

SHOP MANUAL

2003

RALLY™ 200



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2003 Shop Manual

RALLY™ 200

BOMBARDIER
RECREATIONAL PRODUCTS



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SAFETY NOTICE

This manual has been prepared as a guide to correctly service and repair 2003 ATVs.

This edition was primarily published to be used by ATV mechanical technicians who are already familiar with all service procedures relating to Bombardier made vehicles. Mechanical technicians should attend continuous training courses given by Bombardier Training Department.

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

This *Shop Manual* uses technical terms which may be slightly different from the ones used in *Parts Catalog*.

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

The content depicts parts and/or procedures applicable to the particular product at time of writing. *Service* and *Warranty Bulletins* may be published to update the content of this manual. Make sure to read and understand these. It does not include dealer modifications, whether authorized or not by Bombardier, after manufacturing the product.

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 Bombardier 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.

This manual emphasizes particular information denoted by the wording and symbols:

WARNING

Identifies an instruction which, if not followed, could cause serious personal injury including possibility of death.

CAUTION: Denotes an instruction which, if not followed, could severely damage vehicle components.

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

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use. Always use common shop safety practice.

This information relates to the preparation and use of Bombardier ATV and has been utilized safely and effectively by Bombardier Inc. However, Bombardier Inc. disclaims liability for all damages and/or injuries resulting from the improper use of the contents. We strongly recommend that any services be carried out and/or verified by a highly skilled professional mechanic. It is understood that certain modifications may render use of the vehicle illegal under existing federal, provincial and state regulations.

INTRODUCTION

INTRODUCTION

This *Shop Manual* covers the following Bombardier made 2003 ATV:

Models

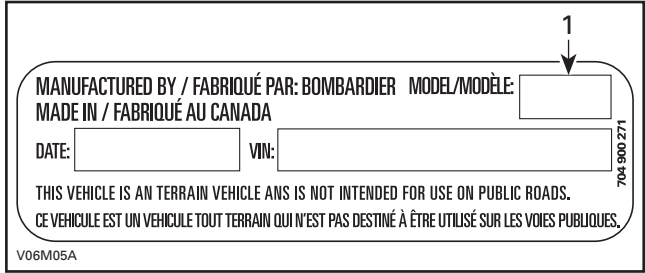
Rally™ 200 (red)	7550
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Rally™ 200 (yellow).....	7552
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ENGINE SERIAL NUMBER LOCATION



E.I.N. (ENGINE IDENTIFICATION NUMBER)



TYPICAL — VEHICLE SERIAL NUMBER LABEL

1. Model number

VEHICLE SERIAL NUMBER LOCATION



1. V.I.N. (Vehicle Identification Number)

ARRANGEMENT OF THE MANUAL

- The manual is divided into 12 major sections:
- 01 SERVICE TOOLS AND SERVICE PRODUCTS
 - 02 MAINTENANCE
 - 03 ENGINE
 - 04 FUEL SYSTEM
 - 05 ELECTRICAL
 - 06 DRIVE TRAIN
 - 07 STEERING/CONTROL SYSTEMS
 - 08 SUSPENSION
 - 09 BRAKES
 - 10 BODY/FRAME
 - 11 TECHNICAL DATA
 - 12 WIRING DIAGRAM

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

LIST OF ABBREVIATIONS USED IN THIS MANUAL

A	ampere
amp	ampere
A•h	ampere-hour
AC	alternate current
BDC	bottom dead center
BTDC	before top dead center
°C	degree Celsius
CDI	Capacitor discharge ignition
cm	centimeter
cm ²	square centimeter
cm ³	cubic centimeter
CVT	Continuously variable transmission
DC	direct current
°F	degree Fahrenheit
fl. oz	fluid ounce
ft	foot
GRD	ground
hal.	halogen
I.D.	inside diameter
IDI	induction discharge ignition
imp. oz	imperial ounce
in	inch
in ²	square inch
in ³	cubic inch
k	kilo (thousand)
kg	kilogram
km/h	kilometer per hour
kPa	kilo pascal
l	liter
lb/in ²	pound per square inch

LH	left hand
lb	pound
lbf	pound (force)
m	meter
MAG	magneto
Max.	maximum
Min.	minimum
ml	milliliter
mm	millimeter
MPH	mile per hour
N	newton
N.A.	not applicable
no.	number
00.0	continuity
0.L	overload (open circuit)
O.D.	outside diameter
OHC	Over head camshaft
OPT	optional
oz	ounce
P/N	part number
PSI	pound per square inch
PTO	power take off
RPM	revolution per minute
Sp. Gr.	specific gravity
TDC	top dead center
U.S. oz	ounce (United States)
USFD	U.S. Forest Service
V	volt
Vac	volt (alternative current)

INTRODUCTION

This *Shop Manual* uses technical terms which may be slightly different from the ones in the parts catalog.

TYPICAL PAGE

— Page heading indicates section and subsection detailed.

Section 03 ENGINE

Subsection 04 (REMOVAL AND INSTALLATION)

REMOVAL AND INSTALLATION

- Subsection title indicates beginning of the subsection.

- Exploded view assists you in identifying parts and related positions.

Tightening torque — nearby fastener. In this case, nut must be torqued to 10 N•m or 89 lbf•in.

CAUTION: Pay attention to torque specifications. Some of these are in lbf•in instead of lbf•ft. Use appropriate torque wrench.

Illustration-
number for
publishing
process.

- Drop represents a liquid product to be applied to a surface.

VMR2001-037_03-04A.FM

Document
number for
publishing
process.

Bold face number indicates special procedure concerning this part.

Page numbering system:
03: ENGINE section
04: REMOVAL AND INSTALLATION
 subsection
 1: First page of this subsection

TYPICAL PAGE

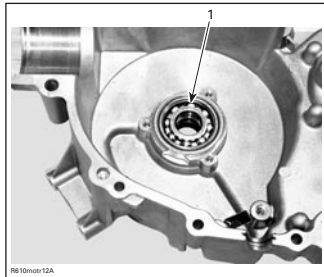
Title indicates main procedure to be carried-out.

Section 03 ENGINE
Subsection 06 (MAGNETO SYSTEM)

BEARING

Inspection
Ball bearing no. 10 must rotate freely. Otherwise, replace it.

Removal
– Heat up the magneto housing cover to about 100°C (212°F) for an easy ball bearing removal.



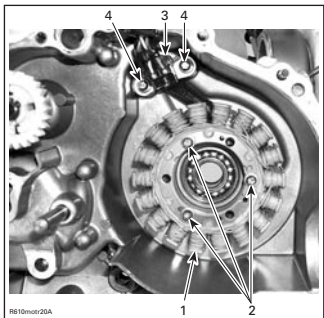
1. Ball bearing

Call-outs for above illustration.

Installation
For installation also heat the magneto housing up to about 100°C (212°F) to put ball bearing in place.
Place new ball bearing in freezer for 10 minutes approximately.
Reinstall other removed parts in the reverse order.

STATOR AND TRIGGER COIL

Removal
Remove.
– magneto housing cover no. 7
– screw no. 11 and 12
– stator with trigger coil no. 13.



1. Stator
2. Stator screws
3. Trigger coil
4. Trigger coil screws

Inspection
Check stator and trigger coil condition. If damaged replace the faulty part.
For electrical inspection, refer to CHARGING SYSTEM for the stator and IGNITION SYSTEM for the trigger coil.

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

Reference to look up a certain section and subsection. In this case it concerns IGNITION SYSTEM.

INTRODUCTION

GENERAL INFORMATION

The information and component/system descriptions contained in this manual are correct at time of publication. Bombardier Inc. 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, it may have some differences between the manufactured product and the description and/or specifications in this document.

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

ILLUSTRATIONS AND PROCEDURES

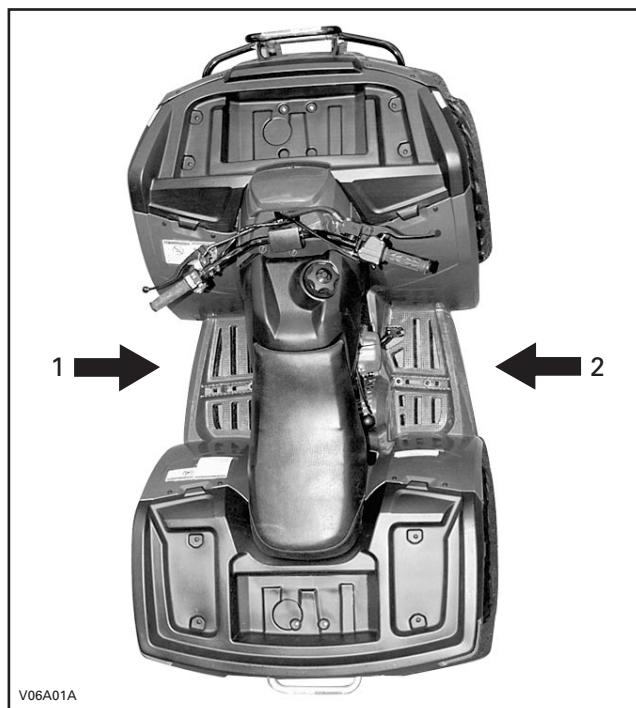
Illustrations and photos show the typical construction of the different assemblies and, in all cases, may not reproduce the full detail or exact shape of the parts shown, however, they represent parts which have the same or a similar function.

CAUTION: Most components of those 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.

As many of the procedures in this manual are interrelated, we suggest, that before undertaking any task, you read and thoroughly understand the entire section or subsection in which the procedure is contained.

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

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



1. Left
2. Right

SELF-LOCKING FASTENERS PROCEDURE

The following describes the most common application procedures when working with self-locking fasteners.

Use a metal brush or a screwtap to clean the hole properly then use a solvent (Methyl-Chloride), let act during 30 minutes and wipe off. The solvent utilization is to ensure the adhesive works properly.

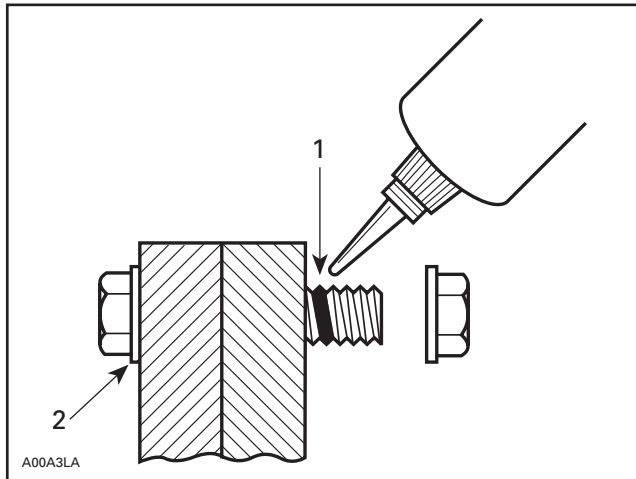
LOCTITE APPLICATION PROCEDURE

The following describes the most common application procedures when working with Loctite products.

NOTE: Always use proper strength Loctite product as recommended in this *Shop Manual*.

Threadlocker

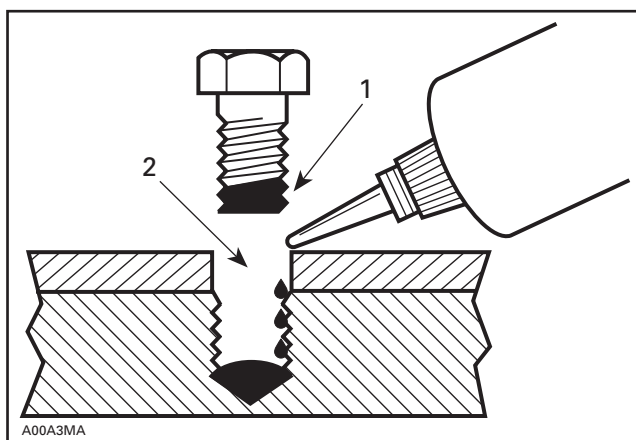
Uncovered Holes (bolts and nuts)



1. Apply here
2. Do not apply

1. Clean threads (bolt and nut) with solvent.
2. Apply Loctite Primer N (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.

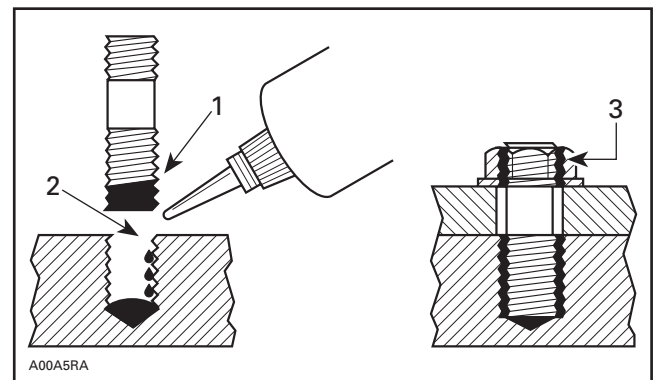
Blind Holes



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

1. Clean threads (bolt and hole) with solvent.
2. Apply Loctite Primer N (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.

Stud in Blind Holes

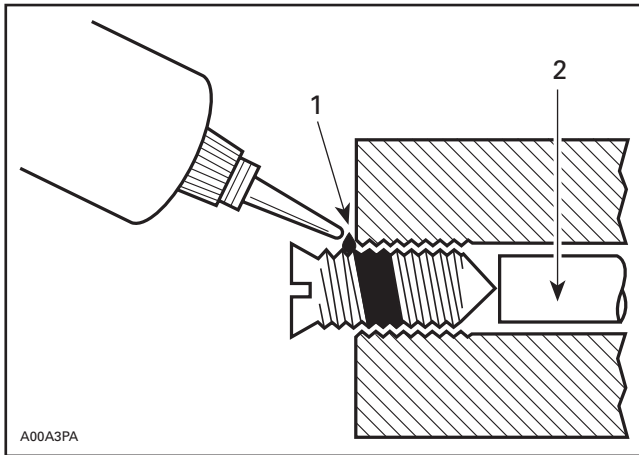


1. On threads
2. On threads and in the hole
3. Onto nut threads

1. Clean threads (stud and hole) with solvent.
2. Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
3. Put several drops of proper strength Loctite threadlocker on female threads and in hole.
4. Apply several drops of proper strength Loctite on stud threads.
5. Install stud.
6. Install cover, etc.
7. Apply drops of proper strength Loctite on uncovered threads.
8. Tighten nuts as required.

INTRODUCTION

Adjusting Screw



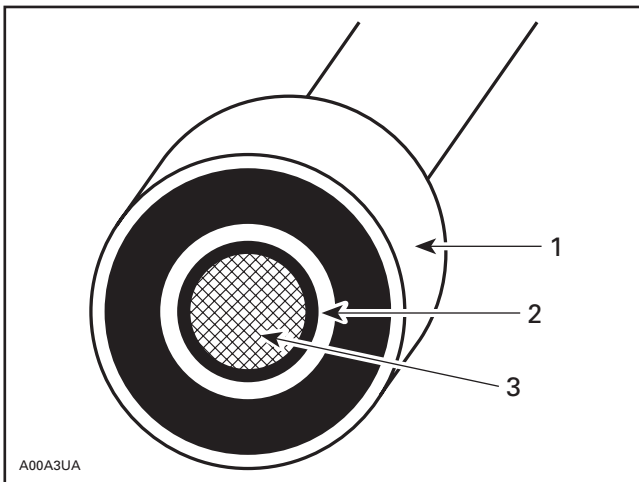
1. Apply here
2. Plunger

1. Adjust screw to proper setting.
2. Apply drops of proper strength Loctite thread-locker 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)).

Mounting on Shaft

Mounting with a Press



1. Bearing
2. Proper strength Loctite
3. Shaft

Standard

1. Clean shaft external part and element internal part.
2. Apply a strip of proper strength Loctite on shaft circumference at insert or engagement point.

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

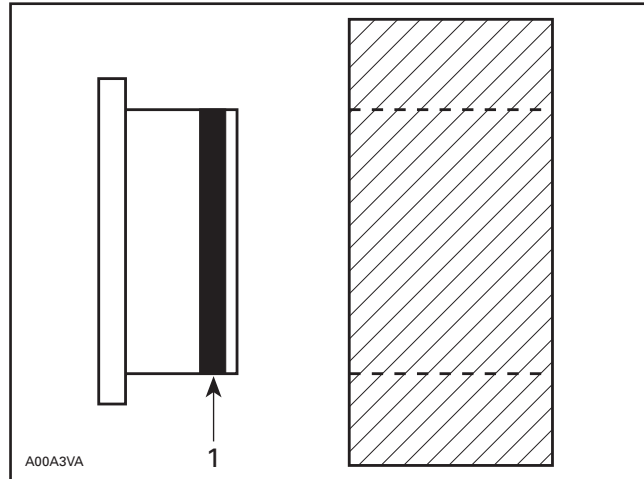
3. DO NOT use anti-seize Loctite or any similar product.
4. No curing period is required.

Mounting in Tandem

1. Apply retaining compound on internal element bore.
2. Continue to assemble as shown above.

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 Primer N (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 surplus.
6. Allow it to cure for 30 minutes.

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.

TIGHTENING TORQUES

Tighten fasteners to torque mentioned in exploded views and text. When they are not specified refer to following table. The table also gives the metric conversion.

⚠ WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

In order to avoid a poor assembling, tighten screws and bolts in accordance with the following procedure:

1. Manually screw all screws, bolts and/or nuts.
2. Apply the half of the recommended torque value.

NOTE: When possible, always apply torque on nut.

3. Torque at the recommended torque value.

NOTE: Always torque screws, bolts and/or nuts in a criss-cross sequence.

SCREW OR BOLT THREAD	DRIVING TORQUE*	
	N•m	lbf•in
M4	2	18
M5	4	35
M6	10	89

SCREW OR BOLT THREAD	DRIVING TORQUE*	
	N•m	lbf•ft
M8	23	17
M10	48	35
M12	80	59
M14	135	100

** TIGHTENING TORQUES FOR 8.8 GRADE BOLTS AND NUTS*

We would be pleased if you could communicate to Bombardier any suggestions you may have concerning our publications.

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Publication title and year _____ Page _____

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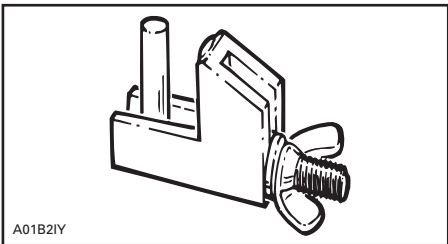
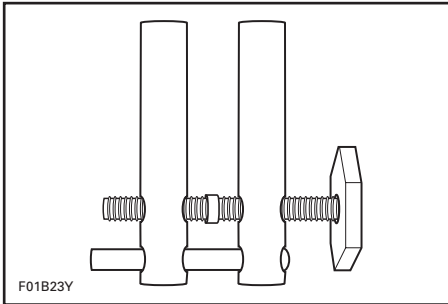
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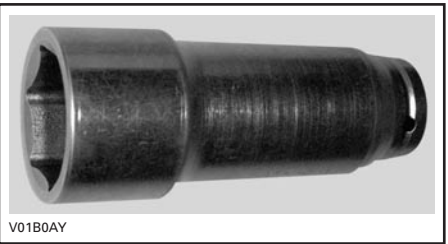
SERVICE TOOLS

MANDATORY SPECIAL TOOL

All Models

TOOL	DESCRIPTION	P/N
 A01B21Y	Small Hose Pincher	295 000 076
 F01B23Y	Large Hose Pincher	529 032 500
 A01B5EY	Fuel System Pressure Tester	529 033 100

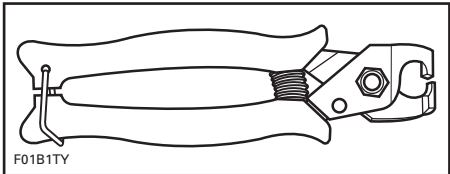
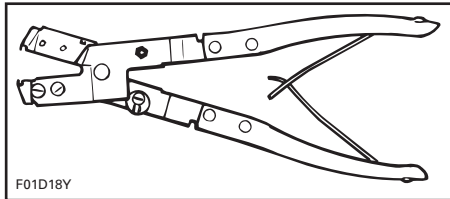
Traxter — Rally

TOOL	DESCRIPTION	P/N
 V01B0AY	46 mm Socket for Crankshaft/ Driven Pulley	529 035 648

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

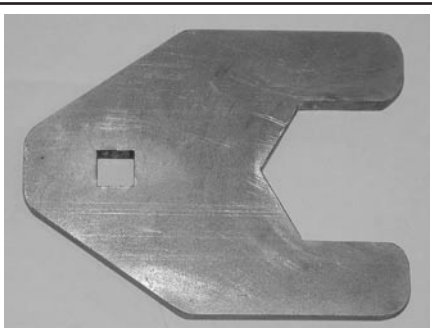
DS 650/Baja — Quest 500/650 — Traxter

TOOL	DESCRIPTION	P/N
	Caillau Pliers	295 000 054
	CV Boot Clamp Installation and Removal Tool	295 000 069
	Crankshaft Protector	420 876 557
	Flywheel Puller	529 035 748

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

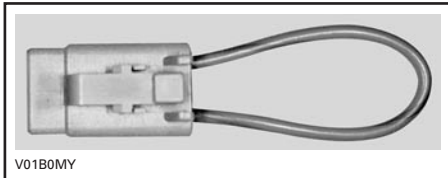
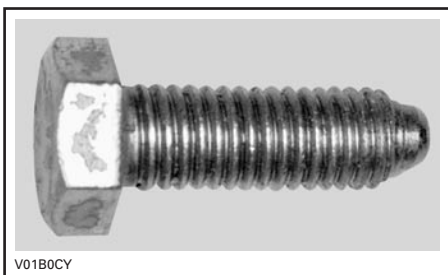
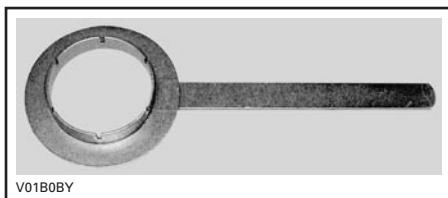
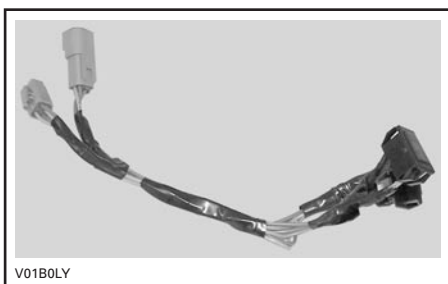
Rally

TOOL	DESCRIPTION	P/N
 V00B0KY	Clutch Holding Tool	529 035 862
 V00B0LY	Clutch Support	529 035 863
 V00B0OY	51 mm (2 in) Open Wrench	529 035 866
 V00B0PY	51 mm (2 in) Crow Foot	529 035 884

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Traxter

TOOL	DESCRIPTION	P/N
 V01B09Y	Lifting Bar	529 035 610
 V01B0MY	Jumper for Self Diagnostics	529 035 605
 V01B0CY	Crankshaft Locking Bolt	529 035 645
 V01B0BY	Spanner Tool for Clutch Basket	529 035 647
 V01B0LY	T-Harness for Diagnoses of Solenoids	529 035 653

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

DS 650/Baja

TOOL	DESCRIPTION	P/N
 V02B02Y	Magneto Cover Removal Tool	529 035 622
 V02B0NY	Engine Installation and Removal Tool	529 035 619
 V02B0VY	64 mm (2-1/2 in) Crow Foot Rear Axle Nut	529 035 729
 V02B03Y	Clutch Basket Holder	529 035 618

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

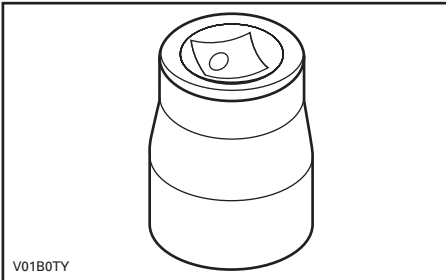
Quest 500/650

TOOL	DESCRIPTION	P/N
 V04B06Y	Bevel Gear Lock Pin/Driven Clutch Expander	529 035 747
 V04B05Y	Drive Clutch Puller	529 035 746
 V04B03Y	Driven Clutch Holding Tool	529 035 771
 V04B04Y	Drive Clutch Colding Tool	529 035 745
 V04H0GY	Bearing Aligment Tool	529 035 806

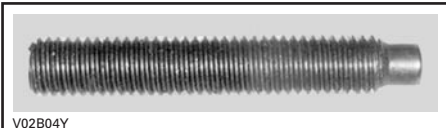
Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Quest 500/650 — Traxter

TOOL	DESCRIPTION	P/N
 F01B28Y	6 Pin Harness for Magneto	529 035 604
 V01B0TY	41 mm Socket for Swing Arm Nut	PROTO 5541
 V01B0OY	Hub Puller	529 035 612

DS 650/Baja — Quest 500/650 — Rally

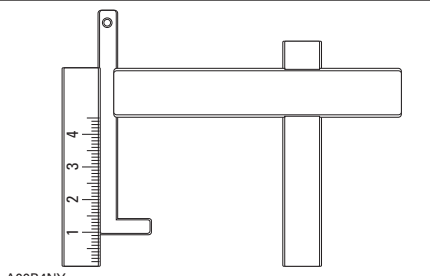
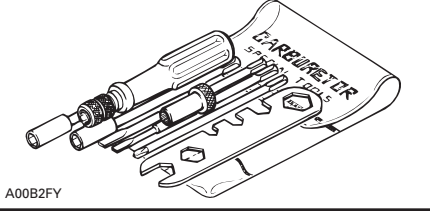
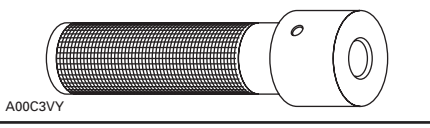
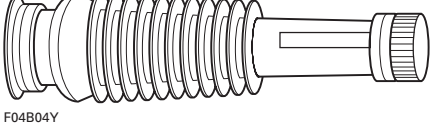
TOOL	DESCRIPTION	P/N
 V02B04Y	Crankshaft Locking Bolt	529 035 617

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

RECOMMENDED SPECIAL TOOL

All Models

TOOL	DESCRIPTION	P/N
 V04B08Y	Ring Compressor	Snap-On RC980
 V04B0AY	Low Speed Screw Adjuster	529 035 732
 A00B4NY	Float Level Gauge	529 035 520
 A00B2FY	Carburetor Kit	404 112 000
 V00B04Y	Valve Spring Compressor	529 035 724
 A00C3VY	Insertion Jig Handle	420 877 650
 F04B04Y	Flexible Spout for Oil Container	414 837 300

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

All Models (Continued)

TOOL	DESCRIPTION	P/N
 V00B08Y	Vacuum/Pressure Pump	529 021 800
 V04B0JY	Cable Luber	529 035 738
 V00B0CY	Leak Down Tester	529 035 661
 V00B0HY	Multimeter	529 035 868

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Quest 500/650 — Rally

TOOL	DESCRIPTION	P/N
 R610out03Y	Blind Hole Bearing Puller	Snap-On
 V00B0QY	Needle Bearing Installer (Main Shaft in Crankcase)	529 035 762

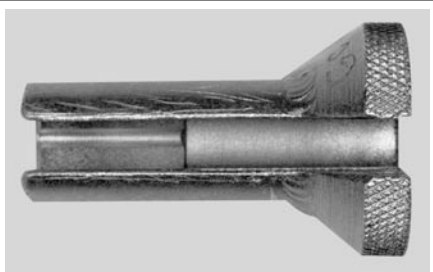
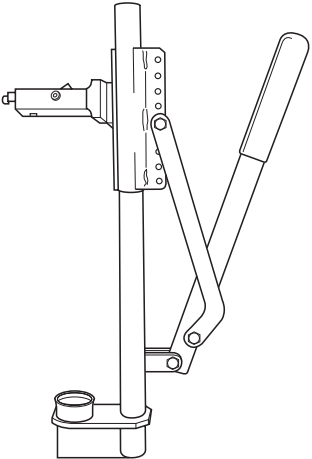
Quest 500/650 — Traxter

TOOL	DESCRIPTION	P/N
 V00B1JY	Ball Joint Remover	529 035 873
 V01B0SY	Differential Spanner Socket	529 035 649

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Quest 500/650 — Traxter (Continued)

TOOL	DESCRIPTION	P/N
 V01B0GY	Choke Nut Tool	529 035 660
 V00B1LY	Ball Joint Installer Support	529 035 875
 V00B1KY	Ball Joint Installer	529 035 874
 F01B1JY	Terminal Remover	Snap-On TT660-4
 A01B4OY	Shock Spring Disassembly Tool	529 035 504

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

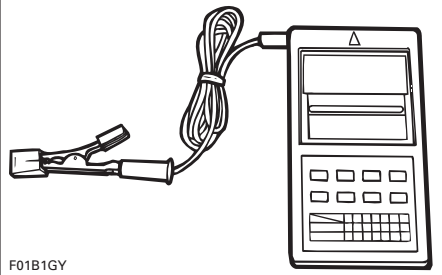
DS 650/Baja — Quest 500/650 — Rally

TOOL	DESCRIPTION	P/N
 V04B09Y	Valve Spring Compressor Cup	529 035 764

DS 650/Baja — Quest 500/650

TOOL	DESCRIPTION	P/N
 V02B06Y	Valve Stem Seal Pliers	Snap-On YA 8230

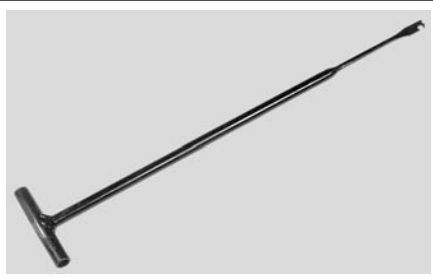
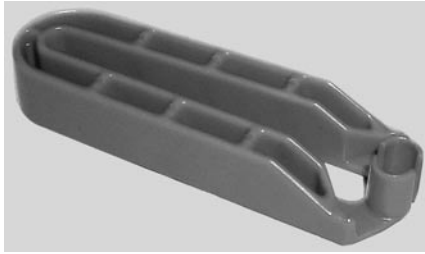
DS 650/Baja — Quest 500/650 — Traxter

TOOL	DESCRIPTION	P/N
 V00B07Y	Oil Pressure Adapter	529 035 652
 F01B1GY	Digital/Inductive Type Tachometer	529 014 500

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

DS 650/Baja — Quest 500/650 — Traxter (Continued)

TOOL	DESCRIPTION	P/N
 A01B58Y	Exhaust Spring Installer/Remover	529 035 401
 V00B06Y	Oil Pressure Gauge	529 035 709
 F12B0GY	Connection tool	529 035 714

Section 01

SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02

(SERVICE TOOLS)

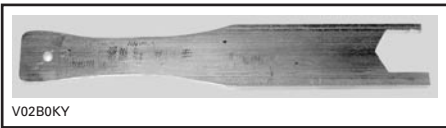
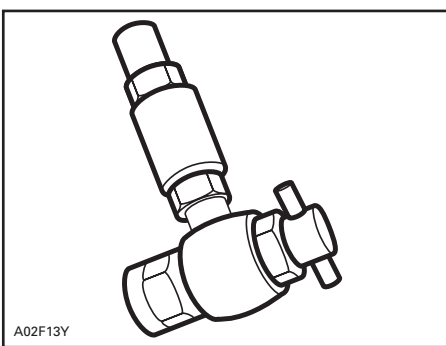
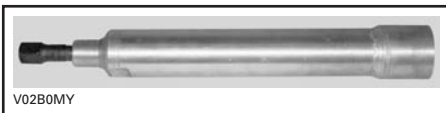
DS 650/Baja

TOOL	DESCRIPTION	P/N
 V02B0TY	Front Hub Seal Installer	529 035 632
 V02B0PY	Ball Joint Guide	529 035 705
 V02B0QY	Ball Joint Drive	529 035 706

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

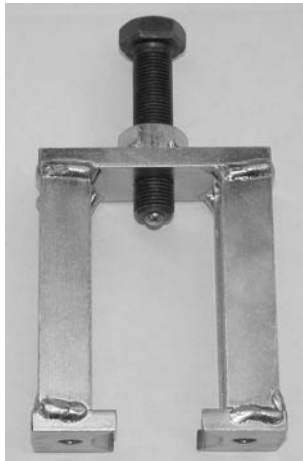
DS 650/Baja (Continued)

TOOL	DESCRIPTION	P/N
 V02B0KY	Swing arm key	529 035 696
 V00B0BY	Shock Tool	529 035 636
 V02B0UY	Rear Hub Seal Installer	529 035 634
 V02B0RY	Front Knuckle Wear Ring Installer	529 035 637
 A02F13Y	Shock Charging Tool	529 035 570
 V02B0MY	Brake Hub Remover	529 035 695

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

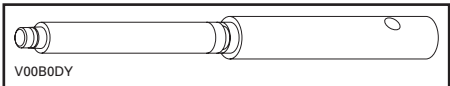
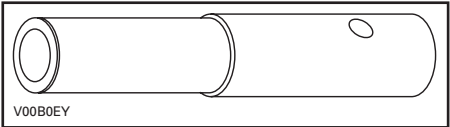
DS 650/Baja (Continued)

TOOL	DESCRIPTION	P/N
 V02B0SY	Rear Axle Wear Ring Installer	529 035 694
 V00B1GY	Crankshaft Bushing Installer	529 035 689
 V00B0RY	Primary Crankshaft Gear Puller	529 035 624

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

DS 650/Baja (Continued)

TOOL	DESCRIPTION	P/N
	Clutch Shaft Bearing Installer	529 035 691
	Clutch Shaft Seal Installer	529 035 693
	Crankshaft Bushing Remover	529 035 688

Quest 500/650

TOOL	DESCRIPTION	P/N
	Water Pump Ceramic Seal Installer	529 035 766
	Valve Stem Seal Installer	529 035 687

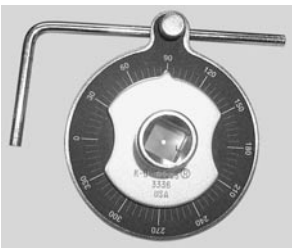
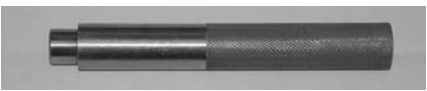
Section 01

SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02

(SERVICE TOOLS)

Quest 500/650 (Continued)

TOOL	DESCRIPTION	P/N
 V04B07Y	Lifting Ring	529 035 770
 V04B014Y	Torque Angle	Snap-On TA 362
 V00B0TY	Oil Seal Installer (Crankshaft Oil Seal on Crankcase)	529 035 760
 V00B0XY	Needle Bearing Installer (Starter Drive Pinion in Crankcase)	529 035 756

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Quest 500/650 (Continued)

TOOL	DESCRIPTION	P/N
 V00B0SY	Oil Seal Installer (Main Shaft Oil Seal on Crankcase)	529 035 761
 V00B0UY	Oil Seal Installer (Water Pump Shaft Oil Seal)	529 035 757
 V00B0VY	Oil Seal Installer (Crankshaft Oil Seal on Magneto Cover)	529 035 759

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Quest 500/650 (Continued)

TOOL	DESCRIPTION	P/N
 V00B0WY	Oil Seal Installer (Shift Shaft Oil Seal on Magneto Cover)	529 035 758
 V00B0YY	Needle Bearing Installer (Bevel Gear Shaft in Crankcase)	529 035 763
 V04B0BY	Piston Circlip Installer	529 035 765
 V00B0ZY	Crankcase Plain Bearing Remover/Installer (CVT Side)	529 035 752

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Quest 500/650 (Continued)

TOOL	DESCRIPTION	P/N
 V00B10Y	Crankcase Plain Bearing Remover/Installer (MAG Side)	529 035 753
 V00B11Y	Crankcase Support (CVT Side)	529 035 754
 V00B12Y	Crankcase Support (MAG Side)	529 035 755

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

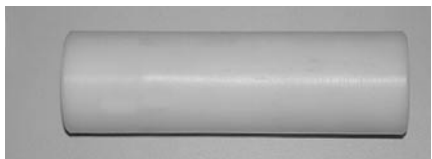
Traxter

TOOL	DESCRIPTION	P/N
 F00B0EY	Crimping Tool (for AMP Connectors)	295 100 164
 V01B0FY	Lifting Ring	529 035 644
 V01B0NY	Front Suspension Spacer Bar (Model Year 1999/2000)	529 035 611
 V00B05Y	Valve Spring Compressor Cup	529 035 725

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

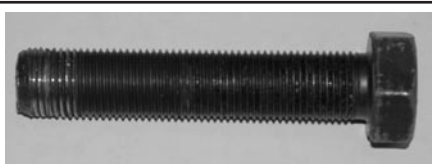
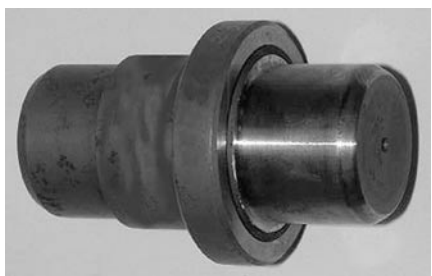
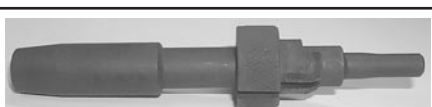
Rally

TOOL	DESCRIPTION	P/N
 V00B0MY	Clutch Holding Support	529 035 864
 V00B13Y	Crankshaft Oil Seal Installer	529 035 847
 V00B14Y	Water Pump Oil Seal Installer	529 035 849
 V00B15Y	Shifter Oil Seal Installer	529 035 851
 V00B16Y	Valve Guide Remover	529 035 852
 V00B17Y	Valve Guide Installer	529 035 853
 V00B18Y	Gearbox Oil Seal Installer	529 035 854

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

Rally (Continued)

TOOL	DESCRIPTION	P/N
 V00B0NY	Magneto Puller (used bolt from magneto puller P/N 529 035 748)	529 035 883
 V00B19Y	Crankshaft Plain Bearing Remover/Installer	529 035 855
 V00B1AY	Needle Bearing Installer	529 035 858
 V00B1MY	Piston Circlip Installer	529 035 859
 V00B1EY	Allen Wrench	529 035 861
 V00B1HY	Rear Axle Bearing Puller	420 276 930

SERVICE PRODUCTS

MANDATORY SERVICE PRODUCTS

Paste gasket
(P/N 293 800 038)

Loctite® 518:
Gasket eliminator (50 ml)



F01B124

Loctite® primer
(P/N 293 800 041)
Primer N 128 g (5 oz)



A00B3N4

High strength retaining compound
(P/N 293 800 073)

Loctite 277 (10 ml) (red)



V00B0J4

Medium-strength threadlocker
(P/N 293 800 060)

Loctite® 243: Threadlocker (10 ml)
(blue, medium strength)



F00A0O4

Synthetic grease
(P/N 293 550 010)
(400 g)



F01B154

Molykote G-n paste
(P/N 711 297 433)
(50 g)



A00B5P4

Gasket/paint remover
(P/N 413 708 500)

Loctite® Chisel 510 g (18 oz)



A00B574

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS
Subsection 03 (SERVICE PRODUCTS)

RECOMMENDED SERVICE PRODUCTS

Thermally conductive adhesive
(P/N 293 800 099)
Loctite 384 (300 ml)



V00B114

Chaincase oil
(P/N 413 801 900)
(16 x 250 ml)



A00B5Y4

Synthetic chaincase oil
(P/N 413 803 300)
(12 x 355 ml)



A00B5Z4

Fuel stabilizer
(P/N 413 408 600)
(12 x 8 oz)



A00B604

Storage oil
(P/N 413 711 600)
(350 g spray can) (12 x 350 g)



A00B634

BOMBARDIER LUBE
(P/N 293 600 016)
(12 x 14 oz)



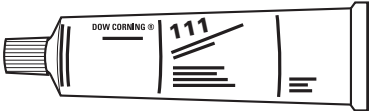
A00B624

Premixed coolant 50/50
- 37°C (- 35°F)
(P/N 293 600 038)
(16 x 1 l)



A00B5X4

Molykote 111
(P/N 413 707 000)



A00B3W4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 03 (SERVICE PRODUCTS)

RECOMMENDED SERVICE PRODUCTS (continued)

Anti-seize lubricant

(P/N 293 800 070)

Loctite anti-seize
lubricant 236 ml (8 oz)



A00B594

Heavy duty cleaner

(P/N 293 110 001)

(400 g)

(P/N 293 110 002)

(4 l)

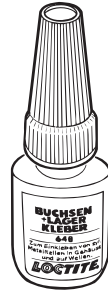


A00B614

High temperature and
strength retaining compound

(P/N 413 711 400)

Loctite 648 (5 ml) (green)

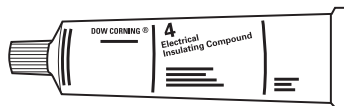


A00B3D4

Silicone dielectric grease

(P/N 293 550 004)

(3 oz)



A00B1X4

Plastic & vinyl cleaner

(P/N 413 711 200)

(6 x 1 l)



A00B5W4

Pipe sealant

(P/N 293 800 013)

Loctite 567 (250 ml)



A00B2W4

Loctite 5150

(P/N 293 800 086)



A00B5S4

Pulley flange cleaner

(P/N 413 711 809)

(320 g)



A00B5V4

Paint for frame touch-up

(P/N 413 401 000)

Black semi-gloss (spray can)



A00B3H4

Section 01

SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 03 (SERVICE PRODUCTS)

RECOMMENDED SERVICE PRODUCTS (continued)

Bombardier Cleaner
(P/N 293 110 001) (400 g)
(P/N 293 110 002) (4 l)



F01B2J4

Super Lube grease
(P/N 293 550 030)



V00B0I4

Bombardier Cable Lubricant
(P/N 293 600 041)
(400 g)



V00B0A4

Bombardier Synthetic
4-Stroke Oil 5W-40
(P/N 293 600 039)
(12 x 1 l)



V00B094

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MAINTENANCE CHART

NOISE EMISSION CONTROL SYSTEM REGULATION

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:

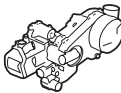
1. Removal or alteration or the puncturing of the muffler or any engine component which conducts removal of engine exhaust gases.
2. Removal or alteration or the puncturing of any part of the intake system.
3. Replacing any moving parts of the vehicle or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.
4. Lack of proper maintenance.

Section 02 MAINTENANCE

Subsection 02 (MAINTENANCE CHART)

LUBRICATION AND MAINTENANCE CHART

Some items may not apply to your particular model.

I: Inspect, verify, clean, adjust, lubricate, replace if necessary C: Clean L: Lubricate R: Replace		INITIAL 10 HOURS OR 200 KM (125 m.)	EVERY				REFER TO THE SUBSECTION
			25 HOURS OR 500 KM (310 m.)	50 HOURS OR 1000 KM (620 m.)	100 HOURS OR 2000 KM (1250 m.) OR ONCE A YEAR	200 HOURS OR 4000 KM (2485 m.) OR 2 YEARS	
	Engine oil and filter	R		R			Maintenance/ Lubrication
	Engine oil strainer					C	
	Engine oil pressure regulator		C				
	Spark arrester				C		
	Engine mount fasteners	I			I		Removal/ installation
	Exhaust system	I			I		
	Condition of seals	I			I		N.A.
	Gear box oil	I					Gear box
	Valve adjustment	I			I		Cylinder and head
	Coolant	I			①	R	Cooling system
	Radiator cap/cooling system pressure test	I				I	
	Radiator condition/cleanliness (radiator fins) ②	I		I			
	Drive belt				I ③		CVT
	Centrifugal clutch				I		
	Cleaning/condition of drive and driven pulleys				C		
CVT air inlet duct condition/cleanliness and sealing	I		I				
	Air filter		C ②		R ②		Maintenance/ lubrication
	Fuel lines and connections	I			I		Fuel circuit
	Fuel valve strainers					R	
	Carburetor	I			I		Carburetor
	Choke	I			I		
	Spark plug	I ④			R ④		Ignition system
	Battery electrolyte level, connection and vent	I		I			Starting system
	Wiring harness, cables and lines	I			I		Instruments/ accessories
	Condition of ignition switch, start button and engine stop switch	I			I		
	Condition of lighting system (hi/lo intensity, brake light, etc.)	I			I		
	Headlight beam aiming	I			I		
	Drive chain adjustment	EVERY RIDE					Rear Axle
	Drive chain lubrication	EVERY RIDE					
	Drive chain slider condition	EVERY RIDE					
	Sprockets	I			I		
	Wheel bearings condition				I		
	Throttle/housing/cable	I		I			Steering/ control systems
	Handlebar fastener				I		
	Steering system ②	I			I		
	Tie rod ends			I			
	Front wheel alignment	I			I		
	Wheel nuts/studs	I		I			Maintenance/ lubrication
	Wear/pressure of tires	I	I				

Section 02 MAINTENANCE

Subsection 02 (MAINTENANCE CHART)

I: Inspect, verify, clean, adjust, lubricate, replace if necessary C: Clean L: Lubricate R: Replace		INITIAL 10 HOURS OR 200 KM (125 m.)	EVERY				REFER TO THE SUBSECTION
			25 HOURS OR 500 KM (310 m.)	50 HOURS OR 1000 KM (620 m.)	100 HOURS OR 2000 KM (1250 m.) OR ONCE A YEAR	200 HOURS OR 4000 KM (2485 m.) OR 2 YEARS	
	Swing arm				I		Front and rear suspension
	Shock absorber			I			
	A-arm			I			
	Brake fluid	I	I			R	Hydraulic brakes
	Brake cable	I		I			
	Brake system (discs, hoses, etc.)				I		
	Brake pads		I				
	Engine area	C		C			Body and frame
	Chassis fastener			I			
	Hitch/trailer ball condition (if installed)	I		I			
	Seat fastening	EVERY RIDE					
	Frame				I		
	Vehicle cleaning and protection			C			

The initial maintenance is very important and must not be neglected.

- ① Every 100 hours, check coolant strength.
- ② More often under severe use such as dusty area, sand, snow, wet or muddy conditions.
- ③ Measure and verify the drive belt. If the drive belt width is equal or less than 19.5 mm (25/32 in) or if flat spots, cracks or other damages are visible, replace the drive belt.
- ④ Make sure that the spark plug gap is correct.

N.A.: Not Available

MAINTENANCE/LUBRICATION

SPECIAL PROCEDURES

Flipped Over

When vehicle has flipped over or stays tilted on the side, wait around 5 minutes before starting engine. Check oil level and adjust if necessary. Do not start the engine if the oil level is lower than the minimum recommended. If oil pressure light stays ON after starting engine, stop engine and check oil level.

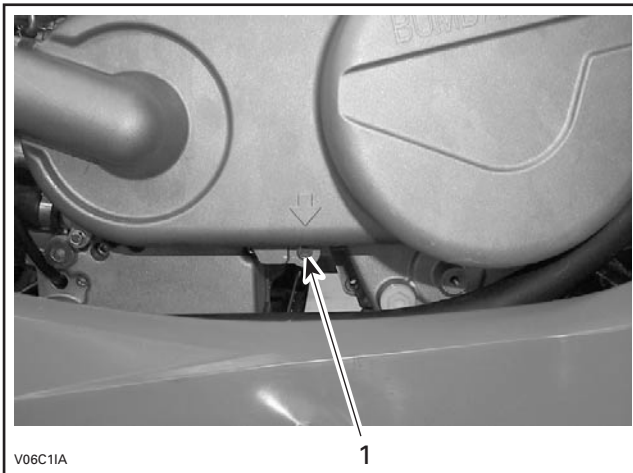
If oil level is good, refer to **Low or no Oil Pressure** in **TROUBLESHOOTING** section.

ATV Immersion

If the ATV has been flooded, **DO NOT START ENGINE**.

Check if engine oil is contaminated. If so, change engine oil and filter.

If there is water in CVT housing, remove the CVT cover drain plug to drain CVT housing.



1. CVT cover drain plug

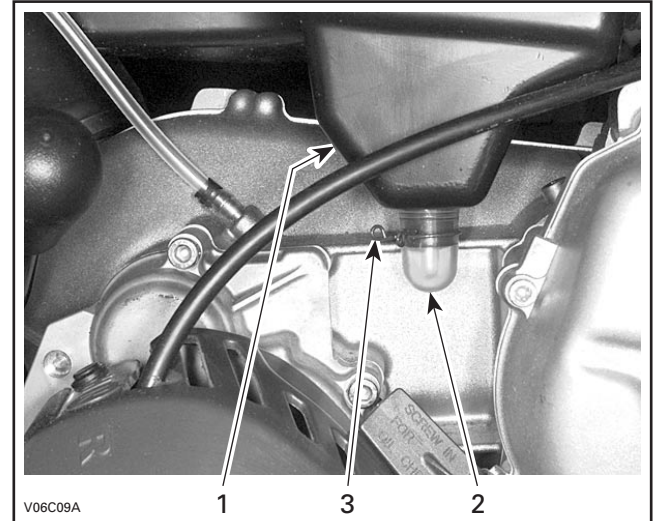
Remove CVT cover.

Clean and check all parts of CVT before starting engine. Refer to **CVT** section.

AIR BOX

Draining

Periodically inspect air filter box drain plug for water or deposits. Refer to the maintenance chart.



TYPICAL

1. Air filter box
2. Drain plug
3. Clamp

NOTE: If vehicle is used in dusty area, inspect more frequently than specified in maintenance chart.

If water/deposits are found, squeeze the clamp and remove. Pull drain tube out.

CAUTION: Do not start engine when water or oil is found in the drain tube. If you have oil in the air box, check engine oil level. Maybe oil level is too high.

When water/deposits are found, air filter must be inspected/dried/replaced depending on its condition.

Remove air filter as explained below.

AIR FILTER

Air Filter Removal

CAUTION: Never remove or modify any component in the air box. Always use genuine parts when replacing air filter and foam. The engine carburation is calibrated to operate specifically with these components. Otherwise, engine performance degradation or damage can occur.

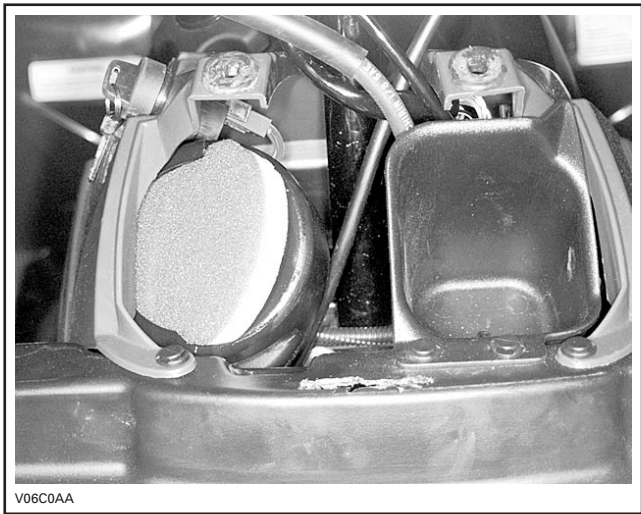
Section 02 MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)

Remove cluster cover.



Remove air filter.



Cleaning

Pour cleaning solution into a bucket, dunk the filter in multiples times until clean. Rinse with warm water.

NOTE: Products like Simple Green®, dish soap or mild solvents can be used to clean the air filter. Simple Green® from Sunshine Makers Inc. is available at hardware stores or at automotive parts retailer.

While filter soaks, clean inside of air box.

Next, let the filter dry completely.

When the filter is dried, re-oil with air filter oil.

If air filter foam is dirty, replace with a new one.

Installation

Properly reinstall removed parts in the reverse order of their removal.

Reinstall the air filter with the grey part on top.

NOTE: Check if the air filter broach is properly located before installing air filter.

BOLTS, FASTENERS AND NUTS

Check that all fasteners, bolts and nuts are tightened to the proper torque.

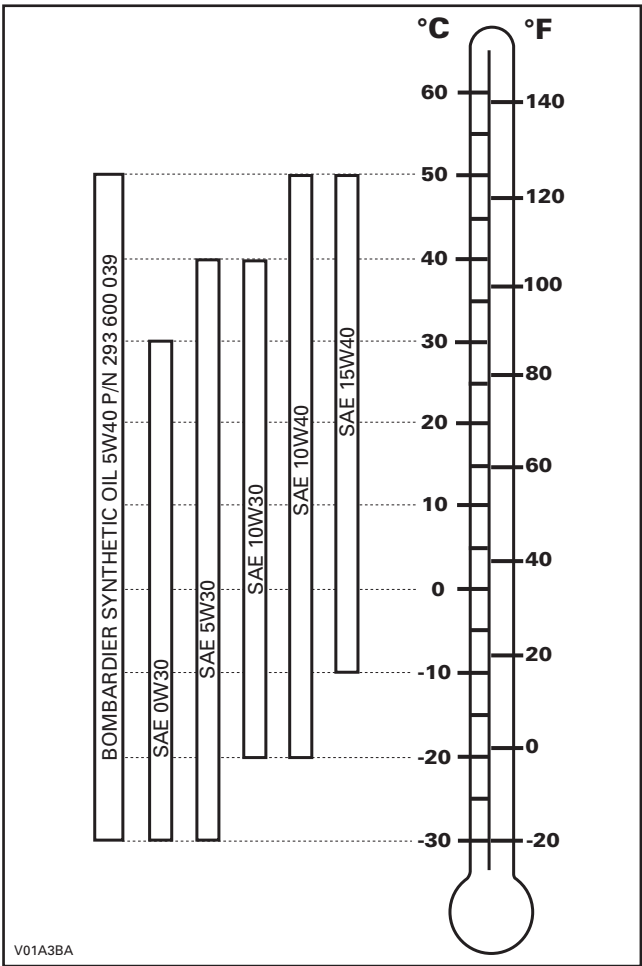
For installation, use the torque values and Loctite products from exploded views. Clean threads before using Loctite product when installing screws. Refer to SELF-LOCKING FASTENERS and LOCTITE APPLICATION for proper procedure.

ENGINE OIL AND FILTER

Oil Viscosity

SAE 5W30 is recommended for all seasons.

Other viscosity should be used if the average temperature is outside the range of the recommended oil. See chart below.



Oil Level

Using the following procedure, check the engine oil level.

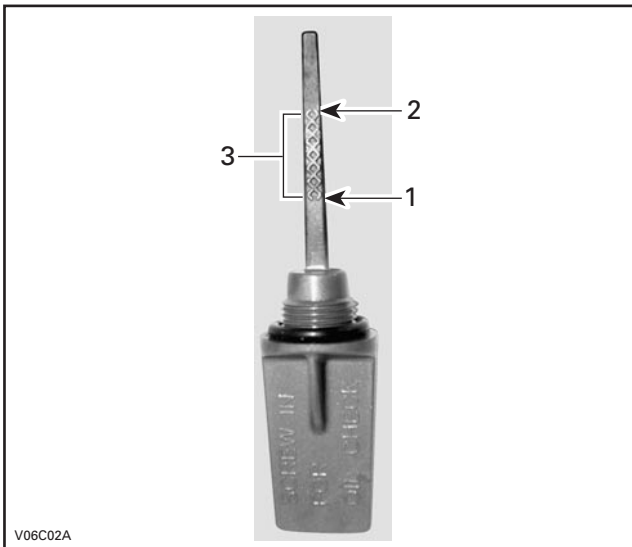
Place the vehicle on a level surface.

NOTE: The engine must be cold, not running.

Unscrew and remove the dipstick then wipe clean.

Reinstall the dipstick, **screw it in completely**.

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



1. Full
2. Add
3. Operating range

Oil and Oil Filter Change

WARNING

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

NOTE: Oil and filter are to be replaced at the same time. Oil change should be done with a warmed up engine.

Ensure vehicle is on a level surface.

Clean the drain plug area.

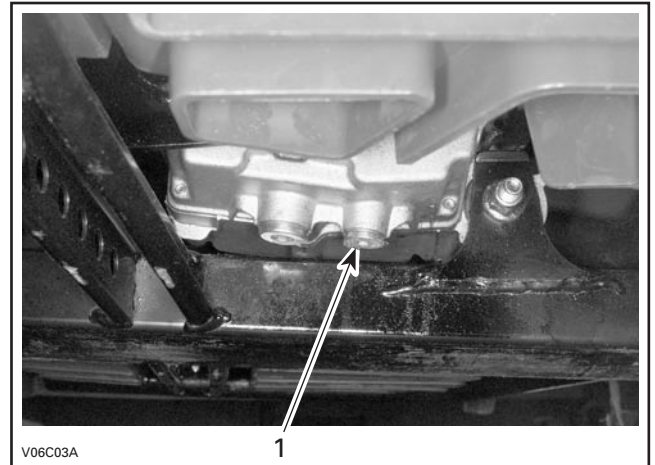
Remove dipstick.

Place a drain pan under the engine magnetic drain plug area.

Clean the magnetic drain plug area.

Unscrew magnetic drain plug.

CAUTION: Pay attention not to lose gasket ring on magnetic drain plug.



1. Magnetic drain plug

Allow enough time for oil to flow out of oil filter.

Unscrew oil filter cover.



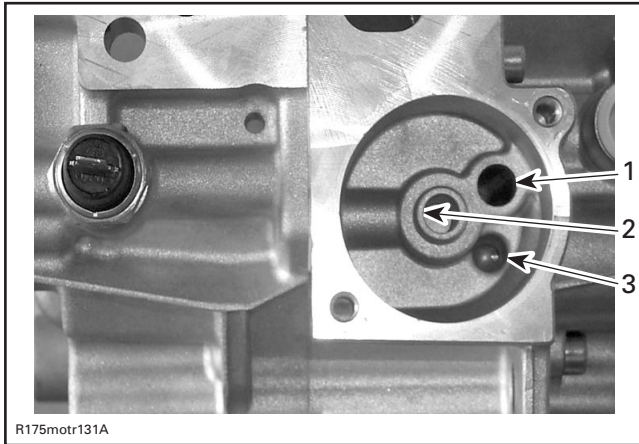
Remove oil filter and replace with a new filter.

Check O-ring on filter cover and change it if necessary.

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

Section 02 MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)



1. Inlet bore from oil pump to oil filter
2. Outlet bore to engine oil providing system
3. Oil line to pressure regulator valve

Install filter cover and torque screw to 10 N•m (89 lbf•in).

Wipe out any oil spillage on engine.

Inspect gasket on drain plug and replace as necessary. Clean gasket area on engine and drain plug then reinstall plug.

Refill engine at the proper level with the recommended oil. Refer to **TECHNICAL DATA** for capacity. Do not overfill.

Start engine and let idle for a few minutes. Ensure oil filter area and 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.

Dispose oil as per your local environmental regulations.

OIL STRAINER

Refer to LUBRICATION section.

SPARK ARRESTER

The muffler must be periodically purged of accumulated carbon.

Select a well-ventilated area and make sure the muffler is cool.

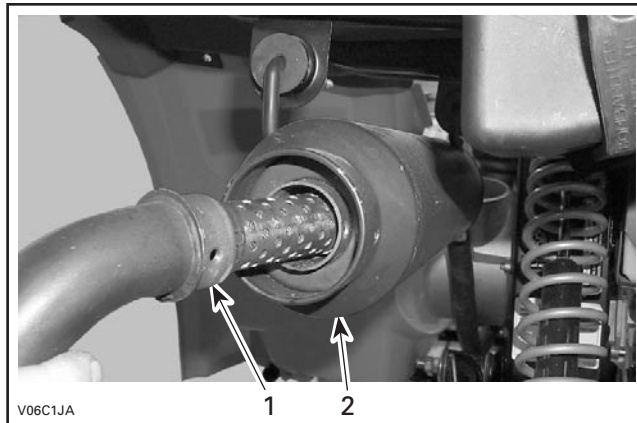
WARNING

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

Place transmission on NEUTRAL position and apply parking brake.

Remove the screw retaining the spark arrester to muffler.

Pull the spark arrester out of muffler.



1. Spark arrester
2. Muffler

Using a brush, remove the carbon deposits from the spark arrester.

NOTE: A soft brush is recommended to avoid damaging spark arrester.

Install the spark arrester in muffler.

Check the exhaust system for damage, crack or leak (exhaust pipe). Repair or change if necessary.

TIRES AND WHEELS

Tire Pressure

CAUTION: Underpressure may cause tire to deflate and rotate on wheel. Overpressure might burst the tire. Always follow recommended pressure. Since tires are low-pressure type, a manual pump should be used.

Check pressure when tires are cold before using the vehicle.

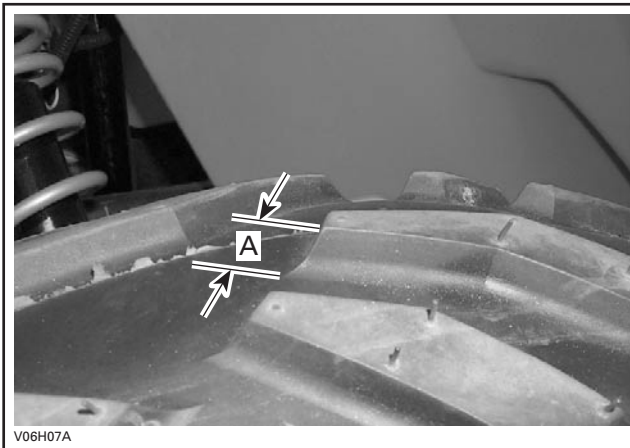
NOTE: Tire pressure changes with temperature and altitude. Recheck pressure if one of these conditions has changed.

For your convenience, a pressure gauge is supplied in tool box.

TIRE PRESSURE		
RALLY MODELS		
	FRONT	REAR
RECOMMENDED	24 kPa (3.5 PSI)	
MINIMUM	21kPa (3 PSI)	

Tire/Wheel Condition

Check tire for damage and wear. Measure thread height. It should be 4 mm (5/32 in) minimum. Replace if damaged or worn.



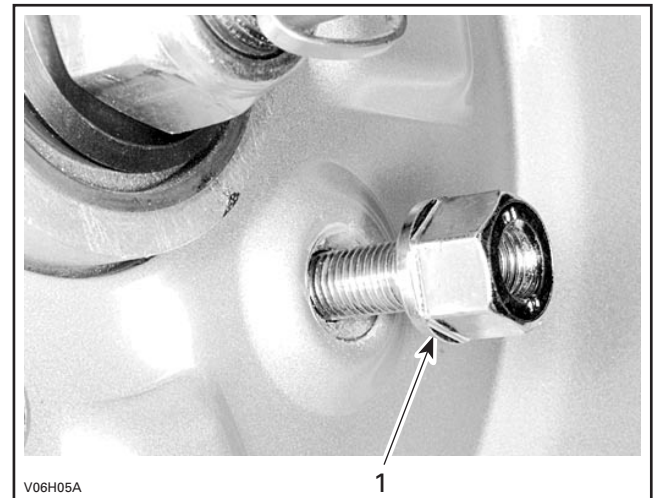
A. 4 mm (5/32 in)

NOTE: Do not make a tire rotation. The front and rear tires have a different size. Besides, these tires are directional and their rotation must be kept in a specific direction for proper operation.

Wheel Removal

Untighten nuts then lift vehicle where needed. Place a support under vehicle. Remove nuts then withdraw wheel.

At installation, it is recommended to apply anti-seize lubricant on threads. Gently tighten nuts in a criss-cross sequence then apply a final torque of 70 N•m (52 lbf•ft).



1. Taper side of nut

ENGINE AREA

Check in the engine area , for leak or other damage. Clean mud, leafs, etc. from engine area.

STORAGE/PRESEASON PREPARATION

STORAGE

If the ATV is to be stored for an extended period of time more than 1 month, be sure to thoroughly check the vehicle for needed repairs and have them performed.

FUEL STABILIZER

A fuel stabilizer (P/N 413 408 600) can be added in fuel tank to prevent fuel deterioration and avoid draining fuel system for storage. Follow manufacturer's instructions for proper use.

If above fuel stabilizer is not used, drain fuel system including fuel tank and carburetor.

CAUTION: Fuel stabilizer should be added prior to engine lubrication to ensure carburetor protection against varnish deposit.

ENGINE LUBRICATION

WARNING

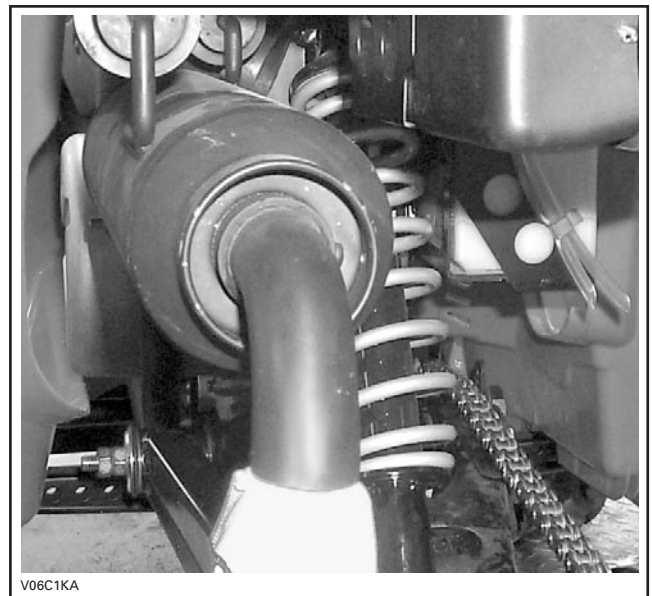
This procedure must only be performed in a well-ventilated area. Do not run engine during storage period.

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

Proceed as follows:

- Place the vehicle on blocks to raise all four tires off the ground.
- 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. Refer to **MAINTENANCE/LUBRICATION**.
- Remove the intake adaptor between carburetor and air box to spray storage oil (P/N 413 711 600) into carburetor bore.
- Restart engine and run at idle speed.

- Inject storage oil until the engine stalls or until a sufficient quantity of oil has entered the engine (approximately a quarter of can). Reinstall the grommet.
- Remove spark plug and spray storage oil into cylinder. Press start button, 1 or 2 seconds maximum, to lubricate cylinder.
- Stop the engine and remove the battery. Store it in dry and cool place out of the sun, refer to **BATTERY**.
- Reinstall the spark plug.
- Turn the fuel valve to OFF and drain carburetor.
- Install a clean rag in the muffler opening to block the exhaust system outlet.



CAUTION: Remove those rags at preseason preparation.

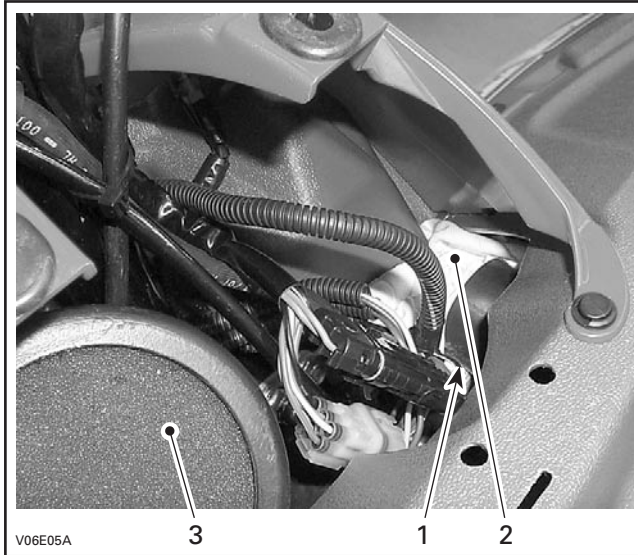
RAGS INTO INLET AND OUTLET HOSES OF CVT

If the vehicle is not used during a long time, block inlet and outlet hoses of CVT with clean rags. The rags will prevent the intrusion of small animals, leaves or other debris.

Section 02 MAINTENANCE

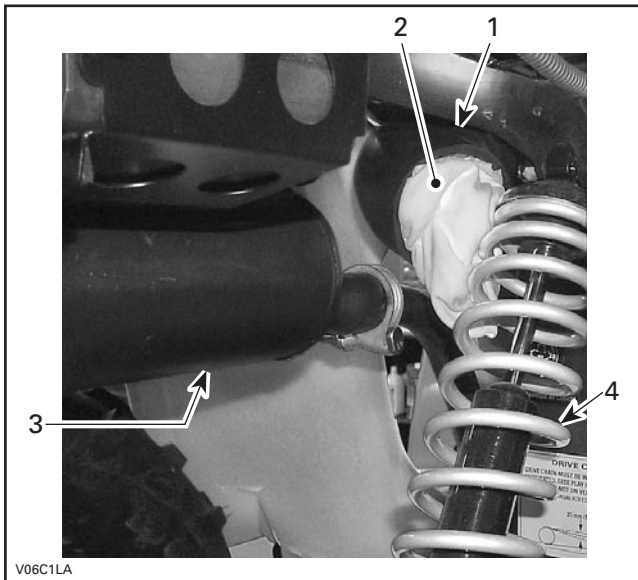
Subsection 04 (STORAGE/PRESEASON PREPARATION)

The inlet hose is located under console in front of fuel tank. Open the console cover then remove the cup.



1. CVT inlet hose
2. Rag
3. Air filter

The outlet hose is located near the seat, under rear luggage rack.



1. CVT hose
2. Rag
3. Muffler
4. Rear shock absorber

CAUTION: Remove those rags at preseason preparation.

VEHICLE CLEANING AND PROTECTION

Wash and dry the vehicle.

Remove any dirt or rust.

To clean the plastic parts, use only flannel clothes or Kimtowels® wipers no. 58-380 from Kimberly-Clark.

CAUTION: It is necessary to use flannel cloths or Kimtowels wipers on plastic parts to avoid damaging further surfaces to clean.

To clean the entire vehicle, including metallic parts with a **thick** coat of grease, use Endust® imported by Bristol Myers, available at hardware stores or supermarkets.

CAUTION: Do not use Bombardier Cleaner on decals, plastic parts or vinyl.

To clean the entire vehicle, including metallic parts with a **thin** coat of grease, use Simple Green® from Sunshine Makers Inc., available at hardware stores or at automotive parts retailer.

For vinyl and plastic parts, use Vinyl & Plastic Cleaner (P/N 413 711 200 (6 x 1 l)).

CAUTION: Never clean plastic parts with strong detergent, degreasing agent, paint thinner, acetone, products containing chlorine, etc.

Inspect the vehicle and repair any damage. Touch up all metal spots where paint has been scratched off. Spray all metal parts with BOMBARDIER LUBE (P/N 293 600 016).

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

CAUTION: 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.

COOLANT DENSITY

Test the density of the coolant using an antifreeze hydrometer.

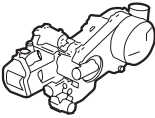
NOTE: Follow manufacturer's instructions for proper use.

A 50/50 mixture of antifreeze and distilled water will provide the optimum cooling, corrosion protection and antifreeze protection.

Do not use tap water, straight antifreeze or straight water in the system. Tap water contains minerals and impurities which build up in the system. Straight water or antifreeze will cause the system to freeze. Change coolant if necessary.

Section 02 MAINTENANCE
Subsection 04 (STORAGE/PRESEASON PREPARATION)

PRESEASON PREPARATION

SYSTEM	PRESEASON OPERATIONS	TO BE PERFORMED BY		REFER TO SECTION
		CUSTOMER	DEALER	
	Test Run Vehicle ②④. Check Clutch and Transmission Operation		✓	N.A.
	Engine Oil and Filter Oil Replacement ①	✓		Maintenance
	Spark Arrester		✓	
	Rags Removal (Intake and Exhaust) ②	✓		
	Coolant Replacement and Pressurization of System		✓	Cooling System
	Condition of Seals		✓	N.A.
	Exhaust System Condition		✓	Removal/Installation
	CVT System Condition		✓	CVT
	Rags in CVT Hoses ④	✓		Maintenance
	Fuel Line and Connectors Condition		✓	Fuel Circuit
	Carburetor Adjustment		✓	Carburetor
	Throttle Cable Inspection/Adjustment/Lubrication		✓	
	Air Filter Cleaning/Replacement	✓		Maintenance
	Spark Plug Replacement ③	✓		Ignition System
	Battery Condition/Charging and Installation		✓	Starting System
	Starter Connections and Routing		✓	
	Operation of Lighting System	✓		Instruments/Accessories
	Drive Chain Adjustment	✓		Rear Axle
	Drive Chain Lubrication	✓		
	Drive Chain Slider Condition	✓		
	Steering System Inspection and Adjustment		✓	Steering/Control Systems
	Handle Bar Fastener Tightness		✓	
	Wheel Tightness	✓		Maintenance
	Tire Pressure	✓		
	Tire Condition	✓		
	Suspension System Inspection		✓	Front/Rear Suspension
	Bearing Condition		✓	
	A-arm Condition		✓	
	Swing Arm Condition		✓	
	Brake Fluid Change		✓	Hydraulic Brakes
	Brake Condition		✓	
	Brake Cable Adjustment		✓	
	Frame and Skid Plate Condition		✓	Body
	Hitch/Trailer Ball Condition (if so equipped)	✓	✓	
	Seat Fasteners	✓		

① Replace oil and filter only if it has not been previously performed at the storage.

② Before starting the engine, remove rags in intake and exhaust that were installed at the storage.

③ Before installing new spark plugs at preseason preparation, it is suggested to burn excess storage oil by starting the engine with the old spark plugs. Only perform this operation in a well-ventilated area.

④ Before starting the engine, remove rags in CVT hoses that were installed at the storage.

N.A.: Not applicable

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TROUBLESHOOTING

The following charts are provided to help in diagnosing the probable source of troubles. It should be used as a guideline. This section pertains to engine mechanical components only. Some related problems can come from other systems such as ignition system, fuel system etc. and have an impact on the engine. Ensure to check the other systems prior to concluding that the engine is in fault.

COOLING SYSTEM

SYMPTOM	HIGH ENGINE OPERATING TEMPERATURE.
CONDITION	NORMAL USE.
	1. Check coolant level. a. Coolant less than recommended level. <i>Refill.</i>
	2. Check temperature sensor for electrical/mechanical failure. a. Temperature sensor defective. <i>Replace.</i>
	3. Check thermostat (located on cylinder head). a. Thermostat defective (does not open when engine gets hot). <i>Replace thermostat.</i>
	4. Check weep hole (oil pressure switch area MAG side) if coolant leaks. a. Coolant leaking from weep hole means a damaged oil seal and/or O-ring on water pump housing. <i>Replace both oil seals and O-rings (refer to COOLING SYSTEM and MAGNETO COVER).</i>
	5. Check coolant bleeding screw on thermostat housing. a. Screw looses and/or gasket ring is missing. <i>Retighten screw and/or place gasket ring.</i>
	6. Check condition of hoses and hose clamps fixation. a. Hoses are brittle and/or hard. <i>Replace.</i> b. Hose clamps are loose. <i>Retighten clamps.</i>
	7. Check condition of impeller located on the water pump shaft. a. Impeller wings broken and/or impeller thread is damaged. <i>Replace.</i>
	8. Check coolant drain screw on crankcase PTO (marked with Coolant Drain). a. Gasket ring on drain screw leaks. <i>Retighten screw and/or replace gasket.</i>
	9. Check cylinder head and/or cylinder base gasket. a. Worn out gasket(s) is (are) causing waterleakage. <i>Replace.</i>

Section 03 ENGINE

Subsection 02 (TROUBLESHOOTING)

MAGNETO SYSTEM

SYMPTOM	NO SPARK.
CONDITION	NORMAL USE.
 Test/Inspection	1. Check spark plug electrode condition. a. Gap is too big. <i>Readjust gap (refer to TECHNICAL DATA).</i>
	2. Check ignition coil for damage and/or electrical failure. a. Ignition coil damaged. <i>Replace ignition coil.</i> b. Connector is corroded or ignition coil shows electrical failure. <i>Clean connector area and/or replace ignition coil.</i> c. Wire harness is brittle or hard (no connection). <i>Replace.</i>
	3. Check wire harness for cracks or other damages. a. Harness shows electrical failure and/or other damages. <i>Replace wire harness.</i>
	4. Check magneto for damage and/or electrical failure. a. Radial position of rotor wrong due to a broken woodruff key. <i>Replace woodruff key.</i> b. Connector on magneto is damaged and/or has electrical failure. <i>Repair and clean contacts of connector.</i>
	5. Check electronic module. a. Module shows electrical failure or violent damages. <i>Replace electronic module.</i> b. Connectors are corroded. <i>Clean and reconnect.</i> c. Electronic module has bad ground to the vehicle frame. <i>Clean metal surface for good ground.</i>

LUBRICATION

SYMPTOM	LOW OR NO OIL PRESSURE/HIGH OIL CONSUMPTION.
CONDITION	NORMAL USE.
	1. Check oil level and search for leakage on crankcase and/or defective sealing ports. a. Crankcase is leaking due to damage. <i>Rebuild engine with new crankcase and gasket parts. Use a high quality oil (refer to TECHNICAL DATA).</i> b. Crankcase is leaking due to loose screws. <i>Retighten screws with recommended torque.</i> c. Sealing rings, O-rings and/or gaskets are brittle and/or hard or damaged. <i>Replace damaged parts.</i> d. Piston rings worn out (blue coloured engine exhaust emission). <i>Replace piston rings (refer to CYLINDER AND HEAD).</i> e. Piston rings are broken (low compression and blue coloured engine exhaust emission). <i>Replace piston rings (refer to CYLINDER AND HEAD).</i> f. Valve stem seal damaged and/or sealing lip is hard and/or brittle. <i>Replace all valve stem seals.</i>
	2. Check oil filter for contamination. a. Oil filter clogged. <i>Replace oil filter and oil at the same time. Use a high quality oil (refer to TECHNICAL DATA).</i>
	3. Check oil pressure regulator valve (spring) function. a. Valve spring damaged (valve always open). <i>Replace spring.</i> b. Valve stays open in crankcase PTO due to contamination (metallic particles). <i>Clean and/or repair valve piston.</i>
	4. Check oil drain plug on engine bottom. a. Plug is loosed and/or gasket ring is missing. <i>Retighten the plug and/or place gasket ring.</i>
	5. Check oil strainer screw on engine bottom. a. Screw is loose and/or gasket is damaged, brittle or hard. <i>Retighten screw and/or replace gasket.</i>
	6. Check weep hole if oil leaks (oil pressure switch area MAG side). a. Oil leaking from weep hole means a damaged oil seal and/or O-ring on water pump housing. <i>Replace both oil seals and O-rings (refer to COOLING SYSTEM and MAGNETO COVER).</i>
	7. Check oil pressure switch function. a. Oil pressure switch damaged. <i>Replace oil pressure switch.</i>

Section 03 ENGINE

Subsection 02 (TROUBLESHOOTING)

SYMPTOM	LOW OR NO OIL PRESSURE/HIGH OIL CONSUMPTION.
CONDITION	NORMAL USE.
 Test/Inspection	8. Check oil orifice(s) on the oil pump suction side. a. Oil orifice(s) is (are) clogged. <i>Clean from contamination. Replace oil and oil filter if necessary (refer to MAINTENANCE or LUBRICATION).</i>
	9. Check oil pump function. a. Oil pump rotor is out of wear limit. <i>Replace oil pump shaft (refer to LUBRICATION).</i> b. Oil pump seized due to oil leakage and/or air inclusion. <i>Replace oil pump (refer to LUBRICATION).</i> c. Gears driving oil pump are broken or otherwise damaged. <i>Replace gears.</i> d. Incorrect oil being used. <i>Use a high quality oil (refer to TECHNICAL DATA).</i>
	10. Check plain bearings in crankcase for heavy wear. a. Plain bearings out of specification (increased clearance). <i>Replace all plain bearings at the same time (refer to CRANKSHAFT).</i>

SYMPTOM	OIL CONTAMINATION (WHITE APPEARANCE).
CONDITION	NORMAL USE.
 Test/Inspection	1. Check weep hole (oil pressure switch area MAG side) if water and oil leaks. a. Leakage of oil/water mixture from weep hole means damaged oil seals and/or O-rings on water pump housing. <i>Replace sealing rings, O-rings and refill with recommended oil and/or coolant (refer to COOLING SYSTEM and MAGNETO COVER).</i>
	2. Check cylinder head and/or cylinder base gasket. a. Gasket damaged or leaking. <i>Retighten cylinder head with recommended torque and/or replace gasket.</i>
	3. Check screws for torque. a. Screws not fixed. <i>Retighten screws with recommended torque and/or replace oil.</i>
	4. Check oil for particles (may indicate possible damages inside the engine). a. Oil contamination due to metal or plastic particles. <i>Replace possibly damaged parts. Use a high quality oil (refer to TECHNICAL DATA).</i>

CYLINDER AND HEAD

SYMPTOM	UNUSUAL ENGINE NOISE AND/OR VIBRATION IN IDLE SPEED.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check oil pressure regulator valve (spring) function. - Valve fixed due contamination and/or spring damaged (valve remains open). <i>Clean and/or replace spring and/or mechanism.</i> - Faulty chain tensioner. <i>Replace spring and/or mechanism.</i>

SYMPTOM	UNUSUAL ENGINE NOISE AND/OR VIBRATION WHILE OPERATING.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check items 1 of UNUSUAL ENGINE NOISE AND/OR VIBRATION IN IDLE SPEED. 2. Check noise coming from cylinder head area. - Check valve timing. <i>Readjust valve timing and/or replace failure part(s).</i> - Chain guide worn out. <i>Replace chain guide.</i> - Stretched chain and/or worn out sprocket. <i>Replace chain and sprocket at the same time.</i> - Sprocket screw got loose. <i>Retighten screw with recommended torque.</i> - Rocker arm(s) is (are) worn out (valve adjustment). <i>Readjust valve clearance and/or replace rocker arm(s).</i> - Thrust washer(s) on rocker arm shaft is(are) missing. <i>Fit thrust washer(s) (refer to CYLINDER AND HEAD).</i>

SYMPTOM	OIL CONTAMINATION ON CYLINDER AND/OR HEAD.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check screws for torque. - Loose screws. <i>Retighten screws with recommended torque.</i> - Gaskets are brittle, hard, worn out or otherwise damaged. <i>Replace damaged gaskets, O-rings or the V-ring on breather.</i>

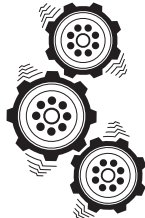
Section 03 ENGINE

Subsection 02 (TROUBLESHOOTING)

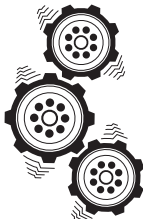
CRANKSHAFT

SYMPTOM	UNUSUAL ENGINE NOISE AND/OR VIBRATIONS.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check thrust washer(s) on crankshaft MAG/PTO side. a. Thrust washer(s) is (are) missing on MAG and/or PTO side. <i>Fit thrust washer(s).</i>

GEARBOX

SYMPTOM	UNUSUAL ENGINE NOISE AND/OR VIBRATIONS.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check bearings in the gearbox for free movement. a. Bearing(s) do(es) not move freely. <i>Replace bearing(s).</i>
	2. Check oil level in gearbox. a. Oil leakage through plug cover area (near speed sensor support). <i>Replace O-ring and retighten screw with recommended torque.</i> b. Oil leakage in gearbox cover gasket area. <i>Replace gasket and do the torque procedure (refer to GEARBOX).</i>
	3. Check chain condition. a. Reverse gear chain shows heavy wear (rolles, chain links). <i>Replace chain.</i>
	4. Check for whistling noise inside gearbox. a. Countershaft and intermediate shaft are noisy. <i>Replace countershaft and intermediate shaft the same time.</i>
	5. Check for knocking noise. a. Tooth of gears are damaged and/or worn. <i>Replace respective gears.</i>

SYMPTOM	GEAR INDICATION FAILS.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check contact screws on PTO side (gearbox area) for damage and/or wear. - Shifting indicator switch(es) pin(s) is (are) worn and/or otherwise damaged. <i>Replace shifting indicator switch(es).</i> - Contact(s) is (are) corroded and/or contact screw for wire harness got loose. <i>Clean contact surface and retighten contact screw(s) with recommended torque.</i> - Wire harness has broken cables. <i>Replace wire harness.</i>
	2. Check connector condition and/or electrical system. - Connector contact(s) is (are) corroded and/or otherwise damaged. <i>Clean connector(s) and/or replace wire harness if damaged.</i> - Electrical system failed and/or otherwise damaged. <i>Repair and/or replace damaged part(s).</i>
	3. Check index spring placed on gearbox cover. Indexation fails due to broken and/or damaged index spring. <i>Clean gearbox from metal particles, replace index spring and/or damaged part(s).</i>

SYMPTOM	GEAR(S) IS (ARE) HARD TO SHIFT.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check shift plate and/or shift forks for wear and/or damages. - Shift plate has worn out and/or damaged tracks. <i>Replace shift plate.</i> - Shift fork(s) is (are) worn out and/or engagement pins are damaged. <i>Replace shift fork(s).</i> - Shift fork(s) is (are) worn out and/or fork(s) is (are) damaged. <i>Replace shift fork(s).</i> - Shift gear(s) is (are) worn out. <i>Replace shift gear(s).</i> - High gear worn and/or otherwise damaged. <i>Replace high gear.</i> - Index spring worn in front area (stops intermediate gear in idle). <i>Replace index spring.</i>
	2. Check engine idle speed (choke in use). - Idle speed is to high (CVT starts to work). <i>Adjust idle speed.</i> - Choke is in use and increases the engine RPM. <i>Release choke.</i>

Section 03 ENGINE

Subsection 02 (TROUBLESHOOTING)

CVT

SYMPTOM	THE ATV ACCELERATES SLOWLY, ESPECIALLY WHEN IT IS STOPPED.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check drive belt condition. a. Belt is too narrow (drive belt engagement is higher in drive pulley). <i>Replace belt if width is less than specified (refer to CVT or TECHNICAL DATA).</i>
	2. Check centrifugal clutch on driven pulley. a. Liners of centrifugal clutch are out of specification (refer to CVT). <i>Replace centrifugal clutch assembly.</i>
	3. Check roller on drive pulley inner half. a. Rollers are worn and/or wrong installed and/or otherwise damaged (refer to CVT). <i>Replace all rollers at the same time (roller kit).</i>
	4. Check function of sprag clutch on driven pulley. a. Sprag clutch is clogged and/or worn out (refer to CVT). <i>Replace sprag clutch together with ball bearing and oil seal (refer to CVT).</i>

SYMPTOM	ENGINE MAXIMUM RPM IS TOO HIGH AND TOP SPEED IS NOT REACHED.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check items 1 to 3 of THE ATV ACCELERATES SLOWLY, ESPECIALLY WHEN IT IS STOPPED.
	2. Check driven pulley spring tension. a. Spring tension is too stiff. <i>Replace spring (recommended Bombardier spring).</i>

SYMPTOM	DRIVE PULLEY NOISE IN IDLE SPEED.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check slide pieces (drive pulley). a. Worn slide pieces (increased clearance to drive pulley inner half). <i>Replace all slide pieces at the same time (slide piece kit).</i>
	2. Check driven pulley sliding mechanism (between driven pulley outer and inner half). a. Mechanism is stucked and/or damaged. <i>Replace driven pulley assembly.</i>
	3. Check rollers for wear (located on inner half of drive pulley). a. Roller(s) worn out. <i>Replace all rollers at the same time (roller kit).</i>
	4. Check drive pulley nut for torque. a. Loose nut. <i>Retighten nut with recommended torque.</i>
	5. Check driven pulley bearing(s) for free movement. a. Bearing(s) do(es) not move freely. <i>Replace bearing(s) and oil seal inside driven pulley at the same time.</i>

SYMPTOM	DRIVE PULLEY NOISE WHEN ACCELERATING/DECELERATING.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check items 1 to 5 of DRIVE PULLEY NOISE IN IDLE SPEED.
	2. Check if belt runs in dry conditions. a. Drive pulley area is wet/contaminated due to water/dirt intrusion. <i>Clean driven pulley area and/or drain water out of CVT cover.</i>
	3. Check driven pulley nut/bearing in CVT cover for free movement. a. Bearing does not move freely. <i>Replace bearing.</i> b. Bearing seat on driven pulley nut is worn and/or otherwise damaged. <i>Replace driven pulley nut.</i>

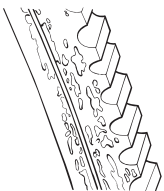
SYMPTOM	VIBRATIONS ORIGINATING FROM DRIVE PULLEY.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check tightening torque of drive pulley nut. a. Moving outer half. <i>Retighten nut.</i>
	2. Check inner half bushings. a. Excessive gap between bushings and inner half shaft, thus restraining sliding half movements. <i>Replace inner half assembly.</i>

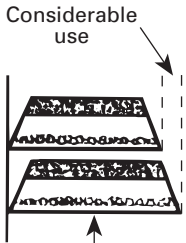
Section 03 ENGINE

Subsection 02 (TROUBLESHOOTING)

SYMPTOM	VIBRATIONS ORIGINATING FROM DRIVEN PULLEY.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check centrifugal clutch on driven pulley. Centrifugal clutch out of round after replacement. <i>Reinstall centrifugal clutch turned by 180°.</i>

SYMPTOM	PULLEYS DO NOT DOWN SHIFT PROPERLY.
CONDITION	NORMAL USE.
Test/Inspection 	1. Refer to VIBRATIONS COMING FROM DRIVEN PULLEY and check items listed. 2. Check drive pulley bushings (cleanliness, wear, etc.). - Bushings stick to fixed half pulley shaft. <i>Clean or replace.</i> 3. Check driven pulley spring tension. - Spring tension is too weak. <i>Replace.</i>

SYMPTOM	BELT GLAZED EXCESSIVELY OR HAVING BAKED APPEARANCE.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check if drive pulley air intake is clogged. - Drive pulley area heats up due to contamination. <i>Clean air intake from contamination.</i> 2. Check if pulley halves are clean. - Oil on pulley surfaces. <i>Clean pulley halves and replace belt.</i>

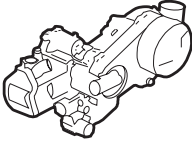
SYMPTOM	BELT WORN EXCESSIVELY IN TOP WIDTH.
CONDITION	NORMAL USE.
Test/Inspection  A00D0BY	1. Check drive pulley. - Excessive slippage due to irregular outward actuation movement of drive pulley. <i>Carry out drive pulley inspection.</i> 2. Check drive belt identification number. - Improper belt angle (wrong type of belt). <i>Replace belt with an appropriate drive belt.</i> 3. Check drive belt width. - Considerable wear. <i>Replace belt if less than specified (refer to CVT or TECHNICAL DATA).</i>

SYMPTOM	BELT SIDES WORN CONCAVE.
CONDITION	NORMAL USE.
Test/Inspection  A00D0DY	1. Check pulley half surfaces. a. Rough or scratched pulley half surfaces. <i>Repair or replace.</i> 2. Check drive belt identification number. a. Unspecified type of belt. <i>Replace belt with an appropriate drive belt (refer to TECHNICAL DATA).</i>
SYMPTOM	BELT DISINTEGRATION.
CONDITION	NORMAL USE.
Test/Inspection  A00D0EY	1. Check drive belt identification number. a. Excessive belt speed. <i>Using unspecified type of belt. Replace belt with proper type of belt (refer to TECHNICAL DATA).</i> 2. Check if pulley halves are clean. a. Oil on pulley surfaces. <i>Clean pulley surfaces with fine emery cloth and wipe clean using Pulley Flange Cleaner (P/N 413 711 809) and a cloth.</i>
SYMPTOM	FLEX CRACKS BETWEEN COGS.
CONDITION	NORMAL USE.
Test/Inspection  A00D0GY	1. Check drive belt condition. a. Considerable use, belt wearing out. <i>Replace.</i>

Section 03 ENGINE

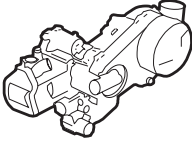
Subsection 02 (TROUBLESHOOTING)

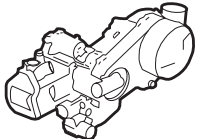
ENGINE GENERAL

SYMPTOM	ENGINE BACKFIRES.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check spark plug and/or electrical system. a. Carbon accumulation caused by defective spark plug. <i>Clean carbon accumulation and replace spark plug.</i> b. Electrical system has failure. <i>Replace defective part(s).</i>
	2. Check leakage on intake manifold. a. Air leak on intake system. <i>Retighten screws and/or replace intake manifold.</i>
	3. Check exhaust air leaking. a. Exhaust gasket is leaking. <i>Retighten screws and/or replace exhaust gasket.</i>
	4. Check intake valve(s) for leaking. a. Intake valve(s) is (are) leaking. <i>Repair or replace valve(s).</i>
	5. Check if fuel supply is to less at high RPM. a. Fuel line is contaminated and/or bent (engine gets lean). <i>Clean and/or replace defective part(s).</i>

Section 03 ENGINE

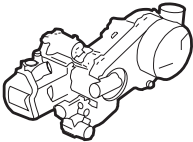
Subsection 02 (TROUBLESHOOTING)

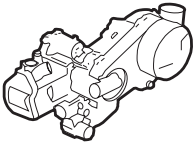
SYMPTOM	ENGINE SUDDENLY TURNS OFF.
CONDITION	NORMAL USE.
Test/Inspection 	6. Cracked or broken piston. a. Cracked or broken piston due to excessive piston/cylinder clearance or engine overrevving. <i>Replace piston. Check piston/cylinder clearance (refer to CYLINDER AND HEAD).</i>
	7. Check piston rings and cylinder surface for grooves. a. Poor oil quality. <i>Use a high quality oil.</i> b. Contamination (like sand) through engine intake. <i>Replace defective part(s) and use new air filter.</i>
	8. Check connecting rod, crankshaft, rocker arm rollers movement. a. Connecting rod failure due to leak of oil. <i>Repair and replace defective parts and use a high quality oil.</i> b. Crankshaft failure due to leak of oil. <i>Repair and replace defective parts and use a high quality oil.</i> c. Oil contamination due to clogged oil filter. <i>Replace oil filter and oil at the same time, replace defective part(s) (refer to MAINTENANCE CHART).</i>
	9. Check valve springs exhaust/inlet. a. Broken valve spring damages the cylinder head, valve(s), rocker arm(s)/piston. <i>Replace defective part(s) and do the valve adjustment.</i>

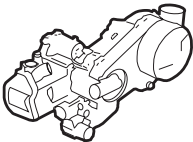
SYMPTOM	ENGINE DOES NOT OFFER MAXIMUM POWER AND/OR DOES NOT REACH MAXIMUM OPERATING RPM.
CONDITION	NORMAL USE.
	1. Check items 1 and 2 of ENGINE SUDDENLY TURNS OFF.
	2. Check air intake system. a. Air filter is clogged due to contamination. <i>Replace air filter.</i>
	3. Check spark plug condition and/or gap. a. Fouled spark plug or wrong spark plug gap. <i>Readjust gap and clean spark plug or replace.</i>
	4. Check spark plug type. a. Improper spark plug heat range. <i>Install recommended spark plug (refer to TECHNICAL DATA).</i>
	5. Perform engine leak test. Refer to ENGINE LEAK TEST procedure. Check for possible piston seizure. a. Damaged head gasket and/or seal and/or leaking inlet/exhaust valve(s). <i>Replace and/or repair defective parts.</i>
	6. Check for water in fuel (wrong fuel). a. There is water in fuel or wrong fuel. <i>Drain fuel system, search for leakage and refill it with appropriate fuel.</i>
	7. Check drive belt. a. Worn belt. <i>Replace belt if width is less than specified (refer to CVT).</i>
	8. Check engine compression. a. Worn piston and/or piston ring(s). <i>Replace (refer to CYLINDER AND HEAD).</i>

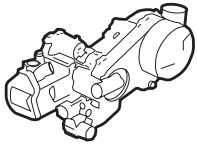
Section 03 ENGINE

Subsection 02 (TROUBLESHOOTING)

SYMPTOM	ENGINE TURNS OVER BUT FAILS TO START.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check items of ENGINE DOES NOT START — NO SPARK AT SPARK PLUG.
	2. Check spark plug. a. Define spark plug (no spark) or wrong spark plug gap. <i>Readjust gap and clean spark plug or replace.</i>
	3. Check for fuel on spark plug. a. Flooded engine (spark plug wet when removed). <i>Do not overchoke. Remove wet spark plug, turn ignition switch to OFF and crank engine several times. Install clean dry spark plug. Start engine following usual starting procedure.</i>
	4. Check engine compression. a. Insufficient engine compression. <i>Replace defective part(s) (ex.: piston, ring(s), etc.).</i> b. Valve seat worn and/or otherwise damaged. <i>Repair by performing valve guide procedure (refer to CYLINDER AND HEAD). Readjust valve clearance.</i>

SYMPTOM	HIGH ENGINE OPERATING TEMPERATURE.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check if cooling system shows any failure (see COOLING SYSTEM). a. System is leaking. <i>Repair and/or replace damaged part(s).</i>
	2. Check condition and heat range of spark plug. a. Melted spark plug tip or inadequate heat range. <i>Install recommended spark plug (refer to TECHNICAL DATA).</i>
	3. Check air inlet and outlet of the CVT cover. a. Air circulation is clogged (overheating). <i>Clean air circulation from contamination.</i> b. Drive belt worn and/or otherwise damaged. <i>Replace belt with an appropriate drive belt (refer to TECHNICAL DATA).</i>

SYMPTOM	STARTER TURNS, BUT ENGINE DOES NOT CRANK.
CONDITION	NORMAL USE.
Test/Inspection 	1. Check sprag clutch on magneto. a. Spring damaged. <i>Clean and/or replace sprag clutch.</i> b. Sprag clutch bodies worn and/or otherwise damaged. <i>Replace sprag clutch and ring gear at the same time.</i> c. Contact surface on ring gear and/or sprag clutch housing is worn or damaged. <i>Replace ring gear, sprag clutch and sprag clutch housing at the same time.</i>

SYMPTOM	ENGINE DOES NOT START — NO SPARK AT SPARK PLUG (SEE MAGNETO SYSTEM).
CONDITION	AT ENGINE CRANKING.
Test/Inspection 	1. Verify spark plug condition. a. Defective, improperly set, worn out, fouled. <i>Identify source of problem and correct. Replace spark plug.</i>
	2. Verify ignition coil resistance with an ohmmeter. a. Defective part. <i>Replace ignition coil.</i>
	3. Verify trigger coil resistance with an ohmmeter and connector condition. a. Defective trigger coil. Corroded connector terminal. <i>Replace trigger coil. Clean terminals and apply silicone dielectric grease.</i>
	4. Verify condition of ignition coil. a. Mechanically damaged part. Vibration problem. Electrically damaged part. <i>Replace ignition coil.</i>
	5. Verify condition of trigger coil. a. Mechanically damaged part. Vibration problem. Electrically damaged part. <i>Replace trigger coil and/or tighten mounting screw(s).</i> b. Metallic particles caused a short circuit between the soldered connections. <i>Clean trigger coil from metallic dust.</i>
	6. Check magneto for damage and/or electrical failure. a. Windings of stator have electrical failure (no charging causes an empty battery). <i>Replace magneto.</i>

LEAK TEST

VERIFICATION

Before performing the cylinder leak test, verify the following:

- intake port/air filter contaminated (glogged) with dirt, sand, etc. (leads to worn valves, piston rings and finally to leak of power)

CAUTION: In case of piston ring and/or valve replacement always clean the whole engine and replace oil and oil filter.

- blue exhaust gas means damaged/worn piston rings
- clamp(s) tightness
- radiator and hoses
- oily contamination on leak indicator hole (oil pressure switch area) means a damaged oil seal on water pump shaft
- coolant out of leak indicator hole means a damaged oil seal on water pump shaft (refer to **COOLING SYSTEM**).

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

LEAK TEST PROCEDURE

Preparation

NOTE: The following procedures should be done with a cold engine.

Disconnect battery.

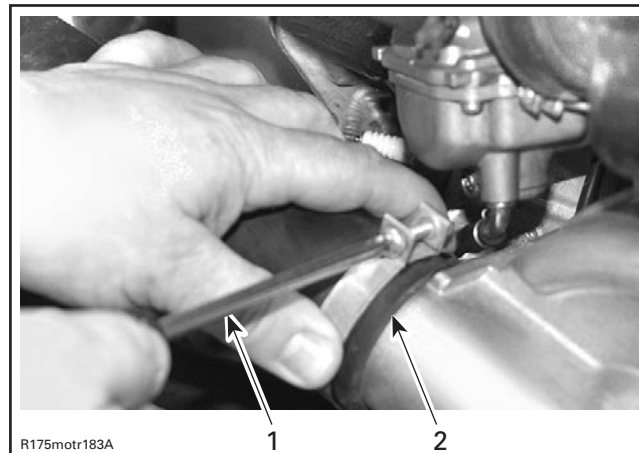
WARNING

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.

