drive belt have successfully endured thousands of miles of durability tests. However, to maximize drive belt durability and to prevent premature failures, it is important that the operator understands the limits of a belt driven CVT system and adapts their riding style and speed accordingly.

If riding in any of the conditions listed below, BRP highly recommends not to constantly hold the throttle wide open (WOT) for more than five (5) minutes.

- High ambient temperatures (above 30°C (86°F)
- Heavy loads: Passengers / Heavy cargo
- Heavy drag: Soft sand / Hill climbing / Mud / Using a track kit.

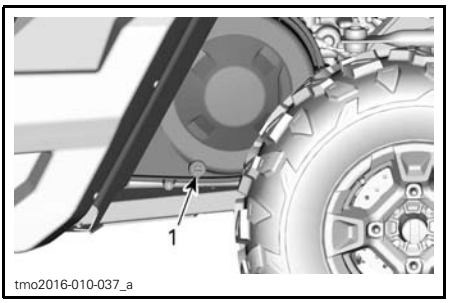
After a few minutes at WOT, partially release the accelerator and allow the CVT to cool down.

For more tips for maximizing the drive belt durability, refer to *CHOOSING THE CORRECT RANGE (LOW OR HIGH)*.

What to do if Water is Suspected to be in the CVT

If water is present in the CVT, the engine will accelerate but the vehicle will remain still.

NOTICE Stop the engine and drain the water to avoid damage to the CVT.



TYPICAL - LEFT SIDE OF VEHICLE UNDER CARGO BOX
1. CVT drain

See an authorized Can-Am dealer , a repair shop or person of your choosing to have the CVT inspected and cleaned.

What to do if Battery is Drained out

The vehicle can be jump started by using the red (+) cable to the battery positive pole and the black (-) cable to the vehicle chassis.

NOTICE Do not connect any electrical source to the steering column or components which are in contact with DPS.

What to do if Vehicle Rolled Over

Abrupt maneuvers, sharp turns, side hilling or accident may cause vehicle to rollover.

Should the vehicle be rolled over, it will be necessary to have it transported to an authorized Can-Am dealer for inspection as soon as possible. NEVER START THE ENGINE!

What to do if Vehicle is Submerged

Should the vehicle become immersed, it will be necessary to have it transported to an authorized Can-Am dealer as soon as possible.

NOTICE Never start the engine as immersion of the vehicle can cause serious damage to the engine if the correct restart procedure is not followed.

TRANSPORTING THE VEHICLE

If your vehicle needs to be transported, it should be carried on a flatbed trailer of the proper size and capacity.

NOTICE **Do not tow this vehicle — towing can seriously damage the vehicle's drive system.**

When contacting a towing or transporting service, be sure to ask if they have a flatbed trailer, loading ramp or power ramp to safely lift the vehicle and tie-down straps. Ensure the vehicle is properly transported as specified in this section.

NOTICE **Avoid using chains to tie the vehicle — they may damage the surface finish or plastic components.**

⚠ WARNING

Never tow this vehicle backwards with a windshield in place. Windshield could break away. Always trailer this vehicle facing forward.

To load the vehicle on a platform for transport, proceed as follow:

1. Place shift lever to NEUTRAL (N).
2. If the vehicle is equipped with a winch, use the winch to roll the vehicle on the platform.
3. If the vehicle is not equipped with a winch, proceed as follows:
   - 3.1 Attach strap to lower front bumper tow anchor.
   - 3.2 Attach the strap to the winch cable of the towing vehicle.
   - 3.3 Pull the vehicle on the flatbed trailer with the winch.
4. Remove the key from the ignition switch.
5. Strap the front tires by using tire towing straps.
6. Pass a tie-down strap inside each rear wheel.
7. Firmly attach the rear wheels tie-down straps to both sides of the rear of the trailer with ratchets.
8. Ensure that both the front and rear wheels are firmly attached to the trailer.

⚠ WARNING

Make sure no loose objects are present inside vehicle or in cargo box during vehicle transportation.

LIFTING AND SUPPORTING THE VEHICLE

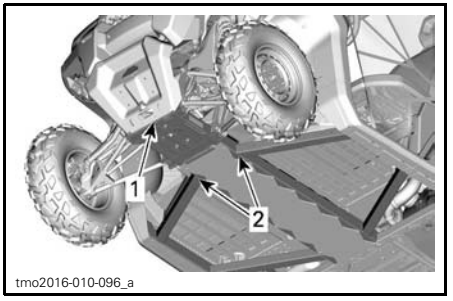
Front of Vehicle

Place vehicle on a flat non slippery ground.

Ensure vehicle shift lever is set to PARK.

Install an hydraulic jack under front skid plate.

Lift front of vehicle and install a jack stand on each side under frame section.



1. Front of vehicle
2. Frame section

Lower hydraulic lift and ensure vehicle is supported safely onto both jack stands.

Rear of Vehicle

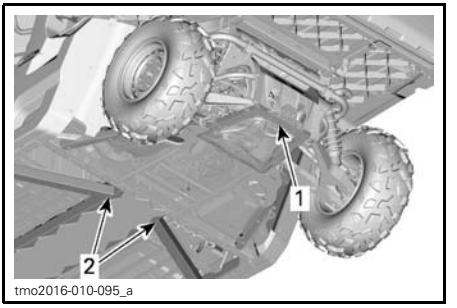
Place vehicle on a flat non slippery ground.

Activate 4WD mode.

Ensure vehicle shift lever is set to PARK.

Install an hydraulic jack under the trailer hitch.

Lift rear of vehicle and install a jack stand on each side under frame section in front of rear wheel.



1. Lifting location under trailer hitch
2. Frame section to install jacks under.

Lower hydraulic lift and ensure vehicle is supported safely onto both jack stands.

MAINTENANCE

MAINTENANCE SCHEDULE

Maintenance is very important for keeping your vehicle in safe operating condition. The vehicle should be serviced as per the maintenance schedule.

A repair shop or person of the owner's choosing may maintain, replace, or repair emission control devices and systems. These instructions do not require components or service by BRP or authorized Can-Am dealers. Although an authorized Can-Am dealer has an in-depth technical knowledge and tools to service the Can-Am SSV, the emission-related warranty is not conditioned on the use of an authorized Can-Am dealer or any other establishment with which BRP has a commercial relationship. For emission-related warranty claims, BRP is limiting the diagnosis and repair of emission-related parts to the authorized Can-Am dealers. For more information, please refer to the *US EPA EMISSION-RELATED WARRANTY* contained herein. Proper maintenance is the owner's responsibility. A warranty claim may be denied if, among other things, the owner or operator caused the problem through improper maintenance or use.

You must follow the instructions for fuel requirements in the fueling section of this manual. Even if gasoline containing greater than ten volume percent ethanol is readily available, the US EPA issued a prohibition against the use of gasoline containing greater than 10 vol% ethanol that applies to this vehicle. The use of gasoline containing greater than 10 vol% ethanol with this engine may harm the emission control system.

The following message appears in the gauge after every 200 hours of operation, to remind you of maintenance requirements: MAINTENANCE REQUIRED. To erase the message, refer to the appropriate *MULTIFUNCTION GAUGE* section.

⚠ WARNING

Failure to properly maintain the vehicle according to the maintenance schedule and procedures can make it unsafe to operate.

SEVERE DUSTY CONDITIONS

Air Filter Maintenance Guideline

Air filter maintenance should be adjusted according to riding conditions.

Air filter maintenance must be increased in frequency in the following dusty conditions:

- Riding on dry sand
- Riding on dry dirt covered surfaces
- Riding on dry gravel roads or similar conditions.

NOTE: Riding in a group in these conditions would increase even more the air filter maintenance.

MAINTENANCE SCHEDULE LEGEND

Operation in trail riding conditions
Operation in severe riding conditions (dusty or muddy) or carrying heavy loads condition

MAINTENANCE SCHEDULE

Make sure to perform proper maintenance at recommended intervals as indicated in the tables. Some items of the maintenance schedule must be performed in function of the calendar, regardless of the distance or time of operation.

EVERY YEAR OR EVERY 3 000 KM (2,000 MI) OR 200 HOURS (whichever comes first)
EVERY YEAR OR EVERY 1 500 KM (1,000 MI) OR 100 HOURS (whichever comes first)
Check fault codes
Perform all items indicated in the pre-ride inspection.
Replace engine oil and filter
Inspect gearbox oil level (HD8 and HD10 models) and look for contamination (every 3000 km)
Replace gearbox oil (HD8 and HD10 models) (Perform at the first 3000 km)
Inspect and clean engine air filter. Replace if needed
Inspect steering system for abnormal play and damages (column, rack and pinion, bellows)
Inspect the tie rod ends and ball joints for play and inspect boots condition
Inspect wheel bearings for abnormal play
Inspect suspension arm bushing and wear plates. Replace if needed.
Inspect CV joints and rubber boots condition (check for abnormal play in the joints and for cuts in the rubber boots)
Lubricate suspension arms and stabilizer bar bushings
Inspect and clean the brake system (fluid level, pads, discs, lines, calipers)
Check front differential oil level and rear drive unit (HD5 only), and look for contamination and overall condition (vents, mount bolt torque, seals)
Inspect rear final drive oil level (HD5 models) and look for contamination and overall condition (vents, mount bolt torque, seals)
Inspect battery condition and connections
Inspect propeller shaft U-joints for abnormal play. On HD5, inspect rubber boot condition
Clean exhaust pipes and muffler area
Clean muffler spark arrester
Adjust valve clearance
Replace fuel vent breather filter
Inspect CVT drive belt

EVERY YEAR OR EVERY 3 000 KM (2,000 MI) OR 200 HOURS (whichever comes first)
EVERY YEAR OR EVERY 1 500 KM (1,000 MI) OR 100 HOURS (whichever comes first)
Clean CVT pulleys
Inspect centrifugal levers and rollers of drive pulley
Inspect, clean and lubricate drive pulley bearing (HD5)
Inspect and lubricate drive pulley hub needle bearing (HD8/HD10)
Inspect input and output shaft seals (engine, gearbox (HD8 and HD10 models), rear final drive (HD5 models), front differential)
Tighten cage fasteners
Inspect and clean seat belts retractors and buckles
Verify coolant level and adjust if needed
Lubricate door latches (On Cab models)
Tighten windshield hinge screws (Cab models)

EVERY TWO YEAR OR EVERY 6 000 KM (4,000 MI) OR 400 HOURS (whichever comes first)
EVERY TWO YEAR OR EVERY 3 000 KM (2,000 MI) OR 200 HOURS (whichever comes first)
Check fault codes
Perform all items indicated in the pre-ride inspection.
Replace front differential oil
Replace gearbox oil (HD8 and HD10 models)
Replace rear final drive oil (HD5 models)
Replace brake fluid (must be performed every 2 years)
Verify cooling system
Test engine coolant strength and level
Verify fuel system for leaks (including evaporative emission system components if equipped)
Verify fuel pump pressure (idle and WOT)
Replace spark plugs
Clean vehicle speed sensor
Replace canister vent pre-filter (evaporative emission system) if equipped

EVERY 5 YEARS OR EVERY 12 000 KM (8,000 MI) (whichever comes first)
EVERY 5 YEARS OR EVERY 6 000 KM (4,000 MI) (whichever comes first)
Replace engine coolant

This section includes instructions for basic maintenance procedures.

Due to the complexity of some of the maintenance procedures, good mechanical skills are required. If you are not comfortable with these procedures, do not hesitate to contact an authorized Can-Am off-road dealer, repair shop or person of your own choosing.

⚠ WARNING

Unless otherwise indicated, always turn ignition switch to the OFF position before performing any maintenance and remove key.

⚠ WARNING

Should removal of a locking device be required (e.g. lock tab, self-locking fastener, etc.) , always replace it with a new one.

Engine Air Filter

NOTICE Never modify the air intake system. Otherwise, engine performance degradation or damage can occur. The engine is calibrated to operate specifically with these components.

Engine Air Filter Replacement Guideline

Engine Air filter inspection and replacement frequency should be adjusted according to riding conditions as it is critical to ensure proper engine performance and life span.

Engine Air filter inspection and replacement frequency must be increased for the following severe riding conditions:

- Riding on dry sand.
- Riding on dry dirt covered surfaces.
- Riding on dry gravel trails or similar conditions.
- Riding in areas with high concentration of seeds or crop husks.
- Riding in severe snow conditions.

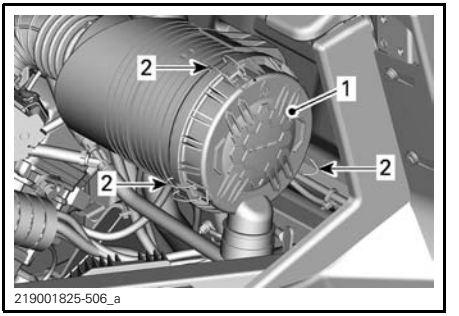
NOTICE When riding in dusty conditions or sand, the air box needs to be cleaned before every ride.

NOTE: Riding in a group under these conditions would increase even more the air filter replacement frequency.

Engine Air Filter Removal

Open cargo box.

Unlatch air filter cover and remove air filter.



RH SIDE OF VEHICLE, UNDER CARGO BOX
1. *Air filter cover*
2. *Latches*

The filter fits tightly over the outlet tube and there will be some initial resistance. Gently move the end of the filter back and forth to break the seal, then rotate while pulling straight out. Avoid knocking the filter against the housing.

Engine Air Filter Cleaning

Inspect the filter for any signs of leaks. A streak of dust on the clean side of the filter is a telltale sign. Replace filter if there is any damages. Eliminate any source of air leaks before installing a new filter.

Clean engine air filter by tapping out heavy dust from paper element, this will allow dirt and dust to get out of the paper filter.

NOTICE It is not recommended to blow compressed air on the paper element; this could damage the paper fibers and reduce its filtration ability when used in dusty environments. If engine air filter is too dirty and cannot be cleaned following the recommended procedure, it should be replaced.

Use a clean damp cloth to wipe both the filter sealing surface and the inside of the outlet tube. Ensure that the outlet tube sealing area is undamaged.

Inspect air filter housing for cleanliness.

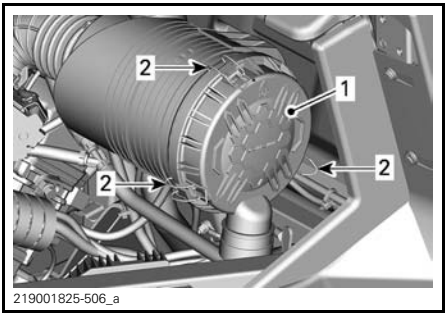
Duckbill Valve Cleaning

Visually check and physically squeeze the duckbill valve. Make sure the valve is flexible and not inverted, damaged or plugged.

Engine Air Filter Installation

Insert the filter carefully. Seat the filter by hand, making certain it is inserted completely into the air cleaner housing. Apply pressure by hand at the outer rim of the filter, not the flexible center.

Secure air filter cover with latches.



RH SIDE OF VEHICLE, UNDER CARGO BOX
1. *Air filter cover*
2. *Latches*

CVT Air Filter

CVT air filter inspection and cleaning frequency should be adjusted according to riding conditions as it is critical to ensure proper engine performance and life span.

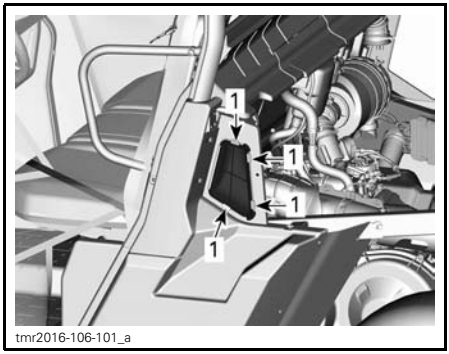
CVT Air filter inspection and cleaning frequency must be increased for the following severe riding conditions:

- Riding on dry sand.
- Riding on dry dirt covered surfaces.
- Riding on dry gravel trails or similar conditions.
- Riding in areas with high concentration of seeds or crop husks.
- Riding in severe snow conditions.

NOTE: Riding in a group in these conditions would increase even more the air filter replacement requirement.

CVT Air Filter Removal

1. Tilt cargo box.
2. Press the filter tabs to release it.



1. *Press here*

CVT Air Filter Inspection and Cleaning

1. Inspect filter and replace if damaged.
2. Clean filter, using a solution of soft soap and water, then rinse it.
3. Gently shake off excess water and allow filter to dry at room temperature.

4. Clean inside the CVT air inlet with a vacuum cleaner.

CVT Air Filter Installation

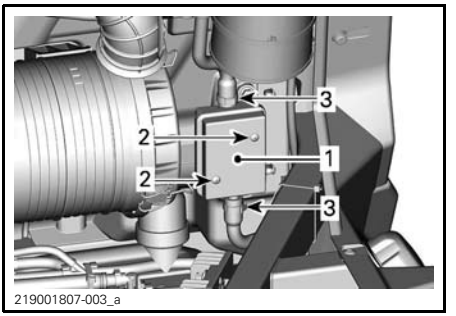
Reinstall CVT air filter and and lower cargo box.

NOTE: Maintaining a clean CVT air filter will maximize air flow for an optimum CVT components lifespan.

Evaporative Emission System Pre-Filter (If Equipped)

Evaporative Emission System Pre-Filter Replacement

1. Tilt cargo box, refer to *CARGO BOX TILT RELEASE HANDLE*..
2. Remove the hose clamps.
3. Remove the retaining screws.
4. Remove the pre-filter assembly.



