

REAR DRIVE

SERVICE TOOLS

Description	Part Number	Page
BACKLASH MEASUREMENT TOOL.....	529 035 665	620
CV BOOT CLAMP PLIER	529 036 120	616
CV JOINT EXTRACTOR.....	529 036 005	617
SPANNER SOCKET	529 035 649	623

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 277	293 800 073	625
LOCTITE 648 (GREEN)	413 711 400	619
XPS SYNTHETIC GREASE.....	293 550 010	615, 618

Subsection 03 (REAR DRIVE)

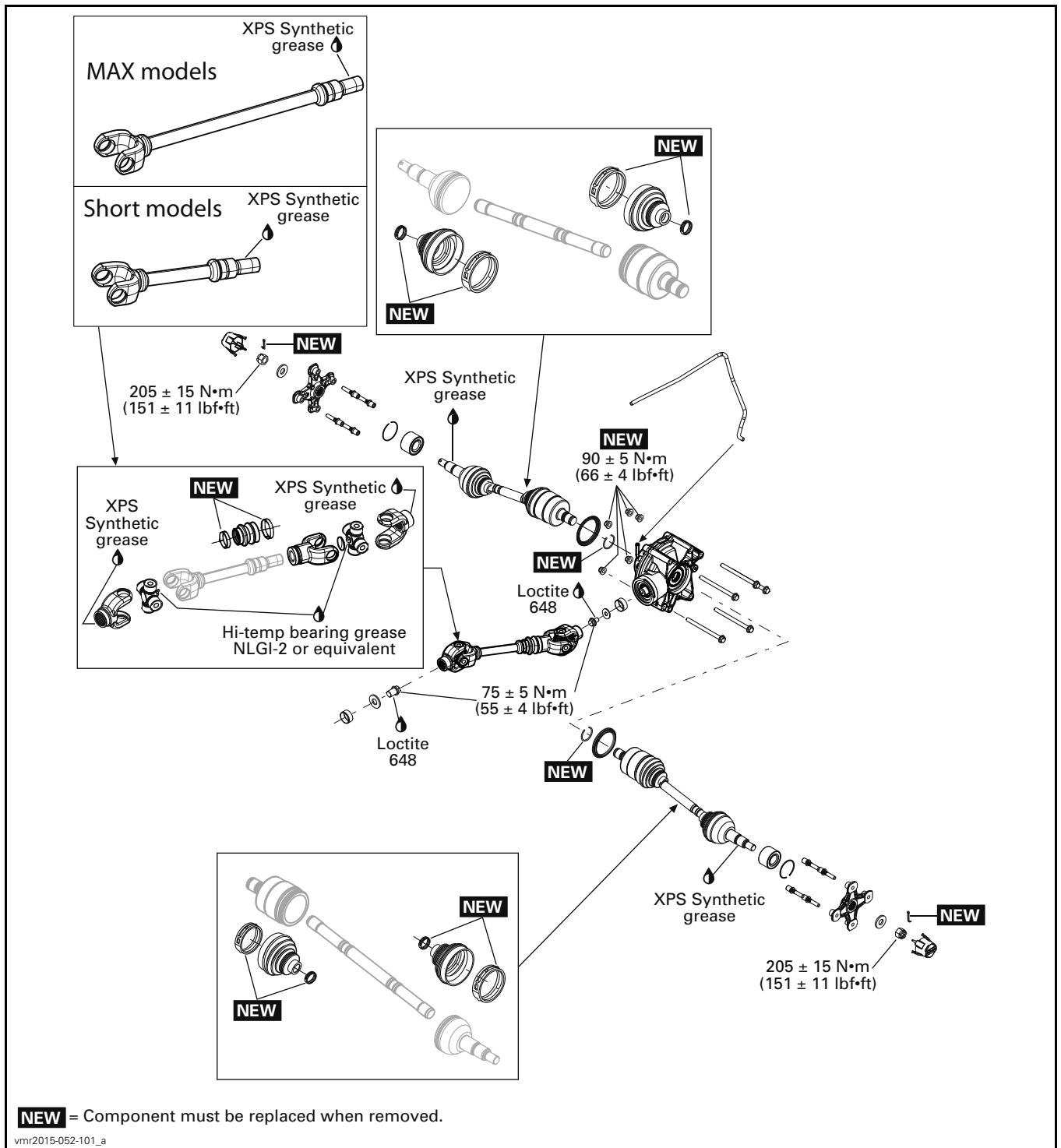
The diagram illustrates the assembly process for a drive shaft. Key components and steps include:

- MAX models** and **Short models**: Two types of drive shafts are shown at the top left.
- XPS Synthetic grease**: Applied to various joints throughout the assembly.
- NEW**: Components that must be replaced when removed, indicated by black boxes.
- Torque Specifications**:
 - $205 \pm 15 \text{ N}\cdot\text{m}$ ($151 \pm 11 \text{ lbf}\cdot\text{ft}$) for the main shaft nut.
 - $90 \pm 5 \text{ N}\cdot\text{m}$ ($66 \pm 4 \text{ lbf}\cdot\text{ft}$) for the intermediate joint nut.
 - $75 \pm 5 \text{ N}\cdot\text{m}$ ($55 \pm 4 \text{ lbf}\cdot\text{ft}$) for the output joint nut.
- Loctite 648**: Applied to the output joint nut.
- Hi-temp bearing grease NLGI-2 or equivalent**: Applied to the bearings.

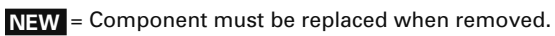
NEW = Component must be replaced when removed.

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MODELS WITH 450 ENGINE



Subsection 03 (REAR DRIVE)



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PROCEDURES

WHEEL HUB

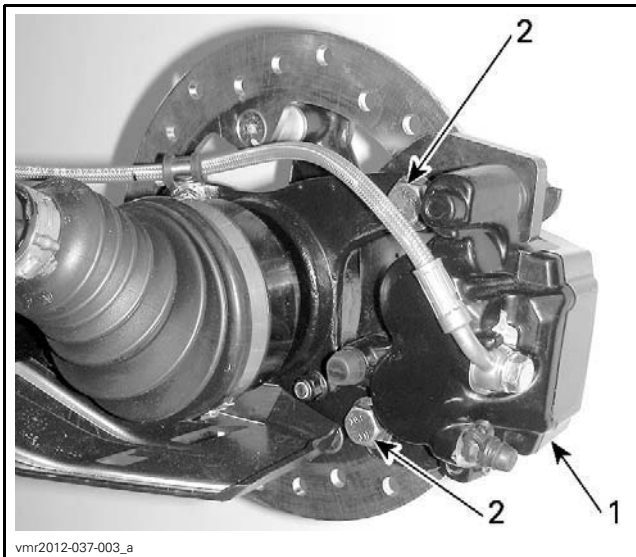
Wheel Hub Removal

Lift and support vehicle.

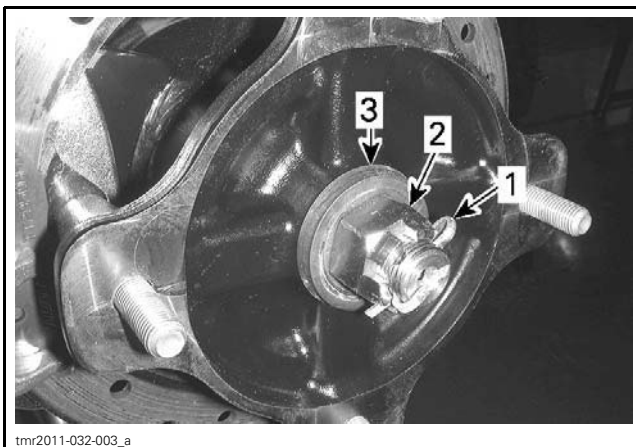
Remove the wheel.

Remove the following parts:

- Caliper mounting bolts (if applicable), refer to *BRAKES* subsection
- Hub cap
- Cotter pin
- Wheel hub nut
- Belleville washer.



1. Caliper
2. Remove bolts



TYPICAL

1. Cotter pin
2. Wheel hub nut
3. Belleville washer

Remove wheel hub.