Remove:

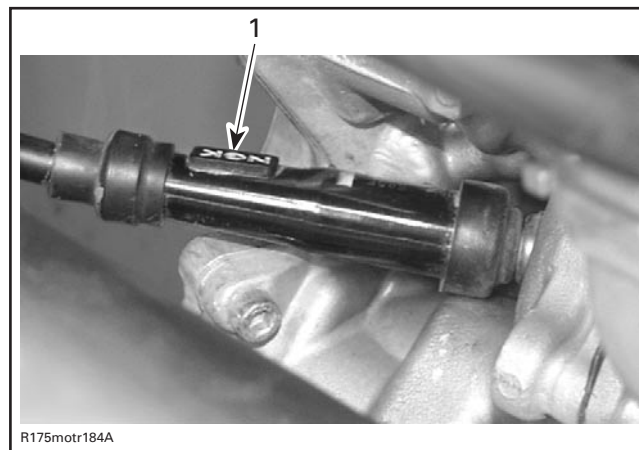
- radiator cap
- CVT hose inlet.

NOTE: To ease reaching cylinder head area it is recommended to disconnect CVT hose inlet.



1. Screwdriver
2. CVT hose inlet

Unplug spark plug cable.



1. Spark plug connector

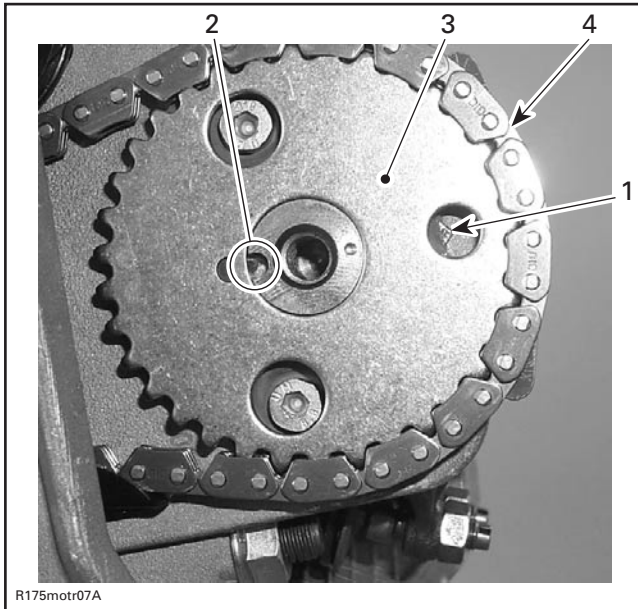
Remove spark plug from cylinder head.

Remove valve cover (refer to **CYLINDER AND HEAD**).

Section 03 ENGINE

Subsection 03 (LEAK TEST)

Rotate crankshaft until piston is at TDC.



1. Cylinder bore axle (arrow middle of the timing gear bore)
2. Groove in the camshaft
3. Chain timing gear
4. Timing chain

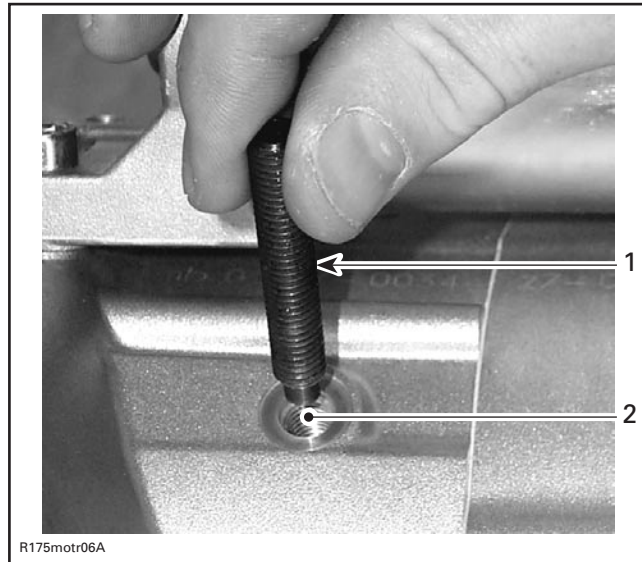
To place piston at TDC, it is possible to use two procedures.

First procedure:

- Remove CVT cover (refer to **CVT**).
- Turn the drive pulley until piston is at TDC.
- Install crankshaft locking bolt (P/N 529 035 617) (refer to **CRANKSHAFT**).

Second procedure:

- Remove the RH engine side panel.
- Remove magneto cover and the rotor on crankshaft until piston is at TDC.
- Install crankshaft locking bolt (P/N 529 035 617) (refer to **CRANKSHAFT**).



1. Crankshaft locking bolt
2. Thread in the area of electrical starter

Test

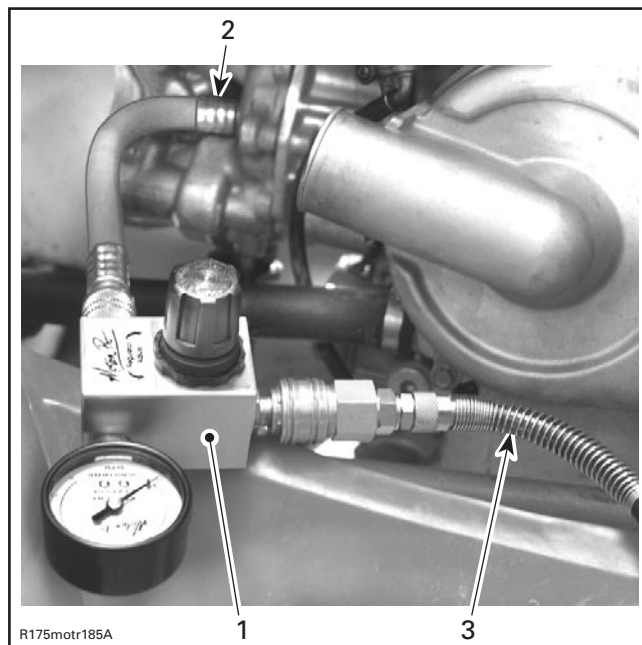
Connect leak tester (P/N 529 035 661) to adequate air supply.

Set needle of measuring gauge to zero.

NOTE: Each tester will have specific instruction on the gauge operation and required pressure.

Install gauge adapter into previously cleaned spark plug hole.

Supply combustion chamber with air pressure.



1. Leak tester
2. Adequate adapter for spark plug hole
3. Air supply hose

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

LEAKAGE PERCENTAGE	ENGINE CONDITION
0% to 7%	Excellent condition.
8% to 15%	Fair condition; proceed with tuned up or adjustment.
16% to 30%	Poor condition; engine will run and performance might be down in some cases.
30% and higher	Very poor condition, diagnose and repair engine.

Diagnose

Listen for air leaks.

- air escaping on intake port/carburetor means leaking intake valve(s)
- air escaping on exhaust port means leaking exhaust valve(s)
- air bubbles out of radiator means leaking cylinder head gasket
- air/oil escaping from crankcase means damaged gasket and/or loosened screws (refer to **GEARBOX**)
- air/coolant escaping from cylinder/head means damaged gasket(s) and/or loosened screws (refer to **CYLINDER AND HEAD**)
- air escaping into crankcase area means excessively worn cylinder and/or broken piston rings.

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

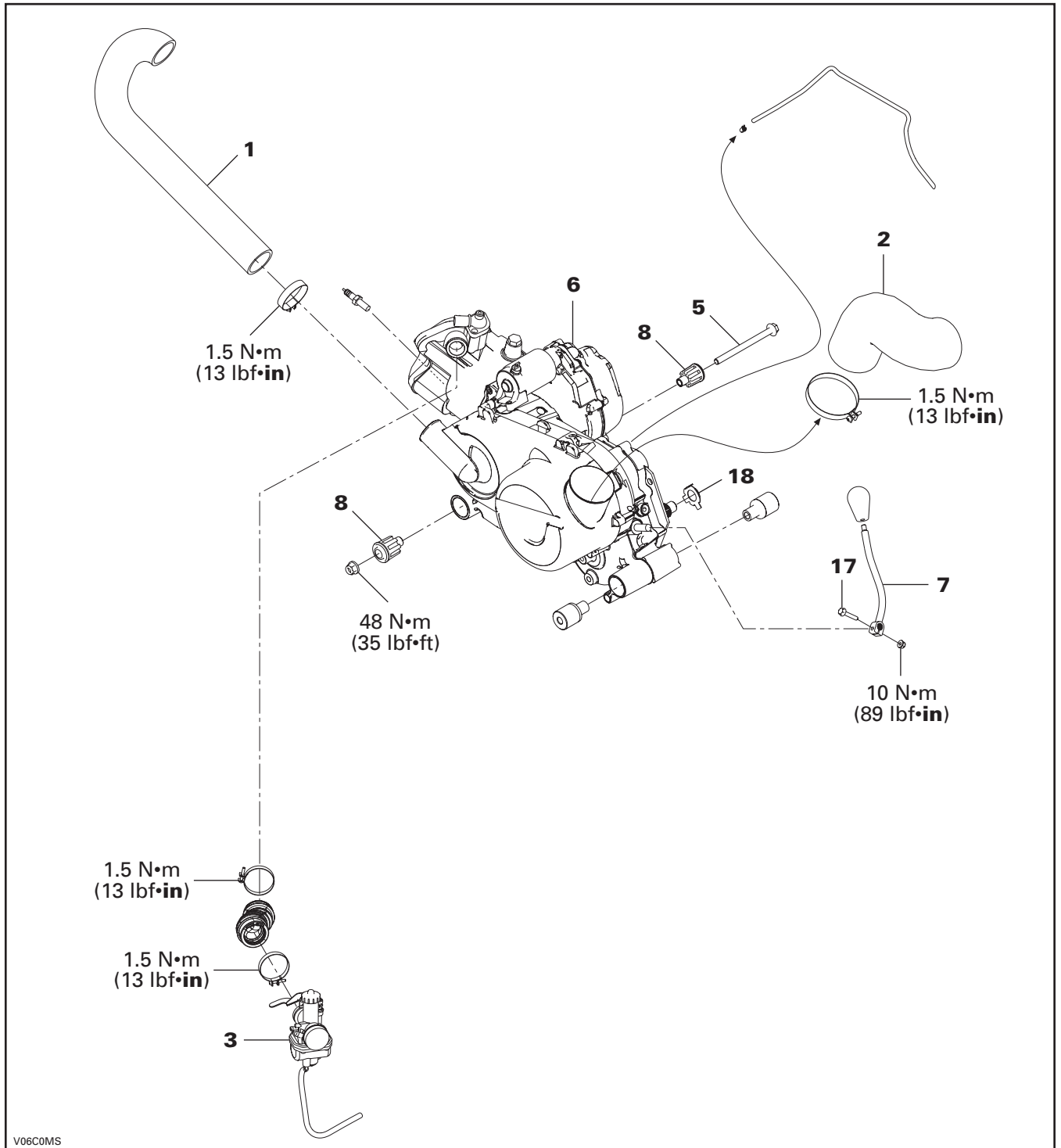
Installation

NOTE: At reassembly, use the torque values and Loctite products from the exploded views (refer to particular engine sections).

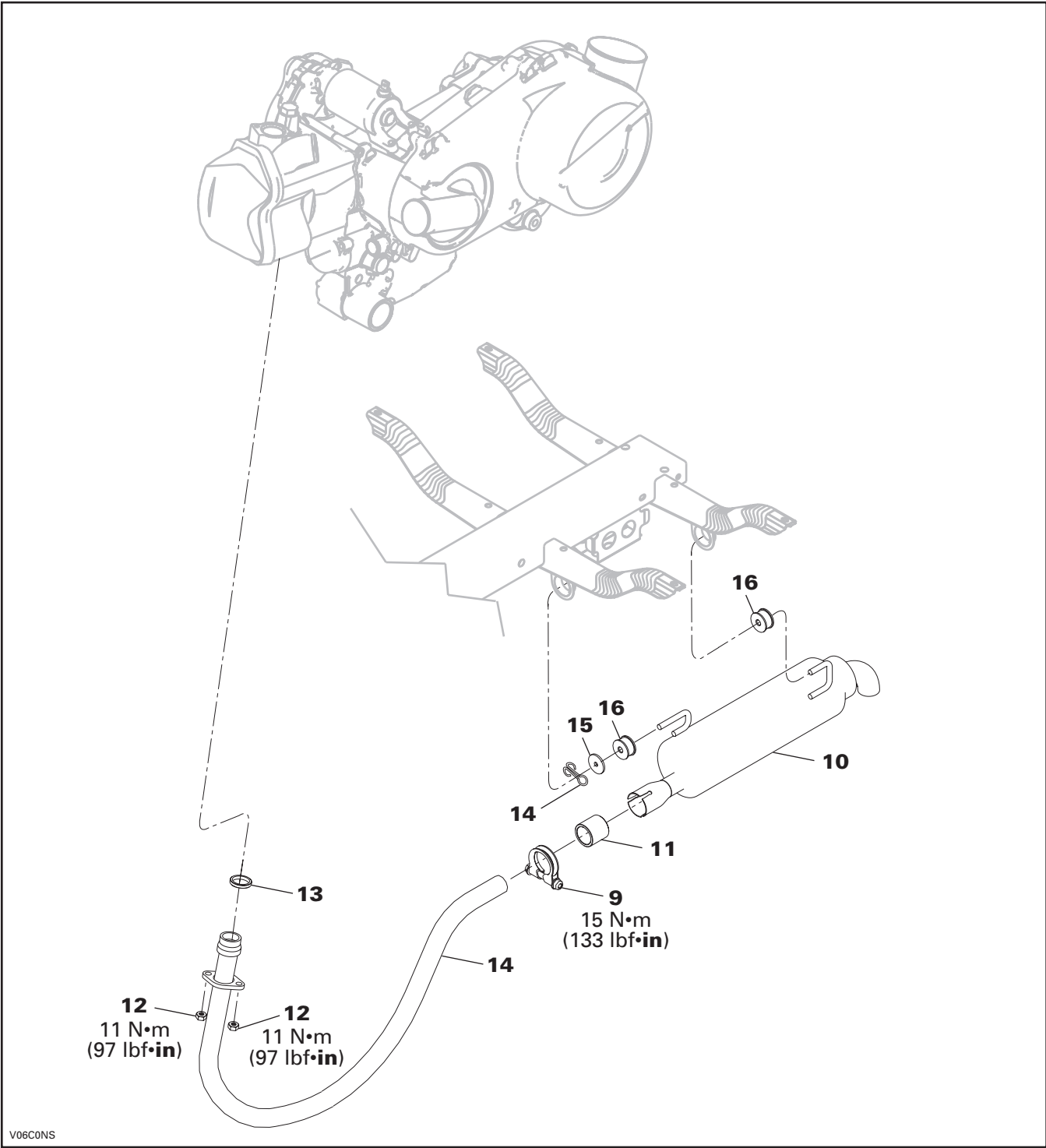
For installation, reverse the preparation procedure.

REMOVAL AND INSTALLATION

ENGINE SYSTEM



EXHAUST SYSTEM



GENERAL

Always disconnect battery.

WARNING

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

At installation, use torque values and Loctite products from the exploded view. Clean threads before using Loctite products when installing screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

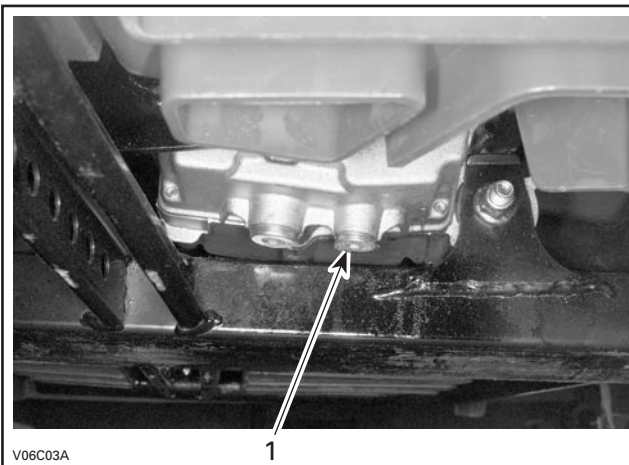
ENGINE

Removal

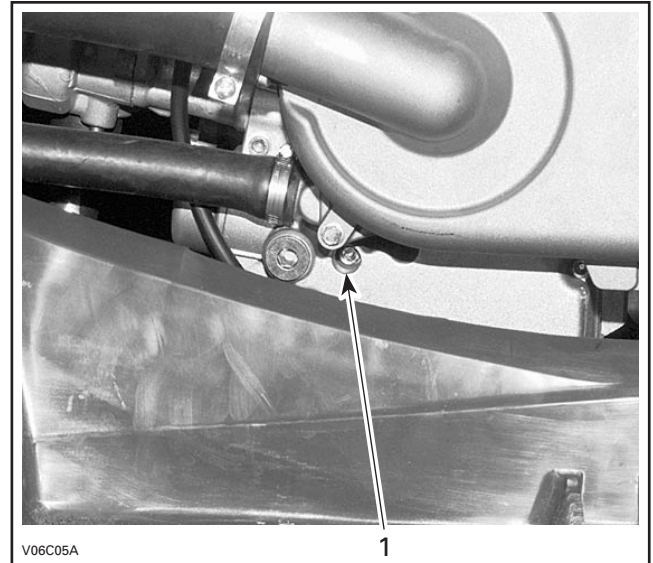
Place vehicle at workstation that will have access to an engine-lifting hoist. Then start with initial preparation of vehicle by doing the following.

Turn fuel valve on OFF position.

Drain engine oil and engine coolant.



1. Oil drain plug

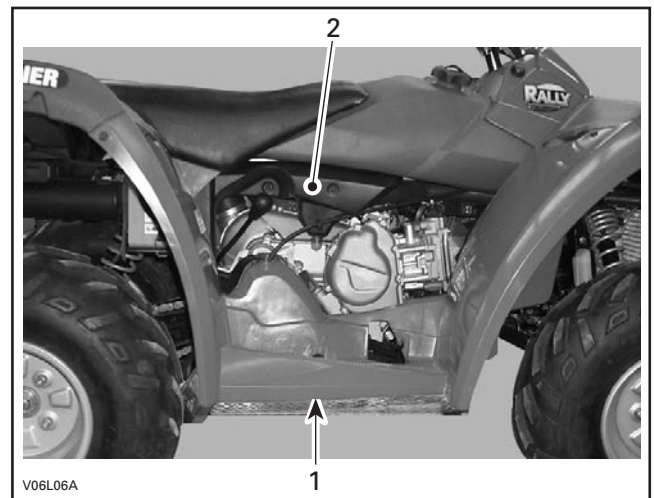


1. Cooling drain plug

On right side of vehicle, do the following:

Remove:

- RH footwell and RH cover (refer to **BODY**)

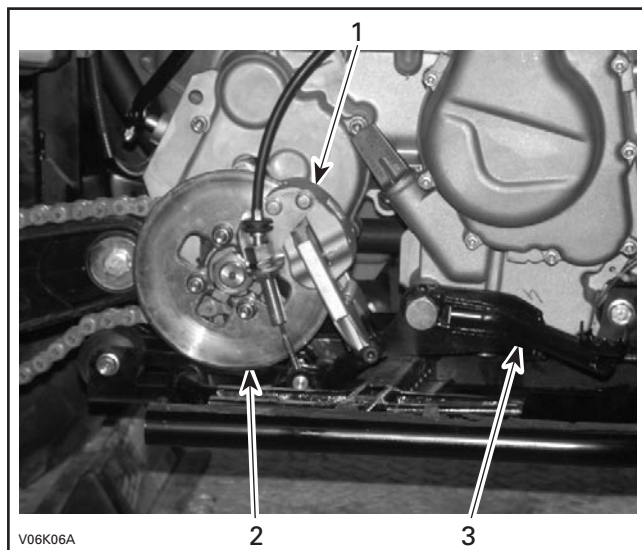


- 1. Footwell
- 2. RH cover

Section 03 ENGINE

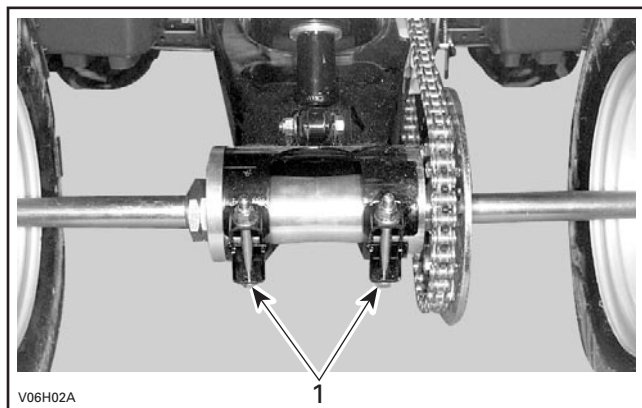
Subsection 04 (REMOVAL AND INSTALLATION)

– rear brake caliper/disc/pedal (refer to **BRAKES**)



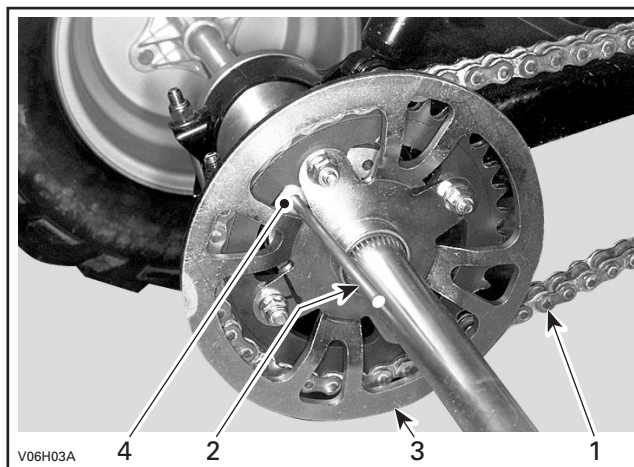
1. Rear brake caliper
2. Rear brake disc
3. Rear brake pedal

Loosen chain tensioner lock bolts.



1. Chain tensioner lock bolts

Insert adjuster lock through sprocket hub and into chain tensioner.



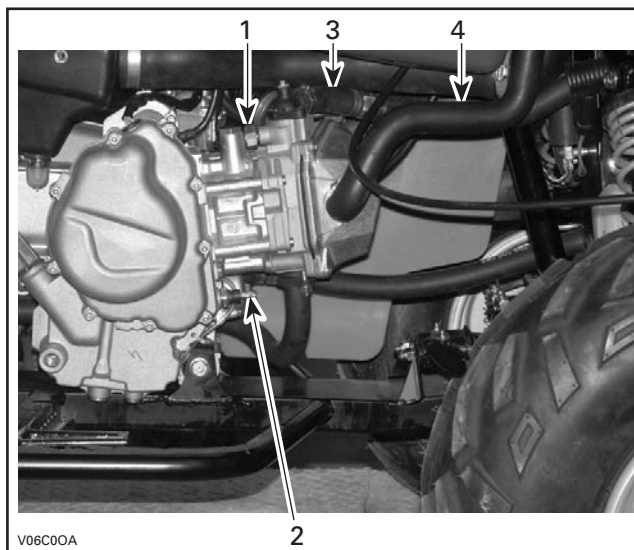
1. Drive chain
2. Adjuster lock
3. Sprocket hub
4. Chain tensioner

Slacken drive chain tightness.

Disconnect:

- water temperature sensor
- oil pressure sensor
- breather hose on valve cover
- coolant engine outlet hose

NOTE: Catch any coolant spillage.

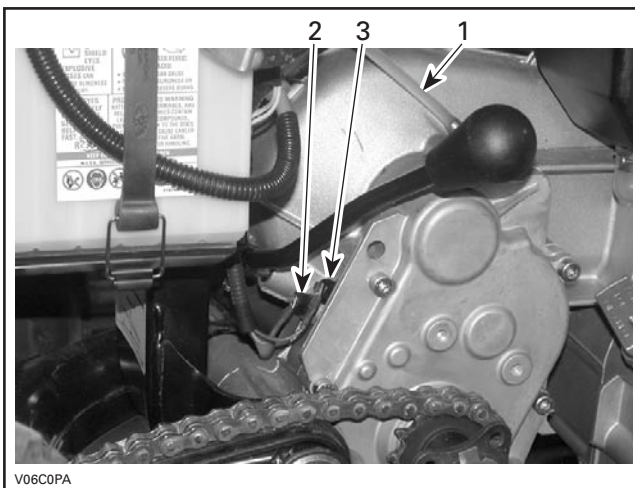


1. Water temperature sensor
2. Oil pressure sensor
3. Coolant engine outlet hose
4. Breather hose

Section 03 ENGINE

Subsection 04 (REMOVAL AND INSTALLATION)

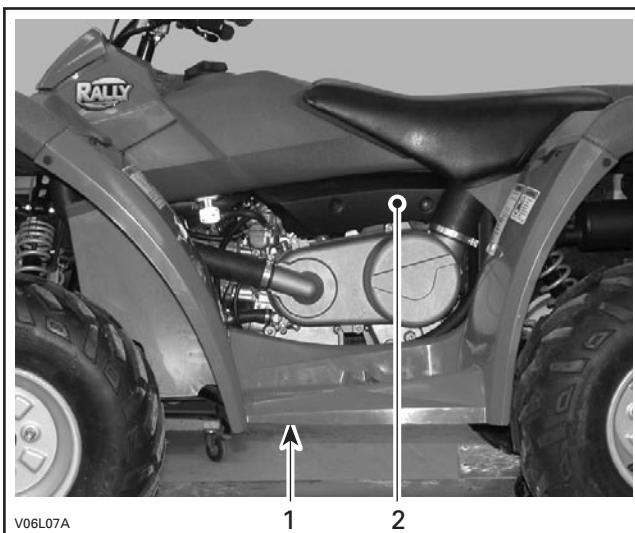
- gearbox vent tube
- neutral and reverse switches.



1. Gearbox vent tube
2. Neutral switch
3. Reverse switch

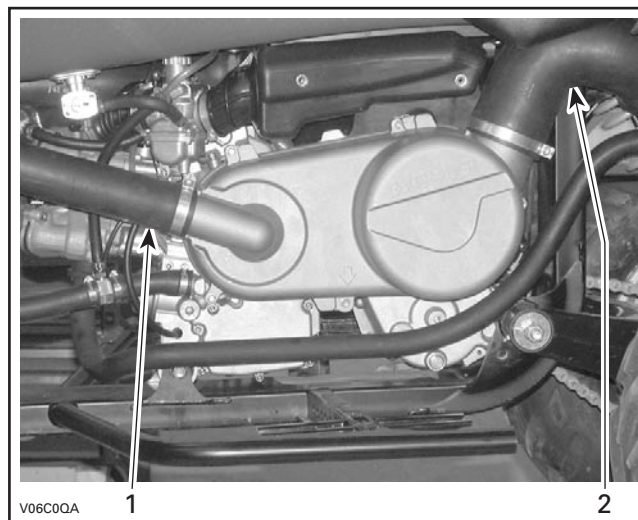
On left side of vehicle, remove the following:

- LH footwell and LH cover (refer to **BODY**)



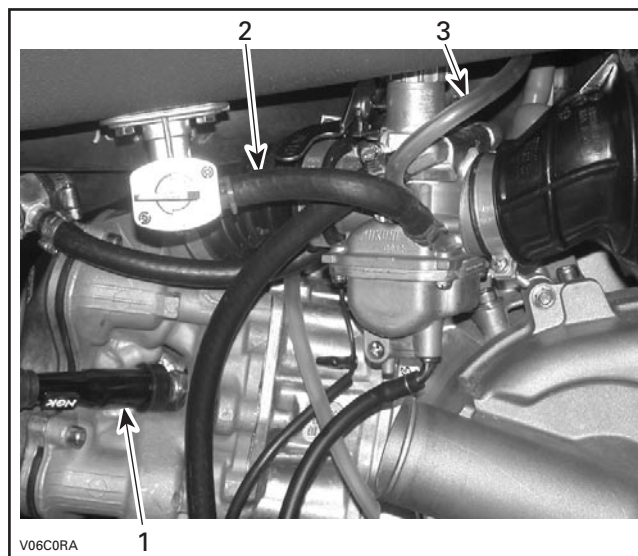
1. Footwell
2. LH cover

- CVT inlet no. 1 and outlet no. 2 hoses



1. CVT inlet hose
2. CVT outlet hose

- spark plug cable
- fuel line
- carburetor vent hose

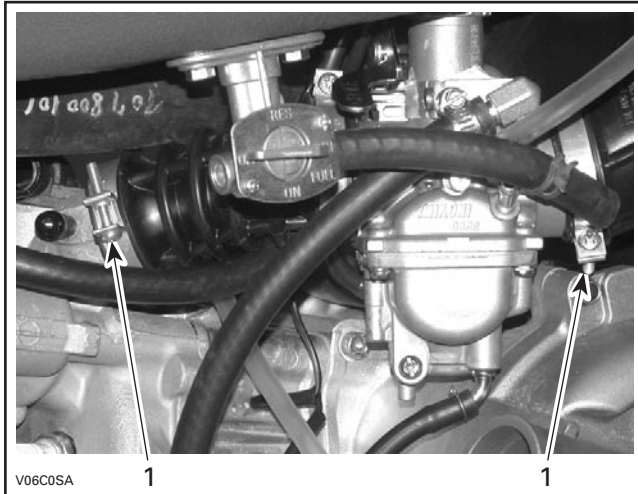


1. Spark plug cable
2. Fuel line
3. Carburetor vent hose

Section 03 ENGINE

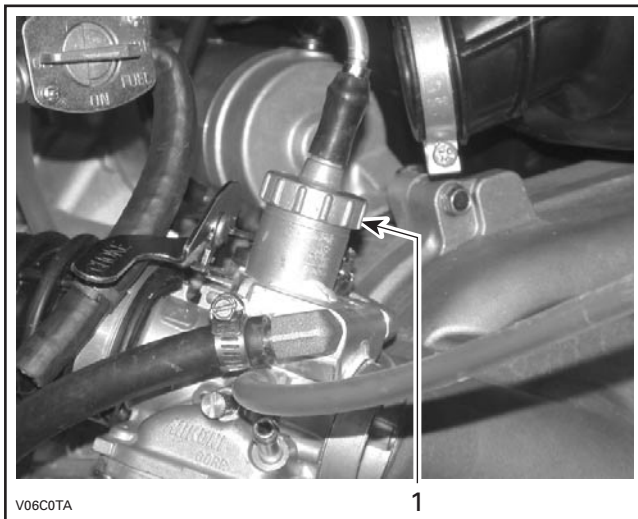
Subsection 04 (REMOVAL AND INSTALLATION)

- clamps retaining the carburetor to the engine and to the air box



1. Unscrew these clamps

- coolant engine inlet hose
- carburetor no. 3 (place it off to one side)
- carburetor cap



1. Carburetor cap

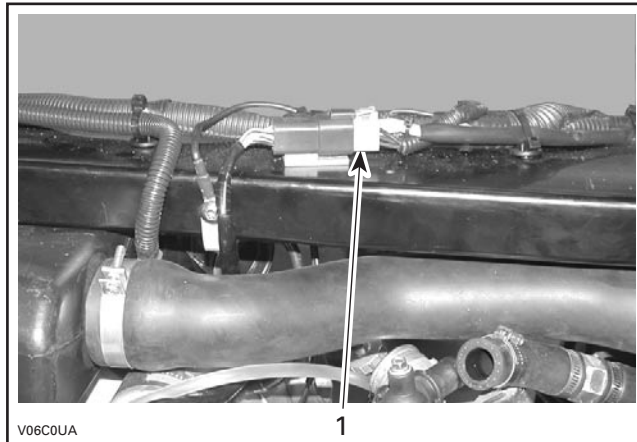
- exhaust pipe no. 4 (see EXHAUST PIPE further in this section).

From the top side, do the following:

Remove:

- seat (refer to **BODY**)
- fuel tank (refer to **FUEL CIRCUIT**).

Unplug the magneto connector.



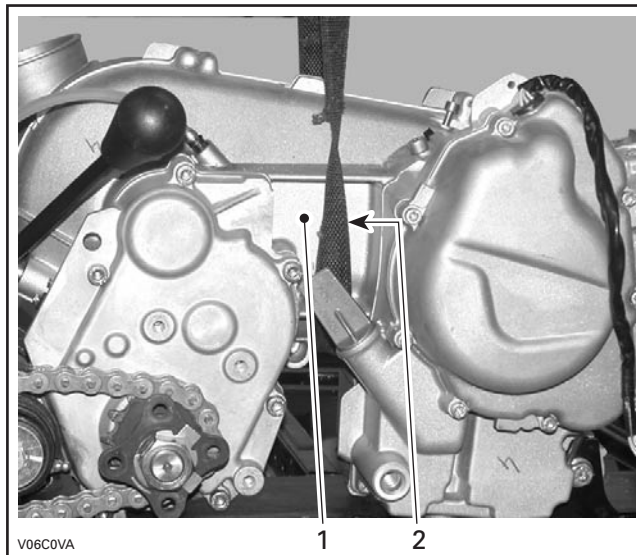
1. Magneto connector

Remove air box and the air intake hose.

Remove starter.

From bottom side, do the following:

Install engine lifting strap under CVT housing.



1. CVT housing

2. Engine lifting strap

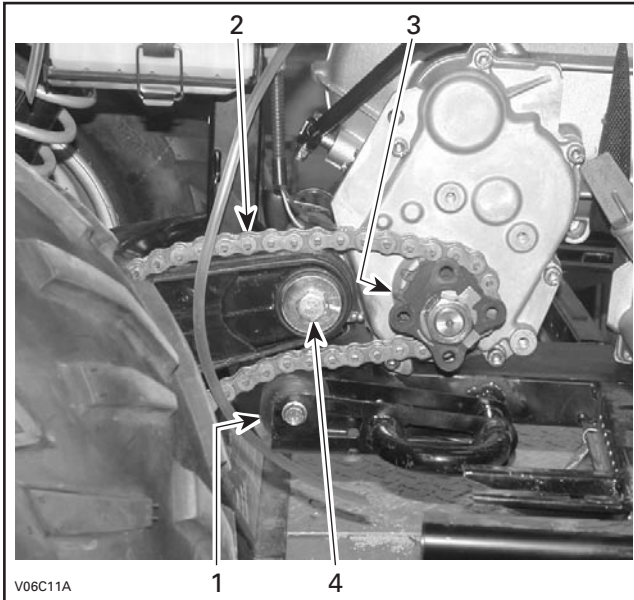
NOTE: Check local specialized supplier to buy an engine lifting strap.

Section 03 ENGINE

Subsection 04 (REMOVAL AND INSTALLATION)

Remove:

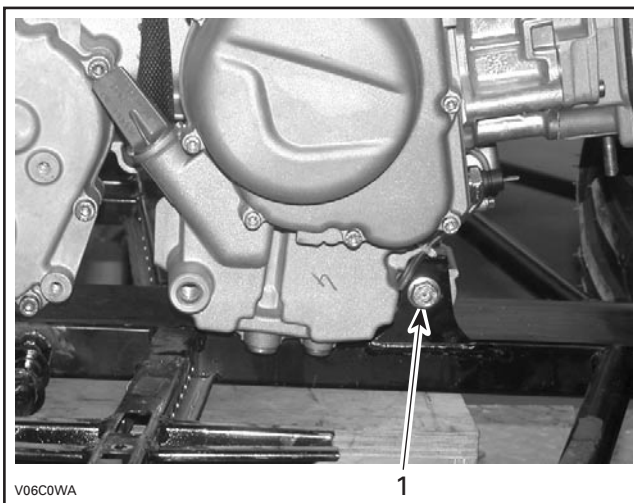
- chain roller
- drive chain from engine sprocket
- swing arm bolt



1. Chain roller
2. Drive chain
3. Engine sprocket
4. Swing arm bolt

NOTE: Move the swing arm back. Take care do not lose the O-rings (4).

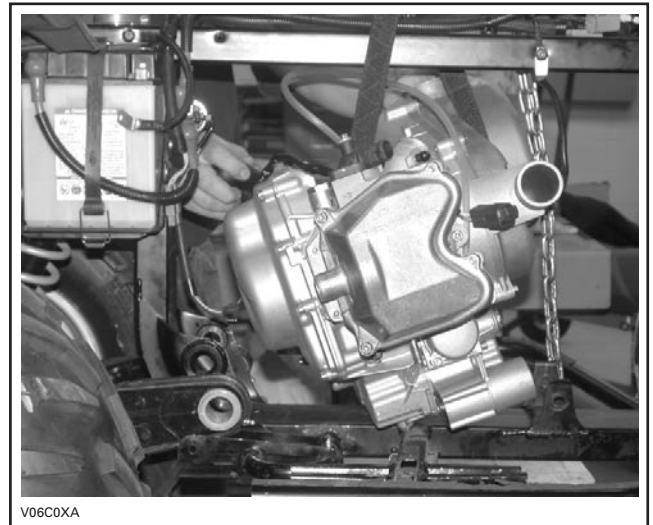
- front engine mounting bolt **no. 5**.



1. Front engine mounting bolt

Lift engine **no. 6** approximately 25 mm (1 in) to clear front mounting brackets.

Turn engine 90°, cylinder head towards right side of vehicle.



Rest engine onto frame and relocate engine lifting strap.

Relift engine and move away from vehicle.

Installation

Lift engine and move towards vehicle.

Rest engine onto frame and relocate lifting strap to opposite side of frame.

Start lifting engine up, turn engine 90°, cylinder head towards front of vehicle, until complete engine has entered frame area.

Lower engine into its place.

Install the front engine mounting bolt **no. 5**. Do not torque yet.

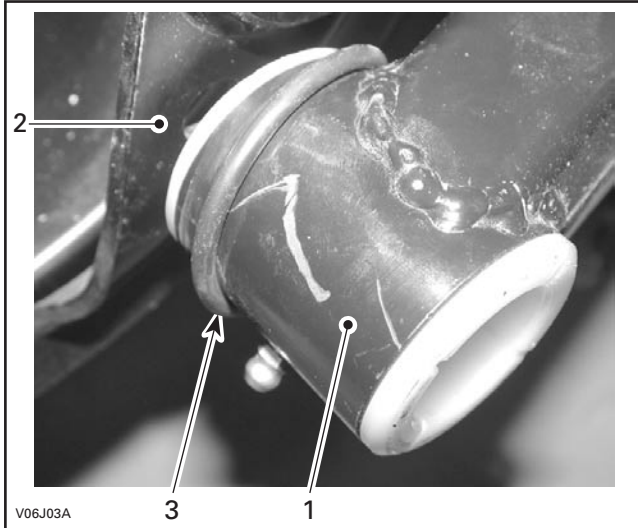
Section 03 ENGINE

Subsection 04 (REMOVAL AND INSTALLATION)

From bottom side, do the following:

Install inner bushings into swing arm. Apply Loc-tite anti-seize lubricant on bushing tapers.

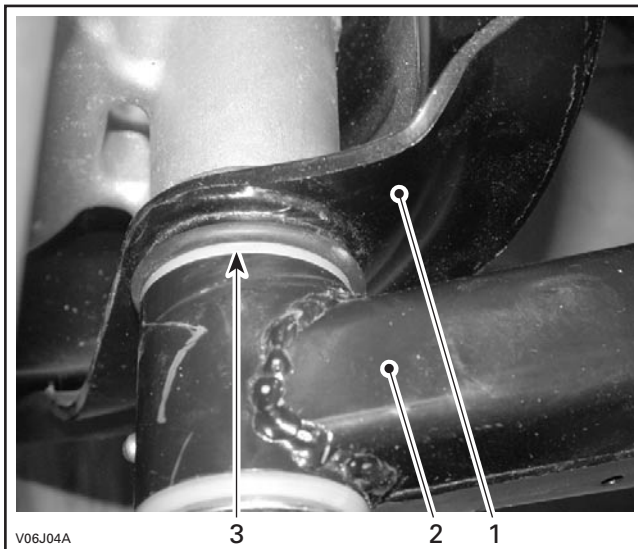
Position the swing arm at its place then install the swing arm bolt. Before installing the swing arm, place an O-ring on each inner side of swing arm.



1. Swing arm
2. Frame
3. O-ring

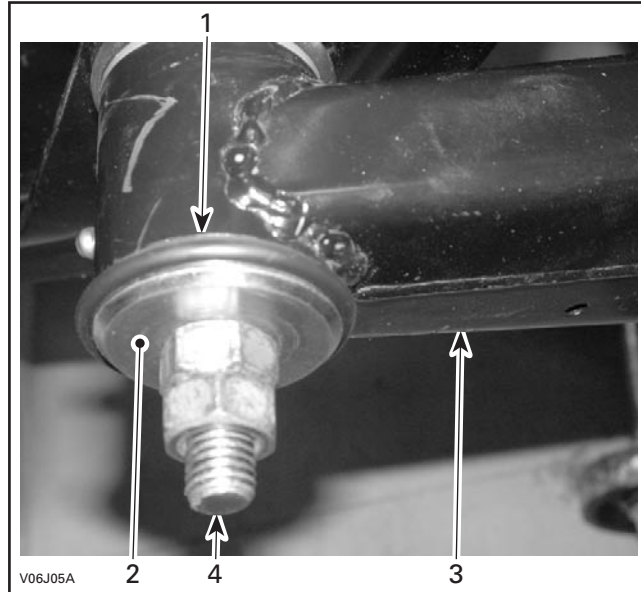
Install both nuts with washers at the end of swing arm bolt and torque them to 100 N•m (74 lbf•ft).

Install O-rings between frame and swing arm bushings on both side.



1. Frame
2. Swing arm
3. O-ring

Install O-rings between swing arm bushing and washers. One on each side.



SWING ARM BOLT SIDE SHOWN

1. O-ring
2. Washer
3. Swing arm
4. Swing arm bolt

Torque the front engine mounting bolt **no. 5**.

Remove lifting strap.

Install drive chain on engine sprocket.

From the top side, do the following:

Connect the magneto connector.

Install:

- starter
- air box and air intake hose
- fuel tank (refer to **FUEL CIRCUIT**)
- seat.

On left side of vehicle, install the following:

- exhaust pipe **no. 4**
(refer to EXHAUST PIPE further in this section)
- coolant engine inlet hose
- carburetor **no. 3**
- carburetor vent hose
- fuel line
- CVT hoses (inlet **no. 1** and outlet **no. 2**).

On right side of vehicle, do the following:

Connect:

- neutral and reverse switches
(the neutral switch wire is YELLOW/GREY)
- gearbox vent tube
- breather hose on valve cover
- coolant engine outlet hose
- oil pressure sensor
- water temperature sensor.

Install drive chain on rear axle sprocket.

Final Assembly Procedure

Confirm coolant and oil drain plugs are reinstalled and tight.

Fill cooling system. Refer to **COOLING SYSTEM**.

Fill engine with appropriate amount of oil and recommended viscosity.

Reconnect battery.

WARNING

Connect RED (+) cable then BLACK (-) cable.
Always connect RED (+) cable in first.

Before starting the engine, remove spark plug and ground it on engine or frame. Run starter about thirty seconds. This operation will activate the oil pump. Reinstall spark plug.

Place transmission lever **no. 7** on NEUTRAL position.

Start vehicle.

Set carburetor.

Stop engine and reverify coolant and oil levels are correct.

Adjust drive chain (refer to **REAR AXLE**).

Test drive to confirm all is working well.

ENGINE SPROCKET

Removal

Remove:

- RH footwell (refer to **BODY**)
- caliper and disc (refer to **BRAKES**).

Unhook the tab washer **no. 18**.

Unscrew the sprocket nut then remove the tab washer.

Slack the drive chain.

Remove the chain roller then remove the drive chain from engine sprocket.

Remove sprocket.

Inspection

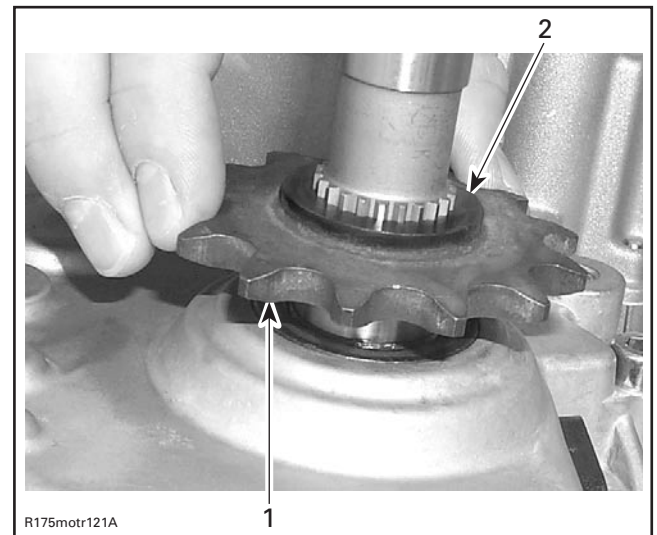
Check sprocket teeth for wear or other damages. Change sprocket if necessary.

CAUTION: Replace drive chain, engine sprocket and rear sprocket together to prevent rapid chain and sprockets wear. Install a new tab washer retaining ring each time the engine sprocket is removed.

Installation

The installation is the reverse of removal procedure.

CAUTION: Always install engine sprocket **no. 9** as per following illustration.



1. Engine sprocket
2. Flange mounted visible to the outside

Section 03 ENGINE

Subsection 04 (REMOVAL AND INSTALLATION)

FRONT ANTI-VIBRATION SYSTEM

Removal

NOTE: To remove the front anti-vibration bushings **no. 8**, the engine removal is necessary.

Insert a punch through a bushing **no. 8** and push the other bushing out of engine support.



Use punch to remove the other bushing.

CAUTION: Do not use a screwdriver when removing anti-vibration bushing.

Installation

Insert the anti-vibration bushings in engine support, one on each side.

EXHAUST PIPE

WARNING

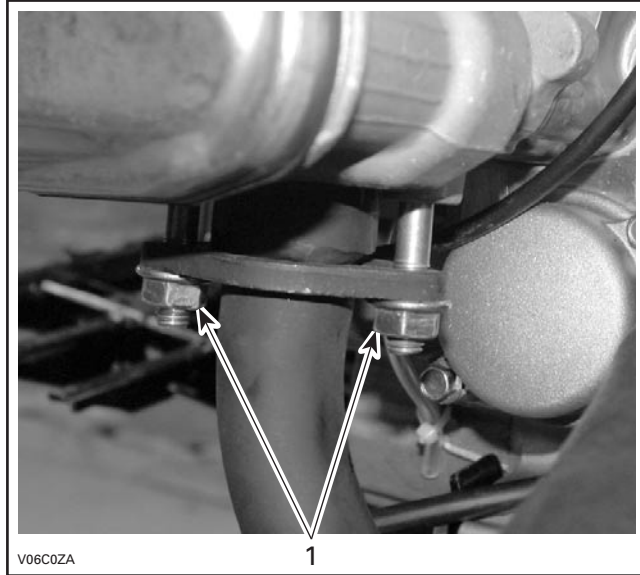
Never touch exhaust system components immediately after the engine has been run because these components are very hot.

Removal

Remove the LH footwell. Refer to **BODY**.

Remove clamp **no. 9** retaining exhaust pipe **no. 4** to muffler **no. 10**.

Unscrew exhaust pipe nuts **no. 12**.



1. Exhaust pipe nuts

Pull exhaust pipe forward then remove it from vehicle.

Remove the gasket **no. 13** in the exhaust port and the muffler gasket **no. 11**.

Installation

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

Using a new exhaust pipe gasket **no. 11**, install the exhaust pipe into muffler.

NOTE: Do not forget the exhaust pipe clamp **no. 9**.

On cylinder head side, install a new gasket **no. 13** on the exhaust pipe end then tighten the exhaust pipe on cylinder head.

Tighten exhaust pipe clamp **no. 9**.

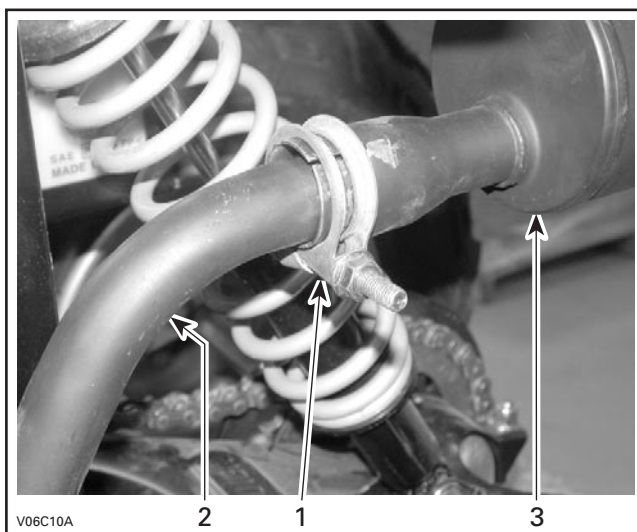
MUFFLER

Removal

Remove cotter pin **no. 14** and washer **no. 15**.

Unscrew the clamp **no. 9**.

Remove muffler **no. 10**.



- 1. Clamp
- 2. Exhaust pipe
- 3. Muffler

Inspection

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

Check if rubber bushings **no. 16** are brittle, hard, cracked or otherwise damaged, change them if necessary.

Installation

For the installation, reverse the removal procedure.

TRANSMISSION LEVER

Removal

Unscrew transmission lever retaining bolt **no. 17** and remove lever **no. 7**.

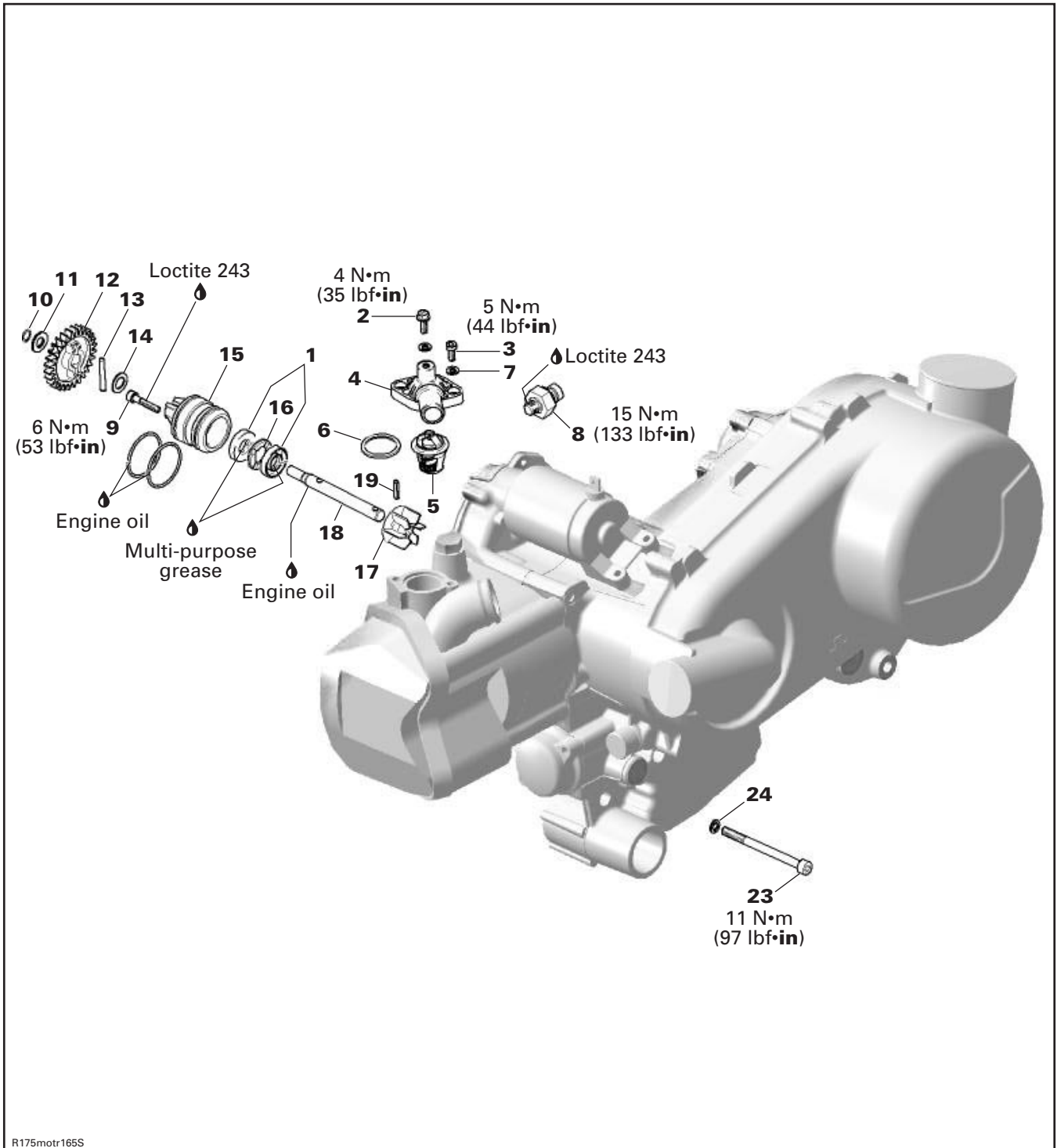
NOTE: Mark the lever position for easier installation.

Installation

For installation, reverse the removal procedure.

COOLING SYSTEM

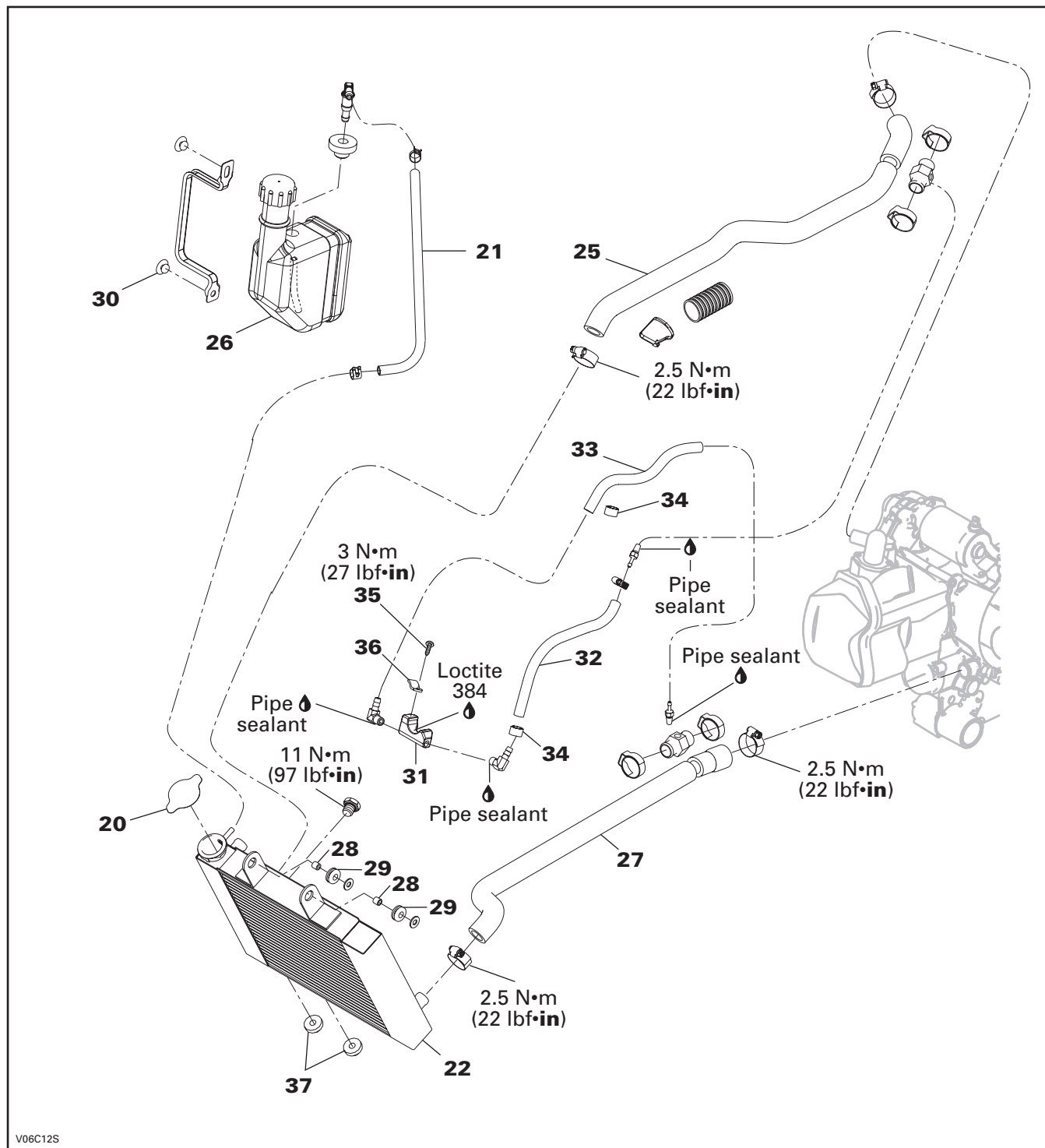
WATER PUMP



Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

COOLING SYSTEM



V06C12S

GENERAL

The engine removal is not necessary when working on water pump, thermostat or temperature switch.

WARNING

To prevent burning yourself, do not remove the radiator cap or loosen the engine drain plug if the engine is hot.

For installation, use the torque values and Loctite products from the exploded views. Clean threads before using Loctite when installing the screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

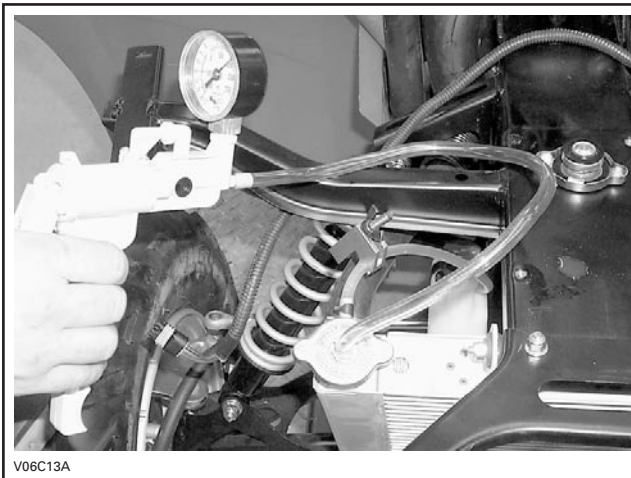
Locking devices (ex.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pin, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

COOLING SYSTEM LEAK TEST

Remove the front luggage rack. Refer to **BODY**.

Remove the radiator cap **no. 20**.

Install special plug (radiator cap) (P/N 529 021 400) and hose pincher (P/N 295 000 076) on overflow hose **no. 21**. Pressurize all system through coolant reservoir to 103 kPa (15 PSI).



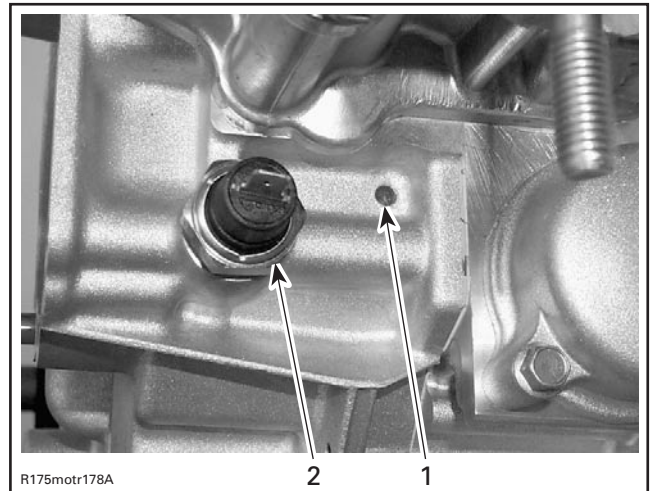
Check all hoses, radiator **no. 22** and cylinder/base for coolant leaks. Spray a soap/water solution and look for air bubbles.

INSPECTION

Check general condition of hoses and clamp tightness.

Check the weep hole if there is oil and/or water and replace oil seals in water pump housing if necessary (refer to WATER PUMP HOUSING further).

NOTE: Flowing water and/or oil out of the weep hole indicates non working oil seal(s) **no. 1**.



1. Weep hole
2. Oil pressure switch area

DRAINING THE SYSTEM

WARNING

Never drain or refill cooling system when engine is hot.

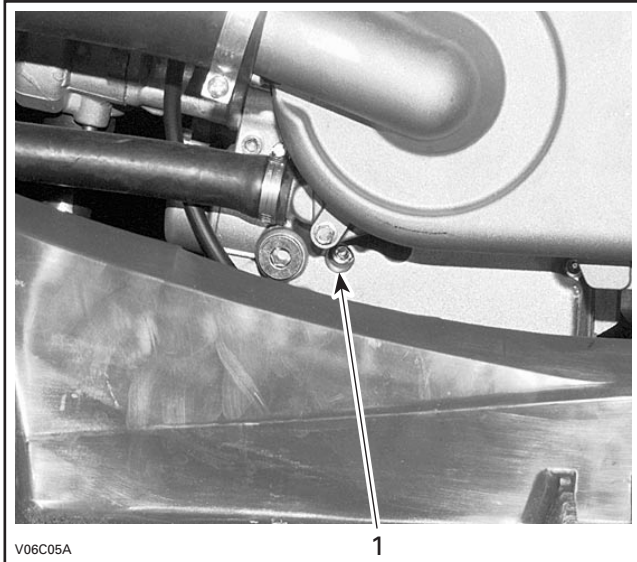
Remove the front luggage rack. Refer to **BODY**.

Remove the radiator cap.

Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

To drain cooling system, partially unscrew cooling drain plug **no. 23** on the left side of engine and drain the coolant into a suitable container.



1. Cooling drain plug

CAUTION: If the drain plug is removed completely, pay attention to the gasket ring **no. 24**.

When cooling system is drained completely, screw the cooling drain plug.

COOLANT REPLACEMENT

Recommended Coolant

Use a blend of 50% antifreeze with 50% water. Do not reinstall pressure cap.

CAUTION: To prevent rust formation or freezing condition, always replenish the system with 50% antifreeze and 50% water. Pure antifreeze without water freezes. Always use ethylene glycol antifreeze containing corrosion inhibitors specifically recommended for aluminum engines.

System Capacity

Refer to **TECHNICAL DATA**.

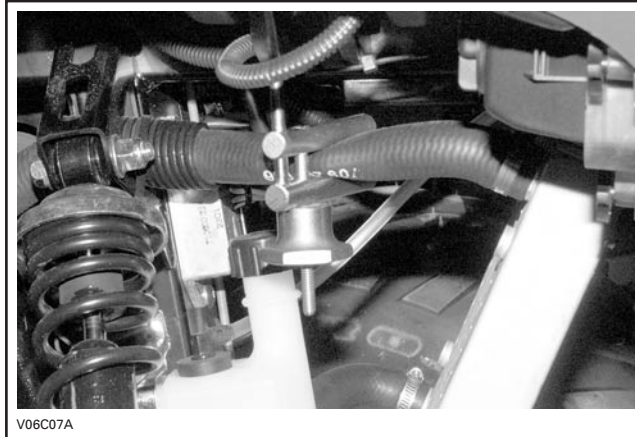
Coolant Replacement Procedure

WARNING

To prevent burning yourself do not remove the radiator cap or loosen the engine drain plug if the engine is hot.

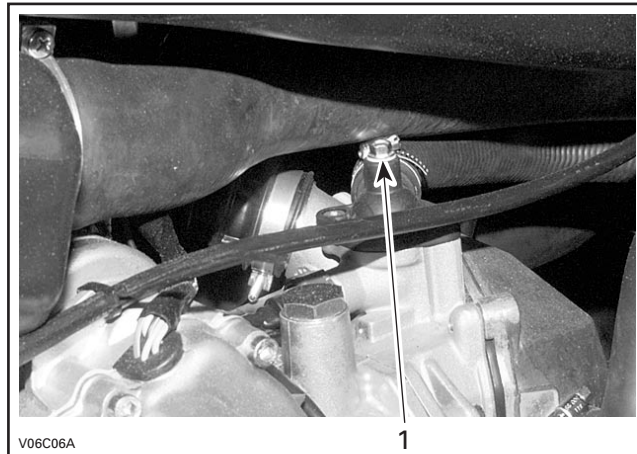
Drain the system completely (see procedure above).

Pinch engine outlet hose **no. 25** between radiator and thermostat housing with a large hose pincher (P/N 529 032 500).



Unscrew bleeding screw on top of thermostat housing.

NOTE: Do not remove the bleeding screw completely.



1. Bleeding screw

With vehicle on a flat surface, engine cold, refill radiator **no. 22**. When the coolant comes out by the thermostat housing hole, install the bleeding screw and remove the hose pincher.

NOTE: If the bleeding screw has been removed completely, do not forget gasket ring when bleeding screw is installed. Gently install screw in the same threads. If the bleeding screw is not removed completely, unscrew the bleeding screw a half turn before screw on.

Refill coolant tank **no. 26** up to MIN. level mark.

Run engine at idle with the radiator cap off. Slowly add coolant if necessary.

At this point, wait until engine reaches normal operating temperature. Depress the throttle lever two or three times; then add coolant if required.

Install the radiator cap. Inspect all connections for leaks and recheck coolant in the reservoir.

Once year, check coolant concentration (freezing point) with proper tester.

THERMOSTAT

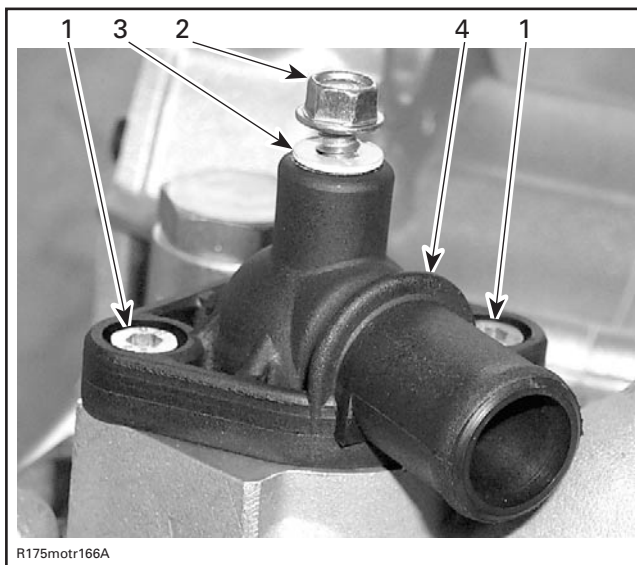
The thermostat is a single action type.

Removal

NOTE: The thermostat is located on the top of cylinder head, on intake side.

Remove:

- bleeding screw **no. 2** on thermostat cover (**only turn loose**)
- thermostat housing screws **no. 3** and pull thermostat cover **no. 4**



1. 2 screws
2. Bleeding screw
3. Gasket
4. Thermostat housing

- thermostat with gasket out of the hole.



1. Thermostat with gasket

Test

To check thermostat, put in water and heat water. Thermostat should open when water temperature reaches 65°C (149°F).

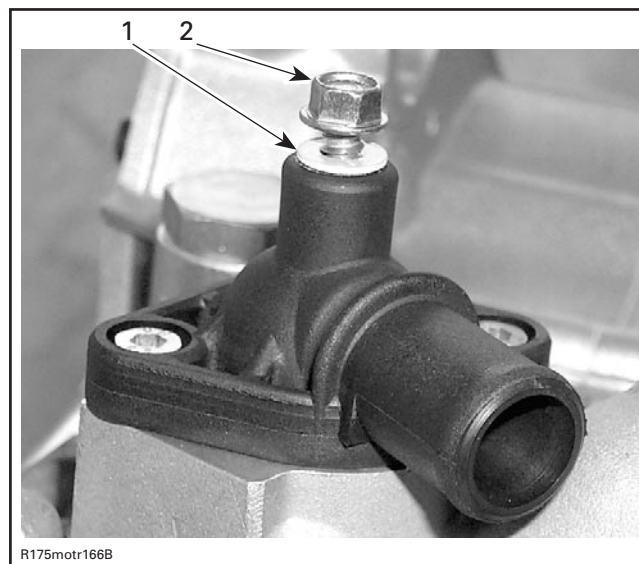
Check if the gasket is not brittle, hard or damaged. If so, replace thermostat and gasket.

Installation

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

NOTE: Replace gasket **no. 6** if necessary.

Place bleeding screw then torque to 4 N•m (35 lbf•in).



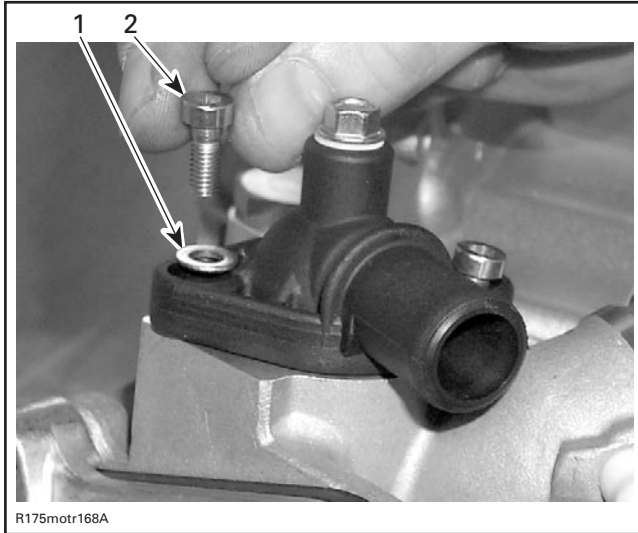
1. Gasket
2. Bleeding screw

Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

Install the thermostat cover then torque screws to 5 N•m (44 lbf•in).

NOTE: Do not forget to place shim no. 7.



- 1. 2 shims
- 2. 2 screws

Check coolant level in radiator and coolant tank and top up if necessary.

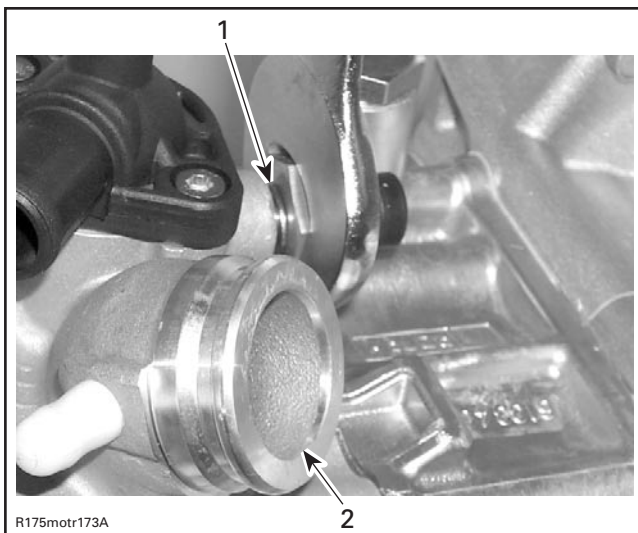
WATER TEMPERATURE SWITCH

Removal

NOTE: The temperature switch is located on the top of cylinder head, on intake side.

Remove:

- wire from temperature switch
- water temperature switch no. 8.



- 1. Water temperature switch
- 2. Intake port

NOTE: Cylinder head has a taper thread.

Test

To check temperature switch, put in water and heat water.

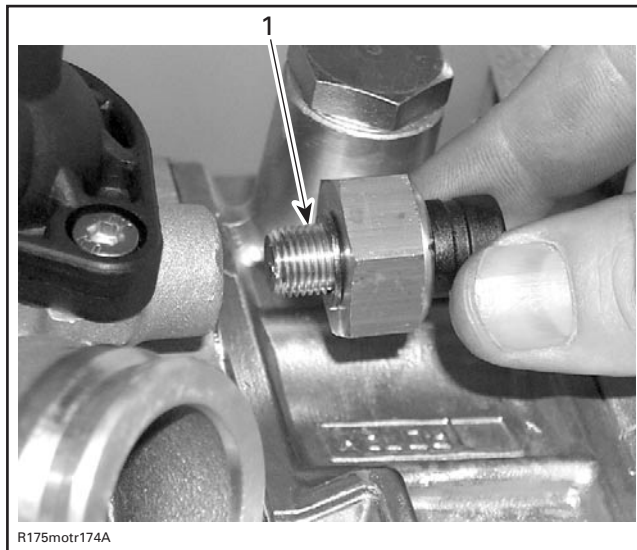
Temperature switch should operate when water temperature reaches 115°C (239°F).

Replace temperature switch if necessary.

Installation

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

Do not apply Loctite 243 in the front area of the switch.



- 1. Loctite area

WATER PUMP HOUSING

It is located on the engine MAG side. Not necessary to remove rotor from crankshaft.

Removal

Drain cooling system and engine oil (refer to LUBRICATION SYSTEM).

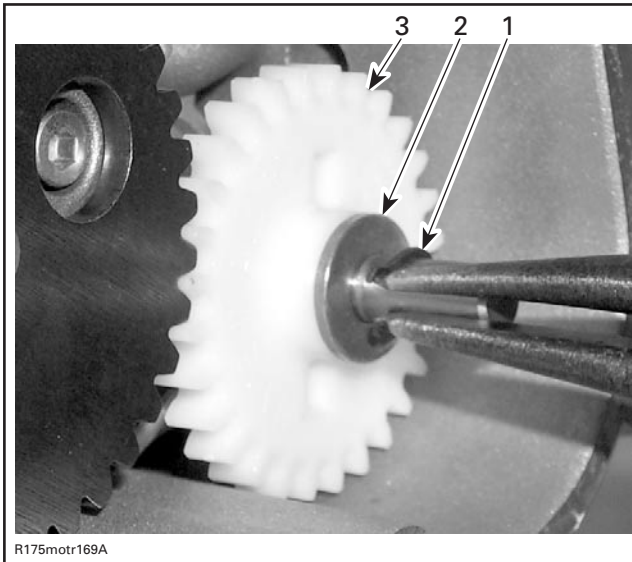
Remove:

- RH footwell (refer to BODY)
- drain screw (refer to DRAINING THE SYSTEM above)
- magneto cover (refer to MAGNETO SYSTEM)

Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

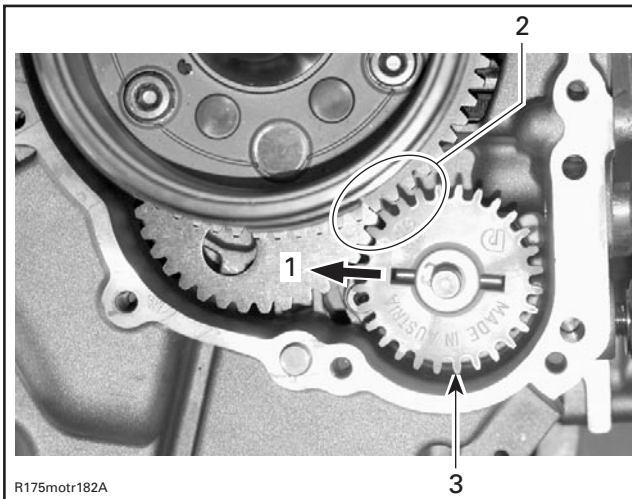
- retaining ring no. 10 (discard), shim no. 11 and water pump gear no. 12



1. Retaining ring
2. Shim
3. Water pump gear

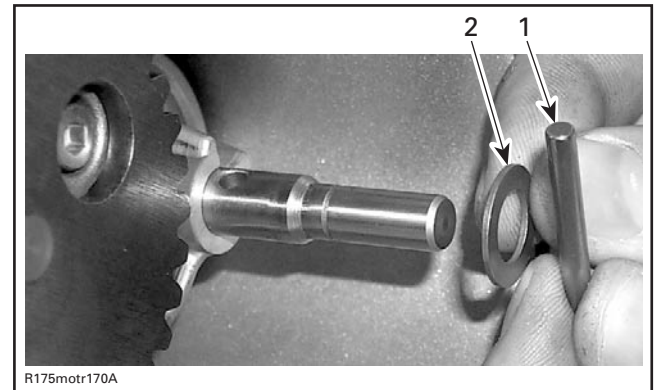
CAUTION: To lift water pump gear turn shaft no. 18 that needle pin points to oil pump shaft.

NOTE: Do not collide splines of water pump gear no. 12 with splines of sprag clutch gear.



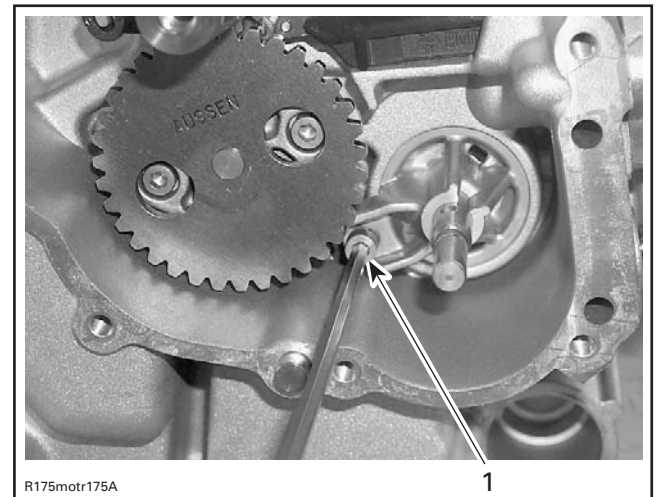
1. Direction of needle pin
2. Possible collision of water pump gear and sprag clutch gear
3. Place to lift water pump gear

- needle pin no. 13 and thrust washer no. 14



1. Needle pin
2. Thrust washer

- screw no. 9 retaining water pump housing no. 15



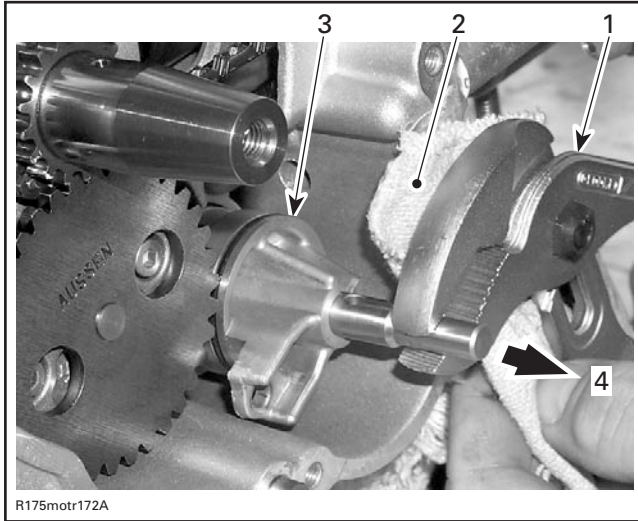
1. Allen socket screw

- water pump housing no. 15

Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

NOTE: Using pliers, pull the water pump housing out of crankcase. See the following illustration.



1. Pliers
2. Rag to protect split surface
3. Water pump housing
4. Lifting direction

– water pump shaft
(refer to WATER PUMP SHAFT below).

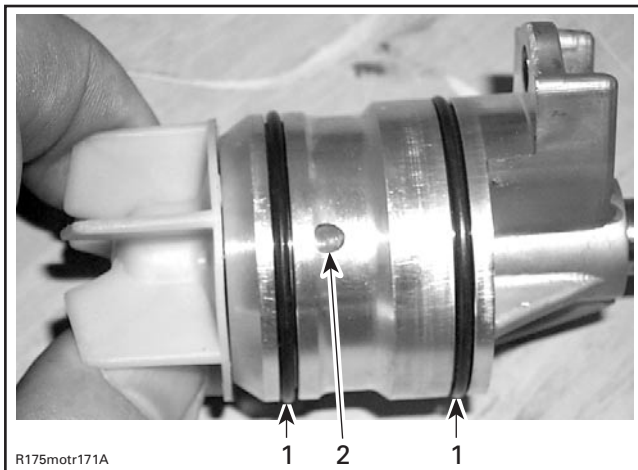
Replace oil seal in water pump housing if necessary.

Extract oil seal **no. 1** from inside of water pump housing with a screwdriver.

CAUTION: Be careful not to damage the surface of the seal bore in water pump housing.

Inspection

Check if O-rings are brittle, hard or damaged and replace if necessary.



1. 2 O-rings
2. Weep hole

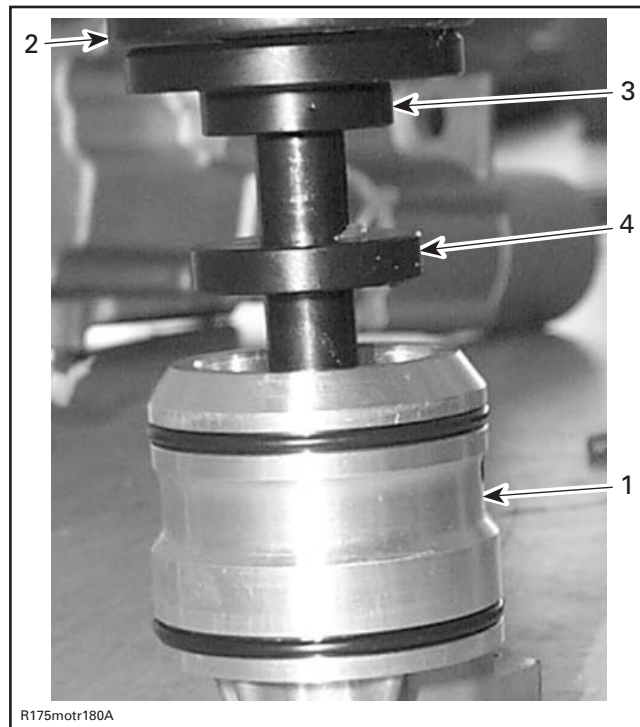
Inspect water pump gear for wear and damage on the snap mechanism to the needle pin. Replace if necessary.

Installation

The installation is the opposite of the removal procedure.

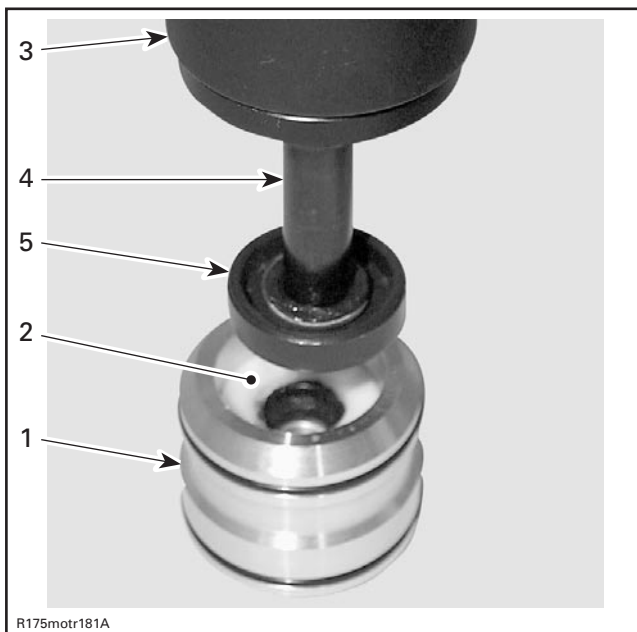
Push oil seals **no. 1** in place by using the handle for insertion jig (P/N 420 877 650) and the oil seal pusher (P/N 529 035 849) as per following procedure:

- Install inner oil seal **no. 1** by using spacer on the oil seal pusher. The sealing lip has to point towards water pump gear.



1. Water pump housing
2. Handle for insertion jig
3. Oil seal pusher
4. Spacer

- Place distance ring no. 16.
- Push outer oil seal no. 1. Sealing lip has to point towards the impeller.



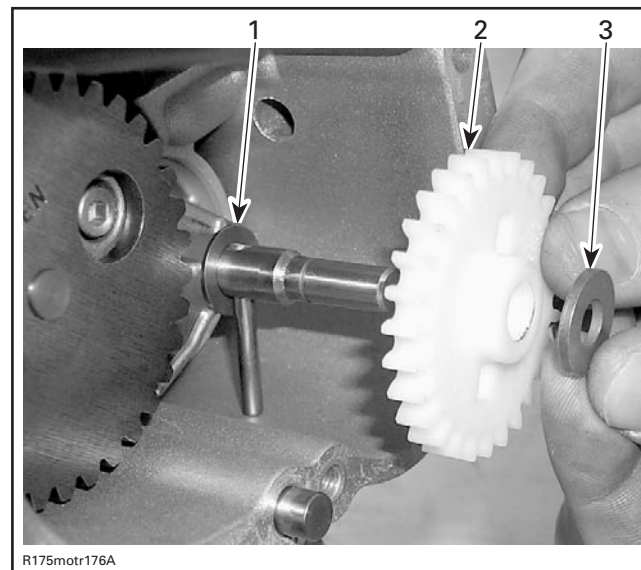
1. Water pump housing
2. Distance ring
3. Handle for insertion jig
4. Oil seal pusher without spacer
5. Oil seal with sealing lip to the outside

NOTE: Apply multi-purpose grease in water pump shaft bore.

CAUTION: To prevent leaking, take care that the O-rings are exactly in grooves when you reinstall the water pump housing.

Install water pump gear.

CAUTION: Do not forget to place shims no. 11 and no. 14.



1. Shim
2. Water pump gear
3. Shim

Install a new retaining ring.

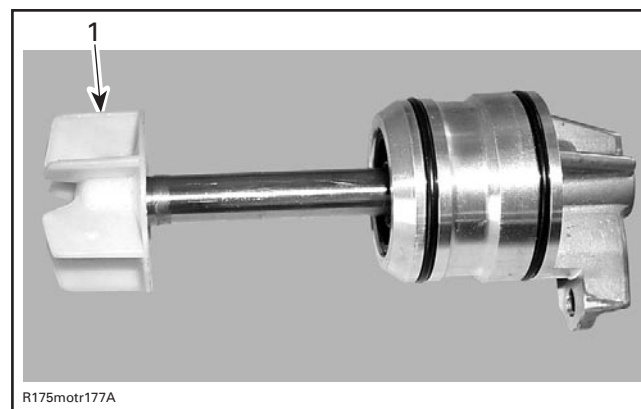
CAUTION: Never use the retaining ring a second time.

WATER PUMP IMPELLER

Removal

Remove:

- water pump housing no. 15 (refer to WATER PUMP HOUSING above)
- impeller no. 17 together with water pump shaft no. 18.



1. Impeller with water pump shaft

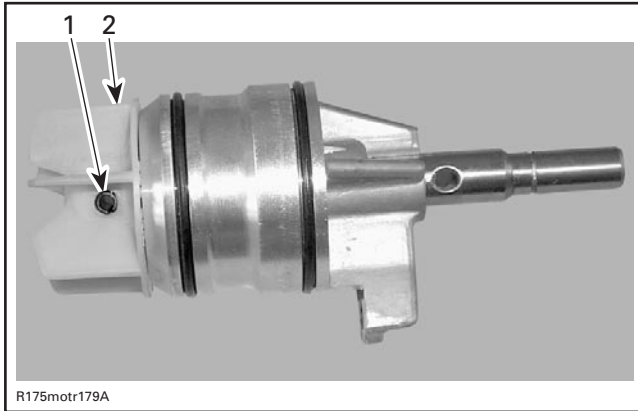
Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

Inspection

Check impeller for cracks, fitting on water pump shaft or other damage. Replace impeller if damaged.

NOTE: Use appropriate punch to remove spring pin no. 19.



- 1. Spring pin
- 2. Impeller

Installation

The installation is the opposite of the removal procedure. Pay attention to the following details.

CAUTION: Be careful not to damage impeller wings during installation.

NOTE: Fix water pump shaft in a vise and use the vise jaw protectors to avoid damaging the water pump shaft no. 18.

WATER PUMP SHAFT

Removal

Remove:

- water pump housing no. 15 (refer to WATER PUMP HOUSING above)
- impeller no. 17 together with water pump shaft no. 18.

Inspection

Water pump shaft must rotate freely. Otherwise, replace it.

NOTE: When removing water pump shaft, always replace together retaining ring, oil seals, water pump shaft with new parts.

Installation

For installation, reverse the removal procedure.

PRESSURE CAP

Check if radiator cap no. 20 pressurizes the system. If not, install a new 110 kPa (16 PSI) cap (do not exceed this pressure).

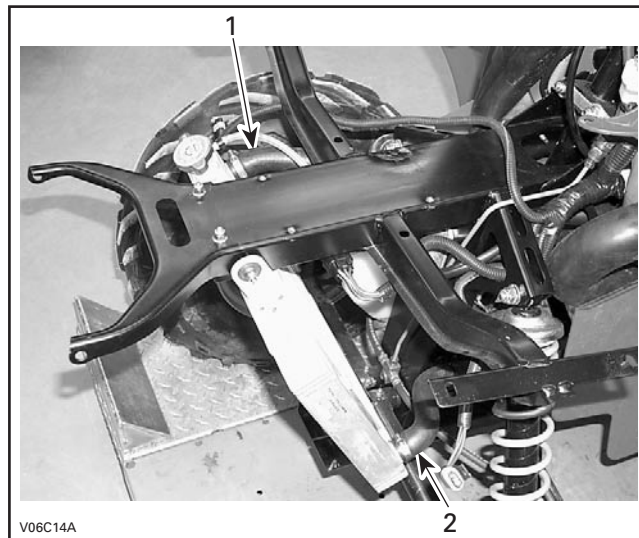
RADIATOR

Removal

Drain cooling system.

Remove:

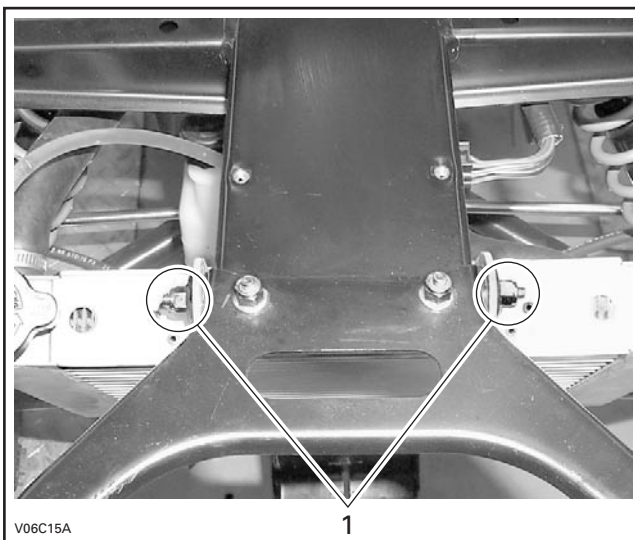
- front luggage rack (refer to BODY)
- engine inlet no. 27 and engine outlet no. 25 hoses



- 1. Engine outlet hose
- 2. Engine inlet hose

- overflow hose no. 21

- mounting bolts on the top of radiator.



1. Radiator mounting bolts

NOTE: Take care do not lose the bushings **no. 28** located in the grommets **no. 29**.

Inspection

Check radiator air passage for clogging or damage. Remove insects, mud or other obstructions with compressed air or low pressure water. Check for any coolant leakage from radiator and hoses.

Installation

For installation, reverse the removal procedure. Pay attention to the following detail.

Install the both grommets **no. 37** under radiator.

Fill up the radiator. Refer, at the beginning of this section, to the COOLANT REPLACEMENT PROCEDURE.

COOLANT TANK

Overflow Coolant Tank

The coolant expands as the temperature (up to 100 - 110°C (212 - 230°F)) and pressure rise in the system. If the limiting system working pressure cap is reached 110 kPa (16 PSI), the pressure relief valve in the pressure cap is lifted from its seat and allows coolant to flow through the overflow hose into the overflow coolant tank.

Removal

Remove overflow hose **no. 21**.

Using a 3/16 drill, remove the rivets retaining the coolant tank support **no. 30** to the frame.

Remove the coolant tank **no. 26**.

Empty coolant tank.

Installation

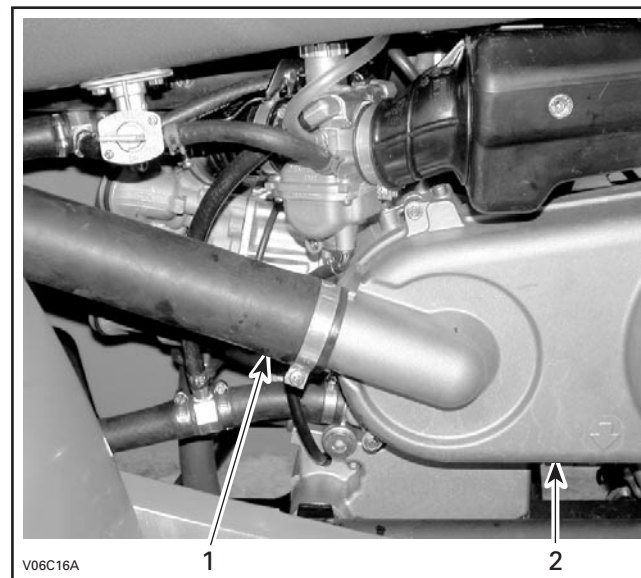
The installation is the reverse of the removal procedure.

BLOCK HEATER

The block heater **no. 31** is located on the carburetor body.

Removal

Remove the CVT air intake hose.

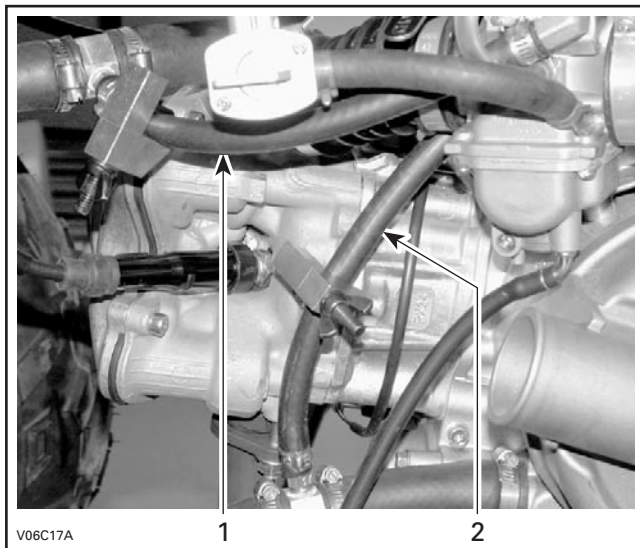


1. CVT air intake hose
2. CVT cover

Section 03 ENGINE

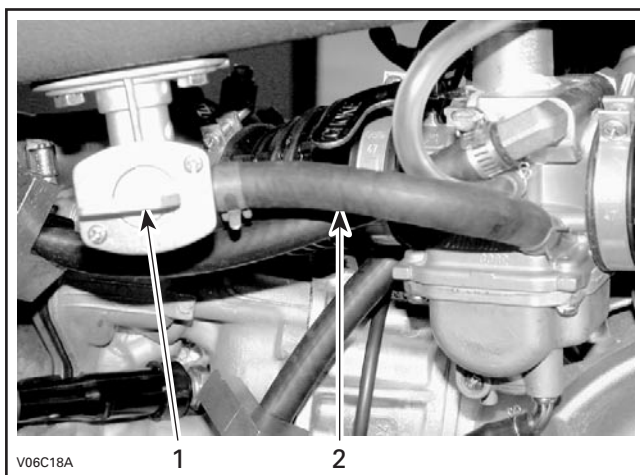
Subsection 05 (COOLING SYSTEM)

Install hose pinchers (P/N 295 000 076) on inlet hose no. 32 and outlet hose no. 33 of block heater.



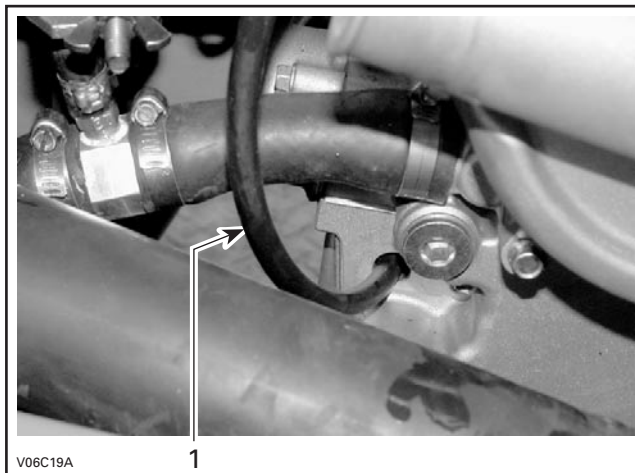
1. Inlet hose
2. Outlet hose

Turn fuel valve OFF then unplug the fuel line.



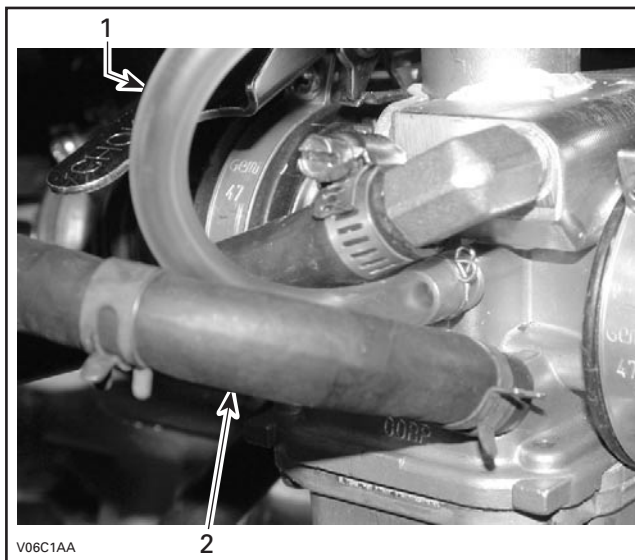
1. Fuel valve on OFF position
2. Fuel line

Come out the carburetor overflow drain hose from its location.



1. Carburetor overflow drain hose

Unplug the carburetor vent hose.

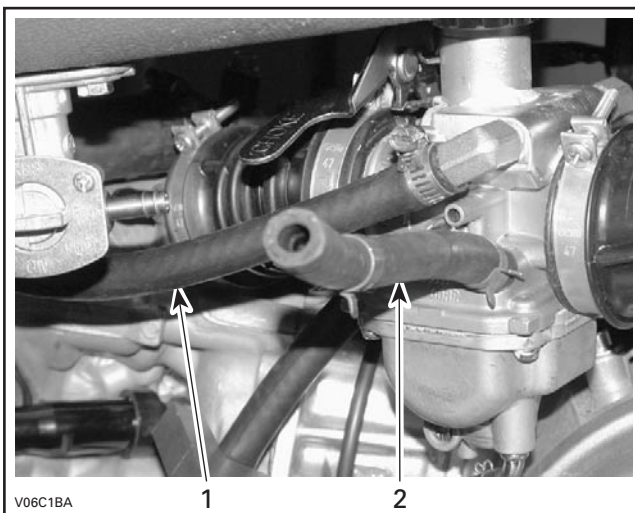


1. Carburetor vent hose
2. Fuel line

Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

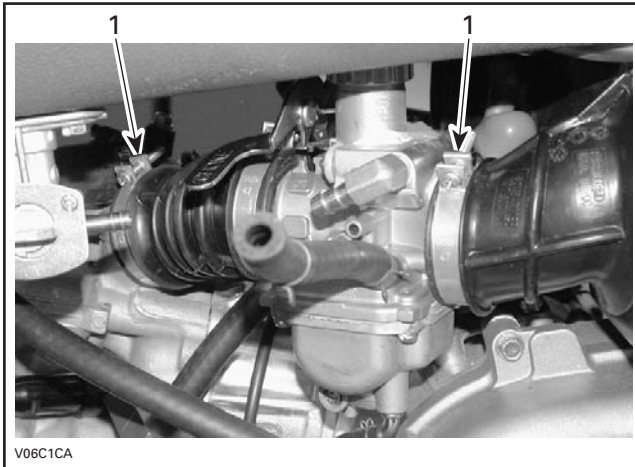
Remove the block heater outlet hose no. 33.