1. Pre-Filter
2. Retaining screw
3. Clamps

5. Install a new pre-filter assembly.

TIGHTENING TORQUE	
Pre-filter retaining screw	2.5 N•m ± 0.5 N•m (22 lbf•**in** ± 4 lbf•**in**)

6. Secure hoses with clamps.

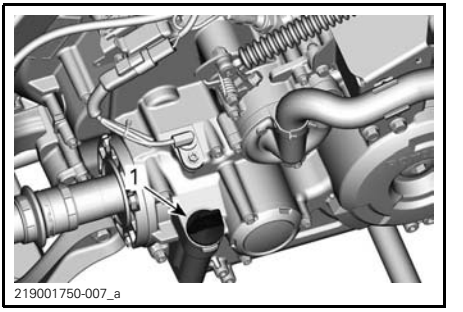
Engine Oil

Engine Oil Level Verification

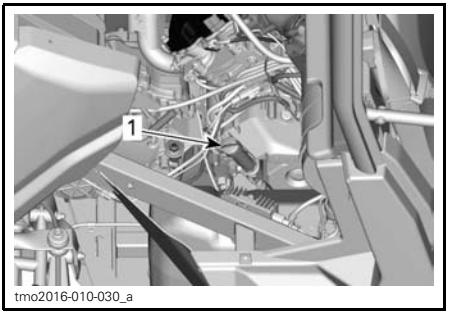
NOTICE Operating the engine with an improper level may severely damage engine.

NOTE: Check oil level when engine is cold.

1. Place vehicle on a level surface.
2. Open cargo box.
3. Unscrew dipstick then remove it and wipe clean.

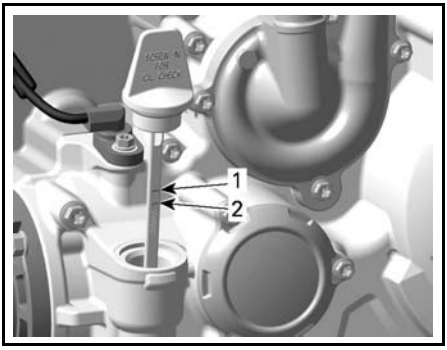


HD5
1. Engine oil dipstick



HD8 AND HD10
1. Engine oil dipstick

4. Reinstall dipstick, screw in it completely.
5. Remove dipstick and check oil level. It should be near or equal to the upper mark.



1. Full
2. Add

To add oil, remove the dipstick. Place a funnel into the dipstick hole.

Add a small amount of recommended oil and recheck oil level.

Repeat the above procedures until oil level reaches the dipstick's upper mark.

NOTE: Do not overfill. Wipe off any spillage.

Properly tighten dipstick.

Recommended Engine Oil

RECOMMENDED ENGINE OIL (GENERAL PURPOSE)	
Scandinavia	4T 5W40 SYNTHETIC BLEND OIL (EUR) (P/N 779290)
All other countries	4T 5W40 SYNTHETIC BLEND OIL (P/N 779133)

RECOMMENDED ENGINE OIL (WARM TEMPERATURE)	
Scandinavia	4T 10W50 SYNTHETIC OIL (EUR) (P/N 779240)
All other countries	4T 10W50 SYNTHETIC OIL (P/N 779234)

RECOMMENDED ENGINE OIL (COLD TEMPERATURE)	
Scandinavia	4T 0W40 SYNTHETIC OIL (EUR) (P/N 779286)
All other countries	4T 0W40 SYNTHETIC OIL (P/N 779139)

NOTE: The XPS oil is specially formulated to meet the lubrication requirements of this engine. BRP recommends the use of its XPS oil. If XPS engine oil is not available, use a 4-stroke SAE 10W50 or 5W40 engine oil that meets or exceeds the requirements for API service classification SJ, SL, SM or SN. Always check the API service label certification on the oil container it must contain at least one of the above standards.

NOTICE Damages caused by the use of oil not suitable for this engine may not be covered by the BRP limited warranty.

Engine Oil Change

⚠ **CAUTION** The engine oil can be very hot. Wait until engine oil is warm.

NOTICE Engine oil and oil filter must be replaced at the same time.

Bring engine to its normal operating temperature.

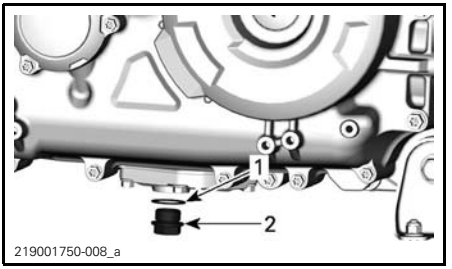
Place vehicle on a level surface.

Place a drain pan under the engine drain plug area.

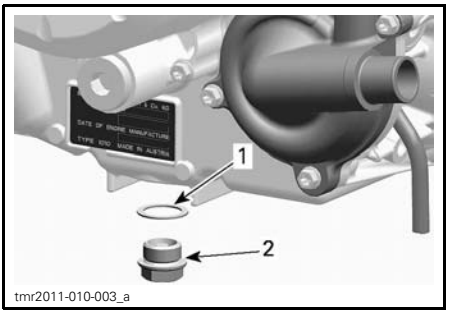
Open cargo box.

Clean the drain plug area.

Unscrew drain plug and discard the gasket ring.



HD5
1. *Gasket ring*
2. *Drain plug*



HD8 AND HD10
1. *Gasket ring*
2. *Drain plug*

Remove the dipstick.

Allow oil to drain completely from the crankcase.

Clean the magnetic drain plug from metal shavings and residue. Presence of debris gives an indication of internal engine damage.

Install a NEW gasket ring on the drain plug.

NOTICE Never use the gasket ring a second time. Always replace by a new one.

Install and tighten drain plug to the recommended specification.

TIGHTENING TORQUE	
Drain plug	30 N•m ± 2 N•m (22 lbf•ft ± 1 lbf•ft)

Replace oil filter. Refer to *OIL FILTER*.

Refill engine with recommended engine oil.

For engine oil capacity, refer to *SPECIFICATIONS*.

Oil Filter

Oil Filter Access

Open cargo box.

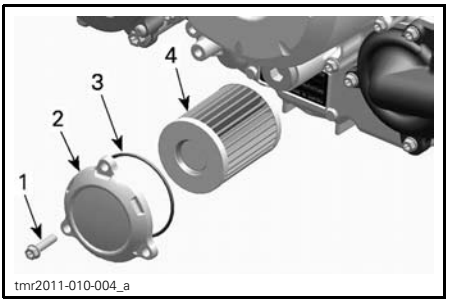
Remove passenger seats and engine service cover if needed.

Oil Filter Removal

Clean oil filter area.

Remove oil filter cover.

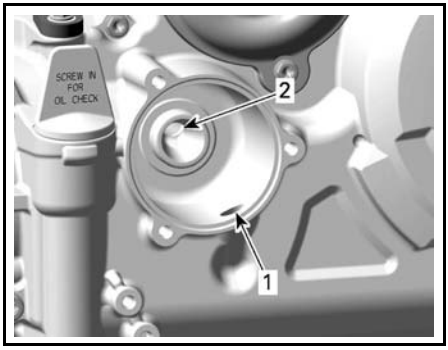
Remove oil filter.



TYPICAL
1. *Oil filter screw*
2. *Oil filter cover*
3. *O-ring*
4. *Oil filter*

Oil Filter Installation

Check and clean the oil filter inlet and outlet area for dirt and other contaminations.

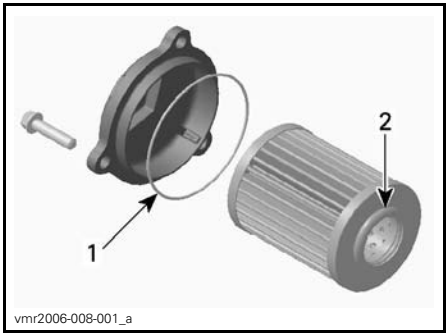


1. *Inlet bore from the oil pump to the oil filter*
2. *Outlet bore to the engine oil providing system*

Install a NEW O-ring on oil filter cover.

Install the new filter into the cover.

Apply engine oil on O-ring and grease on the end of filter.



1. *Slightly oil*
2. *Slightly oil*

NOTICE Pay attention to avoid pinching the O-ring during filter and cover installation.

Install the cover on the engine.

Tighten oil filter cover screws to recommended specification.

TIGHTENING TORQUE	
Oil filter cover screws	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

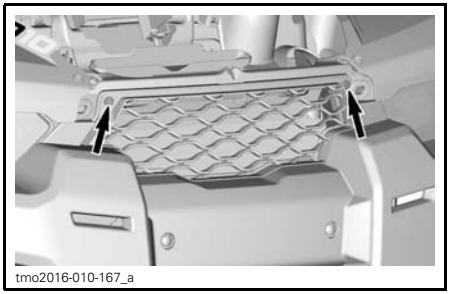
Wipe off any oil spillage on engine.

Radiator

Radiator Inspection and Cleaning

Periodically check the radiator area for cleanliness.

To access radiator, lift front service cover and remove both plastic rivets securing front grille to vehicle.



PLASTIC RIVETS TO REMOVE

Inspect radiator and hoses for leaks or any damage.

Inspect radiating fins. They must be clean, free of mud, dirt, leaves and any other deposit that would prevent the radiator to cool properly.

If available, use a garden hose to rinse the radiating fins.

⚠ **CAUTION** Never clean radiator with your hands when it is hot. Let the radiator cool down before cleaning.

NOTICE Be careful not to damage the radiating fins when cleaning. Do not use any object/tool that could damage the fins. When hosing, use low pressure only. Never use a HIGH PRESSURE washer.

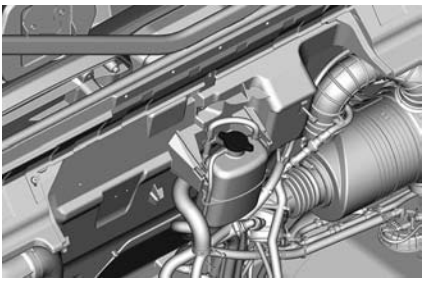
Engine Coolant

Engine Coolant Level Verification

⚠ WARNING

Check coolant level with engine cold.

1. Place vehicle on a level surface.
2. Open cargo box.



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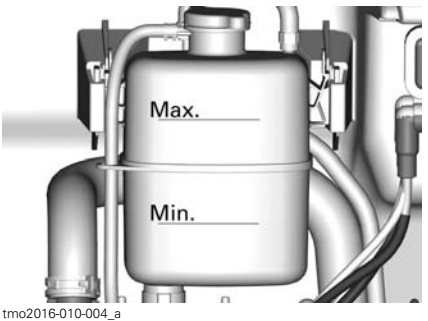
3. Remove the pressure cap.

⚠ WARNING

In order to avoid potential burns, do not remove the pressure cap if the engine is hot.

4. Ensure cooling system is full up to the Max line.



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5. Add coolant in system as necessary. Use a funnel to avoid spillage. Do not overfill.
6. Properly reinstall pressure cap on cooling tank.
7. Close service cover and lower cargo box.

NOTE: A cooling system that frequently requires addition of coolant is an indication of leaks or engine problems.

Recommended Engine Coolant

COUNTRIES	RECOMMENDED COOLANT
Scandinavia	EXTENDED LIFE PRE-MIXED COOLANT (EUR) (P/N 779223)
All other countries	EXTENDED LIFE PRE-MIXED COOLANT (P/N 779150)
Alternative, or if not available	Distilled water and antifreeze solution (50% distilled water, 50% antifreeze)

NOTICE Always use ethylene-glycol antifreeze containing corrosion inhibitors specifically for internal combustion aluminum engines.

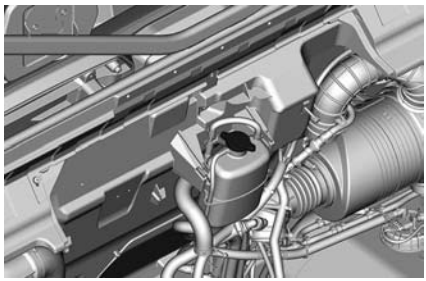
Engine Coolant Replacement

Cooling System Draining

⚠ WARNING

In order to avoid potential burns, do not remove the pressure cap or loosen the coolant drain plug if the engine is hot.

1. Open cargo box.
2. Remove the cooling system pressure cap.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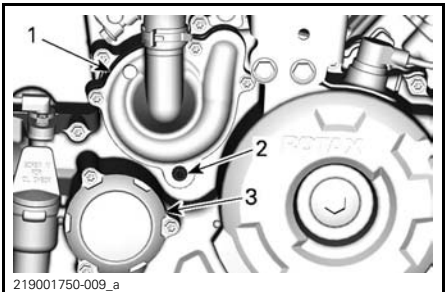
3. Unscrew coolant drain plug and drain the coolant into a suitable container.

NOTE: Do not unscrew the coolant drain plug completely.



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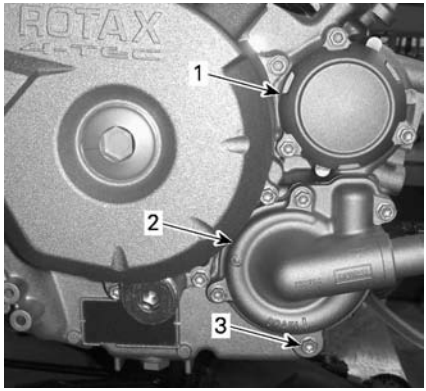
HD5
1. *Water pump cover*
2. *Coolant drain plug*
3. *Oil filter cover*



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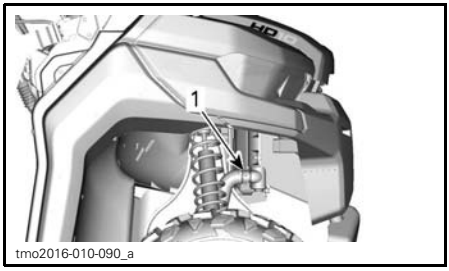
HD8 AND HD10
1. *Oil filter cover*
2. *Water pump cover*
3. *Coolant drain plug*

4. Disconnect the lower radiator hose and drain the remaining coolant into a suitable container.

NOTE: Take note of the position of the hose clamp on the lower radiator hose at the radiator.



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1. Lower radiator hose to disconnect

5. Drain cooling system completely.
6. Reinstall cooling system drain plug and tighten to specification.

TIGHTENING TORQUE	
Coolant drain plug	10 N•m ± 1 N•m (89 lbf•**in** ± 9 lbf•**in**)

7. Reinstall radiator hose as noted prior to removal.

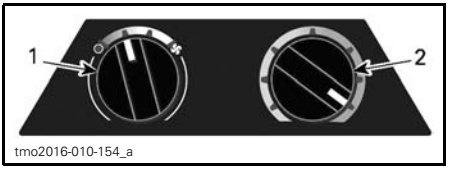
TIGHTENING TORQUE	
Radiator hose clamp	3 N•m ± 0.5 N•m (27 lbf•**in** ± 4 lbf•**in**)

8. Fill cooling system with coolant, refer to *COOLING SYSTEM BLEEDING* procedure.

Cooling System Bleeding

Models with a Heating System

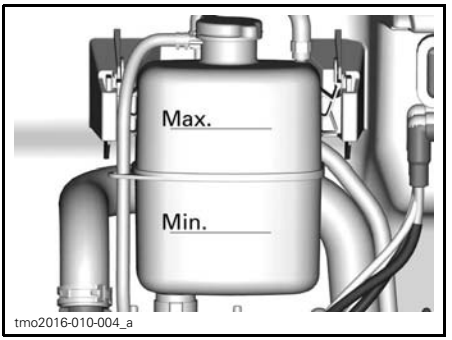
1. Activate heater fan and put heating level to maximum.



1. Heater fan speed control button
2. Heating level button

All Models

2. Remove the pressure cap.
3. Fill coolant system until it is full up to the Max line on the coolant bottle.



4. Install pressure cap.
5. Run engine at idle with the pressure cap ON until the cooling fan cycles on for a second time.
6. Stop the engine and let it cool down.

⚠ WARNING

In order to avoid potential burns, do not remove the pressure cap if the engine is hot.

7. When the engine is cool, remove pressure cap and add coolant if required.
8. Install pressure cap.
9. After the next ride following this procedure, check coolant level. Add coolant as required. Refer to *ENGINE COOLANT LEVEL VERIFICATION* in this section.

Muffler and Spark Arrester

Muffler Cleaning (HD5)

Purge the muffler from accumulated carbon as follows.

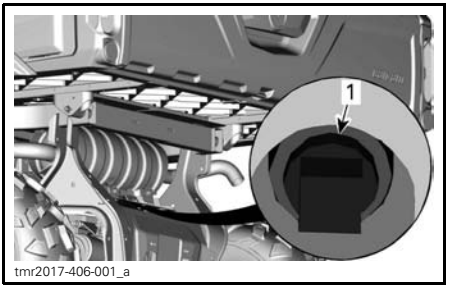
Place the vehicle in a well ventilated area.

Stop engine and let muffler cool down.

⚠ WARNING

Never run engine in an enclosed area. Never perform this operation immediately after the engine has been running because exhaust system is very hot. Make sure that there are no combustible materials in the area. Wear eye protection and gloves. Never stand behind the vehicle while purging exhaust system. Respect all applicable laws and regulations.

Remove the muffler cleanout plug.



UNDERNEATH THE MUFFLER
1. Muffler cleanout plug

Start engine (shift lever in Park).

Block the end of the mufflers with a shop rag.

Quickly increase throttle several times.

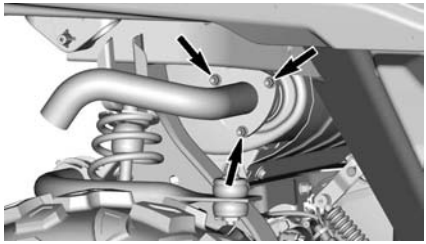
Stop engine and let muffler cool down.

Reinstall the cleanout plug.

Muffler Spark Arrester Cleaning and Inspection (HD8 and HD10)

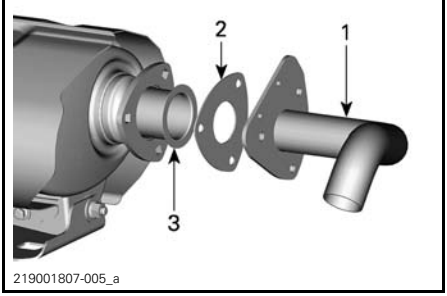
⚠ CAUTION Never perform this operation immediately after the engine has been running as exhaust system is very hot.