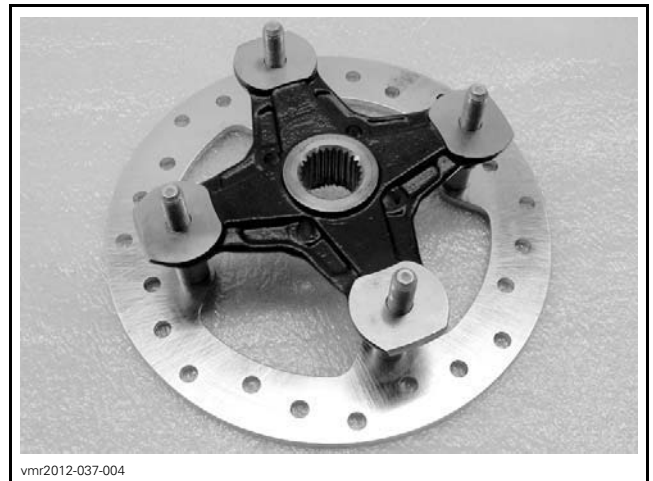
Wheel Hub Inspection

Remove disk from RH wheel hub as necessary.

Check wheel hub for cracks or other damages.

Check inner splines for wear or other damages.

If any damage is detected on wheel hub, replace it with a new one.

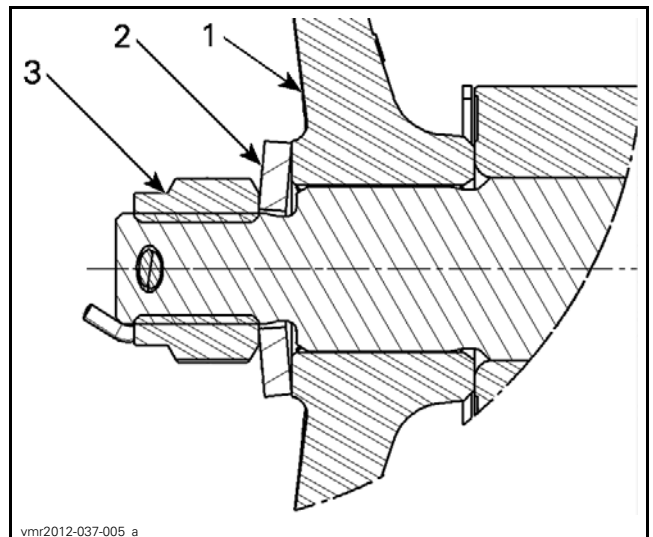


Wheel Hub Installation

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

Apply XPS SYNTHETIC GREASE (P/N 293 550 010) on drive shaft splines.

Install Belleville washer with its convex side outward.



1. Wheel hub
2. Washer — Convex side here
3. Nut

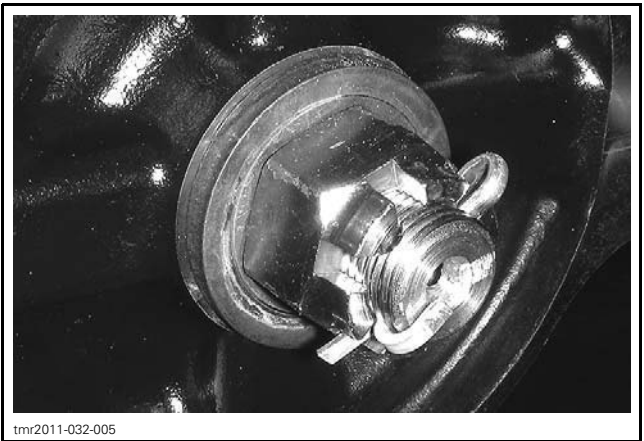
Section 07 DRIVE SYSTEM

Subsection 03 (REAR DRIVE)

TIGHTENING TORQUE	
Wheel hub nut	205 N•m ± 15 N•m (151 lbf•ft ± 11 lbf•ft)