1. Block heater outlet hose
2. Fuel line

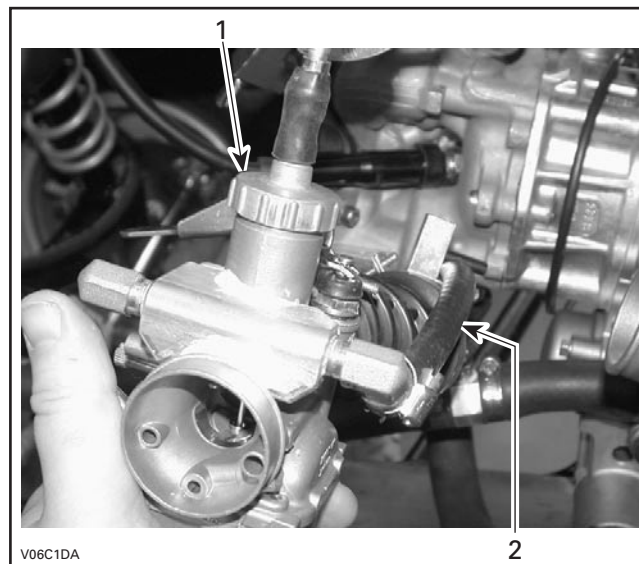
NOTE: Catch any coolant spillage.

Unscrew the clamps retaining the carburetor to the engine and to the air box. Free carburetor from the intake adaptor.



1. Unscrew these clamps

Unscrew the valve piston assembly then remove the block heater inlet hose no. 32.



1. Valve piston assembly
2. Block heater inlet hose

Use the following procedure if the block heater and carburetor separation is necessary (ex: block heater or carburetor replacement).

With the carburetor removed, unscrew the screw no. 35 then remove the block heater lock no. 36.



Section 03 ENGINE

Subsection 05 (COOLING SYSTEM)

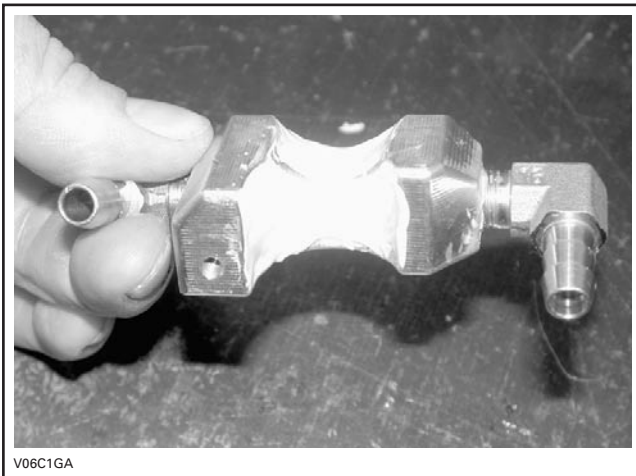
Using a flat screwdriver, gently pry the block heater until the glue is braked. Only use the location showed in the following illustration.



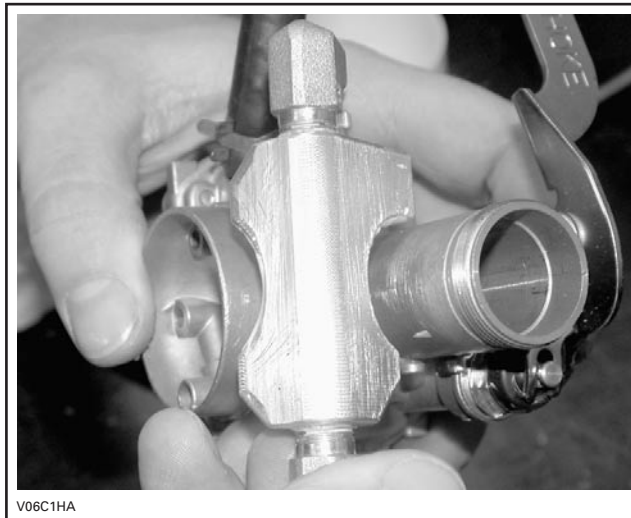
Installation

Remove all residue of glue on the block heater or on the carburetor body.

Apply 2 ml (.06 oz) of Loctite 384 (P/N 293 800 099) on the block heater. Spread the Loctite 384 everywhere on the contact surface of the block heater.



Install the block heater in accordance with the following illustration.



Install the block heater lock and torque screw.

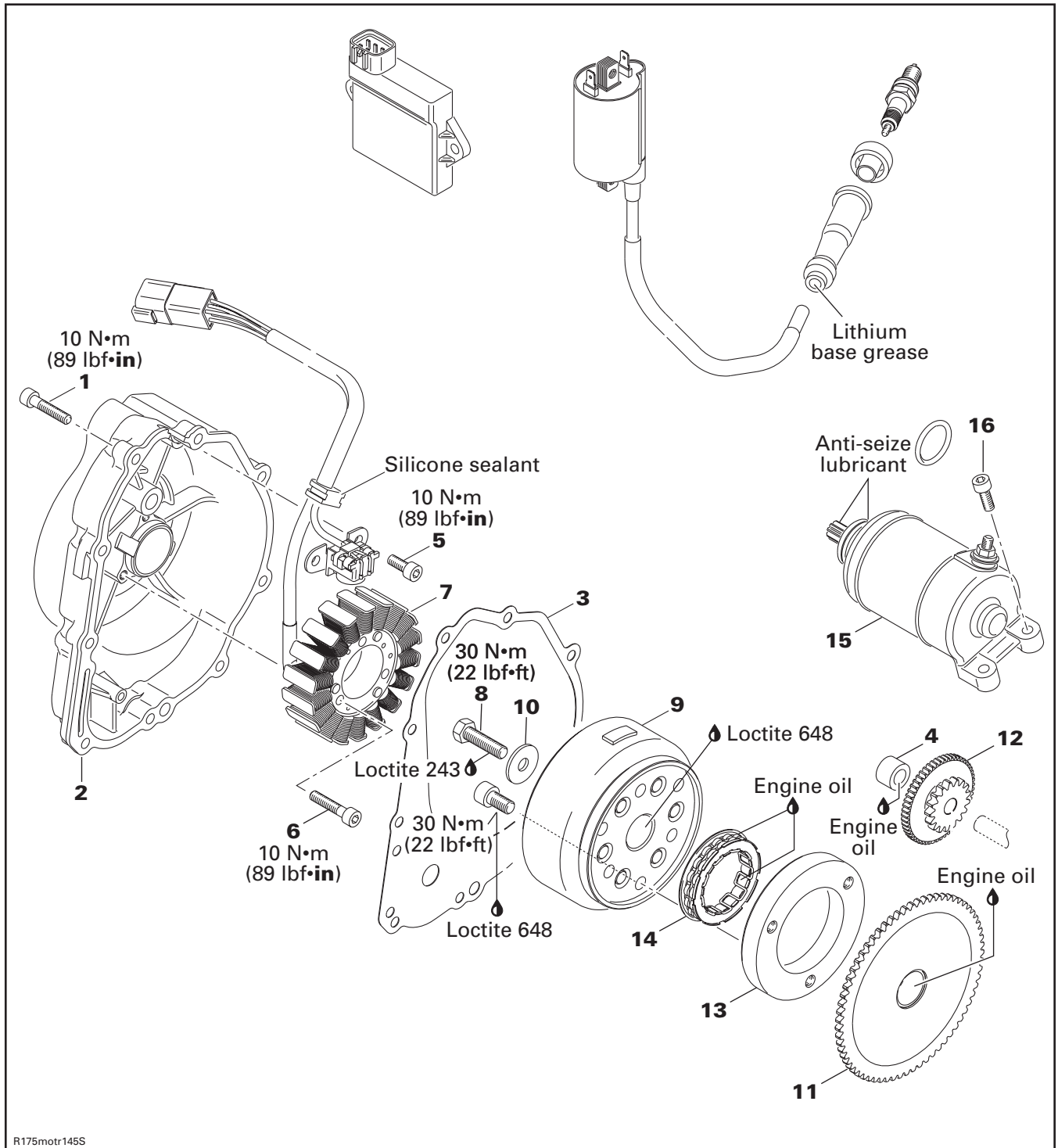
Reinstall carburetor. Reverse the removal procedure.

NOTE: Leave the Loctite 384 dries before installing the carburetor on the vehicle. Refer to manufacturer instructions.

Check coolant level and refill if necessary.

MAGNETO SYSTEM

MAGNETO SYSTEM



Section 03 ENGINE

Subsection 06 (MAGNETO SYSTEM)

GENERAL

Always disconnect battery.

WARNING

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

Always perform the electric tests before removing or installing whatever component.

For installation, use the torque values and Loctite products from the exploded views. Clean threads before using Loctite when installing the screws.

MAGNETO COVER

Removal

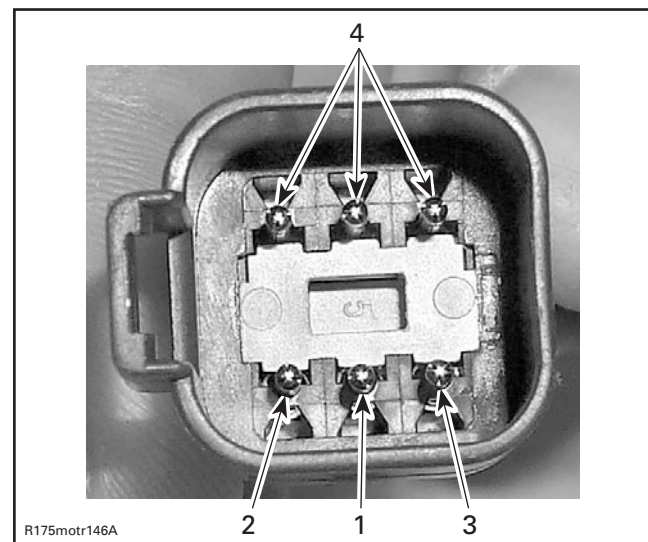
Drain engine oil (refer to LUBRICATION SYSTEM, see OIL CHANGE).

NOTE: No need to drain cooling system.

Remove the RH footwell and the seat (refer to BODY).

Lift up the fuel tank (refer to FUEL CIRCUIT).

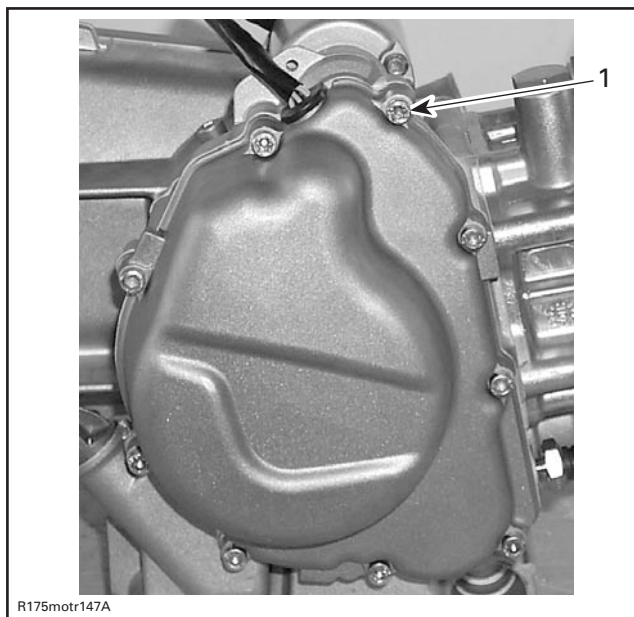
Unplug magneto connector from wire harness.



WIRES LOCATION IN THE CONNECTOR

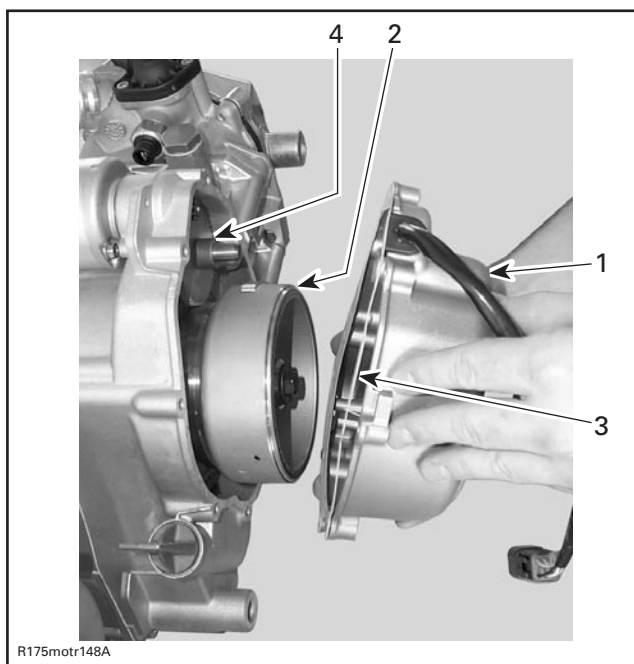
1. Wire WHITE/YELLOW for trigger coil
2. Wire BLUE/YELLOW for trigger coil
3. Wire BLACK/YELLOW for ground
4. Wires YELLOW for charge

Remove magneto cover screws no. 1.



1. Magneto cover screws

Withdraw magneto cover no. 2.



1. Magneto cover
2. Rotor
3. Gasket
4. Distance sleeve

CAUTION: Be careful not to lose the distance sleeve located on the cylindrical pin on the MAG side.

Inspection

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

Installation

Remove all residues on mating surfaces. The mating surfaces must be cleaned of any contaminations.

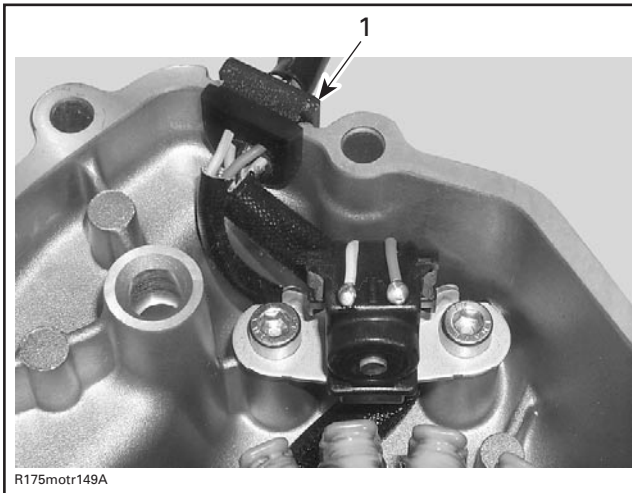
NOTE: Clean all metal component in a non-ferrous metal cleaner. Use Bombardier gasket remover (P/N 413 708 500), or suitable equivalent.

WARNING

Wear safety glasses and work in a well ventilated area when working with strong chemical products. Also wear suitable non-absorbent gloves to protect your hands.

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

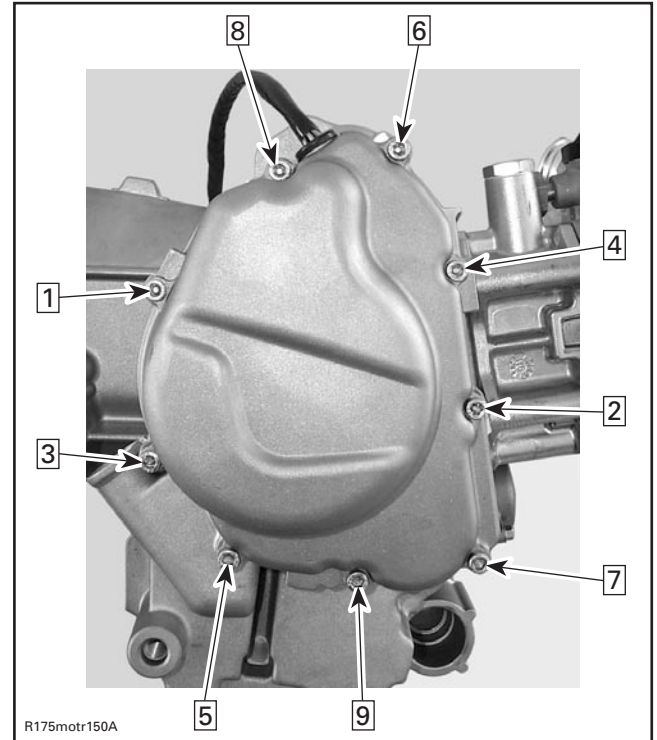
IMPORTANT: Apply small amount of silicon on mating surface in grommet area before placing the gasket.



1. Grommet

Install a new gasket on the magneto cover.

Tightening sequence for screws on magneto cover is as per following illustration.



STATOR AND TRIGGER COIL

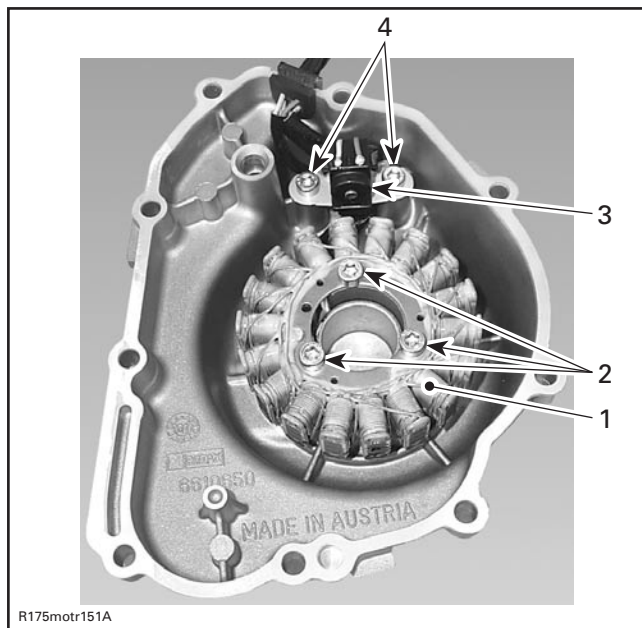
Removal

Remove:

- RH footwell (refer to **BODY**)
- magneto housing cover no. 2
- screws nos. 5 and 6
- stator with trigger coil no. 7.

Section 03 ENGINE

Subsection 06 (MAGNETO SYSTEM)



1. Stator
2. Stator screws
3. Trigger coil
4. Trigger coil screws

Inspection

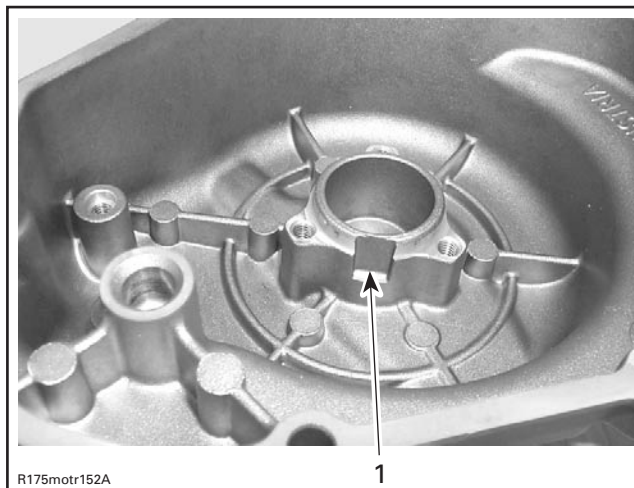
Check stator and trigger coil condition. If damaged replace the faulty part.

For electrical inspection, refer to **CHARGING SYSTEM** for the stator and **IGNITION SYSTEM** for the trigger coil.

Installation

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

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

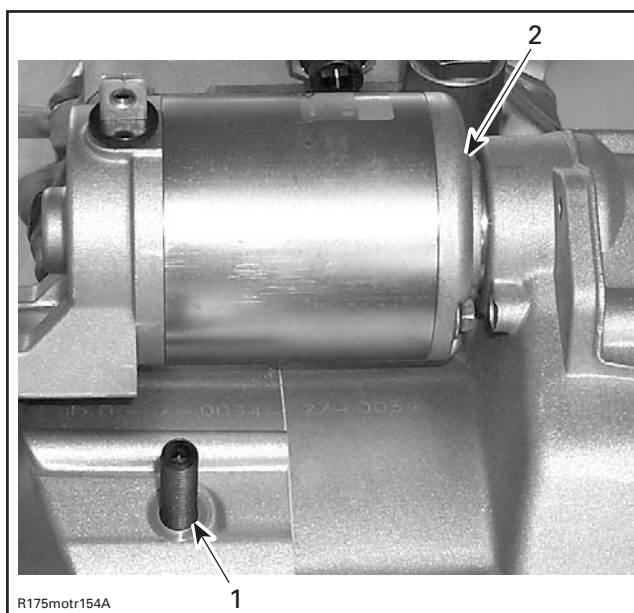


1. Notch for stator

ROTOR

Removal

Lock crankshaft with locking bolt (P/N 529 035 617). Refer to **CRANKSHAFT/BALANCER SHAFT**.



1. Crankshaft locking bolt (P/N 529 035 617)
2. Starter

Section 03 ENGINE

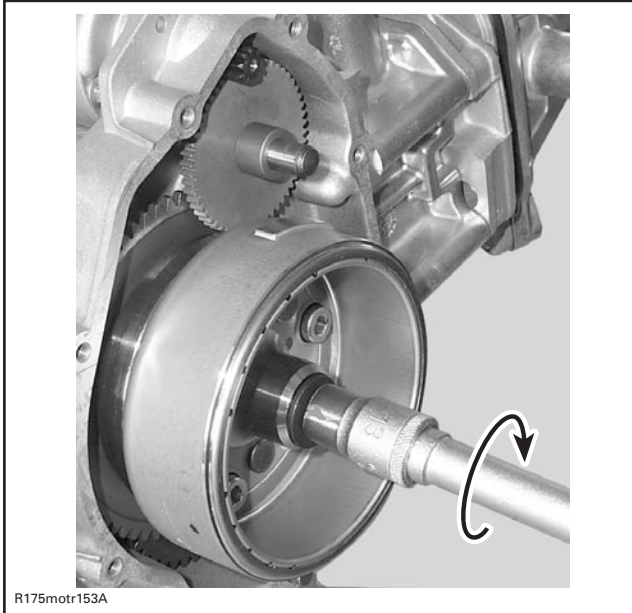
Subsection 06 (MAGNETO SYSTEM)

Remove the RH footwell and the seat (refer to **BODY**).

Lift up the fuel tank (refer to **FUEL CIRCUIT**).

Remove:

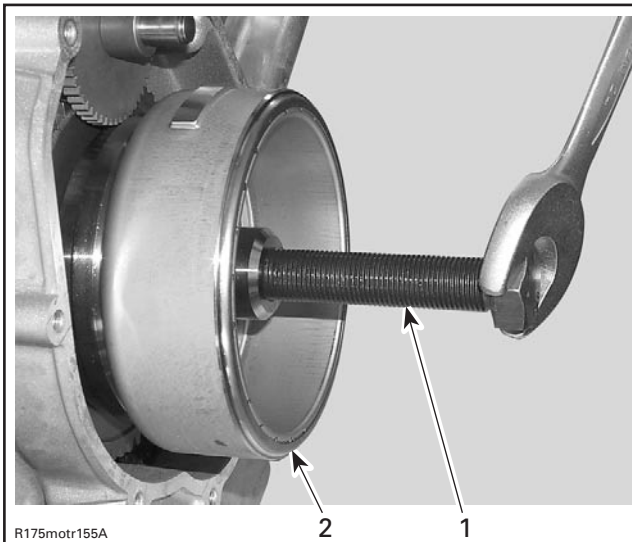
- starter **no. 15** (refer to **STARTER** further)
- magneto housing cover **no. 2**
- screw **no. 8** retaining rotor **no. 9**



TURN CLOCKWISE

- thrust washer **no. 10**.

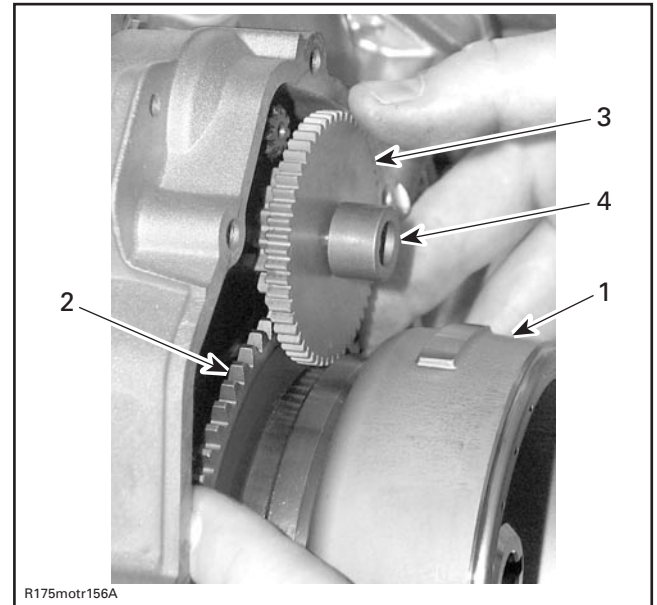
Install bolt included with the magneto puller (P/N 529 035 748), then remove rotor.



1. Magneto puller bolt
2. Rotor

Remove:

- rotor **no. 9** together with sprag clutch gear **no. 11**, distance sleeve **no. 4** and starter intermediate gear **no. 12**



1. Rotor
2. Sprag clutch gear
3. Starter intermediate gear
4. Distance sleeve

- sprag clutch (refer to **SPRAG CLUTCH** further).

Inspection

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

Installation

For installation, reverse the removal procedure.

However, pay attention to the following.

CAUTION: When installing the rotor, take care that the taper is clean and free of grease.

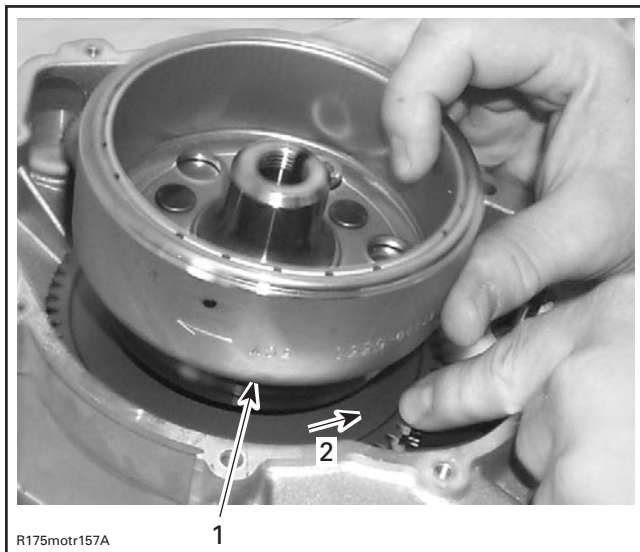
Install the sprag clutch gear **no. 11** in the housing then, install the starter intermediate gear **no. 12**.

Put rotor in place that groove is aligned with woodruff key position on crankshaft.

Section 03 ENGINE

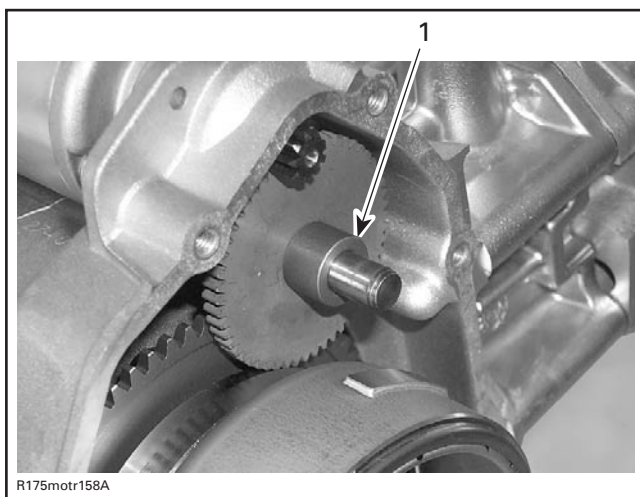
Subsection 06 (MAGNETO SYSTEM)

Turn sprag clutch gear counterclockwise for easily fit in the sprag clutch rollers.



1. Rotor
2. Direction of rotation from sprag clutch gear

Install the distance sleeve no. 4.



1. Distance sleeve

SPRAG CLUTCH

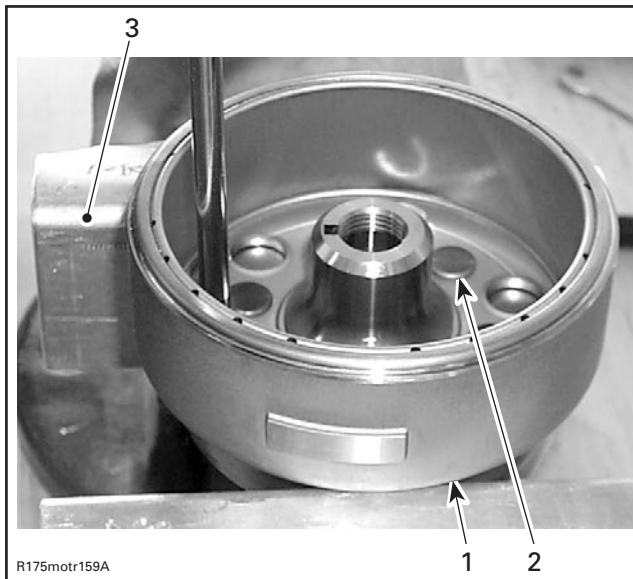
Removal

Remove:

- magneto cover
(refer to MAGNETO COVER above)
- rotor (refer to ROTOR above).

Place the sprag clutch housing no. 13 in vise then remove screws retaining the sprag clutch housing to the rotor.

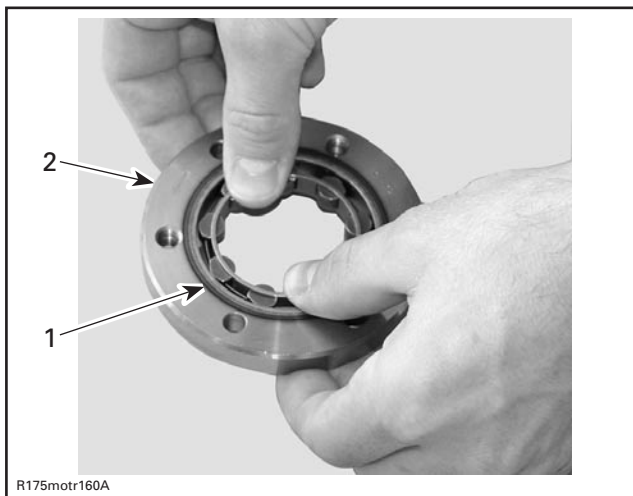
CAUTION: Use protector on the vise jaws to avoid damaging the sprag clutch housing.



1. Rotor
2. 3 screws M8
3. Vise jaw protectors

Separate sprag clutch housing and rotor.

Push the sprag clutch no. 14 out of sprag clutch housing no. 13.



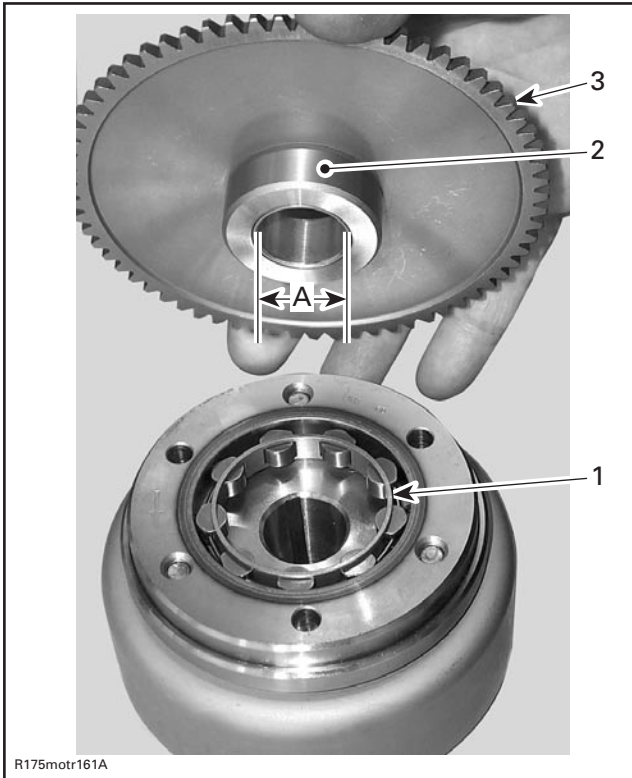
1. Sprag clutch
2. Sprag clutch housing

Inspection

Check contact surface of sprag clutch gear for heavy wear and/or grooves and replace if necessary.

Replace sprag clutch gear no. 11 when spline is worn.

Check bushing of sprag clutch gear for service limit and replace sprag clutch gear no. 11 if necessary.



1. Sprag clutch
2. Contact surface to sprag clutch
3. Sprag clutch gear teeth
- A. Bushing diameter

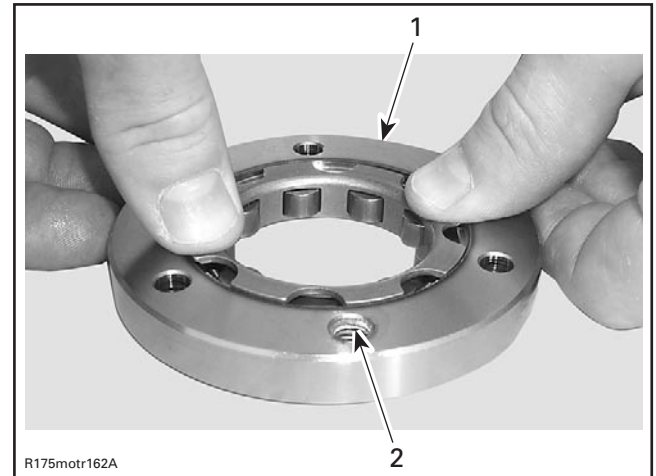
BUSHING DIAMETER mm (in)	
NEW MAXIMUM	22.041 mm (.8677 in)
SERVICE LIMIT	22.050 mm (.8681 in)

Installation

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

Sprag clutch has a snap mechanism to the sprag clutch housing. Press the sprag clutch until the mechanism is locked.

CAUTION: Before reassemble the sprag clutch housing clean threads with a tap from remaining Loctite.



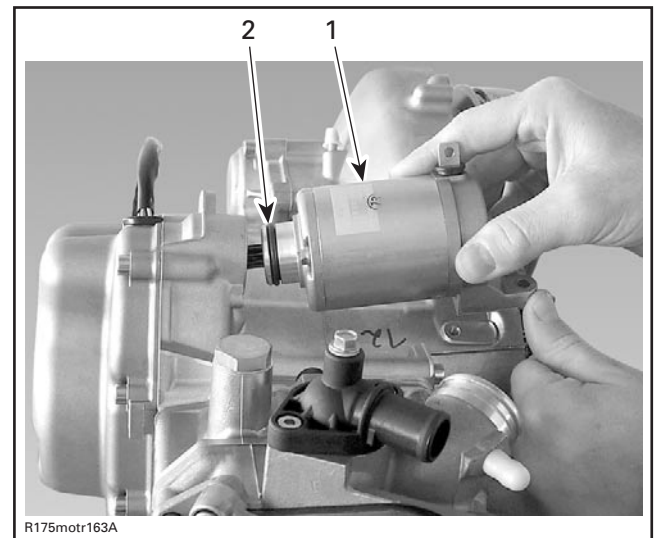
1. Push until snap mechanism works
2. Thread to be clean

STARTER

Removal

Remove:

- wire from starter no. 15
- screws no. 16
- starter.



1. Starter
2. O-ring

Section 03 ENGINE

Subsection 06 (MAGNETO SYSTEM)

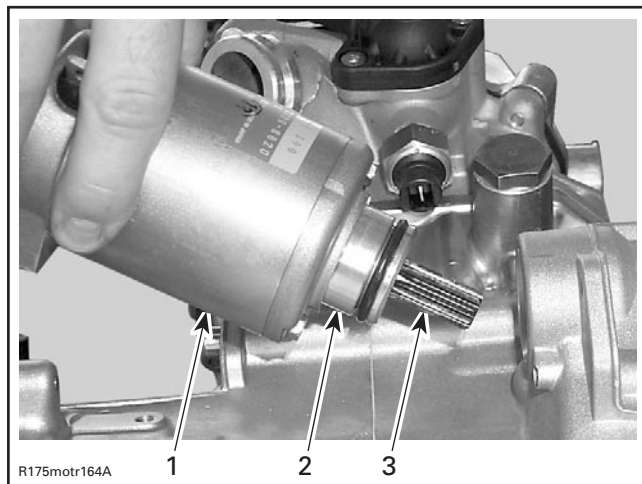
Inspection

Check if O-ring is brittle, hard or otherwise damaged. Replace if necessary.

Installation

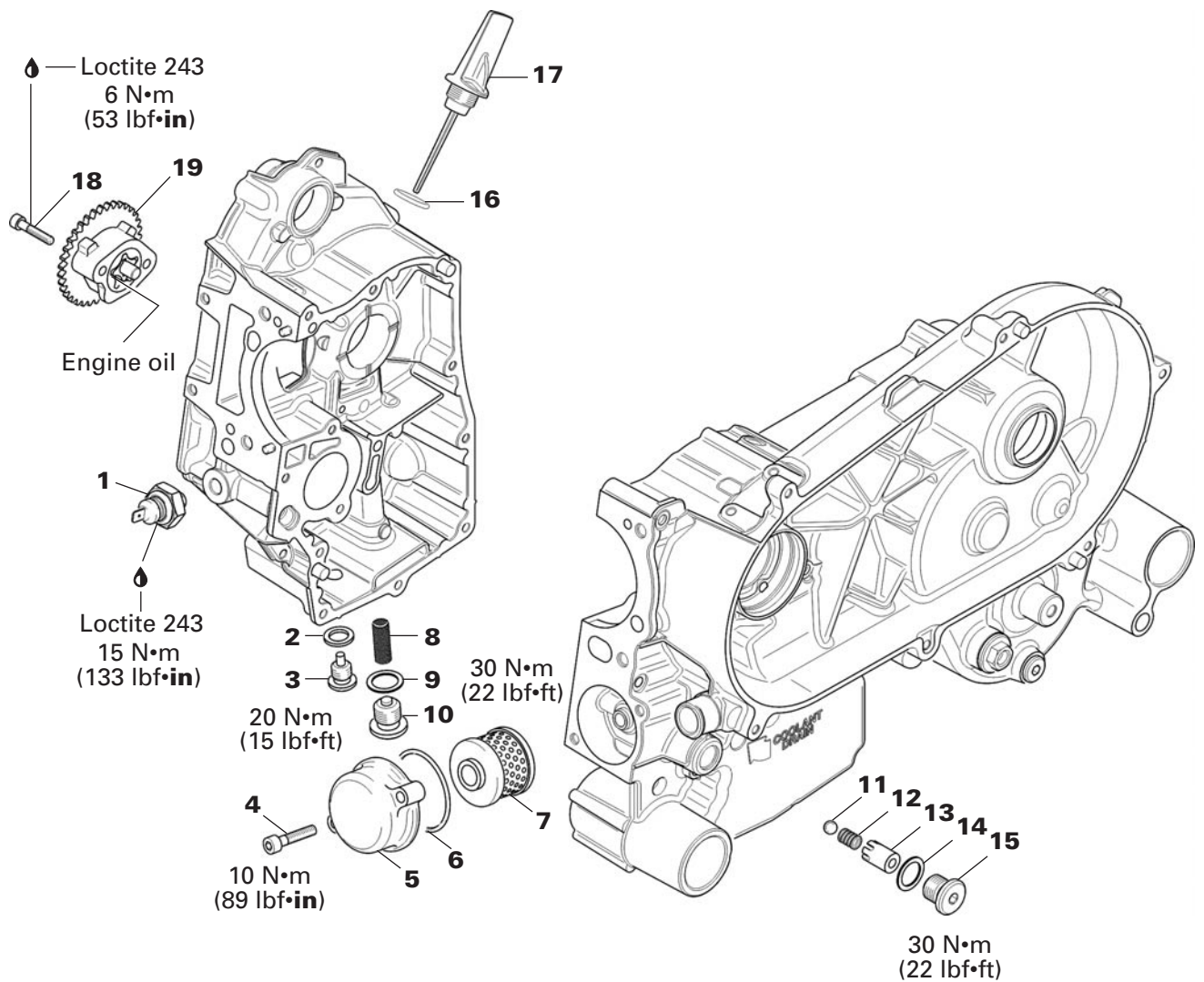
For installation, reverse the removal procedure. However, pay attention to the following.

Always apply the anti-seize lubricant on the support of the starter which is shown in the exploded view.



1. Starter
2. Support to crankcase MAG
3. Spline

LUBRICATION SYSTEM



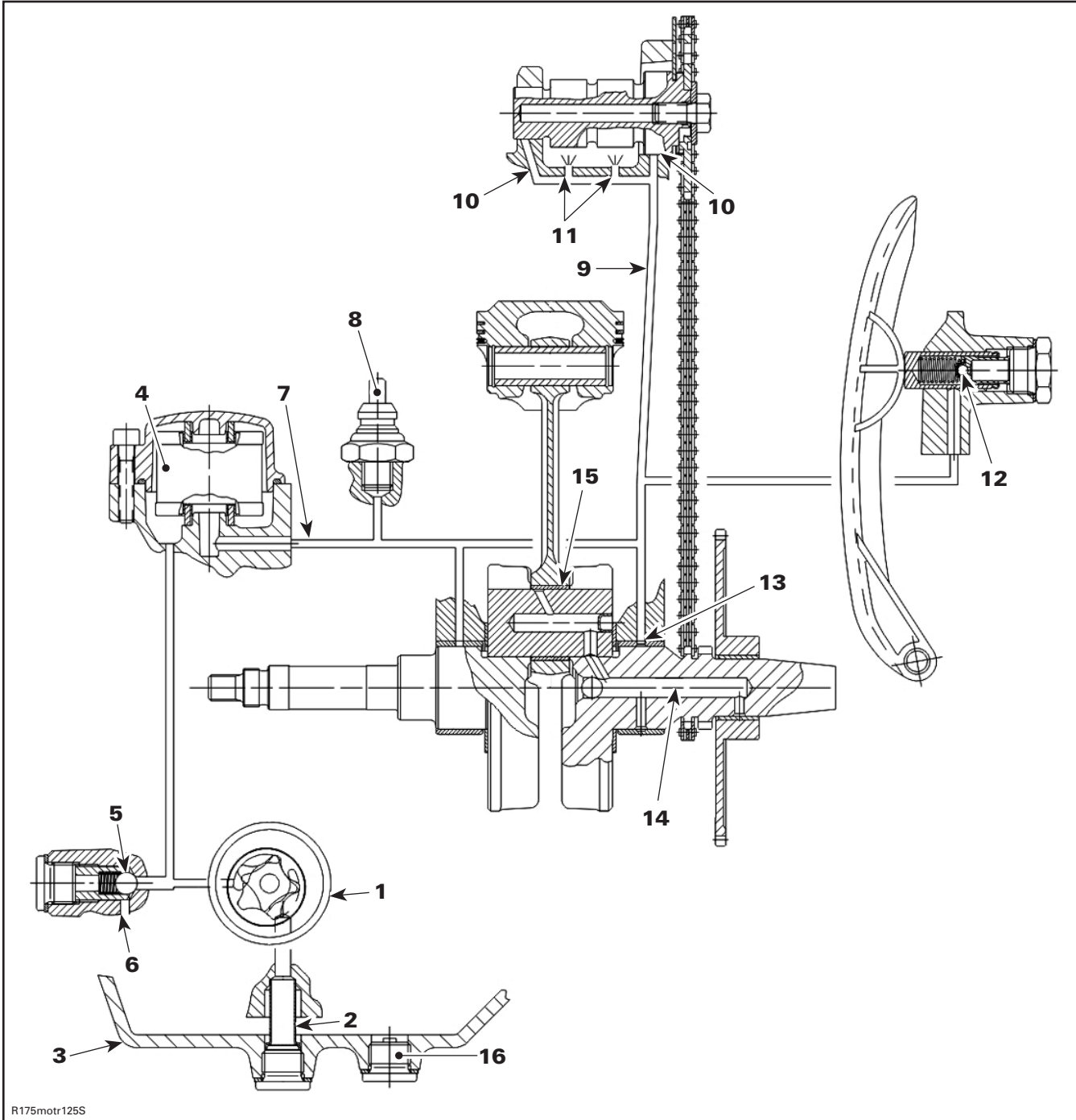
R175motr124S

Section 03 ENGINE

Subsection 07 (LUBRICATION SYSTEM)

ENGINE OIL FLOW CHART

Following illustration gives a general overview regarding the oil supply through the engine.



1. Oil pump
2. Oil strainer
3. Bottom of crankcase
4. Oil filter
5. Pressure regulator valve
6. Bypass back to bottom of crankcase
7. Oil line to pressure switch (crankcase MAG side)
8. Oil pressure switch

9. Cylinder stud screw bore as oil supply to camshaft
10. Camshaft plain bearing
11. Lubrication for rocker arms
12. Chain tensioner
13. Crankshaft plain bearing
14. Oil line to crank pin and sprag clutch gear
15. Big end connecting rod plain bearing
16. Plug screw to separate metallic particles

GENERAL

The engine removal is not necessary when working on the oil pressure switch, oil filter, pressure regulator valve, magnetic plug and/or oil strainer.

Prior to change the engine oil, ensure vehicle is on a level surface.

Oil and oil filter must be replaced at the same time and oil strainer must be cleaned too. Oil change, oil filter replacement and oil strainer cleaning should be done with a warm engine.

WARNING

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

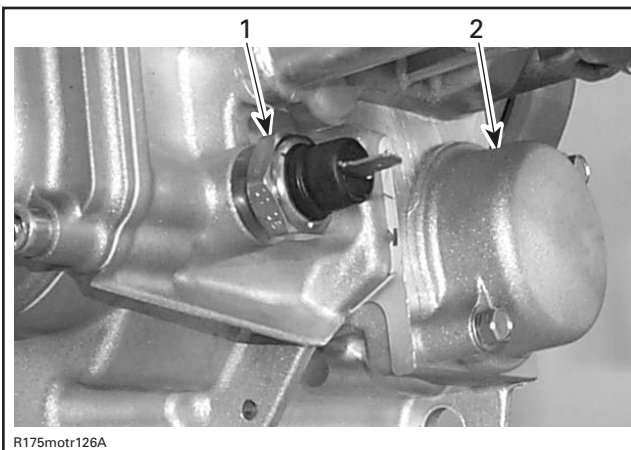
At installation, use torque values and Loctite products from the exploded view. Clean threads before using Loctite products when installing screws.

Dispose oil and filter as per your local environmental regulations.

ENGINE OIL PRESSURE TEST

NOTE: The engine oil pressure test should be done with a **warm engine** and the **recommended oil**.

Remove the oil pressure switch **no. 1** in the area of the cylinder head (exhaust side), mounted on the crankcase MAG side and install the oil pressure gauge (P/N 529 035 709).



1. Oil pressure switch
2. Oil filter cover

NOTE: Oil pressure switch works between 15 kPa (2 PSI) and 35 kPa (5 PSI).

The engine oil pressure should be as following value at warm engine condition (80°C (176°F) approximately).

PRESSION/RPM	1500 RPM	8500 RPM
MINIMAL	15 kPa (2 PSI)	350 kPa (51 PSI)

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

To install oil pressure switch, reverse the removal procedure.

OIL CHANGE

Removal

Place a drain pan under the engine magnetic drain plug area.

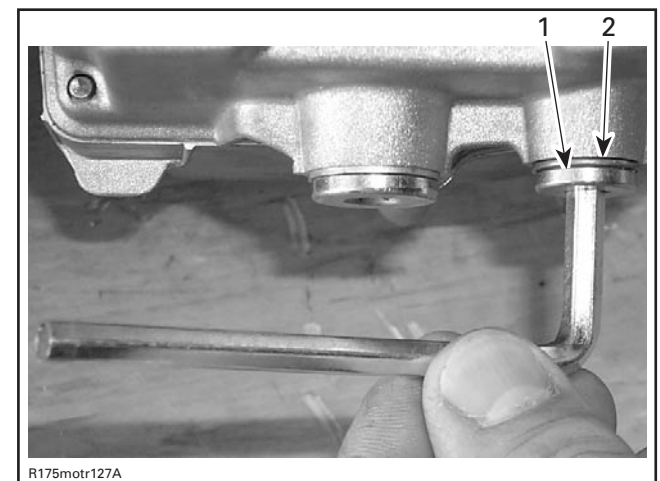
Remove oil dipstick **no. 17**.

CAUTION: Pay attention not to lose O-ring **no. 16** on dipstick.

Clean the magnetic drain plug area.

Unscrew magnetic drain plug **no. 3** then remove dipstick.

CAUTION: Pay attention not to lose gasket ring **no. 2** on magnetic drain plug.



1. Magnetic drain plug
2. Gasket ring

Wait a while to allow oil to flow out of engine.

Inspection

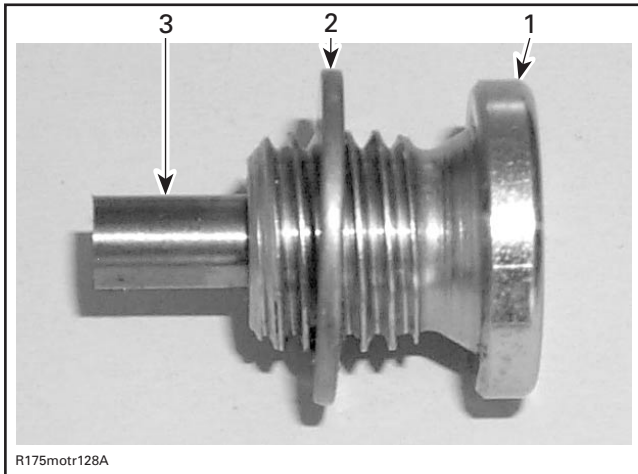
Oil condition gives information about the engine condition. See **TROUBLESHOOTING** section.

Section 03 ENGINE

Subsection 07 (LUBRICATION SYSTEM)

Clean the magnetic drain plug from metal shavings and dirt. Presence of debris gives an indication of failure inside the engine. Check engine to correct the problem.

Change gasket ring on magnetic drain plug if damaged.



1. Magnetic drain plug
2. Gasket ring
3. Magnetic area of drain plug

Installation

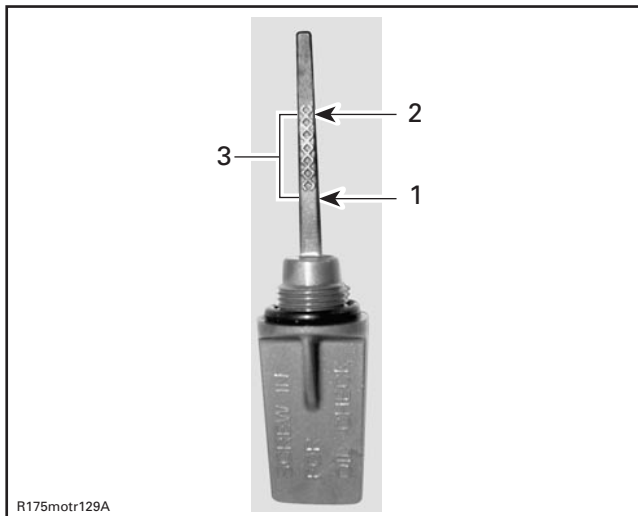
The installation is the reverse of removal procedure.

System Capacity

Refer to **TECHNICAL DATA**.

Double-check the engine oil capacity after operating the vehicle a few minutes.

Oil level should be within the foreseen area.



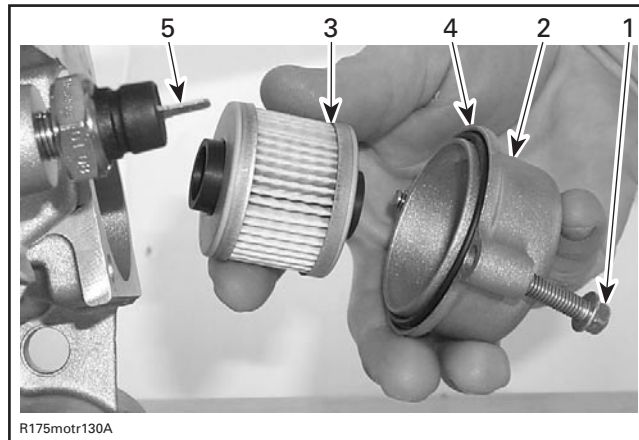
1. Full
2. Add
3. Operating range

OIL FILTER

Removal

Remove:

- engine oil (refer to **Oil Change**)
- oil filter screws **no. 4**
- oil filter cover **no. 5**
- oil filter **no. 7**.

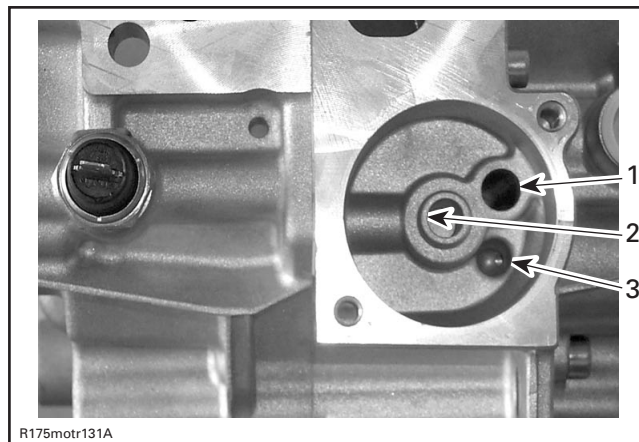


1. Oil filter screws
2. Oil filter cover
3. Oil filter
4. O-ring
5. Oil pressure switch

Inspection

Check oil filter cover O-ring **no. 6**, change it if necessary.

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

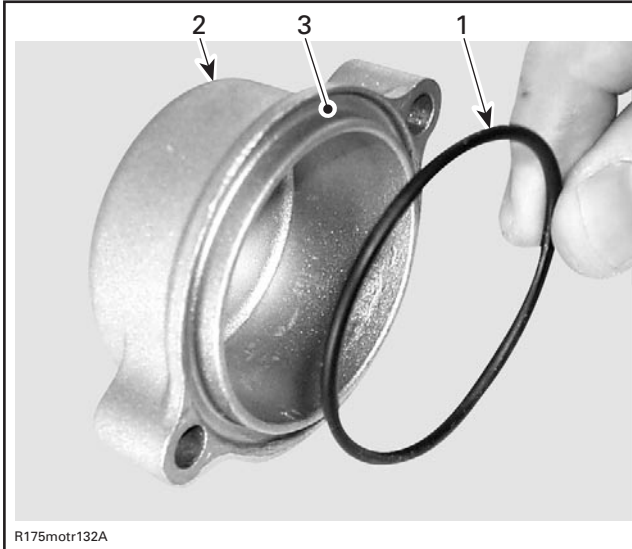


1. Inlet bore from the oil pump to the oil filter
2. Outlet bore to the engine oil providing system
3. Oil line to pressure regulator valve

Installation

The installation is the opposite of the removal procedure. Pay attention to the following details.

Install O-ring **no. 6** on oil filter cover.



1. O-ring
2. Oil filter cover
3. Foreseen groove

Torque oil filter screws to 10 N•m (89 lbf•in).

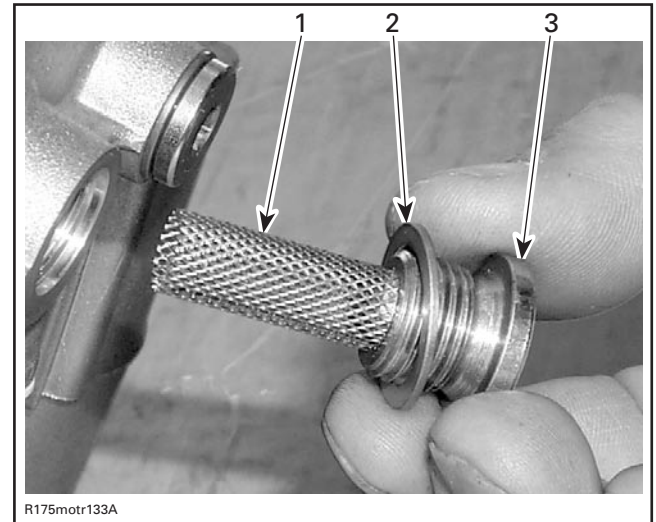
OIL STRAINER

Removal

Remove:

- engine oil (refer to **Oil Change**)
- engine skid plate (refer to **BODY**)
- screw **no. 10** retaining oil strainer **no. 8**.

CAUTION: Pay attention not to lose gasket ring **no. 9** on plug screw.



1. Oil strainer
2. Gasket ring
3. Plug screw

Cleaning and Inspection

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.

On engine, clean the oil strainer area.

CAUTION: To avoid contaminate the oil pump and furthermore engine inside, never use an air gun to clean the hole.

Clean both contact surfaces of plug screw.

Installation

For installation, reverse the removal procedure.

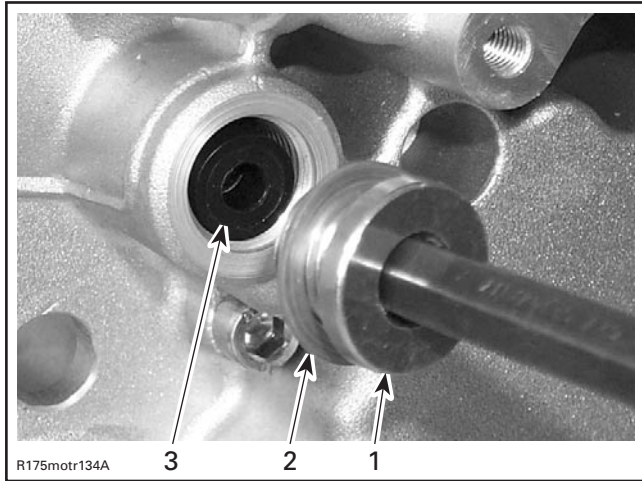
Refill engine at the proper level with the recommended oil. Refer to **TECHNICAL DATA** for capacity.

Start engine and let idle for a few minutes. Ensure plug screw and magnetic drain plug areas are not leaking.

Stop engine. Wait minimum 3 minutes to allow oil to flow down to crankcase then check oil level. Refill as necessary.

ENGINE OIL PRESSURE
REGULATOR

The oil pressure regulator is located on the engine PTO side underneath the water inlet port.



- 1. Oil pressure regulator plug
- 2. Gasket ring
- 3. Valve housing

NOTE: The oil pressure regulator system works when the oil pressure exceeds 400 kPa (58 PSI). If oil pressure is low, check ball of oil pressure regulator valve for contamination (refer to **TROUBLE-SHOOTING**).

Removal

Remove

- oil pressure regulator plug **no. 15**, valve housing **no. 13**, compression spring **no. 12** and ball **no. 11**.

CAUTION: Pay attention not to lose gasket ring **no. 14** on oil pressure regulator plug.

 **WARNING**

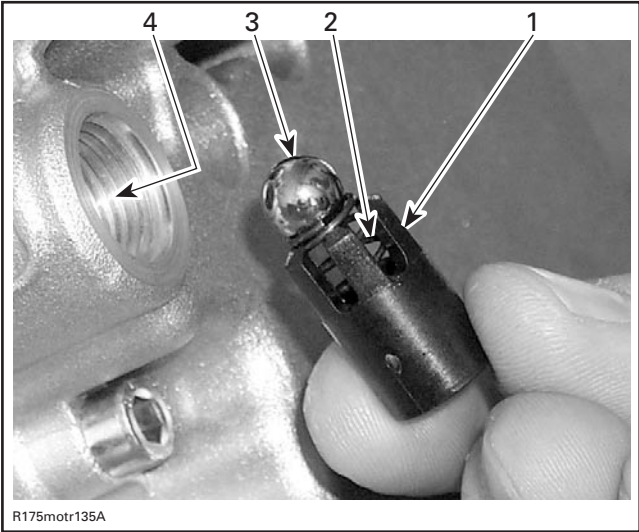
Oil pressure regulator plug is spring loaded.

Extract the ball from the engine.

NOTE: To easily remove the ball use an air gun.

 **WARNING**

Always wear eye protector.



- 1. Valve housing
- 2. Compression spring
- 3. Ball
- 4. Oil pressure regulator port

Clean and Inspection

Clean oil pressure regulator bore from contamination with an air gun.

NOTE: Contamination has to pass oil filter or goes back to bottom of crankcase. The dirt will not reach the oil circulation inside the engine.

Inspect valve housing for damages.

Check compression spring for free length.

COMPRESSION SPRING FREE LENGTH mm (in)	
NEW NOMINAL	13.5 mm (.543 in)
SERVICE LIMIT	13.2 mm (.519 in)

Replace both parts if important wear or damage are present.

Installation

For installation, reverse the removal procedure.

OIL PUMP

The oil pump is located on the engine MAG side near water pump housing (refer to **COOLING SYSTEM**).

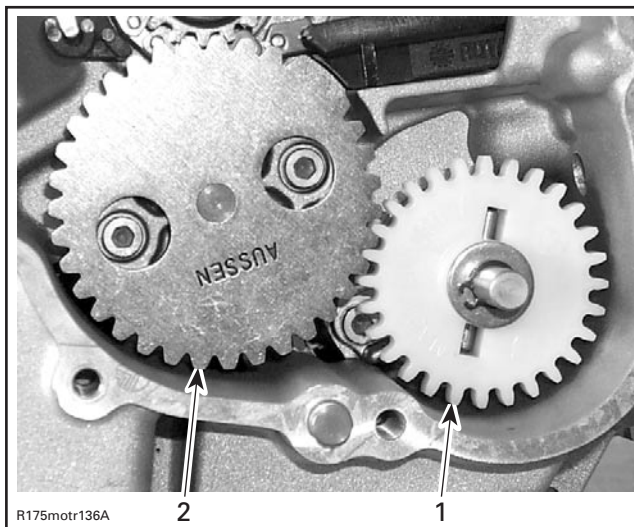
Removal

Remove:

- RH footwell and seat
- engine oil

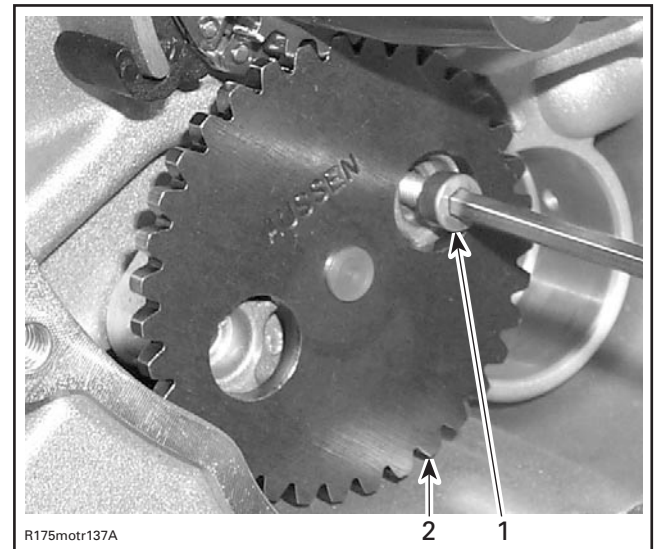
NOTE: No need to drain cooling system.

- magneto cover and rotor (refer to **MAGNETO SYSTEM**)

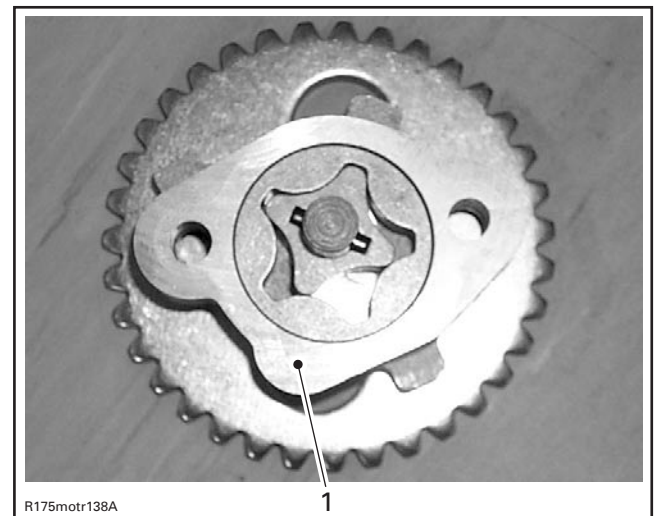


1. Water pump gear
2. Oil pump powered by crankshaft

- screws no. 18
- oil pump assembly no. 19.



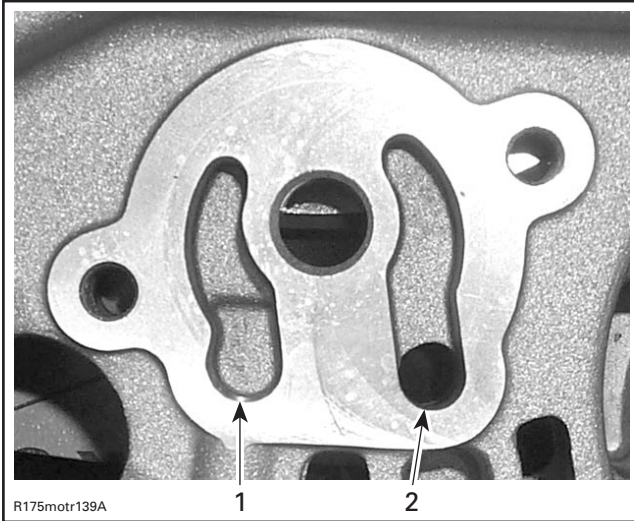
1. 2 screws
2. Oil pump gear



1. Oil pump system

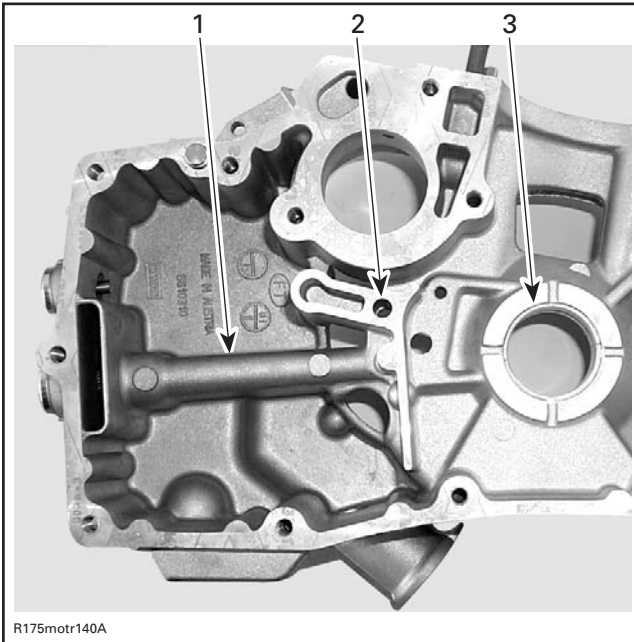
Section 03 ENGINE

Subsection 07 (LUBRICATION SYSTEM)



1. Suction side of the oil pump (oil coming from oil strainer)
2. Oil outlet to pressure regulator valve/oil filter

NOTE: Following illustration shows the oil flow from engine inside.

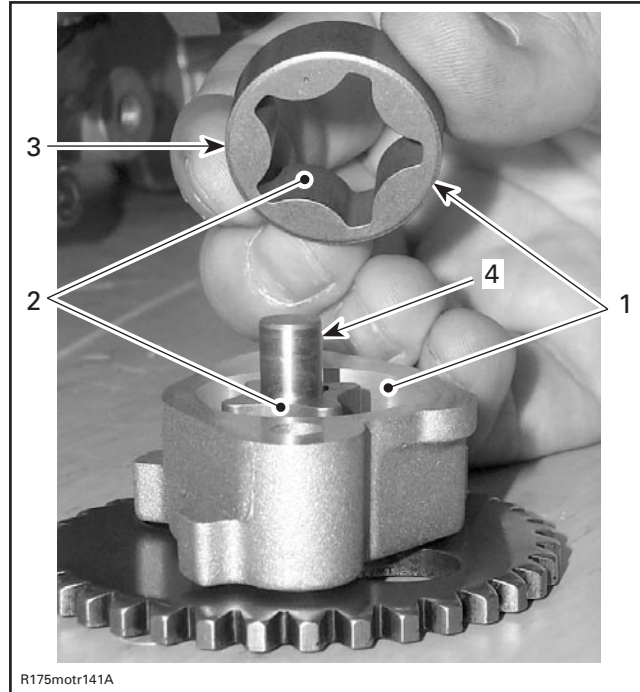


1. Oil line from oil strainer to oil pump
2. Oil pump outlet to pressure regulator valve/oil filter
3. Plain bearing in crankcase MAG

Inspection

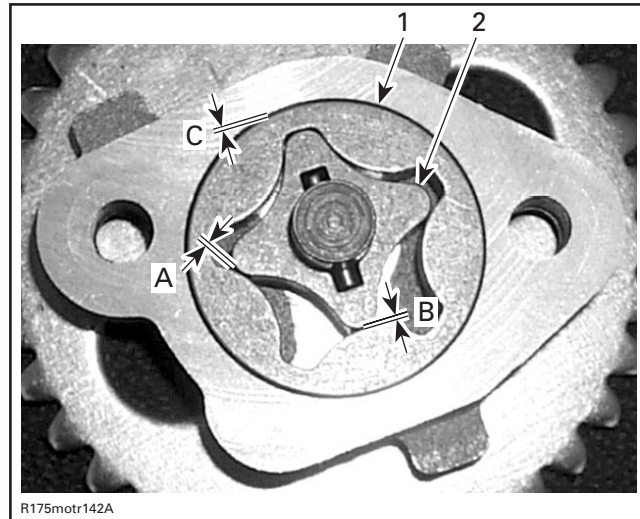
Inspect oil pump assembly for marks or other damages.

Check inner rotor for damages. If so, replace oil pump assembly. Ensure to also check oil pump housing. If damaged, replace the complete oil pump assembly.



1. Bore of oil pump outer rotor
2. Contact surface between inner and outer rotor
3. Mark on outer rotor
4. Oil pump shaft

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



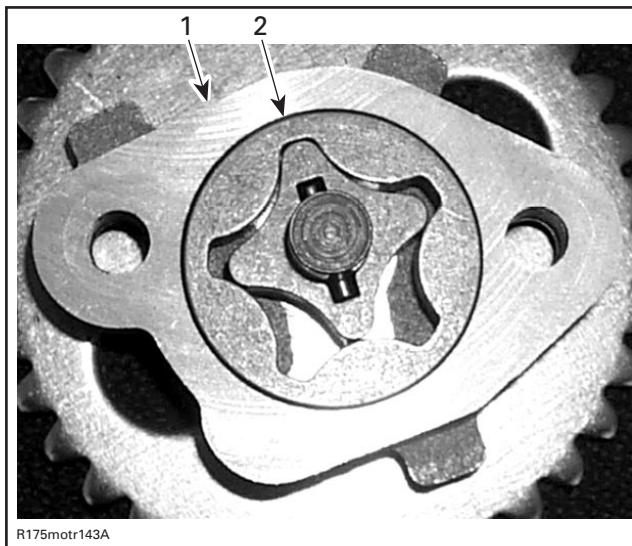
1. Outer rotor
2. Inner rotor

OUTER AND INNER ROTORS CLEARANCE mm (in)	
SERVICE LIMIT	
A	0.25 mm (.009 in)
B	
C	

If clearance between inner and outer rotors exceeds the tolerance, replace oil pump assembly. Ensure to also check oil pump housing. 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.

Using a dial indicator, measure side wear as shown.



1. Measurement 1 on oil pump housing surface
2. Measurement 2 on oil pump outer rotor surface

ROTOR AND OIL PUMP HOUSING CLEARANCE mm (in)	
NEW MINIMUM	0.02 mm (.00079 in)
NEW MAXIMUM	0.09 mm (.0035 in)
SERVICE LIMIT	0.10 mm (.004 in)

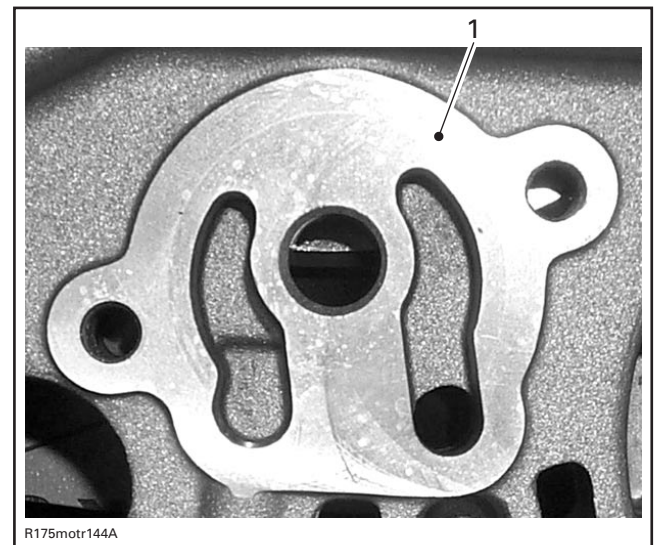
If difference exceeds service limit, replace the complete oil pump assembly.

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

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

NOTE: If the surface only shows a small groove, use a grindstone to burnish burrs.

When the oil pump is seized, replace crankcase assembly and complete oil pump.



1. Oil pump contact surface

Clean the area from contaminations.

Installation

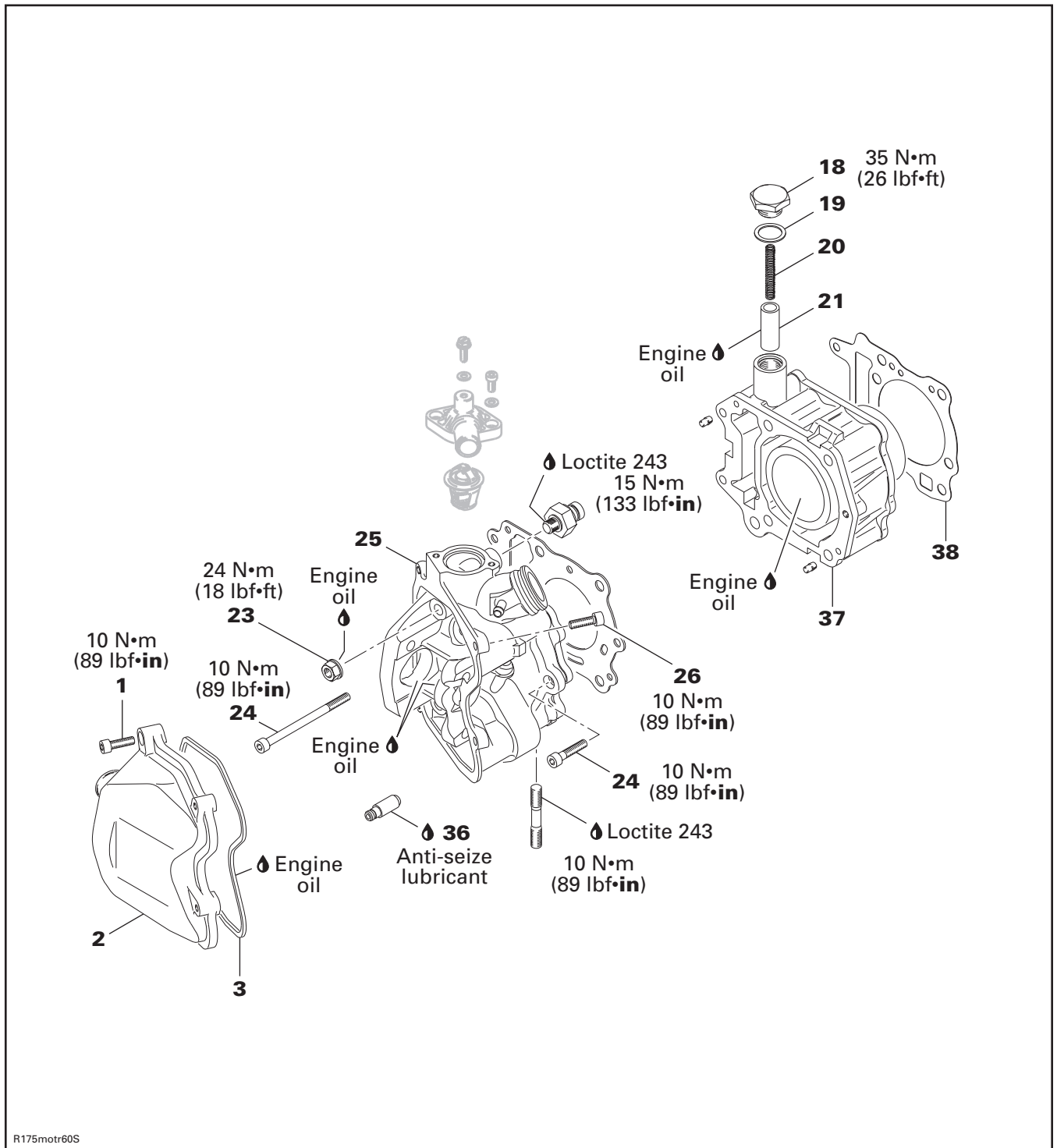
For installation, reverse the removal procedure.

Final Test

After engine is completely reassembled, start engine and make sure oil pressure is within specifications.

CYLINDER AND HEAD

NOTE: For cylinder head, cylinder and piston removal, it is not necessary to remove engine from vehicle.



Subsection 08 (CYLINDER AND HEAD)



GENERAL

NOTE: When diagnosing an engine problem, always perform a cylinder leak test. This will help pin-point a problem. Refer to the instructions included with your leak tester and **LEAK TEST** section for procedures.

Always place the vehicle on level surface.

NOTE: For a better understanding, the following illustrations are taken with engine out of vehicle. To perform the following instructions, it is not necessary to remove engine from vehicle.

Always disconnect the negative wire from the battery before working the engine.

Even if the removal of many parts is not necessary to reach another part, it is recommended to remove these parts in order to check them.

For installation, use the torque values and Loctite products from exploded views. Clean threads before using Loctite product when installing screws.

When disassembling parts that are duplicated in the engine, (eg: valves), it is a strongly recommended to note their position (PTO, MAG side) and to keep them as a "group". If you find a defective component, it would be much easier to find the cause of the failure among its group of parts (eg: you found a worn valve guide. A bent spring could be the cause and it will be easy to know which one among the springs is the cause to replace it if you grouped them at disassembly). Besides, since used parts have matched together during the engine operation, they will keep their matched fit when you reassemble them together within their "group".

Intake port/air filter contaminated (clogged) with dirt, sand, etc. (leads to worn valves, piston rings and finally to leak of power).

CAUTION: In case of piston rings and/or valve replacement, always clean the whole engine and change oil and oil filter.

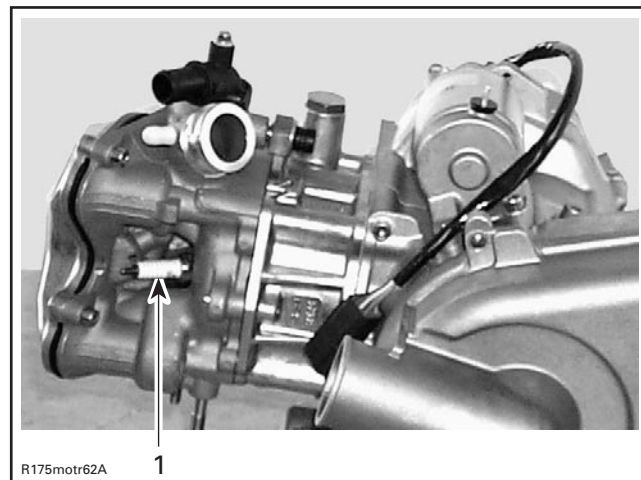
SPARK PLUG

Removal

Unplug the spark plug wire.

Clean spark plug area before disassembly.

Unscrew spark plug.



1. Spark plug on engine PTO side

Inspection

Check spark plug condition (refer to **IGNITION SYSTEM**).

NOTE: To check spark, place connected spark plug with threads against crankcase to simulate electrical ground and crank the engine.

Installation

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

Check spark plug gap (refer to **TECHNICAL DATA**).

Screw spark plug. Torque spark plug to 15 N•m (133 lbf•in). Reinstall the spark plug wire.

THERMOSTAT

Refer to **COOLING SYSTEM**.

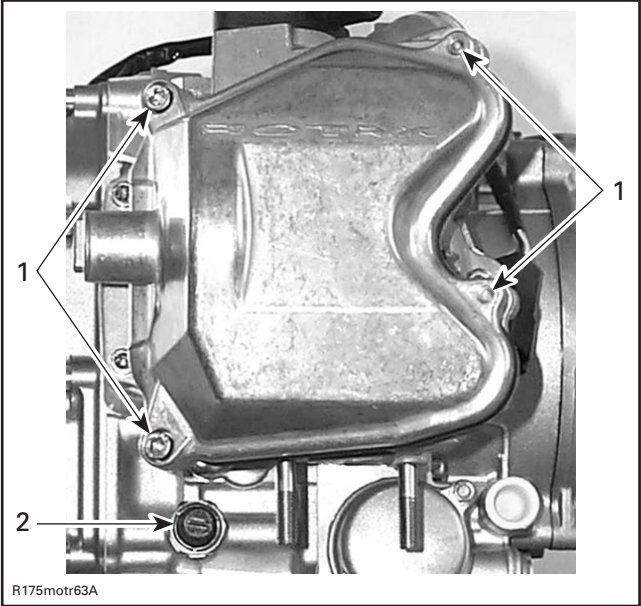
VALVE COVER

Removal

Remove:

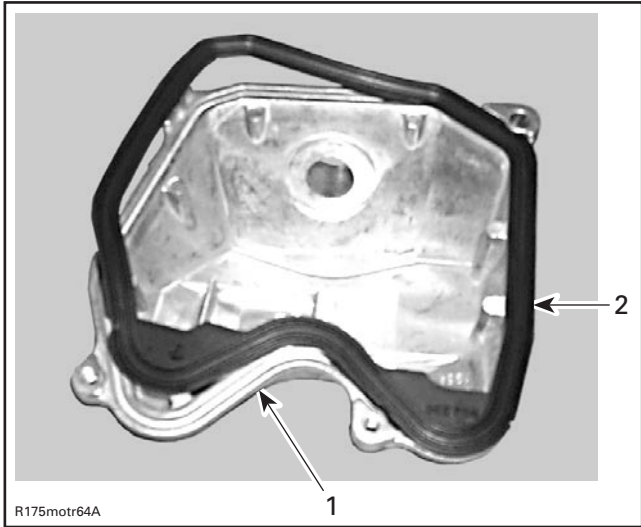
- hose from valve cover
- valve cover screws no. 1

Section 03 ENGINE
Subsection 08 (CYLINDER AND HEAD)



- 1. Valve cover screws
- 2. Oil pressure switch

– valve cover no. 2 and profile sealing ring no. 3.



- 1. Valve cover
- 2. Profile sealing ring

Inspection

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

Installation

For installation, reverse the removal procedure.

NOTE: Install the valve cover screws in a criss-cross sequence.

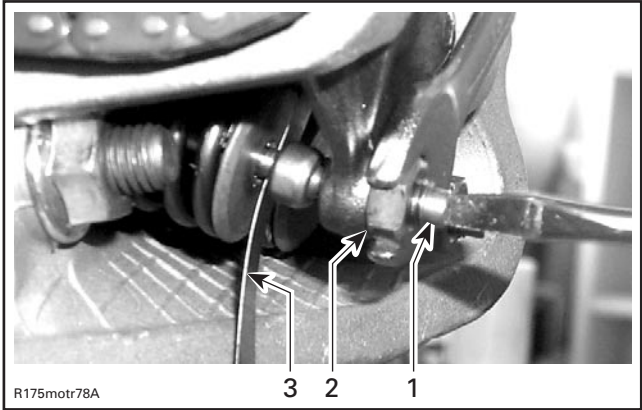
VALVE ADJUSTMENT

Lock crankshaft at the TDC compression position (refer to **CRANKSHAFT**).

Remove valve cover (refer to **VALVE COVER** above).

Hold adjusting screw no. 14 and loosen locking nut no. 13.

Using feeler gauge, check the valve clearance.



- 1. Adjustment screws
- 2. Locking nuts
- 3. Feeler gauge

VALVE CLEARANCE mm (in)	
EXHAUST	0.10 to 0.14 mm (0.0039 to 0.0055 in)
INTAKE	0.05 to 0.09 mm (0.0020 to 0.0035 in)

Hold the adjusting screw at the proper position and torque the locking nut.

Repeat the procedure for each valves.

Before installing valve cover, recheck all valve adjustments.

CHAIN TENSIONER

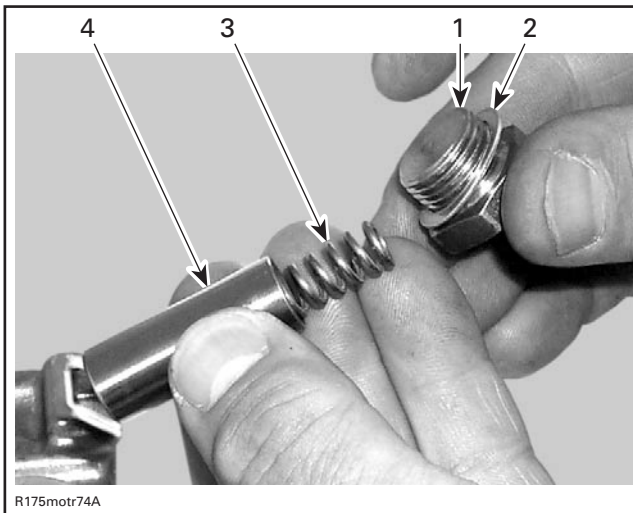
Removal

WARNING

Chain tensioner is spring loaded.

Remove:

- chain tensioner plug **no. 18**
- gasket ring **no. 19** (discard)
- spring **no. 20**
- chain tensioner plunger **no. 21**



1. Chain tensioner plug
2. Gasket ring
3. Spring
4. Chain tensioner plunger

NOTE: To extract the chain tensioner plunger, use a magnetic pick-up tool.

Inspection

Check chain tensioner plunger for free movement and/or scoring.

Check if possible chain guides for wear. Replace as necessary.

Check spring condition. Replace if broken or worn. Install **NEW** gasket ring **no. 19**.

Installation

For installation, reverse the removal procedure.

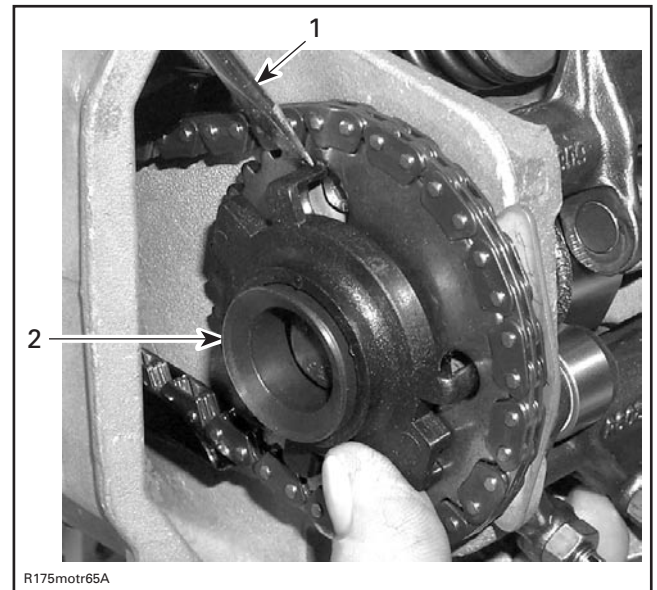
BREATHER

Removal

Remove:

- valve cover
- breather **no. 4** with V-ring **no. 5**.

NOTE: Use flat screwdriver to remove breather as per following illustration.



1. Flat screwdriver
2. Breather

Inspection

Check V-ring **no. 5** and/or breather. If they are brittle, cracked or hard, replace them.

Check if snap mechanism from breather to chain timing gear works properly.

Installation

For installation, reverse the removal procedure.

NOTE: Only one position to place breather on chain timing gear.

Section 03 ENGINE

Subsection 08 (CYLINDER AND HEAD)

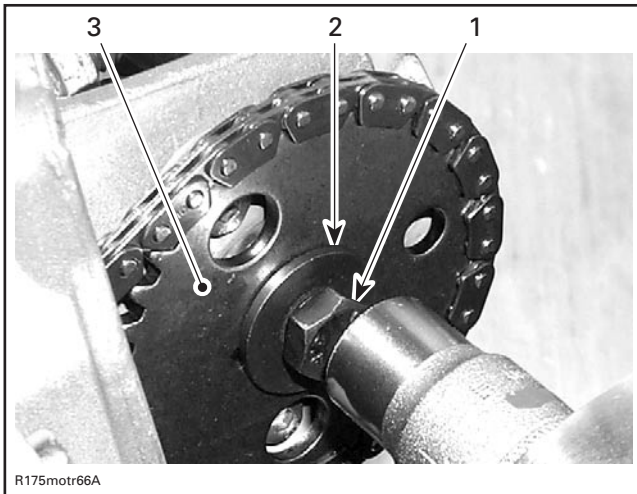
CAMSHAFT TIMING GEAR

Removal

Lock crankshaft at the TDC compression position, refer to **CRANKSHAFT**.

Remove:

- valve cover
- chain tensioner
- chain guide no. 22
- bolt no. 6, washer no. 7 and camshaft timing gear no. 8.



1. Bolt
2. Washer
3. Camshaft timing gear

NOTE: Secure timing chain no. 27 with a retaining wire.

Inspection

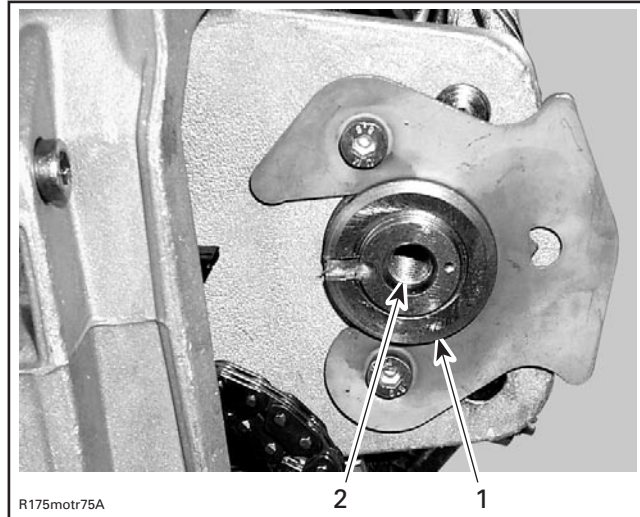
Check camshaft timing gear for wear or deterioration. If gear is worn or damaged, replace it as a set (camshaft timing gear and timing chain).

For crankshaft timing gear, refer to **CRANKSHAFT**.

Installation

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

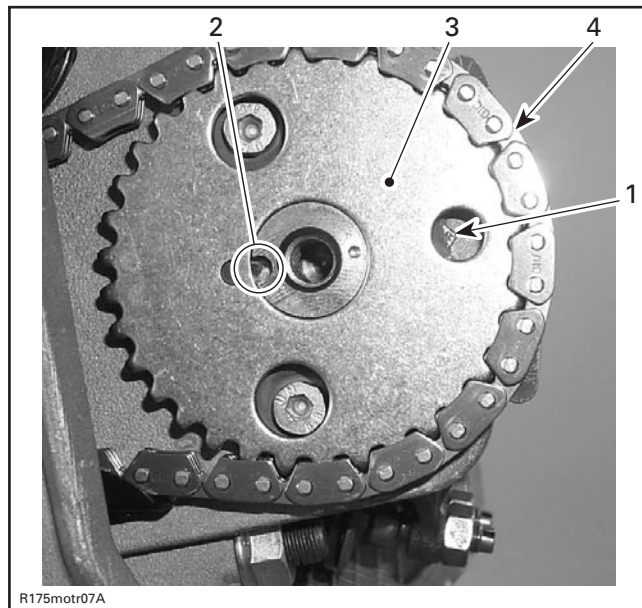
Clean mating surface and threads of camshaft prior to assemble camshaft timing gear.



1. Mating surface on camshaft
2. Threads for timing gear bolt

Camshaft timing gear must be at TDC position before installing the timing chain.

Install camshaft timing gear so that the timing gear tab is located into the camshaft groove. The pointed end of camshaft retaining plate should be visible by the top hole. See the following illustration for a proper positioning.



1. Pointed end of camshaft retaining plate
2. Groove in the camshaft
3. Chain timing gear
4. Timing gear

CAUTION: Crankshaft and camshaft must be locked on TDC position to place camshaft timing gear and timing chain in the proper position.

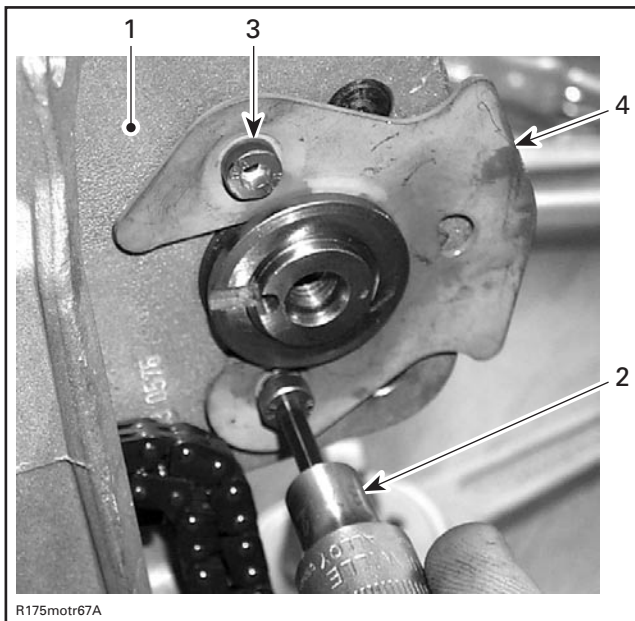
ROCKER ARM

Removal

Lock crankshaft at the TDC compression position, refer to **CRANKSHAFT**.

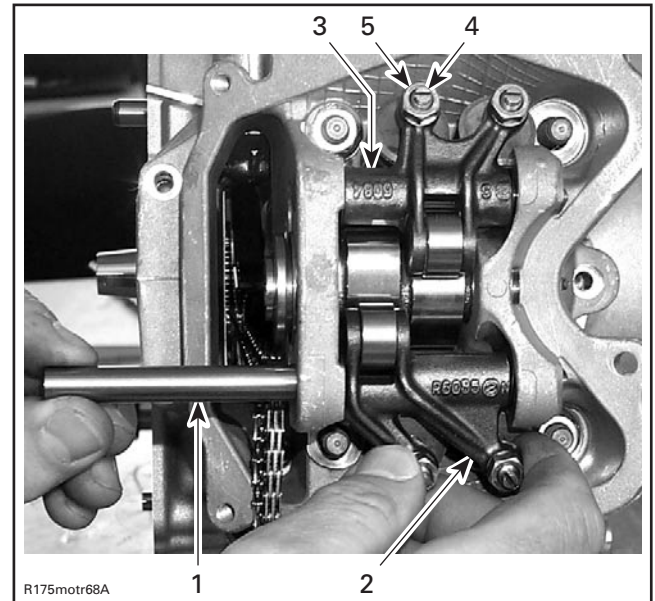
Remove:

- valve cover
- chain tensioner
- breather no. 4
- camshaft timing gear no. 8
- Allen screws no. 9 and camshaft retaining plate no. 10



1. Cylinder head
2. Allen wrench (P/N 529 035 861)
3. Allen screws
4. Camshaft retaining plate

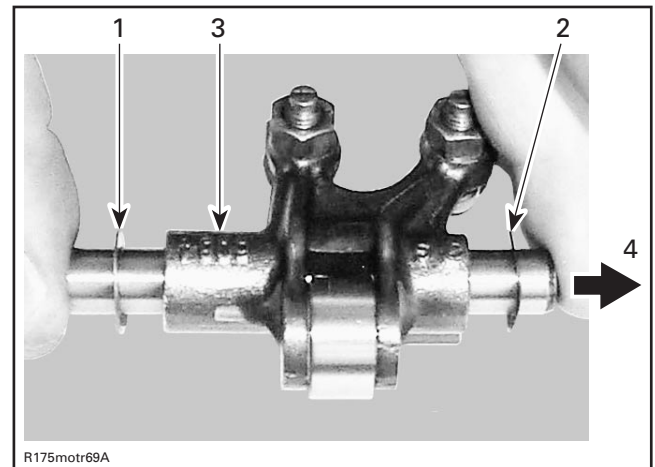
- rocker arm shafts no. 11
- rocker arm assembly (exhaust side no. 12 and intake side no. 15) with adjustment screws no. 14 and nuts no. 13



1. 2 rocker arm shafts
2. Rocker arm assembly exhaust
3. Rocker arm assembly intake
4. 4 adjustment screws
5. 4 nuts

- thrust washers no. 16 and spring washers no. 17.

CAUTION: Pay attention not to lose thrust washer and spring washer.



1. 2 thrust washers
2. 2 spring washers
3. Rocker arm assembly intake
4. Cylinder head — spark plug side

Section 03

ENGINE

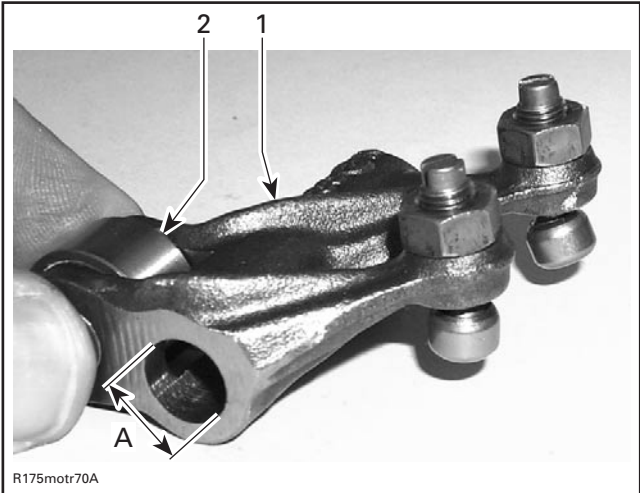
Subsection 08 (CYLINDER AND HEAD)

Inspection

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.

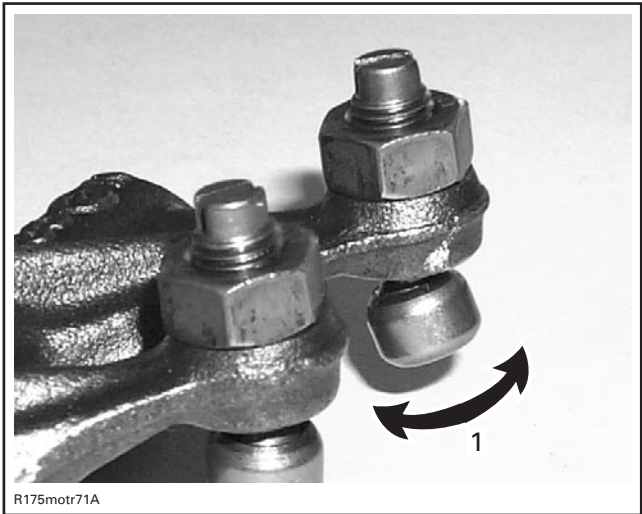


- 1. Rocker arm (exhaust side)
- 2. Roller
- A. Bore for rocker arm shaft

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

ROCKER ARM BORE DIAMETER	
NEW MINIMUM	10.036 mm (.3951 in)
NEW MAXIMUM	10.050 mm (.3957 in)
SERVICE LIMIT	10.060 mm (.3960 in)

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

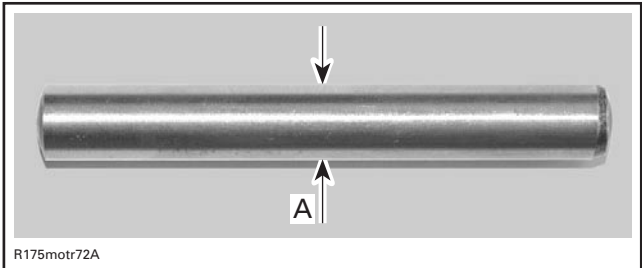


- 1. Free movement of adjustment screw top

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 MINIMUM	10.015 mm (.3942 in)
NEW MAXIMUM	10.006 mm (.3939 in)
SERVICE LIMIT	9.950 mm (.3917 in)

Any area worn excessively will require parts replacement.