Remove and discard the tail pipe retaining bolts and nuts.



TAIL PIPE RETAINING BOLTS AND NUTS

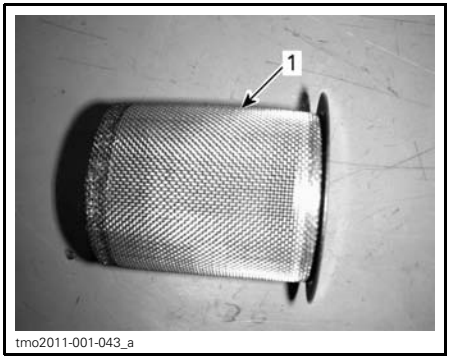
Remove exhaust tail pipe, gasket (discard) and spark arrester.



1. *Tailpipe*
2. *Gasket*
3. *Spark arrester*

Remove carbon deposits from the spark arrester using a brush.

NOTICE Use a metallic soft brush and be careful to avoid damaging spark arrester mesh.



1. *Clean spark arrester*

Inspect mesh of spark arrester for any damage. Replace as required.

Inspect spark arrester chamber in muffler. Remove any debris as required.

Reinstall the muffler spark arrester in the reverse of the removal procedure. However pay attention to the following.

Install new gasket and fasteners. Tighten to specification.

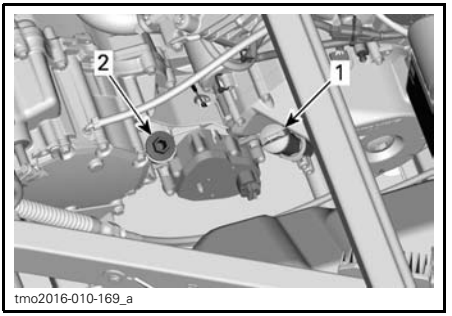
TIGHTENING TORQUE	
Tailpipe retaining screw	32 N•m ± 2 N•m (24 lbf•ft ± 1 lbf•ft)

Gearbox Oil (HD8 and HD10)

Gearbox Oil Level Verification

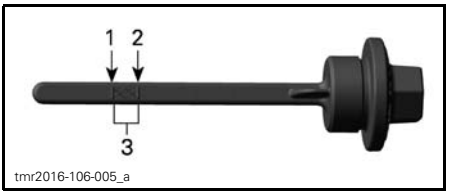
Place the vehicle on a level surface. Select PARK position.

Check the gearbox oil level by removing the gearbox oil dipstick.



1. Engine oil dipstick
2. Gearbox oil level plug

Remove dipstick again and check oil level. It should be near or equal to the upper mark.



1. MIN.
2. MAX.
3. Operating range

To add oil, place a funnel into the dipstick hole.

Add a small amount of recommended oil and recheck oil level.

Repeat the above procedures until oil level reaches the dipstick's upper mark.

NOTICE **Operating the gearbox with an improper oil level may severely damage gearbox.**

NOTE: Do not overfill. Wipe off any spillage.

Properly tighten oil dipstick.

Recommended Gearbox Oil

RECOMMENDED GEARBOX OIL	
Scandinavia	75W140 SYNTHETIC GEAR OIL (EUR) (P/N 779215)
All other countries	75W140 SYNTHETIC GEAR OIL (P/N 779160)

NOTE: The XPS oil is specially formulated to meet the lubrication requirements of this gearbox. BRP strongly recommends the use of its XPS oil. However, if the XPS synthetic gear oil is not available, use the following lubricant:

GEARBOX OIL MINIMUM REQUIREMENT
75W 140 API GL-5 synthetic gear oil

NOTICE **Do not use another type of oil when servicing.**

Gearbox Oil Change

NOTE: When replacing the gearbox oil, it is recommended to clean the vehicle speed sensor (VSS) at the same time.

Place the vehicle on a level surface.

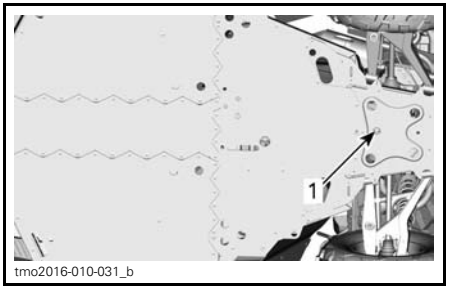
Clean drain plug area.

Clean the oil level plug area.

Under the vehicle, place a drain pan underneath the oil drain plug area.

Remove the oil level plug.

Remove the gearbox drain plug.



1. Oil drain plug

Let oil completely drain from gearbox.

Install the drain plug.

NOTE: Clean drain plug from any metallic particles prior to installation.

Refill gearbox.

NOTICE **Use ONLY the recommended type of oil.**

The oil should be level with the bottom of the oil level orifice.

NOTICE **Do not overfill.**

Reinstall oil level plug.

TIGHTENING TORQUE	
Gearbox drain plug	30 N•m ± 3 N•m (22 lbf•ft ± 2 lbf•ft)

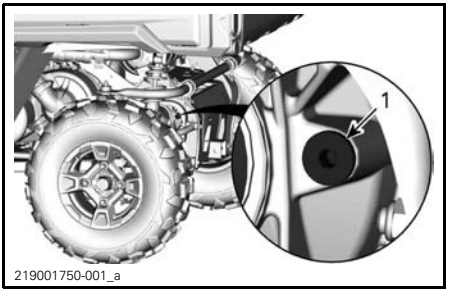
Wipe off any spillage.

Rear Final Drive Oil (HD5)

Rear Final Drive Oil Level Verification

Place the vehicle on a level surface. Select PARK position.

Check the oil level by removing the filler plug.



LH REAR SIDE OF VEHICLE
1. Filler plug

Insert a wire in the oil filler hole.

The oil level must be within the following specification.

OIL LEVEL
20 mm ± 5 mm (9/16 in ± 3/16 in) below the oil filler plug hole bottom edge

Reinstall filler plug with a NEW sealing ring.

TIGHTENING TORQUE	
Filler plug	22.5 N•m ± 2.5 N•m (17 lbf•ft ± 2 lbf•ft)

NOTICE **Operating the vehicle with an improper oil level may severely damage the rear final drive.**

Recommended Rear Final Drive Oil

RECOMMENDED REAR FINAL DRIVE OIL	
Scandinavia	75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212)
All other countries	75W90 SYNTHETIC GEAR OIL (P/N 779158)

NOTE: The XPS oil is specially formulated to meet the lubrication requirements of this gearbox. BRP strongly recommends the use of its XPS oil. However, if the XPS synthetic gear oil is not available, use the following lubricant:

REAR FINAL DRIVE MINIMUM OIL REQUIREMENT
75W 90 API GL-5 synthetic gear oil

NOTICE Do not use another type of oil when servicing.

Rear Final Drive Oil Change

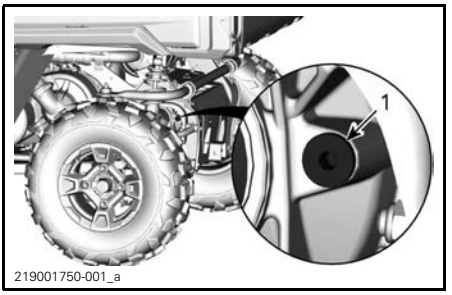
Place the vehicle on a level surface.

Clean drain plug area.

Clean the filler plug area.

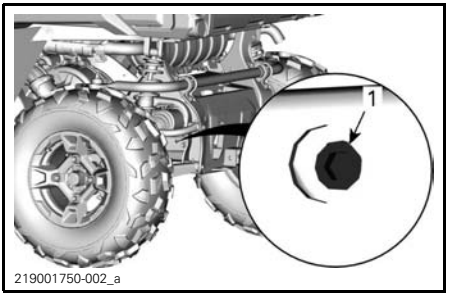
Under the vehicle, place a drain pan underneath the oil drain plug area.

Remove the filler plug.



LH REAR SIDE OF VEHICLE
1. Filler plug

Remove the drain plug.



LH REAR SIDE OF VEHICLE
1. Drain plug

Allow oil to drain completely

Clean the drain plug.

Install the drain plug.

TIGHTENING TORQUE	
Drain plug	7.5 N•m ± 0.5 N•m (66 lbf•**in** ± 4 lbf•**in**)

Fill the final drive unit to the proper level, refer to *REAR FINAL DRIVE OIL LEVEL VERIFICATION*.

For the final drive oil capacity, refer to *SPECIFICATIONS*.

NOTICE Use ONLY the recommended type of oil.

NOTICE Do not overfill.

Reinstall the filler plug with a NEW sealing ring.

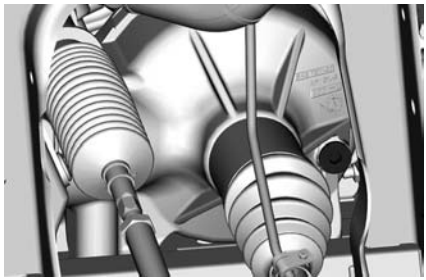
TIGHTENING TORQUE	
Filler plug	7.5 N•m ± 0.5 N•m (66 lbf•**in** ± 4 lbf•**in**)

Wipe off any spillage.

Differential Oil

Front Differential Oil Level Verification

Clean filler plug prior to checking oil level.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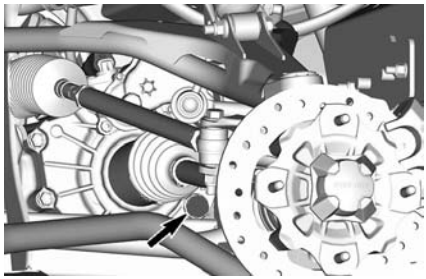
TYPICAL VISCO-LOC- FRONT RIGHT SIDE OF VEHICLE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TYPICAL SMART-LOC- FRONT RIGHT SIDE OF VEHICLE

With vehicle on a level surface, check oil level by removing filler plug. Oil level must reach the lower edge.

Reinstall filler plug.

TIGHTENING TORQUE	
Filler plug	16.5 N•m ± 2.5 N•m (146 lbf•**in** ± 22 lbf•**in**)

Recommended Differential Oil

RECOMMENDED FRONT DIFFERENTIAL OIL	
Scandinavia	75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212)
All other countries	75W90 SYNTHETIC GEAR OIL (P/N 779158)

NOTE: The XPS oil is specially formulated to meet the lubrication requirements of this gearbox. BRP strongly recommends the use of its XPS oil. However, if the XPS synthetic gear oil is not available, use the following lubricant:

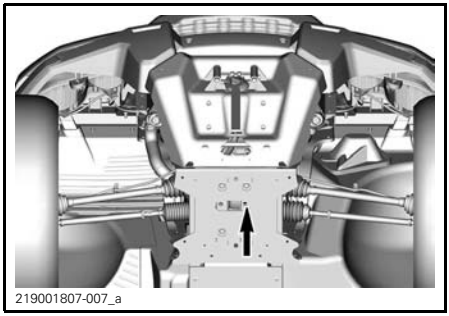
FRONT DIFFERENTIAL MINIMUM OIL REQUIREMENT
75W 90 API GL-5 synthetic gear oil

NOTICE Do not use another type of oil when servicing.

Differential Oil Change

Place vehicle on a level surface. Set gearbox in park position.

From underneath the vehicle, clean the drain plug area.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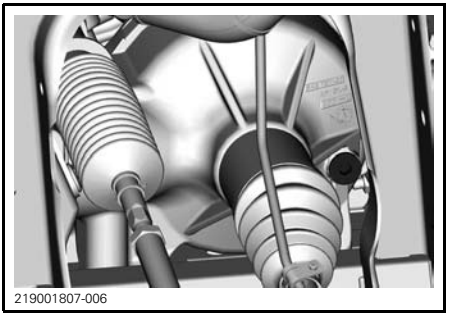
TYPICAL
1. Drain plug access hole

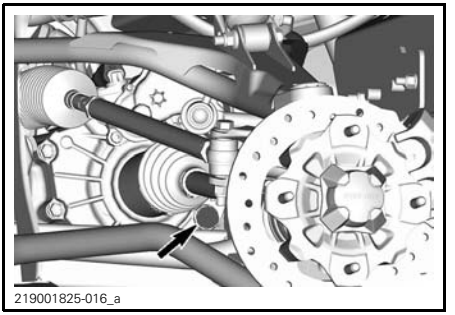
Place a drain pan under the front differential.

Remove drain plug.

Unscrew filler plug.



TYPICAL VISCO-LOC- FRONT RIGHT SIDE OF VEHICLE



TYPICAL SMART-LOC- FRONT RIGHT SIDE OF VEHICLE

Install drain plug.

TIGHTENING TORQUE	
Drain plug	2.7 N•m ± 0.3 N•m (24 lbf•**in** ± 3 lbf•**in**)

Refill front differential with recommended oil.

For the differential oil capacity, refer to *SPECIFICATIONS*.

RECOMMENDED OIL	
Scandinavia	75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212)
All other countries	75W90 SYNTHETIC GEAR OIL (P/N 779158) or a 75W 90 (API GL-5) gear oil

Reinstall filler plug.

TIGHTENING TORQUE	
Filler plug	16.5 N•m ± 2.5 N•m (146 lbf•**in** ± 22 lbf•**in**)

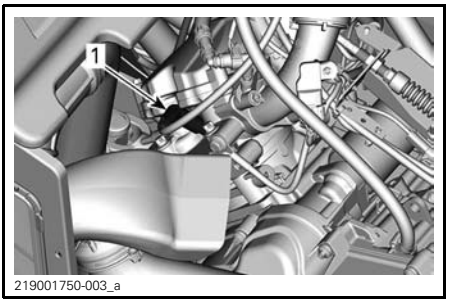
Spark Plugs

Access to Spark Plugs

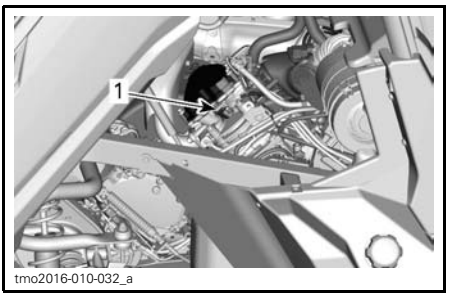
Open cargo box.

Spark Plug Removal

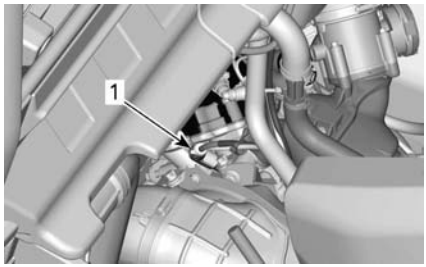
Unplug spark plug cable.



HD5
1. Spark plug



HD8 AND HD10 — REAR CYLINDER (ON THE RH SIDE)
1. Spark plug



HD8 AND HD10 — FRONT CYLINDER (ON THE LH SIDE)
1. Spark plug

Clean spark plug and cylinder head with pressurized air.

⚠ CAUTION Always wear safety goggles when using pressurized air.

Unscrew spark plug completely using a spark plug socket, then remove it.

Spark Plug Installation

Prior to installation make sure that contact surface of cylinder head and spark plug is free of grime.

Using a feeler gauge, set the spark plug gap.

SPARK PLUG GAP
0.7 mm - 0.8 mm (.028 in - .031 in)

Apply a small amount of copper-based anti-seize lubricant over spark plug threads.

Screw spark plug into cylinder heads by hand and tighten with a torque wrench and a proper socket.

⚠ CAUTION Do not overtighen spark plugs, engine damage can occur.

TIGHTENING TORQUE	
Spark plug	20 N•m ± 2.4 N•m (15 lbf•ft ± 2 lbf•ft)

CVT Cover

NOTE: For a better understanding, some illustrations are taken with engine out of vehicle. To perform the following instructions, it is not necessary to remove engine.

This CVT is lubrication free. Never lubricate any components except drive pulley bearing.

⚠ WARNING

Never touch CVT while engine is running. Never drive vehicle when CVT cover is removed.

⚠ WARNING

Engine must be cool before cover is removed. Always wear protective gloves when removing cover.

Place the vehicle on a level surface. Select PARK position.

CVT Cover Access (All Models)

Tilt cargo box.

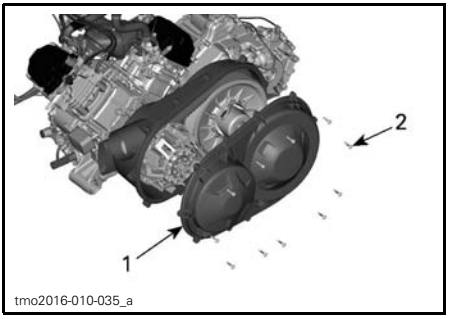
CVT Cover Removal (HD8 and HD10)

Remove all CVT cover retaining screws.

NOTE: Remove the center top screw last to support the cover during removal.

NOTE: Do not use an impact tool to remove CVT cover screws.

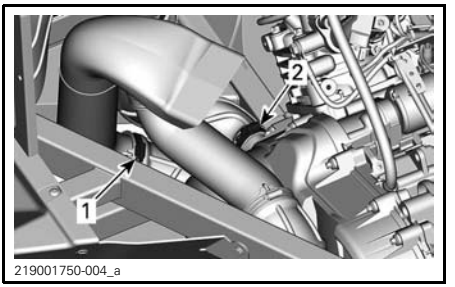
Remove the CVT cover and its gasket.