Installation

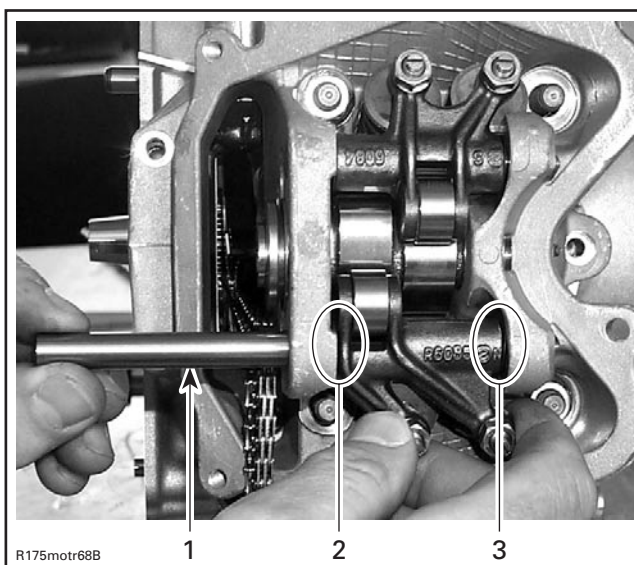
For installation, reverse the removal procedure. Pay attention to the following details.

Apply engine oil on rocker arm shaft.

Install the rocker arm shafts with the chamfered edge first and use following procedure:

CAUTION: Pay attention not to forget thrust washer and spring washer.

- Hold rocker arm intake/exhaust together with thrust washer **no. 16** in place.
- Insert rocker arm shaft **no. 11** until middle of rocker arm bore.



1. Rocker arm shaft
2. Thrust washer
3. Spring washer

- Place spring washer **no. 17** and push rocker arm shaft to end position.

TIMING CHAIN

Refer to **CRANKSHAFT** section.

CYLINDER HEAD

Removal

Lock crankshaft at TDC compression position, refer to **CRANKSHAFT**.

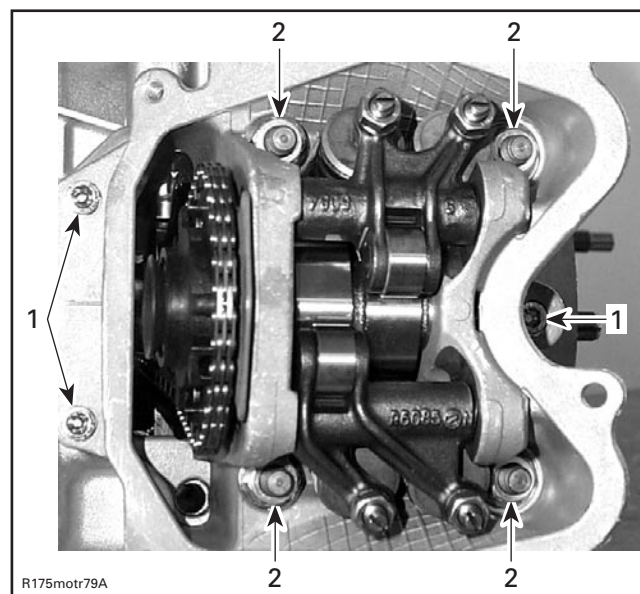
Drain coolant (refer to **COOLING SYSTEM**).

Disconnect:

- spark plug cable
- temperature sensor connector.

Remove:

- RH footwell
- exhaust pipe (refer to **REMOVAL AND INSTALLATION**)
- engine outlet hose
- carburetor (refer to **CARBURETOR**)
- chain tensioner (see **CHAIN TENSIONER** above)
- valve cover and profile sealing ring (see **VALVE COVER** above)
- breather
- camshaft timing gear
- cylinder head screws **no. 24**
- cylinder head nuts **no. 23** retaining cylinder head and cylinder to cylinder base.



1. Cylinder head screws
2. Cylinder head nuts

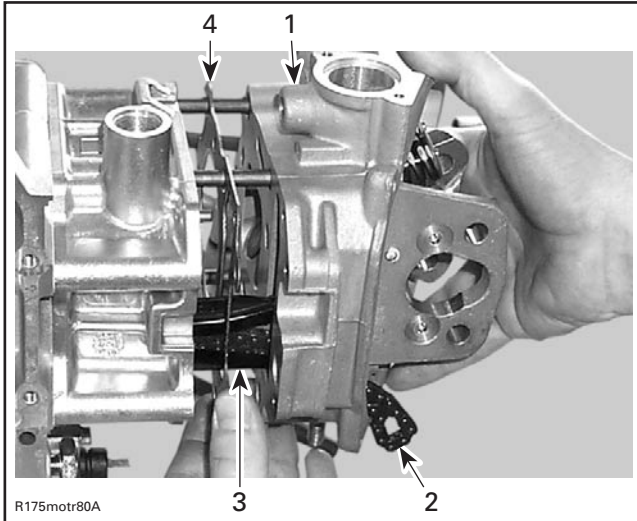
Pull up cylinder head **no. 25**.

Remove:

- chain guide **no. 22**
- gasket **no. 26**.

Section 03 ENGINE

Subsection 08 (CYLINDER AND HEAD)



1. Cylinder head
2. Timing chain
3. Chain guide
4. Head gasket

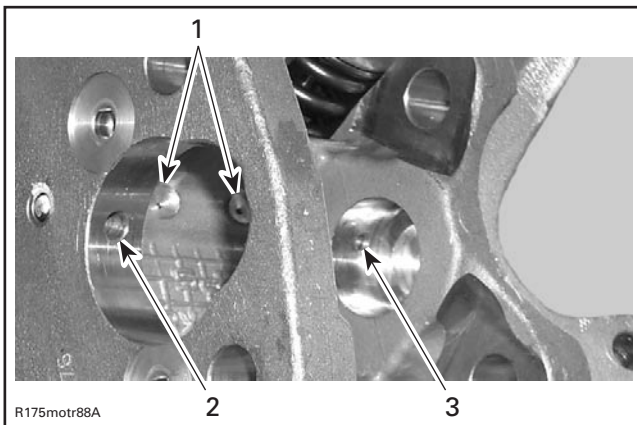
Inspection

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

Check gasket for cracks or other damages.

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 MAG side
3. Oil supply to camshaft bearing journal PTO side

Installation

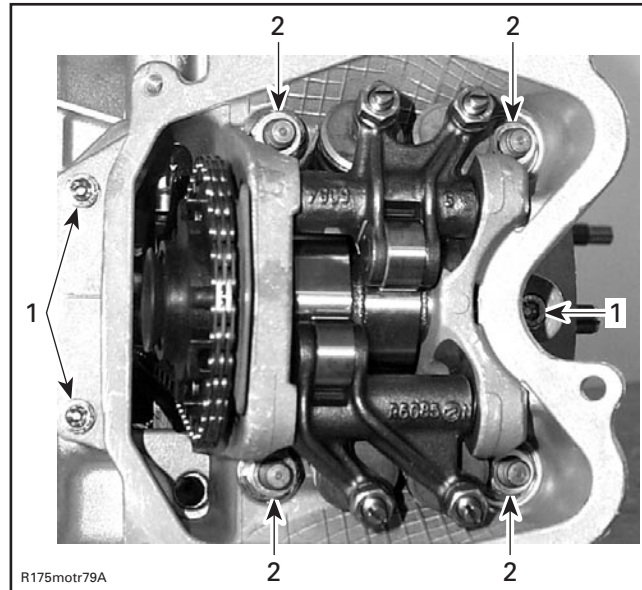
For installation, reverse the removal procedure. Pay attention to the following details.

Ensure dowel pins are in place.

Torque cylinder head nuts **no. 23** in criss-cross sequence at half of the recommended torque value in the exploded view.

Finish tightening hexagonal nuts **no. 23** criss-cross with the recommended values in the exploded view.

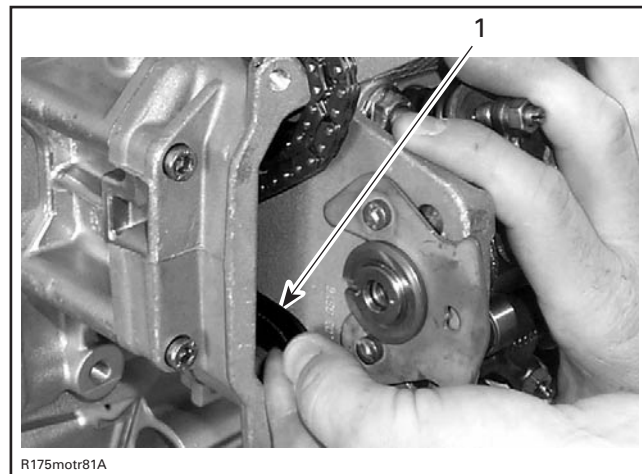
Torque cylinder head screws **no. 24** with the recommended values in the exploded view.



1. Cylinder head screws
2. Cylinder head nuts

Check chain guide **no. 22** for movement.

CAUTION: Chain guide is fixed between cylinder and cylinder head.



1. Chain guide

Remove crankshaft locking bolt then reinstall plug with sealing ring.

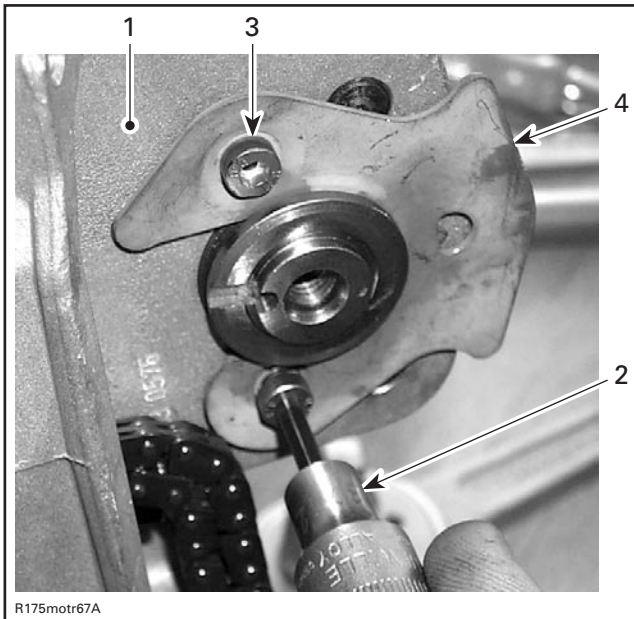
CAMSHAFT

Removal

The camshaft can be removed with the cylinder head installed.

Remove:

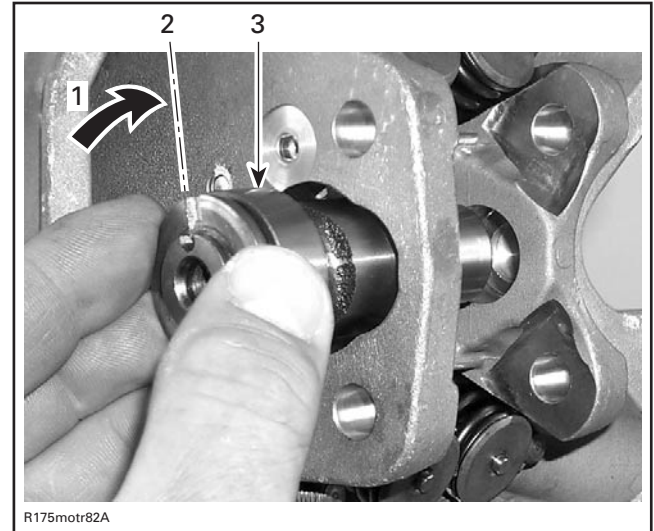
- valve cover (see VALVE COVER above)
- chain tensioner (see CHAIN TENSIONER above)
- breather (see BREATHER above)
- camshaft timing gear (see CAMSHAFT TIMING GEAR above)
- camshaft retaining plate **no. 10**



1. Cylinder head
2. Allen wrench (P/N 529 035 861)
3. Allen screws
4. Camshaft retaining plate

- rocker arms (see ROCKER ARM above)
- camshaft **no. 28**.

NOTE: Rotate camshaft for groove shows to cylinder head intake side to ease removal of the camshaft.

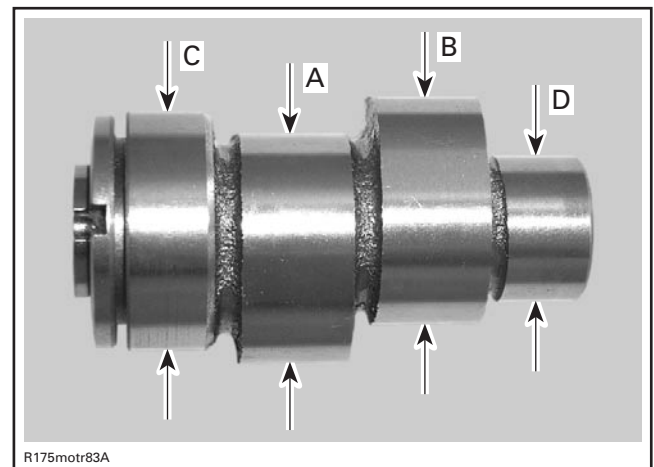


1. Direction of rotation
2. Groove exhaust port
3. Camshaft

Inspection

Check each lobe and bearing journal of camshaft for scoring, scuffing, cracks or other signs of wear.

Measure camshaft bearing journal diameter and lobe height using a micrometer.

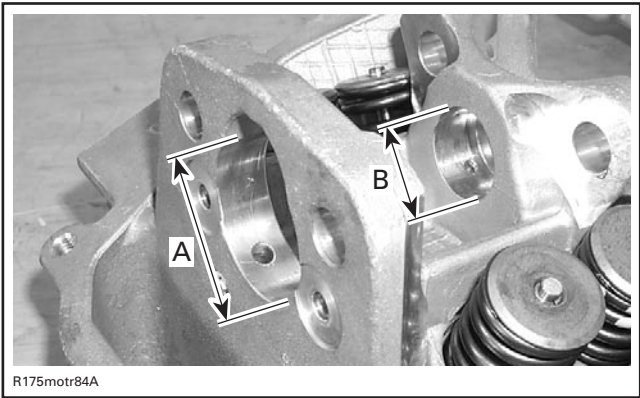


- A. Camshaft lobe (exhaust valves)
- B. Camshaft lobe (intake valves)
- C. Camshaft bearing journal MAG side
- D. Camshaft bearing journal PTO side

Measure clearance between both ends of camshaft and cylinder head.

Section 03 ENGINE

Subsection 08 (CYLINDER AND HEAD)



A. Cylinder head — camshaft bore MAG side
B. Cylinder head — camshaft bore PTO side

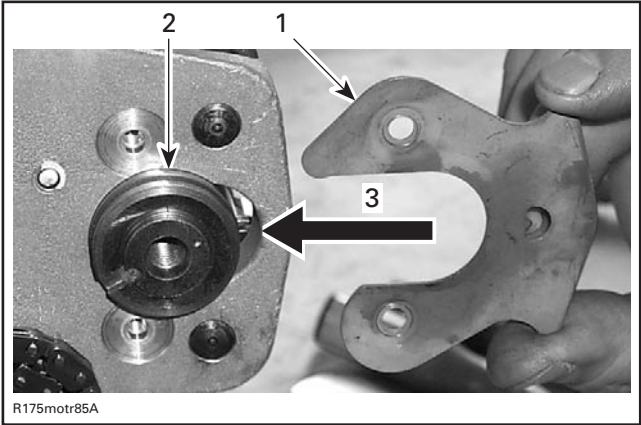
CAMSHAFT LOBE — EXHAUST/INTAKE VALVE	
NEW MINIMUM	30.887 mm (1.216 in)
NEW MAXIMUM	31.087 mm (1.224 in)
SERVICE LIMIT	30.800 mm (1.212 in)
CAMSHAFT BEARING JOURNAL — MAG SIDE	
NEW MINIMUM	31.950 mm (1.2579 in)
NEW MAXIMUM	31.975 mm (1.2589 in)
SERVICE LIMIT	31.930 mm (1.2571 in)
CAMSHAFT BEARING JOURNAL — PTO SIDE	
NEW MINIMUM	19.959 mm (.7858 in)
NEW MAXIMUM	19.980 mm (.7866 in)
SERVICE LIMIT	19.940 mm (.7850 in)
CAMSHAFT BORE — MAG SIDE MEASURED IN DIAMETER	
NEW MINIMUM	32.000 mm (1.2598 in)
NEW MAXIMUM	32.025 mm (1.2608 in)
SERVICE LIMIT	32.040 mm (1.2614 in)
CAMSHAFT BORE — PTO SIDE MEASURED IN DIAMETER	
NEW MINIMUM	20.000 mm (.7874 in)
NEW MAXIMUM	20.021 mm (.7882 in)
SERVICE LIMIT	20.035 mm (.7888 in)

Replace parts that are not within specifications.

Installation

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

Install camshaft in the opposite way of the removal then place the camshaft retaining plate in the slot.



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

For other parts, refer to proper installation procedure.

VALVE SPRING

Removal

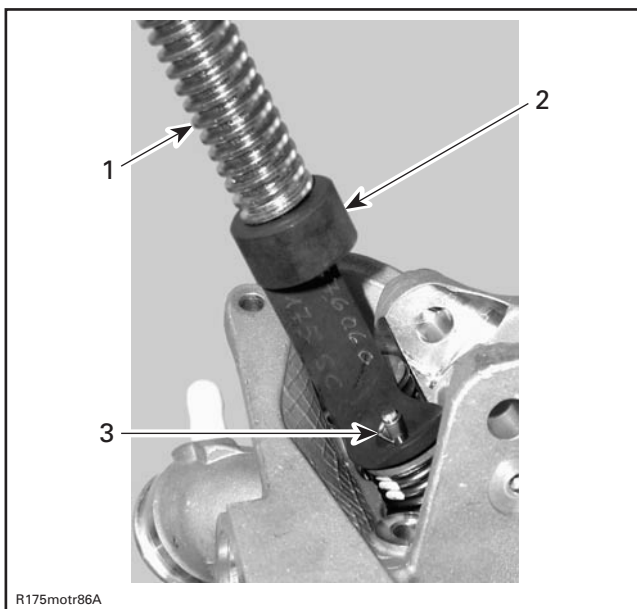
Remove:

- rocker arms (see ROCKER ARM above)
- cylinder head (see CYLINDER HEAD above).

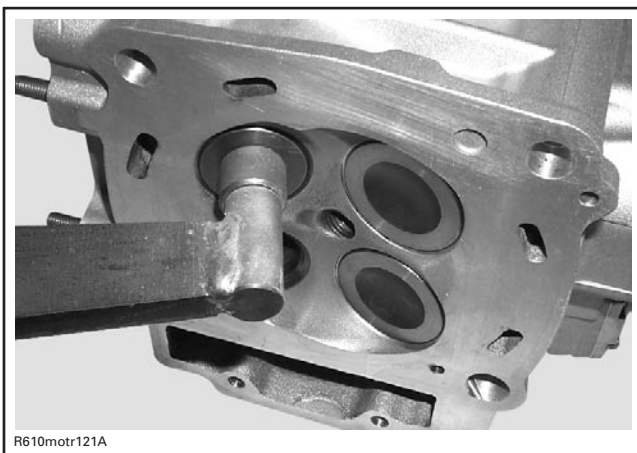
Compress valve spring **no. 29**, use valve spring compressor clamp (P/N 529 035 724) and valve spring compressor cup (P/N 529 035 725).

⚠ WARNING

Always wear safety glasses when disassembling valve springs. Be careful when unlocking valves. Components could fly away because of the strong spring preload.



1. Valve spring compressor clamp (P/N 529 035 724)
2. Valve spring compressor cup (P/N 529 035 725)
3. Valve cotter



LOCATE VALVE SPRING COMPRESSOR CLAMP IN CENTER OF THE VALVE

Remove valve cotteners **no. 30**.

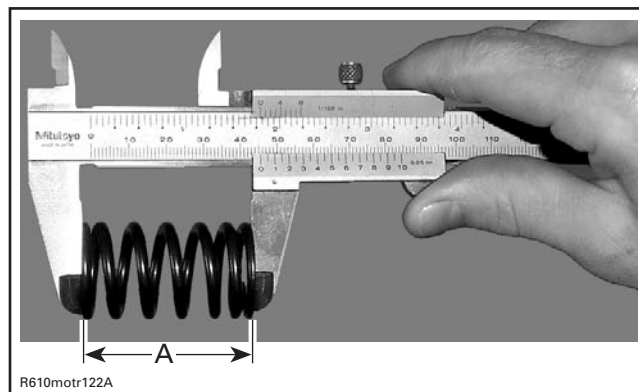
Withdraw valve spring compressor, valve spring retainer **no. 31** and valve spring **no. 29**.

Inspection

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

Check valve spring for free length and straightness.

Replace valves if not within specifications.



A. Valve spring length

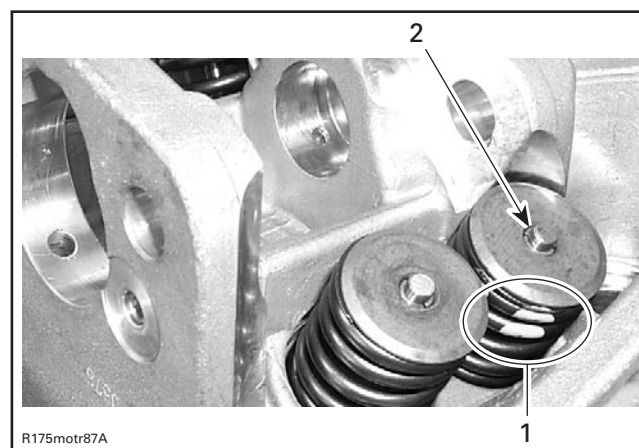
VALVE SPRING FREE LENGTH	
NEW NOMINAL	33.6 mm (1.323 in)
SERVICE LIMIT	33.0 mm (1.299 in)

Installation

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

Colored area of the valve spring must be placed on top.

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



1. Position of the valve spring
2. Valve cotteners

Section 03

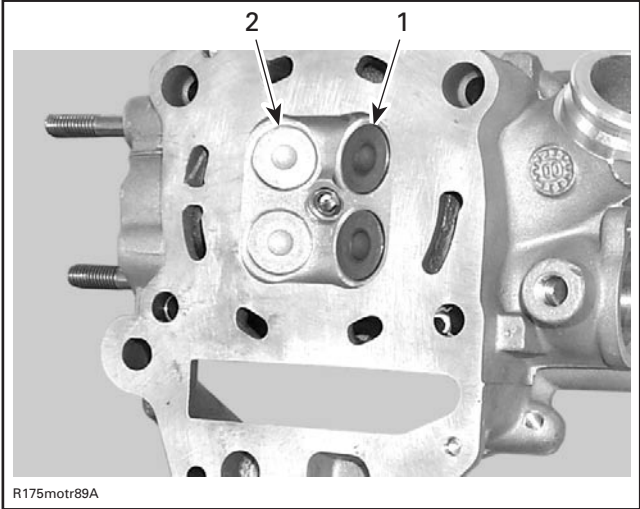
ENGINE

Subsection 08 (CYLINDER AND HEAD)

VALVE

Removal

Remove valve spring.
Push valve stem then pull valves no. 32 and no. 33 out of valve guide no. 36.



- 1. Intake valve 20 mm
- 2. Exhaust valve 18 mm

Remove valve stem seal no. 35 with special pliers such as Snap-ON YA 8230.



Inspection

Valve Stem Seal

Inspection of valve stem seals is not needed because new seals should always be installed whenever cylinder head is removed.

Valve

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

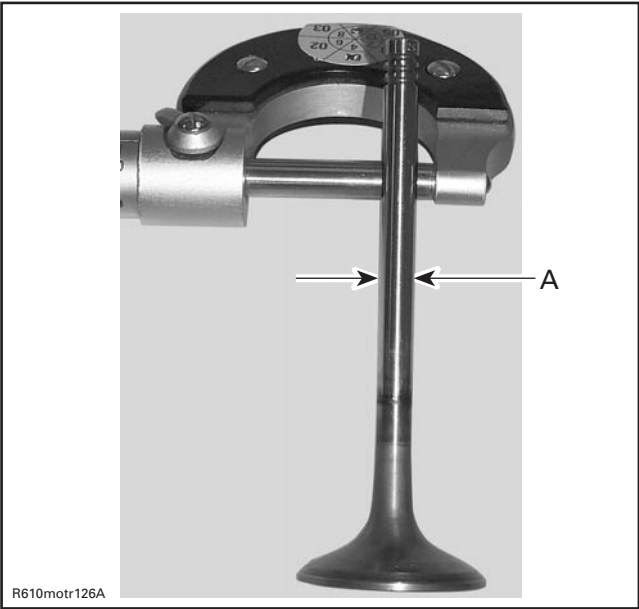
VALVE OUT OF ROUND mm (in)	
NEW NOMINAL	
EXHAUST	0.005 mm (.0002 in)
INTAKE	
SERVICE LIMIT	
EXHAUST	0.06 mm (.0024 in)
INTAKE	

Valve Stem and Valve Guide Clearance

Measure valve stem and valve guide in three places, using a micrometer and a small bore gauge.

NOTE: Clean valve guide to remove carbon deposits before measuring.

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



A. Valve stem diameter

Section 03 ENGINE

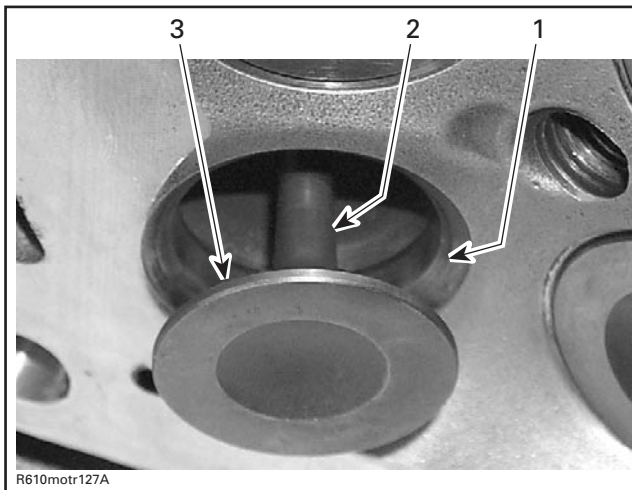
Subsection 08 (CYLINDER AND HEAD)

VALVE STEM DIAMETER mm (in)	
NEW MINIMUM	
EXHAUST	3.96 mm (.1559 in)
INTAKE	3.97 mm (.1563 in)
NEW MAXIMUM	
EXHAUST	3.97 mm (.1563 in)
INTAKE	3.98 mm (.1567 in)
SERVICE LIMIT	
EXHAUST	3.940 mm (.1551 in)
INTAKE	

Replace valve guide out of cylinder head if valve guide is out of specification or has other damages such as wear or friction surface (see VALVE GUIDE PROCEDURE below).

VALVE GUIDE DIAMETER mm (in)	
SERVICE LIMIT	
EXHAUST	4.060 mm (.1598 in)
INTAKE	

Valve Face and Seat



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 GUIDE PROCEDURE below).

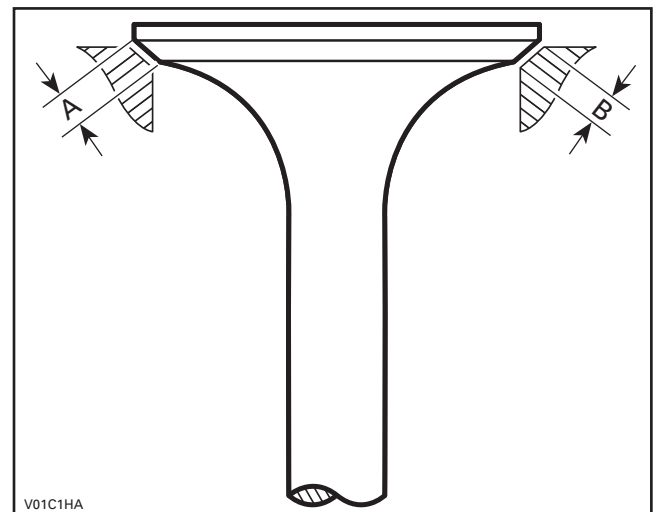
Measure valve face contact width.

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

Measure valve seat width, using a caliper.

VALVE SEAT CONTACT WIDTH mm (in)	
NEW	
EXHAUST	1.25 to 1.55 mm (.049 to .061 in)
INTAKE	1.05 to 1.35 mm (.041 to .053 in)
SERVICE LIMIT	
EXHAUST	2 mm (.078 in)
INTAKE	1.8 mm (.07 in)

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



- A. Valve face contact width
- B. Valve seat contact width

Section 03 ENGINE

Subsection 08 (CYLINDER AND HEAD)

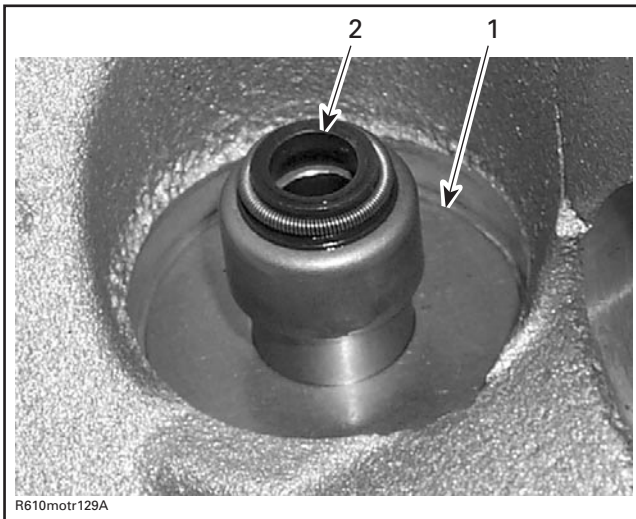
Installation

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

CAUTION: Make sure the thrust washer **no. 34** is installed before installing valve stem seal **no. 35**.

Apply engine oil on valve stem and install it.

CAUTION: Be careful when valve stem is passed through sealing lips of valve stem seal.



1. Thrust washer
2. Sealing lips of valve stem seal

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

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.

CAUTION: An improperly locked valve spring will cause engine damage.

VALVE GUIDE PROCEDURE

Removal

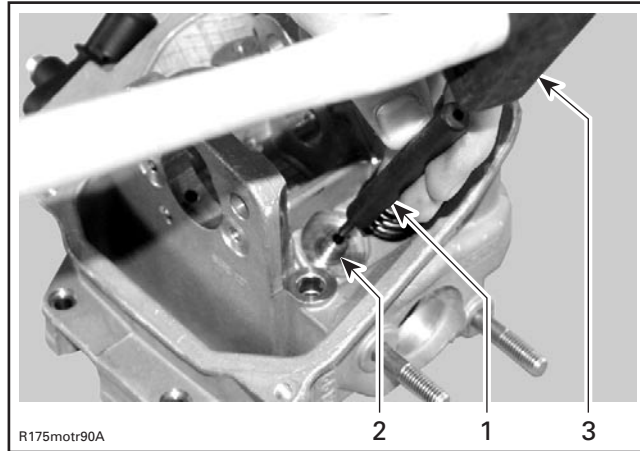
Remove:

- cylinder head (see CYLINDER HEAD above)
- valve spring (see VALVE SPRING above)
- valve (see VALVE above).

NOTE: Clean valve guide area from contamination before removal.

Heat the valve guide area during approximately 10 minutes to 100°C (212°F).

Using valve guide remover (P/N 529 035 852), remove valve guide **no. 36**.



1. Valve guide remover
2. Valve guide
3. Hammer

Inspection

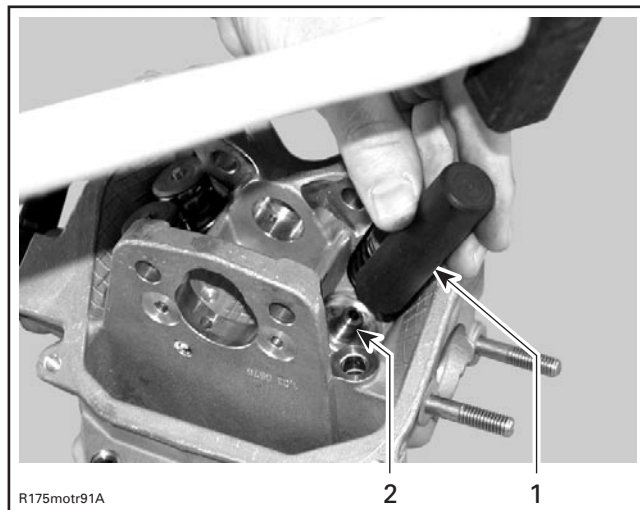
Always replace valve stem seals whenever cylinder head is removed.

Clean the valve guide bore before reinstall the valve guide into cylinder head.

Installation

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

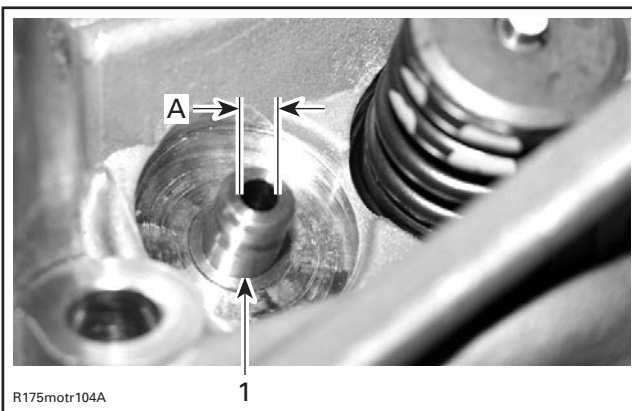
Use valve guide installer (P/N 529 035 853) to install valve guide **no. 36**.



1. Valve guide installer
2. Valve guide

Valve guide to be grinded in diameter by using a reamer.

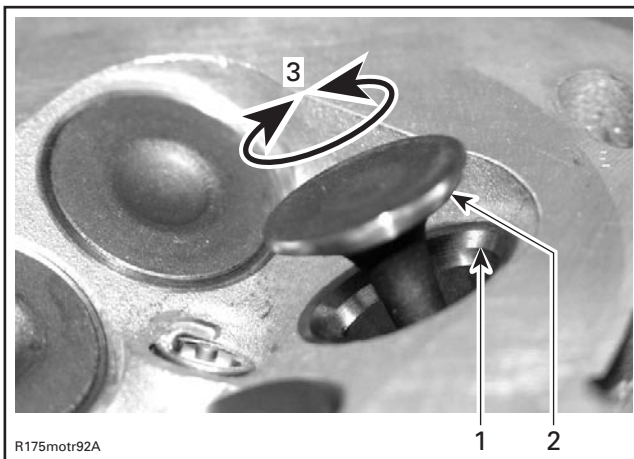
VALVE GUIDE DIAMETER mm (in)	
NEW MINIMUM	
EXHAUST	4.002 mm (.1576 in)
INTAKE	
NEW MAXIMUM	
EXHAUST	4.015 mm (.1581 in)
INTAKE	



1. Valve guide
A. Valve guide diameter

NOTE: Ensure to turn reamer right direction. Use cutting oil and make brakes to clean reamer/valve guide from metal shavings.

Apply some lapping compound to valve face and work valve on its seat with a lapping tool.



1. Valve seat
2. Valve face (contact surface to valve seat)
3. Turn valve while pushing again cylinder head

NOTE: Ensure to seat valves properly. Apply marking paste to ease checking contact pattern.

CYLINDER

Removal

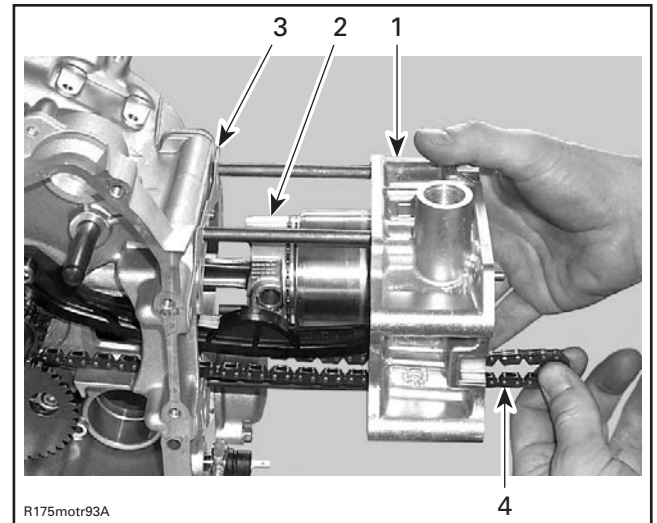
Lock crankshaft at TDC compression position, refer to **CRANKSHAFT**.

Remove:

- chain tensioner (see CHAIN TENSIONER above)
- breather (see BREATHER above)
- camshaft timing chain
- cylinder head (see CYLINDER HEAD above).

Pull cylinder **no. 37**.

Discard cylinder gasket **no. 38**.



1. Cylinder
2. Piston assembly
3. Cylinder base gasket
4. Camshaft timing chain

Inspection

Cylinder

Check cylinder for cracks, scoring and wear ridges on the top and bottom of the cylinder. If so, replace cylinder.

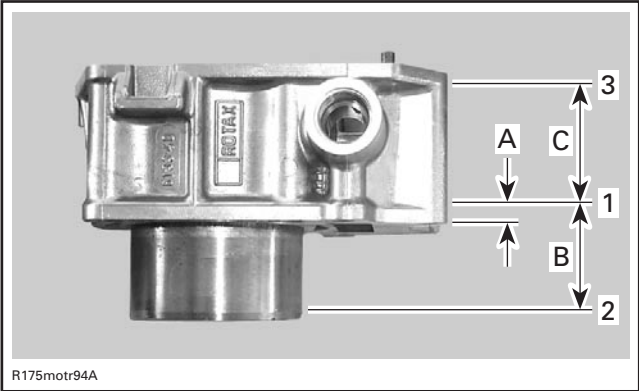
Section 03 ENGINE

Subsection 08 (CYLINDER AND HEAD)

Cylinder Taper

Measure cylinder bore and if it is out of specifications, replace cylinder and piston ring set **no. 39**.

Measure cylinder bore at 3 recommended positions. See the following illustration.



- 1. First measuring diameter
- 2. Second measuring diameter
- 3. Third measuring diameter
- A. 7 mm (.276 in) from cylinder bottom
- B. 36 mm (1.417 in)
- C. 23 mm (.905 in)

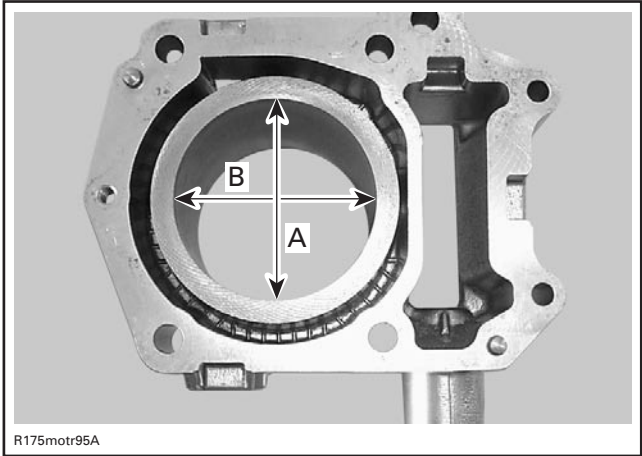
CYLINDER TAPER IN DIAMETER mm (in)	
NEW MAXIMUM	0.052 mm (.002 in)
SERVICE LIMIT	0.090 mm (.004 in)

Distance between measurements should not exceed the service limit mentioned above.

Cylinder Out of Round

Measure cylinder diameter in piston axis direction from top of cylinder. Take an other measurement 90° from first one and compare.

NOTE: Take the same measuring points like described in CYLINDER TAPER above.



- A. Perpendicular to crankshaft axis
- B. Parallel to crankshaft axis

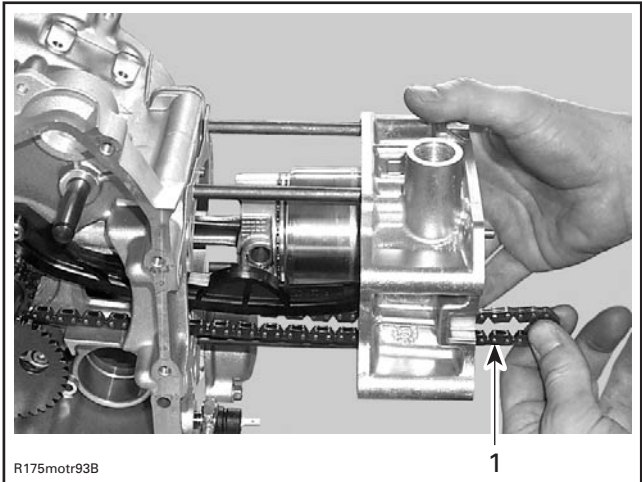
CYLINDER OUT OF ROUND mm (in)	
NEW MAXIMUM	0.015 mm (.0006 in)
SERVICE LIMIT	0.02 mm (.0008 in)

CAUTION: Always replace gasket **no. 38** before installing the cylinder.

Installation

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

Apply engine oil in the bottom area of the cylinder bore and also on the band of the piston ring compressor tool.



- 1. Timing chain

NOTE: Put timing chain through the chain pit then put the cylinder in place.

Install cylinder head and the other parts in accordance with the proper installation procedures.

PISTON

Removal

Remove:

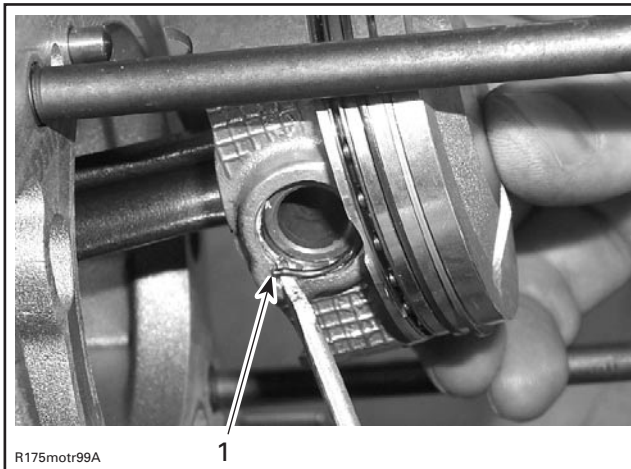
- cylinder head (see CYLINDER HEAD above)
- cylinder (see CYLINDER above).

Place a rag under piston.

WARNING

Piston ring circlips are spring loaded.

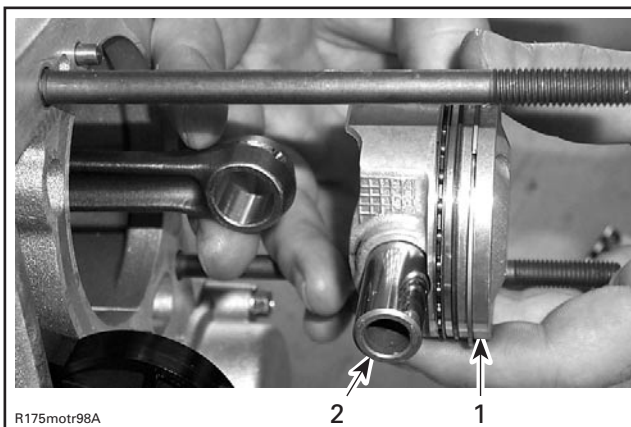
Remove one piston circlip **no. 40** and discard it.



1. Piston circlip

NOTE: The removal of both piston circlips is not necessary to remove piston pin.

Push piston pin **no. 41** out of piston.



1. Piston
 2. Piston pin

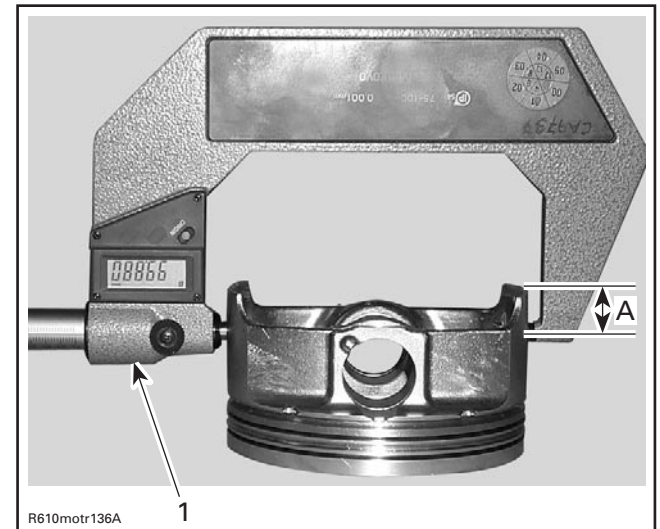
Detach piston **no. 42** from connecting rod.

Inspection

Piston

Inspect piston for scoring, cracking or other damages. Replace piston and piston rings if necessary.

Using a micrometer, measure piston at 9 mm (.354 in) perpendicularly (90°) to piston pin.



1. Measuring perpendicularly (90°) to piston pin
 A. 9 mm (.354 in)

The measured dimension should be as described in the following table. If not, replace piston.

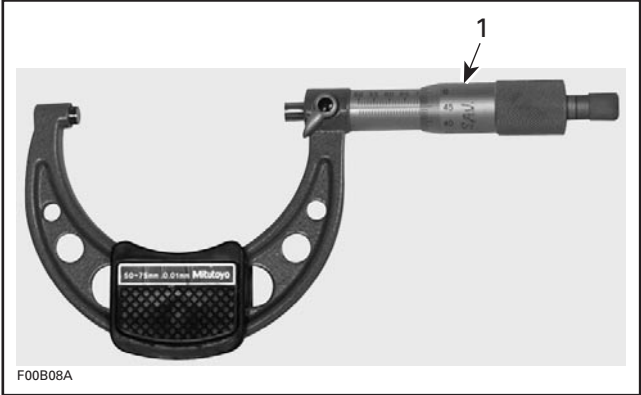
PISTON MEASUREMENT	
NEW NOMINAL	61.942 to 61.958 mm (2.438 to 2.439 in)
SERVICE LIMIT	61.80 mm (2.433 in)

Piston/Cylinder Clearance

Adjust and lock a micrometer to the piston dimension.

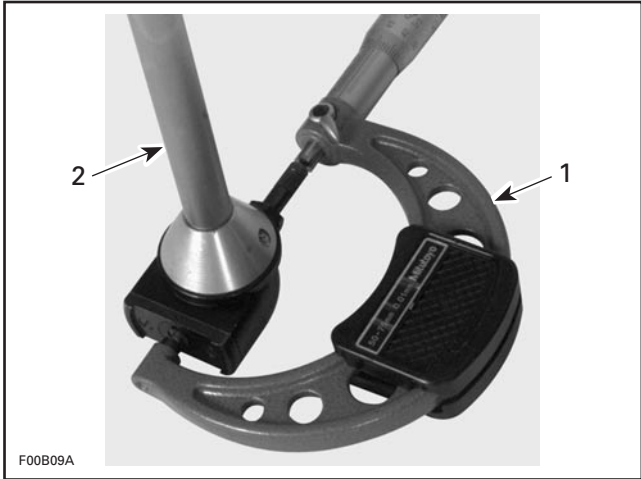
Section 03 ENGINE

Subsection 08 (CYLINDER AND HEAD)

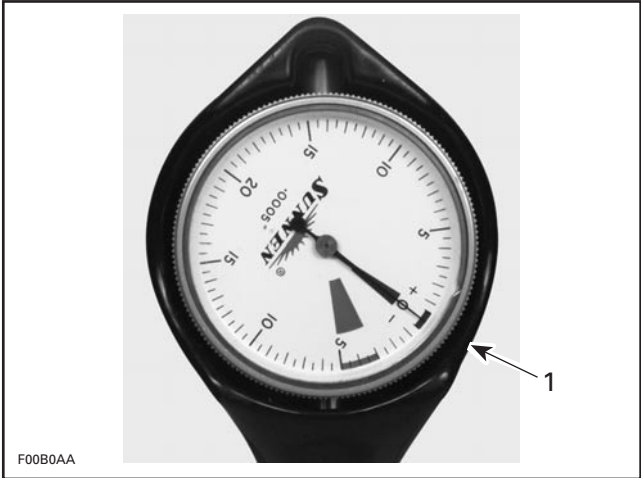


1. Micrometer set to the piston dimension

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 47 mm (1.85 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 NOMINAL	0.042 to 0.072 mm (.0017 to .0028 in)
SERVICE LIMIT	0.090 mm (.004 in)

NOTE: Make sure used piston is not worn. See **Piston Measurement** above.

If clearance exceeds specified tolerance, replace cylinder.

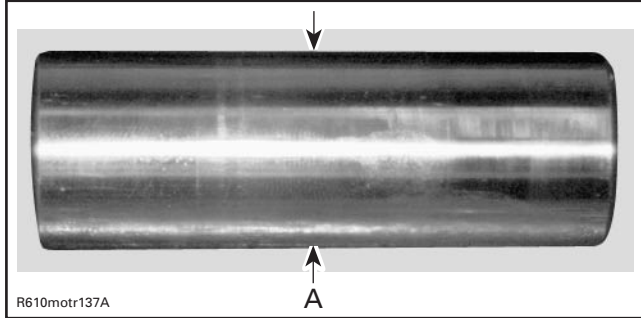
NOTE: Make sure the cylinder bore gauge indicator is set exactly at the same position as with the micrometer, otherwise the reading will be false.

Piston Pin

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.



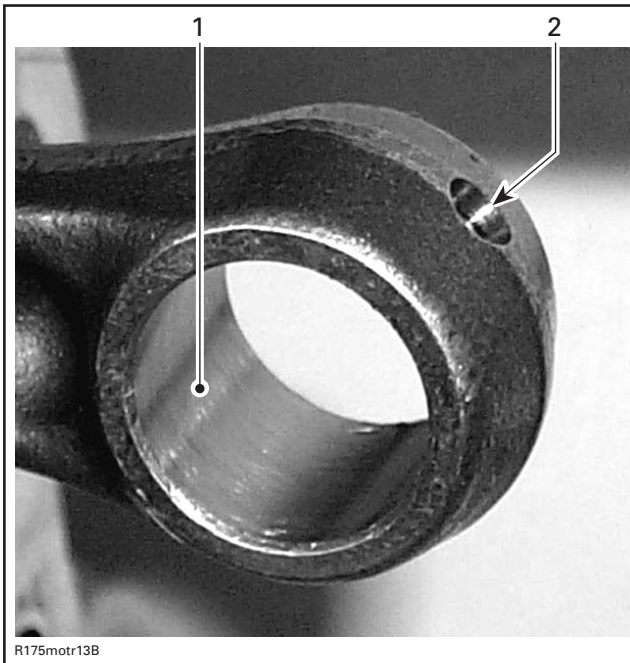
A. Piston pin diameter

PISTON PIN	
NEW MINIMUM	14.997 mm (.5904 in)
NEW MAXIMUM	15.000 mm (.5905 in)
SERVICE LIMIT	14.990 mm (.5902 in)

Replace piston pin if diameter is out of specifications.

Piston Pin/Connecting Rod Bushing Clearance
Measure inside diameter of connecting rod.

CONNECTING ROD SMALL END DIAMETER	
NEW MINIMUM	15.005 mm (.5907 in)
NEW MAXIMUM	15.015 mm (.5911 in)
SERVICE LIMIT	15.06 mm (.593 in)



1. Connecting rod small end diameter
2. Oil supply due to oil dust

Replace crankshaft if diameter of connecting rod small end is out of specifications. Refer to **CRANK-SHAFT** for removal procedure.

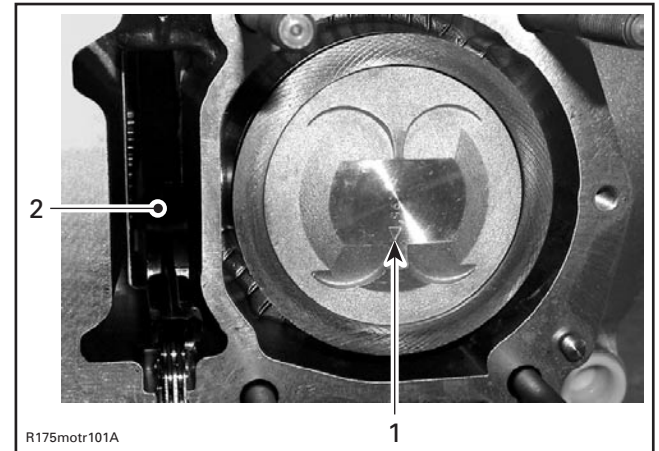
Installation

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

Apply engine oil on the piston pin.

Insert piston pin into piston and connecting rod.

CAUTION: Take care that piston will be installed with the punched arrow on piston top to the exhaust side.

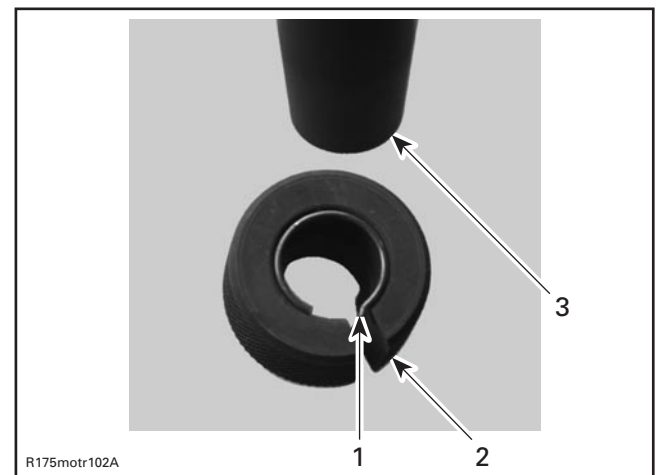


1. Arrow should indicate to the exhaust side
2. Area of timing chain compartment

Use the piston circlip installer (P/N 529 035 859) to assemble the piston circlip as per following procedure:

CAUTION: Secure piston pin with new piston circlips.

- place circlip no. 40 in sleeve as per following illustration



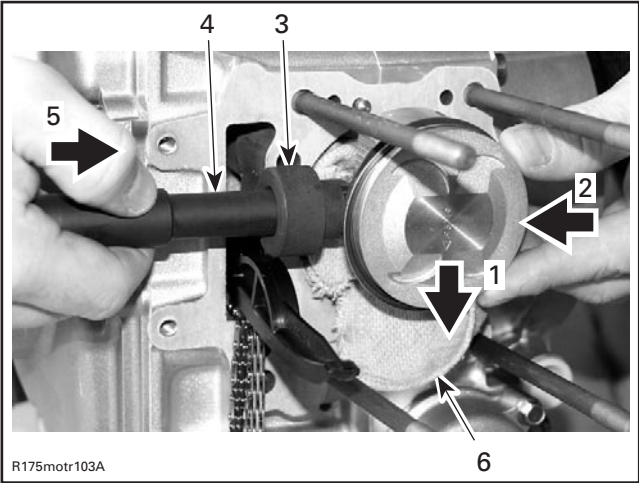
1. Circlip
2. Sleeve
3. Assembly jig from piston clip installer

- push taper side of assembly jig until circlip reaches middle of sleeve
- place sleeve align with piston pin axis and push assembly jig until circlip engages in piston.

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Subsection 08 (CYLINDER AND HEAD)



- 1. Arrow should indicate to the exhaust side
- 2. Hold piston while pushing circlip in place
- 3. Sleeve
- 4. Assembly jig
- 5. Direction to push circlip
- 6. Cleaning rag

NOTE: Take care that the hook of the piston circlip is positioned properly.



CORRECT POSITION OF THE PISTON CIRCLIP

PISTON RINGS

Removal

Remove:

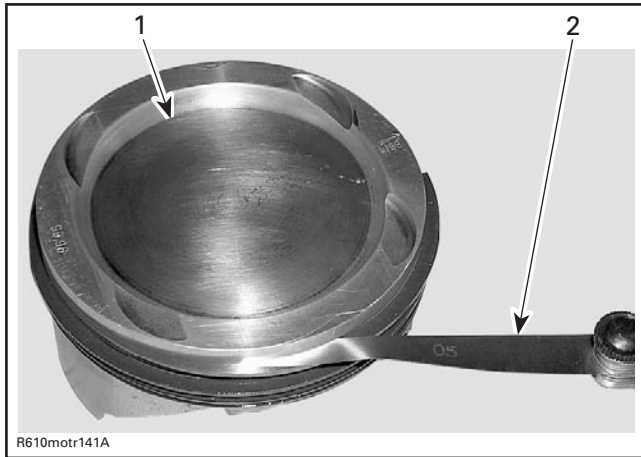
- cylinder head
- cylinder
- piston pin.

Inspection

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 mm (in)	
NEW MINIMUM	
RECTANGULAR	0.03 mm (.0012 in)
TAPER-FACE	0.03 mm (.0012 in)
OIL SCRAPER RING	0.01 mm (.0004 in)
NEW MAXIMUM	
RECTANGULAR	0.065 mm (.0026 in)
TAPER-FACE	0.065 mm (.0026 in)
OIL SCRAPER RING	0.18 mm (.007 in)
SERVICE LIMIT	
RECTANGULAR TAPER-FACE	0.10 mm (.0039 in)
OIL SCRAPER RING	0.25 mm (.0098 in)



- 1. Piston
- 2. Feeler gauge

Ring End Gap

RING END GAP	
NEW MINIMUM	
RECTANGULAR	0.20 mm (.008 in)
TAPER-FACE	0.20 mm (.008 in)
OIL SCRAPER RING	0.20 mm (.008 in)
NEW MAXIMUM	
RECTANGULAR	0.35 mm (.014 in)
TAPER-FACE	0.35 mm (.014 in)
OIL SCRAPER RING	0.70 mm (.028 in)
SERVICE LIMIT	
RECTANGULAR TAPER-FACE	0.8 mm (.032 in)
OIL SCRAPER RING	1.2 mm (.047 in)

Measure position for ring end gap in the area of 8 to 16 mm (.315 to .630 in) from top of cylinder.

NOTE: In order to correctly position the ring in the cylinder, use piston as a pusher.

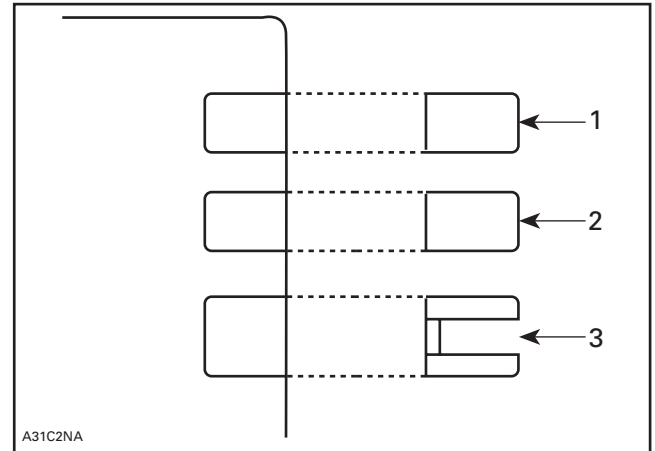
Using a feeler gauge, check ring end gap. Replace ring if gap exceeds above described specified tolerance.

Installation

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

NOTE: First install spring and then rings of oil scraper ring.

Install the oil scraper ring first, then the taper-face ring with the word "N and TOP" facing up, then the rectangular ring with the word "N and TOP" facing up.



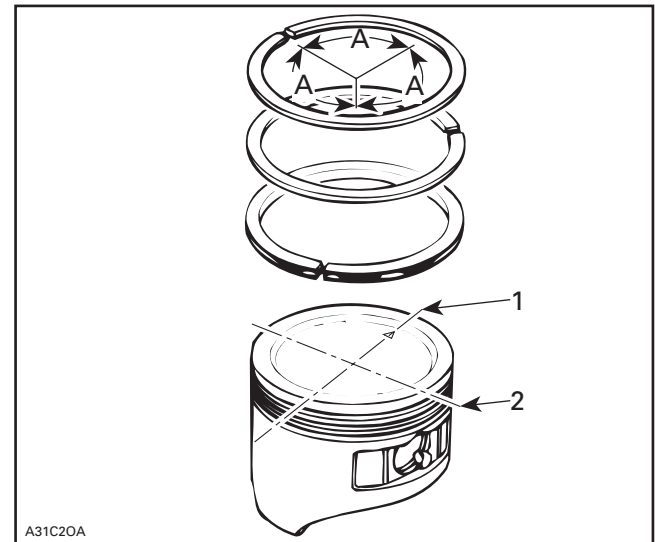
1. Rectangular ring
2. Taper-face ring
3. Oil scraper ring

CAUTION: Ensure that top and second rings are not interchanged.

NOTE: Use a ring expander to prevent breakage during installation. The oil ring must be installed by hand.

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.

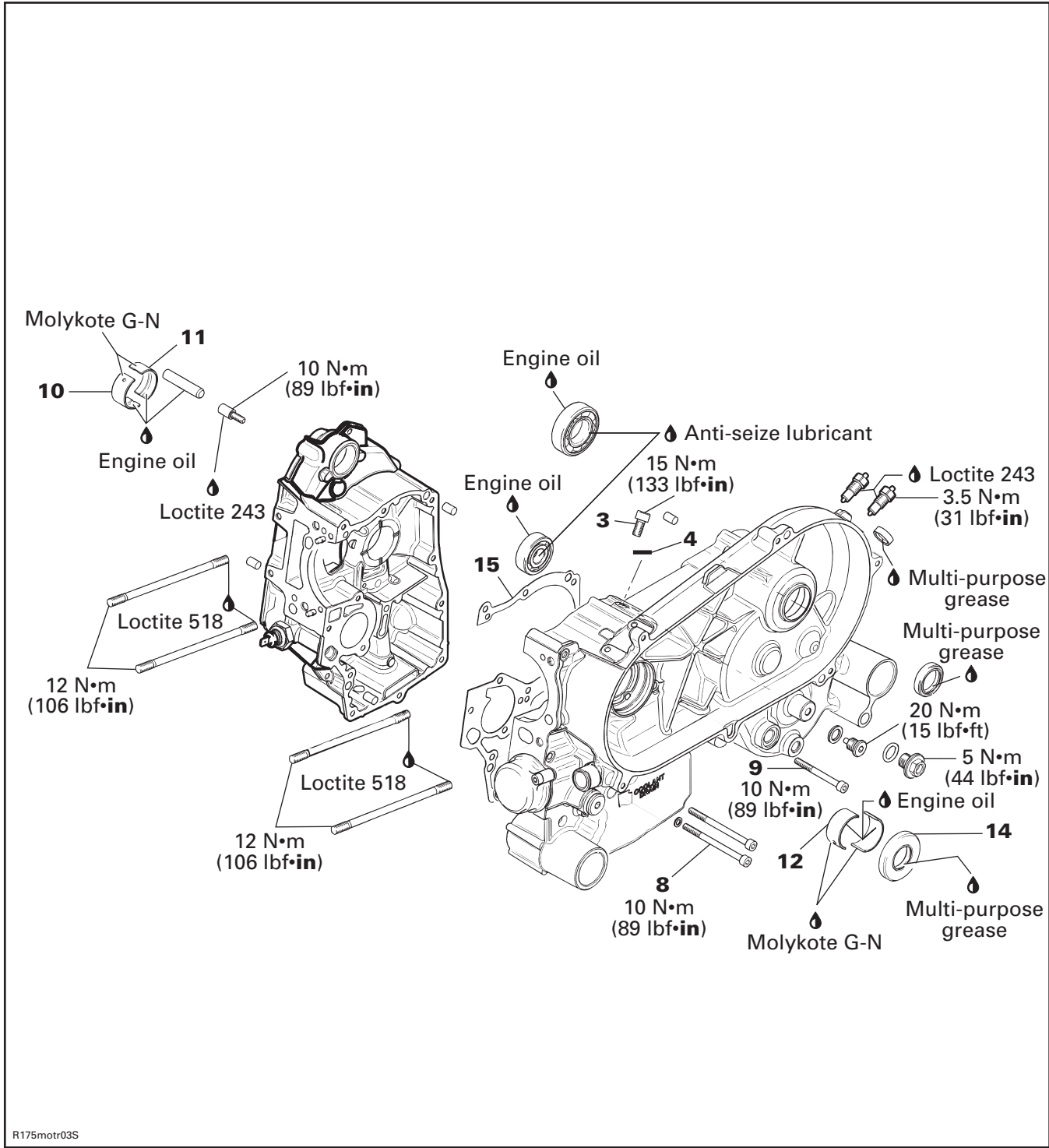


1. DO NOT align ring gap with piston thrust side axis
2. DO NOT align ring gap with piston pin bore axis
- A. 120°

CRANKSHAFT



Section 03 ENGINE
Subsection 09 (CRANKSHAFT)



R175motr03S

GENERAL

For installation, use the torque values and Loctite products from the exploded views. Clean threads before using Loctite when installing the screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

CRANKSHAFT LOCKING PROCEDURE

Removal

Unplug spark plug cable then remove the spark plug.

Remove:

- RH footwell
- valve cover and breather (refer to **CYLINDER AND HEAD**)
- magneto cover (refer to **MAGNETO SYSTEM**)
- screw **no. 3** and shim **no. 4**.



1. Screw
2. Copper shim

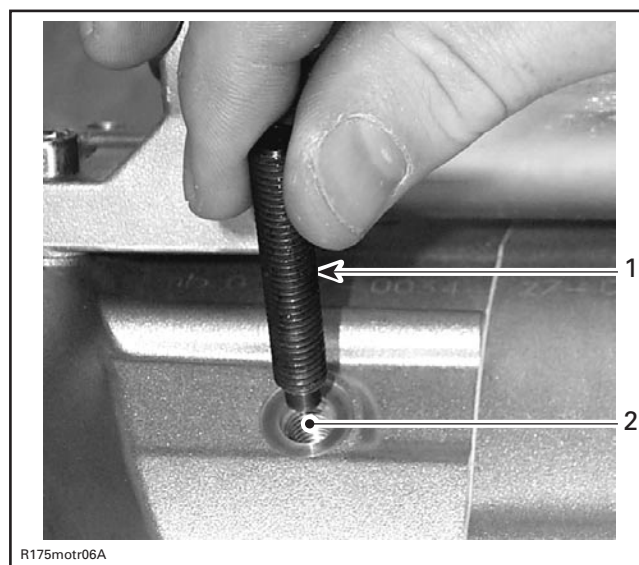
Turn rotor, fixed on crankshaft MAG side, to TDC compression position (refer to **CYLINDER AND HEAD**).

Use a screwdriver to check if groove in crankshaft is aligned with the hole.



1. Screwdriver

Lock crankshaft with crankshaft locking bolt (P/N 529 035 617).

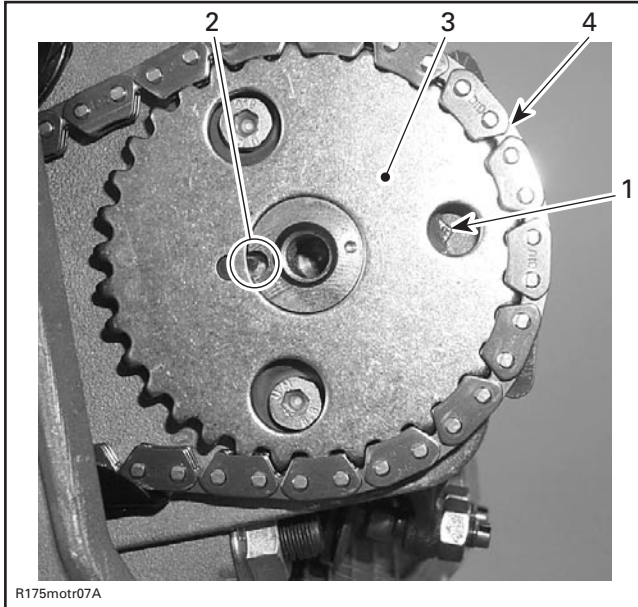


1. Crankshaft locking bolt
2. Hole in the area of electrical starter

Section 03 ENGINE

Subsection 09 (CRANKSHAFT)

Double-check camshaft timing gear position (refer to **CYLINDER AND HEAD**).



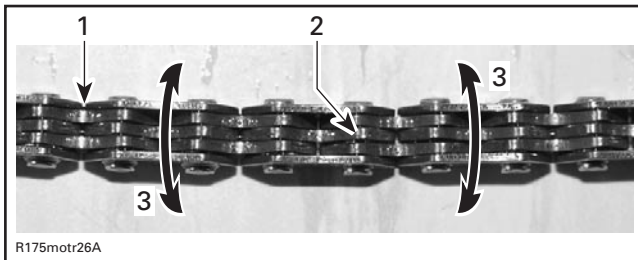
1. Cylinder bore axle (arrow middle of the timing gear bore)
2. Groove in the camshaft
3. Timing chain gear
4. Timing chain

TIMING CHAIN

Inspection

Check timing chain **no. 1** on camshaft timing gear for excessive radial play.

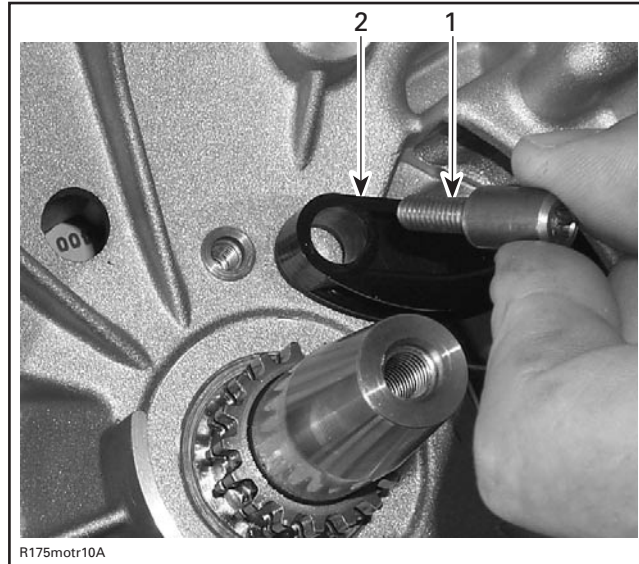
Check chain condition for wear and the condition of the segment.



1. Timing chain
2. Timing chain segments
3. Timing chain bending

If chain is excessively worn or damaged, replace it as a set (camshaft timing gear and timing chain).

Check chain tensioner guide **no. 2** for excessive wear on contact surface to timing chain, replace if necessary.



1. Bearing screw
2. Chain tensioner guide

Removal

Remove RH foot well.

Drain engine oil (refer to **LUBRICATION SYSTEM**, see **OIL CHANGE**).

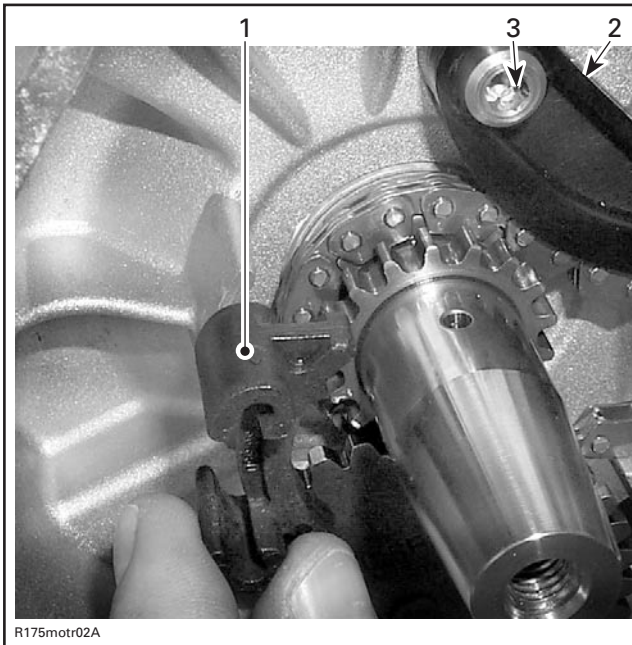
NOTE: No need to drain cooling system.

Remove:

- valve cover
(refer to **CYLINDER AND HEAD**)

Lock crankshaft at TDC compression position (see TDC procedure below).

- chain tensioner
(refer to **CYLINDER AND HEAD**)
- camshaft timing gear
(refer to **CYLINDER AND HEAD**)
- magneto cover and rotor
(refer to **MAGNETO SYSTEM**)
- oil pump
(refer to **LUBRICATION SYSTEM**)
- chain guide



1. Chain guide
2. Chain tensioner guide
3. Bearing screw

– timing chain.

NOTE: Mark timing chain and crankcase MAG as per following illustration for proper chain position after reassembling.



1. Mark on chain
2. Mark on crankcase MAG

Installation

The installation is essentially the reverse of the removal procedure but, pay attention to the following details.

Ensure to perform proper valve timing. Lock crankshaft (see TDC procedure below) and place camshaft at ignition TDC (refer to **CYLINDER AND HEAD**).

CAUTION: Crankshaft and camshaft must be locked on ignition TDC position to place camshaft timing gear and timing chain in the proper position.

NOTE: Place chain according to marks on timing chain and crankcase MAG for proper chain position after reassembling.

Install chain then, adjust chain tension (refer to **CYLINDER AND HEAD**).

CAUTION: Improper valve timing will damage engine components.

CRANKSHAFT

Removal

Drain engine oil and cooling system.

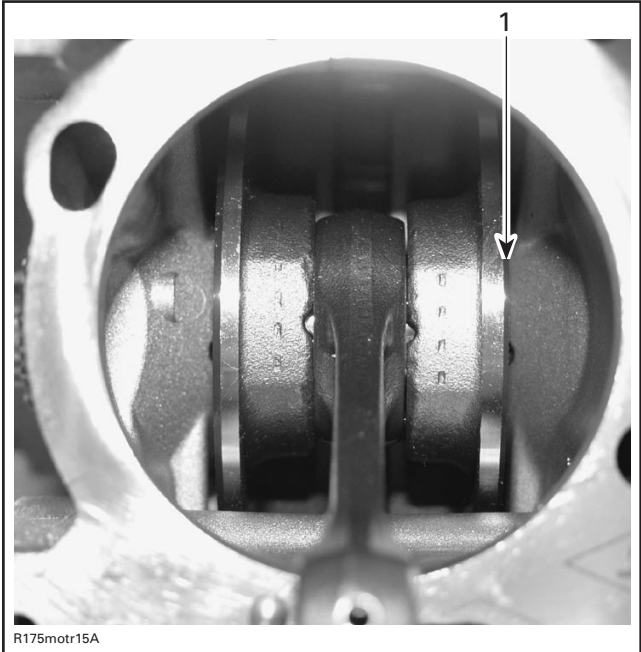
Remove:

- RH footwell and RH cover (refer to **BODY**).
- magneto cover and rotor (refer to **MAGNETO SYSTEM**)
- water pump (refer to **COOLING SYSTEM**)
- oil pump (refer to **LUBRICATION SYSTEM**)
- cylinder and piston (refer to **CYLINDER AND HEAD**).

Section 03 ENGINE

Subsection 09 (CRANKSHAFT)

Measure axial clearance of the crankshaft **no. 5** with a feeler gauge on the PTO side between PTO crankcase and shim **no. 6**.



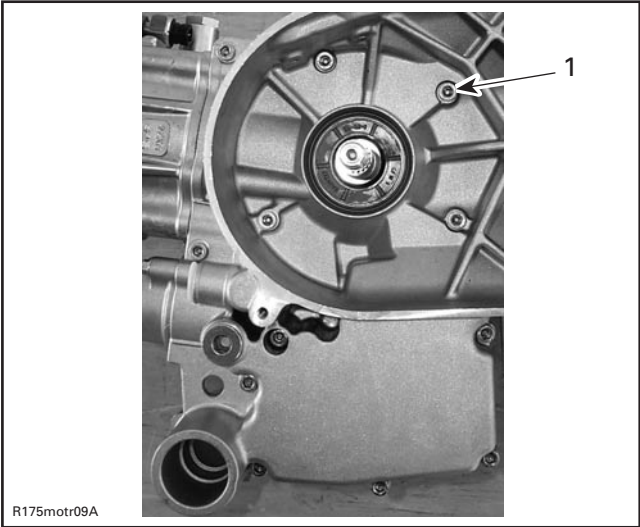
1. Feeler gauge on PTO side

CRANKSHAFT AXIAL CLEARANCE	
NEW MINIMUM	0.2 mm (.0078 in)
NEW MAXIMUM	0.4 mm (.0157 in)

If measurement is out of specification check shims **nos. 6** and **7** for excessive wear and/or if shim(s) is (are) missing. Furthermore, inspect butting faces of crankshaft and crankcases (MAG/PTO side) for excessive wear.

Remove:

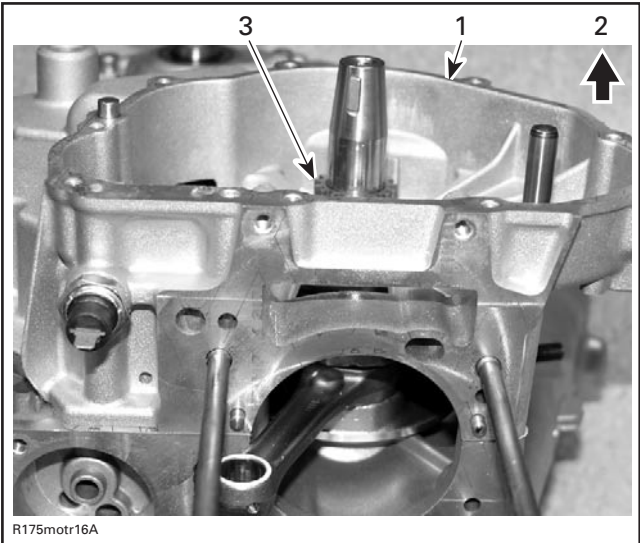
- timing chain
- drive pulley (refer to **CVT**, see **DRIVE PULLEY**)
- screws **no. 8** and screws **no. 9**



1. Screws (12)

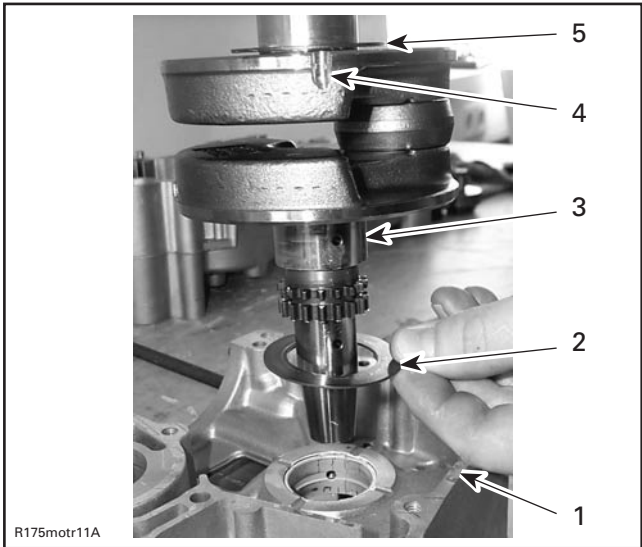
– MAG crankcase (see **CRANKCASE** below)

CAUTION: Pay attention not to damage plain bearing on MAG side with timing gear on crankshaft.



1. Crankcase MAG
2. Lifting direction
3. Timing gear on crankshaft MAG

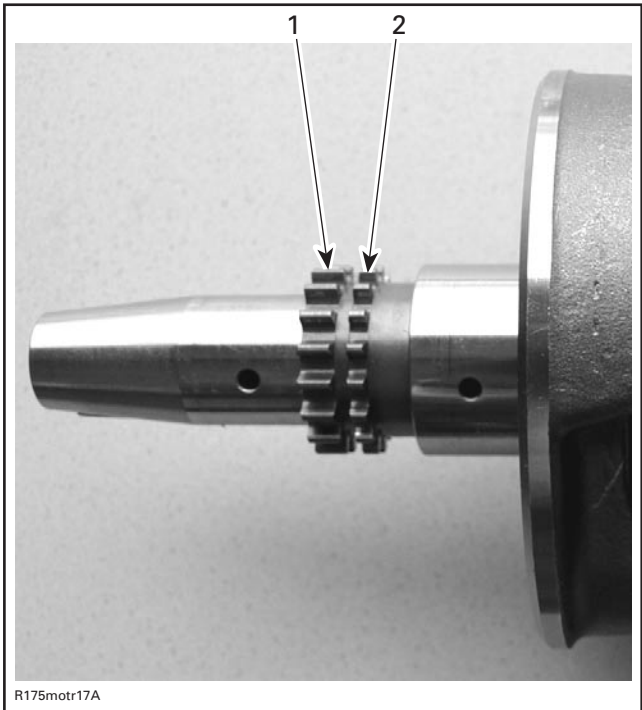
- crankshaft locking bolt
- shim **no. 7** on MAG side
- crankshaft **no. 5**
- shim **no. 6** on PTO side.



1. Crankcase MAG side
2. Shim on MAG side
3. Crankshaft
4. Engagement groove for crankshaft locking bolt
5. Shim on PTO side

Inspection

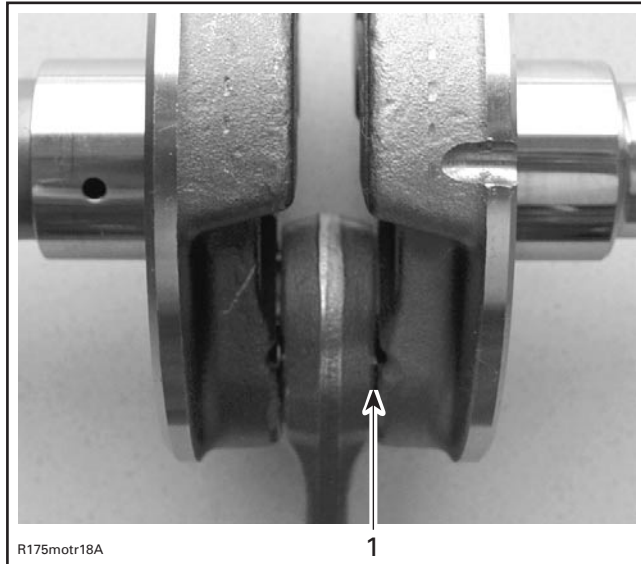
Replace crankshaft if the timing gear is excessive worn or otherwise damaged.



1. Crankshaft timing gear
2. Crankshaft gear for oil pump

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. Measure here with feeler gauge

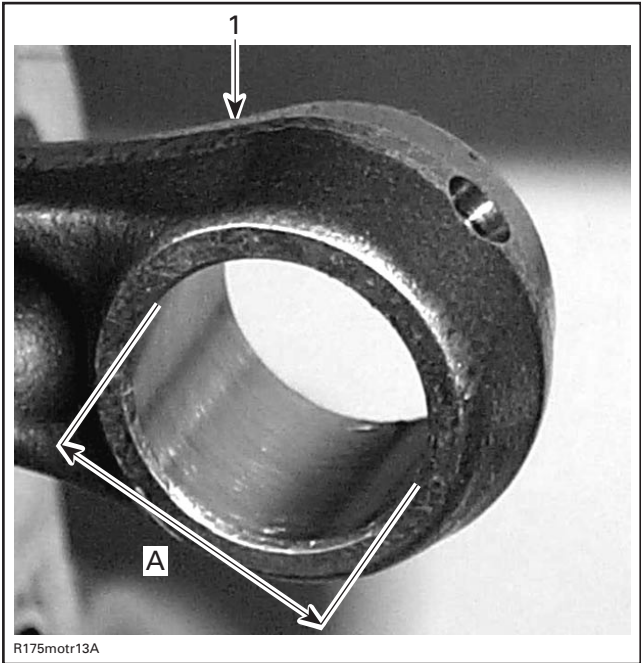
CONNECTING ROD BIG END mm (in)	
NEW MINIMUM	0.3 mm (.012 in)
NEW MAXIMUM	0.627 mm (.025 in)
SERVICE LIMIT	0.8 mm (.032 in)

Section 03 ENGINE

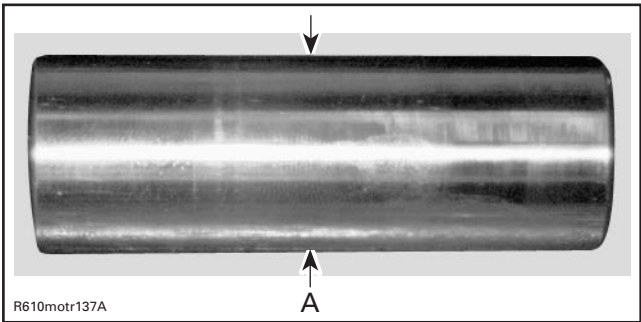
Subsection 09 (CRANKSHAFT)

Connecting Rod/Piston Pin Clearance

Measure piston pin. Compare to inside diameter of connecting rod.



1. Connecting rod
A. Connecting rod small end diameter



A. Piston pin diameter in the area of the bushing

CONNECTING ROD SMALL END DIAMETER	
NEW MINIMUM	15.005 mm (.5907 in)
NEW MAXIMUM	15.015 mm (.5911 in)
SERVICE LIMIT	15.06 mm (.593 in)

PISTON PIN DIAMETER	
NEW MINIMUM	14.997 mm (.5904 in)
NEW MAXIMUM	15.000 mm (.5905 in)
SERVICE LIMIT	14.990 mm (.5902 in)

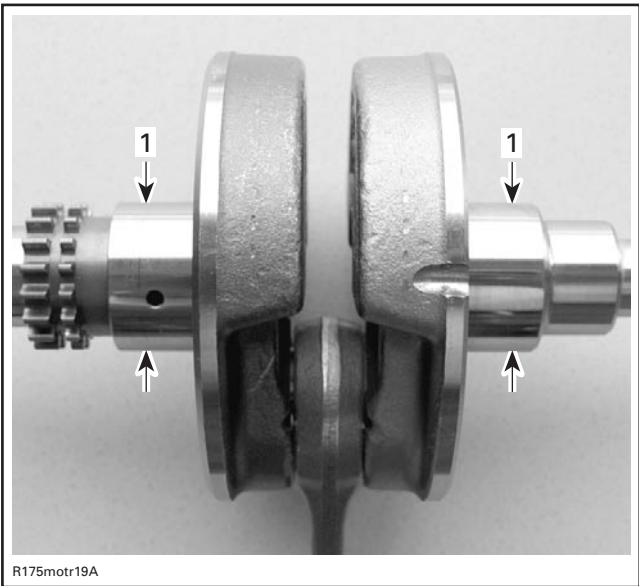
PISTON PIN BORE CLEARANCE

SERVICE LIMIT	0.070 mm (.0028 in)
---------------	---------------------

If the connecting rod small end diameter is out of specification, replace crankshaft and piston pin.

Crankshaft Radial Play MAG/PTO Side

Measure crankshaft on MAG/PTO side. Compare to inside diameter of MAG/PTO bushing (see CRANKCASE below).



1. Measure here with a micrometer

CRANKSHAFT MAG/PTO DIAMETER

NEW MINIMUM	32.010 mm (1.2602 in)
NEW MAXIMUM	32.025 mm (1.2608 in)
SERVICE LIMIT	32.000 mm (1.2598 in)

CRANKSHAFT MAG/PTO RADIAL CLEARANCE

SERVICE LIMIT	0.07 mm (.0028 in)
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Installation

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

CAUTION: Never forget shim **no. 7** for axial adjustment on crankshaft MAG side.



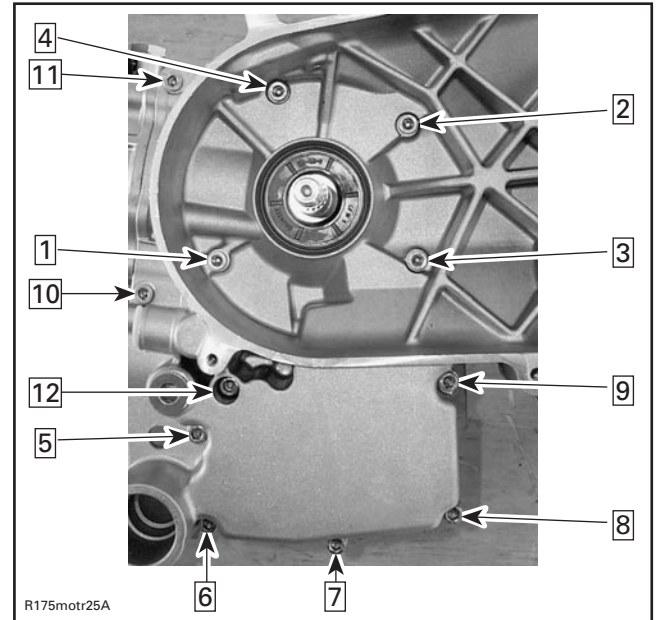
1. Shim for MAG side
2. Oil pump gear
3. Timing chain gear

CAUTION: Install crankshaft locking bolt (P/N 529 035 617) right away to put crankshaft in TDC position before installing rockers (refer to **CYLINDER AND HEAD**).

After reinstalling of crankcase MAG, measure axial clearance of crankshaft with a feeler gauge on the PTO side between PTO crankcase and shim **no. 6**.

Install a new gasket **no. 15** and readjust axial clearance with proper shim on PTO side.

Hand-torqued crankcase screws as per following sequence. Repeat procedure, retightening all screws to 10 N•m (89 lbf•in).



NOTE: Always degrease taper on crankshaft MAG before reinstalling rotor.

CRANKCASE

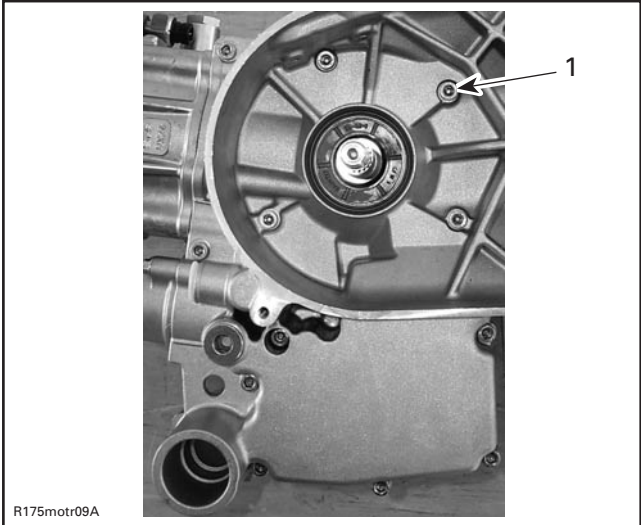
Disassembly

Remove:

- engine from vehicle (refer to **REMOVAL AND INSTALLATION**)
- magneto housing cover and rotor (refer to **MAGNETO SYSTEM**)
- timing chain
- cylinder head and cylinder (refer to **CYLINDER AND HEAD**)
- drive pulley (refer to **CVT**, see **DRIVE PULLEY**)
- screws retaining crankcase MAG

Section 03 ENGINE

Subsection 09 (CRANKSHAFT)



1. 12 screws
- crankshaft.

NOTE: If necessary punch with a soft hammer to ease lifting crankcase MAG.

Inspection

NOTE: To check some parts, it is recommended to remove all components in both crankcase housing.

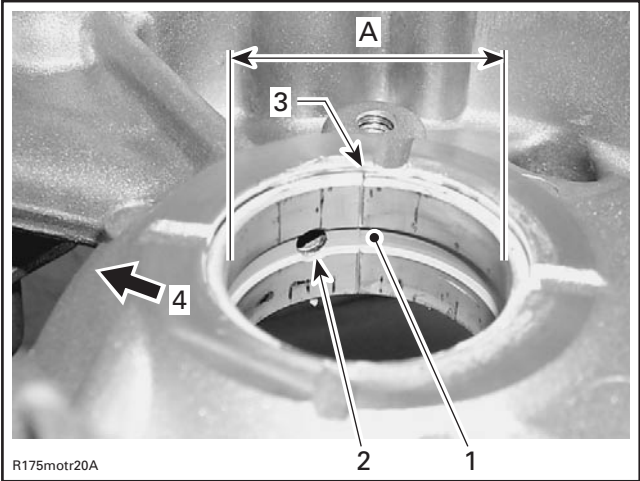
Clean crankcase from contaminations and blow the oil supply lines with compressed air.

**WARNING**

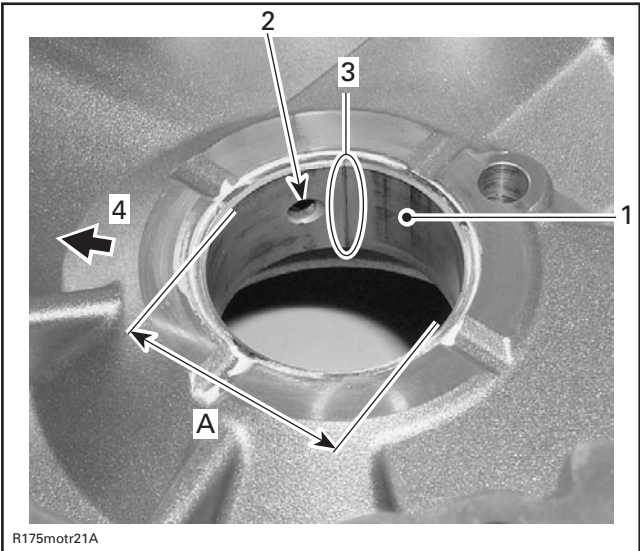
Use safety goggles to avoid injury to your eyes.

Check plain bearings **no. 10**, **no. 11**, **no. 12** and **no. 13** for scorings or other damages.

Measure plain bearing inside diameter. Replace if the measurement is out of specification.



1. MAG plain bearing with groove
2. Oil bore
3. Split of the plain bearing halves
4. Cylinder base direction
- A. Plain bearing inside diameter to be measured in area of oil bore



1. PTO plain bearing without groove
2. Oil bore
3. Split of the plain bearing halves
4. Cylinder base direction
- A. Plain bearing inside diameter to be measured in area of oil bore

PLAIN BEARING INSIDE DIAMETER (MAG/PTO)	
SERVICE LIMIT	32.070 mm (1.2625 in)

Check oil seal **no. 14** if brittle, hard or otherwise damaged. Replace if necessary.

NOTE: The oil seal is removed easily with a flat screwdriver.

Bearing Removal Procedure

Always heat crankcase housing up to 100°C (212°F) before removing ball bearings, needle bearings or plain bearings.

WARNING

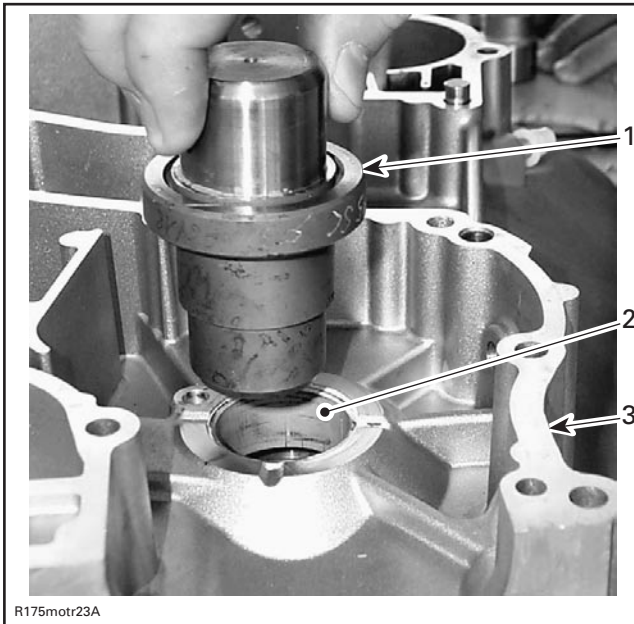
Clean oil, outside and inside, from housing before heat.

CAUTION: Always support crankcase housings properly when ball bearings, needle bearings or plain bearings are removed. Crankcase housing damages may occur if this procedure is not performed correctly.

NOTE: Always use a press for removal or installation of plain bearing halves.

Plain Bearing Procedure

Remove plain bearings no. 10, no. 11, no. 12 and no. 13 with the plain bearing remover/installer (P/N 529 035 855).

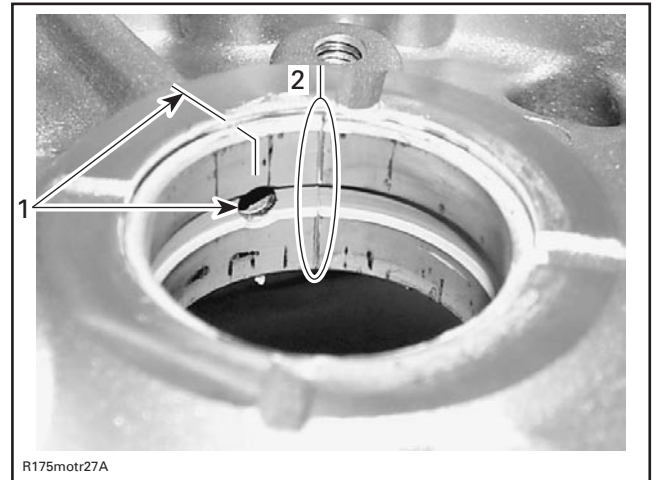


PUSH PLAIN BEARINGS OUTSIDE

1. Plain bearing remover/installer
2. Plain bearing
3. Crankcase MAG

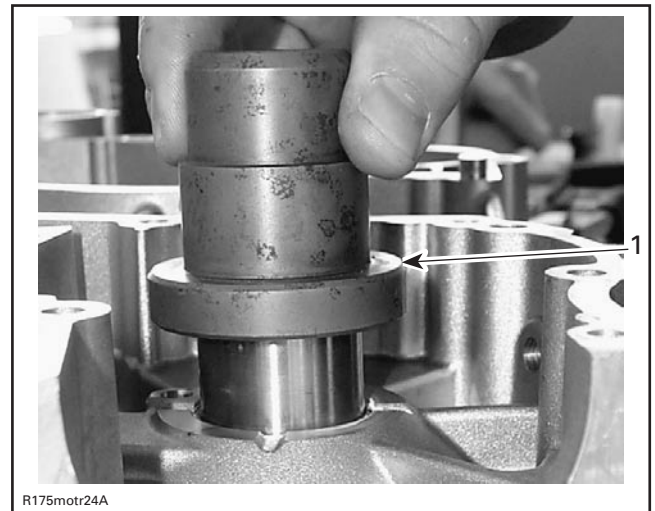
To install the plain bearing turn the plain bearing remover/installer up side down.

NOTE: Apply Molykote grease in crankcase bore to ease installing the plain bearing halves. Mark plain bearing oil bore position together with crankcase thrust surface.



1. Mark on crankcase and oil bore position
2. Split between bearing halves

CAUTION: Push plain bearings correctly in place (oil bore and split between plain bearing halves) to ensure oil supply to crankshaft.



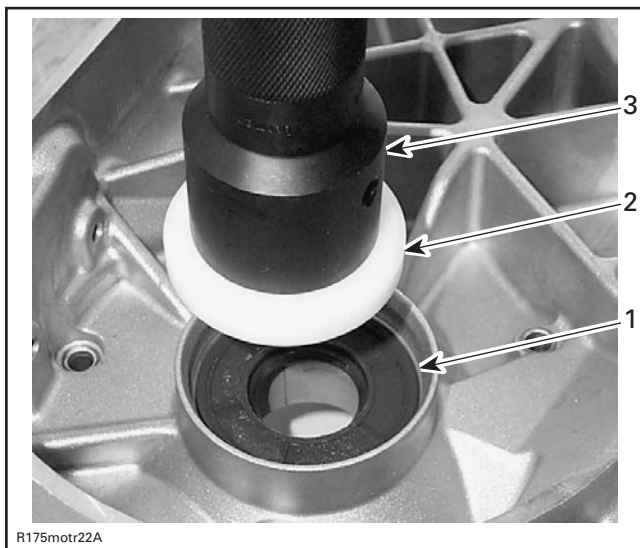
PUSH PLAIN BEARINGS INSIDE

1. Plain bearing installer

Section 03 ENGINE

Subsection 09 (CRANKSHAFT)

Install a new oil seal **no. 14** with the crankshaft oil seal installer (P/N 529 035 847).



1. Crankcase PTO oil seal
2. Crankshaft oil seal installer
3. Insertion jig handle

Assembly

The assembly of crankcase is the reverse of removal procedure. However, pay attention to the following details.

Always install new gasket **no. 15**.

Clean oil passages and make sure they are not clogged.