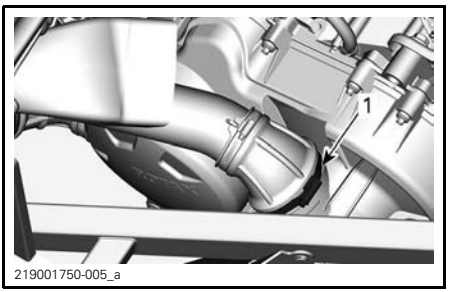
1. CVT cover
2. CVT cover screws

CVT Cover Removal (HD5)

Disconnect CVT cooling ducts.



1. Outlet duct clamp
2. Front inlet duct clamp



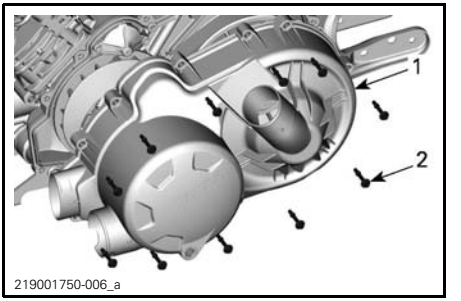
1. Rear inlet duct clamp

Remove all CVT cover retaining screws.

NOTE: Remove the center top screw last to support the cover during removal.

NOTE: Do not use and impact tool to remove CVT cover screws.

Remove the CVT cover and its gasket.

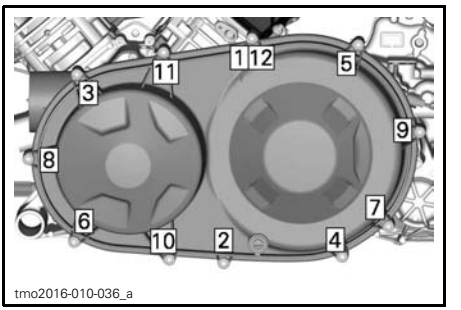


1. CVT cover
2. CVT cover

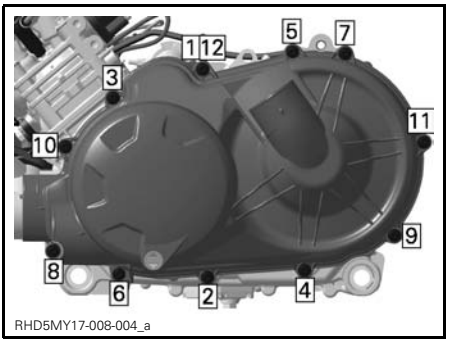
CVT Cover Installation (All Models)

Install the center top screw of first.

Tighten the CVT cover screws as per following sequence.



HD8 AND HD10 - CVT COVER TIGHTENING SEQUENCE



HD5 - CVT COVER TIGHTENING SEQUENCE

TIGHTENING TORQUE	
CVT cover screws	7 N•m ± 0.8 N•m (62 lbf•**in** ± 7 lbf•**in**)

On HD5 models, reinstall the CVT cooling ducts.

Drive Belt

Drive Belt Removal (HD8 and HD10)

NOTICE In case of a drive belt failure, the CVT, cover and air outlet must be cleaned.

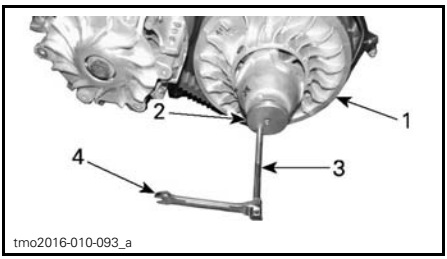
Please refer to *TIPS FOR MAXIMIZING DRIVE BELT DURABILITY* in *BASIC PROCEDURES* section for some IMPORTANT information.

Remove *CVT COVER*.

Open driven pulley.

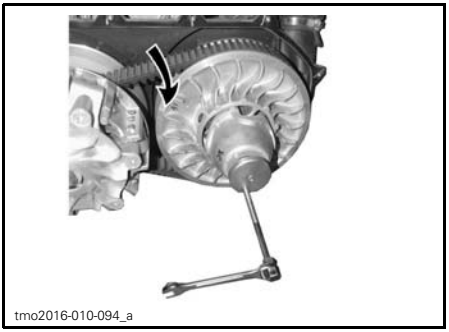
REQUIRED TOOLS	
PULLER/LOCKING TOOL (P/N 529 000 088)	
DRIVEN PULLEY ADAPTER (P/N 708 200 720)	

Insert adaptor in threaded hole of driven pulley then screw tool in the threaded hole of adaptor and tighten to open the pulley.



TYPICAL
1. *Fixed sheave of driven pulley*
2. *Adaptor*
3. *Driven pulley extractor*
4. *Wrench*

To remove belt, slip the belt over the top edge of fixed sheave, as shown.



TYPICAL

Drive Belt Removal (HD5)

NOTICE In case of a drive belt failure, the CVT, cover and air outlet must be cleaned.

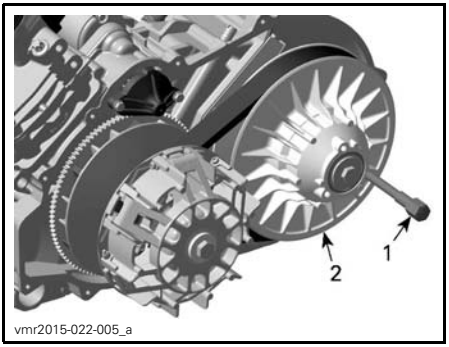
Please refer to *TIPS FOR MAXIMIZING DRIVE BELT DURABILITY* in *BASIC PROCEDURES* section for some IMPORTANT information.

Remove *CVT COVER*.

Open driven pulley.

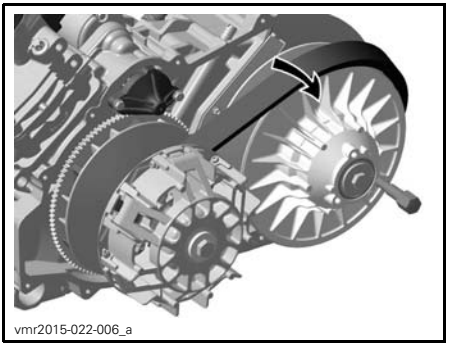
REQUIRED TOOL	
PULLER/LOCKING TOOL (P/N 529 036 098)	

Screw tool in the threaded hole of driven pulley and tighten to open the pulley.



1. *Puller/locking tool*
2. *Fixed sheave of driven pulley*

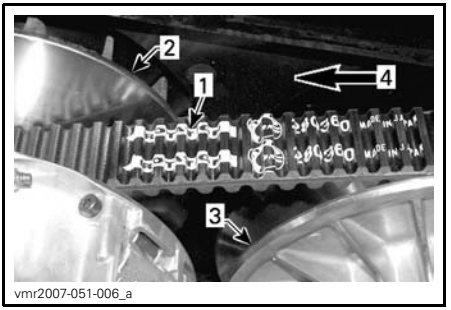
To remove belt, slip the belt over the top edge of fixed sheave, as shown.



Drive Belt Installation (HD8 and HD10)

For installation, reverse the removal procedure. Pay attention to following details.

The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so that the arrow printed on belt is pointing towards front of the vehicle, viewed from top.



1. *Arrow printed on belt*
2. *Drive pulley (front)*
3. *Driven pulley (rear)*
4. *Rotation direction*

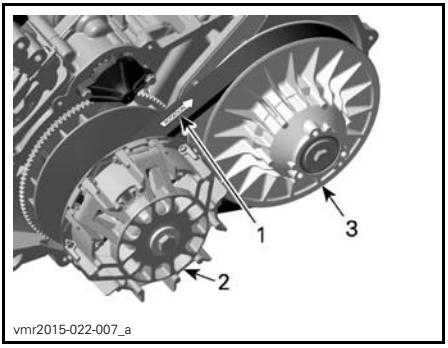
NOTE: Turn the driven pulley until the lowest portion of the cogs on the external surface of drive belt is even with the driven pulley edge.

1. *Lowest portion of cogs even with external surface of drive belt*

Drive Belt Installation (HD5)

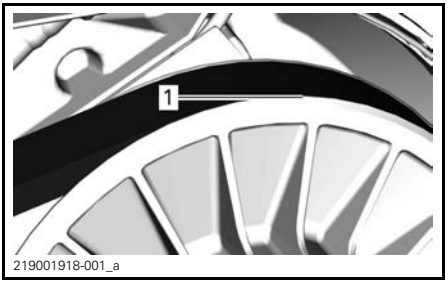
For installation, reverse the removal procedure. Pay attention to following details.

The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so that the arrow printed on belt is pointing towards the back of the vehicle, viewed from top.



1. *Arrow towards the back of the vehicle*
2. *Drive pulley (front)*
3. *Driven pulley (rear)*

NOTE: Turn the driven pulley until the external surface of drive belt is even with the driven pulley edge.



1. *External surface of drive belt*

Drive and Driven Pulleys

Drive and Driven Pulleys Inspection

This inspection must be performed by an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement.

Drive Pulley

Inspect the bushings of the sliding sheave of the drive pulley, replace worn parts.

Driven Pulley

Inspect the bushings of the cam and of the sliding sheave of the driven pulley, replace worn parts.

Battery

Battery Maintenance

NOTICE Never charge a battery while installed in vehicle.

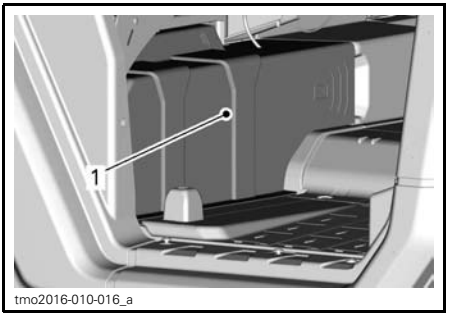
These vehicles are equipped with a VRLA battery (Valve Regulated Lead Acid). It is a maintenance-free type battery, there is no need to add water to adjust electrolyte level.

NOTICE Never remove the battery sealing cap.

Battery Removal

Remove under seat storage compartment if equipped.

Remove battery cover

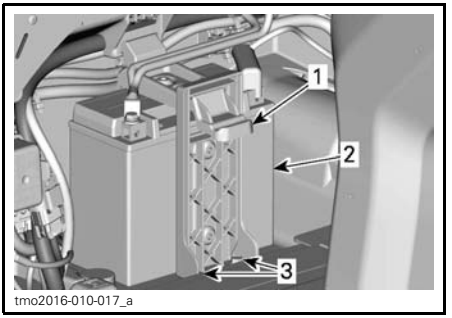


1. *Battery cover*

Disconnect BLACK (-) cable first then RED (+) cable.

NOTICE Always respect this order for disassembly; disconnect BLACK (-) cable first.

Remove battery holder retaining screw(s).



1. Battery holder
2. Battery
3. Battery holder retaining screw(s)

Remove battery holder.

Remove battery.

Battery Cleaning

Clean battery, battery casing and battery posts using a solution of baking soda and water.

Remove corrosion from battery cable terminals and battery posts using a firm wire brush. Battery casing should be cleaned by soft brush and baking soda solution.

Battery Installation

Battery installation is the reverse of the removal procedure.

NOTICE Improper orientation of the battery cables (reverse polarity) will result in damage to the voltage regulator.

CAUTION Always connect RED (+) cable first then BLACK (-) cable.

Fuses and Fusible Links

Fuse Replacement

If a fuse is burnt, replace it by one of the same rating.

NOTICE Do not use a higher rated fuse as this can cause severe damage.

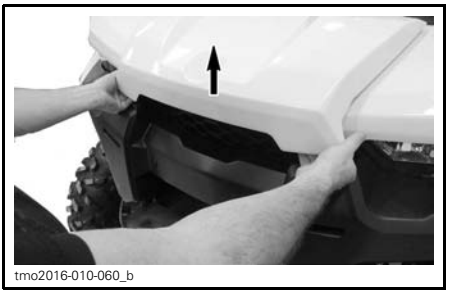
Fuse Box Location

The vehicle is equipped with two fuse boxes. The front fuse box is located under the front service cover and the rear fuse box is located under RH passenger seat near battery.

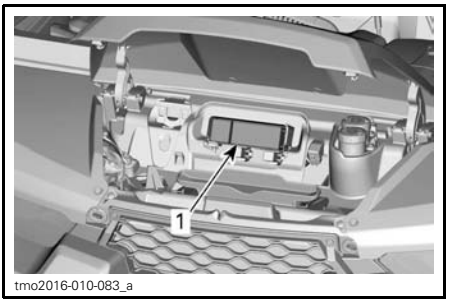
To open front service cover, pull on front edges of service cover to unlock mechanism

PULLING ON FRONT SERVICE COVER EDGE.

Lift service cover.

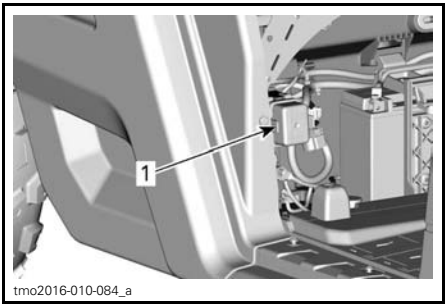


LIFTING FRONT SERVICE COVER EDGE.



FRONT SERVICE COVER OPENED
1. Front fuse box

NOTE: Use screwdriver to remove DPS and Accessories fuse cover.



BATTERY COVER REMOVED
1. Rear fuse box

NOTE: Fuse link 1 connected to starter solenoid.

Fuse Box Description

FDM FUSE BOX		
No	DESCRIPTION	RATING
F19	Smart-Lok™	20 A

SINGLE FUSES AT FRONT		
NO	DESCRIPTION	RATING
PF3	DPS	40 A
PF4	Accessory post (Under dash terminal block)	40 A

FRONT FUSE BOX		
NO	DESCRIPTION	RATING
F7	4WD actuator	10 A
F10	T vehicle (accessory post)	40 A
F11	Headlamps	20 A
F12	DC3/12V accessory outlet 1	10 A
F14	12 V accessory outlet 2	10 A
F16	Tail lamps	10 A

FRONT FUSE BOX		
NO	DESCRIPTION	RATING
R9	Fuses PF4/F14 Accessory post 12V/outlet 2	50 A
R3	ECM accessory 12V	30 A
R8	Brake lights	20 A
Spare1	Spare	20 A

REAR FUSE BOX		
NO	DESCRIPTION	RATING
F4	Cluster/relays	10 A
F5	Ignition/injection/fuel pump	10 A
F6	Engine Control Module (ECM)	10 A
F8	Ignition switch Clock	10 A
F9	Cooling fan	25 A
F18	Oxygen sensor Emission control	10 A
R1	Fan	30 A
R2	Main	20 A
Spare2	Spare	10 A

NOTE: Fuses are identified inside fuse box cover.

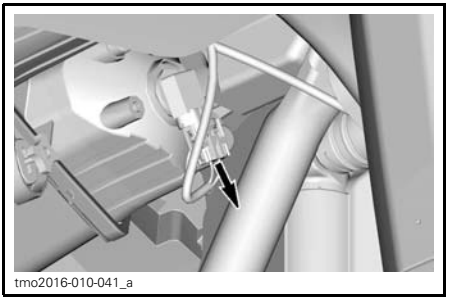
FUSE LINKS		
FUSE LINK	DESCRIPTION	RATING
1	Main	18 awg
2	Accessory post	14 awg

Lights

Headlight Bulb Replacement

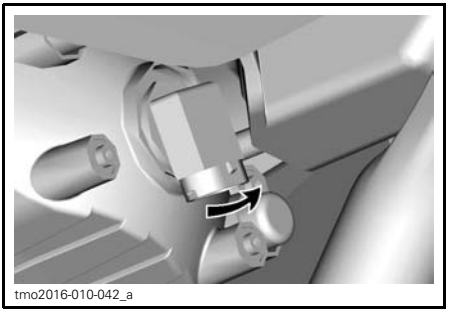
NOTICE Never touch glass portion of a halogen bulb with bare fingers, it shortens its operating life. If glass is touched, clean it with isopropyl alcohol which will not leave a film on the bulb.

Unplug connector from bulb.


tmo2016-010-041_a

TYPICAL

Rotate bulb.


tmo2016-010-042_a

TYPICAL

Pull out bulb.

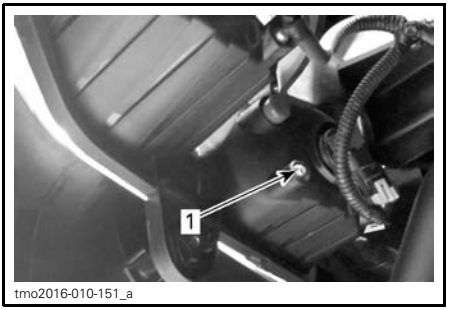
Properly reinstall removed parts in the reverse order of their removal.

Validate headlights operation.

Headlight Beam Aiming

Turn adjustment screw to adjust beam height to your convenience.

NOTE: Adjust headlights evenly.



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1. Adjustment screw

Taillight Bulbs Replacement

The taillights are built with LEDs (light emitting diode) and this technology proved to be reliable. In the unlikely event they do not work, have them checked by an authorized Can-Am dealer, a repair shop or person of your choosing.

Drive Shaft Boot and Protector

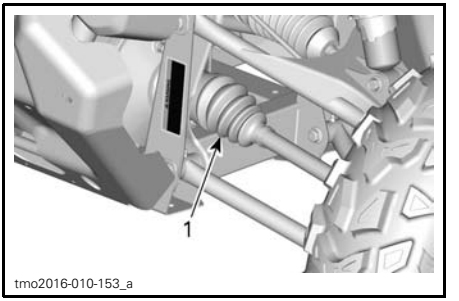
Drive Shaft Boot and Protector Inspection

Visually inspect drive shaft protectors and boots condition.

Check protectors for damage or rubbing against shafts.

Check boots for cracks, tears, leaking grease, etc.

Repair or replace damaged parts as necessary.