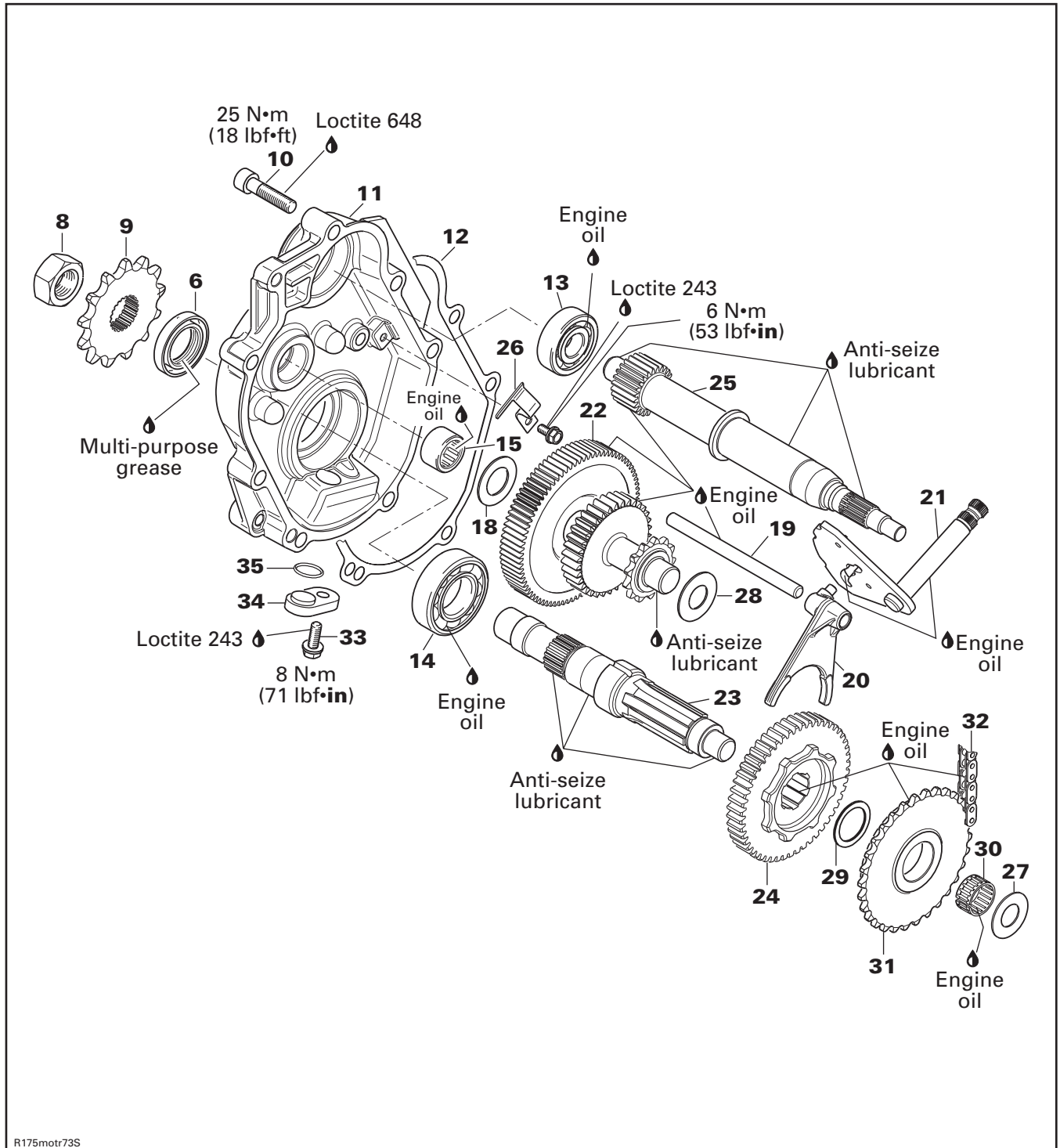
Clean all metal components in a solvent.

Crankcase mating surfaces are best cleaned using a combination of the Chisel gasket remover (P/N 413 708 500) and a brass brush. Brush a first pass in one direction then make the final brushing perpendicularly (90°) to the first pass cross (hatch).

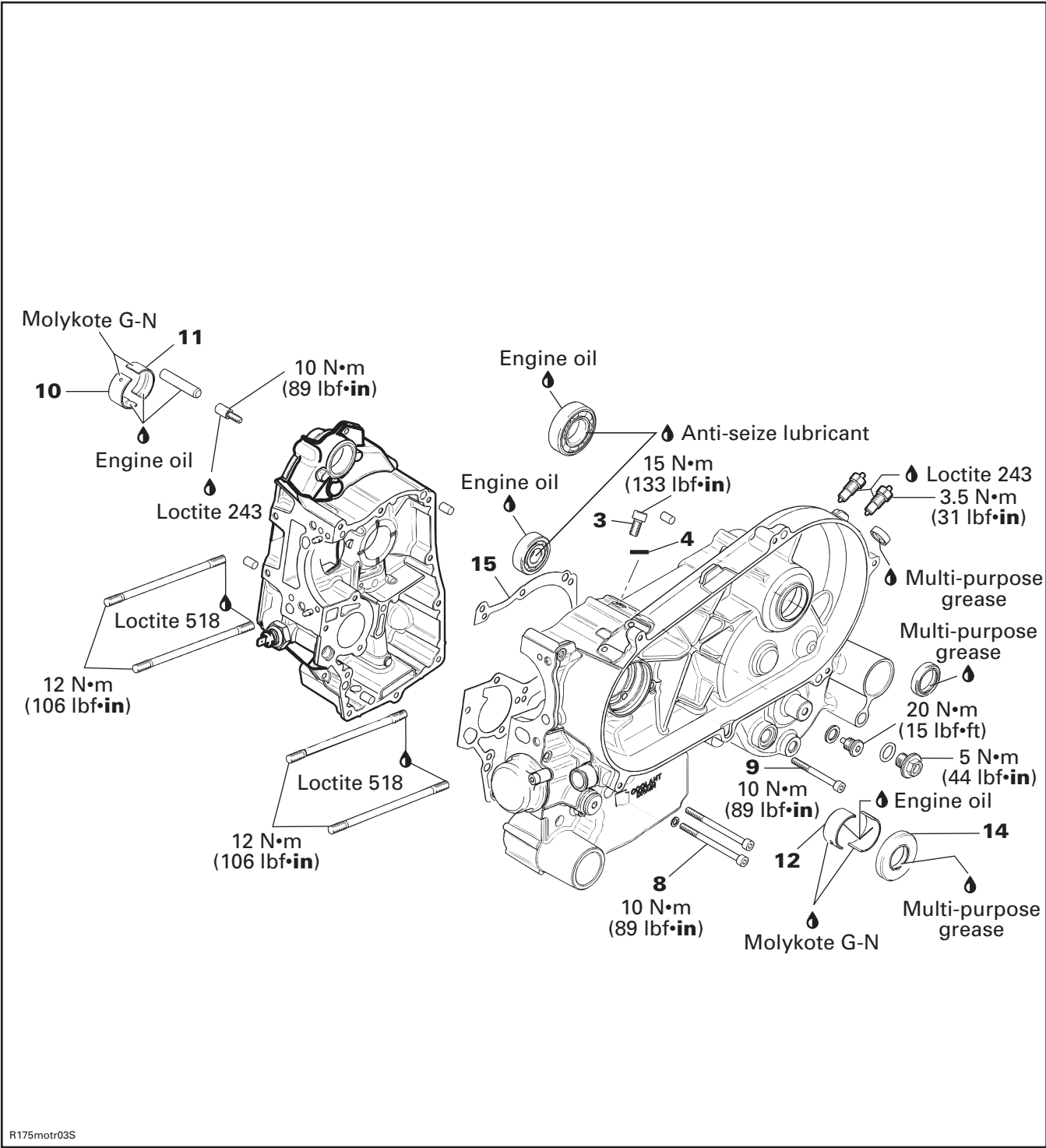
CAUTION: Do not wipe with rags. Use a new clean hand towel only.

GEARBOX

GEARBOX



CRANKCASE



R175motr03S

GENERAL

To remove gear box cover, the engine removal is necessary.

For installation, use the torque values and Loctite products indicated in the exploded views. Clean threads before using Loctite when installing screws.

Always drain the gearbox before working on it.

Prior to change the oil, ensure vehicle is on a level surface.

Oil change should be done with a warm engine.

WARNING

The gear box oil can be very hot. Wait until oil is warm.

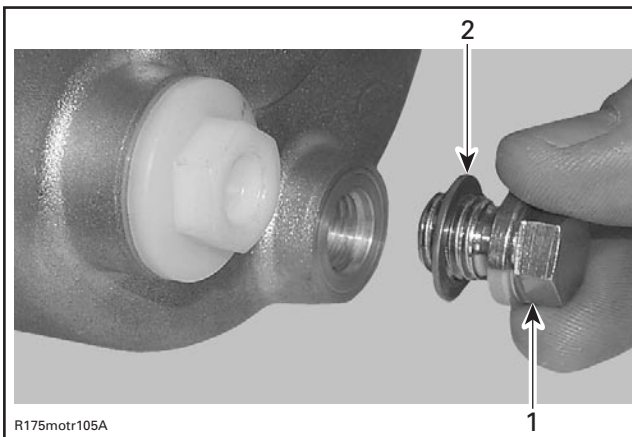
Dispose gear box oil as per your local environmental regulations.

OIL CHANGE

Draining Procedure

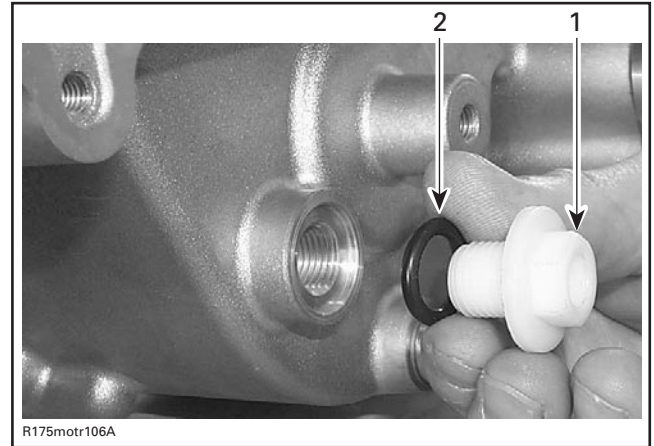
Place a drain pan under the gear box drain plug area.

Clean plug area and unscrew drain plug **no. 1**.



1. Drain plug
2. Gasket ring

Remove oil level screw **no. 3** including O-ring **no. 4**.



1. Oil level screw
2. O-ring

CAUTION: Pay attention not to lose gasket ring **no. 2** on drain plug and/or O-ring **no. 4**.

Wait a while to allow oil to flow out of gear box.

Inspection

Oil condition gives information about the teeth condition inside the gear box. See **TROUBLE-SHOOTING** section.

Clean the drain plug from metal shavings and dirt. Presence of debris gives an indication of failure inside the gear box. Check gear box to correct the problem.

Change gasket ring **no. 2** on drain plug if damaged.

Replace O-ring **no. 4** if brittle, hard or otherwise damaged.

Filling Procedure

With the vehicle on a level surface, fill the gear box with the recommended oil until the oil reaches the lower threads of housing.

Refer to **TECHNICAL DATA** to know which oil and quantity are used in the gear box.

OIL SEALS

Removal

Remove:

- driven pulley on PTO side (refer to **CVT**, see **Driven Pulley**)
- engine sprocket on MAG side (see **CRANKCASE** below)

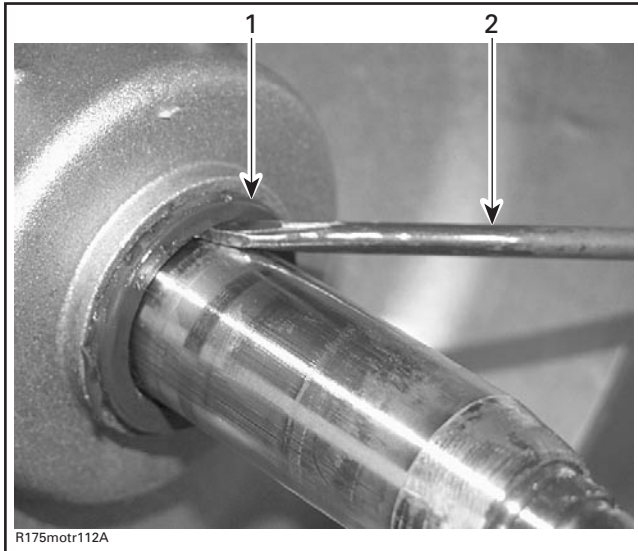
Section 03 ENGINE

Subsection 10 (GEARBOX)

NOTE: Use a small, flat screwdriver to remove oil seals from MAG/PTO side.

CAUTION: Pay attention not to damage CVT/main shaft during removal of oil seals.

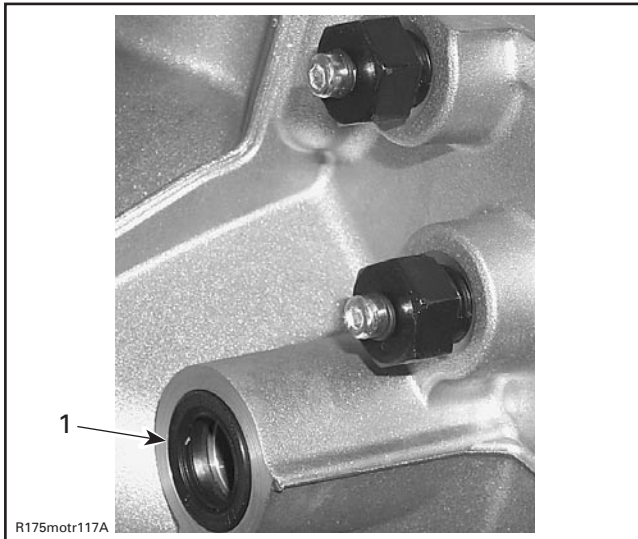
- oil seals no. 6 and no. 5 on engine MAG/PTO side



1. Oil seal MAG/PTO
2. Flat screwdriver

- oil seal no. 7 in shift shaft area.

CAUTION: Pay attention not to damage shift shaft during removal of oil seal.



1. Oil seal on shift shaft

Inspection

Check bearings behind each oil seal for contamination and/or metal shavings.

Check surface on CVT/main shaft in oil seal area for grooves and replace if necessary (see GEAR BOX below).

Installation

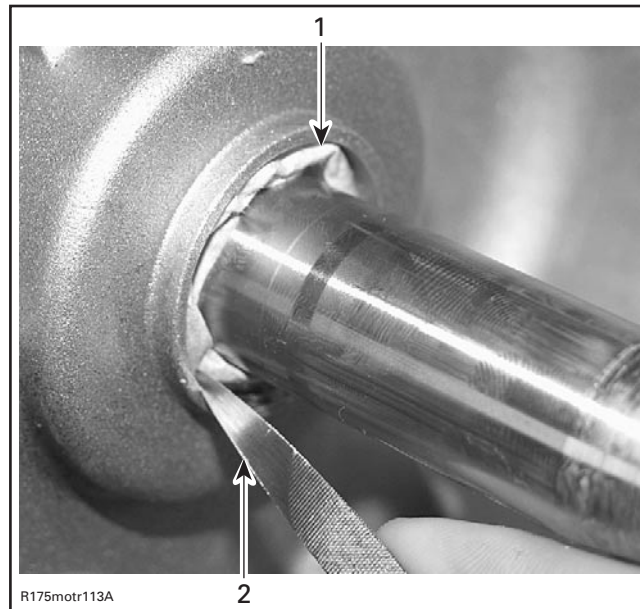
The installation is the reverse of removal procedure.

Pay attention to the following details.

CAUTION: Place a small rag to avoid ball bearing contamination due to metal shavings.

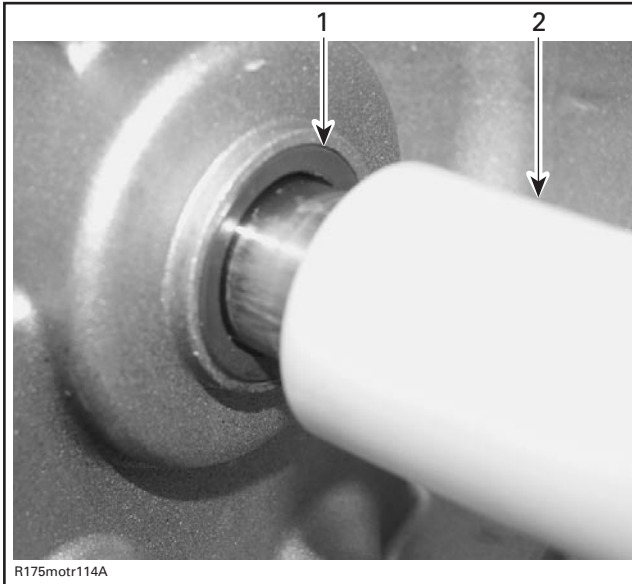
Prepare a chamfer with a three-square scraper to ease placing oil seals no. 5 and no. 6.

NOTE: Size of the chamfer should be approximately 30°.



1. Rag
2. Three-square scraper

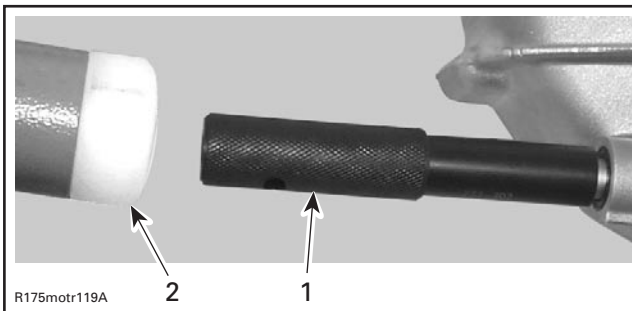
Install oil seal **no. 5** on PTO side with oil seal installer (P/N 529 035 854) as per following illustration.



- 1. Oil seal
- 2. Oil seal installer

Install oil seal **no. 6** on MAG side with oil seal installer (P/N 529 035 854).

Install oil seal **no. 7** in shift shaft area with oil seal installer (P/N 529 035 851) as per following illustration.



- 1. Oil seal installer
- 2. Soft hammer

CRANKCASE

Disassembly

Drain gear box oil (see OIL CHANGE above).

Remove:

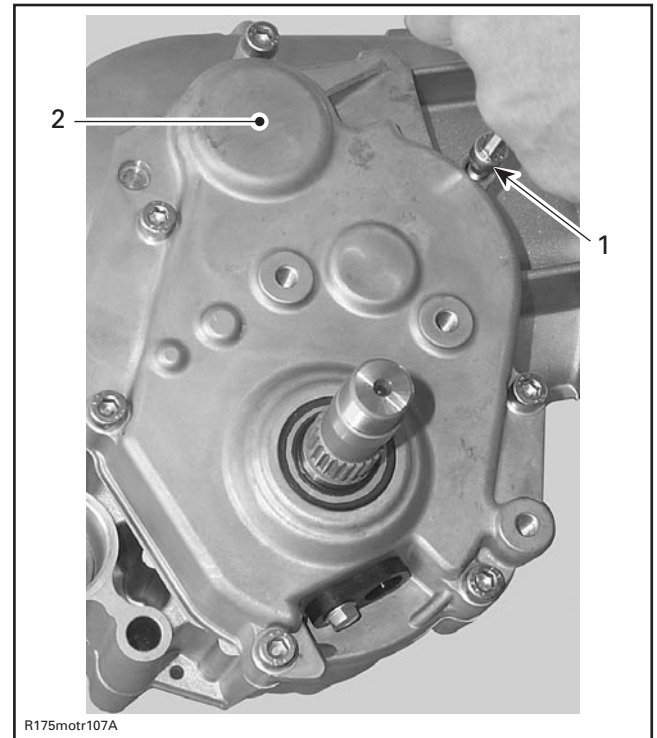
- sprocket nut **no. 8**
- engine sprocket **no. 9**

NOTE: Due to vibrations it is recommended to check/retorque gear box cover screws **no. 10** if only replacing the engine sprocket.

- engine from vehicle
(refer to **REMOVAL AND INSTALLATION**)
- screws **no. 10** retaining gear box cover

NOTE: To ease removing screws **no. 10** it is recommended to warm up the gearbox cover area with a heat gun.

CAUTION: Do not use an impact wrench for removal or installation of the gear box cover screws.



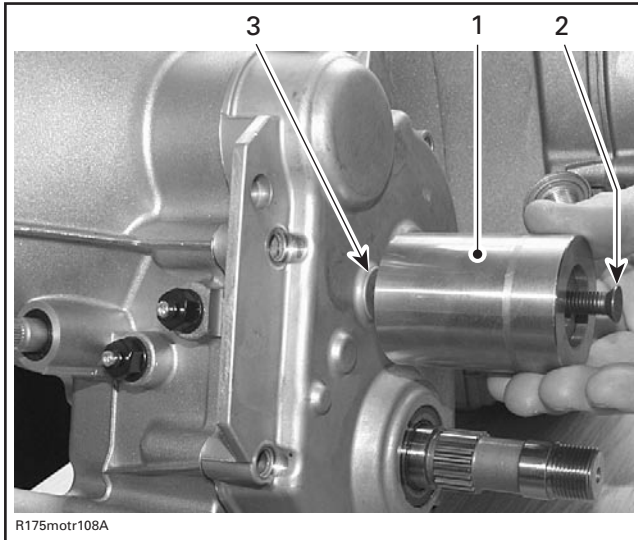
- 1. 7 screws
- 2. Gear box cover

Section 03 ENGINE

Subsection 10 (GEARBOX)

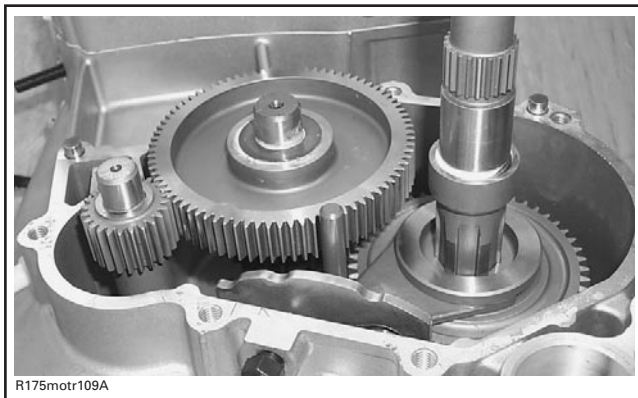
NOTE: To ease lifting the gear box cover no. 11 follow the procedure below while holding the main shaft in place:

- Put a distance sleeve on a long M8 screw.
- Place this screw together with distance sleeve in gear box cover thread.
- Pull sleeve until gear box cover gets loose.



1. Distance sleeve
2. Screw M8
3. Gear box cover threads

- gear box assembly (see GEAR BOX below).



Inspection

NOTE: To check some parts, it is recommended to remove all components in both crankcase housing.

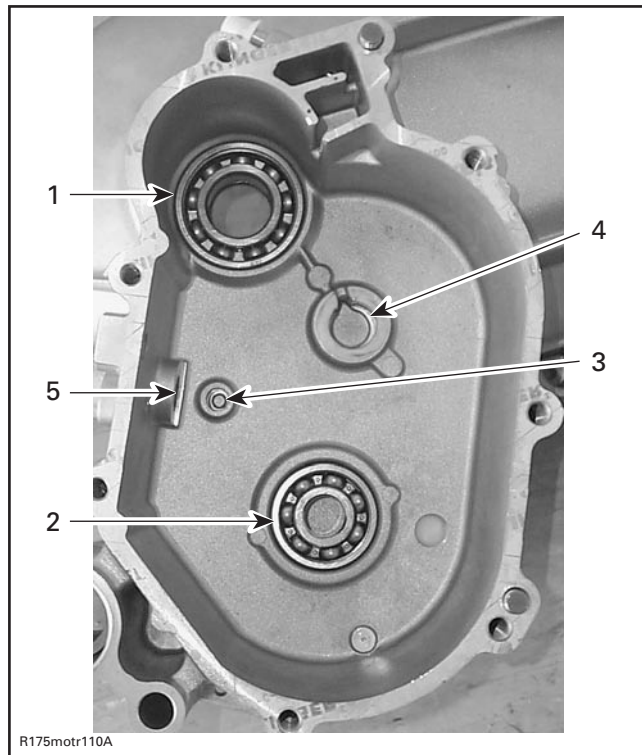
Visually check gasket no. 12 for any damage. Replace if necessary.

Clean crankcase from contaminations and blow the oil with compressed air.

WARNING

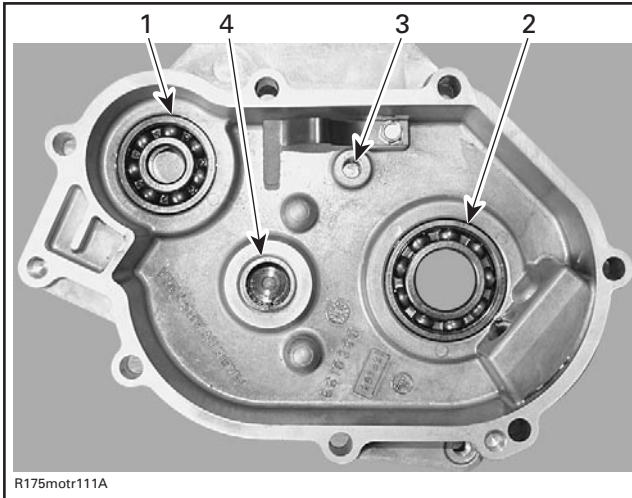
Use safety goggles to avoid injury to your eyes.

Check bearings no. 16 and no. 17 for excessive play and smooth operation. Replace if necessary.



1. Ball bearing main shaft
2. Ball bearing output shaft
3. Bore for shift fork pin
4. Bore for intermediate shaft
5. Bore for shift shaft

Check bearings **no. 13** and **no. 14** as well as needle bearing **no. 15** for excessive play and smooth operation. Replace if necessary.



1. Ball bearing main shaft
2. Ball bearing output shaft
3. Bore for shift fork pin
4. Needle bearing intermediate shaft

Bearing Removal Procedure

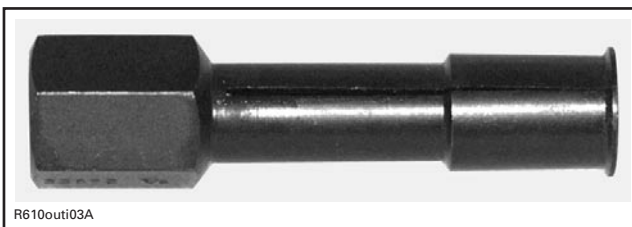
Always heat crankcase housing up to 100°C (212°F) before removing ball bearings and/or needle bearing.

WARNING

Clean oil, outside and inside, from housing before heat.

CAUTION: Always support crankcase housings properly when ball bearings or needle bearings are removed. Crankcase housing damages may occur if this procedure is not performed correctly.

To remove ball bearings **no. 13** and **no. 17** as well as needle bearing **no. 15**, use a blind hole bearing puller.



NOTE: The oil seals **no. 5**, **no. 6** and **no. 7** are removed easily with a flat screwdriver.

Bearing Installation Procedure

Unless otherwise instructed, never use hammer to install ball bearings and/or needle bearings. Use press machine only.

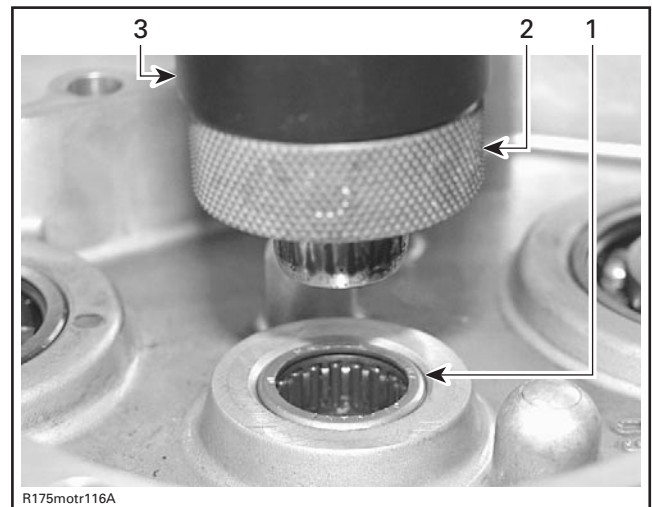
Always heat crankcase housing up to 100°C (212°F) before installing ball bearings and/or needle bearings.

WARNING

Clean oil, outside and inside, from housing before heat.

Place new bearing in freezer for 10 minutes before installation.

Install needle bearing **no. 15** with the needle bearing installer (P/N 529 035 762) and insertion jig handle (P/N 420 877 650).



1. Intermediate shaft needle bearing
2. Needle bearing installer
3. Insertion jig handle

Install new oil seals **no. 5**, **no. 6** and **no. 7** with the proper installer after reassembly of gear box cover (see OIL SEALS above).

Assembly

The assembly of crankcase is essentially the reverse of removal procedure. However, pay attention to the following details.

Clean all metal components in a solvent.

Crankcase mating surfaces are best cleaned using a combination of the Chisel gasket remover (P/N 413 708 500).

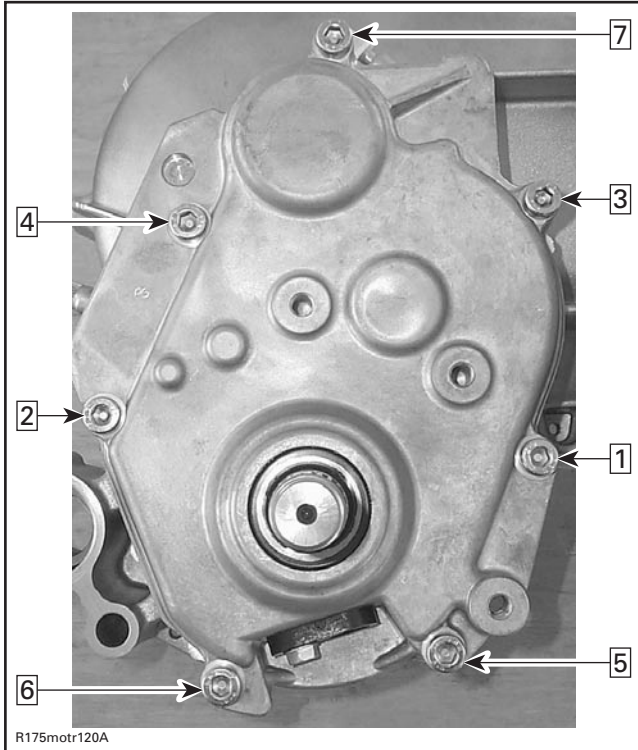
CAUTION: Do not wipe with rags. Use a new clean hand towel only.

Section 03 ENGINE

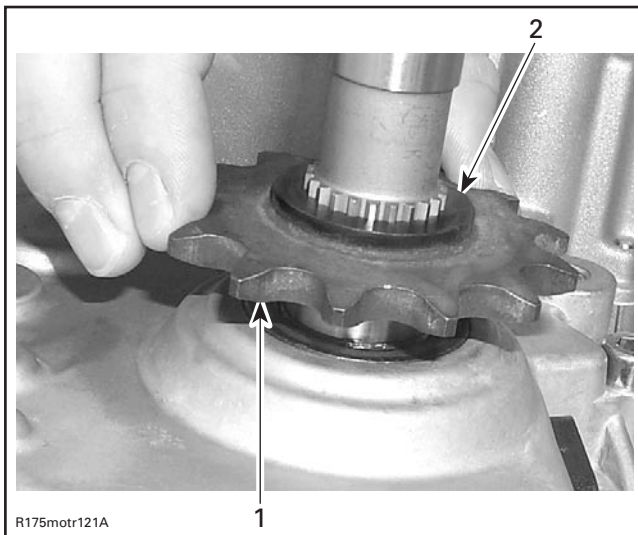
Subsection 10 (GEARBOX)

CAUTION: Do not forget thrust washer **no. 18** and gear box cover gasket **no. 12**.

Hand-torqued crankcase screws as per following sequence. Repeat procedure, retightening all screws to 25 N•m (18.5 lbf•ft).



CAUTION: Always install engine sprocket **no. 9** as per following illustration.



1. Engine sprocket
2. Flange mounted visible to the outside

GEARBOX

General

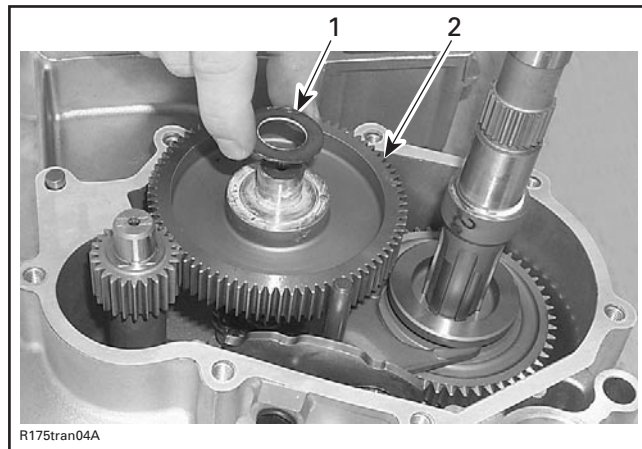
During and after gear box disassembly, inspect the condition of each part closely. In particular, check for:

- gear teeth damage
- worn or scoured bearing surfaces
- worn or scoured shift fork
- worn or scoured shift fork shaft
- rounded engagement dogs and slots
- bent shift forks
- bent shift fork shaft
- worn shift fork engagement pins
- worn tracks on shift shaft plate
- worn shift fork engagement groove
- worn splines on shafts and gears.

Removal

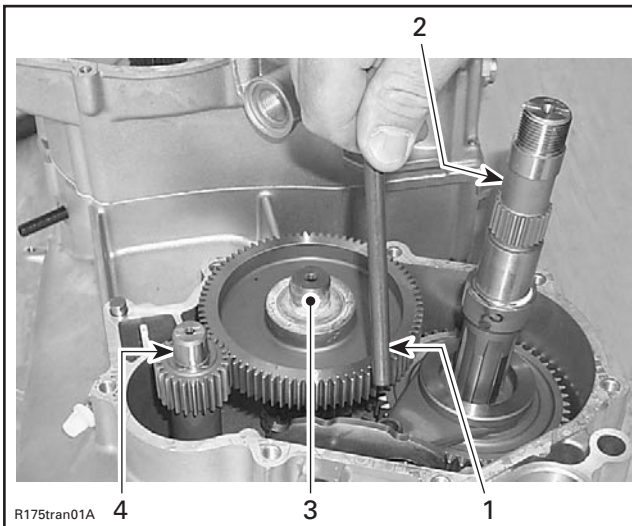
Remove:

- gear box cover (see CRANKCASE above)
- thrust washer **no. 18**



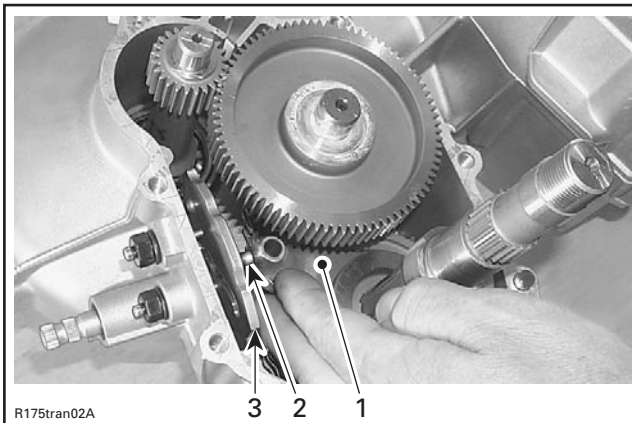
1. Thrust washer
2. Intermediate shaft

– shift fork shaft no. 19.



1. Shift fork shaft
2. Output shaft
3. Intermediate shaft
4. Main shaft

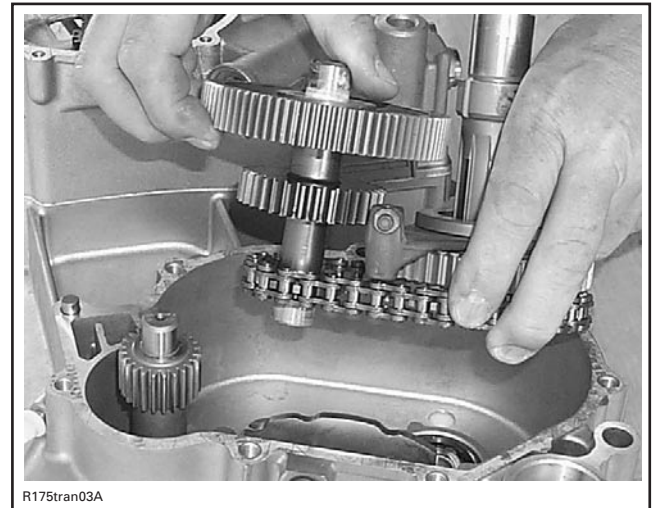
NOTE: Disengage shift fork no. 20 from shift shaft plate no. 21.



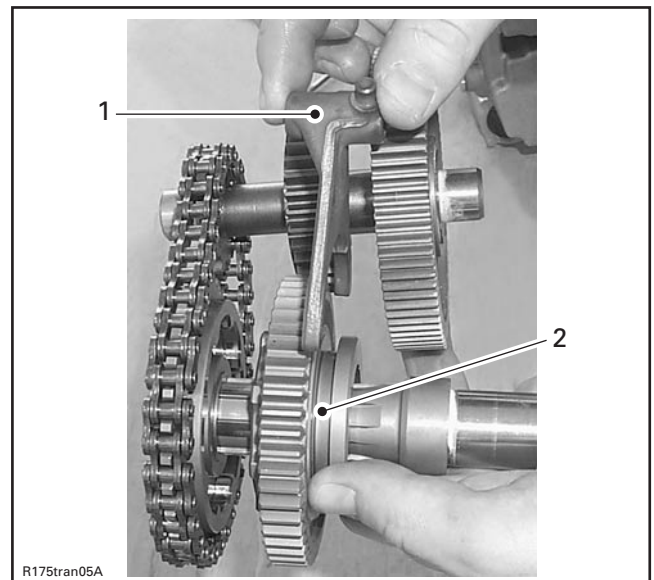
1. Shift fork
2. Engagement pin on shift fork
3. Shift shaft plate

Remove:

– intermediate shaft no. 22 together with output shaft no. 23



– shift fork no. 20

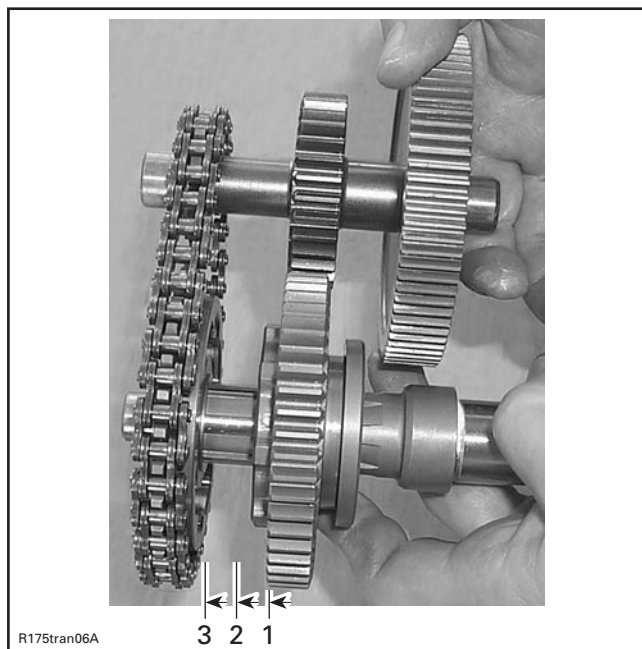


1. Shift fork reverse-neutral-high
2. Engagement groove for shift fork pin

Section 03 ENGINE

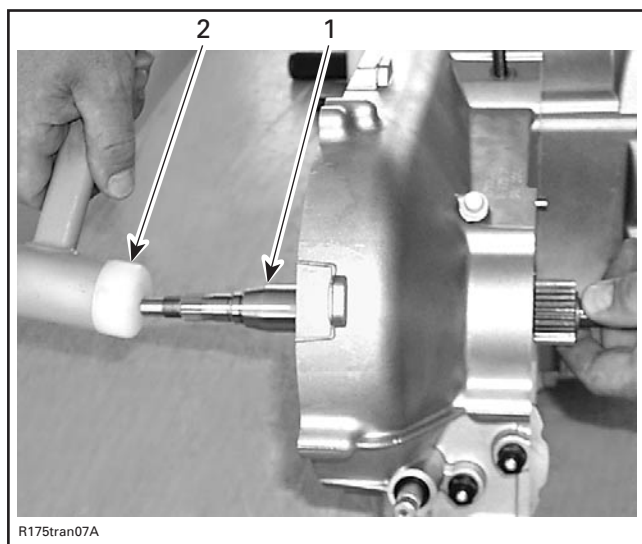
Subsection 10 (GEARBOX)

NOTE: Following illustration shows gear no. 24 and the respective shifting position.



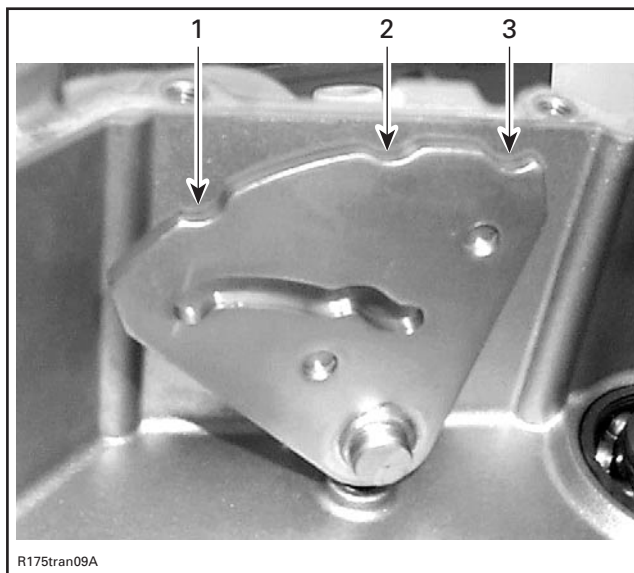
1. High gear position
2. Neutral position
3. Reverse gear (chain drive)

– main shaft no. 25 with a soft hammer



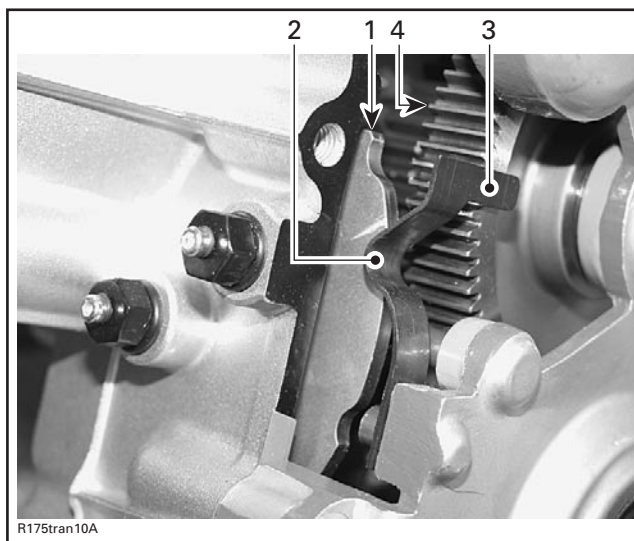
1. Main shaft
2. Soft hammer

NOTE: Following illustration shows engagement grooves for spring plate no. 26 and the respective shifting position.



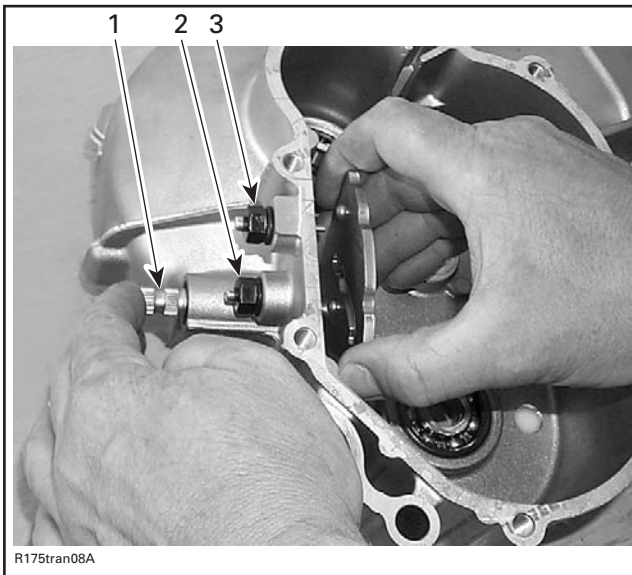
1. High gear position
2. Neutral position
3. Reverse position

NOTE: In neutral position the spring plate engages deeper in the shift shaft groove. The spring plate arm pushes against the intermediate shaft gear and retards its motion in idle.



1. Shift shaft plate
2. Spring plate
3. Spring plate arm
4. Contact area to spring plate arm in neutral position

– shift shaft plate no. 21.



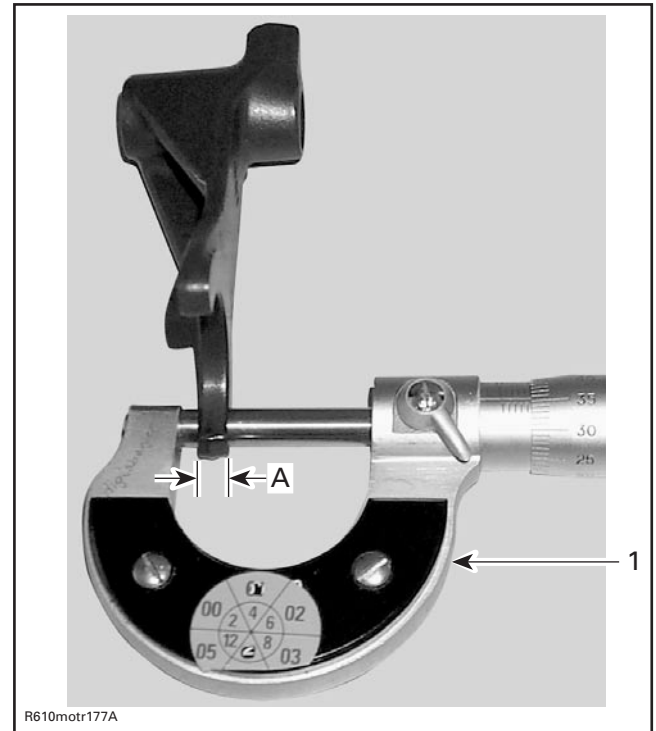
1. Shift shaft plate
2. Reverse switch
3. Neutral switch

Inspection

Check shift fork for visible damage, wear or bent shift fork claws.

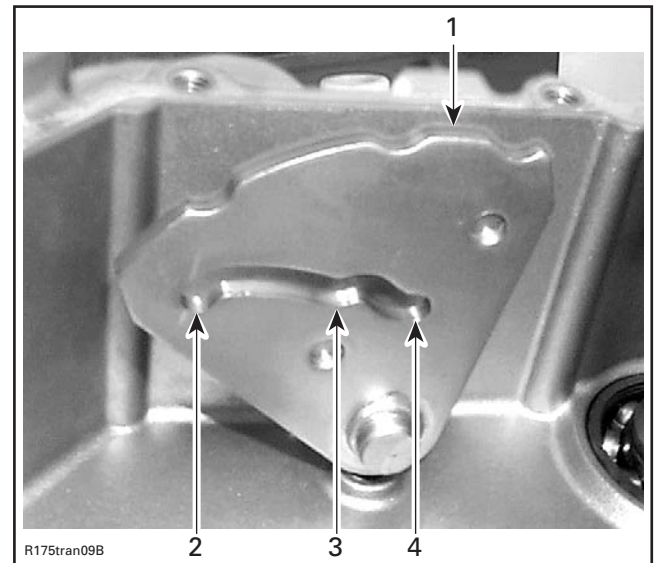
Measure the shift fork claw thickness.

SHIFT FORK CLAW THICKNESS	
NEW MINIMUM	4.800 mm (.189 in)
NEW MAXIMUM	4.900 mm (.193 in)
SERVICE LIMIT	4.750 mm (.187 in)



1. Micrometer
- A. Shift fork claw thickness

Check shift shaft plate track for scouring or heavy wear like rounded engagement slots.



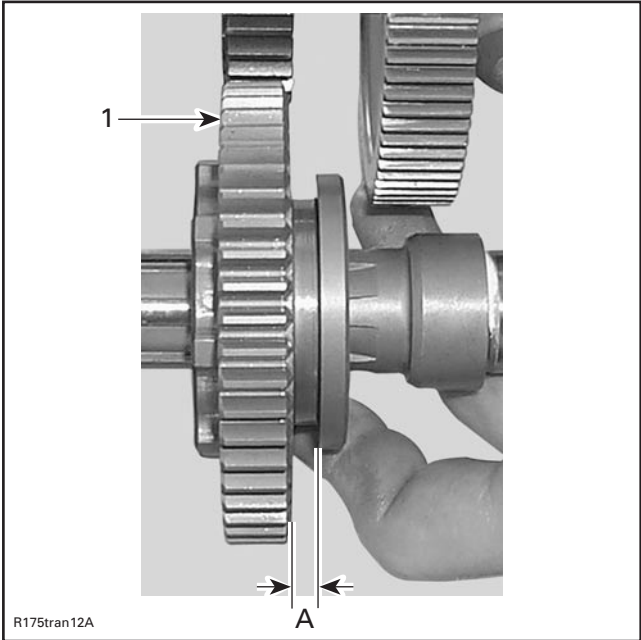
1. Shift shaft plate
2. Shift fork position for high gear
3. Shift fork position for neutral gear
4. Shift fork position for reverse gear

Section 03 ENGINE

Subsection 10 (GEARBOX)

Measure the gap of shift fork engagement groove.

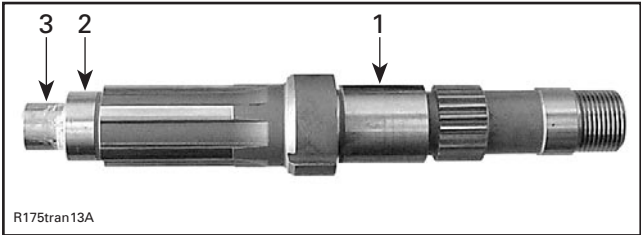
GAP OF SHIFT FORK ENGAGEMENT GROOVE	
NEW MINIMUM	5.00 mm (.197 in)
NEW MAXIMUM	5.10 mm (.201 in)
SERVICE LIMIT	5.20 mm (.205 in)



1. Main gear
A. Gap for engagement of shift fork

Check output shaft for wear.

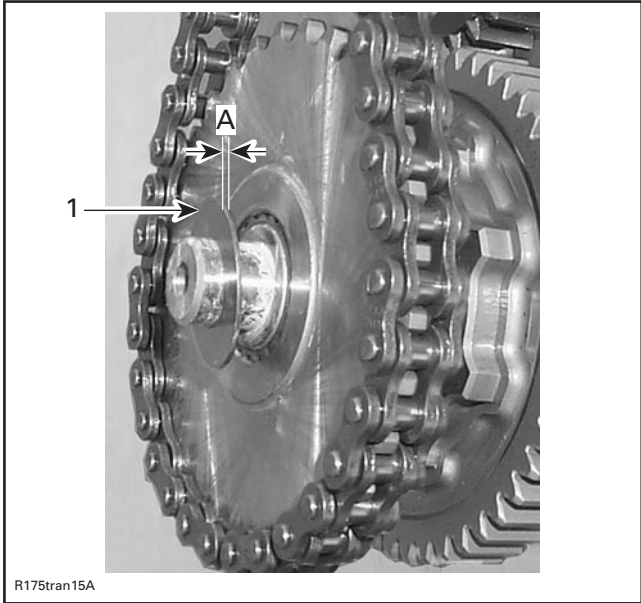
OUTPUT SHAFT	
SERVICE LIMIT	
MAG SIDE	24.960 mm (.983 in)
PTO SIDE (SPROCKET)	21.960 mm (.866 in)
PTO SIDE (CRANKCASE)	14.960 mm (.589 in)



1. Mag side (gearbox cover)
2. PTO side (running surface for reverse gear sprocket)
3. PTO side (crankcase)

Check thrust washer no. 27 on output shaft for wear limit.

THRUST WASHER THICKNESS	
SERVICE LIMIT	
PTO SIDE	0.900 mm (.035 in)

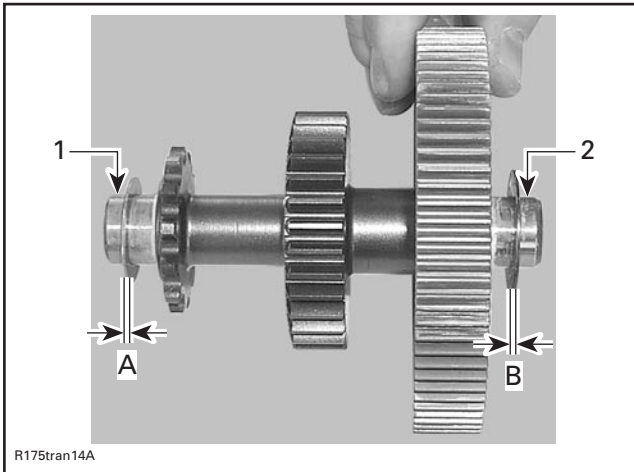


1. Thrust washer (output shaft)
A. Thrust washer PTO

Check intermediate shaft for wear limit and thickness of thrust washer no. 28.

INTERMEDIATE SHAFT	
SERVICE LIMIT	
PTO/MAG SIDE	17.990 mm (.708 in)

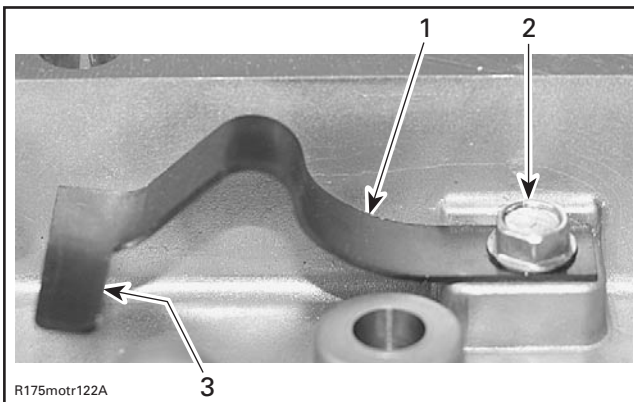
THRUST WASHER THICKNESS	
SERVICE LIMIT	
PTO/MAG SIDE	0.900 mm (.035 in)



1. PTO side (crankcase)
2. MAG side (gearbox cover)
- A. Thrust washer thickness (PTO side)
- B. Thrust washer thickness (MAG side)

Check all bearings, bearing points, tooth flanks, taper grooves and annular grooves. Annular grooves must have sharp edges.

Check for condition of shift shaft plate in the front area as per following illustration. Replace in case of excessive wear.



1. Spring plate
2. Screw retaining the spring plate
3. Front area of spring plate arm

Assembly

NOTE: Preassemble intermediate gear shaft and output shaft prior to insert it into crankcase PTO.

NOTE: Run all gears before installing the gear box cover on MAG side.

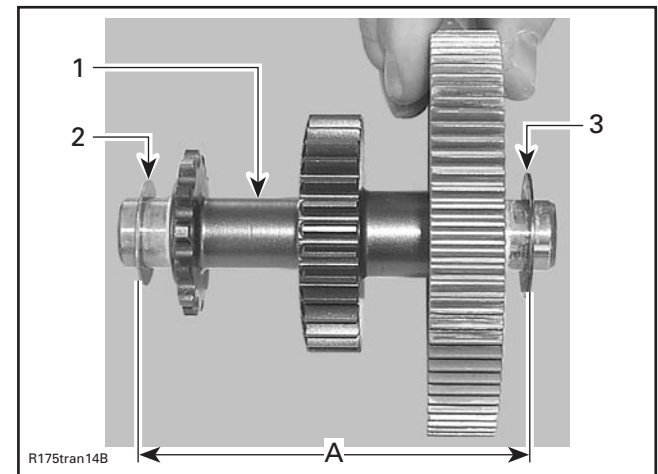
Install:

NOTE: Use lubricants from the exploded view during preassembling of gear box shafts.

- intermediate gear shaft **no. 22**, thrust washer **no. 28** and thrust washer **no. 18**

NOTE: Check axial measurement of intermediate shaft including thrust washer **no. 18** and **no. 28**. If out of measurement check for wrong and/or missing thrust washers MAG/PTO.

AXIAL MEASUREMENT	
NEW MINIMUM	82.00 mm (.269 ft)
NEW MAXIMUM	82.20 mm (.270 ft)



1. Intermediate shaft
2. Thrust washer PTO
3. Thrust washer MAG
- A. Axial measurement

- output shaft **no. 23** with main gear **no. 24**, shim **no. 29**, needle bearing **no. 30**, reverse gear sprocket **no. 31** and thrust washer **no. 27**
- gear box chain **no. 32**
- shift fork **no. 20**.

Installation

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

Install:

- main shaft **no. 25**

NOTE: If necessary use a soft hammer to put main shaft in place.

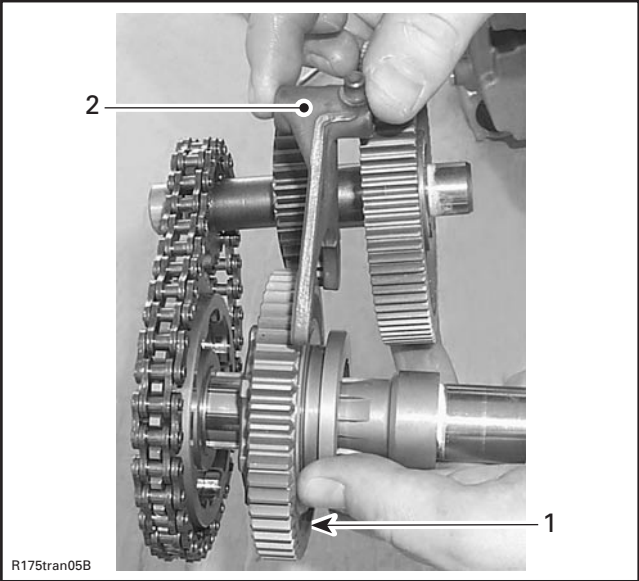
- shift shaft plate **no. 21**
- preassembled gear box as per following illustration.

CAUTION: Don't forget thrust washer **no. 27** and **no. 28**.

NOTE: Check axial measurement of intermediate gear shaft including thrust washers (see **Assembly** above).

Section 03 ENGINE

Subsection 10 (GEARBOX)

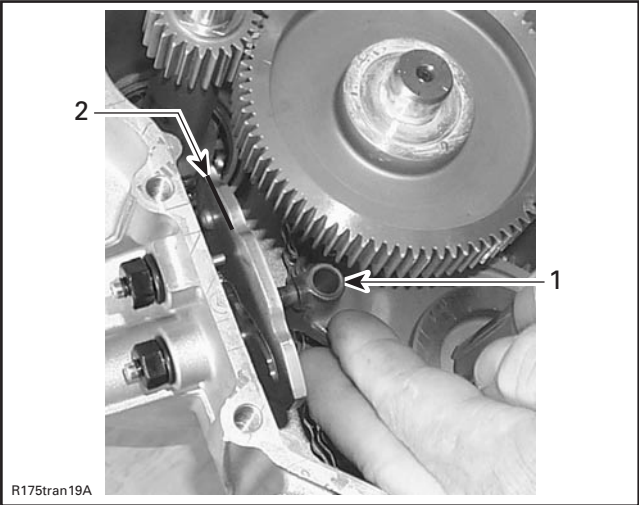


1. Preassembled gears
2. Shift fork

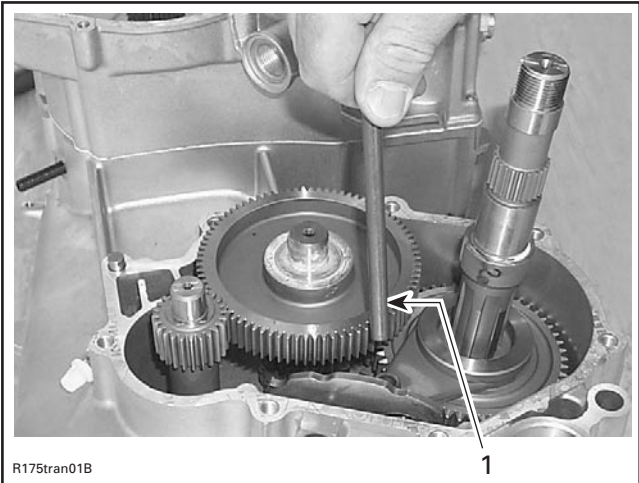
Install the shift fork into shift plate track.

NOTE: Place shift shaft plate in neutral position prior to insert pin of shift fork.

CAUTION: Do not forget thrust washer **no. 18**.



1. Shift fork
2. Neutral position



1. Shift fork shaft

Install gearbox cover (see CRANKCASE above).

NOTE: Run all gears as a final function check. The same time check output shaft and main shaft axial play.

OUTPUT SHAFT AXIAL PLAY	
NEW MINIMUM	0.05 mm (.002 in)
NEW MAXIMUM	0.69 mm (.027 in)

MAIN SHAFT AXIAL PLAY	
NEW MINIMUM	0.05 mm (.002 in)
NEW MAXIMUM	0.49 mm (.019 in)

Refill recommended oil (see **System Capacity** above).

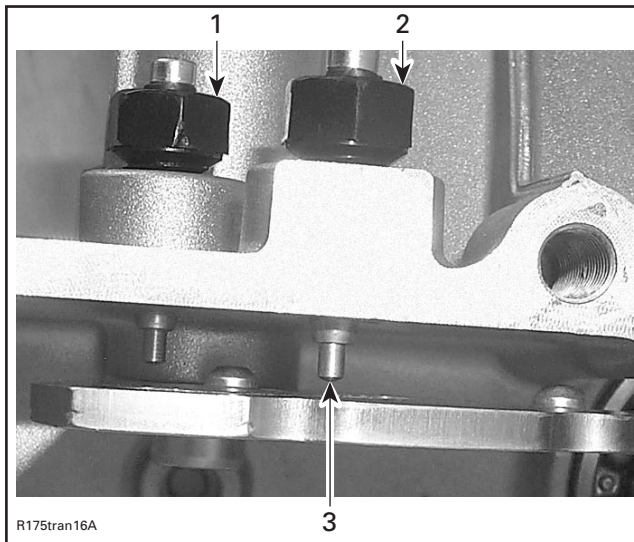
SHIFTING INDICATOR SWITCH

NOTE: The engine removal is not necessary to reach the shifting indicator switches.

Removal

NOTE: Clean area from dirt before removing parts.
Remove screws retaining shifting indicator switch wires.

Unscrew the shifting indicator switches **no. 32**.



1. Neutral switch
2. Reverse switch
3. Contact pin on switch

NOTE: Remove the shifting indicator switches one at a time. It is recommended to use a socket to removing an indicator switch.

Test

Check if shifting indicator switches work properly.

CAUTION: Switch pin has to move freely and must not detach from its housing.

Check wiring harness and replace if brittle or hard.

Using a multimeter, measure the resistance of the shifting indicator switches. Use the following procedure:

- Reinstall screw on each switch.
- Place one probe of multimeter on switch screw and the other on the engine.

NOTE: The alligator clip is recommended.

Apply the end of switch on the engine.

If the resistance is infinite (O.L.), replace the shifting indicator switch.

If the shifting indicator switch and its harness are good, check the vehicle harness and/or indicator lights.

Installation

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

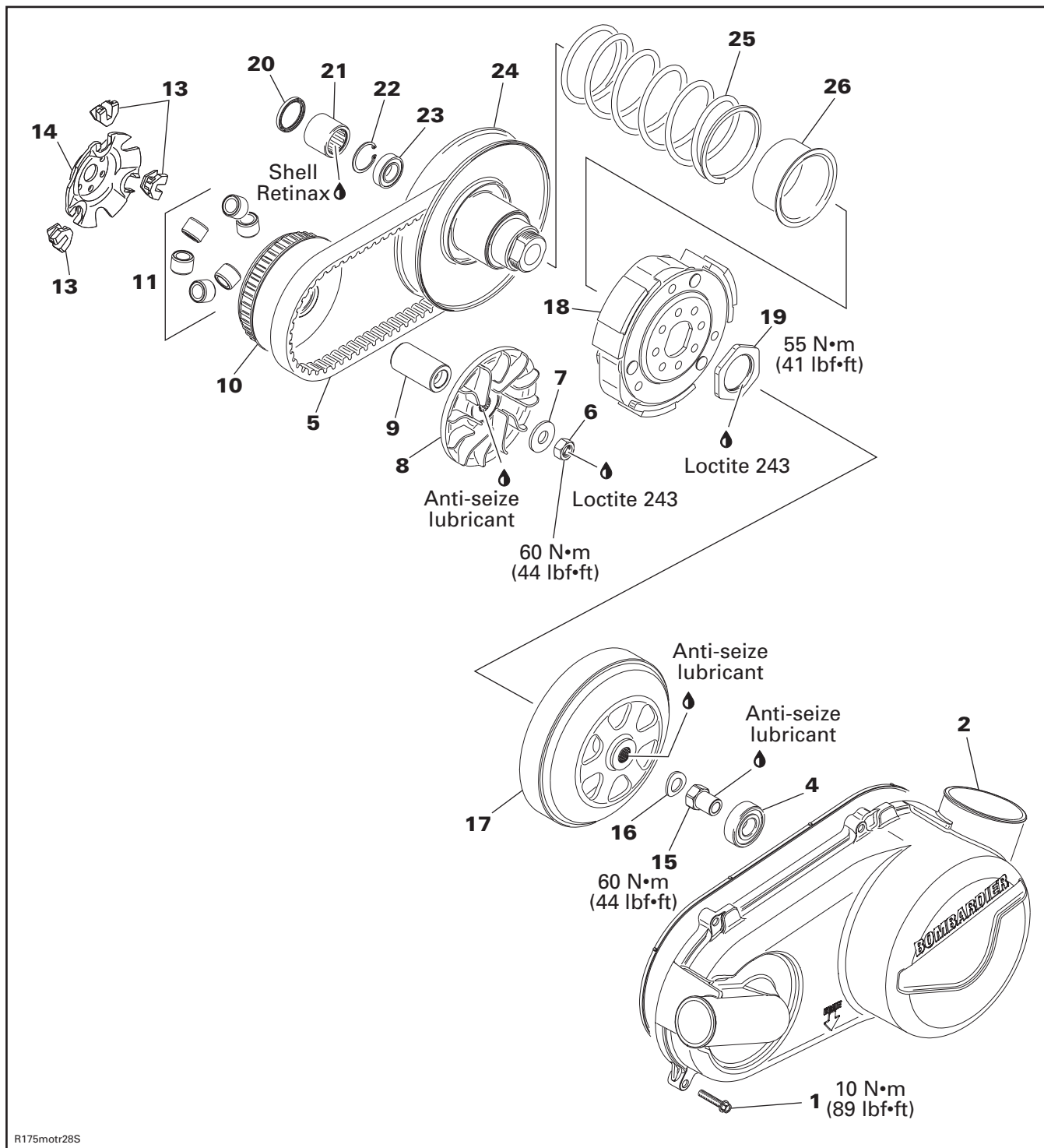
If all switches are removed, take care to put back wires at the proper location.

WIRES	SWITCH
YELLOW/GREY	Neutral
VIOLET/GREY	Reverse

Take care do not damage shifting indicator switches threads during installation.

CVT

NOTE: This is a lubrication free drive pulley.



GENERAL

NOTE: For a better understanding, the following 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.

For installation, use torque values and Loctite products from the exploded view. Clean threads before using Loctite products when installing screws.

 **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 Bombardier ATV dealer. Sub-component installation and assembly tolerances require strict adherence to procedures detailed.

 **WARNING**

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.

 **WARNING**

Torque wrench tightening specifications must strictly be adhered to.
Locking devices (ex.: 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.

CAUTION: These pulleys have metric threads. Do not use imperial threads puller. Always tighten puller by hand to ensure that the drive pulley has the same type of threads (metric vs imperial) prior to fully tightening.

DRIVE BELT REPLACEMENT

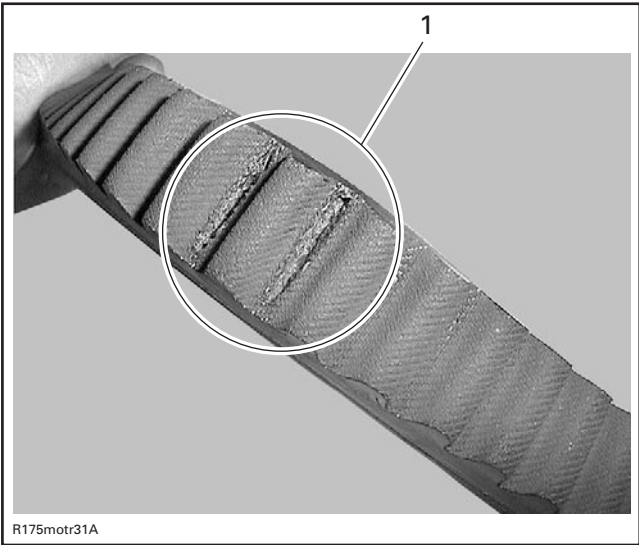
Removal

Remove CVT cover (refer to **CVT Cover** further).

There are two possibilities to remove the drive belt. You can remove the drive pulley or the driven pulley (see **the corresponding sections** further for removal and installation procedure).

Inspection

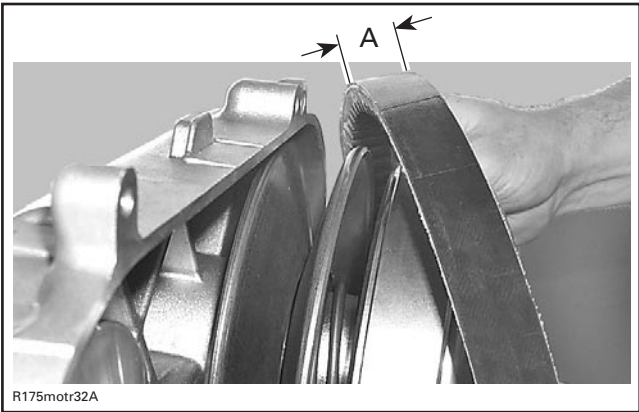
Inspect belt for cracks, fraying or abnormal wear. Replace if necessary.



1. Cracks inside the belt

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

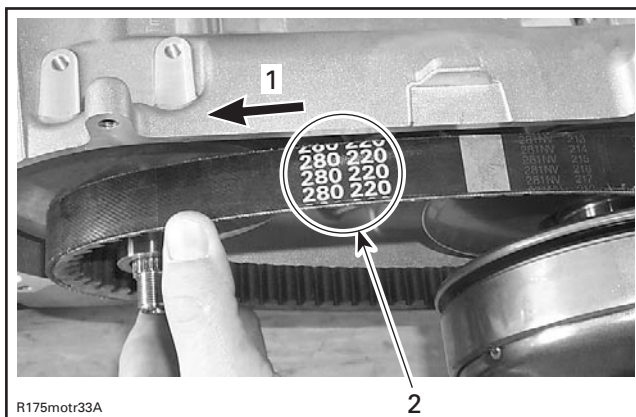
DRIVE BELT WIDTH	
NEW NOMINAL	21.0 to 22.00 mm (.069 to .072 in)
SERVICE LIMIT	19.50 mm (.064 in)



A. Drive belt width

Installation

The maximum drive belt life span is obtained when the drive belt has the proper rotation direction. Install it so the printed text on belt is pointing towards front of the vehicle (the text must be legible).



1. Vehicle front area
2. Printed number

As the case may be, refer to **Drive Pulley Installation** or **Driven Pulley Installation** for the proper procedure.

Install the CVT cover. See below for the procedure.

CVT COVER

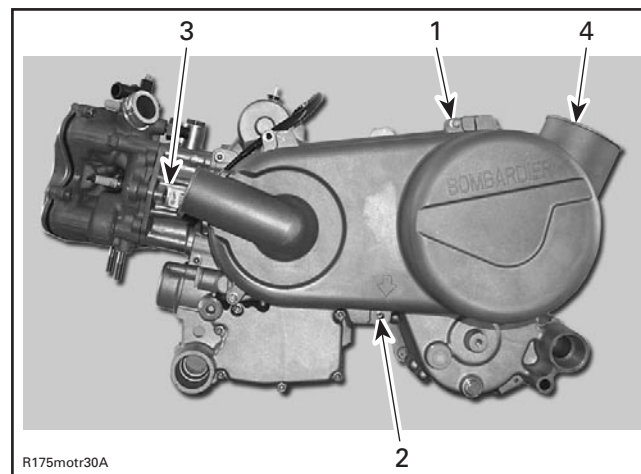
Unscrew clamps retaining CVT cover to CVT inlet and exhaust hoses.

Remove:

- screws no. 1

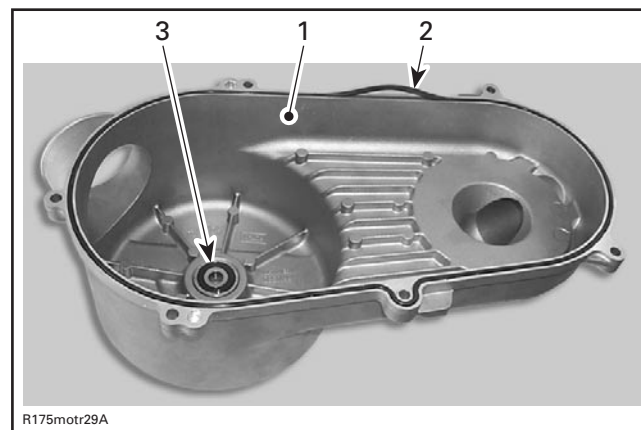
WARNING

To avoid burning yourself, wait until the exhaust system cools down before removing the bottom screws.



1. Center top screw
2. CVT drain plug
3. CVT air inlet hose
4. CVT air outlet hose

- CVT cover no. 2 and gasket no. 3.



1. CVT cover
2. Gasket
3. Ball bearing

NOTE: Remove the center top screw last. This screw allows to support the cover during removal.

Section 03 ENGINE

Subsection 11 (CVT)

Inspection

Check CVT cover for cracks or other damages. Replace if necessary.

Check if the gasket is brittle, hard or otherwise damaged. Replace if necessary.

Check if the CVT cover bearing must turn smoothly and freely. Otherwise, replace it. See **CVT Cover Bearing** below).

Installation

Place the gasket in the CVT cover groove.

Install the CVT cover. Align the end of driven pulley nut **no. 15** with the ball bearing **no. 4**.

NOTE: Do not overdo the CVT cover to install it.

Install the center top screw of cover in first.

Install the other screws then torque them in a crisscross sequence.

Install hoses then torque clamps.

CVT COVER BEARING

Inspection

Check if the CVT cover bearing must turn smoothly and freely. Otherwise, replace it.

Removal

Heat up CVT cover to about 100°C (212°F) for an easy bearing removal.

CAUTION: Do not overheat.

Using a slide hammer with the proper attachment, remove the bearing.

Installation

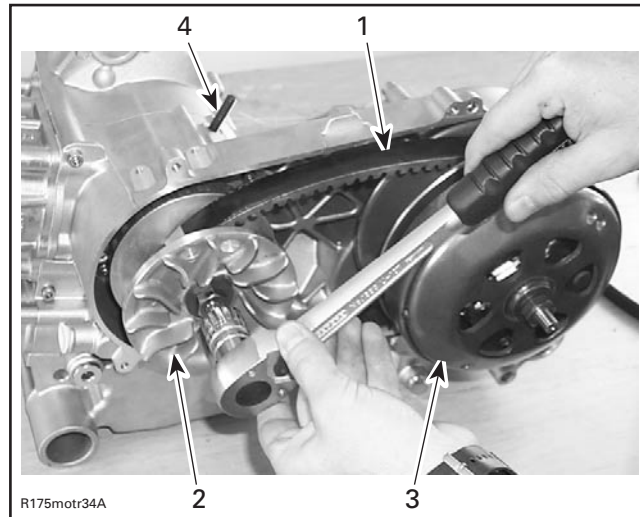
Place the new bearing in freezer for 10 minutes.

Heat the CVT cover to about 100°C (212°F) to put the bearing in place.

CAUTION: Do not overheat.

Then, install the bearing.

DRIVE PULLEY

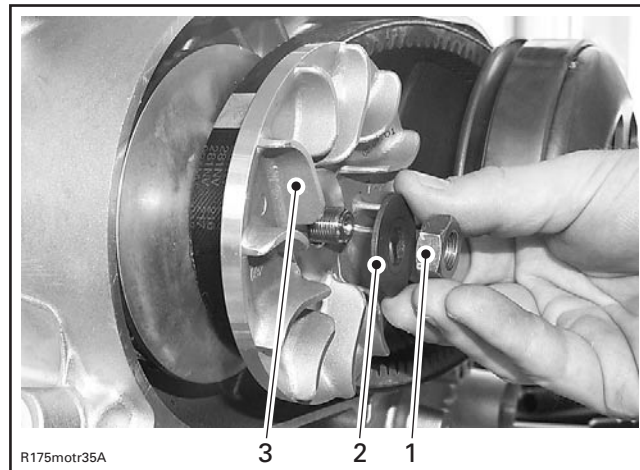


1. Drive belt
2. Drive pulley
3. Driven pulley
4. Crankshaft locking bolt (P/N 529 035 617)

Removal of Drive Pulley

Lock crankshaft at TDC compression position, refer to **CRANKSHAFT**.

Remove drive pulley nut **no. 6** and thrust washer **no. 7** then pull outer half.



1. Drive pulley nut
2. Thrust washer
3. Drive pulley outer half

Remove belt **no. 5**.

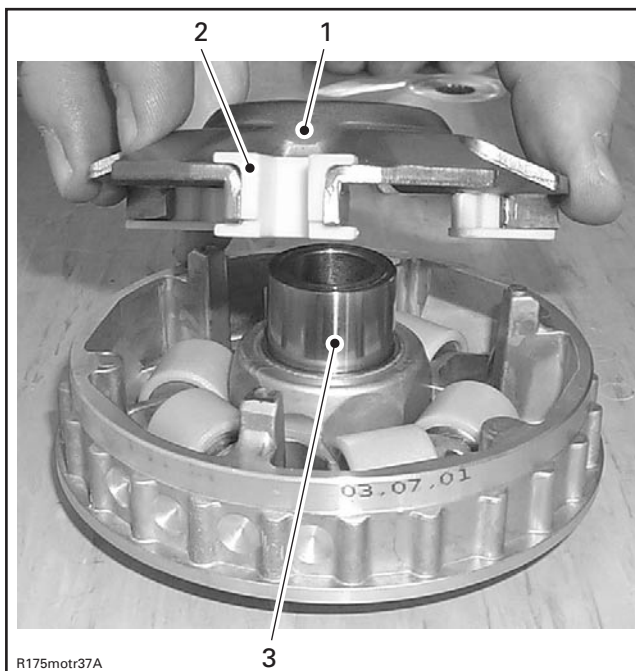
Remove whole drive pulley sliding half, **no. 9** to **no. 14**.

Disassembly of Drive Pulley

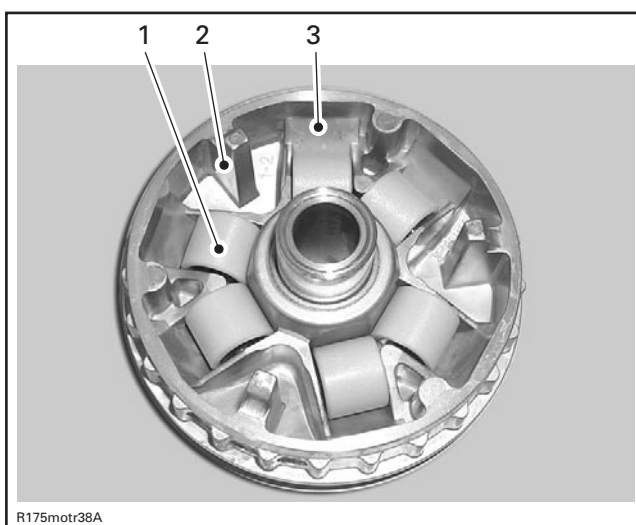
Sliding Half

Lift ramp plate no. 14 with sliding shoes no. 13.

Withdraw spacer no. 9.



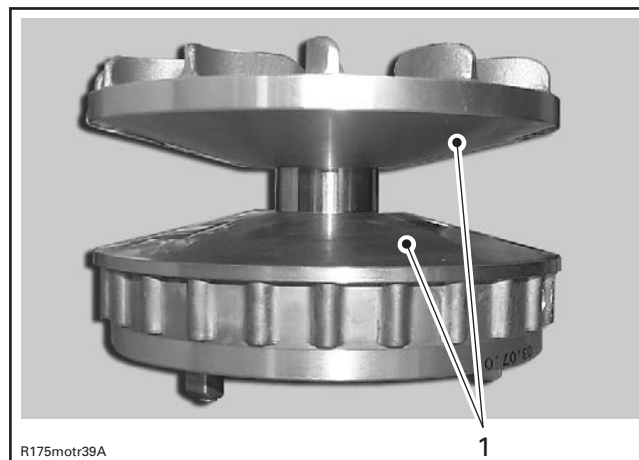
1. Ramp plate
2. Sliding shoes
3. Spacer



1. Roller
2. Contact surface to sliding shoes
3. Ramp for the rollers

Cleaning of Drive Pulley

Clean pulley faces and shaft with fine steel wool and dry cloth.



1. Faces of drive pulley

Reclean mounting surfaces with paper towel and cleaning solvent. Use Bombardier pulley flange cleaner (P/N 413 711 809).

Wipe off the mounting surfaces with a clean, dry paper towel.

Only use petrol base cleaner when cleaning bushings inside sliding half.

CAUTION: Do not use acetone to clean bushing.

Inspection of Drive Pulley

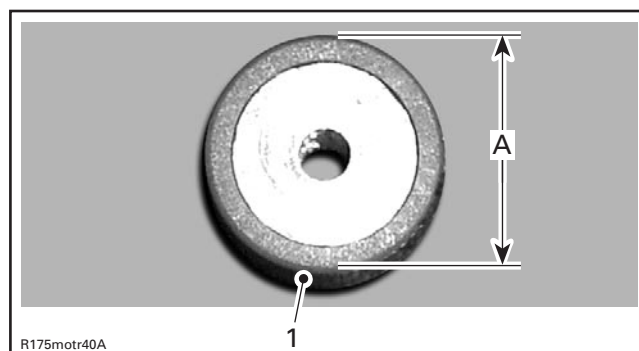
Drive Pulley

Drive pulley should be inspected annually.

Roller

Check roller kit no. 11 for roundness of external diameter.

NOTE: Replace roller kit, when rollers are showing flat surfaces.



1. Contact surface to drive pulley sliding half
- A. Roller diameter

Section 03 ENGINE

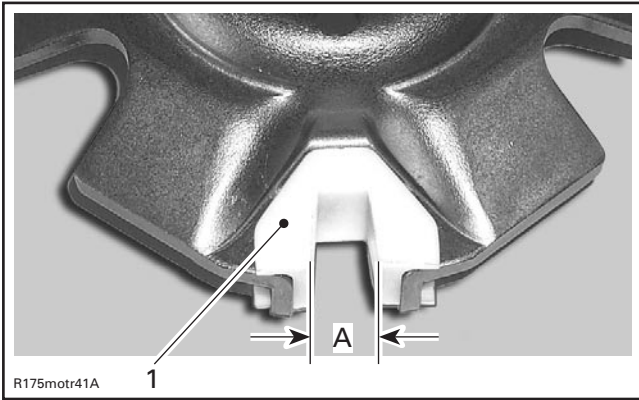
Subsection 11 (CVT)

Measure the roller diameter. If a roller is out of specification, replace roller kit **no. 11**.

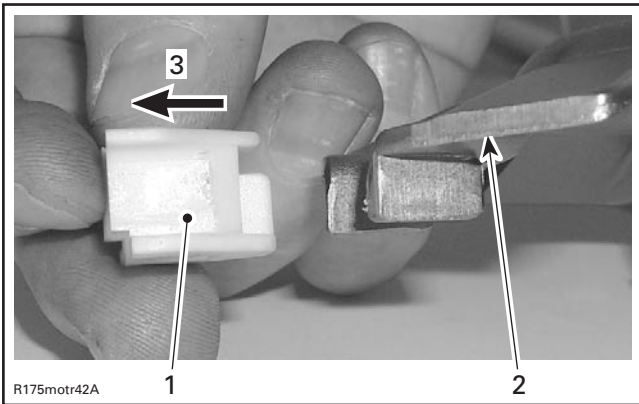
ROLLER DIAMETER	
NEW MINIMUM	20.00 mm (.787 in)
NEW MAXIMUM	20.20 mm (.795 in)
SERVICE LIMIT	19.50 mm (.768 in)

Slider Shoe

Check slider shoes kit **no. 13** for visible wear and replace if damaged or out of specification.



1. Slider shoe
A. Slider shoe gap



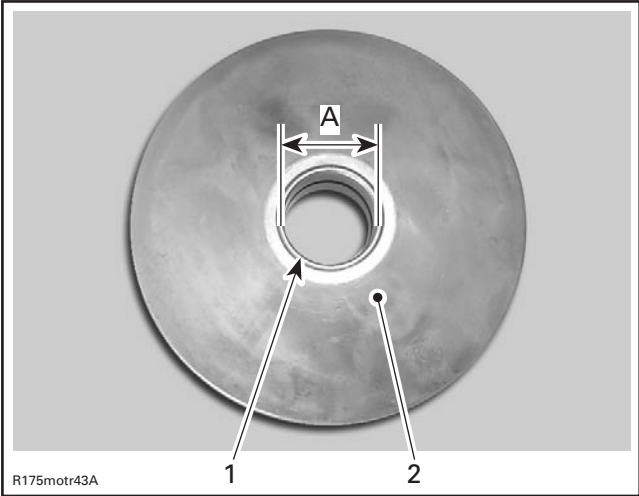
1. Slider shoe
2. Ramp plate
3. Lift slider shoes this way

Sliding Half

Check sliding half for cracks and sliding contact surface for excessive wear. Replace sliding half if necessary.

Measure bushing diameters of sliding half.

Use a dial bore gauge to measure bushing diameter. Measuring point must be at least 5 mm (1/4 in) from each bushing edge.



1. Bushing
2. Drive pulley sliding half
A. Bore diameter of bushing

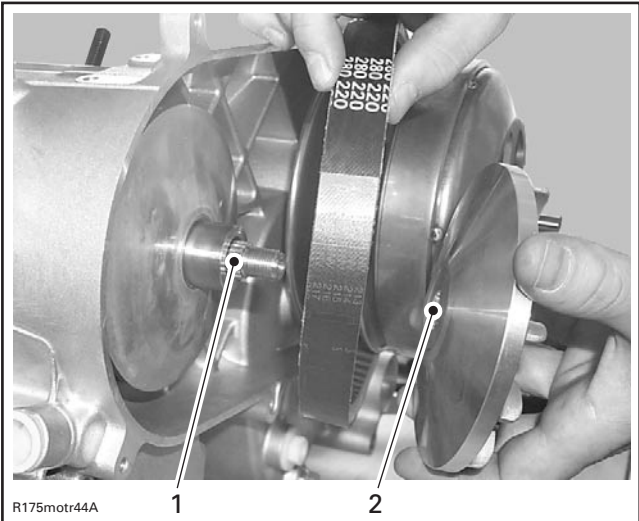
SLIDING HALF BUSHING	
NEW MINIMUM	26.000 mm (1.024 in)
NEW MAXIMUM	26.025 mm (1.025 in)
SERVICE LIMIT	26.100 mm (1.028 in)

Replace sliding half if bushing(s) is(are) out of specification. Visually inspect coatings.

Fixed Half

Check fixed half for scorings and other damages. If so, replace fixed half.

Check for any marks on fixed half spline. Replace if necessary.



1. Spline on crankshaft PTO side
2. Drive pulley fixed half spline

Assembly of Drive Pulley

For assembly, reverse the disassembly procedure. Pay attention to following details.

Insert slider shoes into ramp plate to properly slide in guides of drive pulley sliding half.

Installation of Drive Pulley

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

WARNING

Do not apply anti-seize or any lubricant on drive pulley.

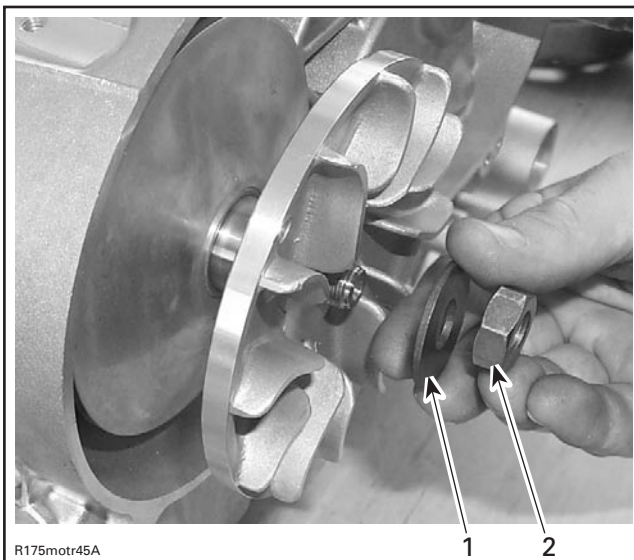
WARNING

Never use any type of impact wrench at drive pulley removal and installation.

Clean mounting surfaces as described in CLEANING above.

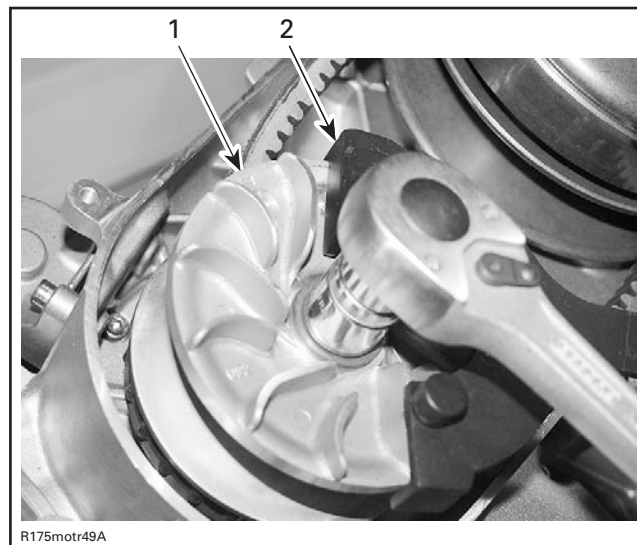
Install drive pulley on crankshaft extension.

NOTE: Do not forget shim no. 7.



1. Shim
2. Drive pulley nut

Install crankshaft locking bolt (P/N 529 035 617) or clutch holding tool (P/N 529 035 862) and torque screw to 60 N•m (44 lbf•ft).



1. Drive pulley outer half
2. Clutch holding tool

DRIVEN PULLEY

Removal of Driven Pulley

Remove:

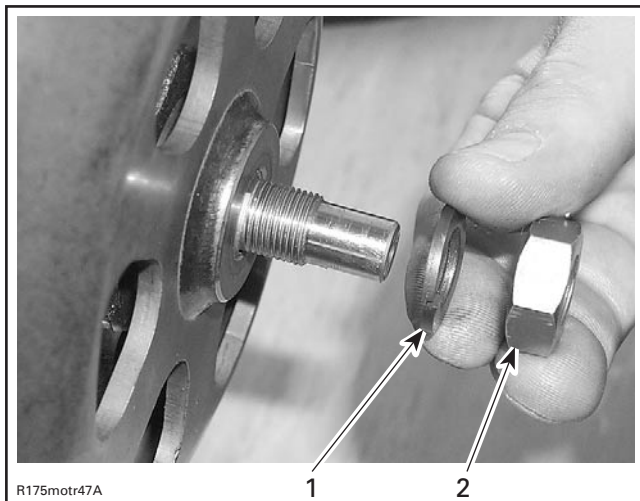
- driven pulley nut no. 15, lock washer no. 16



1. Clutch holding tool
2. Clutch drum

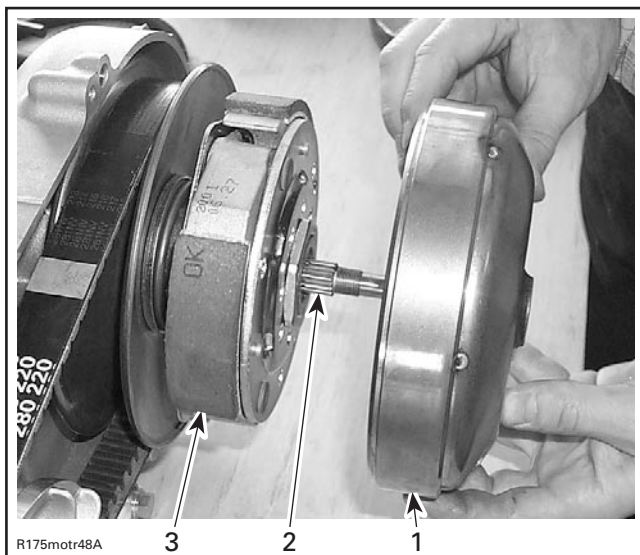
Section 03 ENGINE

Subsection 11 (CVT)



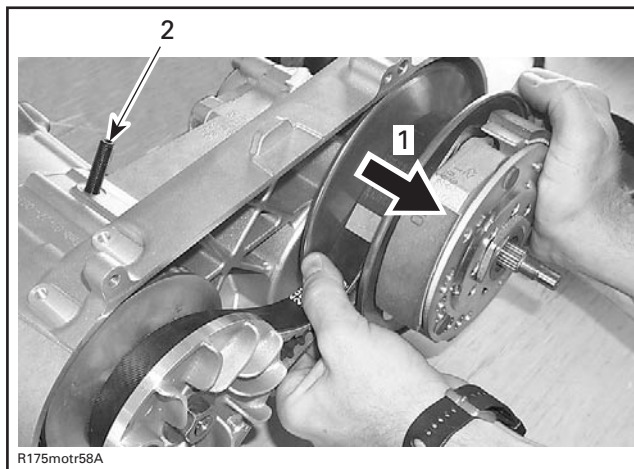
1. Lock washer
2. Driven pulley nut

– withdraw clutch drum no. 17



1. Clutch drum
2. CVT shaft
3. Clutch

– belt no. 5.



1. Driven pulley outer half against clutch assembly
2. Crankshaft locking bolt

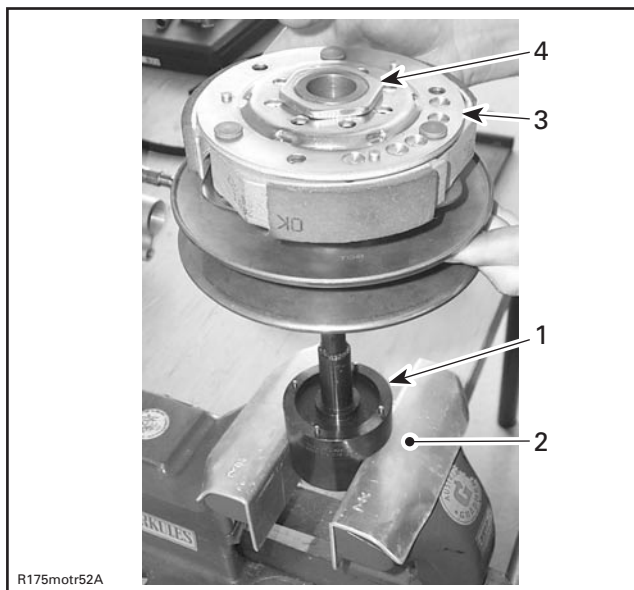
Disassembly of Driven Pulley

NOTE: The following procedure is not necessary except if clutch no. 18 must be removed. Refer to **Inspection** before proceed.

Remove:

– nut no. 19 as per following procedure.

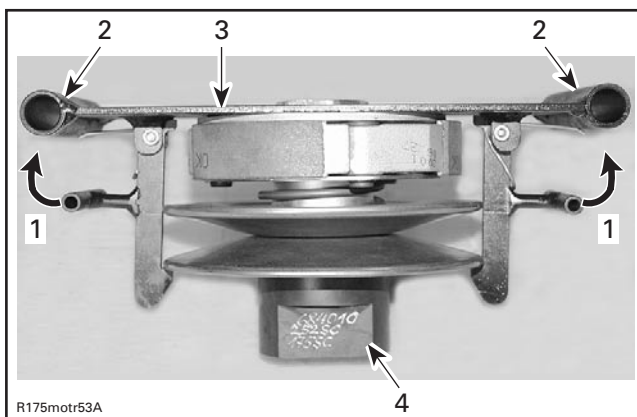
Fix clutch support (P/N 529 035 863) in a vise and place driven pulley assembly.



1. Clutch holding tool
2. Vise
3. Driven pulley assembly
4. Nut wrench size 46

Mount clutch holding tool (P/N 529 035 864).

CAUTION: Both hooks on spring loaded levers have to be engaged on outside diameter of driven pulley fixed half.



1. Withdraw levers to install tool
2. Handle grip
3. Clutch holding tool
4. Clutch support

Disassemble nut, disengage the hooks of the levers on clutch holding tool and slowly release tool.

⚠ WARNING

Centrifugal clutch is spring loaded.

Cleaning of Driven Pulley

When a dust deposit has to be removed use dry cloth.

Clean pulley faces and shaft with fine steel wool and dry cloth.

Use Bombardier pulley flange cleaner (P/N 413 711 809) to clean driven pulley.

Clean the CVT crankcase area from contamination.

⚠ WARNING

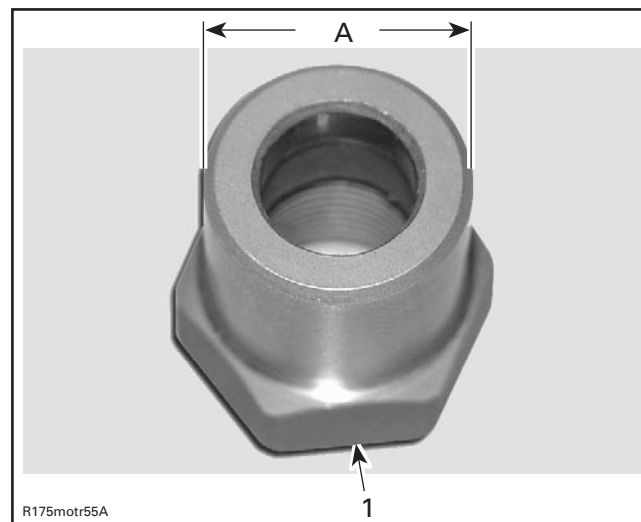
This procedure must be performed in a well-ventilated area.

CAUTION: Avoid contact between cleaner and oil seals because damage may occur.

Inspection

Nut

Measure nut no. 15 for wear on outside diameter and replace if necessary.



1. Nut
- A. Wearing diameter

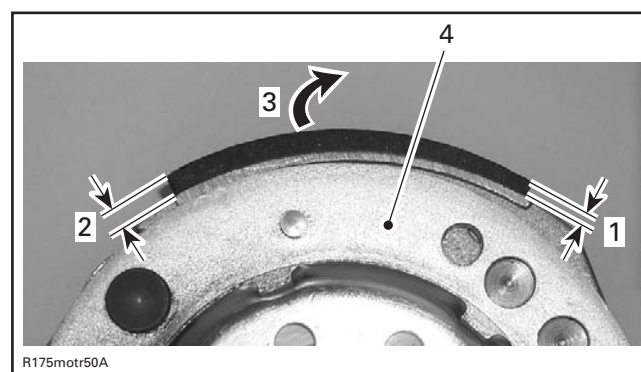
NUT OUTSIDE DIAMETER

NEW MINIMUM	16.980 mm (.6685 in)
NEW MAXIMUM	16.991 mm (.6689 in)
SERVICE LIMIT	16.880 mm (.6646 in)

Centrifugal Clutch

Check levers on centrifugal clutch no. 18 for free movement and lining wear.

NOTE: When lining thickness is getting less, higher RPM is needed for centrifugal clutch engagement.



1. Lining thickness next to lever fixation
2. Lining thickness on lever end
3. Direction of lever movement
4. Centrifugal clutch ass'y

LINING THICKNESS

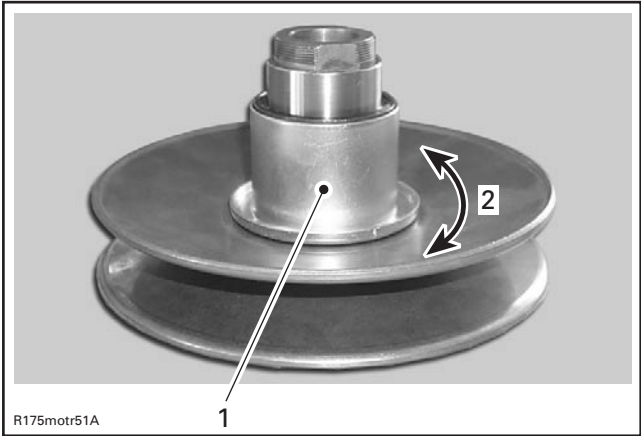
NEW NOMINAL	2.50 mm to 4.50 mm (.0984 in to .1772 in)
SERVICE LIMIT	1.00 mm (.0394 in)

Section 03 ENGINE

Subsection 11 (CVT)

Sliding Half

Check sliding half of driven pulley for free movement. Replace driven pulley if necessary.



1. Driven pulley unit
2. Sliding pulley movement

Fixed Half

Check oil seal **no. 20** if brittle hard or otherwise damaged. Replace if necessary.

Check ball bearing **no. 23** for free play and smooth operation. Replace if necessary.

Check one-way clutch **no. 21** for free movement and lock function. Replace if necessary.

Check CVT shaft for heavy wear or visible damage. Replace if necessary.

Spring

Measure spring free length and squareness. If spring is out of specification, replace by a new.

SPRING FREE LENGTH	
NEW NOMINAL	159 mm (6.260 in)
SERVICE LIMIT	150 mm (5.905 in)

CLUTCH SPRING SQUARENESS	
NEW NOMINAL	4.5 mm (.177 in)
SERVICE LIMIT	4.2 mm (.165 in)

Assembly of Driven Pulley

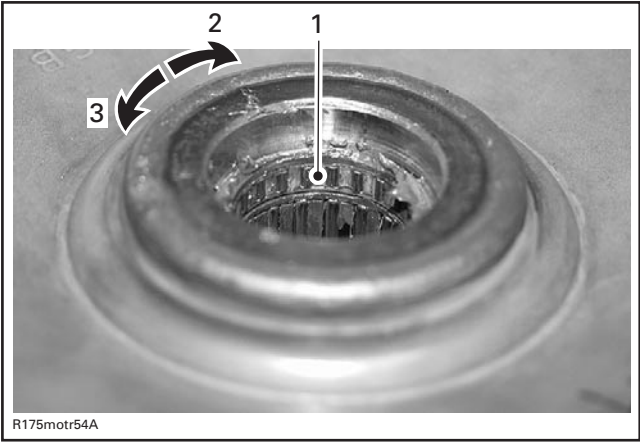
For installation, reverse the removal procedure. Pay attention to following details

Heat ball bearing area up to 100°C (212°F) before installing ball bearing **no. 23** or one-way clutch **no. 21**.

NOTE: Place new ball bearing in a freezer for 10 minutes before installation.

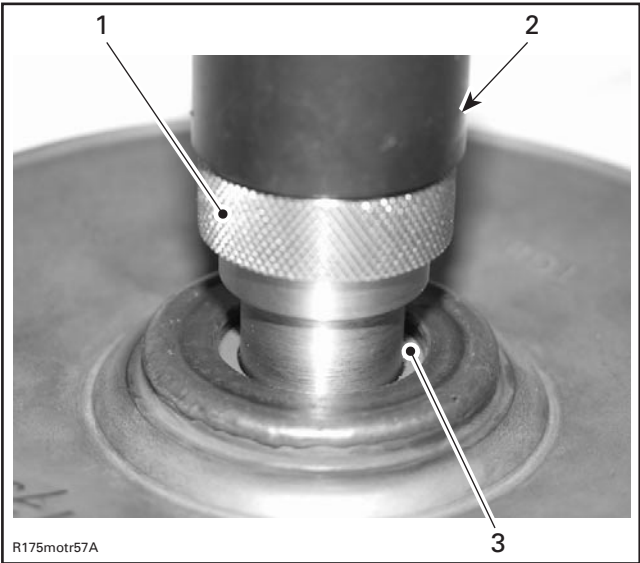
Install ball bearing **no. 23** by pushing only on the outer ring.

For installation of one-way clutch **no. 21** and oil seal **no. 20** use bearing installer (P/N 529 035 858).



1. One-way clutch
2. Direction for lock function of one-way clutch
3. Direction for free movement

CAUTION: Do not use hammer, use press machine only for one-way clutch installation.

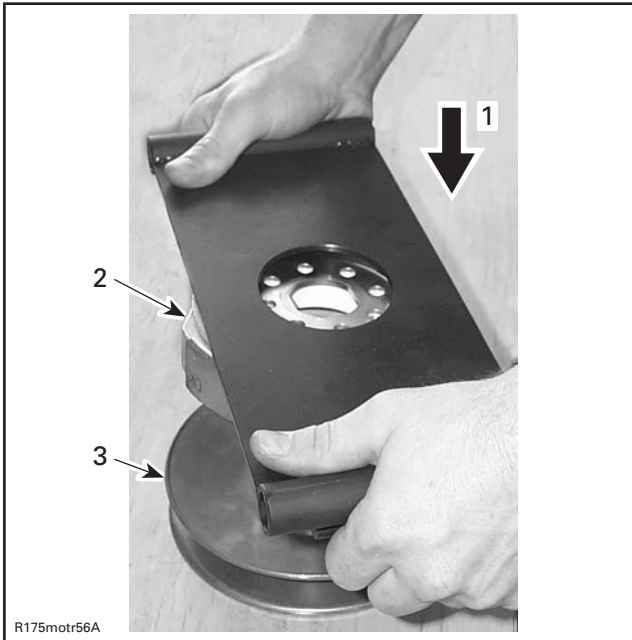


1. Bearing installer
2. Handle (P/N 420 877 650)
3. Oil seal

Place spring **no. 25**, sleeve **no. 26** behind sliding half and push the centrifugal clutch assembly **no. 18** against driven pulley with clutch holding tool (P/N 529 035 864).

⚠ WARNING

Centrifugal clutch is a spring loaded system.



1. Pushing direction
2. Centrifugal clutch assembly
3. Driven pulley assembly

Installation of Driven Pulley

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

CAUTION: Always use a new spring washer **no. 16** at the time of driven pulley installation.

NOTE: Driven pulley end-play is 0 (zero).

Install clutch holding tool (P/N 529 035 862) to torque driven pulley nut to 60 N•m (44 lbf•ft).

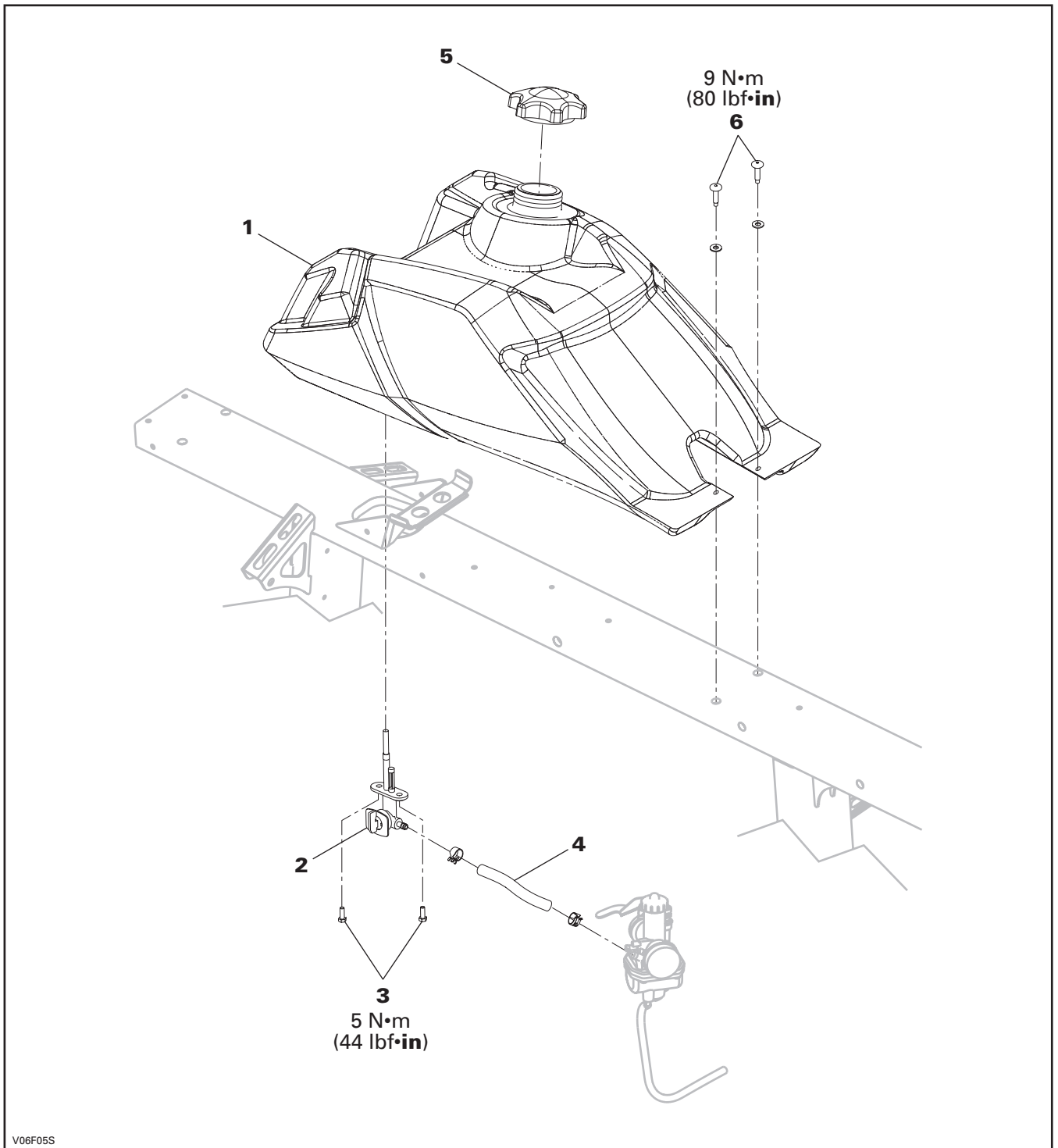
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FUEL CIRCUIT



Section 04 FUEL SYSTEM

Subsection 02 (FUEL CIRCUIT)

GENERAL

Disconnect battery before working on fuel system.

WARNING

Always disconnect battery exactly in the specified order, BLACK (-) cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

WARNING

When draining a fuel tank or whenever a fuel line is disconnected, obstruct line with a hose pincher (P/N 295 000 076) or equivalent device. 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.

For installation, use the torque values and Loctite products from the exploded view. Clean threads before using Loctite when installing the screws.

FUEL LINE

WARNING

Whenever working on fuel system, always verify for water or dust infiltration in reservoir. Replace any damaged, leaking or deteriorated fuel lines.

When replacing fuel line, be sure to use hoses as available from Bombardier parts department. This will ensure continued proper and safe operation.

WARNING

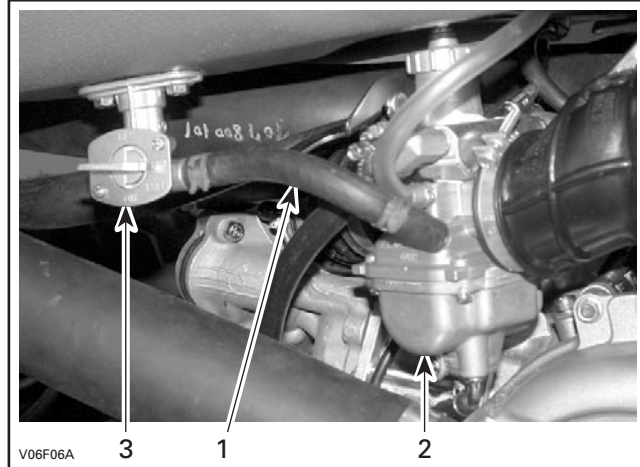
Use of improper fuel line could compromise fuel system integrity.

FUEL TANK

Draining

Turn fuel valve **no. 2** to the position OFF.

Disconnect fuel line from carburetor.



1. Fuel line
2. Carburetor
3. Fuel valve on OFF position

Place fuel line **no. 4** in to an approved fuel container.

Turn fuel valve on RESERVE position to drain the fuel tank.

NOTE: To accelerate fuel tank draining and ensure complete draining, remove cap **no. 5**.

When the tank is empty, turn valve OFF.

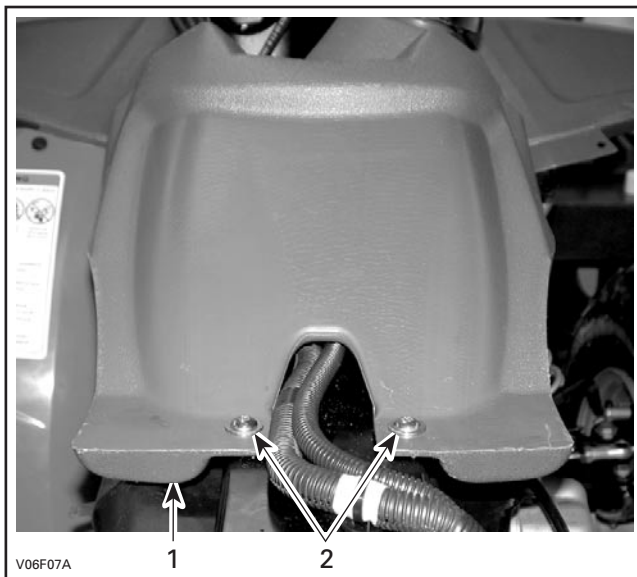
Removal

Drain fuel tank.

Remove following items from body. Refer to **BODY** for complete detailed procedure:

- seat
- console.

Unscrew the bolts **no. 6** retaining fuel tank to frame.



1. Fuel tank
2. Bolts

Inspection

Inspect fuel tank for any damage or cracks which may result in fuel leaks. If so, replace tank with new one.

Installation

Reverse removal procedure, however pay attention to the following.

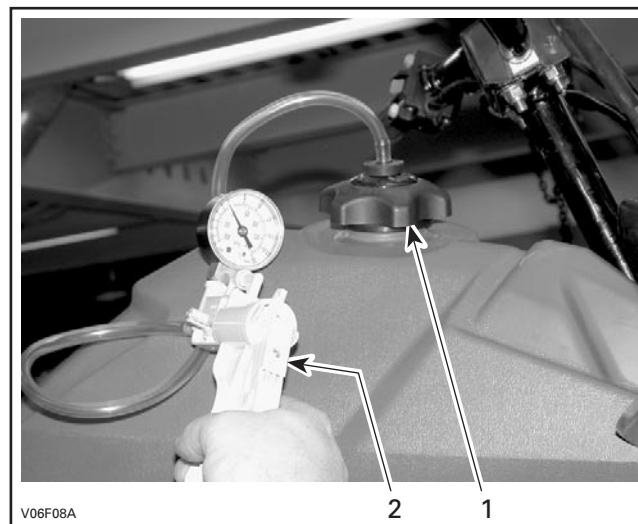
Perform fuel system pressurization as described in the following procedure.

Fuel System Pressurization

Fill up fuel tank **no. 1**.

Install on fuel tank, the special cap of leak testing kit (P/N 529 033 100).

Using air pump from engine leak test kit (P/N 861 749 100) inject air into fuel tank. See next photo.



1. Special cap on tank
2. Air pump

Pressurize fuel system to 21 kPa (3 PSI). That pressure must not drop during 3 minutes.

If pressure drops, locate fuel leak(s) and repair/replace leaking component(s).

To ease locating leak(s) at fuel tank vent fitting, fuel gauge or fuel cap spray soapy water on components; bubbles will indicate leak location(s).

FUEL VALVE

Removal

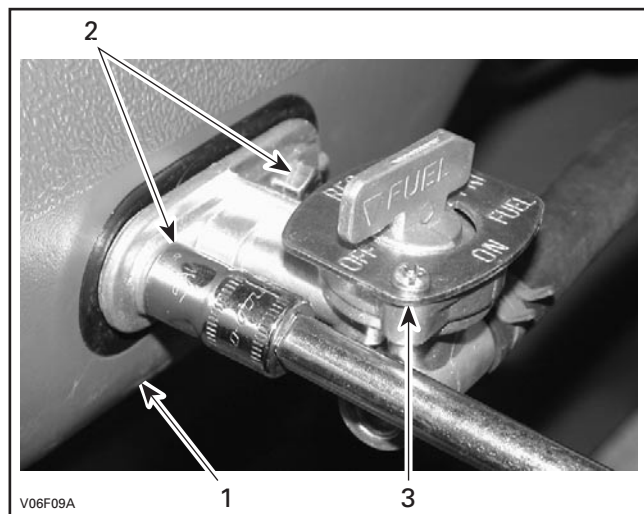
Remove LH side cover (refer to **BODY**).

Drain fuel tank, refer to **Fuel Tank Draining**.

Unscrew the bolts **no. 3** retaining fuel valve **no. 2** to fuel tank **no. 1**.

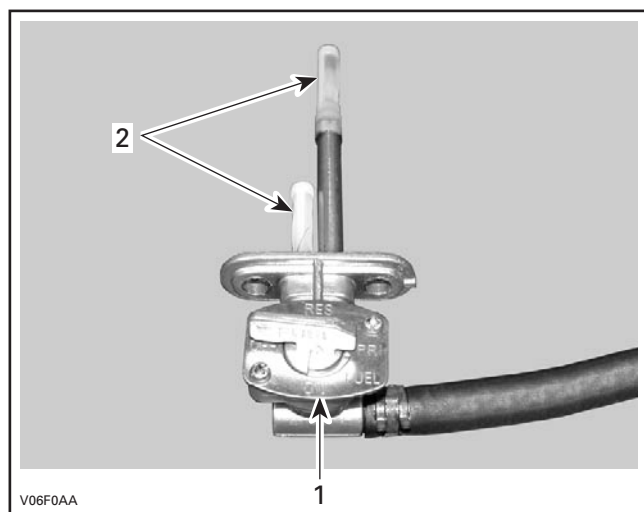
Section 04 FUEL SYSTEM

Subsection 02 (FUEL CIRCUIT)



1. Fuel tank
2. Bolts
3. Fuel valve on OFF position

Remove fuel valve.



1. Fuel valve
2. Strainers

Inspection

Check fuel valve strainers. If one strainer is damaged, change fuel valve.

Check gasket between fuel valve and fuel tank for damage. If so, change fuel valve.

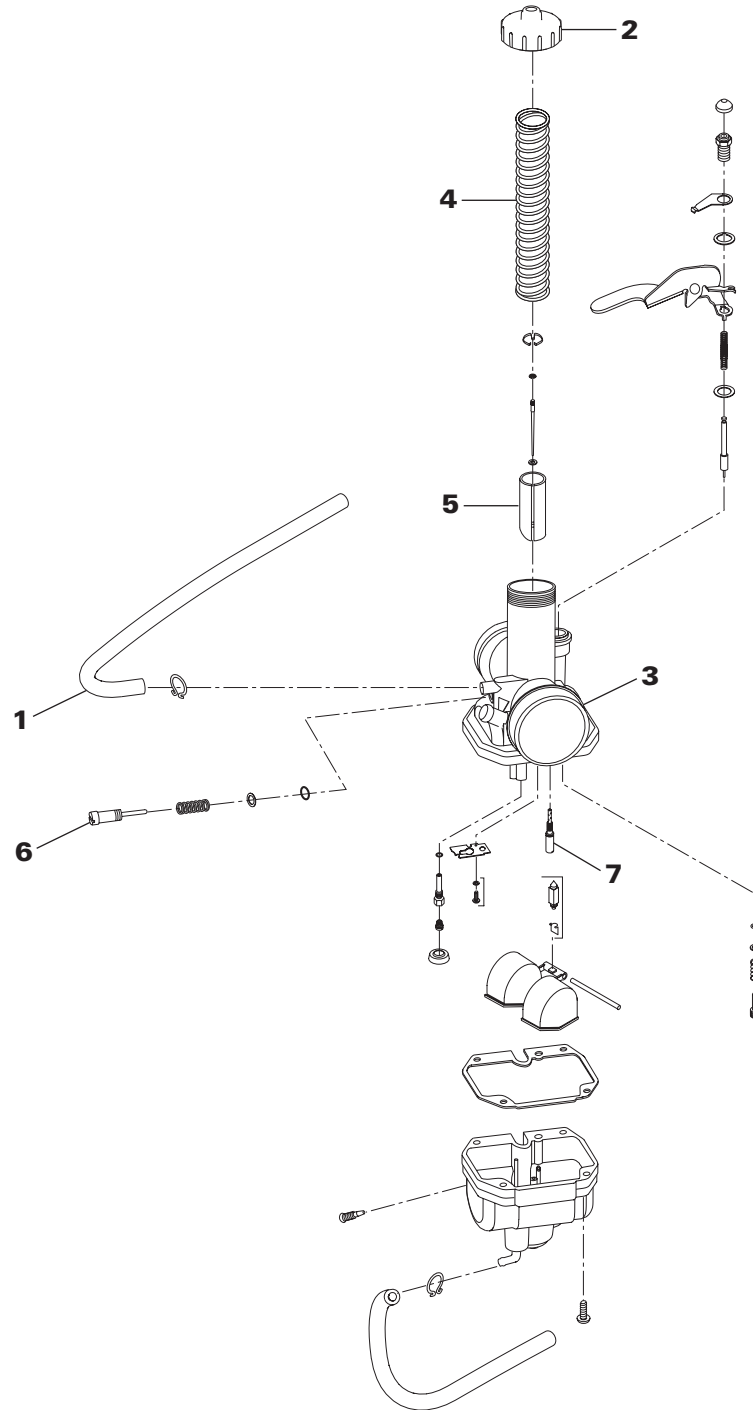
Installation

For installation, reverse the removal procedure.

Clean fuel valve strainers.

Perform fuel system pressurization as described in the **Fuel System Pressurization** section.

CARBURETOR



V06F0BS

Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR)

GENERAL

Disconnect battery before working on fuel system.

WARNING

Always disconnect battery exactly in the specified order, **BLACK (-)** cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

CARBURETOR

CAUTION: Although some jets can be replaced by other jets from other carburetors, such modifications shouldn't be performed. They can greatly affect engine calibration and can cause severe damage to engine. Use only recommended jetting specific for this carburetor.

Removal

Turn fuel valve OFF.

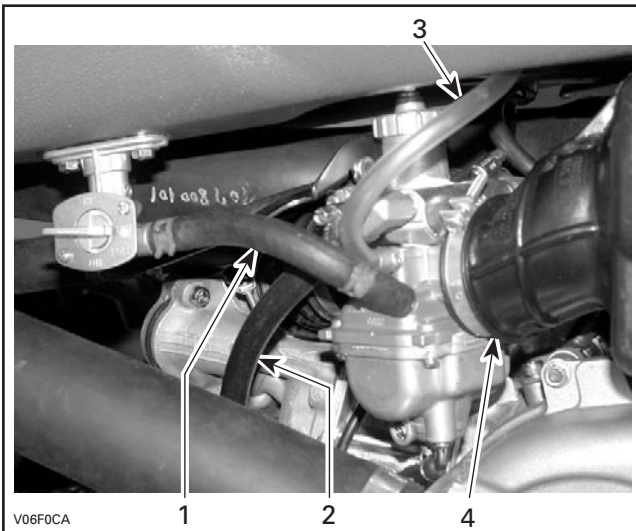
Disconnect fuel line from carburetor.

Unclamp the carburetor intake adaptor from carburetor. Refer **AIR INTAKE SILENCER**.

Disconnect two block heater hoses.

Disconnect vent hose **no. 1**.

Unscrew carburetor cap **no. 2** from the carburetor **no. 3**.



1. Fuel line
2. Block heater hose
3. Vent hose
4. Air intake adaptor

Remove throttle cable. See **THROTTLE CABLE** further in this section.

Pull out carburetor.

Cleaning and Inspection

The entire carburetor should be cleaned with a general solvent and dried with compressed air before disassembly.

CAUTION: Heavy duty carburetor cleaner may be harmful to the float material and to the rubber parts, O-rings, etc. Therefore, it is recommended to remove those parts prior to cleaning.

Carburetor body and jets should be cleaned in a carburetor cleaner following manufacturer's instructions.

WARNING

Solvent with a low flash point such as gasoline, naphtha, benzol, etc., should not be used as they are flammable and explosive.

Float Level Adjustment

Correct fuel level in float chamber is vital toward maximum engine efficiency. To check for correct float level proceed as follows:

- Remove float bowl and gasket from carburetor.
- Make sure that float arm is symmetric, not distorted.

With carburetor chamber up side down:

- Measure height between bowl seat and the top edge of float arm. Use float level gauge (P/N 529 035 520).
- Keep float level gauge perfectly vertical and in line with main jet hole.

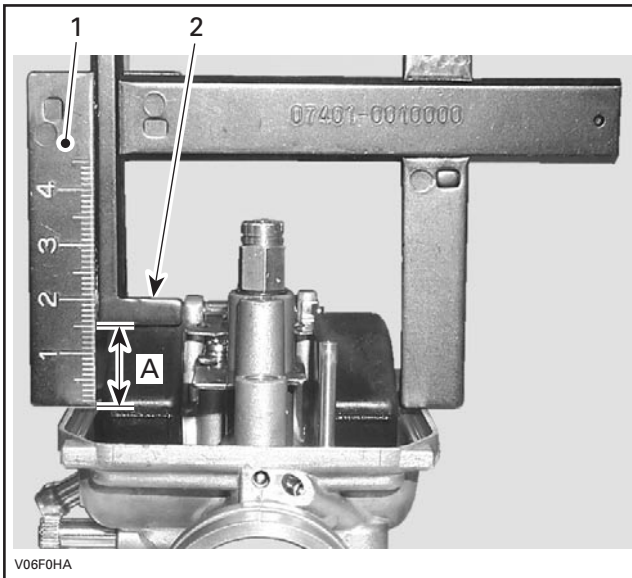
Ensure that both float level gauge tips are properly positioned on carburetor body and that "L" arm is leaning on float while compressing valve spring.

Refer to following photos for proper float level gauge positioning.

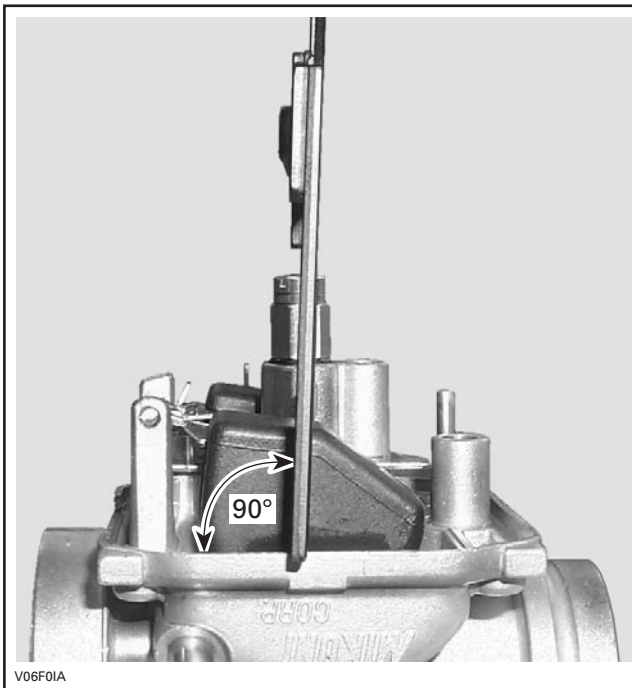
NOTE: Refer to **TECHNICAL DATA** for proper level.

Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR)



- 1. Gauge tips
- 2. "L" arm
- A. Height



GAUGE ALIGNED WITH MAIN JET

To adjust height, bend the contact tab of float arm until the specified height is reached.

CAUTION: When adjusting contact tab, do not pry on. This would apply pressure on needle and damage valve seat/needle.

CARBURETOR FLOAT LEVEL ADJUSTMENT

Float level	15 mm $\pm$ 1mm (.591 in $\pm$.039 in)
-------------	--

Installation

To install carburetor on engine, inverse removal procedure, as described:

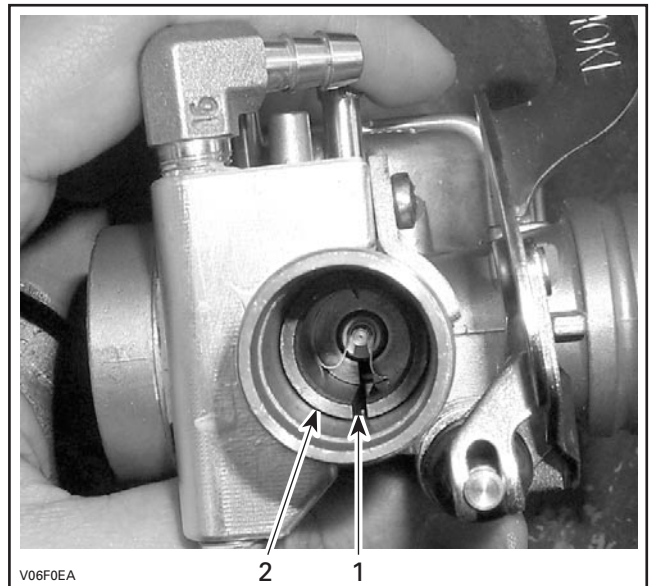
Adjust the throttle cable, then install the carburetor cap. Refer to CARBURETOR ADJUSTMENTS below in this section.

Carefully replace carburetor cap no. 2 in its original position.

Make sure valve piston no. 5 groove passes the inside protrusion in carburetor no. 3 before closing the carburetor cap no. 2.

⚠ WARNING

Throttle valve piston groove must be aligned with carburetor inside protrusion to allow throttle valve piston to reach idle bottom position. Otherwise throttle valve piston should be half open leading to potential dangerous situation.



- 1. Protrusion
- 2. Valve piston

Reinstall carburetor on engine.

When reinstalling carburetor on engine, pay attention to the following:

Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR)

CAUTION: The rubber flanges must be checked for cracks and/or damage. At assembly, the rubber flanges must be perfectly matched with the air box, carburetor and engine or severe engine damage will occur. Do not use screwdriver or other tool to install the rubber flanges.

Install rubber flange on air box side so that its recess aligns with air box notch.

CARBURETOR ADJUSTMENTS

Pilot Screw Preliminary Adjustment

NOTE: The pilot screw no. 6 is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or replaced.

Completely close the pilot screw (until a slight seating resistance is felt) then back off as specified.

Refer to **TECHNICAL DATA** for specifications.

Pilot Screw Adjustment

NOTE: Warm up the engine to operating temperature.

Turn the pilot screw clockwise until it sits lightly then unscrew of 3/4 turn.

CAUTION: Take care when screwing the pilot screw, the feeling is very slight.

Adjust the idle speed, see below for procedure.

Idle Speed Adjustment

Start engine and allow it to warm then adjust idle speed to specifications by turning **idle speed screw** clockwise to increase engine speed or counterclockwise to decrease it.



1. Idle speed screw

NOTE: Use the deluxe automotive meter, such as ESI 585 for the best measure.

CAUTION: Do not attempt to set the idle speed by using the pilot screw.

Refer to **TECHNICAL DATA** for idle speed specifications.

THROTTLE CABLE

Removal

Carburetor Side

WARNING

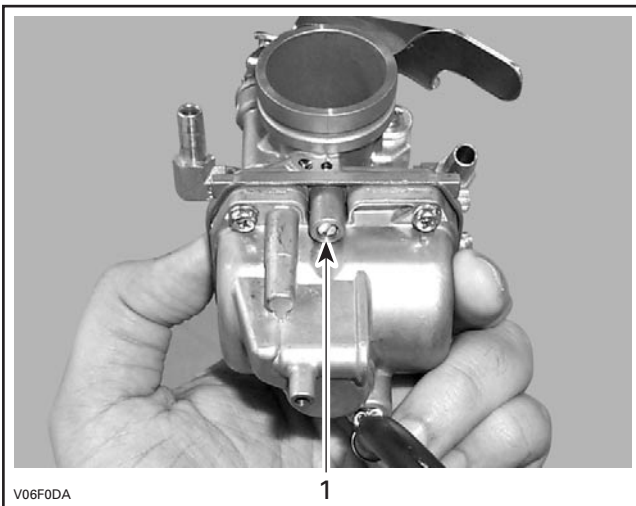
Ensure the key is turned OFF, prior to performing the throttle cable removal.

NOTE: To ease reinstallation, take note cable routing.

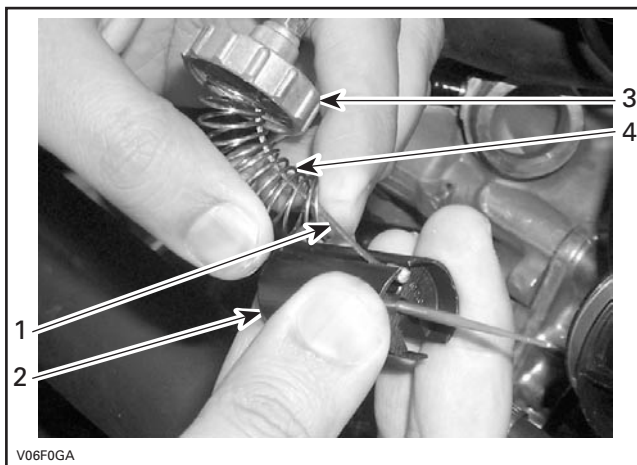
Unscrew carburetor cap no. 2 from the carburetor no. 3.

Push back the carburetor spring no. 4 to get hold of the throttle cable.

Push forward throttle cable out of the valve piston no. 5.



1. Pilot screw



1. Throttle cable
2. Valve piston
3. Carburetor cap
4. Carburetor spring

Pull cable out of carburetor.

Throttle Lever Side

Remove both screws on throttle housing.

Remove throttle cable.

Lubrication

The throttle cable must be lubricated with Bombardier cable lubricant (P/N 293 600 041) only.

⚠ WARNING

Using another lubricant could cause sticking or stiffness of throttle lever/cable.

To lubricate the throttle cable, remove cable from throttle lever and from carburetor.

Install cable lubber (P/N 529 035 738) on cable.

Insert the needle of lubricant can on cable lubber hole.

⚠ WARNING

Always wear eye protection and gloves when lubricating cables.

NOTE: Place a rag around cable lubber to prevent lubricant splash.

Put lubricant until it passes through the cable.

Place the cable in a vertical position during approximately 15 minutes or until no lubricant flow out of cable.

Reinstall and adjust cable, see below.

Installation

For installation, reverse the removal procedure.

Adjustment

⚠ WARNING

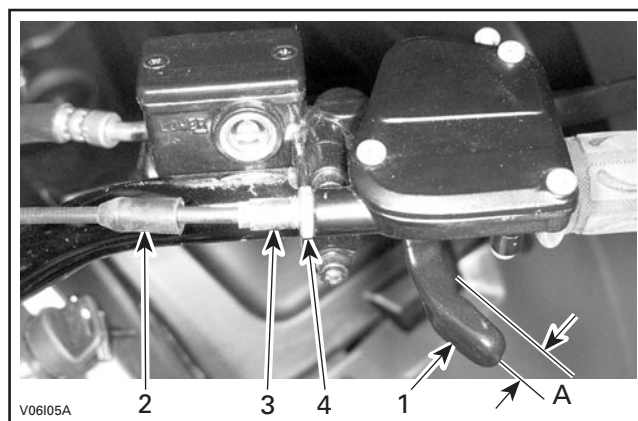
Ensure the key is turned OFF, prior to perform the throttle cable adjustment.

Slide rubber protector back to expose throttle cable adjuster.

Loosen lock nut then turn the adjuster to obtain correct throttle lever free play.

NOTE: Measure throttle free play at the tip of throttle lever.

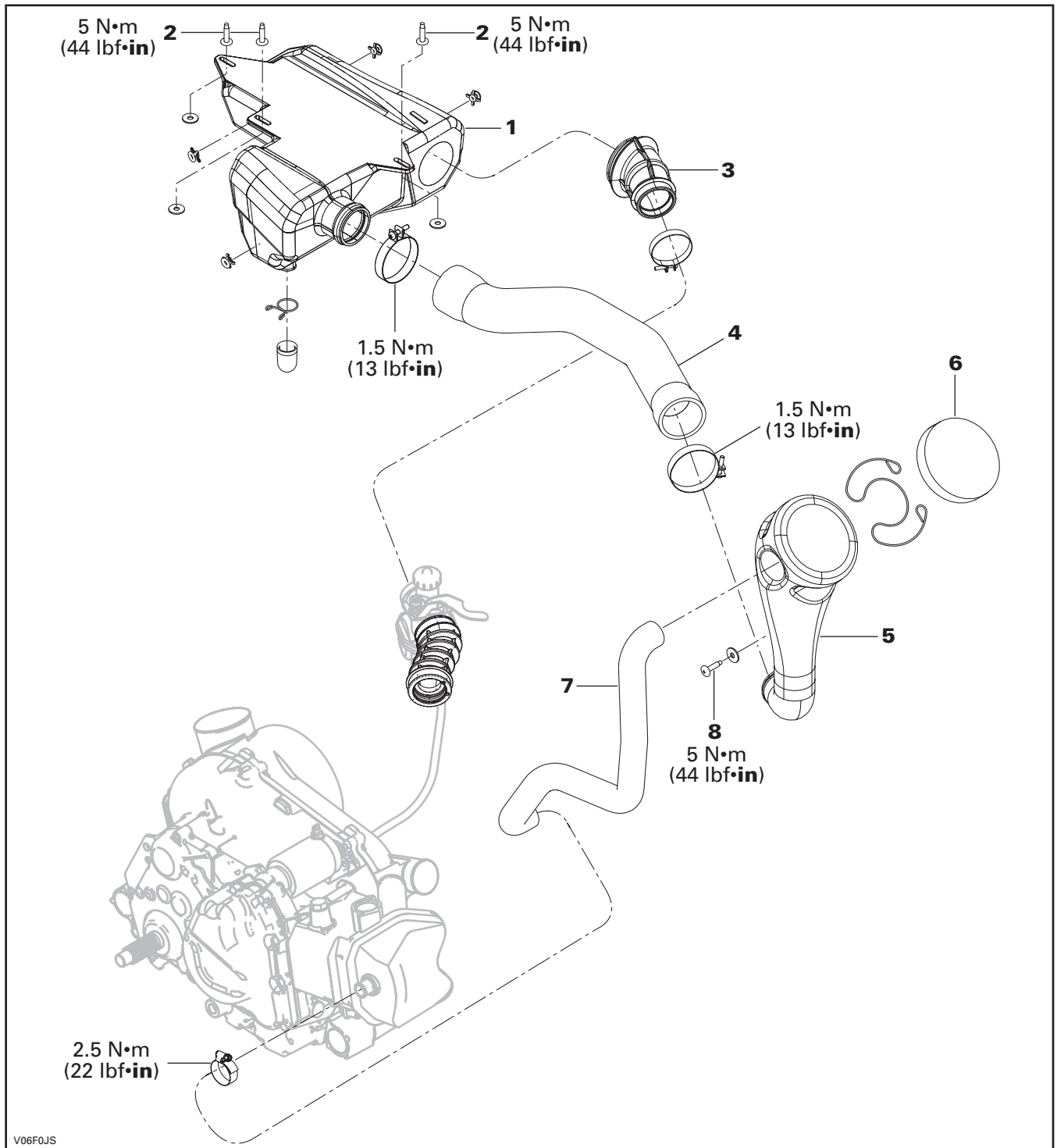
Tighten lock nut and reinstall protector.



1. Throttle lever
2. Protector
3. Cable adjuster
4. Lock nut
- A. 3 to 8 mm (1/8 to 5/16 in)

Tighten lock nut and reinstall protector.

AIR INTAKE SILENCER



Section 04 FUEL SYSTEM

Subsection 04 (AIR INTAKE SILENCER)

GENERAL

Disconnect battery before working on fuel system.

WARNING

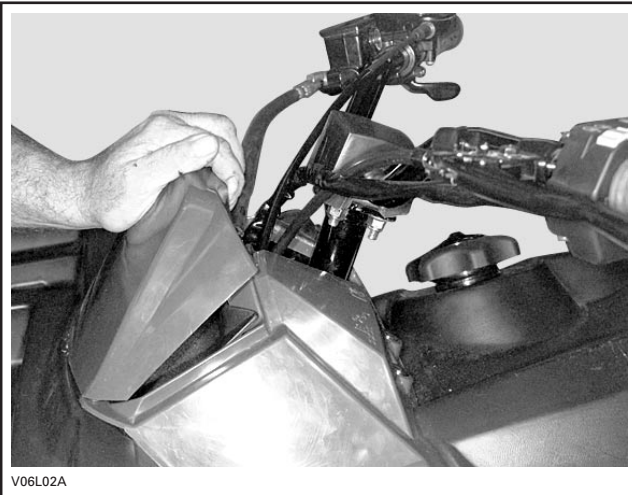
Always disconnect battery exactly in the specified order, **BLACK (-)** cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

For installation, use the torque values and Loctite products from the exploded view. Clean threads before using Loctite when installing the screws.

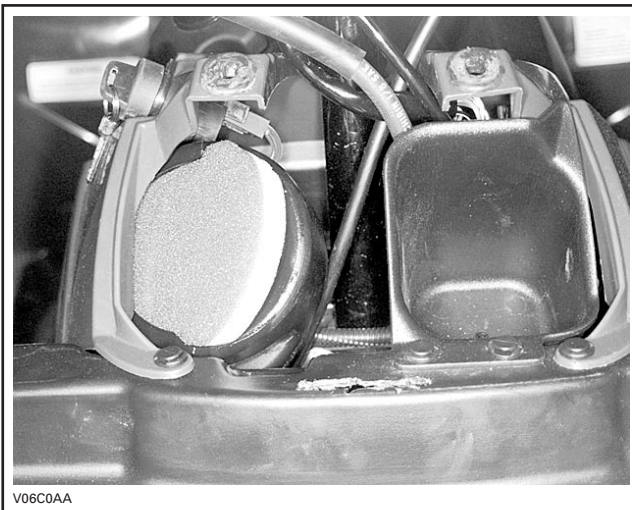
AIR FILTER AND CLEANING

Removal

Remove cluster cover.



Remove air filter.



Pour Bombardier air filter cleaner (P/N 293 600 059) into a bucket, dunk the filter multiple times until clean. Rinse with warm water.

While filter soaks, clean the air filter area.

Then, let the filter dry completely.

When the filter is dried, re-oil it with Bombardier air filter oil (P/N 293 600 058).

Installation

Properly reinstall removed parts in the reverse order of their removal.

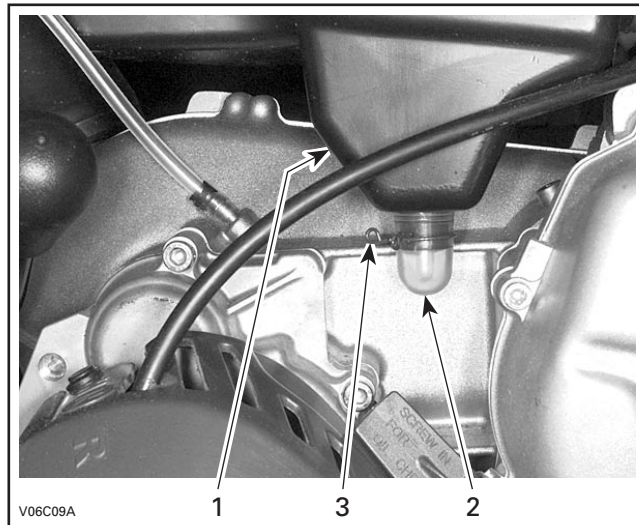
Reinstall the air filter with the grey part on top.

NOTE: Check if the air filter broach is properly located before installing air filter.

AIR BOX

Draining

Periodically inspect air box drain tube for water or deposits.



TYPICAL

1. Air box
2. Drain tube
3. Clamp

NOTE: If vehicle is used in dusty area, inspect more frequently than specified in **Maintenance Chart**.

If water/deposits are found, squeeze and remove the clamp. Pull drain tube out.

CAUTION: Do not start engine when water is found in the drain tube.

When water/deposits are found, the air filter must be inspected/dried/replaced depending on its condition.

Section 04 FUEL SYSTEM

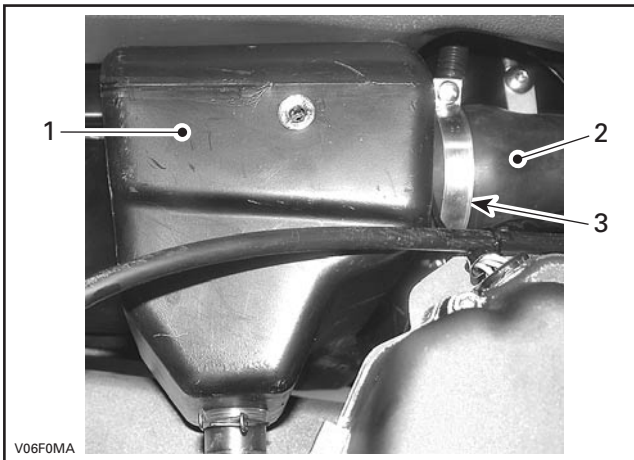
Subsection 04 (AIR INTAKE SILENCER)

Removal

CAUTION: Never remove or modify any component in the air box. The engine carburation is calibrated to operate specifically with these components. Otherwise, engine performance degradation or damage can occur.

Remove LH and RH side covers to get access to the air box **no. 1**. Refer to **BODY** for LH and RH side covers removal.

Unclamp vent hose **no. 4** on RH side.



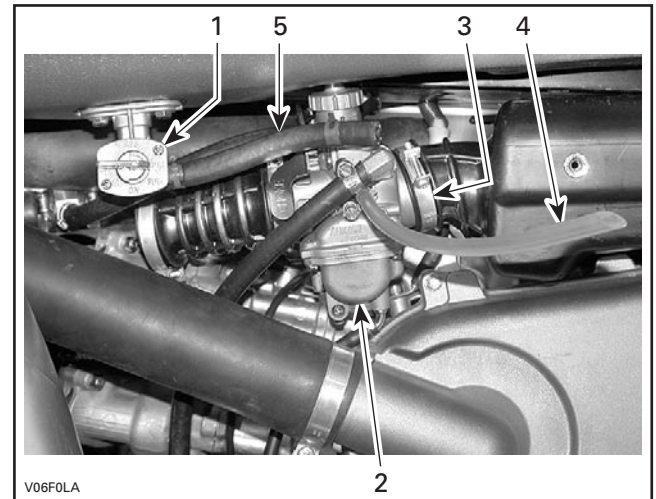
RIGHT SIDE SHOWN

1. Air box
2. Vent hose
3. Clamp

Turn off the fuel valve.

Unclamp the carburetor intake adaptor **no. 3** from carburetor and remove it from air box.

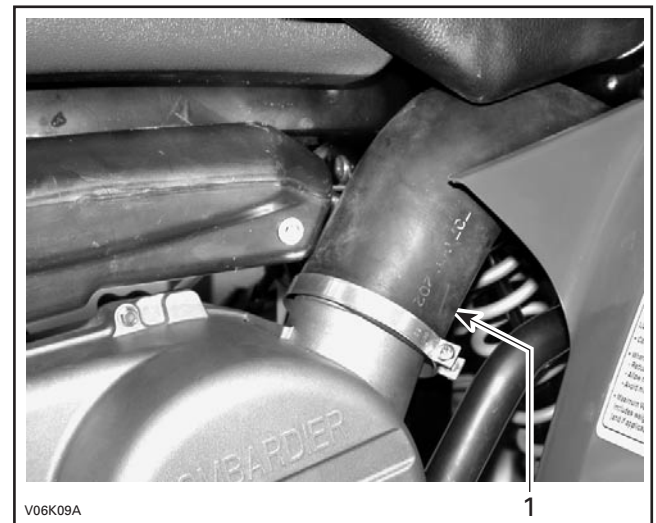
Disconnect carburetor vent hose and carburetor fuel line. Remove and place carburetor off to one side to get access of the torx screw retaining the air box to the frame.



LEFT SIDE SHOWN

1. Fuel valve on OFF position
2. Carburetor
3. Carburetor intake adaptor clamp
4. Carburetor vent hose
5. Carburetor fuel line

Unclamp the CVT air outlet hose.



LEFT SIDE SHOWN

1. CVT air outlet hose

Section 04 FUEL SYSTEM

Subsection 04 (AIR INTAKE SILENCER)

Remove the torx screws **no. 2**.

Remove air box **no. 1**.

NOTE: Air box **no. 1** can only be removed through right hand side.

Installation

Properly reinstall removed parts in the reverse order of their removal.

AIR FILTER HOUSING

Removal

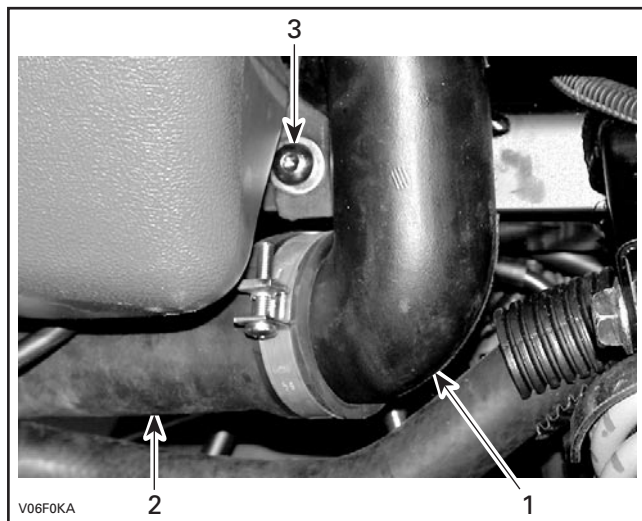
Air filter housing can be removed as follows:

Remove RH side cover and console cover. Refer to **BODY**.

Unclamp vent hose **no. 4** from air filter housing **no. 5**.

Pull out the breather vent hose **no. 7** from air filter housing **no. 5**.

Unscrew the screw **no. 8** and pull upwards air filter housing **no. 5**.



- 1. Air filter housing
- 2. Vent hose
- 3. Screw

Installation

Properly reinstall removed parts in the reverse order of their removal.

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Section 05

ELECTRICAL

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OVERVIEW

GENERAL OPERATION INFORMATION

The electrical system consist of different sub-systems where some are inter-related:

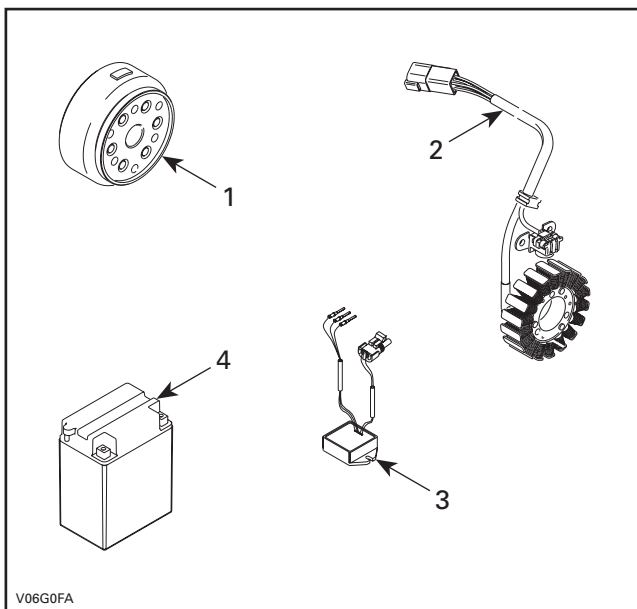
- charging system
- starting system
- ignition system
- accessories.

The following gives an outline of each components.

CHARGING SYSTEM

It is the source of electrical energy to charge the battery and keep it at a full state of charge. The magneto is coupled to the engine and it transforms magnetic field into electric current through a 3 phase, delta wound stator on 18 poles.

The magneto supplies unregulated AC current (alternative current) to the voltage regulator/rectifier.



1. Magneto flywheel
2. Stator
3. Voltage regulator/rectifier
4. Battery

Voltage Regulator/Rectifier

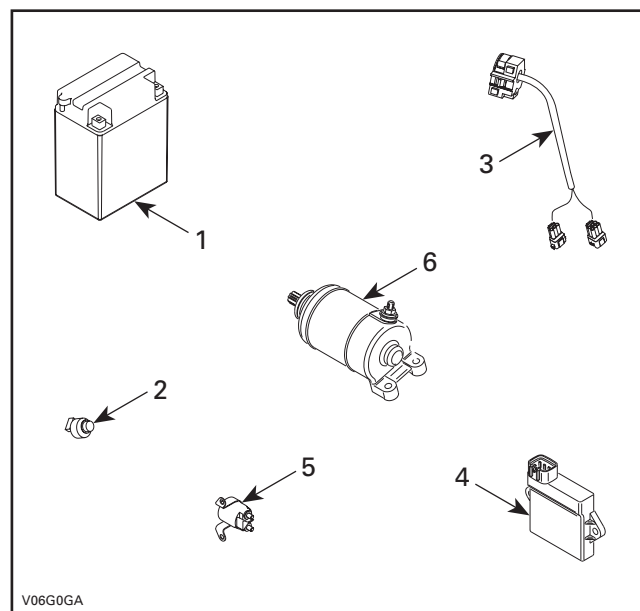
A 3-phase full-wave series-type voltage regulator/rectifier receives the AC voltage and rectifies (converts) it into DC. The voltage is also regulated to a maximum of 14.7 ± 0.4 volts (DC).

Battery

The battery supplies the entire vehicle. Therefore, DC current only is used in the entire electrical system.

STARTING SYSTEM

When ignition switch is turned on and start button is pressed, a signal is sent to the starting solenoid. The battery then supply the starter through the starting solenoid to start the engine.



TYPICAL

1. Battery
2. Ignition switch
3. Start button
4. Electronic module
5. Solenoid
6. Electric starter

Transmission must be NEUTRAL to allow engine starting.

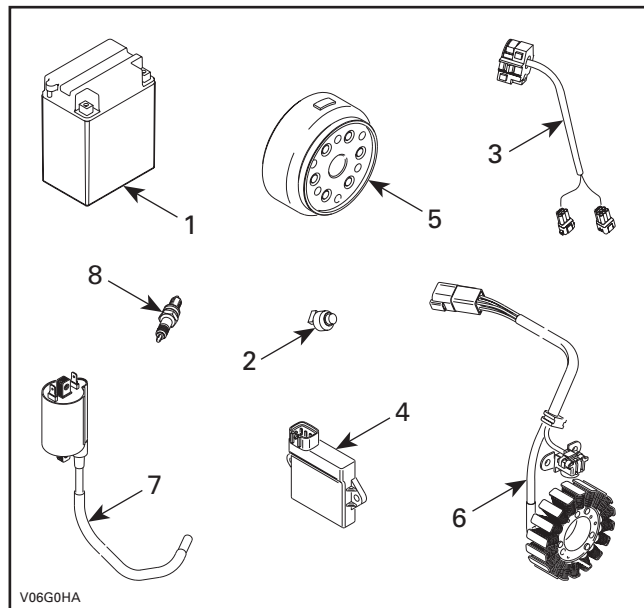
However, an override mode allows to start the engine with the transmission lever in any position when holding front brake lever while pressing the start button.

Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

IGNITION SYSTEM

An IDI (Inductive Discharge Ignition) system is utilized. The ignition system is made up of the following components:



TYPICAL

1. Battery
2. Ignition switch
3. Start button
4. Electronic module
5. Magneto flywheel
6. Trigger coil with stator
7. Ignition coil
8. Spark plug

Battery/Ignition Switch

The ignition switch allows battery to supply the electronic module for the ignition system.

Start Button

The start button enables the starting system.

Magneto Flywheel/Trigger Coil

The magneto flywheel features one protrusion that is working with the trigger coil. The trigger coil sends the signals to the electronic module to be processed for the ignition system.

Ignition Coil/Spark Plug

The ignition coil receives its signal from the electronic module. The ignition coil steps up the input voltage and the end result is firing of the spark plug.

Electronic Module

It is basically responsible for interpreting/computing information, distribution of information, ignition system, the engine RPM limiter and the vehicle speed limiter. It reads information through many external sensors to then compute the output actions to the related systems.

GENERAL TESTING/TROUBLESHOOTING INFORMATION

The following gives general electrical-related problems. For specific system-related problems, refer to proper system section.

It is possible that a component seems to operate in static condition but in fact, it is defective. In this case, the best way to solve this problem is to remove the original part and replace it with one which is in good condition.

IMPORTANT: When having to solve an electrical problem, the first thing to do is to check battery condition as well as its cables and connections. Also ensure the ignition switch is turned on. Check related-circuit fuse condition with an ohmmeter — visual inspection could lead to false results — and solidity (close to battery). Also visually examine harness and connections.

CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic parts.

To perform verifications, a good quality multimeter such as Fluke 111 (P/N 529 035 868) should be used.

Pay particular attention to ensure that pins are not out of their connectors or out of shape. The troubleshooting procedures cover problems not resulting from one of these causes.

WARNING

Ensure all terminals are properly crimped on wires and connector housings are properly fastened.

Before replacing any electric or electronic part(s), always check electrical connections. Make sure that they are very tight and they make good contact and that they are corrosion-free. The voltage and current might be too weak to go through dirty wire pins. Check carefully if posts show signs of moisture, corrosion or if they look dull. Clean pins properly and then coat them with silicon-based dielectric grease or other appropriate lubricant (except if otherwise specified) when reassembling them. See connectors information below.

It is recommended to always disconnect the battery when replacing the any electric or electronic part(s).

⚠ WARNING

Always disconnect battery exactly in the specified order, BLACK (-) cable first. It is recommended to disconnect electrical connections prior to replacing any electric or electronic parts.

IMPORTANT: In usual electric circuit, the battery supplies a switch which then supplies the electric consumer. Therefore the switch opens and closes the positive side of the circuit. However, in our electrical system, the battery supplies the electric consumer then **the switch completes the circuit to the ground**. So the switch opens and closes the negative side of the circuit. Take this into account when troubleshooting the electrical system. Pay attention to grounding wires.

Checking for Shorts Between 2 Wires

When checking continuity of a wire in a circuit, wires should be checked for short circuit as follows.

Make sure to isolate circuit wires by unplugging connectors.

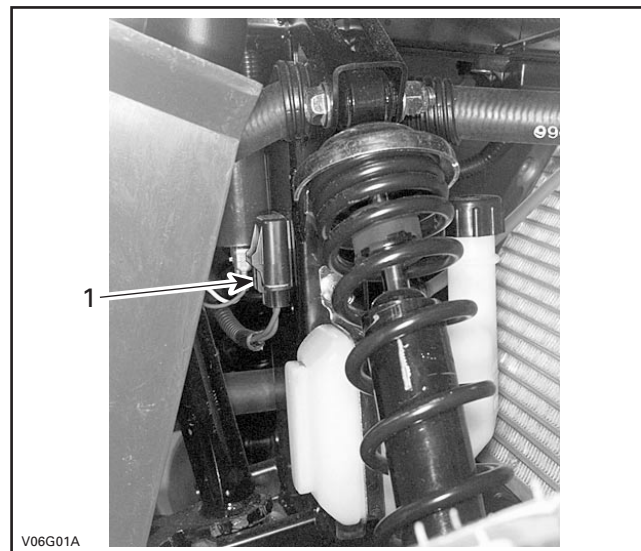
Let's suppose that the circuit to be checked has a RED and a BLACK wire. Using an ohmmeter, measure the resistance between the RED and the BLACK wire. The resistance should be infinite (0 L). Otherwise, there is a short circuit between both wires. We must therefore identify and correct the fault.

FUSE LOCATION

If the fuse is damaged, replace it by one of the same rating.

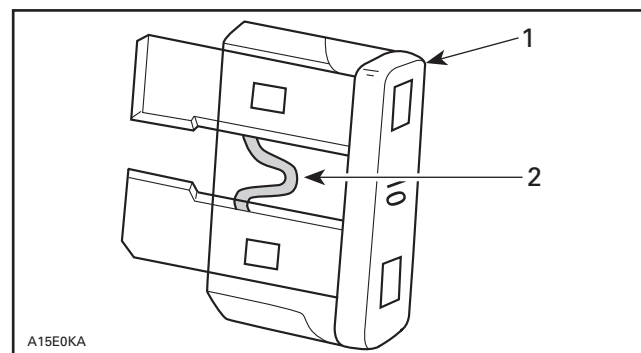
CAUTION: Do not use a higher rated fuse as this can cause severe damage.

Fuse is located behind front right shock, near coolant reservoir. Remove the cluster cover to allow an access at the fuse holder.



1. Fuse holder

To remove fuse from holder, unclip and remove holder cover then pull fuse out. Check if filament is melted.

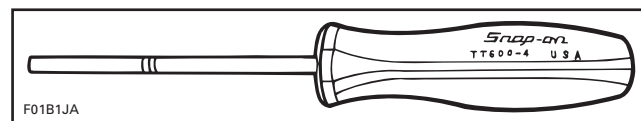


TYPICAL

1. Fuse
2. Check if melted

SERVICING PACKARD CONNECTORS

To remove terminal from Packard connector housing, use Snap-on TT600-4 tool.



Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

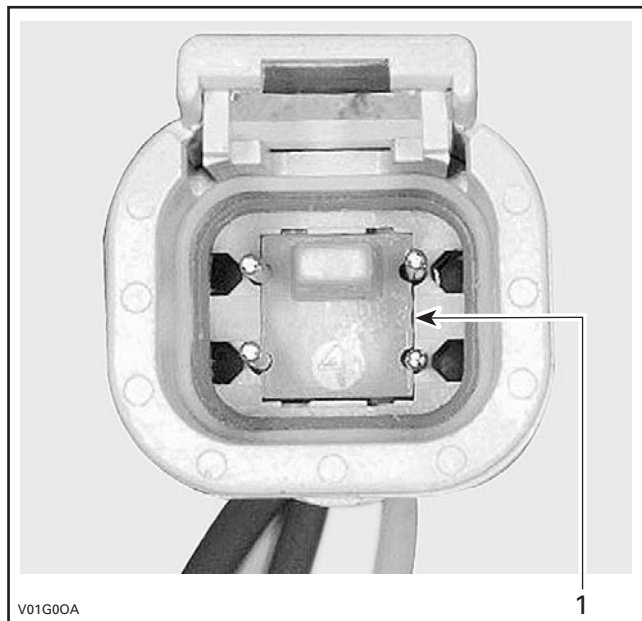
SERVICING DEUTSCH CONNECTORS

Waterproof Connector Housing

Female and Male Connector Housing

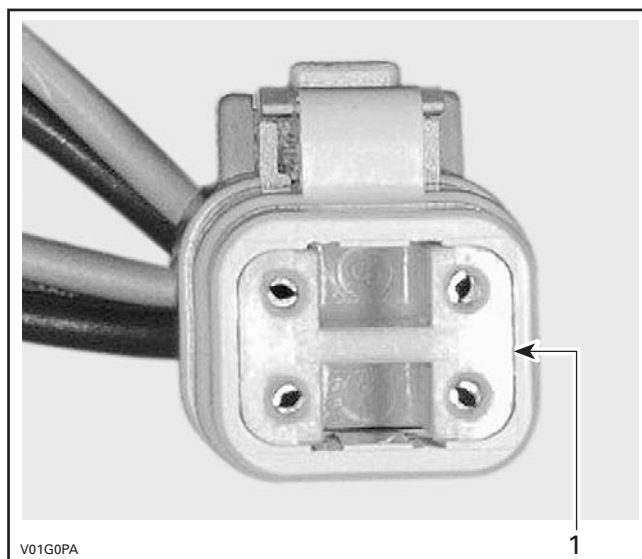
To remove:

- Using a long nose pliers, pull out the lock.



FEMALE HOUSING

1. Female lock

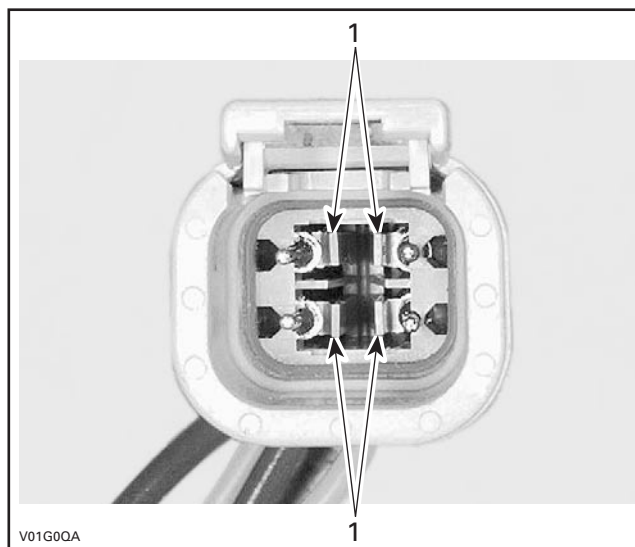


MALE HOUSING

1. Male lock

NOTE: Before extraction, push wire forward to relieve pressure on retaining tab.

- Insert a 4.8 mm (0.189 in) wide screwdriver blade inside the front of the contact cavity.
- Pry back the retaining tab while gently pulling wire back until contact is removed.



FEMALE CONNECTOR HOUSING

1. Retaining tab

To install:

- For insertion of signal contact, make sure the lock is removed.
- Insert contact into appropriate circuit cavity and push as far as it will go.
- Pull back on the contact wire to be sure the retention fingers are holding the contact.
- After all required contacts have been inserted, the lock must be installed.

CAUTION: Never apply dielectric grease on contacts in plug connector. The use of dielectric grease will make the seal swollen and move out of the connector. Do not lubricate.

IDENTIFICATION OF MAJOR CONNECTOR PINS

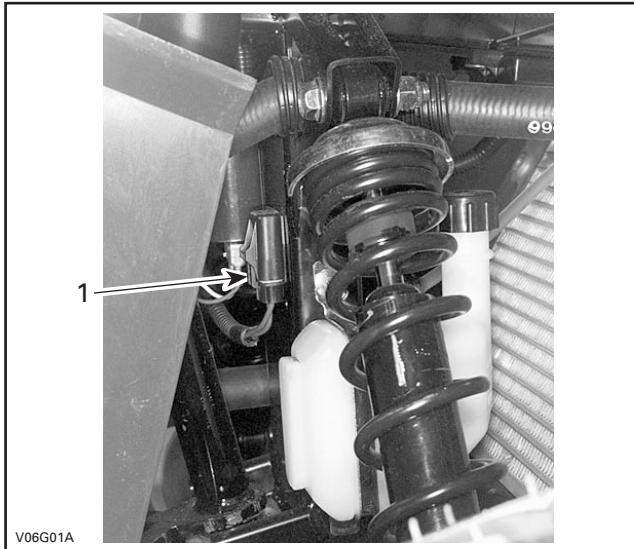
					DEUTSCH	
PACKARD					AMP MULTILOCK	

CHARGING SYSTEM

TESTING PROCEDURE

NOTE: First, ensure that battery is in good condition prior to performing the following test using a current inductive ammeter such as Snap-on MT 110.

If the battery is regularly discharged, check main (25 amp) fuse located behind front right shock, near coolant reservoir.



1. Fuse holder

The voltage regulator/rectifier could be the culprit of a blown fuse. To check, simply disconnect the voltage regulator/rectifier from the circuit.

If the fuse still burns, check for a defective wire.

CAUTION: Do not use a higher rated fuse as this can cause severe damage.

The magneto connector is located on the RH side of vehicle, between fuel tank and frame.

On some vehicle the magneto connector is located under fuel tank. To get access to magneto connector remove:

- seat (refer **BODY**)
- fuel tank (refer **FUEL CIRCUIT**).

Voltage Regulator/Rectifier

STATIC TEST: CONTINUITY

1. Due to internal circuitry, there is no static test available.

DYNAMIC TEST

Current Test

Proceed as follows:

- Start engine.
- Lay an inductive ammeter on positive cable of battery.
- Bring engine to approximately 3500 RPM.

Depending on battery charge, current reading should be approximately **5 amperes**. If not, check magneto output prior to concluding that voltage regulator/rectifier is faulty.

Voltage Test

Proceed as follows:

- Start engine.
- Connect a multimeter to battery posts. Set multimeter to Vdc scale.
- Bring engine to approximately 3500 RPM.

If multimeter reads over 15 volts, voltage regulator/rectifier is defective. Replace it.

NOTE: Whatever the voltmeter type used (peak voltage or RMS), the voltage must not exceed 15 V. A faulty voltage regulator/rectifier will allow voltage to exceed 15 V as engine speed is increased.

NOTE: If it is continually necessary to add distilled water to the battery, this indicates an over voltage situation, requiring replacement of the voltage regulator/rectifier. If, on the other hand, the battery will not stay charged, the problem can be any of the charging circuit components. If these all check good, you would be accurate in assuming the problem to be in the voltage regulator/rectifier.

If there is no charging at the battery with the preceding voltage test, the following test can also be performed.

Voltage Regulator/Rectifier Output Test

Remove the main (25 amp) fuse.

Connect the negative probe on engine and the positive probe in the charging system fuse location where the value is 0 Vdc. The obtained value in the other location should be 12 Vdc.

Section 05 ELECTRICAL

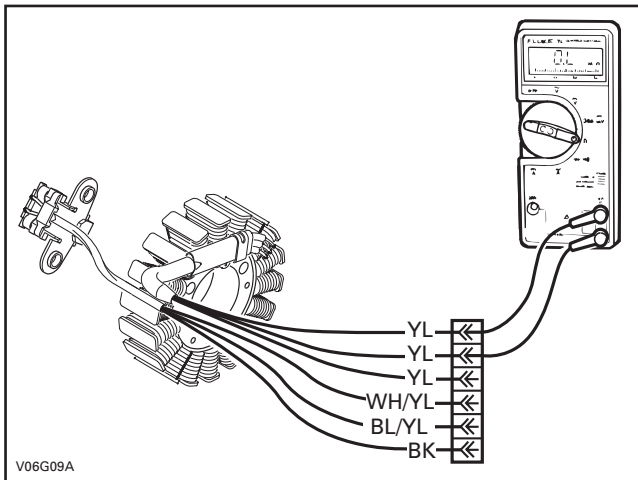
Subsection 03 (CHARGING SYSTEM)

NOTE: If the voltage regulator/rectifier is within the specification, the wiring harness between the voltage regulator/rectifier and battery is defective. If the voltage regulator/rectifier is out of specification and the stator test good, the voltage regulator/rectifier is defective.

Stator

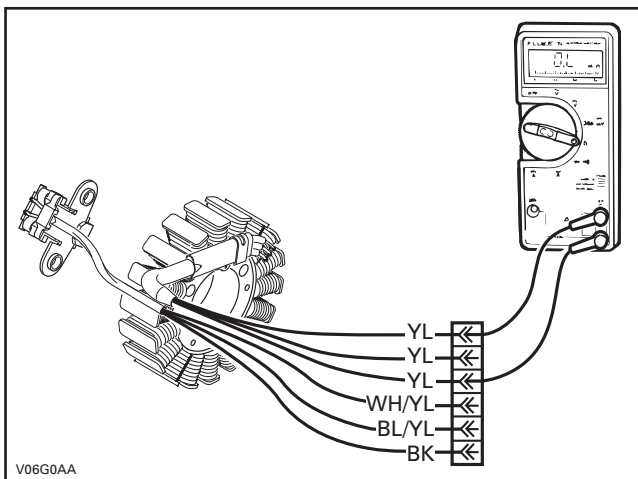
STATIC TEST: CONTINUITY

1. Disconnect the magneto wiring harness connector. With a good multimeter (preferably a digital one), place the 2 meter test probes onto the stator wire leads AC-1 and AC-2 of the stator. The resistance should be $0.3 \Omega \pm 0.2$.



TYPICAL

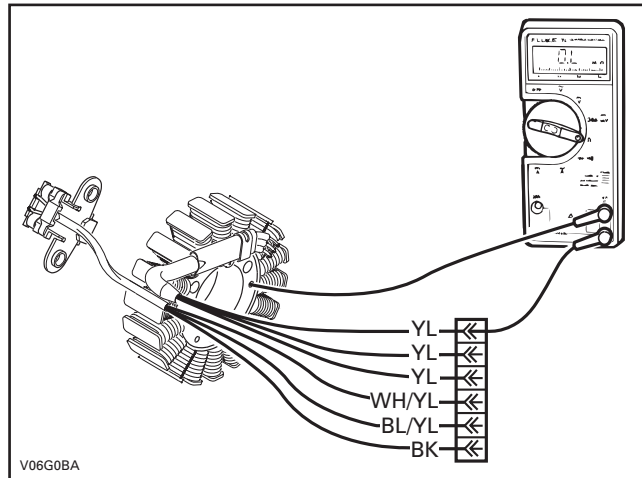
2. Place either meter test probe into the remaining stator lead (AC-3) and note the resistance (same as step no. 1). If the readings are out of specification, the stator will need to be replaced.



TYPICAL

STATIC TEST: INSULATION

With the stator leads disconnected, insert either meter test probe onto AC-1 and ground the other meter test probe to the engine or the stator iron core and note the reading. There should be no continuity (infinity) between the stator insulated coils and ground. If there is a reading, the stator coils and/or the wiring from the coils is grounded and needs to be replaced/repaired respectively.



TYPICAL

DYNAMIC TEST

1. Unplug magneto wiring harness connector.
2. On magneto side, connect test probes of the multimeter to two of the YELLOW wires.
3. Set multimeter to Vac scale.
4. Put the fuel tank back on the vehicle.
5. Crank engine. The obtained value should be between 6 ± 0.5 Vac.
6. Repeat operation 3 times.
7. If the stator is out of specification, replace it.

Trigger Coil

STATIC TEST

Unplug the magneto connector.

Measure the resistance between WHITE/YELLOW and BLUE/YELLOW wires. The obtained value should be between 190 to 300 Ω .

If the resistance is out of specifications, change the trigger coil.

STARTING SYSTEM

BATTERY

TROUBLESHOOTING

SYMPTOM: DISCHARGED OR WEAK BATTERY	
CAUSE	REMEDY
1. Battery posts and/or cable terminal oxidized.	Clean and coat with dielectric grease.
2. Loose or bad connections.	Check wiring and connector cleanliness, damaged or short circuit.
3. Faulty battery (sulfated, doesn't keep a full charge, damaged casing, loose rectifier).	Replace.
4. Main system fuse burnt or faulty voltage regulator/rectifier.*	First check charging system generator coil. If it is in good condition replace fuse or rectifier.
5. Faulty charging system generator coil.*	Replace.

* To test charging system, refer to **CHARGING SYSTEM**.

BATTERY TESTING

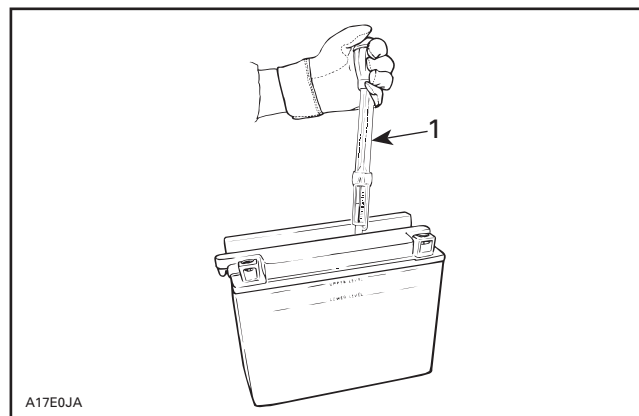
There are 2 types of battery tests: unloaded and loaded. An unloaded test is made on a battery without discharging current. It is the simplest and commonly used. However, be aware that the voltage test can be good while the battery has not enough power to start the engine. A load test gives more accuracy of the battery condition.

Unload Test

Check charge condition using either a hydrometer or a multimeter.

With a multimeter, voltage readings appear instantly to show the state of charge. Always respect polarity. A fully charged battery will have a reading of 12.6 Vdc.

A hydrometer more accurately measures the charge of a battery in terms of specific gravity of the electrolyte. A fully charged battery will have a specific gravity between 1.265 to 1.280.



TYPICAL

1. Specific gravity 1.265

A hydrometer measures the charge of a battery in terms of specific gravity of the electrolyte. Most hydrometers give a true reading at 21°C (70°F).

In order to obtain correct readings, adjust the initial reading by **adding** .004 points to the hydrometer readings for each 5.5°C (10°F) **above** 21°C (70°F) and by **subtracting** .004 point for every 5.5°C (10°F) **below** 21°C (70°F).

This chart will be useful to find the correct reading.

ELECTROLYTE TEMPERATURE		OPERATION TO PERFORM
°C	°F	
38	100	add .012 to the reading
32	90	
27	80	
21	70	correct reading
16	60	subtract .004 from the reading
10	50	
4	40	
- 1	30	

EXAMPLE NO. 1

Temperature below 21°C (70°F):

Hydrometer reading: 1.250

Electrolyte temperature: - 1°C (30°F)

Subtract .016 Sp. Gr.

Corrected Sp. Gr. is 1.234

EXAMPLE NO. 2

Temperature above 21°C (70°F):

Hydrometer reading: 1.235

Electrolyte temperature: 38°C (100°F)

Add .012 Sp. Gr.

Corrected Sp. Gr. is 1.247

Section 05 ELECTRICAL
Subsection 04 (STARTING SYSTEM)

Load Test

This is the best test of battery condition under a starting load. Use a load testing device that has an adjustable load.

Apply a load of 3 times the ampere-hour rating of the battery. At 14 seconds into the test, check battery voltage; if battery is in good condition, it will have at least 10.5 Vdc.

REMOVAL

Remove RH side cover and RH footwell (refer BODY).

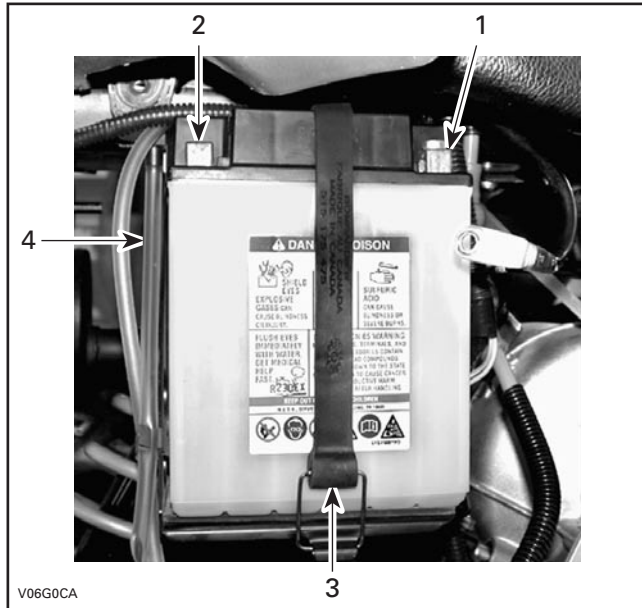
Disconnect BLACK (-) cable first then RED (+) cable.

⚠ 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.

Remove the holding strap.

Pull out vent tube.



- 1. Negative terminal
- 2. Positive terminal
- 3. Holding strap
- 4. Vent tube

Remove battery from vehicle being careful not to tilt it so that electrolyte flows out of vent tube.

⚠ WARNING

Battery electrolyte is a caustic substance that burns or destroys organic tissues by chemical action. Avoid contact with eyes, skin and clothing. Wear protective eyeglasses and a suitable pair of non-absorbent gloves when removing the battery by hand. Should any electrolyte spillage occur, immediately wash off with a solution of baking soda and water.

CAUTION: Should any electrolyte spillage occur, immediately wash off with a solution of baking soda and water.

CLEANING

⚠ WARNING

Battery electrolyte is a caustic substance that burns or destroys organic tissues by chemical action. Avoid contact with eyes, skin and clothing. Wear protective eyeglasses and a suitable pair of non-absorbent gloves when removing the battery by hand. Should any electrolyte spillage occur, immediately wash off with a solution of baking soda and water.

Clean the battery casing, caps, 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.

INSPECTION

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

⚠ WARNING

Should the battery casing be damaged, wear a suitable pair of non-absorbent gloves when removing the battery by hand.

Inspect battery rack mounting.

Inspect battery posts for security of mounting.

Inspect for cracked or damaged battery caps, replace defective caps.

⚠ WARNING

Battery caps do not have vent holes. Make sure that vent tube is not obstructed.

BATTERY STORAGE

Disconnect and remove battery from the vehicle (see above).

Check electrolyte level in each cell, add distilled water up to upper level line.

CAUTION: Do not overfill.

The battery must always be stored in fully charged condition. If required, charge until specific gravity of 1.260 is obtained.

CAUTION: Battery electrolyte temperature must not exceed 50°C (122°F). The casing should not feel hot.

Clean battery terminals and cable connections using a wire brush. Apply a light coat of dielectric grease (P/N 293 550 004) or petroleum jelly on terminals.

Clean battery casing and caps using a solution of baking soda and water. Do not allow cleaning solution to enter battery, otherwise it will destroy the electrolyte. Rinse battery with clear water and dry well using a clean cloth.

Store battery on a wooden shelf in a cool dry place. Such conditions reduce self-discharging and keep fluid evaporation to a minimum.

During the storage period, recheck electrolyte level and specific gravity readings at least every 40 days. As necessary, keep the battery at its upper level line and near full charge as possible (trickle charge).

ACTIVATION OF A NEW BATTERY

⚠ WARNING

Never charge or boost battery while installed on vehicle.

CAUTION: Prior to charging the battery, always remove it from the vehicle to prevent electrolyte spillage.

A new battery is factory fresh dry charged. For storage purposes, it is fitted with a temporary sealing tube.

Do not remove the sealing tube or loosen battery caps unless activation is desired.

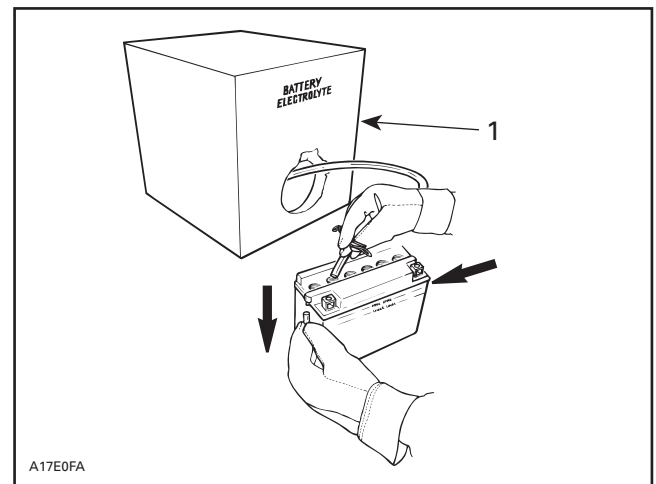
In case of accidental premature removal of caps or sealing tube, battery should be given a full charge.

Perform the following operations anytime a new battery is to be installed.

1. Remove the sealing tube from the vent elbow. Install vent tube, included in the battery kit, to battery elbow.

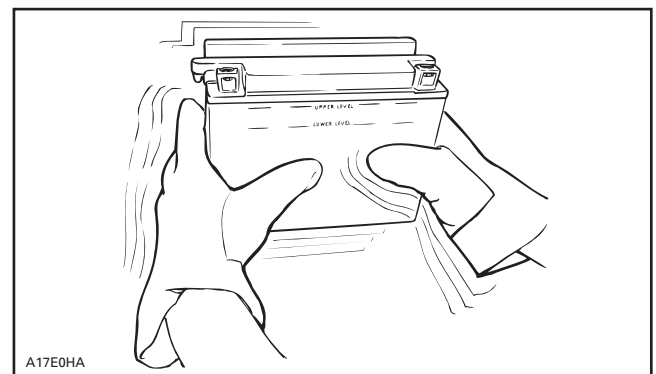
⚠ WARNING

Failure to remove the sealing tube could result in an explosion.



1. Battery electrolyte

2. Remove caps and fill battery to UPPER LEVEL line with electrolyte (specific gravity: 1.260 at 20°C (68°F)).
3. Allow the battery to stand for 30 minutes MINIMUM so that electrolyte soaks through battery cells.
4. Allow gas bubbles to escape by lightly shaking battery by hand.



5. Readjust the electrolyte level to the UPPER LEVEL line.

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

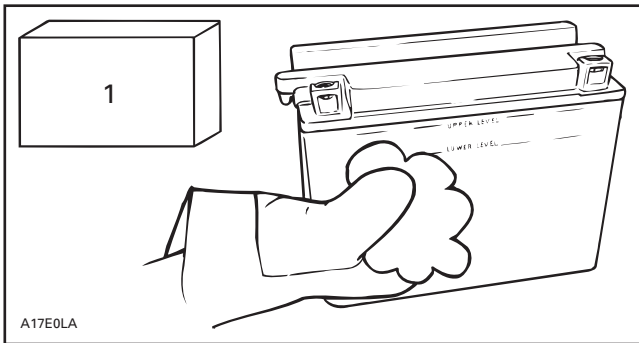
6. Connect a 2 A battery charger for until the battery is fully charged.

WARNING

Gases given off by a battery being charged are highly explosive. Always charge in a well ventilated area. Keep battery away from cigarettes or open flames. Always turn battery charger off prior to disconnecting cables. Otherwise a spark will occur and battery might explode.

CAUTION: If charging rate raises higher than 2.4 A reduce it immediately. If cell temperature rises higher than 50°C (122°F) (if the casing feels hot) discontinue charging temporarily or reduce the charging rate.

7. Disconnect battery charger.
8. Test battery state of charge. Use a hydrometer.
9. Let battery settle for 1 hour.
10. Allow gas bubbles to escape by lightly shaking battery.
11. Readjust electrolyte level.
12. Reinstall caps and clean any electrolyte spillage using a solution of baking soda and water.



1. Baking soda

CAUTION: Do not allow cleaning solution to enter battery interior since it will destroy the electrolyte.

NOTE: It is recommended to verify the battery charge once a month. If necessary, fully charge battery.

TIPS FOR CHARGING A USED BATTERY

WARNING

Prior to charging the battery, always remove it from vehicle.

For best results, battery should be charged when the electrolyte and the plates are at room temperature. A battery that is cold may not accept current for several hours after charging has begun.

Do not charge a frozen battery. If the battery charge is very low, the battery may freeze. If it is suspected to be frozen, keep it in a heated area for about 2 hours before charging.

WARNING

Do not place battery near open flame.

The time required to charge a battery will vary depending on some factors such as:

- **Battery temperature:** The charging time is increased as the temperature goes down. The current accepted by a cold battery will remain low. As the battery warms up, it will accept a higher rate of charge.
- **State of charge:** Because the electrolyte is nearly pure water in a completely discharged battery, it cannot accept current as well as electrolyte. This is the reason the battery will not accept current when the charging cycle first begins. As the battery remains on the charger, the current from the charger causes the electrolytic acid content to rise which makes the electrolyte a better conductor and then, the battery will accept a higher charging rate.
- **Type of charger:** Battery chargers vary in the amount of voltage and current that they can supply. Therefore, the time required for the battery to begin accepting measurable current will also vary.

Charging a Very Flat or Completely Discharged Battery

Unless this procedure is properly followed, a good battery may be needlessly replaced.

- Measure the voltage at the battery posts with an accurate voltmeter. If it is below 10 volts, the battery will accept current at very low rate, in term of milliamperes, because electrolyte is nearly pure water as explained above. It could be some time before the charging rate increases. Such low current flow may not be detectable on some charger ammeters and the battery will seem not to accept any charge.
- Exceptionally for this particular case, set the charger to a high rate.

NOTE: Some chargers have a polarity protection feature which prevents charging unless the charger leads are connected to the correct battery terminals. A completely discharged battery may not have enough voltage to activate this circuitry, even though the leads are connected properly. This will make it appear that the battery will not accept a charge. Follow the charger manufacturer's instruction on how to bypass or override this circuitry so that the charger will turn on and charge a low-voltage battery.

- Since the battery chargers vary in the amount of voltage and current they provide, the time required for the battery to accept measurable charger current might be up to approximately 10 hours or more.
- If the charging current is not up to a measurable amount at the end of about 10 hours, the battery should be replaced.
- If the charging current is measurable before the end or at the end of about 10 hours, the battery is good and charging should be completed in the normal manner.
- It is recommended that any battery recharged by this procedure be load tested prior to returning it to service.

INSTALLATION

Reinstall and fasten the battery, making sure to reinstall the vent tube.

WARNING

Connect RED (+) cable first then BLACK (-) cable. Always connect RED (+) cable first.

NOTE: Place the RED (+) cable between holding strap and battery.



1. Cable between battery and strap

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

STARTING SYSTEM TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
Starter does not turn.	Ignition switch is in the OFF position.	Turn switch in the ON position.
	Burnt fuse.	Check main fuse and wiring condition.
	Transmission is not set on Neutral.	Set transmission in Neutral or use the override mode.
	Poor contact of battery terminal(s) or ground cable connections.	Clean and tighten terminal(s).
	Weak battery.	Recharge battery.
	Poor contact or open circuit of: start button and engine stop switch, ignition switch or starting solenoid.	Check and replace defective part.
	NEUTRAL switches is defective.	Check NEUTRAL switch and wiring condition.
	Engine mechanical problem (ensure that other electric components are good).	Communicate with the Service Representative.
Starter turns; but does not crank the engine.	Poor contact of battery terminal(s).	Clean and tighten terminal(s).
	Poor battery ground cable connection.	Clean and tighten.
	Burnt or poor contact of solenoid switch contact disc.	Replace starting solenoid.
	Poor contact of brush.	Straighten commutator and brush or replace electric starter.
	Burnt commutator.	Turn commutator in a lathe or replace electric starter.
	Worn commutator segments.	Undercut mica or replace electric starter.
	Shorted armature.	Replace electric starter.
	Weak brush spring tension.	Replace electric starter.
	Weak magnet.	Replace electric starter.
	Worn bushings.	Replace electric starter.
	Weak battery.	Recharge or replace battery.
Starter turns, but overrunning drive pinion does not mesh with ring gear.	Worn drive pinion gear.	Replace starter drive pinion.
	Defective drive.	Replace starter drive pinion.
	Poor movement of drive on splines.	Replace starter drive pinion.
	Worn drive bushing.	Replace starter drive pinion.
	Worn ring gear.	Recharge ring gear.
Starter motor keeps running.	Shorted starting solenoid or stuck start button.	Replace starter solenoid.
	Melted solenoid contacts.	Replace starter solenoid.
	Sticking or defective starter drive pinion.	Replace starter drive pinion.

STARTING SYSTEM TESTS

GENERAL

First ensure the problem is not related to engine mechanical components.

Causes of troubles are not necessarily related to starter but may be due to a burnt fuse (main), faulty battery, start button, ignition switch, engine stop switch, starting solenoid, electrical cables or connections.

Check these components before removing starter. Consult also the Starting System Troubleshooting table above for a general view of possible problems.

WARNING

Short circuiting electric starter is always a danger, therefore disconnect BLACK (-) cable before carrying out any kind of maintenance on starting system. Do not place tools on battery.

Fuses

Make sure the main fuse is in good condition. If the fuse test good, continue the next tests.

Battery

To check battery condition, refer to **Battery** above. If it tests good, continue the next tests.

Starting Solenoid

NOTE: Solenoid is located on frame, near battery rack.

Ensure the solenoid receives electric current as follows. Using a multimeter, place a probe on the RED wire (starter side) and the other probe on frame. Measure the voltage when pressing the start button with the ignition key turned on.

If solenoid does not properly receive voltage, the start button can be suspected.

If solenoid receives voltage, test the solenoid as follows.

Disconnect large cables from solenoid.

Inspect connections and clean as necessary. Solenoid condition can be checked with an ohmmeter. Install test probes on large connectors of solenoid. Measure resistance when current is applied to small connectors; if it is more than a few ohms, replace solenoid.

If solenoid test good, check the electric starter. If starter test good, the NEUTRAL switches can be suspected.

Ignition Switch

A quick test to validate it is working. Turn the ignition switch ON. If the lights turn on the ignition switch is good. Otherwise, refer to **IGNITION SYSTEM**, for testing procedure. If it tests good, continue the next tests.

Engine Stop Switch

If engine does not start when placing engine stop switch to RUN and pressing the start button, test the engine stop switch as follows.

Remove the steering cover and unplug the multi-function switch connector.

Using a multimeter, measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
Switch to OFF	BLACK and BLACK/WHITE	1 Ω max.
Switch to RUN		Infinite (0.L)

Replace multi-function switch if defective.

If switch tests good, check wiring. If it tests good, continue the next tests.

Start Button

If engine does not turn when pressing the start button, test the switch as follows.

Remove the steering cover and unplug the multi-function switch connector.

Using a multimeter, measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
Switch released	RED/VIOLET and YELLOW/RED	Infinite (0.L)
Switch depressed and held		0.6 Ω max.

Replace multi-function switch if defective.

If switch tests good, check wiring going to electronic module. If it tests good, continue the next tests.

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

Electrical Cables or Connections

Check all connections, cables and wires. Tighten any loose cables. Replace any chafe wires/cables.

If wiring and connectors are good, check the electric starter. See below.

Electric Starter

NOTE: Starter is located in the middle of engine.

Remove LH footwell to give access to the starter. Refer to **BODY/FRAME**.

Remove carburetor to get access to the starter. Refer to **CARBURETOR**.

Using boosting cables, carefully supply current from the battery directly to the starter. Connect the BLACK (-) cable first. Then connect the remaining jump cable from the battery then to the starter.

If starter now turns ensure the cables/connections from battery to solenoid and to starter are in good condition. If they test good, the NEUTRAL switch can be suspected.

If starter does not turn, check for mechanical problems in the starter.

ELECTRIC STARTER

REMOVAL

Turn OFF ignition switch.

Disconnect BLACK (-) cable connection from battery.

WARNING

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

Disconnect RED (+) cable connection from battery.

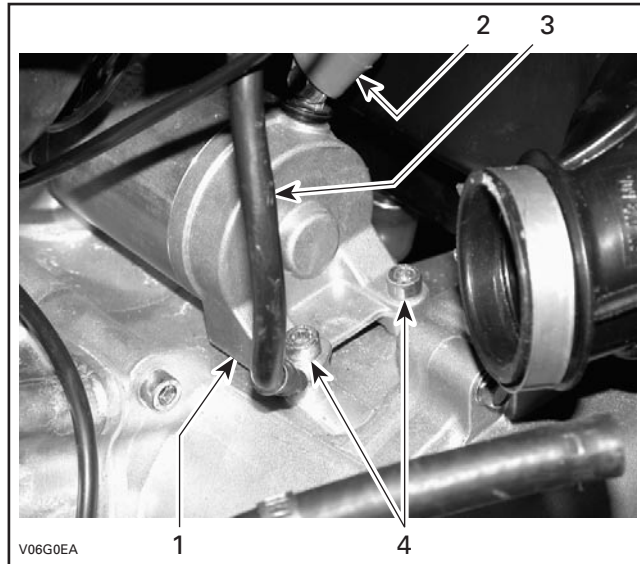
Remove LH footwell. Refer to **BODY/FRAME**.

Remove Carburetor. Refer to **CARBURETOR**.

Disconnect all cables from starter.

Remove starter mount screws.

Pull starter out.



1. Starter
2. Red battery cable
3. Black (-) cable
4. Mounting screws

INSTALLATION

Installation is essentially the reverse of removal procedure. However, pay particular attention to the following.

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

Torque starter mounting screws to 10 N•m (88 lbf•in).

Connect the RED (+) battery cable to the starter and torque nut to 2.5 N•m (22 lbf•in). Apply dielectric grease on terminal and nut.

First connect RED (+) cable to battery then connect the BLACK (-) cable.

WARNING

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

Test starter operation.

IGNITION SYSTEM

IGNITION SYSTEM TESTING PROCEDURE

GENERAL

Ignition Problems

When dealing with ignition problems, the following items should be checked in this order. After one item has been checked and it is found not to be the problem, continue with the next item:

1. main fuse condition
2. spark occurrence
3. battery condition
4. ignition switch
5. trigger coil
6. ignition coil
7. electronic module.

Intermittent Ignition Problems

In dealing with intermittent problems there is no easy diagnosis. For example, problems that occur only at normal engine operating temperature have to be tested under similar conditions.

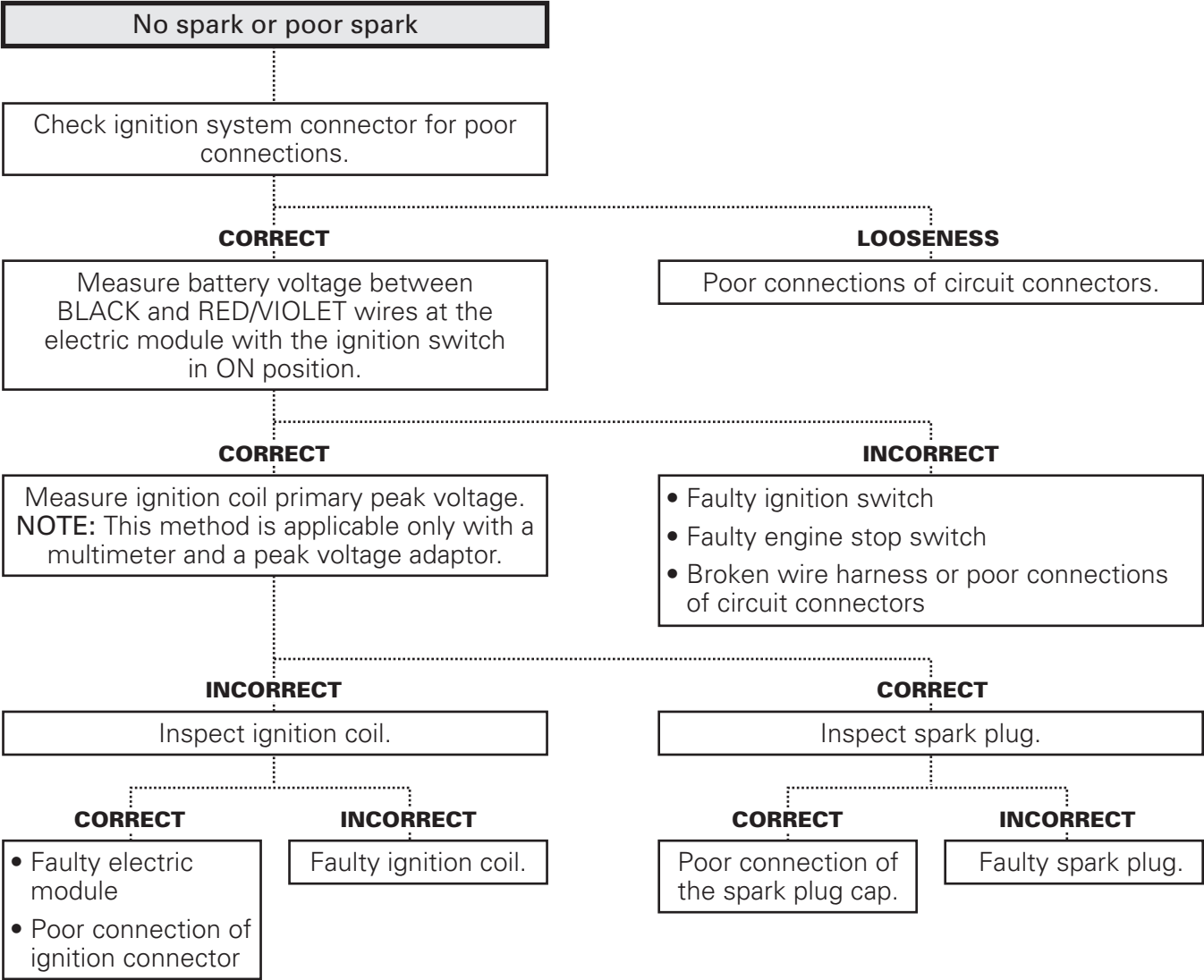
In most cases of temperature and/or vibration failure, only parts replacement might solve the problem as most of these failures return to normal when engine is not running.

Multiple Problems

There is always the possibility of more than one faulty part. If after a component has been replaced, the problem still persists, carefully repeat the complete test procedure to find the other faulty part.