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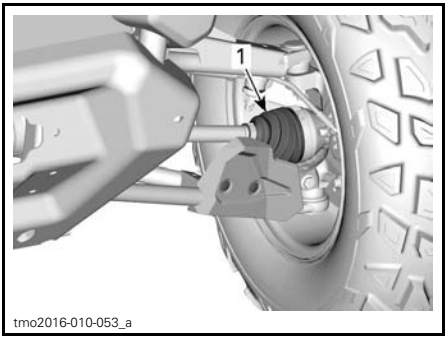
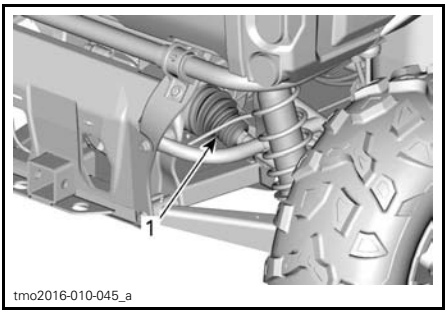
FRONT OF VEHICLE

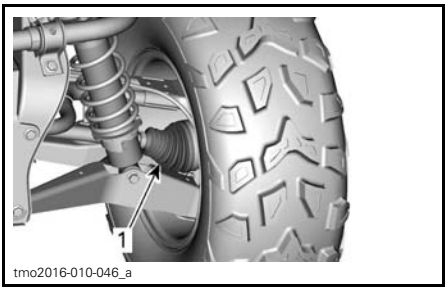
1. Inner drive shaft boots



FRONT OF VEHICLE
1. *Outer drive shaft boot*



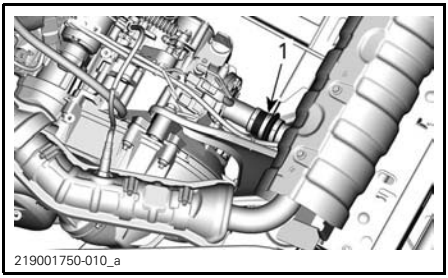
REAR OF VEHICLE
1. *Inner drive shaft boots*



REAR OF VEHICLE
1. *Outer drive shaft boot*

Propeller Shaft Boot (HD5)

Visually inspect the propeller shaft boot for cracks, tears, leaking grease, etc.



1. *Propeller shaft boot*

Replace if damaged.

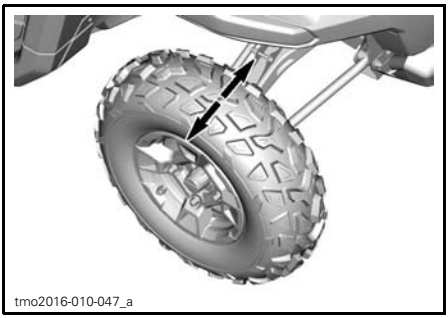
Wheel Bearing

Wheel Bearing Inspection

Lift and support vehicle. Refer to *LIFTING AND SUPPORTING THE VEHICLE*.

Push and pull the wheels from the upper edge to feel the play.

See an authorized Can-Am dealer, a repair shop or person of your choosing if there is an excessive play.



TYPICAL

Wheels and Tires

Wheel Removal

Loosen nuts then lift and support vehicle. Refer to *LIFTING AND SUPPORTING VEHICLE*.

Remove nuts then remove wheel.

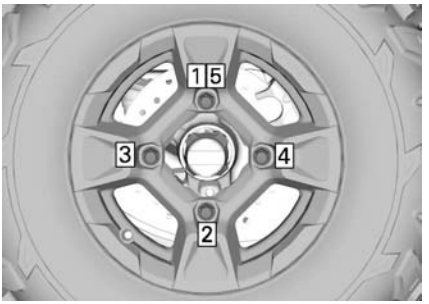
Wheel Installation

Inspect studs and nuts. Replace if needed.

The tires are unidirectional and their rotation must be kept in a specific direction for proper operation.

Tighten wheel lug nuts in accordance with the following illustration.

TIGHTENING TORQUE	
Wheel lug nuts	100 N•m ± 10 N•m (74 lbf•ft ± 7 lbf•ft)



TIGHTENING SEQUENCE

NOTICE Always use the recommended wheel nuts for the type of wheel. Using a different nut could cause damages to the rim or studs.

Tire Pressure

⚠ WARNING

Tire pressure greatly affects vehicle handling and stability. Insufficient pressure may cause tire to deflate and rotate on wheel. Overpressure may burst the tire. Always follow recommended pressure. NEVER set tire pressure below minimum. It could cause the tire to dislodge from the rim.

Check pressure when tires are cold before using the vehicle. Tire pressure changes with temperature and altitude. Recheck pressure if one of these conditions has changed.

For your convenience, a pressure gauge is supplied in tool kit.

Refer to *SPECIFICATIONS* for proper tire pressure.

NOTE: Although the tires are specifically designed for off-road use, a flat may still occur. Therefore, it is recommended to carry a tire pump and a repair kit.

Tire Inspection

Check tire for damage and wear. Replace if necessary.

⚠ WARNING

Do not rotate tires. The front and rear tires have a different size. The left and right tires have different unidirectional tread patterns.

Tire Replacement

Tires replacement should be performed by an authorized Can-Am dealer, a repair shop or person of your choosing.

⚠ WARNING

- Replace tires only with the same type and size as original tires.
- For unidirectional tread pattern, ensure that the tires are installed in the correct direction of rotation.
- Tires should be replaced, by an experienced person, in accordance with tire industry standards and tools.

Suspensions

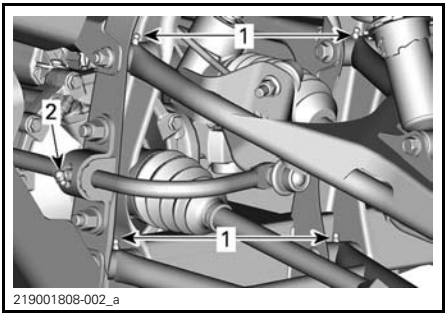
Front Suspension Lubrication

SUSPENSION GREASE	
Scandinavia	SYNTHETIC GREASE SUSPENSION (EUR) (P/N 779226)
All other countries	SYNTHETIC GREASE SUSPENSION (P/N 779163)

Lubricate front arms and stabilizer bar bushings (if equipped).

There are two grease fittings on each arm oriented upwards.

There is one grease fitting on each stabilizer bar pivot bushing.

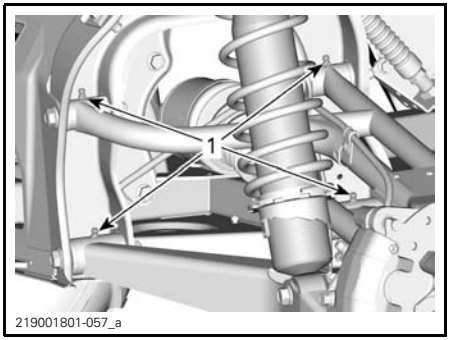


FRONT SUSPENSION - TYPICAL
1. *A-arm grease fittings*
2. *Stabilizer bar bushings grease fittings (if equipped)*

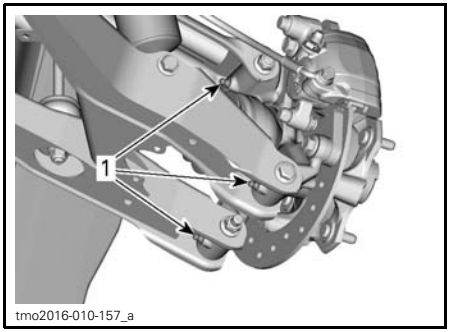
Rear Suspension Lubrication

SUSPENSION GREASE	
Scandinavia	SYNTHETIC GREASE SUSPENSION (EUR) (P/N 779226)
All other countries	SYNTHETIC GREASE SUSPENSION (P/N 779163)

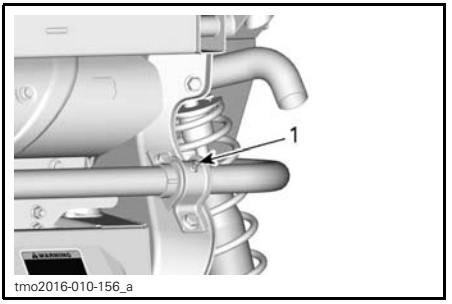
Lubricate rear suspension arms (two grease fittings on each arm), rear knuckles (three grease fittings) and rear stabilizer bar bushing.



TYPICAL
1. *Rear suspension arm grease fittings*



TYPICAL
1. *Rear knuckle grease fittings*



TYPICAL
1. Rear stabilizer bar bushing grease fitting

Suspension Inspection

See an authorized Can-Am dealer, a repair shop or person of your choosing if any problem is detected.

Shock Absorbers

Inspect shock absorber for leaks, bump stop wear out or other damages. Verify fasteners are still well tightened.

Front Suspension Arms

Check suspension arms for cracks, bending or other damages.

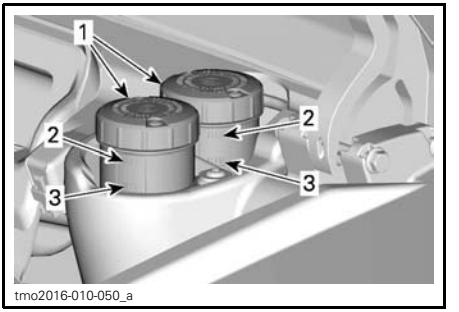
Rear Suspension Arms

Check suspension arms for distortion, cracks or bending.

Brakes

Brake Fluid Reservoir Level Verification

With vehicle on a level surface, check brake fluid in reservoir for proper level. Brake fluid level should be between MIN. and MAX. marks.



1. Brake fluid reservoirs
2. MAX
3. MIN

NOTE: A low level may indicate leaks or worn brake pads.

Adding Brake Fluid

Clean filler cap before removing.

Add fluid as required. Do not overfill.

NOTE: Ensure filler cap diaphragm is pushed inside the cap before closing the brake fluid reservoir.

Recommended Brake Fluid

Always use brake fluid meeting the specification DOT 4 only.

⚠ WARNING

To avoid serious damage to the braking system, do not use fluids other than the recommended one, nor mix different fluids for topping up.

Brake Inspection

The brake inspection, maintenance and repair should be performed by an authorized Can-Am dealer, a repair shop or person of your choosing.

However, verify the following between visits to your dealer:

- Brake fluid level
- Brake system for fluid leaks
- Brake pad wear
- Brake cleanliness.

⚠ WARNING

The brake fluid replacement or brake system maintenance and repairs should be performed by an authorized Can-Am dealer.

Seat Belts

Seat Belt Cleaning

To clean dirt and debris from the seat belts, sponge the straps with mild soap and water. Do not use bleach, dye, or household detergents.

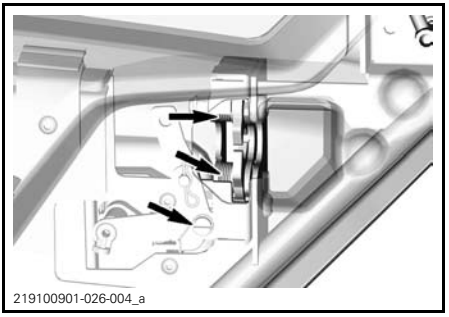
⚠ WARNING

Do not use pressure washer to clean seat belt components. Use of pressure washer can permanently damage seat belt components.

Doors With Electric Windows (If Equipped)

Door Latch Mechanism

Lubricate door latch mechanism periodically using a silicone based lubricant..



⚠ WARNING

Never apply any type of grease on door lock mechanism.

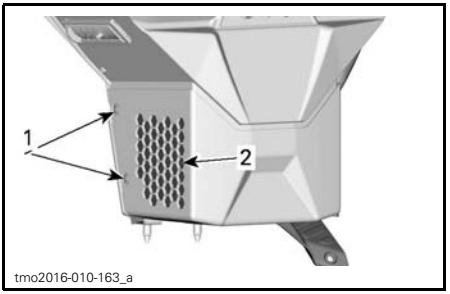
Heating System (If Equipped)

Heating System Filter Cleaning

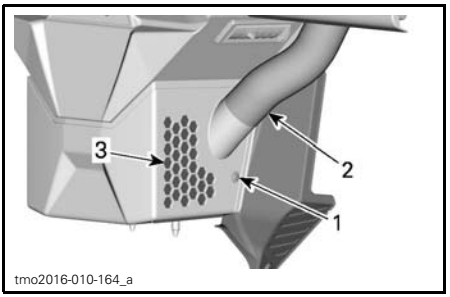
To clean heating system air filter, remove the three retaining screws securing lower cover to heating system assembly.

Disconnect air inlet hose from lower cover.

Slide lower cover rearward to access filters and remove them.



LH OF HEATING SYSTEM
1. *Retaining screws to remove*
2. *Heating system air filter*



RH OF HEATING SYSTEM
1. *Retaining screw to remove*
2. *Heating system air inlet hose*
3. *Heating system air filter*

Clean heating system air filters by tapping out heavy dust, this will allow dirt and dust out of the filters.

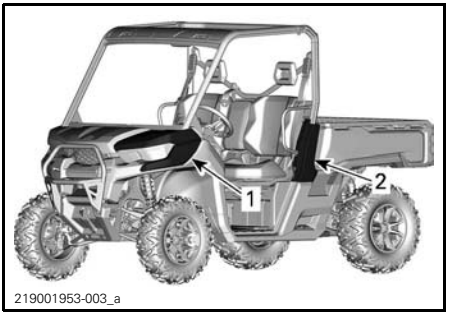
NOTICE Do not blow compressed air on the filters; this could damage fibers and reduce filtration ability. If filters are too dirty and cannot be cleaned following the recommended procedure, they should be replaced.

Cage

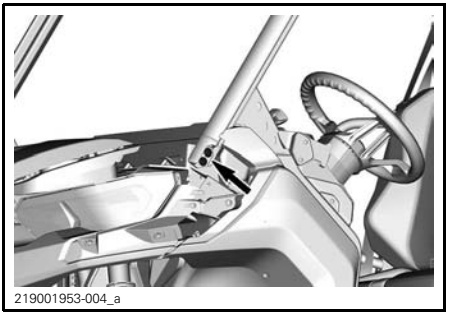
Cage fasteners

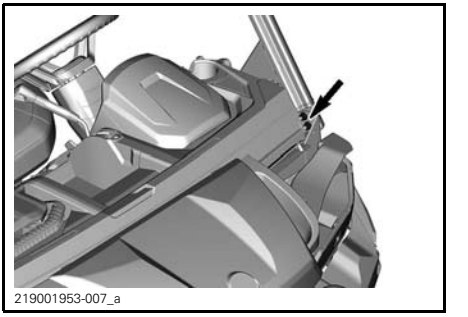
Tighten cage fasteners to specification periodically.

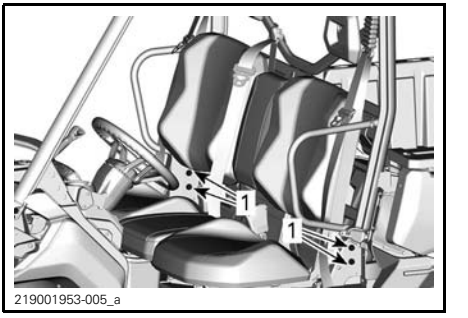
Remove trim to get access to the fasteners.



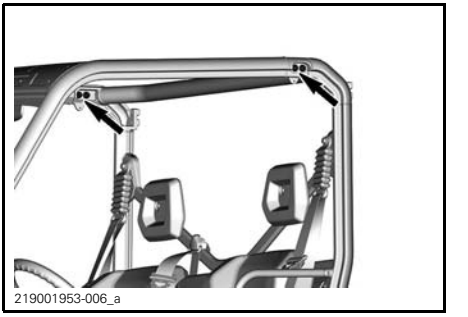
1. Front fender
2. Side cage cover







1. Lower cage fasteners



TIGHTENING TORQUE	
Cage fasteners	67.5 N•m ± 2.5 N•m (50 lbf•ft ± 2 lbf•ft)

Post-Operation Care

When vehicle is used in salt-water environment rinsing the vehicle with fresh water is necessary to preserve vehicle and its components. Metallic parts lubrication is highly recommended. Use LUB. & ANTI-CORROSIVE (P/N 779168) or an equivalent. This must be performed at the end of each operating day.

When vehicle is operated in muddy conditions, rinsing the vehicle is recommended to preserve vehicle and its components.

Vehicle Cleaning and Protection

Never use a high pressure washer to clean the vehicle. **USE LOW PRESSURE ONLY (like a garden hose).** High pressure can cause damage to electrical or mechanical components.

Pay attention to certain areas where mud or debris can accumulate and potentially cause wear, interferences or promote corrosion. The list includes but is not limited to:

- Around exhaust system and between muffler and muffler cover
- Under and around the fuel tank
- Radiator
- Shock absorbers
- Around front and rear differentials
- Around and underneath engine and gearbox
- Inside wheels
- On top of skid plates.

Painted parts which are damaged should be properly repainted to prevent rust.

When required, wash the body with warm water and soap (only use mild detergent). Apply non-abrasive wax.

NOTICE **Never clean plastic parts with strong detergent, degreasing agent, paint thinner, acetone, etc.**

STORAGE AND PRESEASON PREPARATION

When a vehicle is not in use for more than 4 months, proper storage is a necessity.

If the vehicle is to be dormant for more than 21 days, disconnect the BLACK (-) cable of the battery.

Using electrical accessories increases the risk of discharging the battery. Using a low amperage trickle charger is advised when low engine speeds and/or high electrical demand accessories are installed on a vehicle.

When using your vehicle after storage, a preparation is required.

See an authorized Can-Am dealer, repair shop, or person of your own choosing to have your vehicle prepared for either storage or the preseason.