TROUBLESHOOTING

NOTE: Check that the transmission is in NEUTRAL position and the engine stop switch is in “RUN” position. Check that main fuse is not burned and if battery is fully-charged before diagnosing.



V04G09S

IGNITION SYSTEM TEST

Safety Precautions

WARNING

To prevent powerful electric shocks while cranking engine, neither touch any electronic ignition components (ignition coil, wire harness, etc.) nor tester lead clips. Also make sure that tester leads do not touch any metallic object.

Main Fuse Condition

Check main fuse condition. Replace burnt fuse as necessary.

Spark Occurrence

Remove spark plug and connect to the ignition coil. While holding the spark plug against a metallic part of the engine, start the engine. Look for a spark at the spark plug tip. Replace defective spark plug.

Keep in mind that a spark plug might test good this way while not being able to work properly under combustion chamber mixture and pressure.

If known good spark plug does not work, continue the other tests.

Battery Condition

A battery must be present in the vehicle to allow the ignition system to work. Also, at least 8 V is required for proper operation. Check battery voltage.

Ignition Switch

A quick test to validate it is working. Turn the ignition switch ON. If the headlight turn on, the ignition switch is good.

Test

Remove console and disconnect ignition switch.

Measure voltage between RED supply wire and the battery ground. If voltage is lower than battery voltage, test the wiring. If voltage is good, test switch.

Use a multimeter and measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
OFF	RED and RED/YELLOW	Infinite (0.L)
OFF	RED and RED/VIOLET	Infinite (0.L)
ON (w/lights)	RED and RED/YELLOW	$0.2 \pm 0.2 \Omega$ max.
ON (w/lights)	RED and RED/VIOLET	$0.2 \pm 0.2 \Omega$ max.
ON (w/o lights)	RED and RED/YELLOW	Infinite (0.L)
ON (w/o lights)	RED and RED/VIOLET	$0.2 \pm 0.2 \Omega$ max.

Replace switch if defective.

If switch is good, continue the other tests.

Trigger Coil Voltage Testing

NOTE: The trigger coil is not adjustable.

STATIC TEST: CONTINUITY

Check resistance with a high-sensitivity ohmmeter.

1. Disconnect the large connector from the electronic module.
2. Connect multimeter probes to the BLACK/YELLOW wire and to the BLACK wire.
3. Measure resistance; it should be between 190 - 300 ohms.

DYNAMIC TEST

1. Disconnect the magneto connector.
2. Connect multimeter probes to the BLACK/YELLOW wire and to the BLACK wire, then bring selector switch to $\tilde{V}$ and scale to 00.0^{Vac} .
3. Press START button, note result. The obtained value should be between 0.4 and 0.7 Vac. Repeat operation 3 times.
4. If the trigger coil is out of specification, replace it. If it tests good continue the other tests.

Ignition Coil

Ignition coil is mounted on frame along steering column, in front of engine.

Section 05 ELECTRICAL
Subsection 05 (IGNITION SYSTEM)

NOTE: An ignition coil with good resistance measurement can still be faulty. Voltage leak can occur at high voltage level which is not detectable with an ohmmeter. Replacing the stick coil may be necessary as a test.

First, check the ignition coil primary peak voltage.

Remove spark plug.

Insert a pin into RED/VIOLET wire location in ignition coil connector and connect a multimeter probe to it. Place the other probe on the engine.

Shift transmission into NEUTRAL and turn ignition switch ON. Then, place the stop engine switch to RUN position.

Crank engine a few seconds and check the ignition coil primary peak voltage.

Repeat operation 3 times and note the highest peak voltage.

The ignition coil peak voltage should be around 12 Vdc.

If the peak voltage is lower than the specification, check the ignition coil resistance.

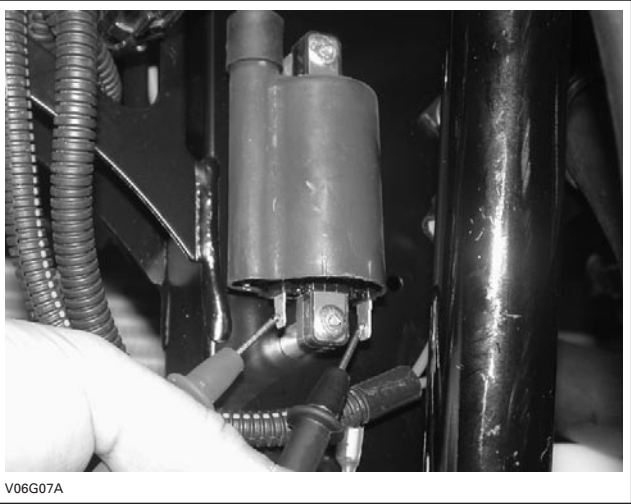
Ignition Coil Resistance

Disconnect both connectors from the ignition coil.

Using a multimeter, check the resistance in both primary and secondary windings.

For checking the resistance of primary windings, do as follows:

Connect the RED (+) probe of multimeter to the WHITE/GREEN wire location and BLACK (-) probe of multimeter to the RED/VIOLET wire location the ignition coil.



PRIMARY WILDING

The primary wilding resistance should be between $2.2 \pm 0.3 \Omega$ at 20°C (68°F).

For checking the resistance of secondary windings, do as follows:

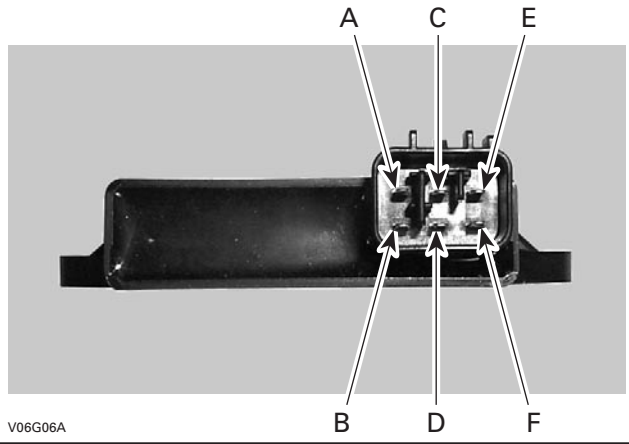
Connect the RED (+) probe of multimeter to the WHITE/GREEN wire location of the ignition coil and BLACK (-) probe of multimeter to the high tension cable.



SECONDARY WILDING

SECONDARY WILDING	RESISTANCE AT 20°C (68°F)
With spark plug cap	$18 \pm 2.5 \text{ k}\Omega$
Without spark plug cap	$13 \pm 2.5 \text{ k}\Omega$

NOTE: Make sure to reconnect WHITE/GREEN wire connector to positive (+) and RED/VIOLET to negative (-) terminals of the ignition coil after the test.

		NEGATIVE (-) TESTER LINE					
		A	B	C	D	E	F
POSITIVE (+) TESTER LINE		A	O.L.	2.985 KΩ	2.567 MΩ	18.41 KΩ	2.481 KΩ
		B	2.540 MΩ	2.539 MΩ	6.37 MΩ	2.538 MΩ	6.23 MΩ
		C	2.983 KΩ	O.L.	2.528 MΩ	21.43 KΩ	2.441 MΩ
		D	O.L.	O.L.	O.L.	O.L.	O.L.
		E	18.84 KΩ	O.L.	21.85 KΩ	2.490 MΩ	2.412 MΩ
		F	O.L.	O.L.	O.L.	O.L.	O.L.

Electronic Module

IDI (Inductive discharge ignition)

When every other components above have been tested and are good, the electronic module can be suspected. Ensure wiring and connectors are in good condition prior to replacing the electronic module.

TEST

NOTE: On the multimeter, set measuring range from 1 MΩ – 10 MΩ. Make sure that positive and negative tester probes are installed on the appropriate wires.

If a fault is detected, the electronic module must be replaced.

IGNITION TIMING

It is impossible to check the ignition timing with a timing lamp because there is no access window or mark.

SPARK PLUG

DISASSEMBLY

Disconnect t hen remove the ignition coil.

Unscrew the spark plug one turn.

Clean the spark plug and cylinder head with pressurized air.

Reinstall ignition coil, unscrew spark plug completely then remove it.

HEAT RANGE

The proper heat range of the spark plugs is determined by the spark plugs ability to dissipate the heat generated by combustion.

The longer the heat path between the electrode tip to the plug shell, the hotter the spark plug operating temperature will be and inversely, the shorter the heat path, the colder the operating temperature will be.

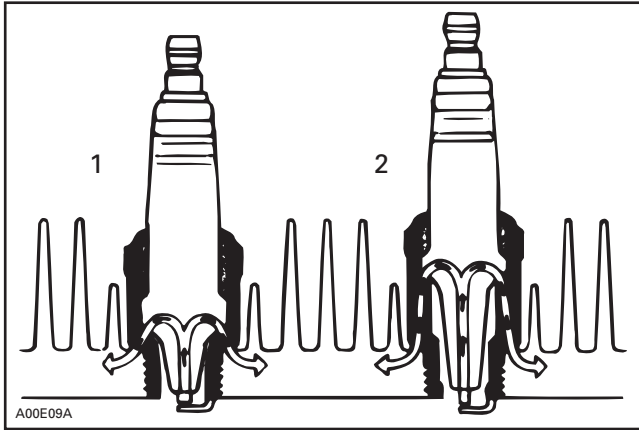
A “cold” type plug has a relatively short insulator nose and transfers heat very rapidly into the cylinder head.

Such a plug is used in heavy duty or continuous high speed operation to avoid overheating.

Section 05 ELECTRICAL

Subsection 05 (IGNITION SYSTEM)

The “hot” type plug has a longer insulator nose and transfers heat more slowly away from its firing end. It runs hotter and burns off combustion deposits which might tend to foul the plug during prolonged idle or low speed operation.



TYPICAL

1. Cold
2. Hot

CAUTION: Severe engine damage might occur or major plastic parts might melt if a wrong heat range plug is used.

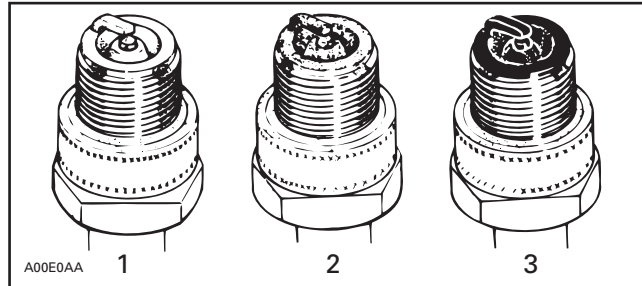
A too “hot” plug will result in overheating pre-ignition, etc.

A too “cold” plug will result in fouling (shorting the spark plug) or may create carbon build up which can heat up red-hot and cause pre-ignition or detonation.

FOULING

Fouling of the spark plug is indicated by irregular running of the engine, decreased engine speed due to misfiring, reduced performance, and increased fuel consumption. This is due to a loss of compression. Other possible causes are: prolonged idling or low-speed riding, or running on a too rich mixture due to abuse of choke, a clogged air filter, a faulty carburetor adjustment, incorrect fuel, defective ignition system, incorrect ignition timing, incorrect spark plug gap, lubricating oil entering the combustion chamber, or too cold spark plug. The plug face of a fouled spark plug has either a wet black deposit or a black carbon fouling. Such coatings form a conductive connection between the center electrode and ground.

SPARK PLUG ANALYSIS



TYPICAL

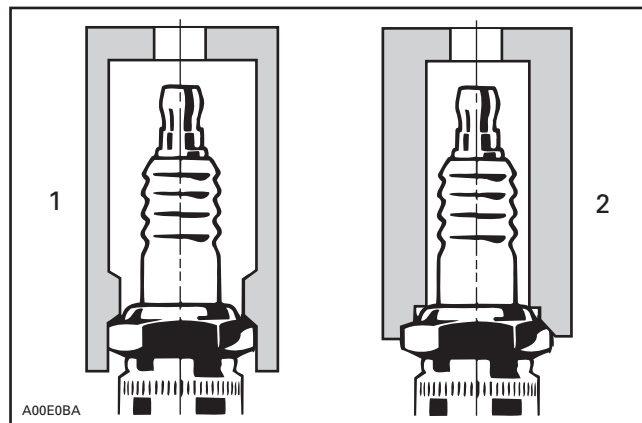
1. Overheated (light grey, white)
2. Normal (light brown, brown)
3. Fouled (black, wet or dry, dark deposits, grey, melted coating)

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 regular intervals, examining the plug face (i.e. the part of the plug projecting into the combustion chamber).

SPARK PLUG INSTALLATION

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

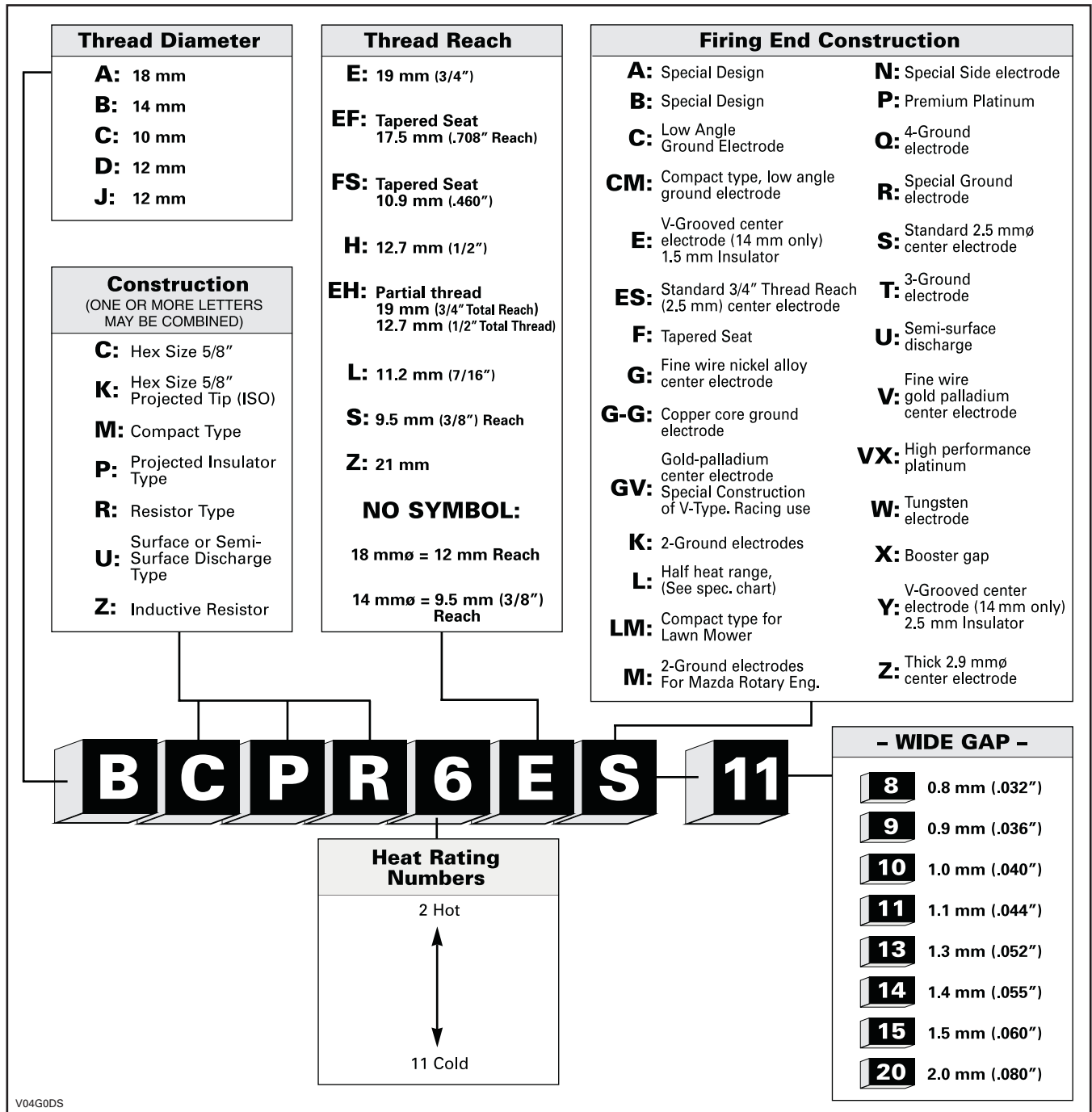
1. Using a wire feeler gauge, set electrode gap to 0.7 mm (.027 in).
2. Apply anti-seize lubricant over the spark plug threads to prevent possible seizure.
3. Hand screw spark plug into cylinder head, with the ignition coil, and tighten with a torque wrench and a proper socket.



1. Proper socket
2. Improper socket

4. Torque spark plug to 18 N•m (159 lbf•in).

NGK SPARK PLUG SYMBOL EXPLANATION



INSTRUMENTS AND ACCESSORIES

GENERAL

⚠ WARNING

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. Do not place tools on battery.

HEADLIGHT

Test

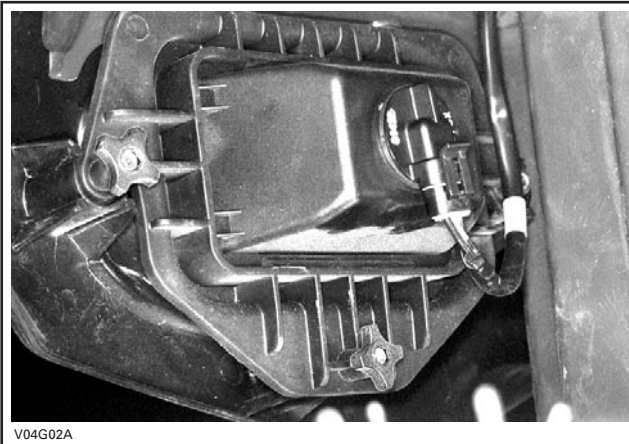
Refer to TESTS section.

Bulb Replacement

Always check light operation after replacement.

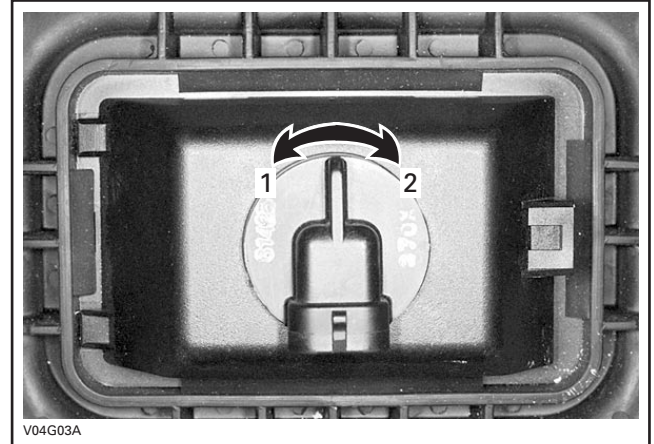
CAUTION: Never touch glass portion of an halogen bulb with bare fingers, it shortens its operating life. If glass is touched, clean it with isopropyl alcohol which will not leave a film on the bulb.

Unplug connector from headlight.



TYPICAL

Rotate bulb socket counterclockwise then remove headlight bulb.



TYPICAL

1. Unlock
2. Lock

Properly reinstall removed parts in the reverse order of their removal.

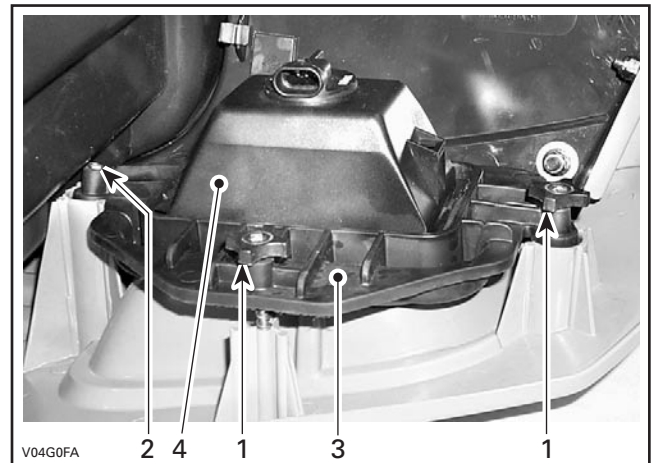
Removal

NOTE: Use the same procedure for RH or LH headlight.

Unplug the headlight connector.

Remove both knobs.

Remove the last screw retaining headlight holder.



TYPICAL

1. Knobs
2. Retaining screw
3. Headlight holder
4. Headlight housing

Section 05 ELECTRICAL

Subsection 06 (INSTRUMENTS AND ACCESSORIES)

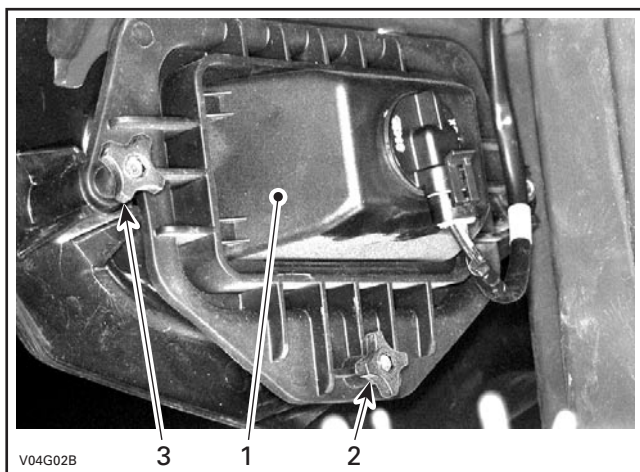
Installation

Properly reinstall removed parts in the reverse order of their removal.

Adjustment

Adjust beam aiming as follows:

Turn knobs to adjust beam height and side orientation as explained below. Adjust both headlights evenly.



TYPICAL

1. Headlight cover
2. Beam height adjustment
3. Beam side adjustment

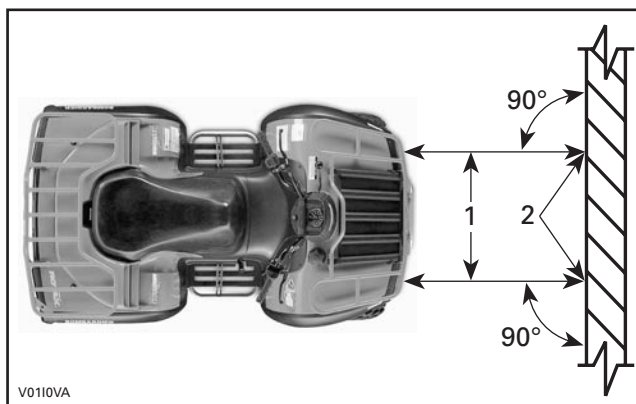
HEADLIGHT BEAM AIMING

Select **high** intensity.

Beam aiming is correct when center of high beam is 131 mm (5 in) below the headlight horizontal center line, scribed on a test surface, 5 m (17 ft) away.

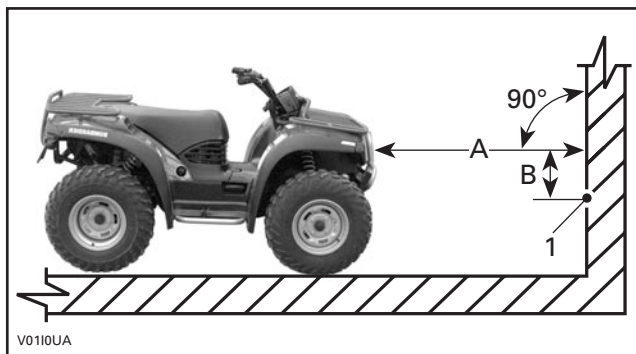
NOTE: Sit down the driver or place the same weight on the vehicle.

Measure headlight center distance from ground. Scribe a line at this height on test surface (wall or screen). Light beam center should be 131 mm (5 in) below scribed line.



TYPICAL

1. Headlights center lines
2. Light beam center



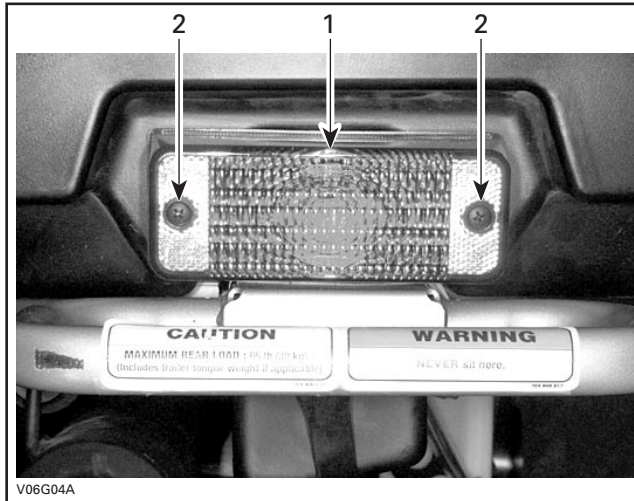
TYPICAL

1. Light beam center
- A. 5 m (17 ft)
- B. 131 mm (5 in)

TAILLIGHT

Bulb Replacement

Unscrew lens screws to expose bulb.



1. Lens
2. Screws

Push bulb in and hold while turning counterclockwise to release.

Install the new bulb by first pushing in while turning clockwise.

IGNITION SWITCH

Test

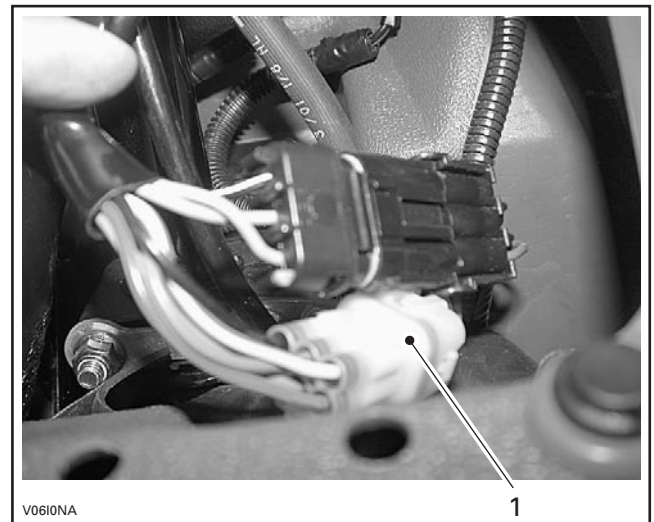
Refer to **IGNITION SYSTEM**.

Removal

Lift the dash board and unscrew the ignition switch nut.

NOTE: Do not unplug connectors when steering cover is lifted.

Unplug the switch connector.



1. Switch connector

Installation

For the installation, reverse the removal procedure.

INDICATOR LAMP

Test

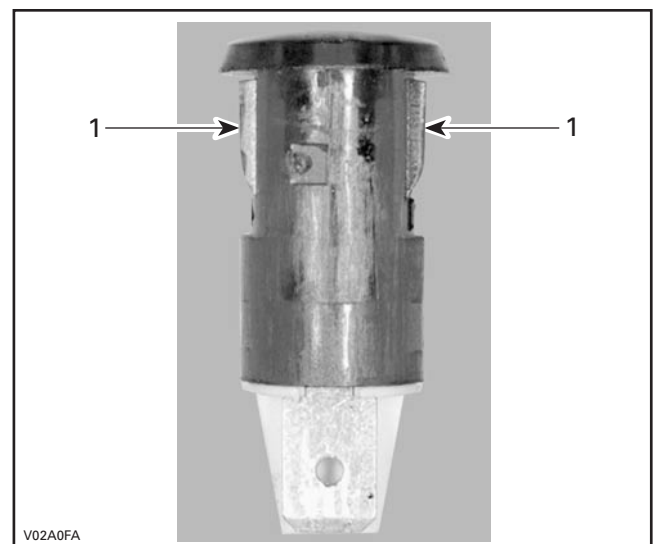
Refer to **TESTS** section.

Replacement

Remove the dash board.

Unplug wires on indicator lamp.

Press both tabs then pull indicator lamp out of hole.



1. Tabs

Section 05 ELECTRICAL

Subsection 06 (INSTRUMENTS AND ACCESSORIES)

Installation

For installation, reverse the removal procedure.

ELECTRONIC MODULE

Test

Refer to IGNITION SYSTEM for testing procedures.

Removal

The electronic module is located on the front frame under front luggage rack.

To remove, unscrew bolts retaining electronic module to frame and unplug the connectors.

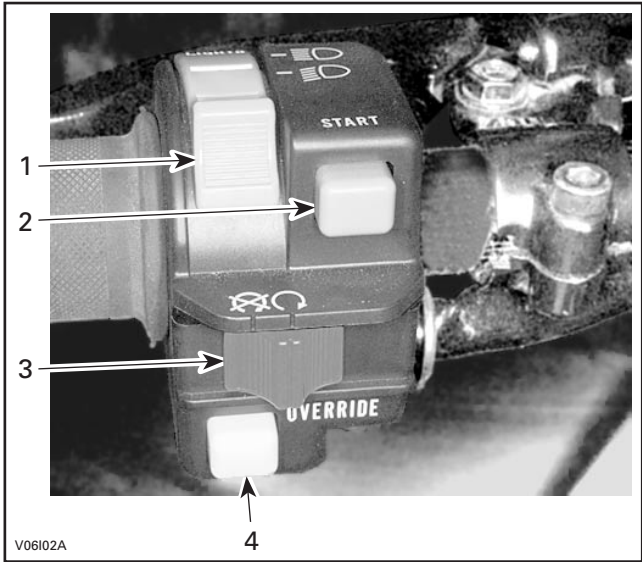
Installation

For the installation, reverse the removal procedure.

TEST

MULTI-FUNCTION SWITCH

Apply parking brake, place transmission lever in NEUTRAL position and start engine.



- 1. Headlight switch
- 2. Start switch
- 3. Engine stop switch
- 4. Override switch

Headlight Switch

Select low beam position on headlight switch.

Using a multimeter, measure the voltage between GREEN and BLACK wires.

The obtained value should be between 12 and 14.5 Vdc.

Place the headlight switch selector on high beam position.

Measure the voltage between BLUE and BLACK wires. The obtained value should be between 12 and 14.5 Vdc.

- No voltage:
 - Check wiring condition and headlight switch.
- Voltage is good:
 - Change headlight bulb(s).

Using a multimeter, measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
Switch to LO	YELLOW/RED and GREEN	0.2 ± 0.2 Ω max.
Switch to HI	YELLOW/RED and BLUE	0.2 ± 0.2 Ω max.

Replace multifunction switch if defective.

Start Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH	WIRE	RESISTANCE
Start switch released	RED/VIOLET and YELLOW/RED	0.2 ± 0.2 Ω max.
Start switch pushed		Infinite (O.L.)

Replace multifunction switch if defective.

Engine Stop Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH	WIRE	RESISTANCE
Engine stop switch on STOP position	BLACK/WHITE and BLACK	$0.2 \pm 0.2 \Omega$ max.
Engine stop switch on RUN position		Infinite (O.L.)

Replace multifunction switch if defective.

Override Switch

Using a multimeter, measure the resistance between the following wires.

SWITCH	WIRE	RESISTANCE
Override switch pushed	VIOLET/GREY and VIOLET/GREY	$0.2 \pm 0.2 \Omega$ max.
Override switch released		Infinite (O.L.)

Replace multifunction switch if defective.

INDICATOR LIGHTS

Remove dash board.

Unplug indicator light connector.

Test each LEDS. The TEMPERATURE/OIL, REVERSE and NEUTRAL LEDS can be tested with 12 Vdc.

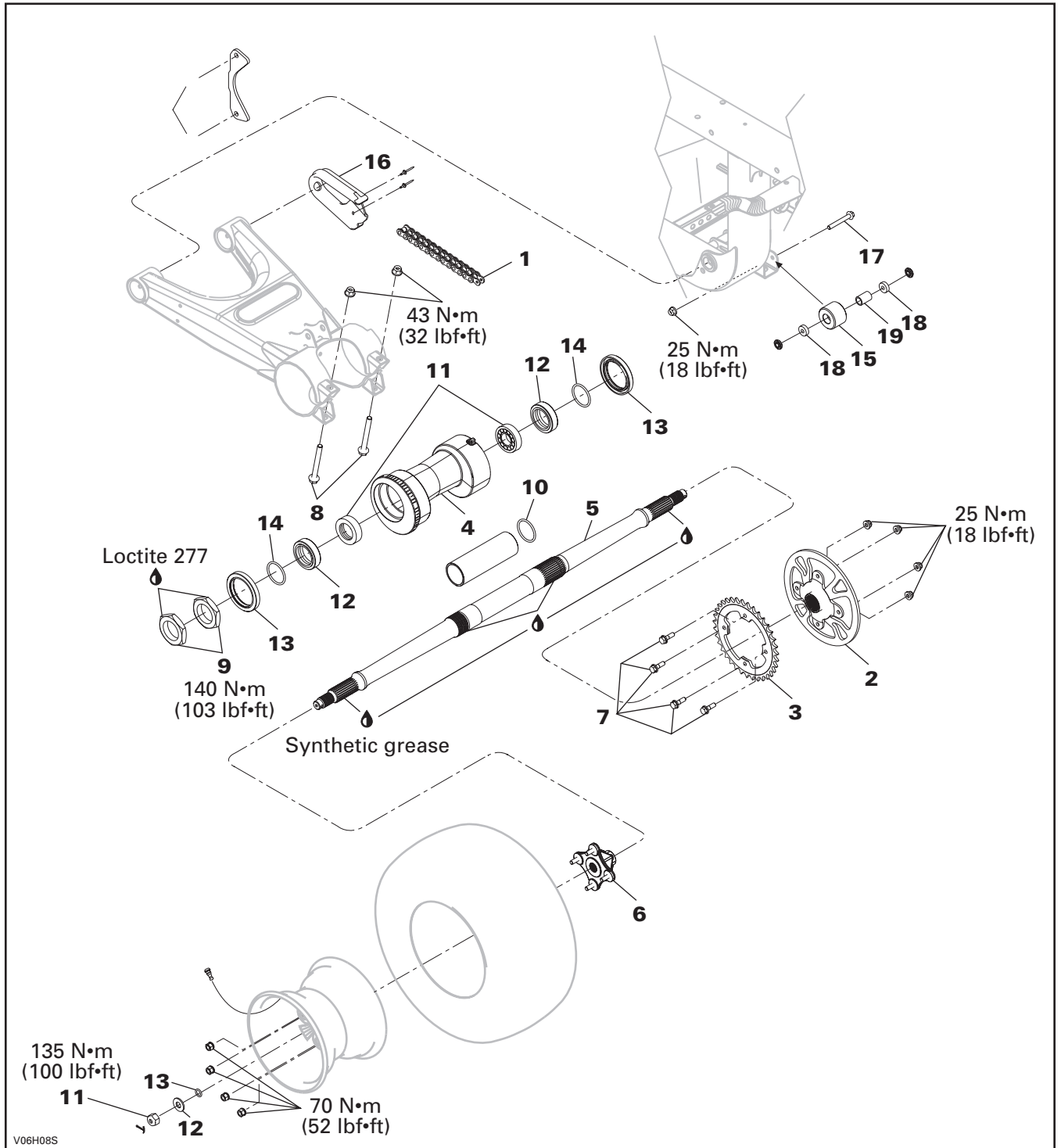
LEDS	WIRES COLOR
Temperature/Oil	RED/VIOLET and BLACK/GREY
Reverse	RED/VIOLET and VIOLET/GREY
Neutral	RED/VIOLET and YELLOW/GREY

- LEDS are good:
 - Check wiring condition.
 - Check connectors.
- LEDS are burned:
 - Change indicator lights.

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REAR AXLE



Section 06 DRIVE TRAIN

Subsection 02 (REAR AXLE)

GENERAL

For installation, use the torque values and Loctite products from the exploded views. Clean threads before using Loctite when installing the screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

CAUTION: During installation, make sure every part is free from old grease and dirt. This allows for a clean re-assembly and will avoid premature wear caused by dirt contamination.

After each job, ride the vehicle for a few minutes and make sure the job is successful; i.e. axle is not loose, chain is not rubbing on any part or making noise, rear brake operates correctly, etc.

DRIVE CHAIN

Adjust and lubricate drive chain before each use.

WARNING

Place ignition switch to OFF before check, adjust or lubricate drive chain.

CAUTION: Never operate this vehicle with the drive chain too loose or too tight as severe damage to the drive components can occur.

Inspection

This ATV is equipped with O-ring sealed permanently greased pins and rollers. Before operating the vehicle, always inspect the drive chain.

Check the free play of drive chain and adjust if necessary.

Check for damage or missing O-ring or rollers.

Lubrication and Cleaning

CAUTION: Never wash the chain with a high pressure washer or gasoline. Damage to the O-ring will result, causing premature wear and drive chain failure.

Clean the side surfaces of the chain with a dry cloth.

NOTE: Do not brush chain.

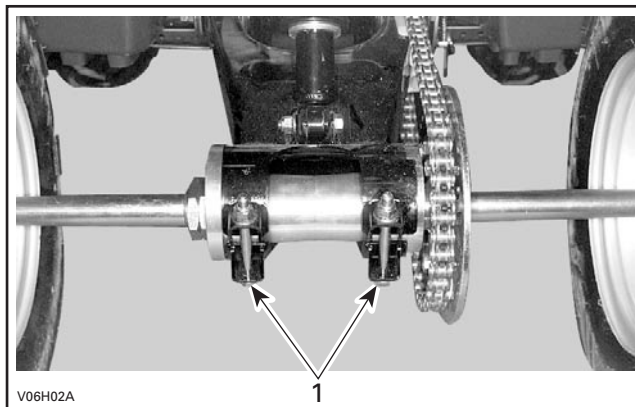
Lubricate only with an approved O-ring chain lubricant. Other commercial chain lubricants may contain solvent which could damage the O-rings.

Adjustment

NOTE: Never adjust drive chain with the driver seated on the vehicle. Remove all load on vehicle.

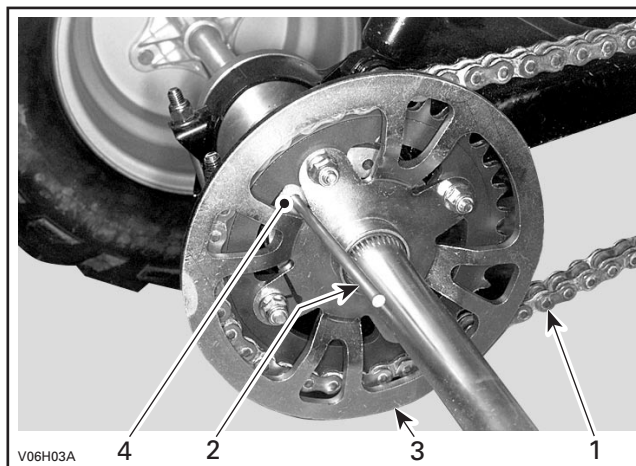
Select a level surface and set transmission to NEUTRAL.

Loosen chain tensioner lock bolts.



1. Chain tensioner lock bolts

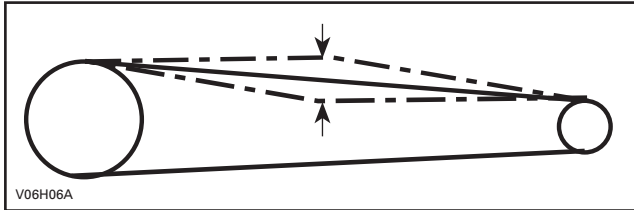
Insert adjuster lock through sprocket hub no. 2 and into chain tensioner.



1. Drive chain
2. Adjuster lock
3. Sprocket hub
4. Chain tensioner

Adjust chain deflection by slowly moving the ATV forward so any slack that may have previously been on the under part of the chain is now on the top of the chain. The bottom part of the chain should be taught during adjustment.

The deflection should be between 10 and 20 mm (3/8 and 3/4 in).



Turn the axle forward to increase or backwards to decrease chain free play.

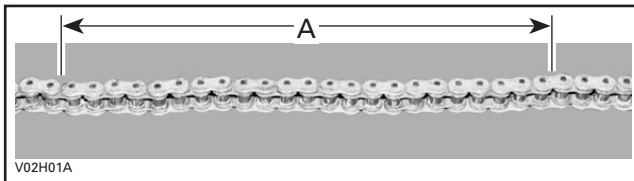
Tighten the chain tensioner lock bolts to 43 N•m (32 lbf•ft).

CAUTION: Never operate this vehicle with the drive chain too loose or too tight as severe damage to the drive components can occur.

When the adjustment is done, repeat the above procedure to check the deflection several times at different spots on the chain.

Replacement

With the chain installed on vehicle, measure the distance between a span of 13 links from pin center to pin center. Change drive chain if the distance exceeds the service limit.



A. 404 mm (15-29/32 in)

CAUTION: Replace chain, engine sprocket and rear sprocket together to prevent rapid chain and sprockets wear. Install a new tab washer each time the engine sprocket is removed.

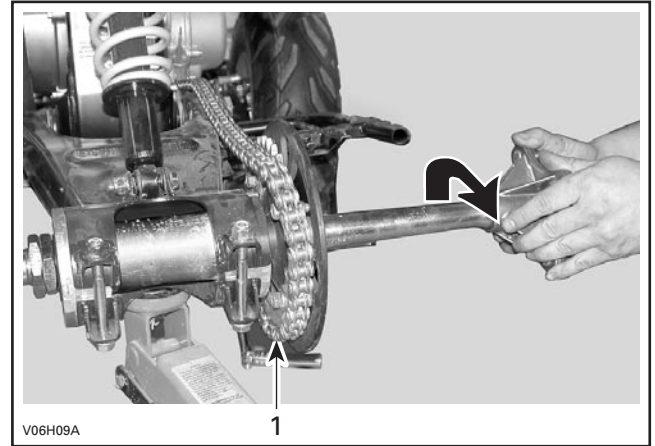
REAR SPROCKET

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle off the ground.

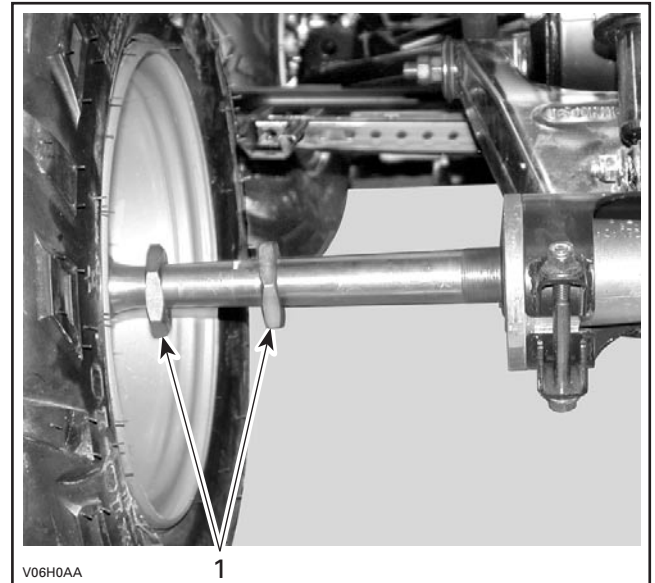
Remove RH rear wheel and wheel hub **no. 6**.

Remove drive chain **no. 1**.



1. Remove chain

Unscrew the locking nut **no. 9** by using 51 mm (2 in) crowfoot (P/N 529 035 884) and 51 mm (2 in) open wrench (P/N 529 035 866).



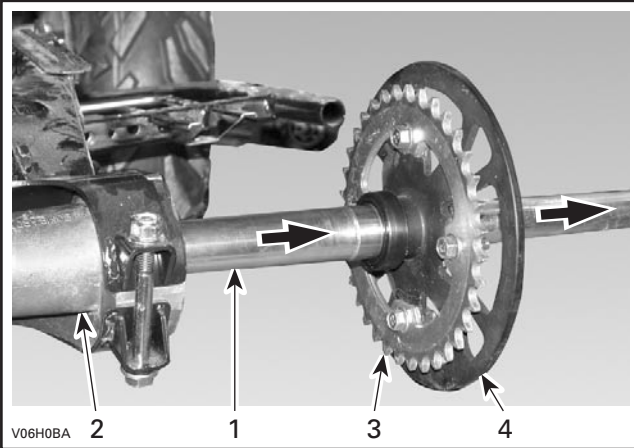
1. Locking nuts

Section 06 DRIVE TRAIN

Subsection 02 (REAR AXLE)

Remove LH rear wheel and wheel hub.

Pull out the rear axle with rear sprocket **no. 3** from drive chain tensioner **no. 4**.

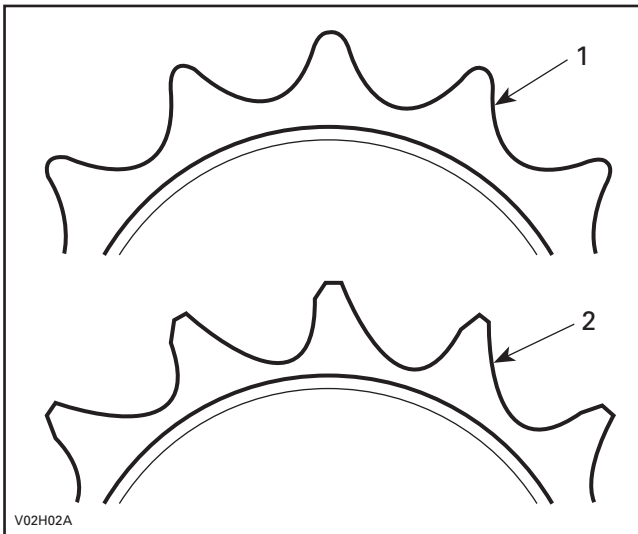


1. Rear axle
2. Chain tensioner
3. Rear sprocket
4. Rear sprocket hub

Unscrew the bolts **no. 7** and remove rear sprocket from rear sprocket hub **no. 2**.

Inspection

Check the sprocket axle and pinion for distortion, excessive wear or other damages.



1. Good
2. Replace

CAUTION: Replace chain, engine sprocket and rear sprocket together to prevent rapid chain and sprockets wear. Install a new tab washer each time the engine sprocket is removed.

NOTE: The drive pinion must be installed with the lip toward the outside of vehicle.

Installation

CAUTION: Replace chain, engine sprocket and rear sprocket together to prevent rapid chain and sprockets wear. Install a new tab washer each time the engine sprocket is removed.

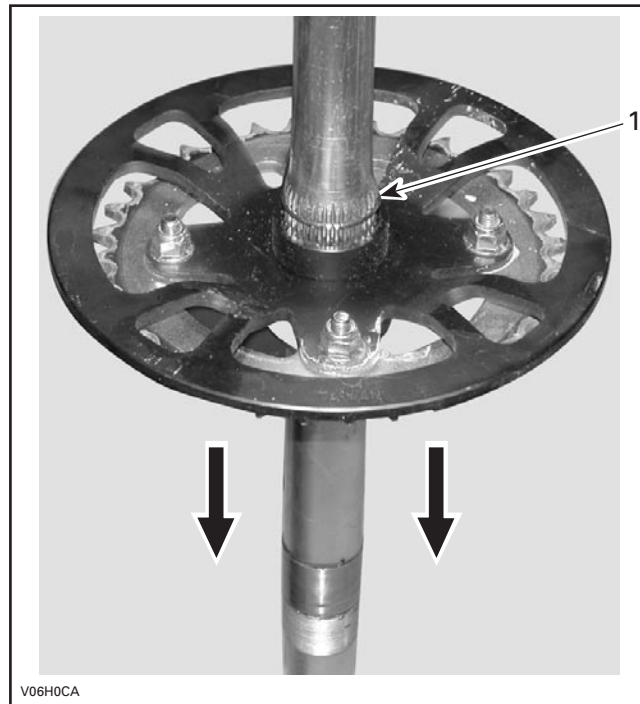
For installation, reverse the removal procedure.

REAR SPROCKET HUB

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle off the ground.

Push down the rear sprocket hub **no. 2** on rear axle to get access of retainer ring **no. 10**.



1. Retainer ring

Remove retainer ring **no. 10** and pull out the rear sprocket **no. 3** out with rear sprocket hub **no. 2**.

Installation

For installation, reverse the removal procedure.

REAR WHEEL HUB

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle off the ground.

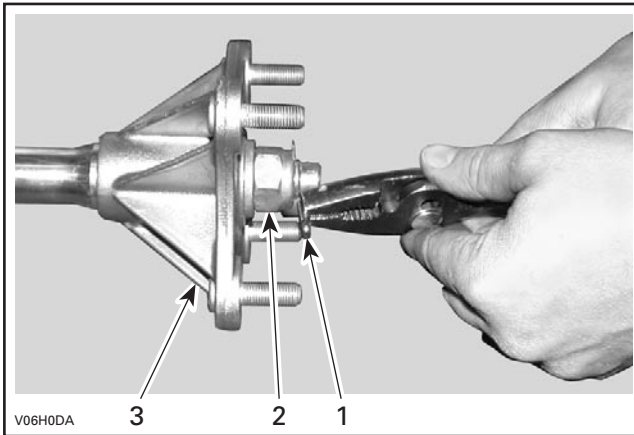
Remove rear wheels.

NOTE: Use the same procedure for both wheel hubs.

Remove the wheel.

Remove cotter pin and unscrew elastic nut **no. 11**. Discard the cotter pin.

Remove washer **no. 12** and the O-ring **no. 13**.



1. Cotter pin
2. Elastic nut
3. Rear wheel hub

Pull out wheel hub.

Inspection

Check wheel hub for cracks splines wear or other damage. Change if necessary.

Check O-ring for damage, if so change it.

Installation

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

Refer to CHAIN TENSIONER BEARING for the proper instructions concerning the bearing pre-load procedure.

Apply synthetic grease (P/N 293 550 019) on splines.

Install wheel hub.

Put the O-ring and washer in place.

Put on the wheel hub nut and tighten.

Install new cotter pin. Both ends of cotter pins must be folded.

Install both rear wheels.

Put vehicle back on the ground.

With no driver on vehicle, adjust chain tension.

Tighten the chain tensioner lock bolts.

REAR AXLE

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle out off the ground.

Remove rear wheels.

Remove the LH and RH wheel hubs **no. 6**.

Remove locking nuts **no. 9**.

Unscrew the chain tensioner lock bolts **no. 8**.

Remove the chain roller.

Install adjuster lock and release the drive chain tension.

Remove drive chain from rear sprocket.

Slide out the axle from the right side of the chain tensioner **no. 4**. If the vehicle ran with failed bearings, it may have damaged many parts around the bearing area. It is possible that the axle will not slide out easily if the bearings are seized on it.

Inspection

Check axle for bending, torsion or other damage. Change if necessary.

Check axle for spots of rust. A spot of rust indicates a possible damage to axle. Change axle if necessary.

If bearings are seized on the axle, the axle must be replaced or its surface cleaned. Bearings must still have a slide fit on the axle, otherwise it will result in a faulty re-assembly and a failure may occur. Bearing races on the axle must be in good condition.

If the sprocket hub **no. 2** has been damaged, replace it also.

If wear sleeves **no. 12** are damaged replace them.

Installation

Insert the axle assembly into the swing arm from the right side.

Apply Loctite 277 on locking nut threads then install them.

Section 06 DRIVE TRAIN

Subsection 02 (REAR AXLE)

Using open wrench (P/N 529 035 866) and crow foot (P/N 529 035 884) torque each nut to 140 N•m (103 lbf•ft).

Install the rear wheel hubs. See the procedure above.

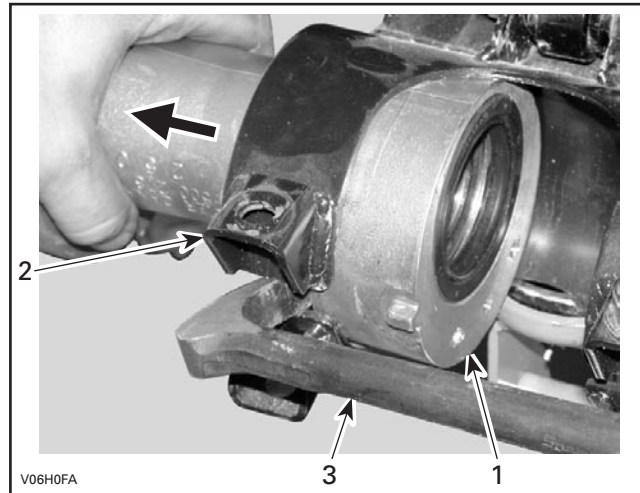
CHAIN TENSIONER

Removal

Remove the rear axle.

Slide out the chain tensioner from the left side of the swing arm.

NOTE: To pull out the chain tensioner, the protrusion should be aligned with the swing arm groove.



1. Chain tensioner
2. Swing arm
3. Pry bar

Inspection

Look at the chain tensioner for damage. The bore must be free of scratches in order to receive new bearings and seals.

Installation

Installation takes place in the reverse order of removal.

Carefully slide the chain tensioner over the axle and seat it against the sprocket hub; the 3 hole side of the chain tensioner goes toward right side.

NOTE: Make sure it is fully seated.

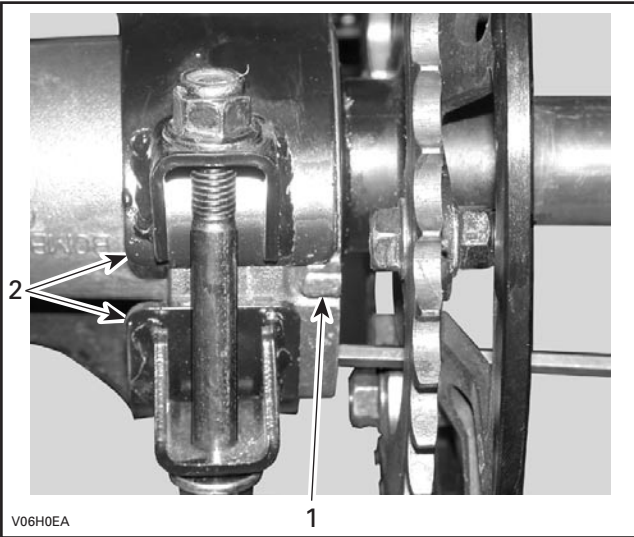
Install all other parts.

CHAIN TENSIONER BEARINGS

Inspection

The chain tensioner should turn smoothly and quietly. If not, change the bearings.

If bearings **no. 11** are seized on the axle, the axle must be replaced or its surface cleaned. Bearings must still have a slide fit on the axle, otherwise it will result in a faulty re-assembly and a failure may occur. Bearing races on the axle must be in good condition.



1. Chain tensioner protrusion
2. Swing arm groove

Dirt inside the swing arm may cause resistance during removal procedure. Use a soft tool to hammer out the chain tensioner if required.

Use pry bar to open the swing arm groove to push the chain tensioner out from the swing arm.

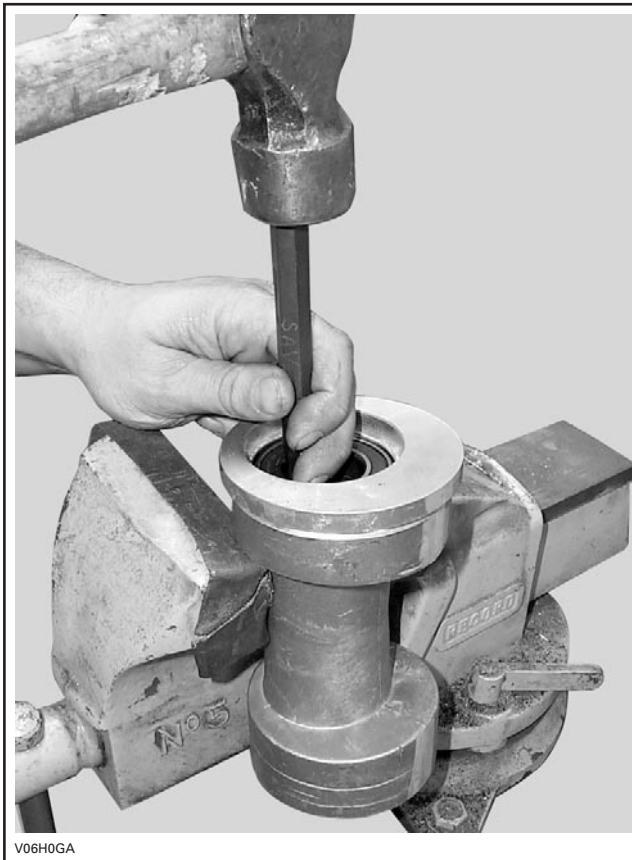
Removal

NOTE: Bearings and seals must be replaced if removed.

Remove O-ring **no. 14**.

Pry out drive axle seals **no. 13**. Be careful not to damage seal bore or chain tensioner.

Use a punch and drive bearings cup outward from opposite end of housing.



Installation

Place new bearings in a freezer for 10 minutes before installation.

To ease the assembly of bearings, it is possible to heat the chain tensioner at 212°F (100°C), 30 minutes in oven.

WARNING

Clean all grease, outside and inside, from eccentric housing before putting in oven.

Press the bearing into the chain tensioner.



The seal must press into a dry bore. Use brake cleaner to make sure the bore is free of grease where the seal goes.

CAUTION: If the seal is pressed into a slippery bore, it will misalign or pop out when the vehicle will be running, which will lead to a bearing failure.

Press the seal in place. Properly installed, it is flush with the edge of the chain tensioner.

Install all other parts.

Section 06 DRIVE TRAIN

Subsection 02 (REAR AXLE)

SLIDER-SHOE

Removal

Remove swing arm. Refer to **REAR SUSPENSION**.

Remove slide-shoe **no. 16**.

Installation

Installation takes place in the reverse order of removal.

CHAIN ROLLER

Removal

Unscrew bolt **no. 17** retaining the chain roller **no. 15**.

Remove the chain roller with ball bearings **no. 18** and bushing **no. 19**.

Installation

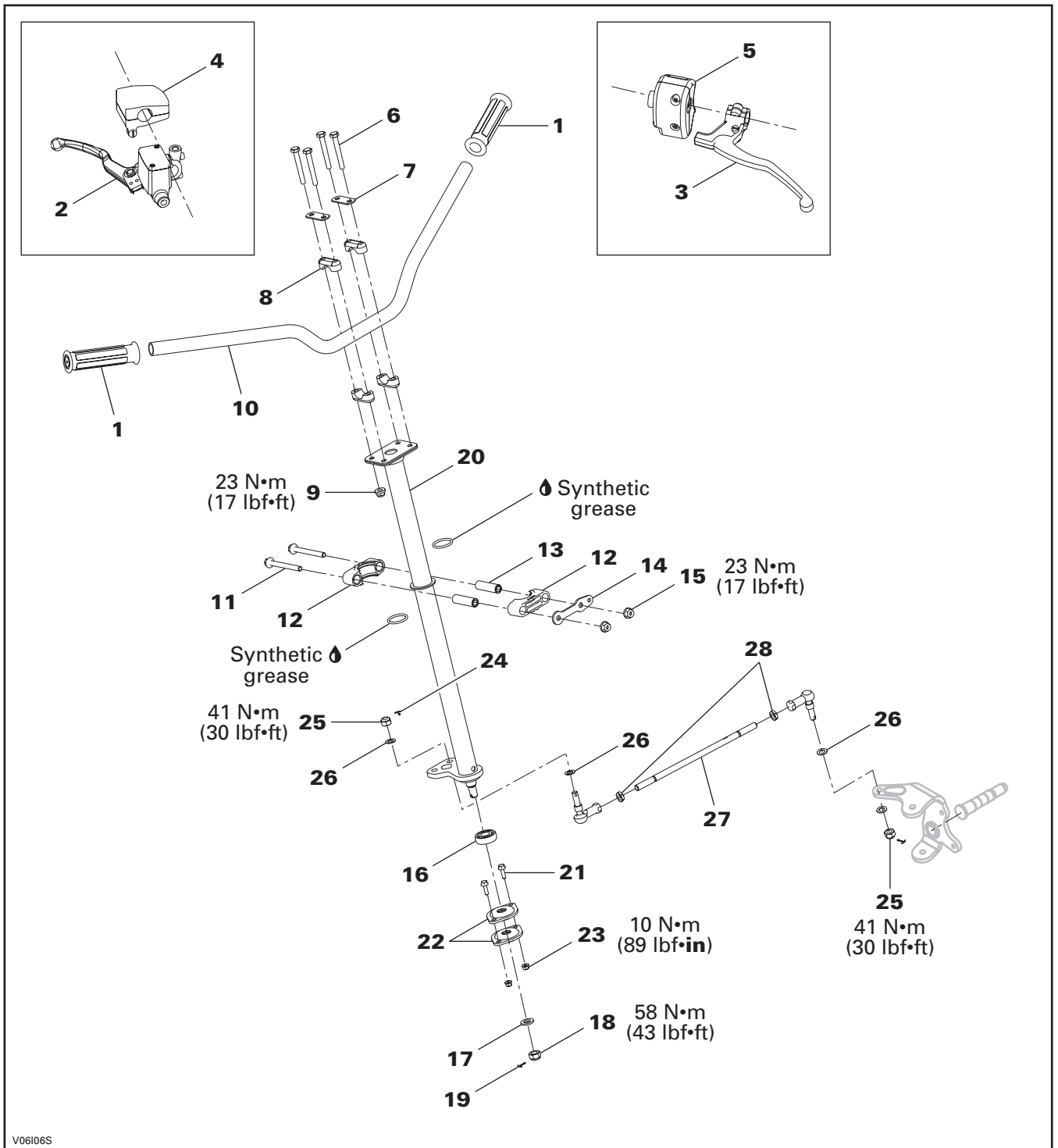
For installation, reverse the removal procedure.

Torque bolt **no. 17** to 25 N•m (18 lbf•ft).

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STEERING/CONTROL SYSTEMS



Section 07 STEERING/CONTROL SYSTEMS

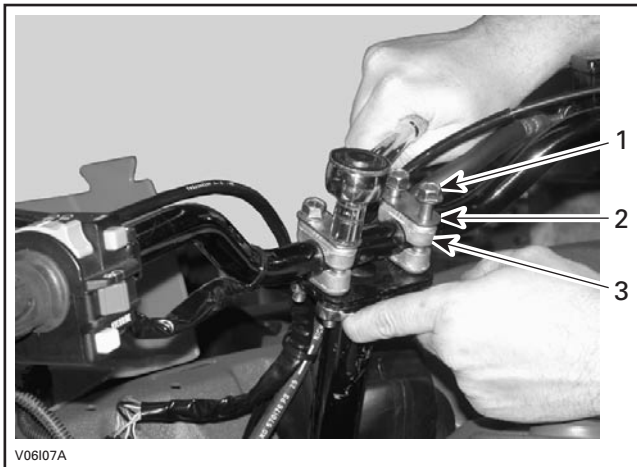
Subsection 02 (STEERING/CONTROL SYSTEMS)

HANDLEBAR

Removal

Remove:

- steering cover (refer to **BODY**)
- handlebar grips **no. 1** by removing grip ends and cutting handlebar grip
- RH handle brake **no. 2** (see below in this section)
- LH handle brake **no. 3** (see below in this section)
- throttle handle **no. 4** and multi-function switch **no. 5** (see below in this section)
- hexagonal screws **no. 6**, reinforcements **no. 7**, steering supports **no. 8** and elastic flange nuts **no. 9**
- handlebar **no. 10**.



1. Handlebar screw
2. Reinforcement
3. Steering support

Inspection

Inspect the handlebar for damage, cracks or bending, replace if any problems is detected.

Installation

For the installation, reverse the removal procedure.

STEERING COLUMN

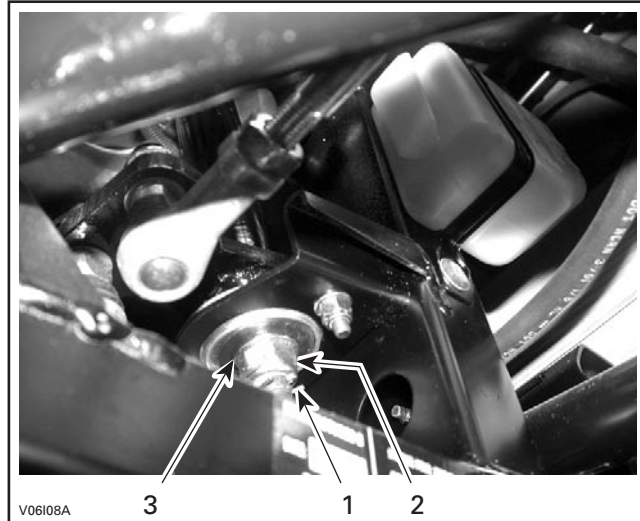
Removal

Place the vehicle on jack stands.

Remove:

- console and seat (refer to **BODY**)
- fuel tank (refer to **FUEL CIRCUIT**)

- tie-rods on the steering column side (see further in this section)
- hexagonal flange screws **no. 11**, half bushing **no. 12**, bushings **no. 13**, stopper plate **no. 14** and elastic flange nuts **no. 15**
- cotter pin **no. 19**, hexagonal stop nut **no. 18**, flat washer **no. 17**.



1. Cotter pin
2. Elastic flanged nut
3. Flat washer

Remove cotter pin **no. 24** elastic stop nut **no. 25**, washer **no. 26**, to bottom end of steering column **no. 20**.

Pull steering column in a downward motion.

Inspection

Inspect steering column for damage, cracks or bending, replace if any problems is detected.

Installation

For the installation, reverse the removal procedure.

Install a new cotter pins. Both ends of cotter pin must be folded.

TIE-ROD

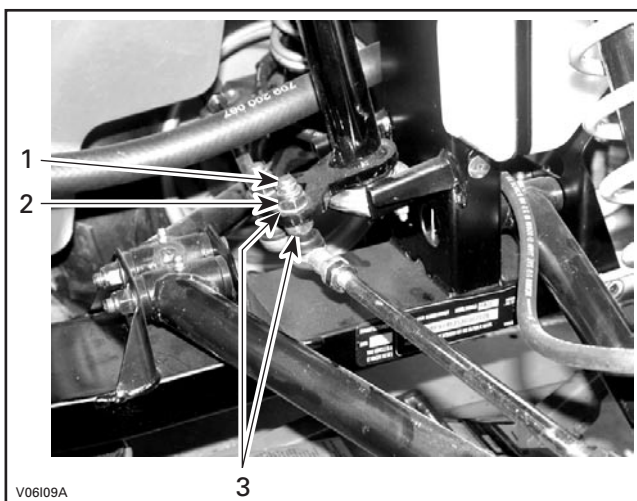
Removal

Place the vehicle on jack stands and remove front wheel(s).

Section 07 STEERING/CONTROL SYSTEMS

Subsection 02 (STEERING/CONTROL SYSTEMS)

Remove cotter pin no. 24 elastic stop nut no. 25, washer no. 26, and tie-rod assembly no. 27.



1. Cotter pin
2. Elastic stop nut
3. Washer

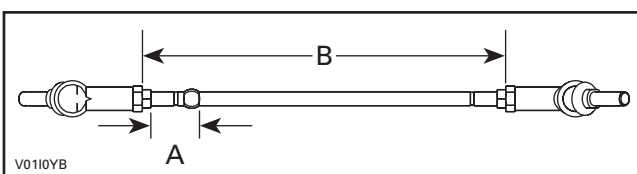
Inspection

Inspect ball joint ends for wear or looseness, if excessive, replace.

Installation

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

At the time of the reinstallation or the new tie-rod(s) installation, screw threaded end of tie-rod into ball joint. The maximum length for tie-rod groove to ball joint end must be the value **A** in the following chart:



MODEL		A	B
All	mm	29 ± 2	217 ± 2
	in	1-13/32 ± 0.078	8-17/32 ± 0.078

NOTE: Torque the ball joint lock nut no. 28 to 22 N•m (16 lbf•ft).

Torque elastic stop nut to 41 N•m (31 lbf•ft).

Install a new cotter pin. Both ends of cotter pin must be folded.

Toe Adjustment

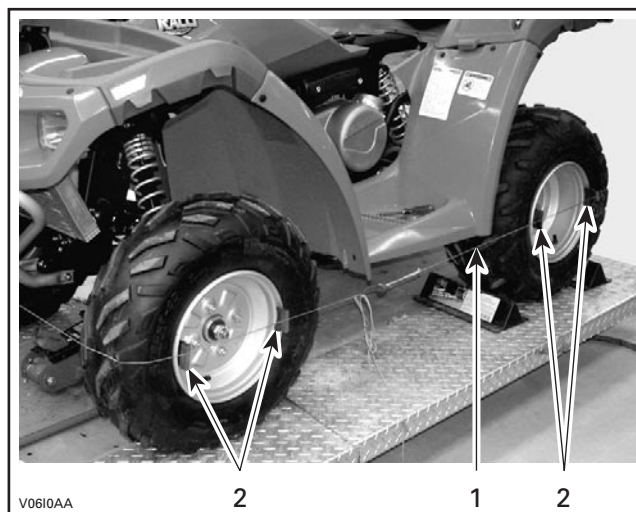
Place vehicle on level surface.

Check that handlebar is straight.

Check pressure in each tires. Always follow recommended pressure.

Place a rope around the vehicle and using an elastic, link both ends together.

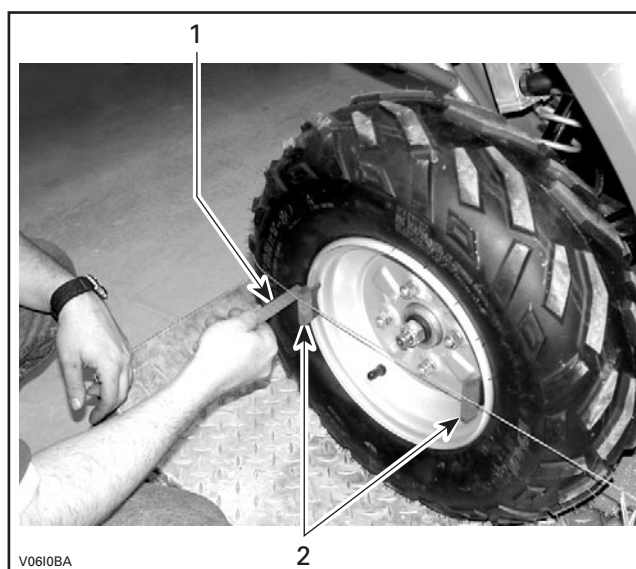
Install spacers on front and rear rims. These spacers will prevent the rope from touching tire.



1. Rope
2. Spacers

NOTE: Some items can be used like spacers, the magnet spacer are recommended.

The rope must be place at the center of the wheels. Do not place rope on tire threads.



1. Ruler
2. Spacers

Section 07 STEERING/CONTROL SYSTEMS

Subsection 02 (STEERING/CONTROL SYSTEMS)

Measure the distance between the front edge of the front rim and the rope and the distance between the rear edge of the front rim and the rope.



TYPICAL

The perfect front toe-out adjustment is $0\text{ mm} \pm 3\text{ mm}$ ($0\text{ in} \pm .118\text{ in}$) each side.

Adjust alignment with tie-rod.

STEERING COLUMN BEARING

Removal

Place vehicle on jack stands.

Remove fuel tank (refer to **FUEL CIRCUIT**).

Unscrew bolts **no. 11**.

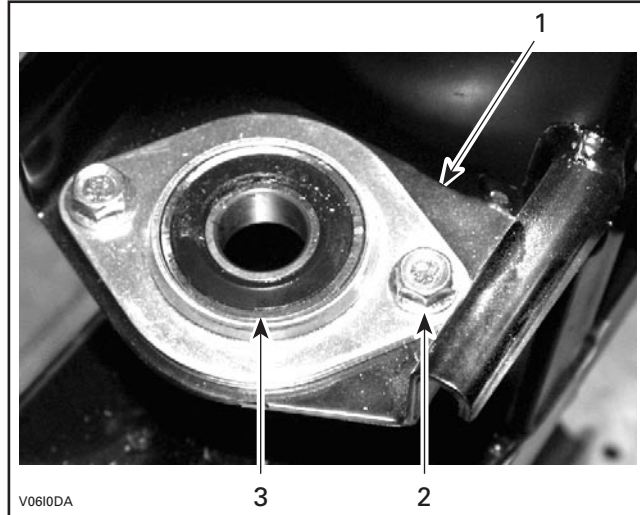
Separate tie-rods **no. 27** from steering column **no. 20**. Refer to TIE-ROD (earlier in this section).

Remove the cotter pin **no. 19**, elastic nut **no. 18** and washer **no. 17**.

Lift up the steering column until the end of steering column is out of bearing.

Remove screws **no. 21** and nuts **no. 23**. Lift up the upper bearing flange **no. 22** to reach the bearing.

Remove bearing **no. 16**.



- 1. Frame support
- 2. Screw
- 3. Bearing flange

Installation

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

Place flanged collar toward outside.

NOTE: Install both bearing flanges on top of frame support.

Install screw **no. 21** and nut **no. 23**.

Install a new cotter pin. Both ends of cotter pin must be folded.

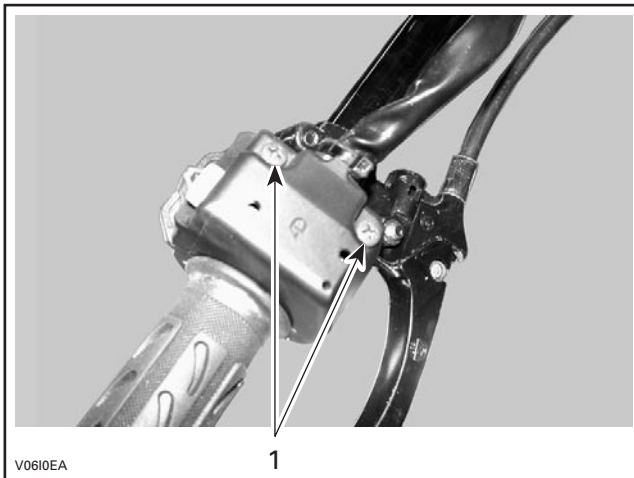
MULTI-FUNCTION SWITCH

Test

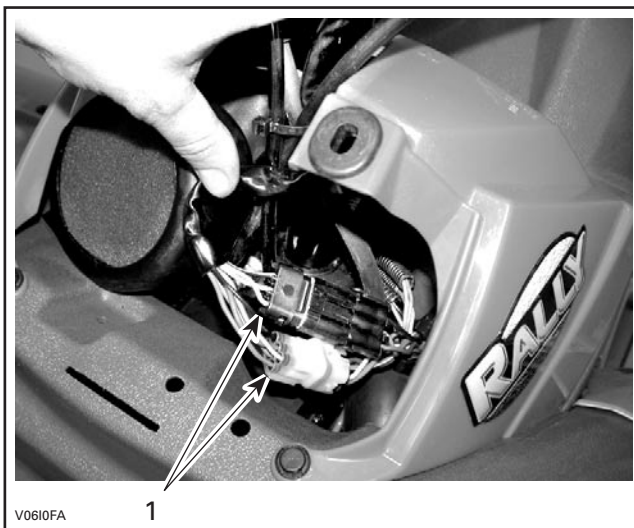
Refer to **INSTRUMENTS AND ACCESSORIES**.

Removal

- dash board cover and cup (refer to **BODY**)
- tie-rod
- socket screws
- disconnect connectors. The connectors are located under the dash board cover.



1. Multi-switch socket screw



1. Unplug multi-switch connectors

Separate multi-function switch **no. 5** from handlebar **no. 10**.

Installation

For installation, reverse the removal procedure.

THROTTLE HANDLE

Removal

Remove:

- throttle cover screws
- throttle clip screws.

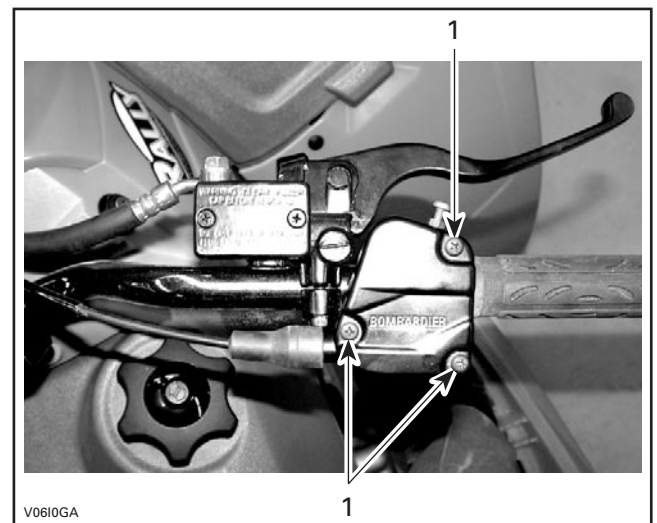
Move back rubber cap.

Tighten adjustment screw to its maximum.

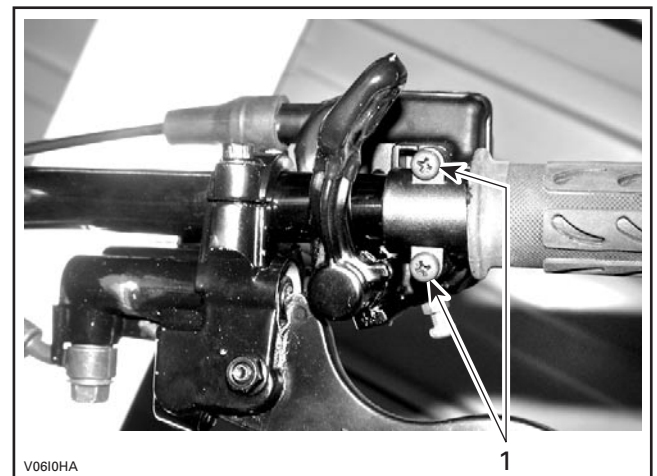
Remove throttle cable from housing.

Slide cable in clip slot and remove the end of the cable from clip.

Remove cable.



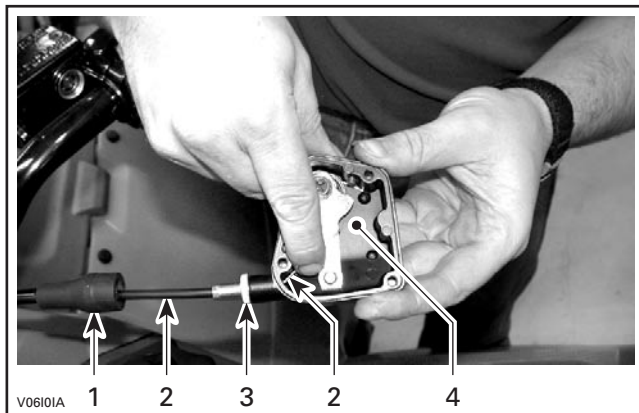
1. Throttle cover screws



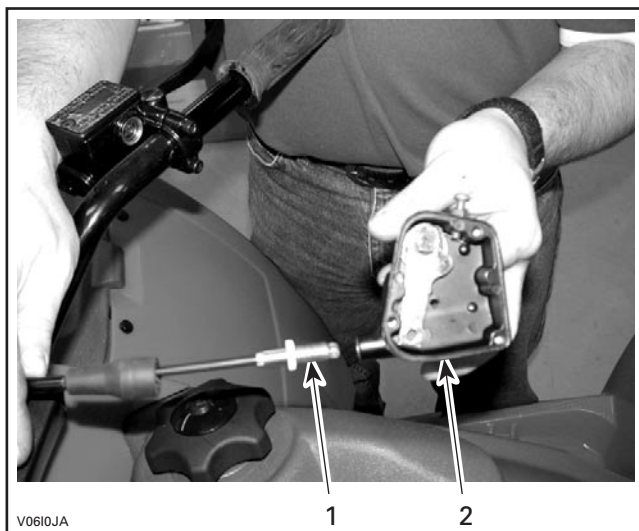
1. Throttle clip screws

Section 07 STEERING/CONTROL SYSTEMS

Subsection 02 (STEERING/CONTROL SYSTEMS)



1. Rubber cap
2. Throttle cable
3. Adjustment screw
4. Throttle cable housing



1. Throttle cable
2. Throttle housing

Separate throttle handle **no. 4** from handlebar **no. 10**.

Remove throttle cable from housing.

Installation

For installation, reverse the removal procedure.

Refer to **CARBURETOR** for adjustment procedure.

Lubrication

Refer to **CARBURETOR**.

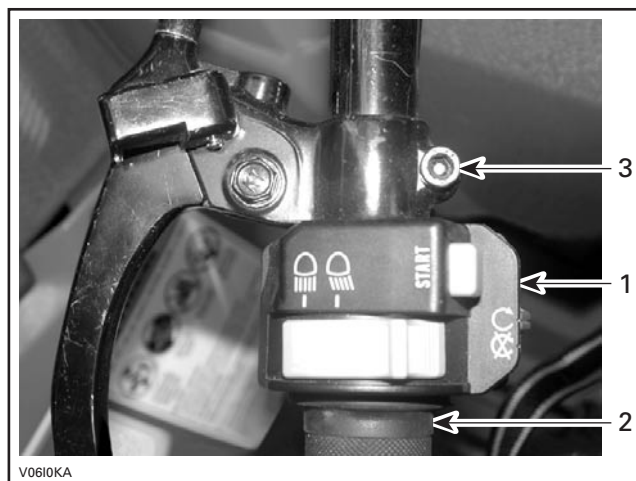
LH HANDLE BRAKE

Removal

Remove multi-switch.

Remove handlebar grip.

Remove cable brake screw.



1. Multi-switch
2. Handlebar grip
3. LH brake screw

Separate handle brake **no. 3** from handlebar **no. 10**.

If necessary, unplug connectors under steering cover cut locking tie.

Installation

For installation, reverse the removal procedure.

RH HANDLE BRAKE

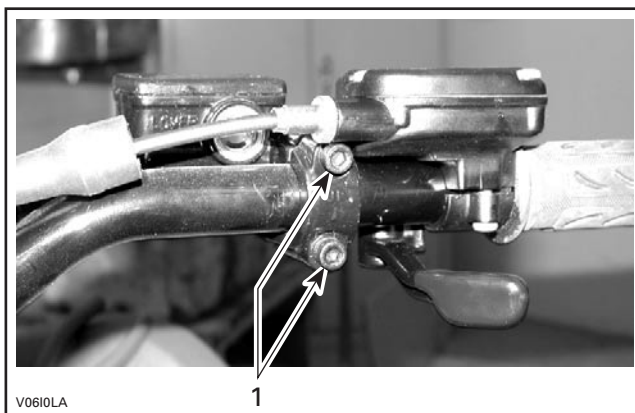
Removal

Remove screws.

Remove RH handle brake.

Cable Removal

Refer to **HYDRAULIC BRAKES** for specifics instructions.



1. RH handle brake screws

Separate handle brake **no. 24** from handlebar **no. 10**.

On some vehicles, unplug connectors under steering cover and cut locking tie.

Hose Removal

Refer to **HYDRAULIC BRAKES** for specifics instructions.

Installation

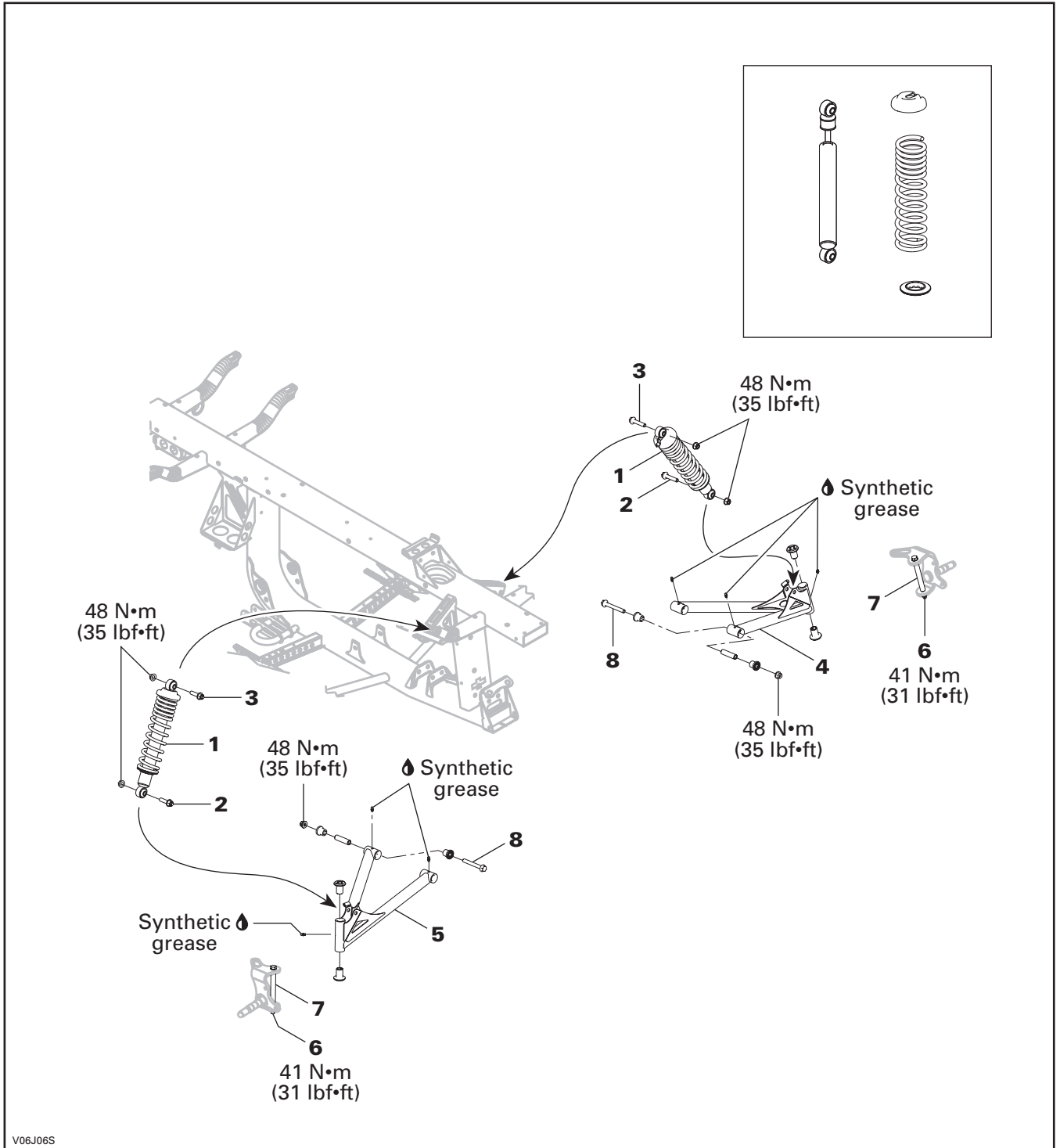
For installation, reverse the removal procedure.

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FRONT SUSPENSION



Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

GENERAL

At installation, use torque values and Loctite products from the exploded view. Clean threads before using Loctite products when installing screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

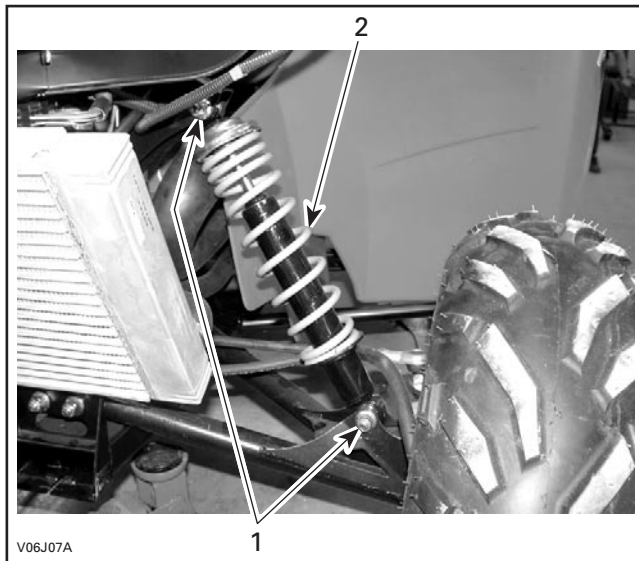
FRONT SHOCK

Removal

Lift front of vehicle until rear shock absorbers are fully extended then install a jack stand under the frame to support the vehicle off the ground.

NOTE: Do not remove front wheels to remove the front shocks.

Remove lower bolt **no. 3** then upper bolt **no. 2** of shock **no. 1**.

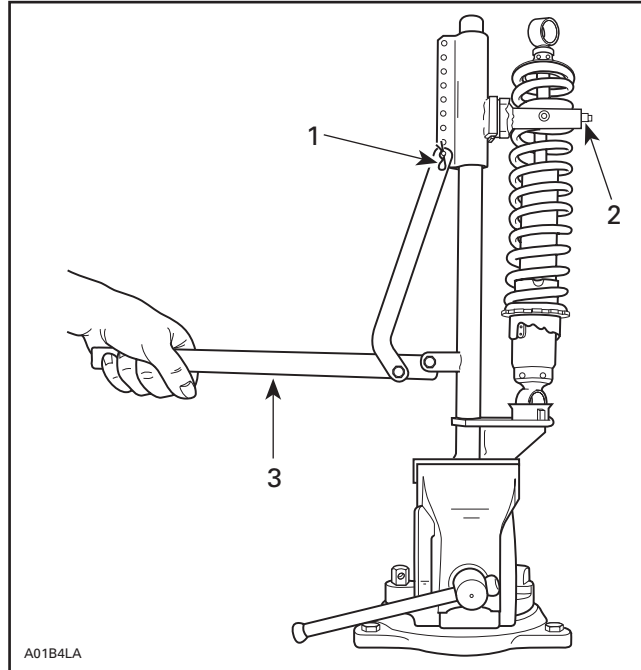


1. Remove bolts
2. Front shock assembly

Disassembly

For shock spring disassembly use shock spring remover (P/N 529 035 504) in a vise. Mount shock in it and turn shock so that spring coils matched spring compressor.

Close and lock the bar. Adjust the handle horizontal position by changing the position of the clevis pin.



TYPICAL

1. Clevis pin
2. Bar
3. Handle horizontal

Push down on the handle until it locks. Remove spring stopper then release handle.

Inspection

Inspect the spring for damage. Replace if necessary.

Inspect shock for oil leakage. Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upwards. Any of the following conditions will denote a defective shock:

- A skip or hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- A gurgling noise after completing one full compression and extension stroke.

Replace shock if any of these conditions are found.

Installation

For assembly, reverse the disassembly and removal procedures.

LH/RH A-ARM

Inspection

Check LH and RH A-arm for distortion or damage. Replace as required.

Move A-arm from side to side. There should be no noticeable side play. Replace bushings if necessary.

Move A-arm up and down. There should be any noticeable play. Replace bushings if necessary.

Removal

NOTE: Both LH **no. 4** and RH **no. 5** A-arms can be removed without removing the tie rods.

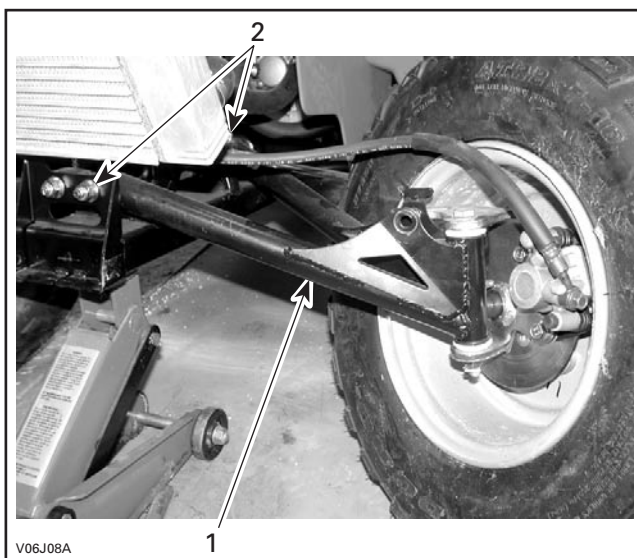
RH A-arm **no. 5** and LH A-arm **no. 4** has the same removal procedure.

Remove bolt **no. 2** retaining the shock absorber **no. 1** to A-arm.

Remove cotter pin on the axle screw and then, remove axle screw **no. 7** from knuckle **no. 6**. Discard the cotter pin.

NOTE: Do not remove knuckle **no. 6**, tie rod and brake from the wheel.

Remove bolts **no. 8** retaining A-arm to frame.



- 1. A-arm
- 2. Bolts

Remove A-arm from vehicle.

Installation

Position front A-arm then install bolts and nuts.

Do not torque yet.

Install bolt and nut retaining shock absorber to front A-arm.

Attach front A-arm to knuckle **no. 6**. Install axle screw.

NOTE: Do not forget the O-rings between bushings (near knuckle) and A-arm.

Torque all bolts and nuts.

Install a new cotter pin. Both ends of cotter pin must be folded.

Lubricate front A-arm with synthetic grease (P/N 293 550 010).

A-ARM BUSHINGS

Removal

Frame Side

Remove:

- A-arm (see above)
- inner bushing
- both cushions.

Knuckle Side

Remove:

- knuckle from A-arm
- bushings
- O-rings.

Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

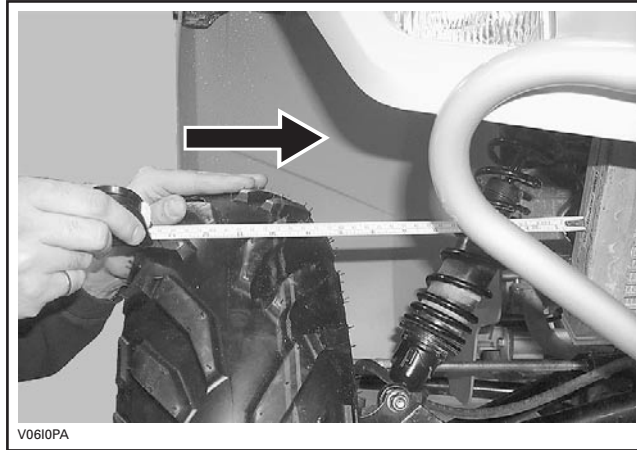
Inspection

Check bushings for wear or other damages. To check bushing wear, use the following procedure:

- Lift front of vehicle until front wheels are out of ground.

NOTE: Move the tire and check if the knuckle moves with the wheel (at the same time). If not, replace the bearing wheel before checking the bushing wear. If so, continue the procedure.

- Place the handlebar straight.
- Using a tape, measure the distance between the middle of the tire and the radiator side. Note this measure.



PUSH TOWARD VEHICLE

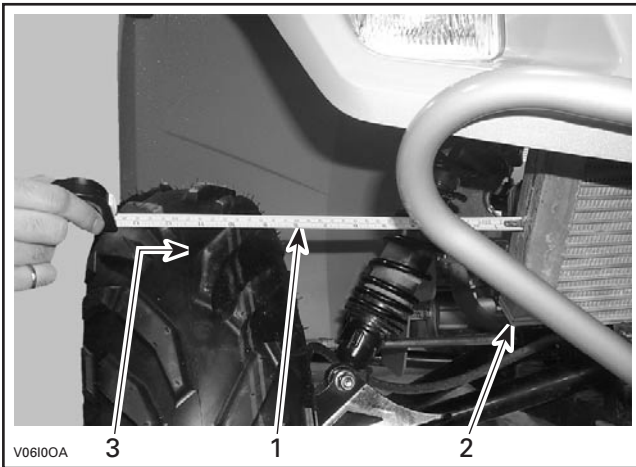
- The difference between both measurements must be lower than $8 \text{ mm} \pm 1 \text{ mm}$ (.315 in $\pm$.039 in).
- If the difference is out of specification, replace the both bushings, O-rings and the pivot bushing.

Check if O-rings are brittle, hard or otherwise damaged.

Replace all defectives parts.

Installation

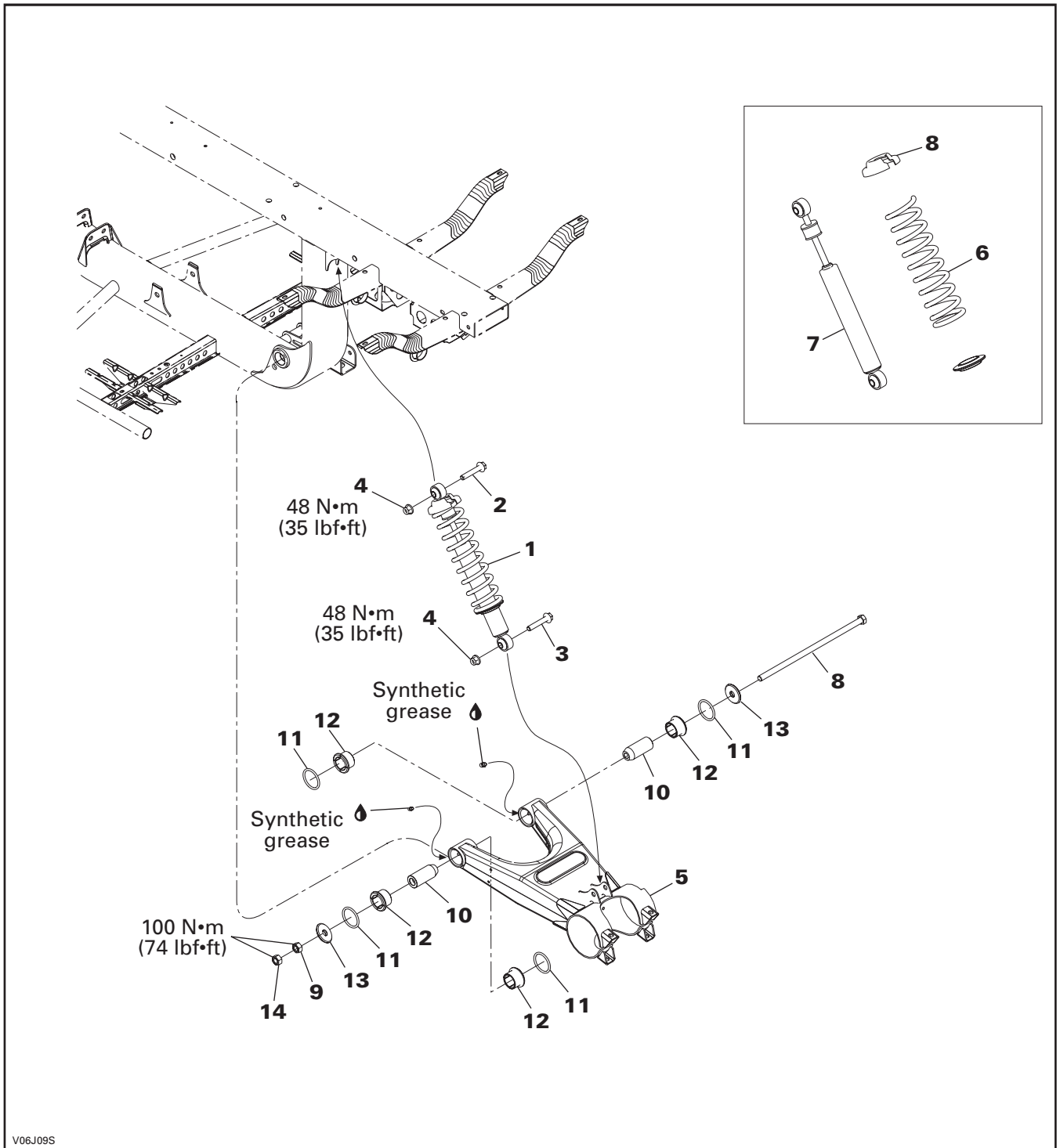
The installation is the reverse of the removal procedure. Pay attention to the following details. Apply synthetic grease (P/N 293 550 010) on inner bushing before installation. Lubricate front A-arms with synthetic grease (P/N 293 550 010).



1. Tape
2. Radiator
3. Middle of tire

- Push on the top side of tire until all play is eliminated (without moving handlebar).
- Measure the distance between the middle of tire and radiator side.

REAR SUSPENSION



Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

GENERAL

At installation, use torque values and Loctite products from the exploded view. Clean threads before using Loctite products when installing screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

REAR SHOCK

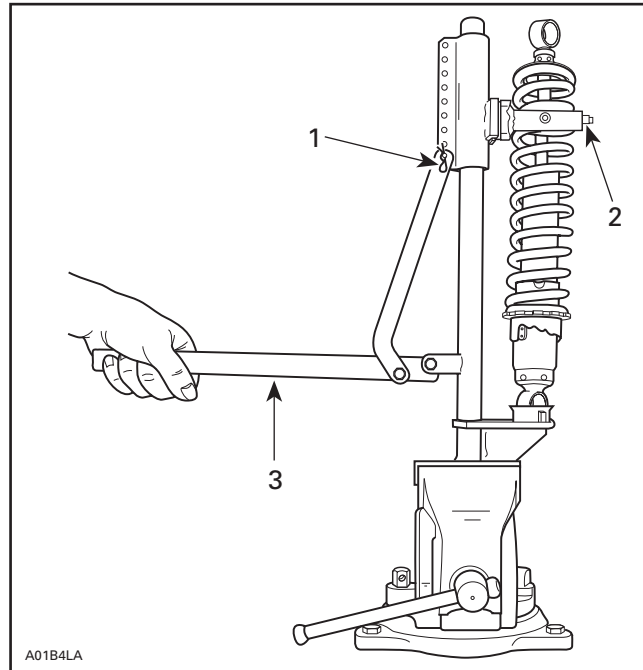
Removal

Lift rear of vehicle until rear shock absorber **no. 1** is fully extended.