TECHNICAL INFORMATION

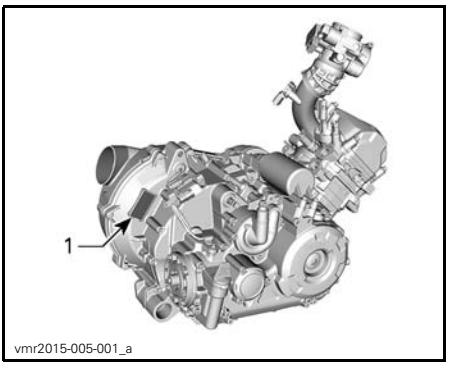
VEHICLE IDENTIFICATION

The main components of your vehicle (engine and frame) are identified by different serial numbers. It may sometimes become necessary to locate these numbers for warranty purposes or to trace your vehicle in the event of loss. These numbers are required by the authorized Can-Am dealer to complete warranty claims properly. We strongly recommend that you take note of all the serial numbers on your vehicle and supply them to your insurance company.

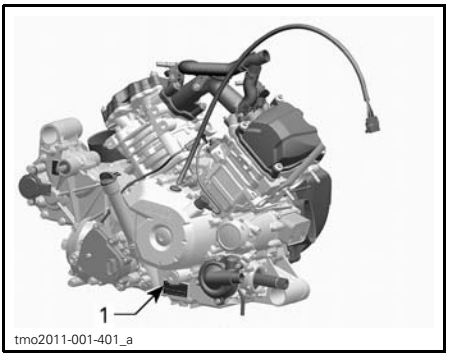
Vehicle Identification Number

TYPICAL — VEHICLE SERIAL NUMBER LABEL UNDER GLOVE BOX

Engine Identification Number



TYPICAL HD5 — ENGINE SERIAL NUMBER LABEL
1. EIN (Engine Identification Number)

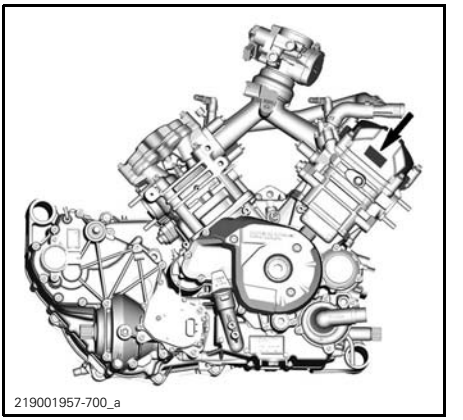


TYPICAL HD8 AND HD10 — ENGINE SERIAL NUMBER LABEL
1. EIN (Engine Identification Number)

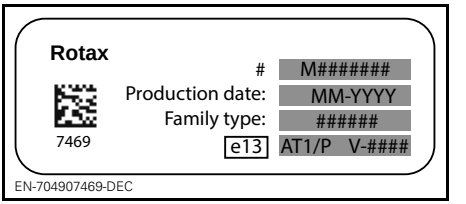
Compliance Label

Regulation (EU) 2016/1628 applicable for Non-Road Mobile Machineries

Vehicles who comply to Regulation (EU) 2016/1628 (NRMM) are identified on the engine valve cover.



TYPICAL



TYPICAL NRMM IDENTIFICATION

EVAPORATIVE EMISSION CONTROL SYSTEM

California Models with Evaporative Emission Control System

Beginning with the 2018 model-year vehicles, some California models are certified to meet the CARB (California Air Resources Board) TP-933. These models are equipped with an evaporative emission control system consisting of a low permeation fuel tank (LPFT), low permeation fuel lines (LPFL) and an actively purged carbon canister.

The following statement is required by the CCR (California Code of Regulation): An add-on or modified part must be compliant with applicable ARB evaporative emission control standards. A violation of this requirement is punishable by civil and/or criminal punishment.

NOISE EMISSION CONTROL SYSTEM REGULATION

USA and Canada Only

Tampering with Noise Control System Is Prohibited!

U.S. Federal law and Canadian provincial laws may prohibit the following acts or the causing there of:

1. The removal or rendering inoperative by any person other than for purposes of maintenance, repair or replacement of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use or
2. The use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those Acts Presumed to Constitute Tampering Are the Acts Listed Below:

1. Removal or alteration or the puncturing of the muffler or any engine component which conducts removal of engine exhaust gases.
2. Removal or alteration or the puncturing of any part of the intake system.
3. Replacing any moving parts of the vehicle or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.
4. Lack of proper maintenance.

The EC-Declaration of Conformity does not appear in this version of the Operator's Guide.

Please refer to the printed version that was delivered with your vehicle.

SPECIFICATIONS

MODEL	**HD5**	**HD8**	**HD10**
ENGINE			
Engine type	ROTAX ® HD5	ROTAX ® HD8	ROTAX® HD10
	4-stroke, Single Over Head Camshaft (SOHC), liquid cooled		
Number of cylinders	1	2	
Number of valves	4 valves (mechanical adjustment)	8 valves (mechanical adjustment)	
Intake valve clearance	0.06 mm to 0.14 mm (.0024 in to .0055 in)		
Exhaust valve clearance	0.11 mm to 0.19 mm (.0043 in to .0075 in)		
Bore	94 mm (3.7 in)	91 mm (3.58 in)	91 mm (3.58 in)
Stroke	61.5 mm (2.42 in)	61.5 mm (2.42 in)	75 mm (2.95 in)
Displacement	426.8 cm^3 (26.04 in^3)	800 cm^3 (48.82 in^3)	976 cm^3 (59.56 in^3)
Exhaust system	Spark arrester approved by USDA Forest Service Catalyst on NRMM models		
Engine air filter	Synthetic paper filter		

MODEL	**HD5**	**HD8**	**HD10**
LUBRICATION SYSTEM			
Type	Wet sump. Replaceable oil filter		
Oil filter	BRP Rotax® paper type, replaceable		

MODEL		HD5	HD8	HD10
LUBRICATION SYSTEM				
Type		Wet sump. Replaceable oil filter		
Engine oil	Capacity (oil change with filter)	3 L (3. qt (U.S. liq.)) (engine/ gearbox)	2 L (2.1 qt (U.S. liq.))	
	Recommended Scandinavia	4T 10W50 SYNTHETIC OIL (EUR) (P/N 779240). or 4T 5W40 SYNTHETIC BLEND OIL (EUR) (P/N 779290) or 4T 0W40 SYNTHETIC OIL (EUR) (P/N 779286)		
	Recommended All other countries	4T 10W50 SYNTHETIC OIL (P/N 779234). or 4T 5W40 SYNTHETIC BLEND OIL (P/N 779133) or 4T 0W40 SYNTHETIC OIL (P/N 779139)		
	Alternate oil if XPS products are not available	If not available, use a 5W40 or 10W50 motor oil that meets the requirements for API service classification SJ, SL, SM or SN		

MODEL		HD5	HD8	HD10
COOLING SYSTEM				
Coolant	Type	Ethyl glycol/water mix (50% coolant, 50% water). Scandinavia: EXTENDED LIFE PRE-MIXED COOLANT (EUR) (P/N 779223) All other countries: EXTENDED LIFE PRE-MIXED COOLANT (P/N 779150) or coolant specifically designed for aluminum engines		
	Capacity (Models without a heating system)	5.5 L (1.5 U.S. gal.)	6 L (1.59 U.S. gal.)	
	Capacity (Models with a heating system)	-	-	6.9 L (1.82 U.S. gal.)

MODEL	HD5	HD8	HD10
CVT TRANSMISSION			
Type	CVT (Continuously Variable Transmission)		
Engagement	2000 RPM	1700 RPM	

MODEL		HD5	HD8	HD10
GEARBOX				
Type		Dual range (HI-LO) with PARK, neutral and reverse		
Gearbox oil	Capacity	-	1.5 L (.396 U.S. gal.)	
	Recommended	-	Scandinavia: 75W140 SYNTHETIC GEAR OIL (EUR) (P/N 779215) All other countries: 75W140 SYNTHETIC GEAR OIL (P/N 779160) or a 75W 140 API GL-5	

MODEL		HD5	HD8	HD10
REAR FINAL DRIVE				
Type		Straight bevel gear Shaft driven final drive	-	-
Rear final drive oil	Capacity	250 ml (8.45 U.S. oz)	-	
	Recommended	Scandinavia: 75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212) All other countries: 75W90 SYNTHETIC GEAR OIL (P/N 779158) or a 75W 90 API GL-5	-	

MODEL		HD5	HD8	HD10
ELECTRICAL SYSTEM				
Magneto generator output		500 W @ 6000 RPM	650 W @ 6000 RPM	
Ignition system type		IDI (Inductive Discharge Ignition)		
Spark plug	Quantity	1	2	
	Make and type	NGK LMAR8D-J or equivalent	NGK DCPR8E or equivalent	
	Gap	0.7mm to 0.9mm (.028in to .035in)	0.7 mm to 0.8 mm (.028 in to .031 in)	

MODEL		HD5	HD8	HD10
ELECTRICAL SYSTEM				
Battery	Type	SLA (Sealed Lead Acid)		
	Voltage	12 volts		
	Nominal rating Base DPS Pro	18 A•h		
	Nominal rating XT XT with cab XT-P Mossy Oak Hunting Edition	30 A•h		
	Power starter output	0.7 KW		
Headlights		4 x 35 H 8		
Taillight		2.3/3.5 W		
Fuses		Refer to *FUSES AND FUSIBLE LINKS* in *MAINTENANCE*		

MODEL		HD5	HD8	HD10
FUEL SYSTEM				
Fuel delivery	Type	Electronic fuel injection (EFI) with iTC		
Throttle body		46 mm with ETA	54 mm with ETA	
Fuel pump	Type	Electric (in fuel tank)		
Idle speed		1250 ± 100 RPM (not adjustable)		
Fuel	Type	Regular unleaded gasoline - Refer to *FUEL REQUIREMENTS*		
	Minimum octane	87 Pump Posted AKI I (R+M)/2) (92 RON)		
Fuel tank capacity		40. L (10.6 U.S. gal.)		
Fuel remaining when low fuel light turns ON		± 8.5 L (2.2 U.S. gal.)		

MODEL		HD5	HD8	HD10
DRIVE SYSTEM				
Drive system type		Selectable 2WD/4WD		
Front Differential oil	Capacity	400 ml (14 U.S. oz)		
	Type	Scandinavia:75W90 SYNTHETIC GEAR OIL (EUR) (P/N 779212) All other countries:75W90 SYNTHETIC GEAR OIL (P/N 779158) or synthetic oil 75W 90 API GL5		
Front drive	Base	Spiral bevel gear Visco-lok† auto-locking front differential		-
	All models except Base and XT-P	Spiral bevel gear Visco-lok† QE auto-locking front differential		
	XT-P	-	-	Spiral bevel gear Smart-Lok electronic control locking front differential
Front drive ratio		3.6:1		
Rear drive	Base and DPS models	Locked differential	-	
	All models	-	Lockable differential	
Rear drive ratio		3.6:1	3.43:1	
CV joint grease		CV JOINT GREASE (P/N 293 550 062) or equivalent		
Spline's propeller shaft grease (grease applied to spline connections)		PROPELLER SHAFT GREASE (P/N 293 550 063) or equivalent		

MODEL	HD5	HD8	HD10
STEERING			
Steering wheel	Adjustable tilt steering		
Turning radius	3.98 m (13.06 ft)		

MODEL			HD5	HD8	HD10
FRONT SUSPENSION					
Suspension type	All except XT Cab		Double A- arm suspension		
	XT Cab		-	Double arched A-arms with sway bar	
Preload adjustment type	All except XT-P		5 positions cam		
	XT-P		-	-	Threaded
Suspension travel			254 mm (10 in)		
Shock absorber	All except XT-P	Qty	2		
		Type	Gas charged/5 spring preload settings		
	XT-P	Qty	-	-	2
		Type	-	-	HPG

MODEL			HD5	HD8	HD10
REAR SUSPENSION					
Suspension type			Torsional Trailing arms (TTA)		
Preload adjustment type	All except XT-P		5 positions cam		
	XT-P		-	-	Threaded
Suspension travel			254 mm (10 in)		
Shock absorber	All except XT-P	Qty	2		
		Type	Gas charged/5 spring preload settings		
	XT-P	Qty	-	-	2
		Type	-	-	HPG

MODEL		HD5	HD8	HD10
BRAKES				
Front brake	Type	Dual 220 mm ventilated disc brakes with hydraulic twin-piston calipers		
Rear brake	Type	Single 220 mm ventilated disc brake with hydraulic twin-piston caliper	Dual 220 mm ventilated disc brake with hydraulic single-piston calipers	

MODEL		HD5	HD8	HD10
BRAKES				
Brake fluid	Capacity	Approximately 310 ml (10.5 U.S. oz)		
	Type	DOT 4		
Caliper		Floating		
Brake pad material	Front	Metallic		
	Rear	Metallic		
Minimum brake pad thickness		0.5 mm (.02 in)		
Minimum brake disc thickness	Front	4 mm (.157 in)		
	Rear	4 mm (.157 in)		
Maximum brake disc warpage		0.2 mm (.01 in)		

MODEL		HD5	HD8	HD10
TIRES				
Pressure	Front	97 kPa (14 PSI)		
	Rear	124 kPa (18 PSI)		
Minimum tire thread depth		3 mm (.118 in)		
Tire size (front)	Base	25 x 8 x 12 (in)	27 x 9R x 12 (in)	-
	DPS	25 x 8 x 12 (in)	27 x 9R x 14 (in)	
	All others	-	27 x 9 x 14 (in)	
Tire size (rear)	Base	25 x 10 x 12 (in)	27 x 11R x 12 (in)	-
	DPS	25 x 10 x 12 (in)	27 x 11R x 14 (in)	
	All others	-	27 x 11 x 14 (in)	

MODEL		HD5	HD8	HD10
WHEELS				
Type	Base	Steel		-
	DPS Mossy Oak Hunting Edition XT XT with cab XT-P PRO	Cast Aluminum		
Rim size (front)	Base	12 x 6 (in)		-
	DPS	12 x 6 (in)	14 x 7 (in)	
	PRO	-	14 x 7 (in)	-
	XT XT with cab	-	14 x 7 (in)	
	Mossy Oak Hunting Edition XT-P	-	-	14 x 6.5 (in)
Rim size (rear)	Base	12 x 8 (in)		-
	DPS	12 x 7.5 (in)	14 x 8.5 (in)	
	PRO	-	14 x 8.5 (in)	-
	XT XT with cab Mossy Oak Hunting Edition XT-P	-	-	14 x 8.5 (in)
Wheel lug nuts torque		100 N•m ± 10 N•m (74 lbf•ft ± 7 lbf•ft)		

MODEL	HD5	HD8	HD10
CHASSIS			
Cage type	Profiled tube section, high strength steel, ROPS-approved cage		

MODEL		HD5	HD8	HD10
DIMENSIONS				
Overall length	Base DPS PRO	305 cm (120 in)		
	XT XT Cab	-	310.5 cm (122.2 in)	
	Mossy Oak Hunting Edition XT-P	-	319.5 cm (125.8 in)	
Overall width	Base DPS XT PRO	157.5 cm (62 in)		
	Mossy Oak Hunting Edition	-	-	167.5 cm (66 in)
	XT with cab	-	165.1 cm (65 in)	
	XT-P	-	-	160 cm (63 in)
Overall height	Base DPS	191.8 cm (75.5 in)	193 cm (76 in)	
	PRO	-		
	XT, Mossy Oak Hunting Edition	198.1 cm (78 in)		
	XT with cab	-	200.6 cm (79 in)	
	XT-P	-	-	195.5 cm (77 in)
Wheelbase		211.5 cm (83 in)		
Wheel track (front)	Base DPS PRO	130 cm (51 in)	131 cm (51.5 in)	
	XT	-	131 cm (51.5 in)	
	Mossy Oak Hunting Edition XT-P	-	-	137.2 cm (54 in)
	XT with cab	-	147.3 cm (58 in)	

MODEL		HD5	HD8	HD10
DIMENSIONS				
Wheel track (rear)	Base DPS XT PRO	126 cm (49.5 in)		
	Mossy Oak Hunting Edition XT-P	-	-	132 cm (52 in)
	XT with cab	-	142.3 cm (56 in)	
Ground clearance	All models (Except XT with cab and XT-P)	26.7 cm (10.5 in)	28 cm (11 in)	
	XT with cab	-	30.48 cm (12 in)	
	XT-P	-	-	30.48 cm (12 in)

MODEL		HD5	HD8	HD10
LOADING CAPACITY AND WEIGHT				
Dry weight	Base	584 kg (1,287.5 lb)	654 kg (1,441.8 lb)	-
	DPS	592 kg (1,305.1 lb)	682 kg (1,503.5 lb)	
	PRO	-	709 kg (1,563.1 lb)	-
	XT	-	708 kg (1,560 lb)	
	Mossy Oak Hunting Edition	-	-	753 kg (1,660.1 lb)
	XT with cab	-	-	841 kg (1,854.1 lb)
	XT-P	-	-	706 kg (1,556.5 lb)

MODEL		HD5	HD8	HD10
LOADING CAPACITY AND WEIGHT				
Weight distribution (front/rear)	Base DPS PRO	44/56	42/58	
	XT Mossy Oak Hunting Edition	-	44/56	
	XT with cab	-	-	47/53
	XT-P	-	-	43/57
Cargo box capacity	All models except California and XT-P	272 kg (600 lb)	454 kg (1,000 lb)	
	California models	-	272 kg (600 lb)	
	XT-P	-	-	272 kg (600 lb)
Total vehicle load allowed (including driver, passengers, all other loads and added accessories)	All models except XT with cab, California models and XT-P	545 kg (1,200 lb)	680 kg (1,500 lb)	
	XT with cab and California model	-	545 kg (1,200 lb)	
	XT-P	-	-	499 kg (1,100 lb)

MODEL		HD5	HD8	HD10
LOADING CAPACITY AND WEIGHT				
Gross vehicle weight rating	Base	1 164 kg (2,566.2 lb)	1 369 kg (3,018.1 lb)	-
	DPS	1 172 kg (2,583.8 lb)	1 396 kg (3,077.7 lb)	
	PRO	-	1 424 kg (3,139.4 lb)	-
	Mossy Oak Hunting Edition	-	-	1 467 kg (3,234.2 lb)
	XT	-	1 422 kg (3,135 lb)	1 419 kg (3,128.4 lb)
	XT with cab	-	1 419 kg (3,128.4 lb)	
	XT-P	-	-	1 239 kg (2,731.5 lb)
Towing capacity		680 kg (1,500 lb)	1 134 kg (2,500 lb)	
Tongue capacity		68 kg (150 lb)	114 kg (250 lb)	
Receiver hitch		50.8 mm (2 in) x 50.8 mm (2 in)		

TROUBLESHOOTING

TROUBLESHOOTING GUIDELINES

CVT BELT IS SLIPPING

1. Water has entered in the CVT.
   – *Refer to SPECIAL PROCEDURES.*

"--" IS DISPLAYED ON GEARBOX POSITION DISPLAY (MULTIFUNCTION GAUGE)

1. Shift lever is between 2 positions.
   – *Properly position the shift lever in the desired position.*
2. Shift lever is not properly adjusted.
   – *Contact an authorized Can-Am dealer.*
3. Electrical communication error.
   – *Contact an authorized Can-Am dealer.*

ENGINE DOES NOT TURN

1. Ignition switch is in the OFF position.
   – *Place switch to ON position.*
2. Shift lever is not set on PARK or NEUTRAL.
   – *Set shift lever to either in PARK or in NEUTRAL or press the brake pedal.*
3. Burnt fuse.
   – *Check fuses.*
4. Weak battery or loose connections.
   – *Check charging system fuse.*
   – *Check fault message in cluster.*
   – *Check battery connections and terminals condition.*
   – *Have the battery checked by an authorized Can-Am dealer.*
5. Defective starter solenoid.
   – *Contact an authorized Can-Am dealer.*

ENGINE TURNS OVER BUT FAILS TO START

1. Flooded engine (spark plug wet when removed).
   – *(If the engine does not start and it is fuel-flooded, the drowned mode can be activated to prevent fuel injection and to cut ignition while cranking. Proceed as follows:*
   • Insert key in ignition switch and turn to ON position.
   • Press completely and HOLD accelerator pedal.
   • Turn key to START position.
   The engine should be cranked for 10 seconds. Release engine START position.
   Release accelerator pedal and start/crank engine again to allow starting.
   If it does not work:
   • Remove the spark plugs. Refer to SPARK PLUGS in the MAINTENANCE PROCEDURES section.
   • Crank engine several times.
   • Install new spark plugs if possible or clean and dry spark plugs.
   • If engine does not start, seek service from an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement. Please refer to the US EPA EMISSIONS-RELATED WARRANTY contained herein for information about warranty claims.

2. No fuel to the engine (spark plug dry when removed).
   – *Check fuel tank level.*
   – *Check fuel pump fuse.*
   – *Obstructed fuel pump pre-filter or fuel pump failure. Seek service from an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement. Please refer to the US EPA EMISSIONS-RELATED WARRANTY contained herein for information about warranty claims.*
3. Spark plug/ignition (no spark).
   – *Check ignition fuse.*
   – *Remove spark plug then reconnect to ignition coil.*
   – *Start engine with spark plug grounded to the engine away from spark plug hole. If no spark appears, replace spark plug.*
   – *If trouble persists, seek service from an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement. Please refer to the US EPA EMISSIONS-RELATED WARRANTY contained herein for information about warranty claims.*

ENGINE LACKS ACCELERATION OR POWER

1. Seat belt not buckled properly. Check cluster message.
   – *Buckle up seat belt.*
2. Fouled or damaged spark plug.
   – *Replace spark plugs.*
3. Engine air filter plugged or dirty.
   – *Check air filter and replace if necessary.*
   – *Check deposits in engine air filter housing.*

ENGINE LACKS ACCELERATION OR POWER (cont'd)

4. Water in CVT
   – *Drain water from CVT. Refer to SPECIAL PROCEDURES.*
5. CVT dirty or worn-out.
   – *Contact an authorized Can-Am dealer.*
6. Lack of fuel
   – *Dirty or clogged fuel pump pre-filter. Seek service from an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement. Please refer to the US EPA EMISSIONS-RELATED WARRANTY contained herein for information about warranty claims.*
7. Engine is in limp home mode.
   – *Check multifunction gauge display for messages.*
   – *Multifunction gauge CHECK ENGINE indicator lamp is on and display shows LIMP HOME, seek service from an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement. Please refer to the US EPA EMISSIONS-RELATED WARRANTY contained herein for information about warranty claims.*

ENGINE OVERHEATS

1. Low coolant level in cooling system.
   – *Check coolant level and refill. See MAINTENANCE PROCEDURES. Seek service from an authorized Can-Am dealer, repair shop, or person of your own choosing for maintenance, repair, or replacement. Please refer to the US EPA EMISSIONS-RELATED WARRANTY contained herein for information about warranty claims*
2. Cooling fan is not working.
   – *Ensure cooling fan is not jammed and working properly.*
   – *Check fan fuse. See FUSES AND FUSIBLE LINKS in MAINTENANCE PROCEDURES.*
3. Dirty radiators fins.
   – *Check and clean radiator fins. See MAINTENANCE PROCEDURES.*

ENGINE MISFIRE

1. Fouled/damaged/worn spark plug.
   – *Replace spark plugs as required.*
2. Water in fuel.
   – *Drain fuel system and refill with fresh fuel.*

THE RPM INCREASES BUT THE VEHICLE DOES NOT MOVE

1. Water in the CVT.
   – *Drain water from CVT. See SPECIAL PROCEDURES.*
2. CVT dirty or worn-out or belt failure.
   – *Contact an authorized Can-Am dealer.*

PARTIAL OR NO RESPONSE FROM THE ACCELERATOR PEDAL INPUTS (CHECK ENGINE IS ON AND PPS FAULT MESSAGE IS DISPLAYED)

1. Partial failure of the accelerator pedal sensors (PPS).
   – *Contact an authorized Can-Am dealer.*
2. Total failure of the accelerator pedal sensors (PPS).
   – *Contact an authorized Can-Am dealer.*

MESSAGES IN MULTIFUNCTION GAUGE

If an abnormal engine condition occurs, the following messages can be combined with a pilot lamp.

MESSAGE	DESCRIPTION
D.E.S.S. KEY NOT RECOGNIZED	Optionnal D.E.S.S. key installed: D.E.S.S. key requires cleaning.
BAD KEY	Optionnal D.E.S.S. key installed:Wrong key used in the ignition switch. Use the right key for the vehicle.
CHECK ENGINE	All active or previously activated faults that require attention. No engine limitation engaged.
LIMP HOME	Critical faults requiring diagnostic as soon as possible. An engine limitation is engaged and/or the engine behavior is modified.
ECM CRC ERROR	Error message from ECM.
TPS FAULT	Throttle body fault, generally followed by a Limp Home message.
BRAKE SWITCH FAULT	Brake signal fault.
ECM NOT RECOGNIZED	Message displayed when the gauge is unable to identify the ECM.
CHECK DPS (models with DPS)	Check engine pilot light on. Indicates that the DPS (Dynamic Power Steering) does not work properly. See an authorized Can-Am dealer.
PPS FAULT	Faulty Pedal Position Sensor(s) (PPS). Refer to *OVERRIDE SWITCH* in *SECONDARY CONTROLS* to drive the vehicle in the limp home mode.
MANUAL LIMP HOME	Confirms the Manual Limp Home is engaged using the Override Switch in case of a PPS fault.
FUEL SENDER RANGE PERFORMANCE	When the fuel sender resistor value is out of range the multifunction gauge (analog/digital) will detect it and display the message.

WARRANTY

BRP LIMITED WARRANTY USA AND CANADA: 2019 CAN-AM® SSV

1) SCOPE OF THE LIMITED WARRANTY

Bombardier Recreational Products Inc. ("BRP")* warrants its 2019 Can-Am side-by-side vehicles ("SSV") sold by authorized Can-Am SSV dealers (as hereinafter defined) in the United States of America ("USA") and in Canada from defects in material or workmanship for the period and under the conditions described below. This limited warranty will become null and void if: (1) the SSV was used for racing or any other competitive activity, at any point, even by a previous owner; or (2) the SSV has been altered or modified in such a way so as to adversely affect its operation, performance or durability, or has been altered or modified to change its intended use.

Non-factory installed parts and accessories are not covered under this limited warranty. Please refer to the applicable parts and accessories limited warranty text.

2) LIMITATIONS OF LIABILITY

THIS WARRANTY IS EXPRESSLY GIVEN AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME STATES/ PROVINCES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH MAY VARY FROM STATE TO STATE, OR PROVINCE TO PROVINCE.

Neither the distributor, any BRP dealer nor any other person has been authorized to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against BRP. BRP reserves the right to modify this limited warranty at any time, being understood that such modification will not alter the warranty conditions applicable to the products sold while this warranty is in effect.

3) EXCLUSIONS – ARE NOT WARRANTED

The following are not warranted under any circumstances:

- Normal wear and tear;
- Routine maintenance items, tune ups, adjustments;
- Damage caused by failure to provide proper maintenance and/or storage, as described in the Operator's Guide;
- Damage resulting from removal of parts, improper repairs, service, maintenance, modifications or use of parts not manufactured or approved by BRP or resulting from repairs done by a person that is not an authorized servicing Can-Am SSV dealer;
- Damage caused by abuse, abnormal use, neglect or operation of the product in a manner inconsistent with the recommended operation described in the Can-Am SSV Operator's Guide;

– Damage resulting from accident, submersion, fire, theft, vandalism or any act of God;
– Operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operator's Guide);
– Damages from rust, corrosion or exposure to the elements;
– Damage resulting from water or snow ingestion;
– Incidental or consequential damages, or damages of any kind including without limitation towing, storage, telephone, rental, taxi, inconvenience, insurance coverage, loan payments, loss of time, loss of income.

4) WARRANTY COVERAGE PERIOD

This limited warranty will be in effect from (1) the date of delivery to the first retail consumer or (2) the date the product is first put into use, whichever occurs first and for the following period:
– TWELVE (12) CONSECUTIVE MONTHS, for private use, commercial use or governmental use owners.
– For emission-related components; please also refer to the *US EPA EMISSION-RELATED WARRANTY* contained herein
– For evaporative emission-related components of California models equipped with evaporative emission control system produced by BRP for sale in the State of California that are originally sold to a resident or subsequently warranty registered to a resident in the State of California, please also refer to the *CALIFORNIA EVAPORATIVE EMISSIONS CONTROL WARRANTY STATEMENT* contained herein.

The repair or replacement of parts or the performance of service under this warranty does not extend the life of this warranty beyond its original expiration date.

5) CONDITIONS TO HAVE WARRANTY COVERAGE

This warranty coverage is available **only** if **each** of the following conditions has been fulfilled:
– The 2019 Can-Am SSV must be purchased as new and unused by its first owner from a Can-Am SSV dealer authorized to distribute Can-Am SSV's in the country in which the sale occurred ("Can-Am SSV dealer");
– The BRP specified pre-delivery inspection process must be completed and documented and signed by the purchaser;
– The 2019 Can-Am SSV must have undergone proper registration by an authorized Can-Am SSV dealer;
– The 2019 Can-Am SSV must be purchased in the country in which the purchaser resides;
– Routine maintenance outlined in the Operator's Guide must be timely performed in order to maintain warranty coverage. BRP reserves the right to make warranty coverage contingent upon proof of proper maintenance.

BRP will not honor this limited warranty to any private use owner or commercial use owner if one of the preceding conditions has not been met. Such limitations are necessary in order to allow BRP to preserve both the safety of its products, and also that of its consumers and the general public.

6) WHAT TO DO TO OBTAIN WARRANTY COVERAGE

The customer must cease using the SSV upon the appearance of an anomaly. The customer must notify a servicing BRP dealer within three (3) days of the appearance of a defect, and provide it with reasonable access to the product and reasonable opportunity to repair it. The customer must also present to the authorized BRP dealer, proof of purchase of the product and must sign the repair/work order prior to starting the repair in order to validate the warranty repair. All parts replaced under this limited warranty become the property of BRP.

7) WHAT BRP WILL DO

BRP's obligations under this warranty are limited to, at its sole discretion, repairing parts found defective under normal use, maintenance and service, or replacing such parts with new genuine Can-Am SSV parts without charge for parts and labor, at any authorized BRP dealer during the warranty coverage period under the conditions described herein. BRP's responsibility is limited to making the required repairs or replacements of parts. No claim of breach of warranty shall be cause for cancellation or rescission of the sale of the SSV to the owner.

In the event that service is required outside of the country of original sale, the owner will bear responsibility for any additional charges due to local practices and conditions, such as, but not limited to, freight, insurance, taxes, license fees, import duties, and any and all other financial charges, including those levied by governments, states, territories and their respective agencies.

BRP reserves the right to improve or modify products from time to time without assuming any obligation to modify products previously manufactured.

8) ADDITIONAL SUPPLIER WARRANTIES

A GPS receiver may be supplied by BRP as standard equipment on certain 2019 Can-Am SSV. The GPS receiver is covered under BRP's limited warranty policy. Additional warranty coverage if offered by the GPS receiver "supplier" that is longer than BRP's limited warranty is to be dealt by the dealer or consumer directly with the GPS receiver "supplier".

9) TRANSFER

If the ownership of a product is transferred during the warranty coverage period, this limited warranty, subject to its terms and conditions, shall also be transferred and be valid for the remaining coverage period provided BRP or an authorized Can-Am SSV Distributor/Dealer receives a proof that the former owner agreed to the transfer of ownership, in addition to the co-ordinates of the new owner.

10) CONSUMER ASSISTANCE

In the event of a controversy or a dispute in connection with this limited warranty, BRP suggests that you try to resolve the issue at the dealership level. We recommend discussing the issue with the authorized dealer's service manager or owner.

If the matter still remains unresolved, contact BRP by filling out the customer contact form at www.brp.com or contact BRP by mail at one of the addresses listed under the *CONTACT US* in *CUSTOMER INFORMATION*.

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US EPA EMISSION-RELATED WARRANTY

BRP warrants to the ultimate purchaser and each subsequent purchaser that this new vehicle, including all parts of its exhaust emission control system and its evaporative emission control system, meets two conditions:

1. It is designed, built, and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of 40 CFR 1051 and 40 CFR 1060.
2. It is free from defects in materials and workmanship that may keep it from meeting the requirements of 40 CFR 1051 and 40 CFR 1060.

Where a warrantable condition exists, BRP will repair or replace, as it elects, any part or component with a defect in materials or workmanship that would increase the engine's emissions of any regulated pollutant within the stated warranty period at no cost to the owner, including expenses related to diagnosing and repairing or replacing emission-related parts. All defective parts replaced under this warranty become the property of BRP.

For all emission-related warranty claims, BRP is limiting the diagnosis and repair of emission-related parts to the authorized Can-Am dealers, unless for emergency repairs as required by item 2 of the following list.

As a certifying manufacturer, BRP will not deny emission-related warranty claims based on any of the following:

1. Maintenance or other service BRP or BRP's authorized facilities performed.
2. Engine/equipment repair work that an operator performed to correct an unsafe, emergency condition attributable to BRP as long as the operator tries to restore the engine/equipment to its proper configuration as soon as possible.
3. Any action or inaction by the operator unrelated to the warranty claim.
4. Maintenance that was performed more frequently than BRP specify.
5. Anything that is BRP fault or responsibility.
6. The use of any fuel that is commonly available where the equipment operates unless BRP written maintenance instructions state that this fuel would harm the equipment's emission control system and operators can readily find the proper fuel. See maintenance information section and fuel requirements of fueling section.

Emission-Related Warranty Period

The emission-related warranty is valid for the following period whichever comes first:

	HOURS	MONTHS	KILOMETERS
Exhaust emission-related components	500	30	5000
Evaporative emission-related components	N/A	24	N/A

Components Covered

The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including the following listed components:

1. For exhaust emissions, emission-related components include any engine parts related to the following systems:
   – Air-induction system

- Fuel system
- Ignition system
- Exhaust gas recirculation systems

2. The following parts are also considered emission-related components for exhaust emissions:
   - Aftertreatment devices
   - Crankcase ventilation valves
   - Sensors
   - Electronic control units
3. The following parts are considered emission-related components for evaporative emissions:
   - Fuel tank
   - Fuel cap
   - Fuel line
   - Fuel line fittings
   - Clamps*
   - Pressure relief valves*
   - Control valves*
   - Control solenoids*
   - Electronic controls*
   - Vacuum control diaphragms*
   - Control cables*
   - Control linkages*
   - Purge valves
   - Vapor hoses
   - Liquid/vapor separator
   - Carbon canister
   - Canister mounting brackets
   - Carburetor purge port connector
4. Emission-related components also include any other part whose only purpose is to reduce emissions or whose failure will increase emissions without significantly degrading engine/equipment performance.

Limited Applicability

As a certifying manufacturer, BRP may deny emission-related warranty claims for failures that have been caused by the owner's or operator's improper maintenance or use, by accidents for which the manufacturer has no responsibility, or by acts of God. For example, an emission-related warranty claim need not be honored for failures that have been directly caused by the operator's abuse of the engine/equipment or the operator's use of the engine/equipment in a manner for which it was not designed and are not attributable to the manufacturer in any way.

If you have any question regarding your warranty rights and responsibility, you should contact Bombardier Recreational Products at 1-888-272-9222.

*As related to the evaporative emission control system

CALIFORNIA EVAPORATIVE EMISSIONS CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board is pleased to explain the evaporative emissions control system warranty on your 2019 Off-Road Sport Vehicle. In California, new off-highway recreational vehicles must be designed, built, and equipped to meet the State's stringent anti-smog standards. BRP must warrant the evaporative emissions control system on your Off-Road Sport Vehicle for the periods of time listed below provided there has been no abuse, neglect, improper maintenance, or unapproved modification of your Off-Road Sport Vehicle.