Install jack stands or blocks under the frame to support the vehicle.

Remove upper **no. 2** and lower **no. 3** bolts and nuts **no. 4** retaining shock absorber.

Push down on handle until it locks. Remove spring stopper and cap then release handle.

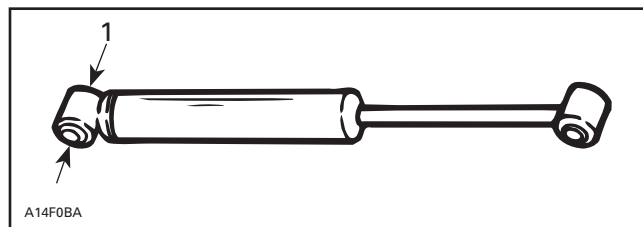


TYPICAL

1. Clevis pin
2. Bar
3. Handle horizontal

Inspection

Secure the shock body end **no. 7** in a vise with its rod upward.



TYPICAL

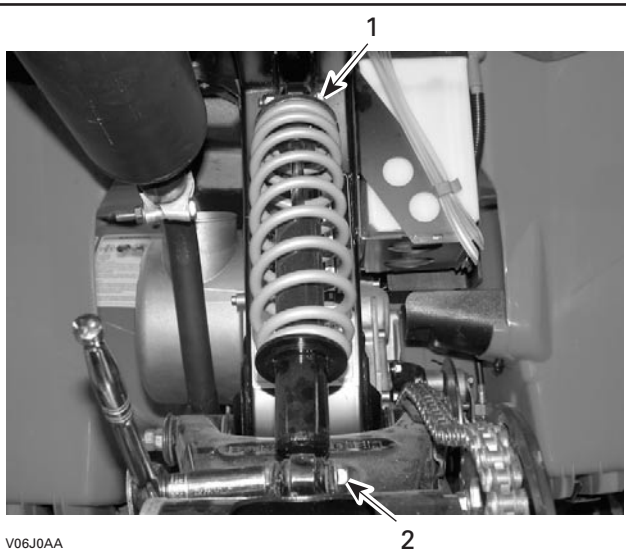
1. Clamp here

CAUTION: Do not clamp directly on shock body.

Examine each shock for leaks. Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upward.

Pay attention to 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.



1. Upper bolt
2. Lower bolt

Disassembly

Use shock spring remover (P/N 529 035 504) and put it in a vise. Mount shock in it and turn shock so that spring coils **no. 6** match spring compressor.

Close and lock bar. Adjust handle horizontal by changing position of clevis pin.

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

- Oil leakage.
 - A gurgling noise, after completing one full compression and extension stroke.
- Renew if any faults are present.

Installation

Assembly and installation are essentially the reverse of disassembly and removal procedures.

SWING ARM

Lubrication

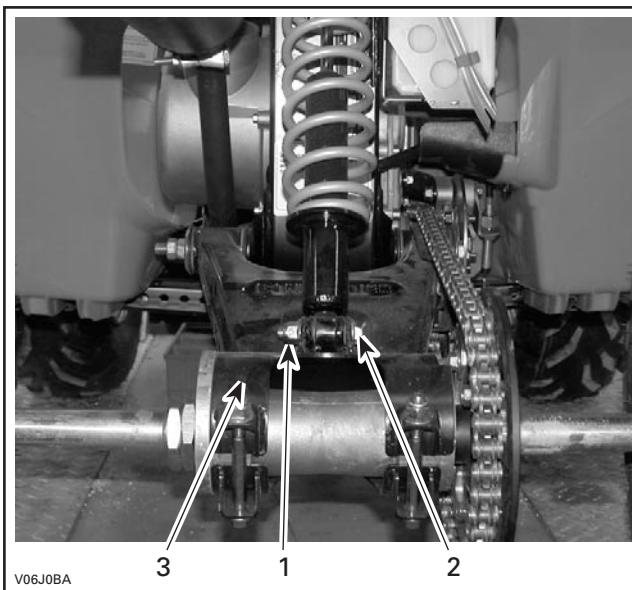
Lubricate swing arm. Use synthetic grease (P/N 293 550 010). There is two grease fittings on the swing arm.

Removal

Lift rear of vehicle until rear shock absorber **no. 1** is fully extended.

Install a jack stands or a blocks under the frame to support the vehicle.

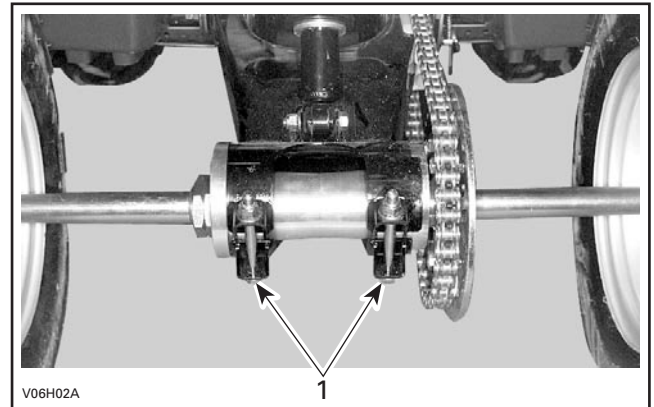
Remove lower nut **no. 4** and bolts **no. 3** retaining shock to swing arm.



1. Lower nut
2. Lower bolts
3. Swing arm

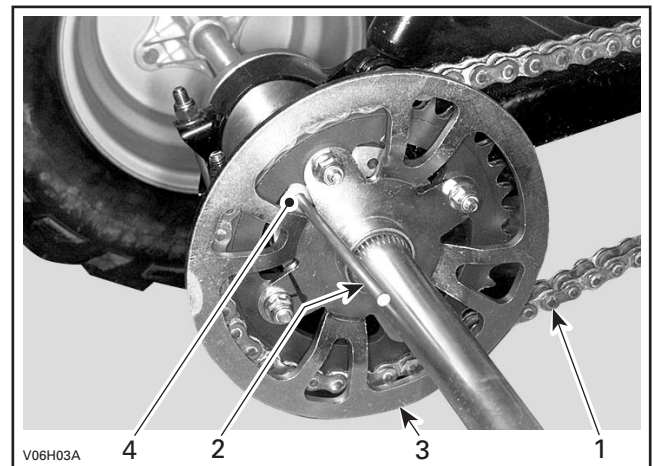
Remove RH footwell (refer to **BODY**).

Loosen chain tensioner lock bolts.



1. Chain tensioner lock bolts

Insert adjuster lock through sprocket hub and into chain tensioner.



1. Drive chain
2. Adjuster lock
3. Sprocket hub
4. Chain tensioner

Slack drive chain.

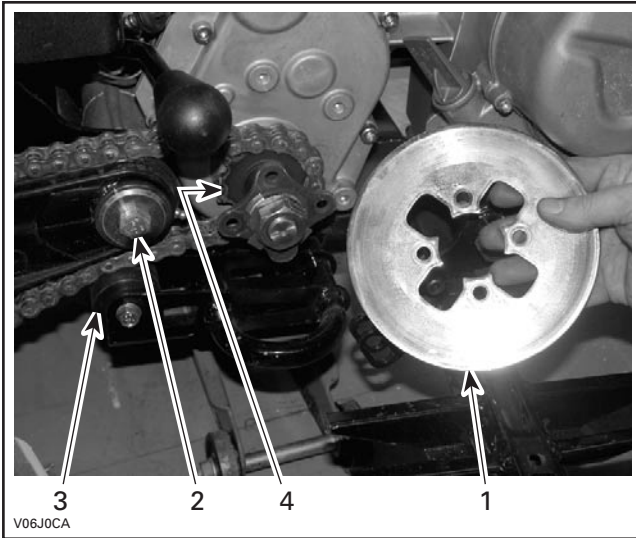
Remove rear brake (refer to **BRAKES**).

Remove swing arm bolt **no. 8** and nuts **no. 9** and **no. 14**.

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

Remove chain roller.



1. Brake disc
2. Swing arm bolt
3. Chain roller
4. Sprocket

Pull back rear drive train assembly to detach swing arm assembly with drive chain from the frame.

If necessary, remove rear axle from swing arm. Refer to **REAR AXLE**.

Inspection

Check swing arm for distortion, rust, cracks, bend or other damages. Change if necessary.

Check bushings **no. 10** and cushions **no. 12** for wear or damages. Replace if necessary.

Check if the O-rings **no. 11** is brittle, hard or otherwise damaged.

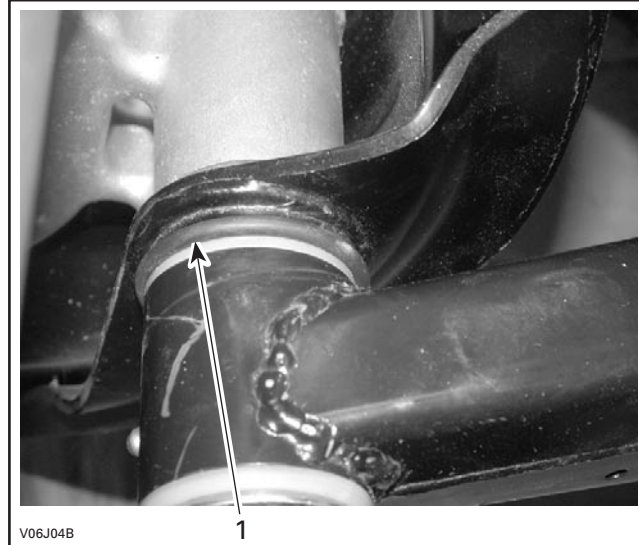
Installation

Installation is the reverse of removal procedure. However, pay attention to the following details.

Insert O-rings **no. 11** in the groove into frame.

Place cushions **no. 12** and bushings **no. 10** then install the swing arm.

Install the swing arm bolt **no. 8** with washers **no. 13** then push the O-rings **no. 11** between frame and bushings.



1. O-ring

Install nuts **no. 9**. Torque to 100 N•m (74 lbf•ft).

NOTE: Check if the swing arm moves freely.

Install the other nut **no. 14** and torque to 100 N•m (74 lbf•ft).

NOTE: Take the first nut with a key when the second nut is torqued.

Install rear shock and drive chain. Torque nut **no. 4** to 48 N•m (35 lbf•ft) to install rear shock.

If necessary, join the rear axle and the swing arm together. See the **REAR AXLE** section for the proper procedure.

Apply synthetic grease (P/N 293 550 010) to swing arm.

Reinstall brake. Check brake pedal adjustment. Refer to **BRAKES** for complete adjustment procedure.

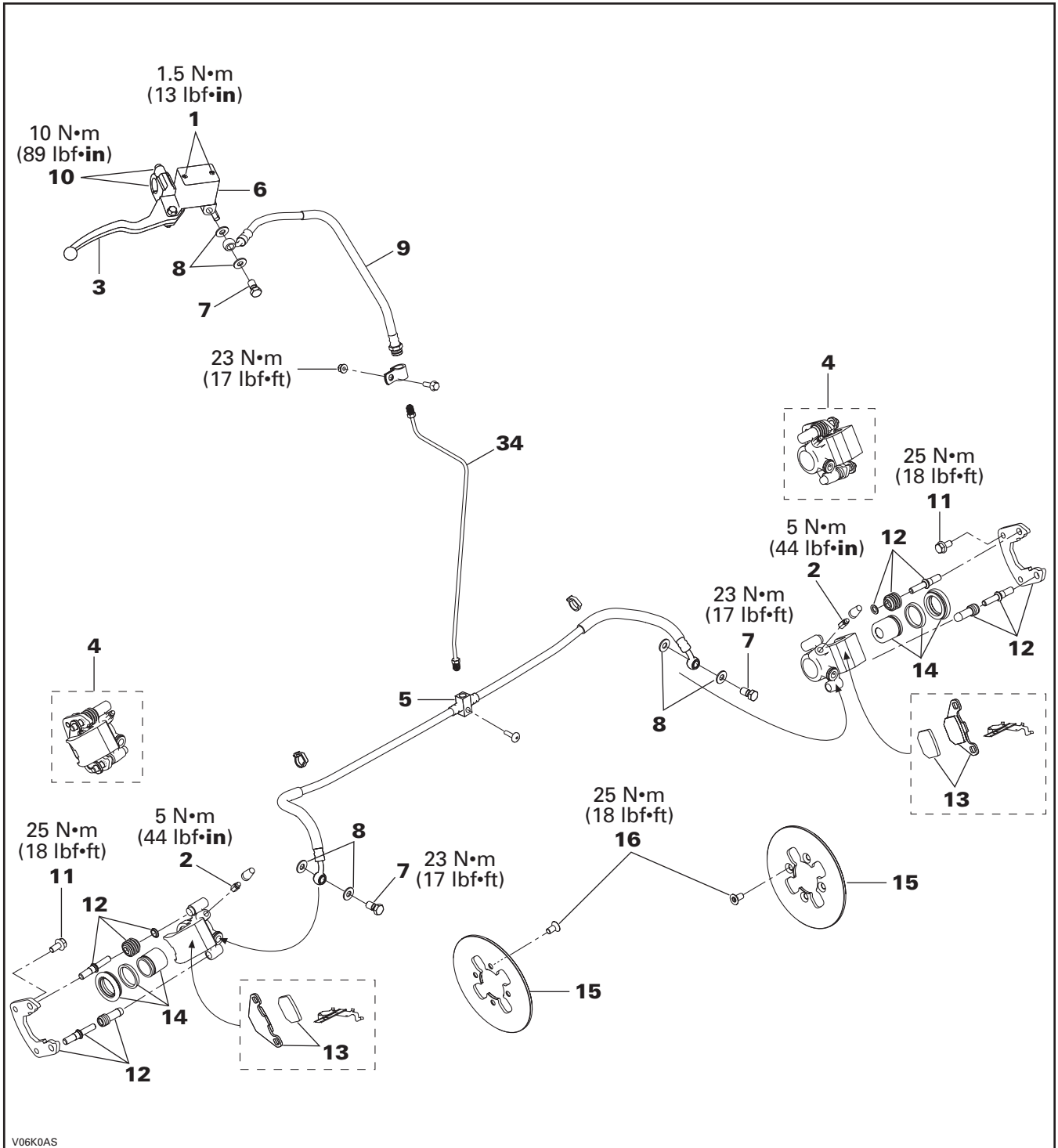
Install RH footwell (refer to **BODY**).

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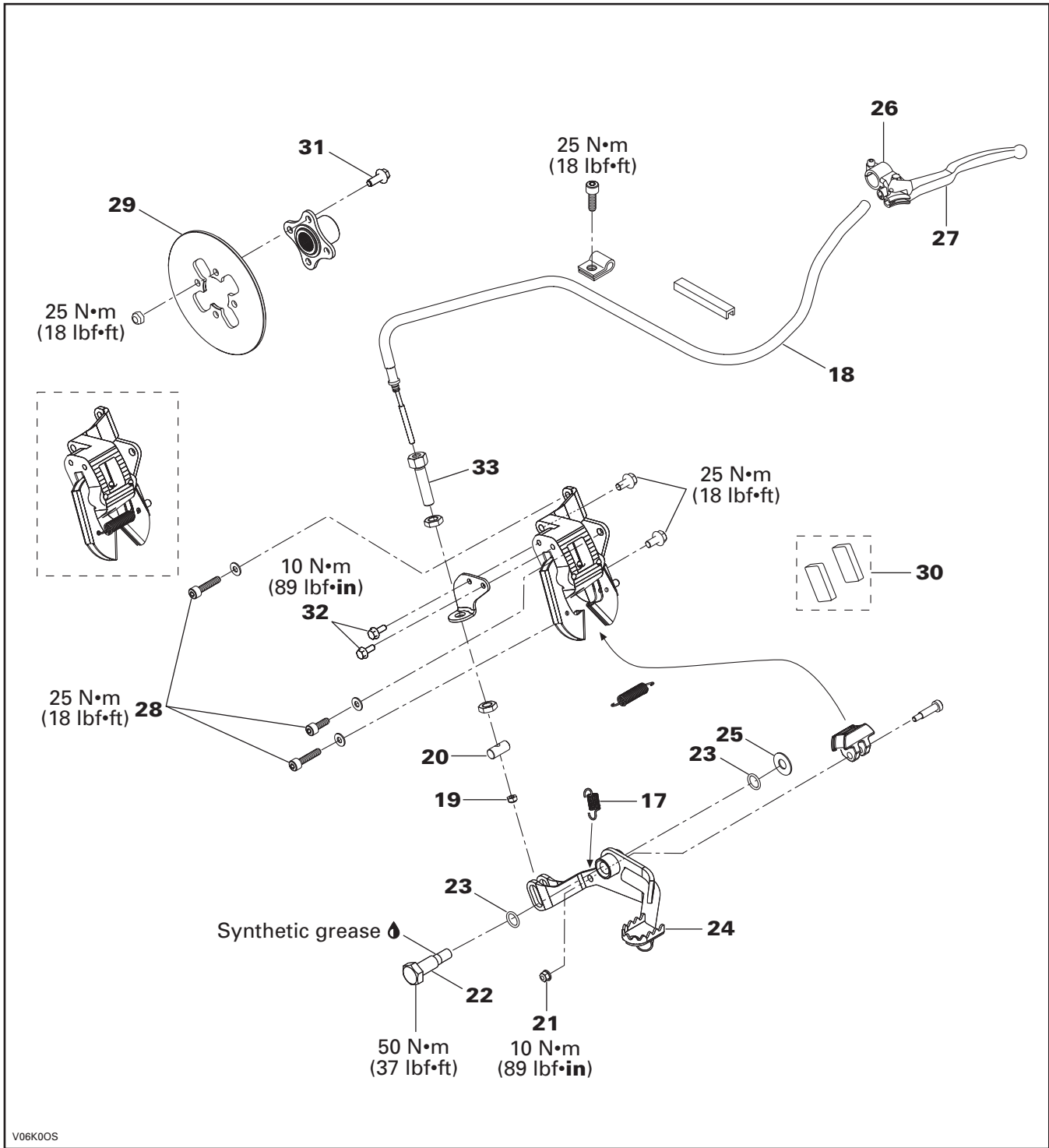
HYDRAULIC BRAKES

FRONT BRAKES



Section 09 BRAKES
Subsection 02 (HYDRAULIC BRAKES)

REAR BRAKE



GENERAL

For installation, use the torque values and Loctite products from exploded views. Clean threads before using Loctite product when installing screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: 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.

Hydraulic Brakes System

The brake system consists of master cylinder and reservoir. Only front brake is hydraulic brake.

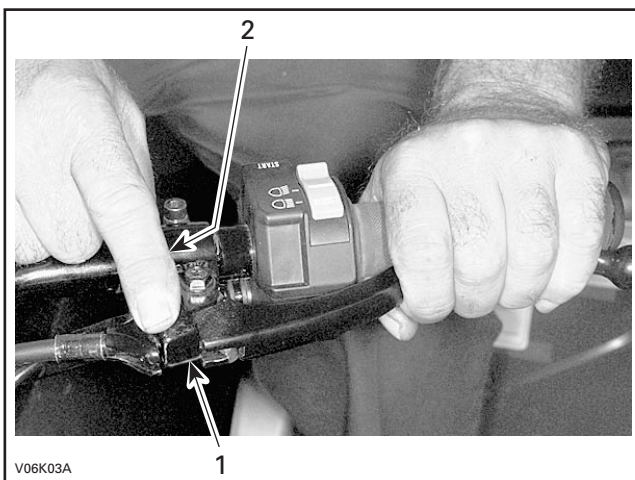
Both front and rear brakes are disc type.

WARNING

Periodically check the brake hoses for damages or leaks. Repair any damage before operating the vehicle.

Parking Brake

The parking brake operates the rear brake only. It is activated by a locking mechanism on LH brake lever.



1. Brake lever lock
2. Press to apply parking brake

BRAKE FLUID

Recommended Fluid

Always use brake fluid meeting the specification DOT 4 only.

CAUTION: To avoid serious damage to the braking system, do not use fluids other than the recommended one, nor mix different fluids for topping up.

Fluid Level

With vehicle on a level surface, check brake fluid in reservoir for proper level. It should be above MIN. mark.

Add fluid as required. **Do not overfill.**

Clean filler cap before removing.

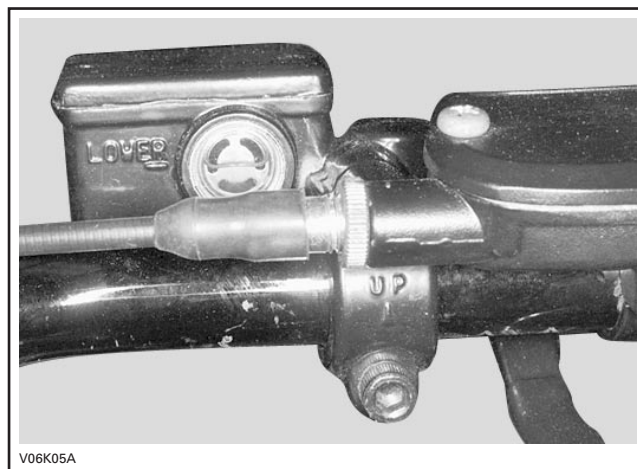
CAUTION: Use only DOT 4 brake fluid from a sealed container. Do not use brake fluid taken from old or already opened containers.

NOTE: A low level may indicate leaks or worn brake pads.

Front Brake Fluid Reservoir

Turn steering in the straight-ahead position to ensure reservoir is level. Check the brake fluid level, the reservoir is full when the fluid reaches the top of window.

Visually inspect lever boot condition. Check for cracks, tears, etc. Replace if damaged.



Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

Fluid Replacement

WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

CAUTION: Avoid spilling brake fluid on plastic, rubber or painted parts. Protect these parts with a rag when servicing brake system.

Brake Fluid Draining

Remove reservoir cover **no. 1**.

Connect bleed hose to bleed valve **no. 2**.

Loosen bleed valve and pump brake lever **no. 3** until no more fluid flows out of bleed valve.

Brake Fluid Filling and Bleeding

Close bleed valve.

Fill reservoir with DOT 4 brake fluid.

CAUTION: To avoid serious damage to the braking system, do not use fluids other than the recommended one, nor mix different fluids for topping up.

CAUTION: Use only DOT 4 brake fluid from a sealed container. Do not use brake fluid taken from old or already opened containers.

Install the vacuum pump (P/N 529 021 800) to bleed valve. See the manufacturer's operating instructions.

Pump vacuum pump and loosen bleed valve. Close bleed valve and refill reservoir when the fluid level is low.

NOTE: Check fluid level often to prevent air from being pumped into the system.

Repeat the procedures until air bubbles don't appear in bleed hose.

NOTE: For the front brake system, switch to LH and RH caliper **no. 4**. Turn handlebar to full RH side when bleeding right caliper and turn to the LH side for the left caliper. This helps the bleeder to reach air in the caliper.

Close bleed valve and operate brake lever **no. 3**. If it still feels spongy, bleed system again.

Repeat the procedures until air bubbles don't appear in tube and lever is stiff.

Fill reservoir to the upper level with DOT 4 brake fluid.

Install cover on reservoir.

If vacuum pump is not available, use the following procedure.

Install a tube to bleed valve.

Open bleeder. Fill reservoir and pump brake lever until fluid freely flows out of the tube.

Close bleed valve.

Pump up system pressure with brake lever until lever resistance is felt.

Squeeze brake lever, open bleed valve and then close it.

NOTE: Do not release brake lever until bleed valve has been closed. For the front brake system, switch to LH and RH caliper. Turn handlebar to full RH side when bleeding right caliper and turn to the LH side for the left caliper. This helps to reach air in the caliper.

Release brake lever slowly.

Repeat the procedures until air bubbles do not appear in tube and lever is stiff.

MASTER CYLINDER

Removal

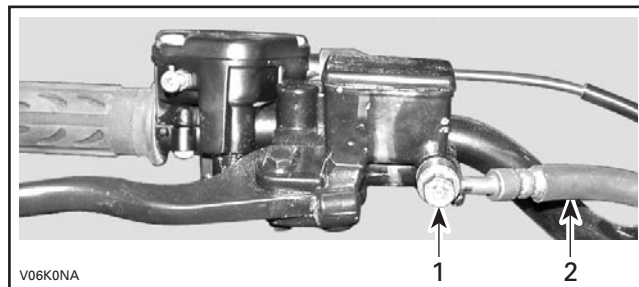
Remove reservoir cover **no. 1** and drain brake fluid from master cylinder **no. 6**.

CAUTION: Avoid spilling brake fluid on plastic, rubber or painted parts. Protect these parts with a rag when servicing brake system.

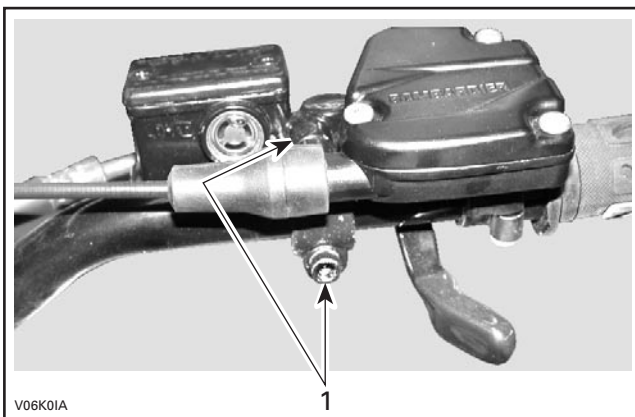
Remove Banjo bolt **no. 7** and sealing washers **no. 8** retaining brake hose **no. 9** to master cylinder **no. 6**.

NOTE: Discard sealing washers.

Remove screws **no. 10** from master cylinder holder and remove master cylinder from handlebar.



1. Banjo bolt
2. Brake hose



1. Screws

Inspection and Lubrication

Discard any remaining fluid inside reservoir.

Check hoses and fittings for damages or leaks.

Clean reservoir, pistons and master cylinders thoroughly with clean brake fluid.

Check:

- boots for crack
- piston cups for wear, deterioration or damage
- master cylinders and pistons for scoring, scratches or other damage.

Change part(s) if necessary.

NOTE: If master cylinder is damaged or leaking, replace as an assembly.

Assembly

Coat piston and piston cups with clean brake fluid.

Install:

- spring onto master piston
- piston into cylinder
- snap ring into groove in the cylinder
- boot into cylinder and the groove in piston.

Apply silicone grease to the brake lever contacting surface of the piston.

Install brake lever and locking mechanism.

NOTE: Apply silicone grease on lever pivot bolt.

Installation

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

Position cylinder holding bracket with the UP mark upward.

Install bolts and tighten loosely.

With the handlebar in straight ahead position, position cylinder reservoir parallel to the ground. Tighten upper bolt first.

Connect brake hose to master cylinder with bolt and new sealing washers.

Bleed front brake system.

Check for leaks and make sure the brakes operate normally before driving.

FRONT BRAKE CALIPERS

Removal

Loosen wheel nuts.

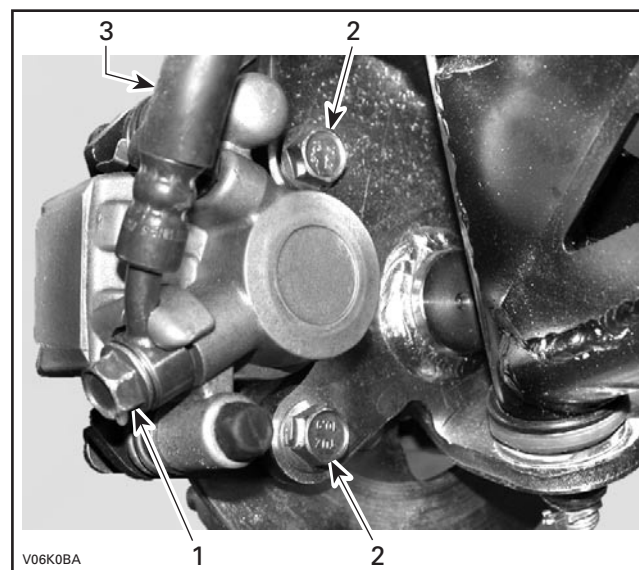
Raise vehicle and support it securely.

Remove wheel(s).

Remove Banjo bolt **no. 7** with sealing washers **no. 8** and detach brake hose from caliper.

Catch spilled fluid with a rag. Attach the brake hose in a position to prevent the fluid from flowing out.

Unscrew bolts **no. 11** retaining caliper to knuckle and remove caliper.



1. Remove Banjo bolt and washers
2. Unscrew bolts
3. Brake hose

Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

Disassembly

Remove brake pads, see the following section.

Remove boot kit **no. 12** and pad spring.

Place rag over piston.

Place caliper body with piston down and apply small squirts of air pressure to the fluid inlet to remove piston.

WARNING

Do not use high pressure air or bring nozzle too close to inlet.

Remove piston seal.

CAUTION: Be careful not to damage piston sliding surface.

Clean piston grooves, caliper cylinder and piston with clean brake fluid.

Clean slide pins with brake cleaner and a rag.

Inspection

If boots **no. 3** are deteriorated or hard, replace with new ones.

Check caliper cylinder for scratches, rust or other damage. If so, replace caliper.

Check piston for scratches, rust or other damage. If so, replace piston.

Assembly

Coat piston seal with clean brake fluid and install it into piston grooves in caliper.

Coat piston with clean brake fluid and install into cylinder with the closed end toward caliper body.

Apply silicone grease into sliding bores and install slide pins.

NOTE: Make sure that rubber boots are correctly installed in slide pins grooves.

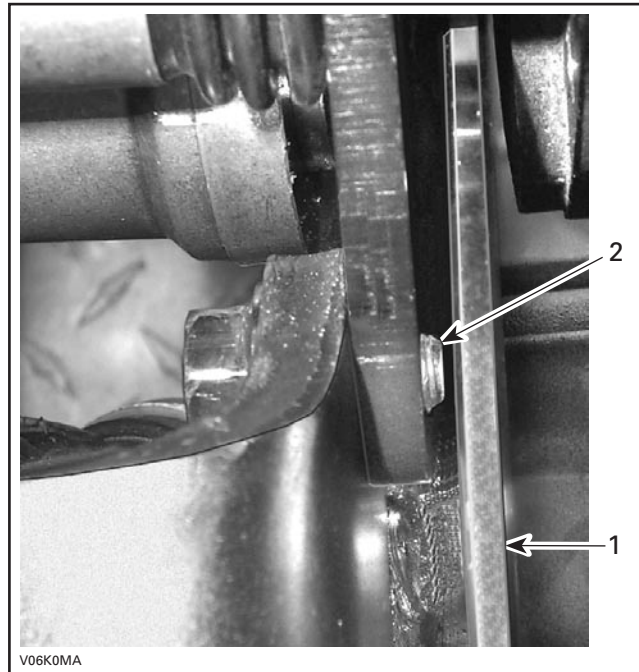
Install pad spring, caliper bracket and pads.

Installation

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

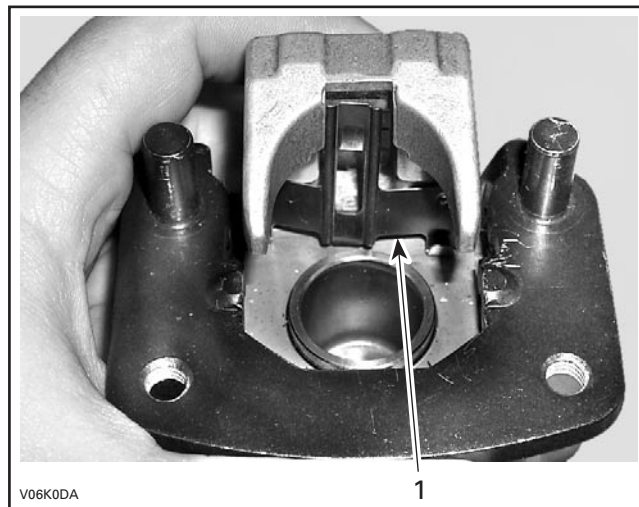
Use new sealing washers when installing Banjo bolt retaining brake hose to caliper.

CAUTION: In case of replacing the bolts **no. 11**, replace it with the same length bolts only. Installing longer bolts can damage brake disc and front brake assembly.



1. Brake disc
2. Bolt

Make sure that the pad spring is installed in the right position.



1. Pad spring

Install caliper to knuckle.

If hose was disconnected, bleed the brakes.

Check for leaks and make sure the brakes operate normally before driving.

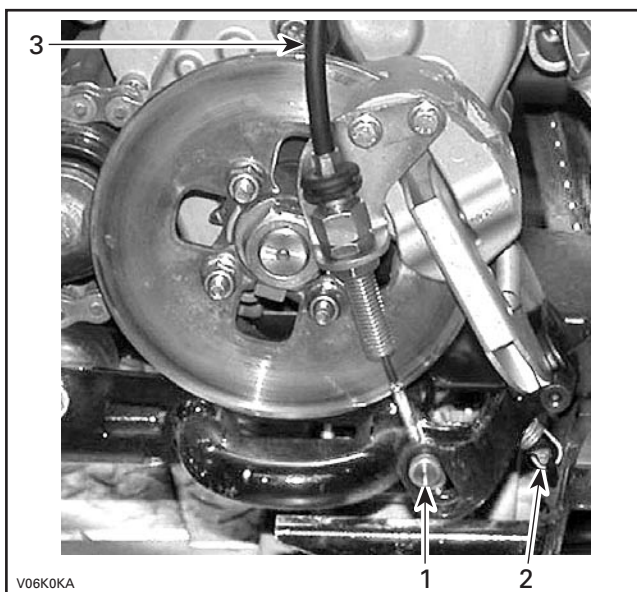
REAR BRAKE CALIPER

Removal

Remove RH side footwell. Refer to **BODY** for removal procedure.

Remove bolts **no. 32** to detach brake cable from rear brake caliper.

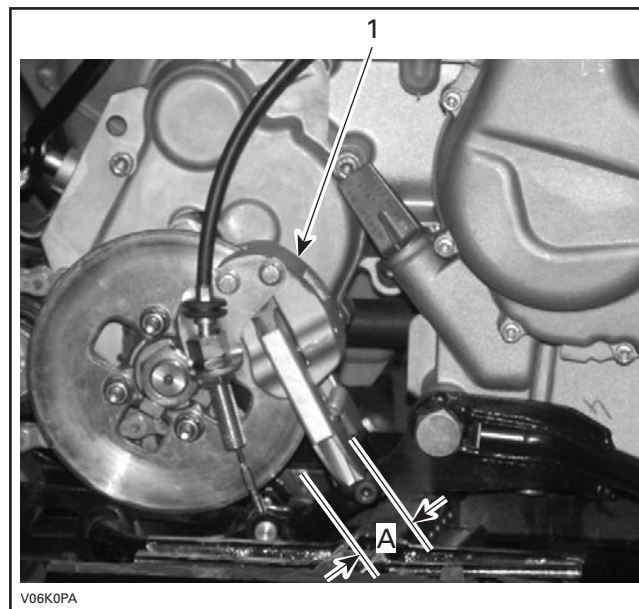
Remove bolts **no. 28** and pull out the rear brake caliper from rear brake disc.



Inspection

Measure play on levers, see the following illustration.

Maximum allowable play is 5 mm (.197 in). If play exceeds specification, replace the caliper.



Installation

For installation, reverse the removal procedure.

BRAKE PADS

Removal

Front Brake Pads

Raise vehicle and support it securely.

Remove wheels.

Drain brake system.

Remove Banjo bolts **no. 7**.

Remove caliper from knuckle.

Push pad pins then remove pads **no. 13**.

CAUTION: Don't let the caliper hang by the hose and don't stretch or twist the hose.

Push piston all the way in to allow installation of new pads.

NOTE: It's very important to clean remaining O.D. of piston out from caliper with brake fluid before pushing the piston back in. Make sure the piston is free of any contaminant and is shiny.

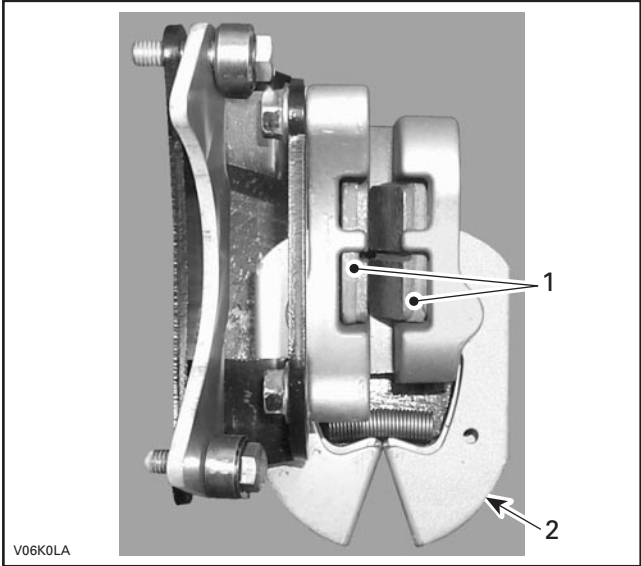
Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

Rear Brake Pads

Remove rear brake calipers, see REAR BRAKE CALIPER for removal procedure.

Remove rear brake pads **no. 30** from the caliper.



1. Rear brake pads
2. Caliper

Inspection

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

Measure brake pad lining thickness.

Brake pads must be replaced when lining is 1 mm (1/32 in) thick or less.



A. 1 mm (1/32 in) minimum

BRAKE PAD MINIMUM THICKNESS	1 mm (1/32 in)
-----------------------------	----------------

⚠ WARNING

Avoid getting oil or grease on brake pads. Contaminated brake pads can affect stopping capacities.

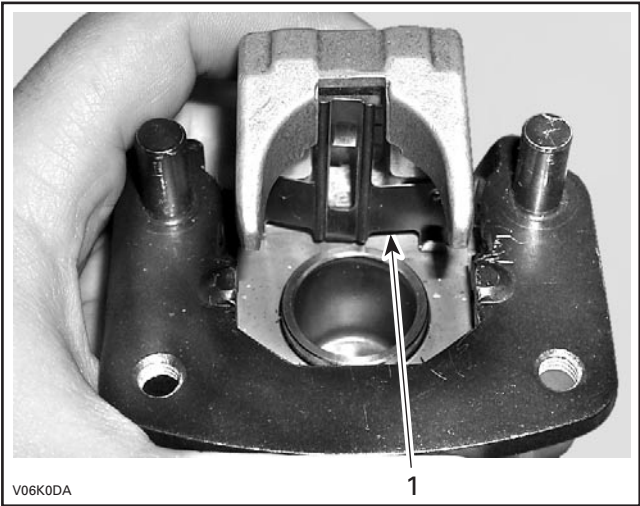
CAUTION: Brake pads must always be replaced in pairs.

Installation

Front Brake Pads

Push caliper pistons inward before installing brake pads.

Make sure that pad spring is in position.



1. Pad spring

Install new brake pads.

Install pad pins by pushing in the pads against pad spring to align pad slots in the pads and caliper body.

Install brake caliper so the disc is positioned between pads.

NOTE: Be careful not to damage pads and that pads are correctly inserted in their location.

After the job is completed, firmly depress the brake lever a few times to bring the pads in contact with the disc.

Check for leaks and make sure the brakes operate normally before driving. The pads must rest flat on the disk.

Rear Brake Pads

Installation procedure is reverse of the removal.

Adjust brake cable.

BRAKE DISC

Front Brake Disc Inspection

Front brake discs **no. 15** can be inspected without removing from the vehicle.

Raise vehicle and support it securely. Remove wheels.

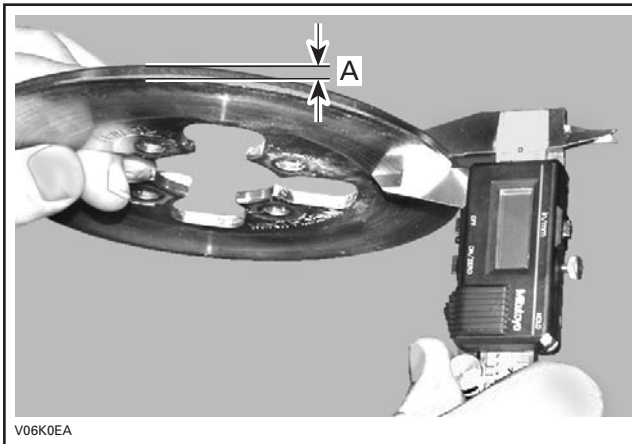
Rear Brake Disc Inspection

NOTE: Rear brake disc **no. 29** can be inspected without removing from vehicle.

Remove RH side footwell. Refer to **BODY** for removal procedure.

Visually inspect disc surfaces for scratches or grooves. Make sure to check both sides of disc.

Measure thickness of the disc. Minimum thickness is 3.5 mm (.13 in).



A. 3.5 mm (.13 in) minimum

Replace disc if not within specifications.

CAUTION: Brake discs should never be machined.

Turn the disc by hand and check run out.

DISC MINIMUM THICKNESS	3.5 mm (.13 in)
DISC RUN OUT (max.)	0.5 mm (.02 in)

Removal

Front Brake Disc

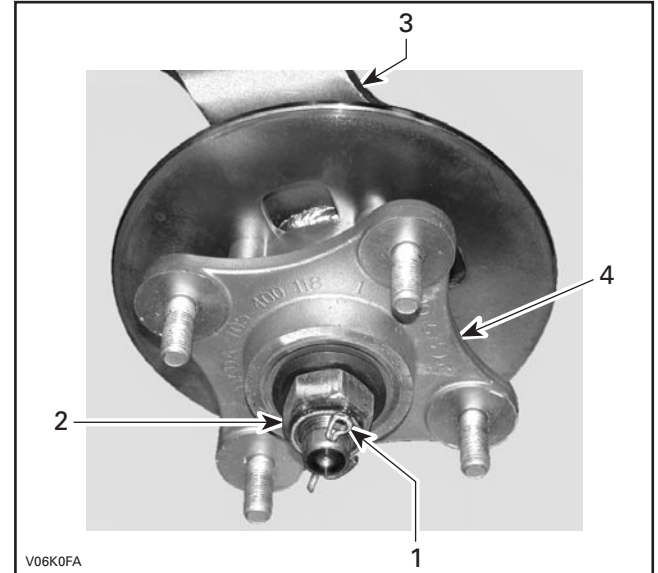
Remove front caliper as described previously.

After removing the caliper, suspend it out of the way.

CAUTION: Don't let the caliper hang by the hose and don't stretch or twist the hose.

NOTE: Wheel hub has to be removed from vehicle to replace brake disc **no.15**.

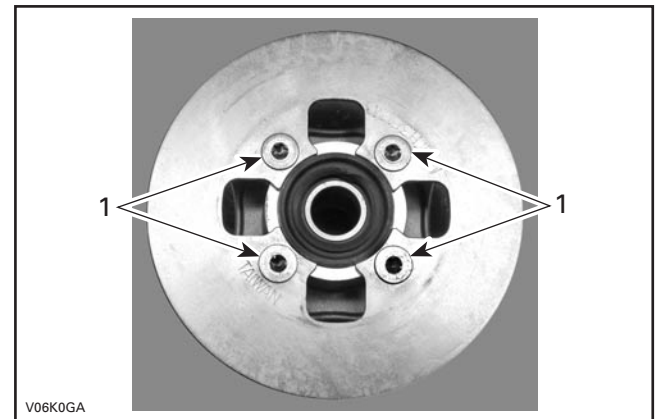
Remove cotter pin and unscrew nut.



1. Cotter pin
2. Nut
3. Knuckle
4. wheel hub

Using hub puller (P/N 529 035 612), pull out wheel hub with disc.

Remove screws **no. 16** retaining brake disc **no. 15** to wheel hub.



1. Screws

NOTE: If necessary, heat up disc around screws to facilitate removal.

Rear Brake Disc

Remove rear caliper as described previously.

Remove bolts **no. 31** retaining brake disc **no. 29**.

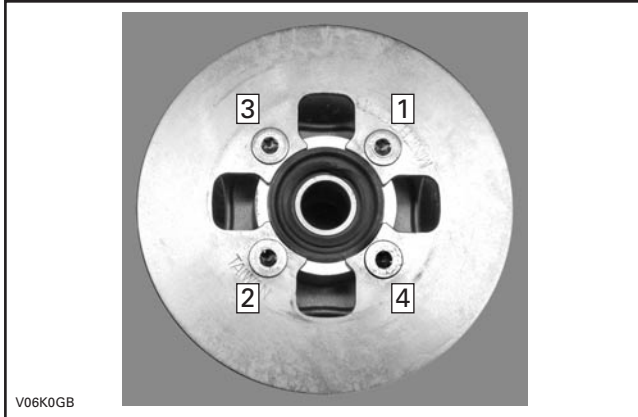
Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

Installation

Front Brake Disc

Install brake disc on wheel hub and tighten screws **no. 16** to 25 N•m (18 lbf•ft) in a criss-cross sequence.



TORQUE TO 25 N•m (18 lbf•ft)

Rear Brake Disc

Install brake disc on hub and tighten the screws **no. 31** to 25 N•m (18 lbf•ft) in a criss-cross sequence.

Install rear caliper as described previously.

Install RH side footwell. Refer to **BODY** for removal procedure.

FRONT BRAKE LEVER

Removal and Installation

Use the same procedure that the front master cylinder.

REAR BRAKE PEDAL

Removal

Remove RH footwell (Refer to **BODY**).

Unhook brake pedal spring **no. 17**.

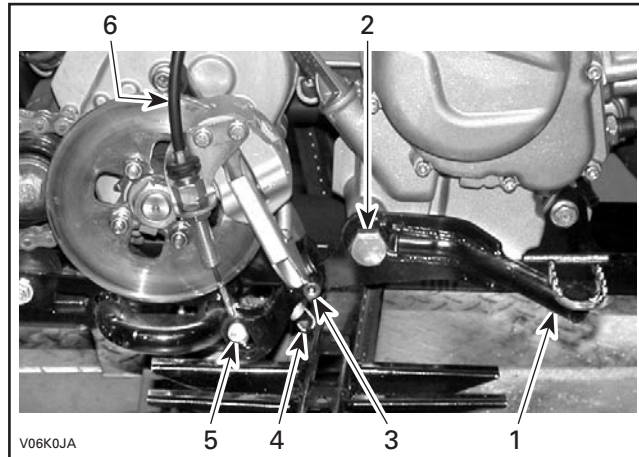
Remove stop nut **no. 19**.

Remove cable barrel **no. 20**.

Remove cable **no. 18** from the brake pedal **no. 24**.

Remove pedal nut **no. 21**.

Remove pivot bolt **no. 22**.



1. Brake pedal
2. Pivot bolt
3. Pedal nut
4. Pedal spring
5. Stop nut
6. Brake cable

Remove washer **no. 25** and outer O-ring **no. 23** then remove pedal **no. 24** from pivot.

Remove the inner O-ring **no. 23** on the pivot.

Inspection

Check brake pedal for cracks or distortion.

Check O-rings for damage, change if necessary.

Installation and Adjustment

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

Apply synthetic grease (P/N 293 550 010) on O-rings.

Install brake cable with the stop nut to the brake pedal.

Install return spring **no. 17**.

Adjust brake cable, see **Brake Cable** for procedure.

REAR BRAKE CABLE

Lubrication

The brake cable must be lubricated with Bombardier cable lubricant (P/N 293 600 041) only.

Remove cable from hand lever. To ease this operation, apply a force on the brake pedal to loosen the cable.

Put the cable luber (P/N 529 035 738) on the cable.

Insert the needle of lubricant can on cable luber hole.

⚠ WARNING

Always wear eye protection and gloves when you lubricate a cable.

NOTE: Place a rag around cable luber to prevent lubricant splash.

Spray a small quantity of Bombardier cable lubricant (P/N 293 600 041) then press the brake pedal to move the brake cable. Repeat this procedure until the silicone lubricant exits the other end of the cable.

Readjust cable, see below.

Removal

NOTE: Before removing brake cable from vehicle, note cable routing for reinstallation.

NOTE: Brake cable can be removed without removing rear caliper and brake pedal.

Remove stop nut **no. 19**.

Remove cable barrel **no. 20** and disconnect brake cable **no. 18** from brake pedal.

Remove the screw retaining the cable clip to the engine.

Inspection

Inspect cable ends for wear or deterioration. Replace if necessary.

Check cable for free movement into the cable sheath. Lubricate or replace if necessary.

Installation and Adjustment

Installation is the reverse of the removal procedure.

Turn the adjustment screw **no. 33** until cable barrel **no. 20** comes in contact with the brake pedal lever.

BRAKE HOSES

Removal

NOTE: Before removing any hoses or tubes, drain brake system.

Front Flexible Brake Hose

Remove:

- console
- front luggage rack.

Refer to **BODY** for complete procedure.

Upper Hose

Disconnect brake handle hose **no. 9** from master cylinder and discard sealing washers.

Remove all locking tie retaining master cylinder hose to handlebar.

Unscrew brake handle hose **no. 9** from vertical brake tube **no. 34**.

Lower Hoses

Disconnect flexible hoses **no. 5** from front calipers and discard sealing washers **no. 8**.

Unscrew flexible hoses **no. 5** from vertical brake tube **no. 34**.

Inspection

Periodically inspect flexible brake hoses for cracks, leaks, blisters and any other damage.

If any sign of deterioration is found, replace the defective part with a new one.

Installation

To install hoses, attach it to the caliper or master cylinder first. Always use new washers on both sides of the fitting.

Make sure brake hoses are properly secured and that they do not come in contact with moving parts.

Bleed brake system.

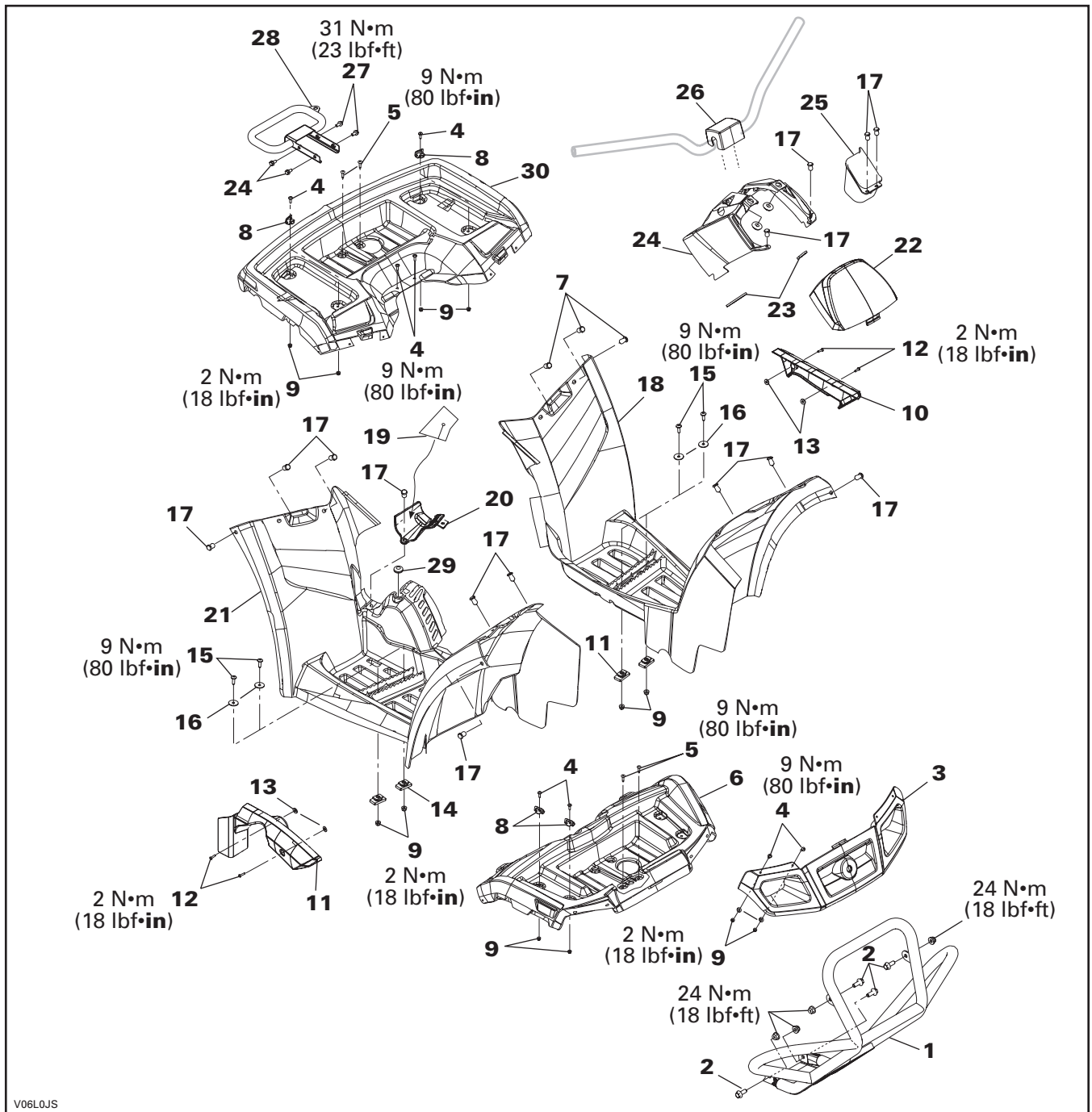
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BODY

BODY PARTS



Section 10 BODY/FRAME
Subsection 02 (BODY)

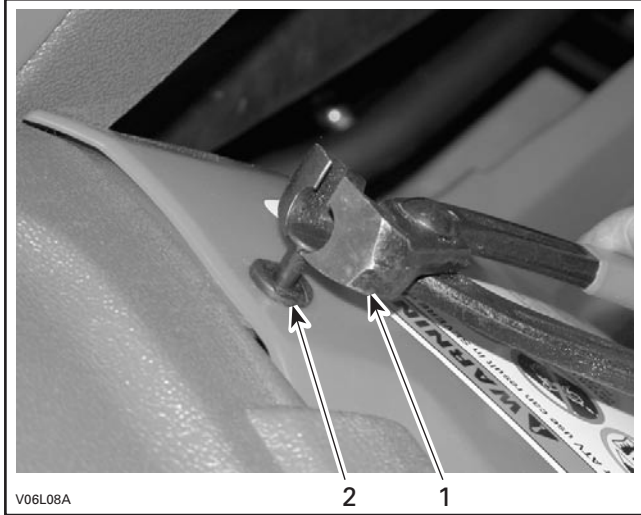
GENERAL

For installation, use the torque values and Loctite products from exploded views. Clean threads before using Loctite product when installing screws.

Plastic Rivet

Plastic rivets **no. 17** are used in the riveting of the various body parts. Plastic rivets can be removed carefully by pliers (P/N 295 000 070).

NOTE: Reuse the plastic rivets.

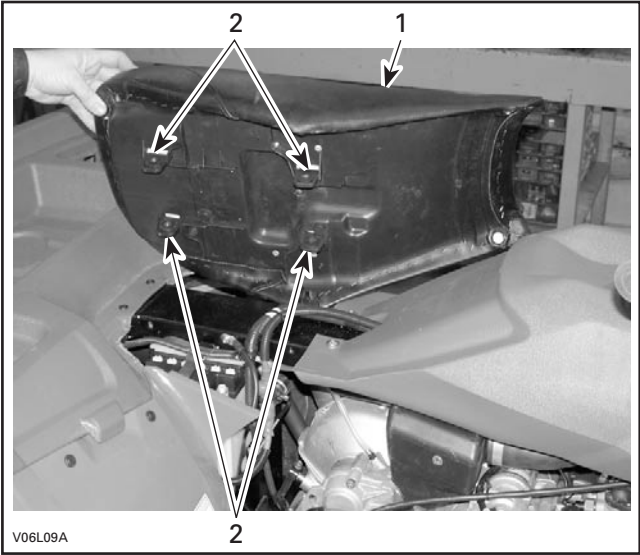


1. Pliers (P/N 295 000 070)
2. Plastic rivet

SEAT

Removal

To remove the seat, first of all remove the right side cover **no. 11** and left side cover **no. 10** to get access to the screws below the seat. Unclamp the CVT air outlet hose. Remove screws below the seat to remove the seat.



1. Seat
2. Screw holes

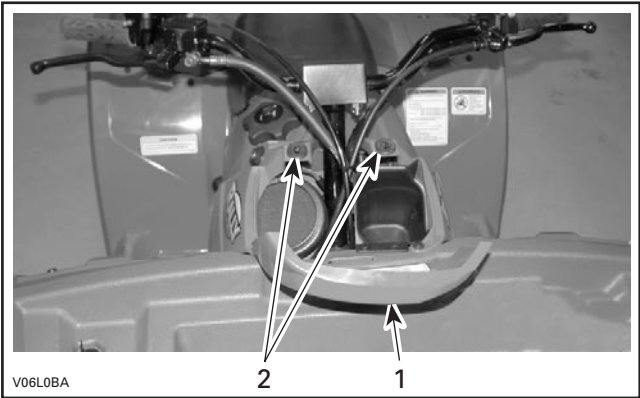
Installation

Insert seat on frame. Install screws below the seat. When seat rests in its position, install the CVT air outlet hose. Install right side cover **no. 11** and left side cover **no. 10**.

DASH BOARD COVER

Removal

Pull out the console cover to release its pins from oblong washers (rubber grommet).



1. Console cover
2. Oblong washers

Installation

The installation is the reverse of removal procedure.

DASH BOARD/STEERING COVER

Removal

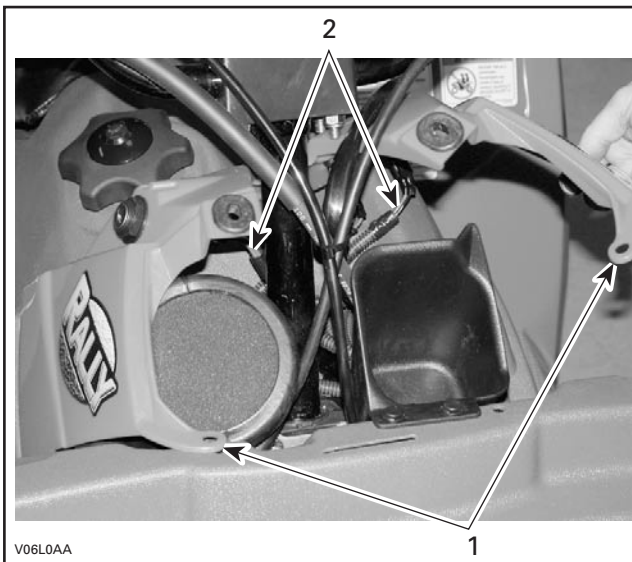
Steering Cover

The steering cover no. 26 can be remove by lifting upwards.

Dash Board

NOTE: Console cover must be removed before removing dashboard.

Dash board no. 24 is retained by two rubber latches no. 23 and plastic rivets no. 17. Unlatch the dash board and remove the plastic rivets. Unplug the electric connections to the dash board to remove it completely from the vehicle.



- 1. Dash board
- 2. Electric connections

Inspection

Check latches no. 23 from dash board for cracks or other damages. Change if necessary.

Installation

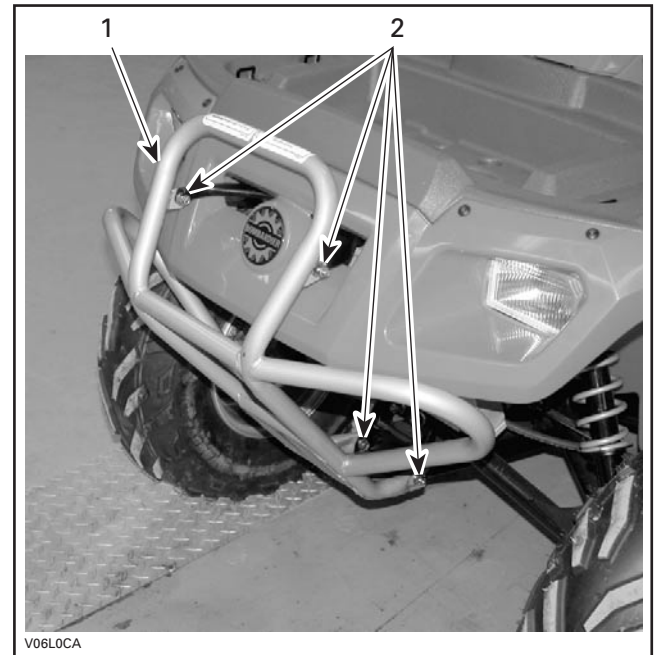
Installation is the reverse order of removal.

FRONT BUMPER/LUGGAGE RACK

Removal

Front Bumper

To remove front bumper no. 1, unscrew screws no. 2.



- 1. Front bumper
- 2. Screws

Front Luggage Rack

CAUTION: Unplug electric connections to headlight before removing luggage rack. Refer to **INSTRUMENTS AND ACCESSORIES**.

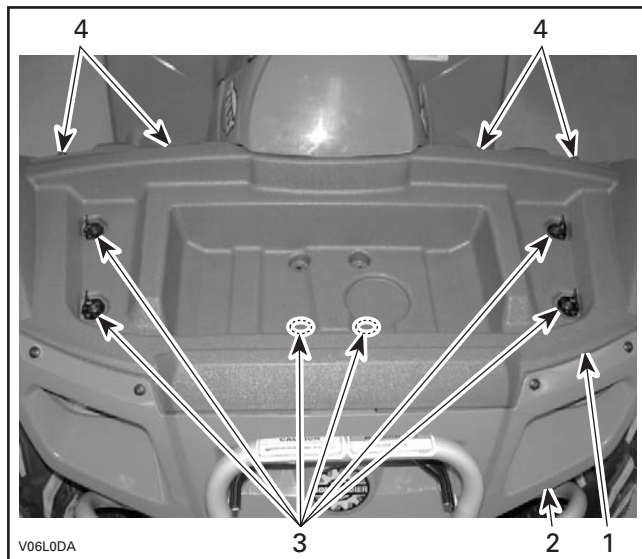
Remove screws no. 4 and no. 5 and plastic rivets no. 17 to remove front luggage rack with front fascia.

NOTE: To remove front luggage rack no. 6 with front fascia, do not remove screws no. 4 attaching to front fascia.

Section 10 BODY/FRAME

Subsection 02 (BODY)

Pull front luggage rack no. 6 upward.



1. Front luggage rack
2. Front fascia
3. Screws
4. Plastic rivets

Installation

Installation is in the reverse order of removal.

FRONT FASCIA

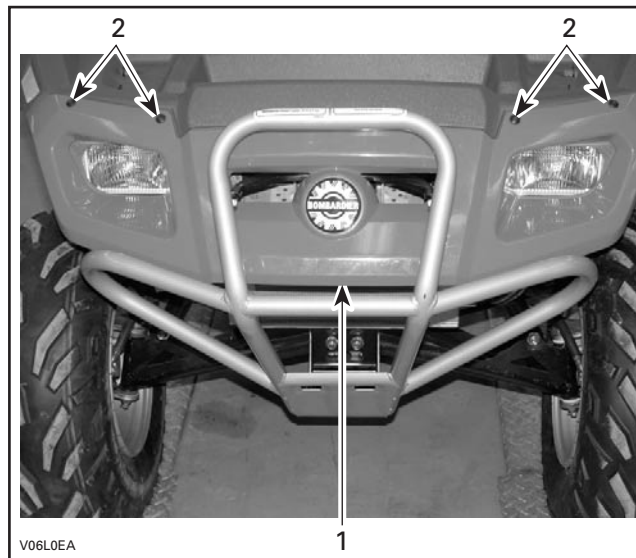
Removal

Remove front bumper.

Front Facia

Remove headlights.

Remove the screws no. 4 attaching front fascia no. 3 to the luggage rack no. 6.



1. Front fascia
2. Screws

Installation

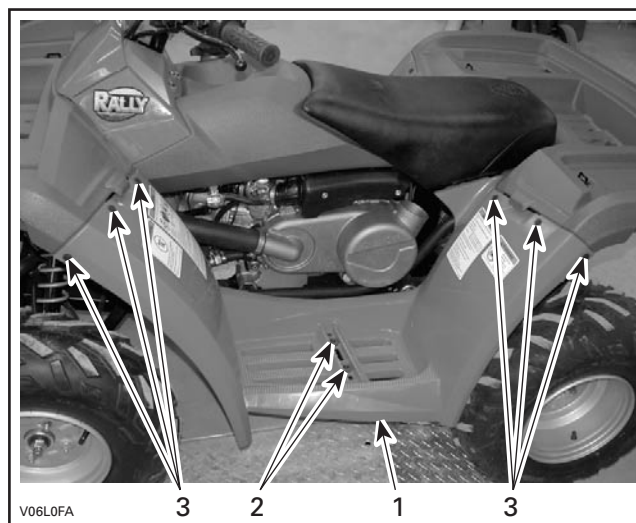
Installation is the reverse order of removal.

RH/LH FOOTWELLS

Removal

LH Side Footwell

Remove screws no. 15. Remove plastic rivets no. 17 to remove the LH side footwell no. 18.

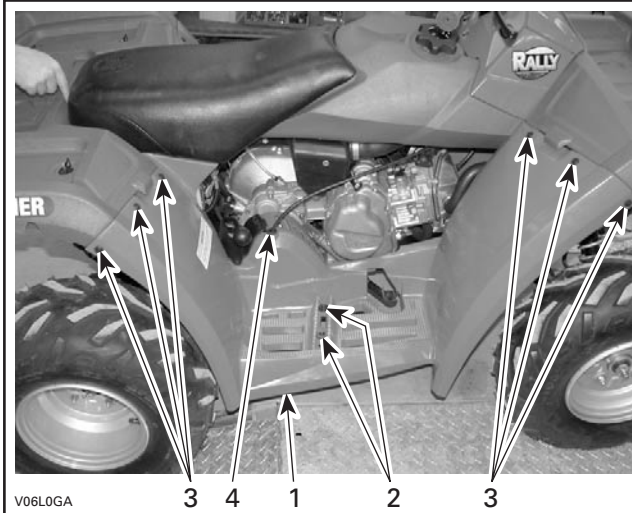


1. LH side footwell
2. Screws
3. Plastic rivets

RH Side Footwell

Remove the chain cover **no. 20** by removing the plastic rivet **no. 17**.

Remove screws **no. 15** retaining RH side footwell **no. 21**. Remove plastic rivets **no. 17**. Pull out the RH side footwell by detaching the grommet **no. 29** from it.



1. RH side footwell
2. Screws
3. Plastic rivets
4. Grommet

Installation

Installation is the reverse order of removal.

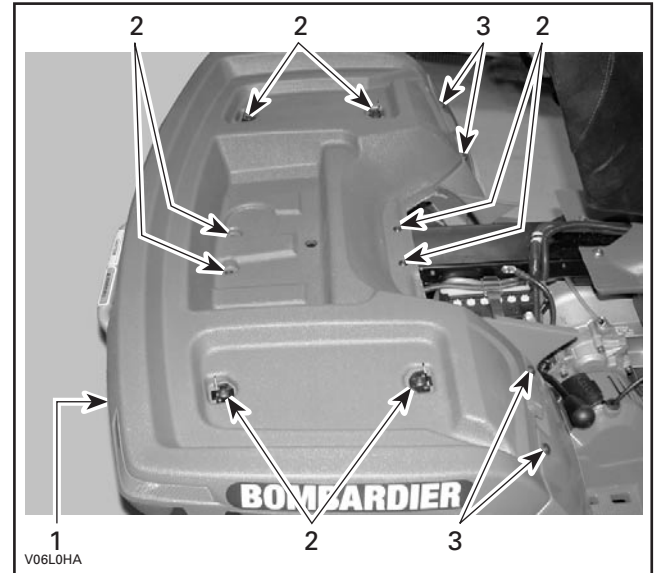
REAR LUGGAGE RACK/ REAR BUMPER

Removal

Rear Luggage Rack

Remove the seat.

Remove screws **no. 4** and screws **no. 5** retaining rear luggage rack **no. 30**. Remove plastic rivets **no. 17** retaining rear luggage rack **no. 30** to the RH and LH footwells.



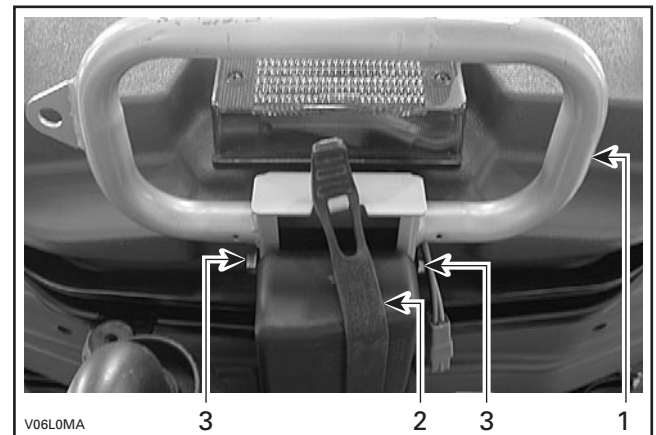
1. Rear luggage rack
2. Screws
3. Plastic rivets

Withdraw rear luggage rack.

Rear Bumper

Unlatch the rubber strap from the rear bumper.

Remove screws **no. 27**.



1. Rear bumper
2. Rubber strap
3. Screws

Pull the rear bumper.

Section 10 BODY/FRAME

Subsection 02 (BODY)

Installation

Installation is the reverse order of removal.

NOTE: Install all screws before torque.

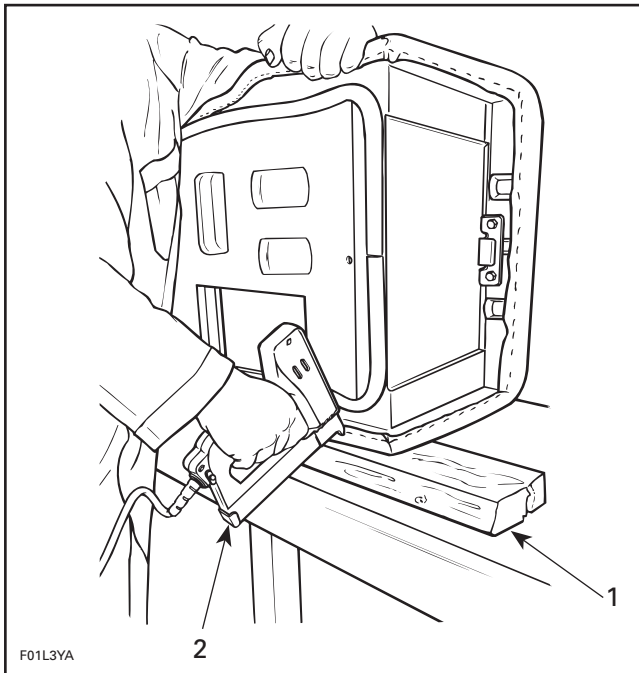
SEAT COVER REPLACEMENT

Remove the old seat cover. Check the foam and replace if necessary.

Install staples with an electric tacker such as Arrow tacker no. ETN-50 or with a manual tacker such as Arrow tacker no. T-50.

NOTE: For an easier installation, it's highly recommended to use an electric tacker.

Ensure that the seat rest firmly against a hard surface such as a piece of wood. This is done to get the staples completely pushed in place.



TYPICAL

1. Piece of wood
2. ETN-50 (electric) or T-50 (manual)

After cover installation cut all around the excess of material.

SEAT CLEANING

It is recommended to clean the seat with a solution of **warm soapy water**, using a soft clean cloth.

CAUTION: Avoid use of harsh detergents such as strong soaps, degreasing solvents, abrasive cleaners, paint thinners, etc. that may cause damage to the seat cover.

DECALS REPLACEMENT

Removal

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.

Installation

There are 2 types of decals used on ATV. One has a protective film on back side and the other has a protective film on both sides. They are used on 2 types of materials; plastic and metal.

DECALS HAVING A PROTECTIVE FILM ON BACK SIDE ONLY

These decals usually contain written information (ex.: warning).

Clean surface with a good solvent such as ACRYL-CLEAN DX 330 from PPG or equivalent (refer to manufacturer instructions).

Using a pencil and the decal as a template, mark the area where decal will be located.

Remove half of the decal back protective film and align decal with marks. Start sticking it from center and remove the other half of the film to stick it completely. Carefully squeegee decal beginning at center and working outward using, firm, short, overlapping strokes.

DECALS HAVING A PROTECTIVE FILM ON BOTH SIDES

These decals usually contain graphics.

INSTALLATION ON PLASTIC

Clean surface with isopropyl alcohol.

Using a pencil and the decal as a template, mark the area where decal will be located.

Apply an activator (P/N 293 530 036) to prepare the surface using a clean cloth. After a few seconds, when the activator evaporates, the surface is ready.

CAUTION: Do not use soapy water to locate decal on plastic parts.

Remove back protective film from decal and carefully align decal with marks. When well aligned squeegee decal beginning at center and working outward using firm, short, overlapping strokes.

PLASTIC MAINTENANCE**MAINTENANCE**

Clean the vehicle thoroughly, removing all dirt and grease accumulation.

To clean use a soft clean cloth and either soapy water or isopropyl alcohol.

To remove grease, oil or glue use isopropyl alcohol.

CAUTION: Do not apply isopropyl alcohol or acetone directly on decals.

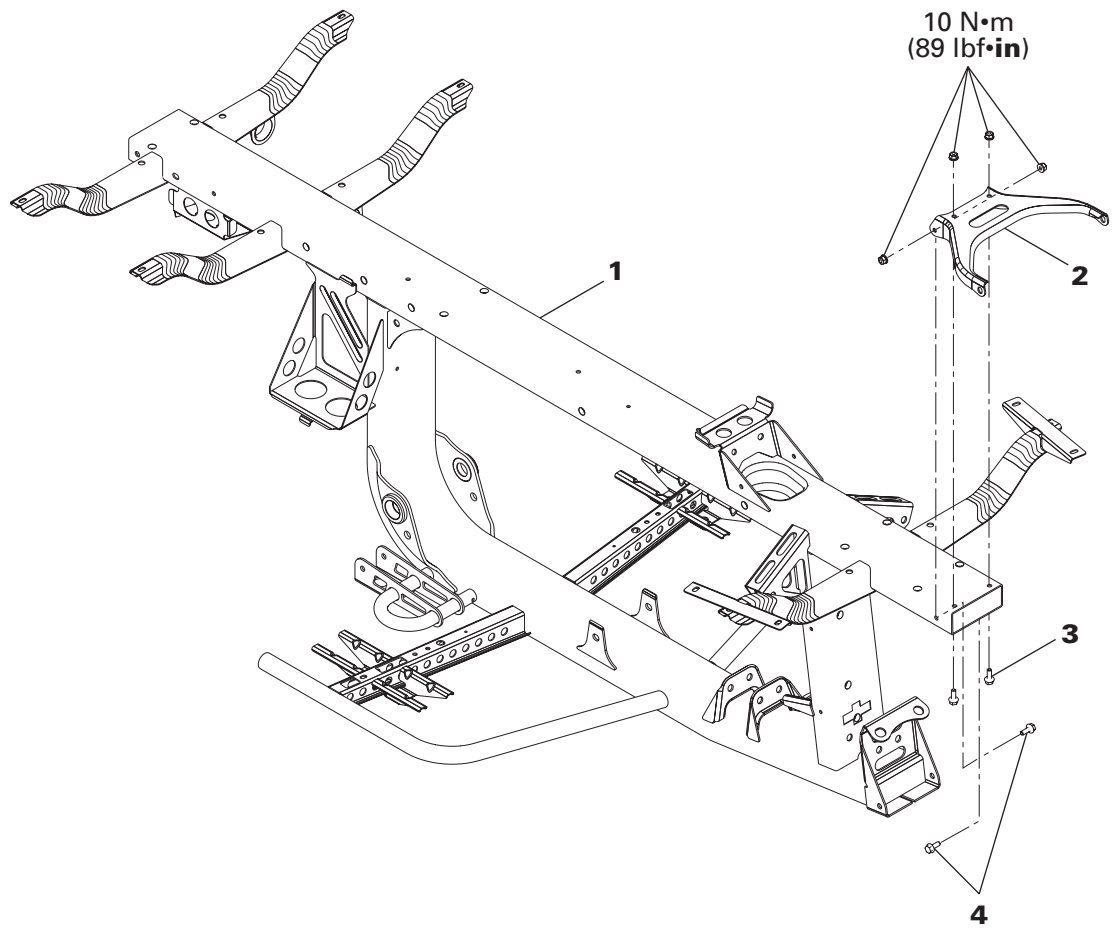
CAUTION: The following products must not be used to clean or wax any of the plastic components used on the vehicles:

- gasoline
- brake fluid
- kerosene
- diesel fuel
- lighter fluid
- varsol
- naphtha
- acetone
- strong detergents
- abrasive cleaners
- waxes containing an abrasive or a cleaning agent in their formula.

PLASTIC REPAIR

No plastic part on the vehicle is repairable. Change all defective parts.

FRAME



V06L0KS

Section 10 BODY/FRAME

Subsection 03 (FRAME)

GENERAL

For installation, use the torque values and Loctite products from exploded views. Clean threads before using Loctite product when installing screws.

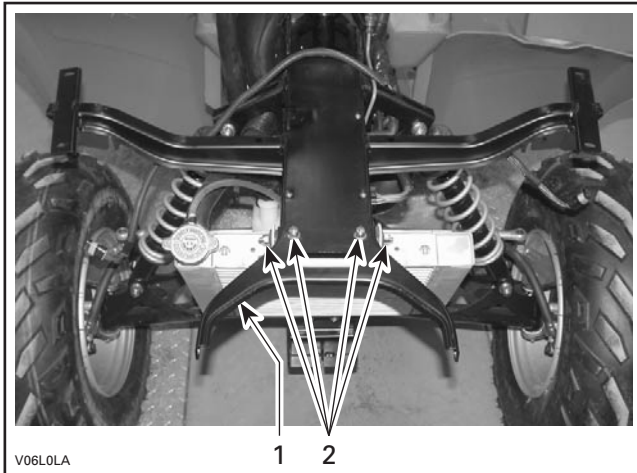
CAUTION: Before performing electrical welding anywhere on the vehicle, unplug the electronic module connector. Also unplug the negative cable and the voltage regulator. This will protect the electronic module and battery against damage caused by flowing current when welding.

FRONT PLATE

Removal

Remove front bumper, front fascia and front luggage rack. Refer to **BODY**.

Remove screws **no. 3** and screws **no. 4**.



1. Front latch
2. Screws

Withdraw the front plate **no. 2** from the frame.

Inspection

Check for crack or other damage. Change if necessary.

Installation

Installation is the reverse of removal procedure.

FRAME

Cleaning

Clean frame **no. 1** with appropriate cleaners and rinse with high pressure hose.

NOTE: Clean the draining holes under frame. The drain holes are located at the rear of bottom side of frame.

Touch up all metal spots where paint has been scratched off. Spray all bare metal parts of vehicle with metal protector.

Welding

Steel Frame:

- electric welding
- amperage: 70 - 110 A
- voltage: 20 - 24 V
- rod: E-7014 (3/32 in).

CAUTION: Before performing electrical welding anywhere on the vehicle, unplug the multiple connector at the electronic module connector. Also unplug the negative cable and the voltage regulator. This will protect the electronic module and battery against damage caused by flowing current when welding.

NOTE: Install the ground as close as possible from the reparation area.

CAUTION: If welding is to be done near plastic material, it is recommended to either remove the part from the area or to protect it with aluminum foil to prevent damage.

TECHNICAL DATA

SI* METRIC INFORMATION GUIDE

BASE UNITS			
DESCRIPTION		UNIT	SYMBOL
length		meter	m
mass		kilogram	kg
force		newton	N
liquid		liter	l
temperature		Celsius	°C
pressure		kilopascal	kPa
torque		newton•meter	N•m
speed		kilometer per hour	km/h
PREFIXES			
PREFIX	SYMBOL	MEANING	VALUE
kilo	k	one thousand	1 000
centi	c	one hundredth	0.01
milli	m	one thousandth	0.001
micro	μ	one millionth	0.000001
CONVERSION FACTORS			
TO CONVERT		TO †	MULTIPLY BY
in		mm	25.4
in		cm	2.54
in ²		cm ²	6.45
in ³		cm ³	16.39
ft		m	0.3
oz		g	28.35
lb		kg	0.45
lbf		N	4.4
lbf•in		N•m	0.11
lbf•ft		N•m	1.36
lbf•ft		lbf•in	12
PSI (lbf/in ²)		kPa	6.89
imp. oz		U.S. oz	0.96
imp. oz		ml	28.41
imp. gal		U.S. gal	1.2
imp. gal		l	4.55
U.S. oz		ml	29.57
U.S. gal		l	3.79
MPH		km/h	1.61
Fahrenheit		Celsius	(°F - 32) ÷ 1.8
Celsius		Fahrenheit	(°C x 1.8) + 32

* The international system of units abbreviates SI in all languages.

† To obtain the inverse sequence, divide by the given factor. To convert "mm" to "in", divide by 25.4.

NOTE: Conversion factors are rounded off to 2 decimals for easier use.

ENGINE AND VEHICLE

VEHICLE MODEL				RALLY™ 200		
ENGINE	Engine type			BOMBARDIER-ROTAX, 4 stroke, Over Head Camshaft (OHC), liquid cooled		
	Starting system			Electric		
	Number of cylinder(s)			1		
	Number of valves			4 valves with mechanical adjustment		
	Bore	Standard	mm (in)	62 (2.4)		
	Stroke		mm (in)	58.4 (2.3)		
	Displacement		cm³ (in³)	176.3 (10.8)		
	Compression ratio		± 0.4	11.3:1		
	Maximum HP RPM			10500		
	Lubrication			Wet sump with replaceable oil filter, without oil filter bypass		
	Oil filter			BOMBARDIER-ROTAX — CHAMPION		
	Air filter type			2 stage foam filter		
	Exhaust system	Type		Single output		
		Spark arrester		USDA approved		
	Intake valve opening			13.00° BTDC		
	Intake valve closing			43.00° ABDC		
	Exhaust valve opening			48.00° BBDC		
	Exhaust valve closing			8.00° ATDC		
	Valve/valve stem diameter clearance	Intake	New minimum	mm (in)	0.022 (.0009)	
			New maximum	mm (in)	0.045 (.0018)	
			Wear limit	mm (in)	0.120 (.0047)	
		Exhaust	New minimum	mm (in)	0.032 (.0013)	
			New maximum	mm (in)	0.055 (.0022)	
			Wear limit	mm (in)	0.120 (.0047)	
	Valve guide diameter		Wear limit	mm (in)	4.06 (.16)	
	Valve spring free length		New nominal	mm (in)	33.6 (1.323)	
			Service limit	mm (in)	33.4 (1.315)	
	Valve seat contact width	Intake	New	mm (in)	1.05 to 1.35 (.041 to .053)	
			Wear limit	mm (in)	1.6 (.063)	
		Exhaust	New	mm (in)	1.25 to 1.55 (.049 to .061)	
			Wear limit	mm (in)	1.8 (.070)	
	Piston measurement		New nominal	mm (in)	61.942 to 61.958 (2.4386 to 2.4393)	
			Wear limit	mm (in)	61.930 (2.4382)	
	Piston/cylinder clearance		New nominal	mm (in)	0.042 to 0.072 (.0016 to .0028)	
			Wear limit	mm (in)	0.100 (.0039)	
	Piston ring type			1 st	Rectangular	
2 nd				Taper-face		
3 rd				Oil scraper ring		
Piston ring end gap	Rectangular	New minimum	mm (in)	0.15 (.006)		
	Taper-face		mm (in)	0.15 (.006)		
	Oil scraper ring		mm (in)	0.15 (.006)		
	Rectangular	New maximum	mm (in)	0.35 (.014)		
	Taper-face		mm (in)	0.35 (.014)		
	Oil scraper ring		mm (in)	0.30 (.012)		
	All	Wear limit	mm (in)	1.5 (.06)		
Piston/ring groove clearance	Rectangular	New minimum	mm (in)	0.025 (.001)		
	Taper-face		mm (in)	0.015 (.0006)		
	Oil scraper ring		mm (in)	0.020 (.0008)		
	Rectangular	New maximum	mm (in)	0.070 (.0028)		
	Taper-face		mm (in)	0.060 (.0024)		
	Oil scraper ring		mm (in)	0.055 (.0021)		
	All	Wear limit	mm (in)	0.15 (.0059)		

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

VEHICLE MODEL			RALLY™ 200			
ENGINE	Rocker arm bore diameter		New minimum	mm (in)	10.036 (.3951)	
			New maximum	mm (in)	10.050 (.3957)	
			Wear limit	mm (in)	10.060 (.3961)	
	Rocker arm shaft diameter		New minimum	mm (in)	10.006 (.3939)	
			New maximum	mm (in)	10.015 (.3943)	
			Wear limit	mm (in)	9.950 (.3917)	
	Cylinder bore		New	mm (in)	62.000 to 62.014 (2.4409 to 2.4415)	
			Wear limit	mm (in)	62.030 (2.4417)	
	Cylinder taper		New maximum	mm (in)	0.052 (.002)	
			Wear limit	mm (in)	0.090 (.004)	
	Cylinder out of round		New maximum	mm (in)	0.015 (.0006)	
			Wear limit	mm (in)	0.02 (.0008)	
	Camshaft bearing journal		PTO side	New minimum	mm (in)	19.959 (.7857)
				New maximum	mm (in)	19.980 (.7866)
				Wear limit	mm (in)	19.940 (.7850)
			Magneto side	New minimum	mm (in)	31.950 (1.2578)
				New maximum	mm (in)	31.975 (1.2588)
				Wear limit	mm (in)	31.930 (1.2571)
	Camshaft bore		PTO side	New minimum	mm (in)	20.000 (.7874)
				New maximum	mm (in)	20.021 (.7882)
				Wear limit	mm (in)	20.035 (.7888)
			Magneto side	New minimum	mm (in)	32.000 (1.2598)
				New maximum	mm (in)	32.025 (1.2608)
				Wear limit	mm (in)	32.040 (1.2614)
	Cam lobe		Intake	New minimum	mm (in)	30.887 (1.216)
				New maximum	mm (in)	31.087 (1.224)
				Wear limit	mm (in)	30.800 (1.252)
			Exhaust	New minimum	mm (in)	30.887 (1.216)
				New maximum	mm (in)	31.087 (1.224)
				Wear limit	mm (in)	30.800 (1.252)
	Crankshaft axial clearance		New minimum	mm (in)	0.2 (.0078)	
			New maximum	mm (in)	0.4 (.0157)	
	Crankshaft deflection		MAG side	New nominal	mm (in)	0.04 (.0024)
			PTO side	New nominal	mm (in)	0.04 (.0024)
	Crankshaft pin diameter		New minimum	mm (in)	26.037 (1.0250)	
			New maximum	mm (in)	26.040 (1.0252)	
			Wear limit	mm (in)	26.020 (1.0244)	
	Crankshaft journal diameter		MAG side	New minimum	mm (in)	32.010 (1.2602)
				New maximum	mm (in)	32.025 (1.2608)
				Wear limit	mm (in)	32.000 (1.2598)
			PTO side	New minimum	mm (in)	32.010 (1.2602)
				New maximum	mm (in)	32.025 (1.2608)
				Wear limit	mm (in)	32.000 (1.2598)
	Crankshaft radial clearance		MAG side	Service limit	mm (in)	0.07 (.0028)
			PTO side			
	Connecting rod big end diameter		New minimum	mm (in)	26.050 (1.0256)	
			New maximum	mm (in)	26.078 (1.0267)	
			Service limit		26.090 (1.0272)	
	Connecting rod big end clearance		Service limit		0.07 (.0028)	
	Connecting rod big end axial play		New minimum	mm (in)	0.3 (.012)	
			New maximum	mm (in)	0.627 (.025)	
			Wear limit	mm (in)	0.8 (.03)	
	Connecting rod small end diameter		New minimum	mm (in)	15.005 (.5908)	
			New maximum	mm (in)	15.015 (.5911)	
			Wear limit	mm (in)	15.060 (.5929)	
	Piston pin diameter		New minimum	mm (in)	14.997 (.5904)	
			New maximum	mm (in)	15.000 (.5906)	
			Wear limit	mm (in)	14.990 (.5902)	
	Piston pin bore clearance		Wear limit	mm (in)	0.03 (.0012)	

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL			RALLY™ 200		
ELECTRICAL	Magnet/generator			200 W @ 6000 RPM		
	Ignition system type			IDI (Inductive Discharge Ignition)		
	Ignition timing			Not adjustable		
	Spark plug	Quantity		1		
		Make and type		NGK CR8E		
		Gapmm (in)		0.6 to 0.7 (.024 to .027)		
	Trigger coil (pickup coil)Ω			190 – 300		
	Battery charging coil (lightning coil)Ω			0.6 ± 01		
	Ignition coil	PrimaryΩ		1.87 to 2.53 @ 20°C (68°F)		
		SecondarykΩ		10.4 to 15.6 @ 20°C (68°F)		
	Engine RPM limiter			10500		
	Engine RPM limiter (reverse)			6000		
	Battery	Type		Electrolyte battery type		
		Voltage		12 volts		
		Nominal rating		14 A•h		
		Power starter output		0.6 KW		
	Headlight			2 x 30 W		
Taillight			8/27 W, 1157			
Pilot lamp cluster			LEDS			
Fuses			25 A			
CARBURETION	Carburetor	Type		Mikuni with manual choke		
		Model		VM-24		
	Idle engine speedRPM			1500 ± 100		
	Main jet			105		
	Pilot jet			22.5		
	Needle jet			0-2M		
	Jet needle			5GNY 72-3		
	Choke plunger position			Variable		
	Adjustment	Throttle cable		4 mm (.157 in)		
		Preliminary pilot screw turn		3/4		
		Float level	± 0.5 mm		15	
			± 0.020 in		.591	
Fuel	Type		Regular unleaded gasoline			
	Octane no.		87 (Ron + Mon)/2			
LUBRICATION	Lubricant			SAE 5W30 or 5W40 Bombardier synthetic oil mineral based		
	Oil pressure switch			30 to 60 kPa (4.35 to 8.70 PSI)		
	Oil temperature (max.)			120°C (248°F)		
	Oil pressure (min.)			350 kPa (50.76 PSI)		
CVT	Belt width	New minimummm (in)		21.00 (.8267)		
		New maximummm (in)		22.00 (.8661)		
		Wear limitmm (in)		19.50 (.7677)		
	CVT - temperature (max.)			75°C (167°F)		
	Centrifugal clutch (driven pulley)	Operating RPM		3500 ± 100		
COOLING	Coolant			Ethyl glycol/water mix (50% coolant, 50% water). Use coolant specifically designed for aluminum engines		
	Water temperature switch			115°C (239°F)		
	Water temperature (max.)			100°C (212°F)		
	Engine thermostat	Opening temperature		65°C (149°F)		
	Radiator cap opening pressure			110 kPa (16 PSI)		
DRIVE TRAIN	Transmission	Type		CVT (Continuously Variable Transmission). HI range, neutral and reverse		
	Rear axle			Chain driven/solid axle		
	Rear axle ratio			2.7:1		

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL			RALLY™ 200
STEERING/ CONTROL	Turning radius			1.85 m (73 in)
	Total toe (vehicle on ground)mm (in)			0 ± 3 (0 ± .118), each side
	Camber angle			4°
	Tie-rod total lengthmm (in)			320 ± 5 (12.598 ± 0.197)
	Tie-rod maximum length unengagedmm (in)			23 ± 5 (.906 ± 0.197)
SUSPENSION	FRONT			
	Suspension type			Independent suspension — single A-arm
	Suspension travelmm (in)			137 (5.39)
	Shock absorber	Qty		2
		Type		Oil
	Spring free lengthmm (in)			261 (10.27)
	Spring color code			Silver
	Front preload adjustment			N.A.
	REAR			
	Suspension type			Rigid swing arm
	Suspension travelmm (in)			163.0 (6.42)
	Shock absorber	Qty		1
		Type		Oil
	Spring free lengthmm (in)			294 (11.57)
	Spring color code			Silver
Rear preload adjustment			N.A.	
BRAKES	Front brake	Qty		2, discs
		Type		Hydraulic
	Rear brake	Qty		1, disc
		Type		Mechanical cable
	Parking brake			Brake lever lock on LH brake lever
	Caliper			Floating
	Lining material			Organic
	Minimum pad thicknessmm (in)			1 (.04)
Minimum brake disk thicknessmm (in)			3.5 (.14)	
Maximum brake disk warpagemm (in)			0.25 (.01)	
TIRES AND WHEELS	TIRE			
	Pressure	Front	Recommended	24 kPa (3.5 PSI)
			Minimum	21 kPa (3 PSI)
		Rear	Recommended	24 kPa (3.5 PSI)
			Minimum	21 kPa (3 PSI)
	Minimum tire thread depthmm (in)			4 (0.16)
	Size	Front		22 x 10 x 7
		Rear		22 x 10 x 10
	WHEELS			
	Size	Front		10 x 5.5
		Rear		10 x 8
	Overall lengthmm (in)			2026 (79.8)
Overall widthmm (in)			1054 (41.5)	
Overall heightmm (in)			1070 (42)	
DIMENSION	Dry weightkg (lb)			176 (388)
	Wheel basemm (in)			1181 (46.5)
	Wheel track	Front	mm (in)	880 (34.6)
		Rear	mm (in)	811 (31.9)
	Front and under engine ground clearancemm (in)			229 (9)
	Rear rigid axle ground clearancemm (in)			160 (6.3)

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL		RALLY™ 200
CAPACITIES	<i>LIQUID</i>		
	Fuel tank		16.5 l (4.4 U.S. gal)
	Fuel tank reserve		5 l (1.2 U.S. gal)
	Engine	Capacity ± 100	1.35 l (1.43 quarts)
		Recommended	SAE 5W30, 4 stroke mineral based oil SG, SH or SJ or 5W40 Bombardier synthetic oil. Refer to the oil viscosity chart in the MAINTENANCE AND LUBRICATION subsection
	Gearbox	Capacity	200 ml (6.76 U.S. oz)
		Recommended	Castrol HYPOX C 175 W or ISO V G 100 (BP GR-XP 100)
	Hydraulics brakes	Capacity	202 ml (6.83 U.S. oz)
		Recommended	Brake fluid DOT 4, ONLY
	Cooling system		2.5 l (2.65 quarts)
	<i>BODY AND FRAME</i>		
	Weight distribution	Front/rear %	52/48
	Rack	Front	16 kg (35 lb)
		Rear (including tongue weight)	30 kg (65 lb)
	Total vehicle load allowed (including driver, all other loads and added accessories)		175 kg (386 lb)
MATERIAL	Gross vehicle weight rating		369 kg (813 lb)
	Towing		227 kg (500 lb)
	Tongue (included with rear rack weight)		14 kg (30 lb)
	Frame	Material	Steel
		Color	Black
	Wheel	Material	Steel
		Color	Silver
	Front/rear rack	Material	High density polyethylene
		Color	Earthen grey
	Front bumper	Material	Steel
		Color	Silver
	Front/rear fender	Material	High density polyethylene
		Color	Red, Green or Yellow
	Steering cover	Material	High density polyethylene
		Color	Red or Green or Yellow
	Front fascia	Material	High density polyethylene
		Color	Red, Green or Yellow
	Engine side panel	Material	HMWPE
		Color	Black
	Air box	Material	High density polyethylene
		Color	Black
	Seat base	Material	High density polyethylene
		Color	Black
	Seat cover	Material	Thermoformed vinyl
		Color	Black

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

VEHICLE MODEL		RALLY™ 200	SERVICE PRODUCT
TORQUE	ENGINE		
	Oil filter screw	9 N•m (80 lbf•in)	None
	Dipstick tube screw		
	Magneto cover bolts		
	Starter bolts		
	Engine sprocket nut	95 N•m (70 lbf•ft)	
	Starter RED (+) cable	6 N•m (53 lbf•in)	Dielectric grease
	Rotor bolt	35 N•m (26 lbf•ft)	Loctite 243
	Stator bolt	9 N•m (80 lbf•in)	None
	Trigger coil bolt		
	COOLING		
	Block heater lock	3 N•m (27 lbf•in)	None
	Thermostat housing	5 N•m (44 lbf•in)	
	Thermostat bleeding screw	4 N•m (35 lbf•in)	
	Temperature sensor	17 N•m (151 lbf•in)	
	Water pump housing	9 N•m (80 lbf•in)	
	Fan mount screw/nut	4.5 N•m (40 lbf•in)	Loctite 243
	Temperature sender on radiator	11 N•m (97 lbf•in)	None
	EXHAUST		
	Exhaust nut	11 N•m (97 lbf•in)	None
	Exhaust clamp	15 N•m (133 lbf•in)	
	LUBRICATION		
	Engine drain plug	20 N•m (15 lbf•ft)	None
	Engine oil strainer	30 N•m (22 lbf•ft)	
	Oil pump housing	6 N•m (53 lbf•in)	Loctite 243
	Oil pressure switch	12 N•m (106 lbf•in)	
	CYLINDER AND HEAD		
	Valve cover	9 N•m (80 lbf•in)	None
	Cylinder head screw	10 N•m (89 lbf•in)	
	Cylinder head nut	25 N•m (18 lbf•ft)	
	Camshaft timing gear	30 N•m (22 lbf•ft)	Loctite 243
	Chain tensioner plug	35 N•m (26 lbf•ft)	None
	CRANKSHAFT		
	Crankcase housing screw	9 N•m (80 lbf•in)	None
	Crankshaft locking access screw	15 N•m (133 lbf•in)	
	GEARBOX		
	Gearbox cover	25 N•m (18 lbf•ft)	Loctite 648
	Shifting indicator switch	4 N•m (35 lbf•in)	Loctite 243
	CVT		
	CVT cover	9 N•m (80 lbf•in)	None
	Centrifugal clutch nut	55 N•m (41 lbf•ft)	
	Drive pulley	60 N•m (44 lbf•ft)	
	Driven pulley		
	FUEL		
	Carburetor mounting clamp	0.6 N•m (5.4 lbf•in)	None
	Air intake silencer screw	5 N•m (44 lbf•in)	
	Fuel tank screw		
	Fuel valve	9 N•m (80 lbf•in)	

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

VEHICLE MODEL		RALLY™ 200	SERVICE PRODUCT
TORQUE	DRIVE TRAIN		
	Front wheel hub nut	135 N•m (100 lbf•ft)	None
	Rear wheel hub nut		
	Chain tensioner lock bolt	42 N•m (31 lbf•ft)	Loctite 277
	Rear axle nut	140 N•m (103 lbf•ft)	
	WHEEL		
	Wheel nuts	70 N•m (52 lbf•ft)	Anti-seize
	STEERING/CONTROL		
	Throttle handle housing	5 N•m (44 lbf•in)	None
	Tie rod ends	42 N•m (31 lbf•ft)	
	Steering column nut	58 N•m (43 lbf•ft)	
	Handle grip screw	1 N•m (9 lbf•in)	
	SUSPENSION		
	Swing arm nut	100 N•m (74 lbf•ft)	None
	BRAKE		
	Caliper brake screws	24 N•m (17 lbf•ft)	None
	Brake pedal	50 N•m (37 lbf•ft)	
	Front master cylinder cover screws	1.5 N•m (13 lbf•in)	
	Front master cylinder BANJO bolt	24 N•m (17 lbf•ft)	
	Caliper BANJO bolt		
	Caliper bleeder valve	5 N•m (44 lbf•in)	
	Rear cable adjusting nut	10 N•m (89 lbf•in)	
	BODY/FRAME		
	Front bumper	24 N•m (17 lbf•ft)	None
	Front fascia	2.5 N•m (22 lbf•in)	
	Luggage rack hook		
	Front/rear luggage rack	5 N•m (44 lbf•in)	
Seat screw	9 N•m (80 lbf•in)		
Footpeg			
Headlight housing	0.6 N•m (5.4 lbf•in)		