Your evaporative emissions control system may include parts such as the carburetor or fuel-injection system, fuel tank, fuel hoses, carbon canister, and engine computer. Also included may be hoses, belts, connectors and other evaporative emissions-related assemblies. Where a warrantable condition exists, Bombardier Recreational Products Inc. will repair your Off-Road Sport Vehicle at no cost to you including diagnosis, parts and labor.

OHRV MANUFACTURER'S WARRANTY COVERAGE

The warranty period for this OHRV is 60 months, or 5000 miles, or 500 hours, whichever comes first.

Parts covered:

- Canister Mounting Bracket(s)
- Carbon Canister
- Purge Port Connector
- Clamp(s)*
- Electronic Control*
- Fuel Cap
- Filler Neck
- Filler Neck Hose
- Fuel Line(s)
- Fuel Line Fitting(s)
- Fuel Tank
- Pressure Relief Valve(s)*
- Purge Valve(s)
- Check Valve(s)*
- Vapor Hose(s)
- Flow Reducer
- Filter(s)*
- All other parts not listed that may affect the evaporative emissions control system

If any evaporative emissions-related part on your Off-Road Sport Vehicle is defective the part will be repaired or replaced by Bombardier Recreational Products Inc.

OWNER'S WARRANTY RESPONSIBILITIES

As the Off-Road Sport Vehicle owner you are responsible for the performance of the required maintenance listed in your owner's manual. Bombardier Recreational Products Inc. recommends that you retain all receipts covering maintenance on your Off-Road Sport Vehicle, but Bombardier Recreational Products Inc. cannot deny warranty solely for the lack of receipts or for failure to ensure the performance of a scheduled maintenance.

As an owner you are responsible for presenting your Off-Road Sport Vehicle to a Bombardier Recreational Products Inc. dealer as soon as a problem exists. The warranty repairs should be completed in a reasonable time, not to exceed 30 days.

As an Off-Road Sport Vehicle owner, you should also be aware that Bombardier Recreational Products Inc. may deny you warranty coverage if your Off-Road Sport Vehicle or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, you should contact Bombardier Recreational Products Inc. at 1-888-272-9222 or the California Air Resources Board at 9528 Telstar Avenue, El Monte, CA 91731.

*As related to the evaporative emission control system

BRP INTERNATIONAL LIMITED WARRANTY: 2019 CAN-AM® SSV

1) SCOPE OF THE LIMITED WARRANTY

Bombardier Recreational Products Inc. (“BRP”)* warrants its 2019 Can-Am SSV sold by Can-Am SSV distributors or dealers authorized by BRP to distribute Can-Am SSVs ("Can-Am SSV Distributor/Dealer") outside of the fifty United States, Canada, member states of the European Economic Area (which is comprised of the states of the European Union plus Norway, Iceland and Liechtenstein) (“EEA”), member states of the Commonwealth of the Independent States (including Ukraine and Turkmenistan) (“CIS”) and Turkey, from defects in material or workmanship for the period and under the conditions described below.

Non-factory installed parts and accessories are not covered under this limited warranty. Please refer to the applicable parts and accessories limited warranty text.

This limited warranty will become null and void if: (1) The SSV was used for racing or any other competitive activity, at any point, even by a previous owner; or (2) the SSV has been altered or modified in such a way so as to adversely affect its operation, performance or durability, or has been altered or modified to change its intended use.

2) LIMITATIONS OF LIABILITY

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY IS EXPRESSLY GIVEN AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME JURISDICTIONS DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH MAY VARY FROM COUNTRY TO COUNTRY. (FOR PRODUCTS PURCHASED IN AUSTRALIA SEE CLAUSE 4 BELOW).

Neither the Can-Am SSV Distributor/Dealer nor any other person has been authorized to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against BRP.

BRP reserves the right to modify this warranty at any time, being understood that such modification will not alter the warranty conditions applicable to the products sold while this warranty is in effect.

3) EXCLUSIONS ARE NOT WARRANTED

The following are not warranted under this limited warranty under any circumstances:

- Normal wear and tear;
- Routine maintenance items, tune ups, adjustments (parts and labor);
- Damage caused by negligence or failure to provide proper maintenance and/or storage, as described in the Operator's Guide;

– Damage resulting from removal of parts, improper repairs, service, maintenance, modifications or use of parts not manufactured or approved by BRP or resulting from repairs done by a person that is not an authorized servicing Can-Am SSV Distributor/Dealer;
– Damage caused by abuse, abnormal use, neglect or operation of the product in a manner inconsistent with the recommended operation described in the Operator's Guide;
– Damage resulting from accident, submersion, fire, theft, vandalism or any act of God;
– Operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operator's Guide);
– Damage resulting from rust, corrosion or exposure to the elements;
– Damage resulting from water or snow ingestion;
– Incidental or consequential damages, or damages of any kind including without limitation towing, transportation expenses, storage, telephone, rental, taxi, inconvenience, insurance coverage, loan payments, loss of time, loss of income or time missed for downtime experience due to service work.

The following list includes, without limitation, items that are considered wear items and that are not covered under BRP's limited warranty unless failure is a direct result of a defect in material or workmanship:
– Batteries
– Brake pads
– Brake disks and drums
– Clutch plates / pads
– Clutch sliders
– Clutch springs
– Clutch replaceable bushings
– Drive belts
– Filters
– Finished and unfinished surfaces
– Fuses
– Light bulbs / sealed
– Lubricants
– Spark plugs
– Suspension bushings
– Suspension slider shoes
– Suspension springs
– Tires

4) WARRANTY COVERAGE PERIOD

This warranty will be in effect from (1) the date of delivery to the first retail consumer or (2) the date the product is first put into use, whichever occurs first and for a period of:
– SIX (6) CONSECUTIVE MONTHS for private use or commercial use.

The repair or replacement of parts or the performance of service under this warranty does not extend the life of this warranty beyond its original expiration date.

FOR PRODUCTS SOLD IN AUSTRALIA ONLY

Nothing in these Warranty terms and conditions should be taken to exclude, restrict or modify the application of any condition, warranty, guarantee, right or remedy conferred or implied under the Competition and Consumer Act 2010 (Cth), including the Australian Consumer Law or any other law, where to do so would contravene that law, or cause any part of these terms and conditions to be void. The benefits given to you under this limited warranty hereto are in addition to other rights and remedies that you have under Australian law.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

5) CONDITIONS TO HAVE WARRANTY COVERAGE

This warranty coverage is available **only** if **each** of the following conditions has been fulfilled:

- The 2019 Can-Am SSV must be purchased as new and unused by its first owner from a Can-Am SSV Distributor/Dealer authorized to distribute Can-Am SSVs in the country in which the sale occurred;
- The BRP specified pre-delivery inspection process must be completed and documented;
- The product must have undergone proper registration by an authorized Can-Am SSV Distributor/Dealer;
- The 2019 Can-Am SSV must be purchased in the country or union of countries in which the purchaser resides; and
- Routine maintenance outlined in the Operator's Guide must be timely performed in order to maintain warranty coverage. BRP reserves the right to make warranty coverage contingent upon proof of proper maintenance.

BRP will not honor this limited warranty to any private use owner or commercial use owner if one of the preceding conditions has not been met. Such limitations are necessary in order to allow BRP to preserve both the safety of its products, and also that of its consumers and the general public.

6) WHAT TO DO TO OBTAIN WARRANTY COVERAGE

The customer must cease using the SSV upon the appearance of an anomaly. The customer must notify a servicing Can-Am SSV Distributor/Dealer within two (2) days of the appearance of a defect, and provide it with reasonable access to the product and reasonable opportunity to repair it. The customer must also present to the authorized Can-Am SSV Distributor/Dealer proof of purchase of the product and must sign the repair/work order prior to starting the repair in order to validate the warranty repair. All parts replaced under this limited warranty become the property of BRP.

Note that the notification period is subject to the applicable national or local legislation in customer's country.

7) WHAT BRP WILL DO

To the extent permitted by law, BRP's obligations under this warranty are limited to, at its sole discretion, repairing parts found defective under normal use, maintenance and service; or replacing such parts with new genuine Can-Am SSV parts without charge for parts and labour, at any authorized Can-Am SSV Distributor/Dealer during the warranty coverage period under the conditions described herein. BRP's responsibility is limited to making the required repairs or replacements of parts. No claim of breach of warranty shall be cause for cancellation or rescission of the sale of the Can-Am SSV to the owner. You may have other legal rights which may vary from country to country.

In the event that service is required outside of the country of original sale, the owner will bear responsibility for any additional charges due to local practices and conditions, such as, but not limited to, freight, insurance, taxes, license fees, import duties, and any and all other financial charges, including those levied by governments, states, territories and their respective agencies.

BRP reserves the right to improve or modify products from time to time without assuming any obligation to modify products previously manufactured.

8) TRANSFER

If the ownership of a product is transferred during the warranty coverage period, this limited warranty, subject to its terms and conditions, shall also be transferred and be valid for the remaining coverage period provided BRP or an authorized Can-Am SSV Distributor/Dealer receives a proof that the former owner agreed to the transfer of ownership, in addition to the coordinates of the new owner.

* For the territory covered by this limited warranty, products are distributed and serviced by Bombardier Recreational Products Inc. or its affiliates.

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BRP LIMITED WARRANTY FOR THE EUROPEAN ECONOMIC AREA, THE COMMONWEALTH OF THE INDEPENDANT STATES AND TURKEY: 2019 CAN-AM® SSV

1) SCOPE OF THE LIMITED WARRANTY

Bombardier Recreational Products Inc. ("BRP")* warrants its 2019 Can-Am SSVs sold by Can-Am SSV distributors or dealers authorized by BRP to distribute Can-Am SSVs ("Can-Am SSV Distributor/Dealer").in member states of the European Economic Area (which is comprised of the member states of the European Union plus Norway, Iceland and Liechtenstein) ("EEA"), in member states of the Commonwealth of the Independent States (including Ukraine and Turkmenistan) ("CIS") and Turkey from defects in material or workmanship for the period and under the conditions described below.

Non-factory installed parts and accessories are not covered under this limited warranty. Please refer to the applicable parts and accessories limited warranty text.

This limited warranty will become null and void if: (1) The SSV was used for racing or any other competitive activity, at any point, even by a previous owner; or (2) the SSV has been altered or modified in such a way so as to adversely affect its operation, performance or durability, or has been altered or modified to change its intended use.

2) LIMITATIONS OF LIABILITY

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY IS EXPRESSLY GIVEN AND ACCEPTED IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT THAT THEY CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE EXPRESS WARRANTY. INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM COVERAGE UNDER THIS WARRANTY. SOME JURISDICTIONS DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS AND EXCLUSIONS IDENTIFIED ABOVE, AS A RESULT, THEY MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH MAY VARY FROM COUNTRY TO COUNTRY.

Neither the Can-Am SSV Distributor/Dealer nor any other person has been authorized to make any affirmation, representation or warranty regarding the product, other than those contained in this limited warranty, and if made, shall not be enforceable against BRP.

BRP reserves the right to modify this warranty at any time, being understood that such modification will not alter the warranty conditions applicable to the products sold while this warranty is in effect.

3) EXCLUSIONS – ARE NOT WARRANTED

The following are not warranted under this limited warranty under any circumstances:

– Normal wear and tear;
– Routine maintenance items, tune ups, adjustments (parts and labor);

– Damage caused by negligence or failure to provide proper maintenance and/or storage, as described in the Operator's Guide;
– Damage resulting from removal of parts, improper repairs, service, maintenance, modifications or use of parts not manufactured or approved by BRP or resulting from repairs done by a person that is not an authorized servicing Can-Am SSV Distributor/Dealer;
– Damage caused by abuse, abnormal use, neglect or operation of the product in a manner inconsistent with the recommended operation described in the Operator's Guide;
– Damage resulting from accident, submersion, fire, snow or water ingestion, theft, vandalism or any act of God;
– Operation with fuels, oils or lubricants which are not suitable for use with the product (see the Operator's Guide);
– Damage resulting from rust, corrosion or exposure to the elements;
– Incidental or consequential damages, or damages of any kind including without limitation towing, transportation expenses, storage, telephone, rental, taxi, inconvenience, insurance coverage, loan payments, loss of time, loss of income or time missed for downtime experience due to service work.

The following list includes, without limitation, items that are considered wear items and that are not covered under BRP's limited warranty unless failure is a direct result of a defect in material or workmanship:
– Batteries
– Brake pads
– Brake disks and drums
– Clutch plates / pads
– Clutch sliders
– Clutch springs
– Clutch replaceable bushings
– Drive belts
– Filters
– Finished and unfinished surfaces
– Fuses
– Light bulbs / sealed
– Lubricants
– Spark plugs
– Suspension bushings
– Suspension slider shoes
– Suspension springs
– Tires

4) WARRANTY COVERAGE PERIOD

This warranty will be in effect from (1) the date of delivery to the first retail consumer or (2) the date the product is first put into use, whichever occurs first and for a period of:
– TWENTY-FOUR (24) CONSECUTIVE MONTHS for private use.
– SIX (6) CONSECUTIVE MONTHS for commercial use or rental use.

The product is used commercially when it is used in connection with any work or employment that generates income during any part of the warranty period. The product is also used commercially when, at any point during the warranty period, it is licensed for commercial use.

The repair or replacement of parts or the performance of service under this warranty does not extend the life of this warranty beyond its original expiration date.

Note that the duration and any other modalities of the warranty coverage are subject to the applicable national or local legislation in your country.

5) CONDITIONS TO HAVE WARRANTY COVERAGE

This warranty coverage is available **only** if **each** of the following conditions has been fulfilled:

- The 2019 Can-Am SSV must be purchased as new and unused by its first owner from a Can-Am SSV Distributor/Dealer authorized to distribute Can-Am SSVs in the country in which the sale occurred;
- The BRP specified pre-delivery inspection process must be completed and documented;
- The product must have undergone proper registration by an authorized Can-Am SSV Distributor/Dealer;
- The 2019 Can-Am SSV must be purchased in the country or union of countries in which the purchaser resides; and
- Routine maintenance outlined in the Operator's Guide must be timely performed in order to maintain warranty coverage. BRP reserves the right to make warranty coverage contingent upon proof of proper maintenance.

BRP will not honor this limited warranty to any private use owner or commercial use owner if one of the preceding conditions has not been met. Such limitations are necessary in order to allow BRP to preserve both the safety of its products, and also that of its consumers and the general public.

6) WHAT TO DO TO OBTAIN WARRANTY COVERAGE

The customer must cease using the SSV upon the appearance of an anomaly. The customer must notify a servicing Can-Am SSV Distributor/Dealer within two (2) months of the appearance of a defect and provide it with reasonable access to the product and reasonable opportunity to repair it. The customer must also present to the authorized Can-Am SSV Distributor/Dealer, proof of purchase of the product and must sign the repair/work order prior to starting the repair in order to validate the warranty repair. All parts replaced under this limited warranty become the property of BRP.

Note that the notification period is subject to the applicable national or local legislation in your country.

CUSTOMER INFORMATION

CHANGE OF ADDRESS ❑ CHANGE OF OWNERSHIP ❑

VEHICLE IDENTIFICATION NUMBER

Model Number | Vehicle Identification Number (V.I.N.)

OLD ADDRESS OR PREVIOUS OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

NEW ADDRESS OR NEW OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

E-MAIL ADDRESS

V00A2F

CHANGE OF ADDRESS ❑ CHANGE OF OWNERSHIP ❑

VEHICLE IDENTIFICATION NUMBER

Model Number | Vehicle Identification Number (V.I.N.)

OLD ADDRESS OR PREVIOUS OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

NEW ADDRESS OR NEW OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

E-MAIL ADDRESS

V00A2F

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CHANGE OF ADDRESS ❑ CHANGE OF OWNERSHIP ❑

VEHICLE IDENTIFICATION NUMBER

Model Number | Vehicle Identification Number (V.I.N.)

OLD ADDRESS OR PREVIOUS OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

NEW ADDRESS OR NEW OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

E-MAIL ADDRESS

V00A2F

CHANGE OF ADDRESS ❑ CHANGE OF OWNERSHIP ❑

VEHICLE IDENTIFICATION NUMBER

Model Number | Vehicle Identification Number (V.I.N.)

OLD ADDRESS OR PREVIOUS OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

NEW ADDRESS OR NEW OWNER:

NAME

NO. STREET APT

CITY STATE/PROVINCE ZIP/POSTAL CODE

COUNTRY TELEPHONE

E-MAIL ADDRESS

V00A2F

⚠ WARNING

To reduce risk of serious injury or death, read this Operator's Guide and safety labels, watch the safety video and:

Be prepared
- Fasten seat belts and make sure nets and/or doors are securely latched in place.
- Wear an approved helmet and protective gear.
- Each rider must be able to sit with back against seat, foot flat on the floor or on footrest, and hands on steering wheel or handholds. Stay completely inside the vehicle.

Drive responsibly
- Avoid loss of control and rollovers.
- Avoid abrupt maneuvers, sideways sliding, skidding or fishtailing and never do donuts.
- Avoid hard acceleration when turning, even from a stop.
- Slow down before entering a turn.
- Plan for hills, rough terrain, ruts and other changes in traction and terrain.
- Avoid paved surfaces.
- Avoid side hilling (riding across slopes).

Be Qualified and Responsible
- Do not allow careless or reckless driving.
- Driver must be at least 16 years old with a valid driver's license.
- Do not operate after using drugs or alcohol.
- Do not allow operation on public roads (unless designated for off-highway vehicle access) – collisions with cars and trucks can occur.
- Do not exceed vehicle seating capacity.

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OPERATOR'S GUIDE DEFENDER / TRAXTER Series / ENGLISH
GUIDE DU CONDUCTEUR Séries DEFENDER / TRAXTER / ANGLAIS

FAIT AU / MADE IN CANADA U/M:P.C.