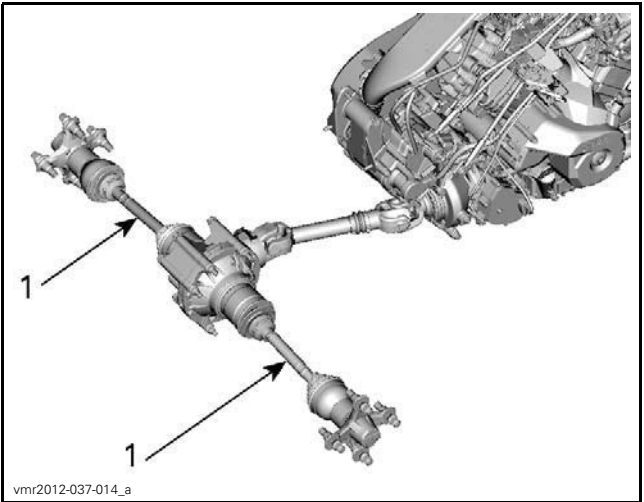
NOTE: If required, tighten castellated nut further to align grooves with drive shaft hole.

Install a **NEW** cotter pin.



DRIVE SHAFT

Drive Shaft Removal



TYPICAL
1. Drive shafts

Lift and support vehicle.

Remove the wheel hub. See procedure in this subsection.

Remove trailing arm. Refer to *REAR SUSPENSION*.

Strongly pull drive shaft out of final drive.

Drive Shaft Inspection

Inspect the condition of boots. If there is any damage or evidence of leaking lubricant, replace them. Refer to *DRIVE SHAFT BOOT*.

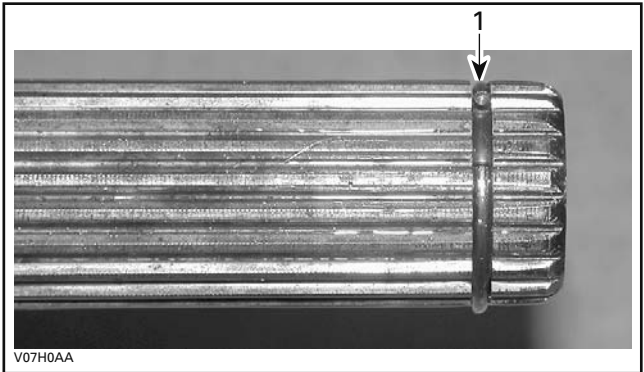
Check shaft splines. Replace drive shaft if necessary.

Check dust shield on drive shaft end. Replace if necessary.

Drive Shaft Installation

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

Install a **NEW** stop ring.



TYPICAL
1. NEW stop ring

After drive shaft insertion in rear final drive, validate if properly locked.

DRIVE SHAFT BOOT

Drive Shaft Boot Removal

Remove the drive shaft from vehicle. See procedure in this subsection.

Remove drive shaft boot clamps using the following tool:

TOOL	
CV BOOT CLAMP PLIER (P/N 529 036 120)	

Dislodge the large boot end.

Separate the joint from the shaft. Two procedures can be done.

Without the Special Tool

Clamp joint housing in a vise.

Align shaft with joint.

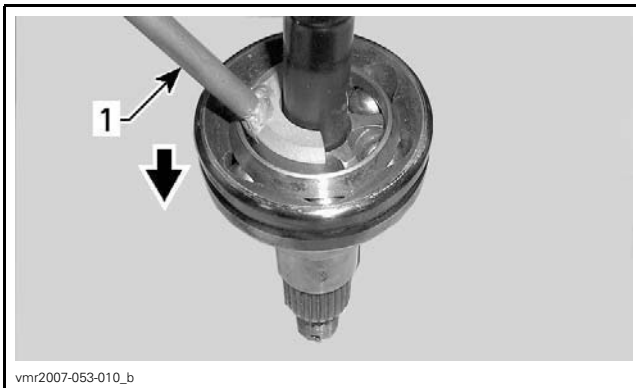
Pull hard on shaft to remove from joint.

Remove boot from drive shaft.

Remove and discard the circlip. A new one is included in the boot kit.

With the Special Tool

Place drive shaft in vice with the joint downward. Install the CV JOINT EXTRACTOR (P/N 529 036 005) on bearing.



TYPICAL — CV JOINT SHOWN
1. Joint extractor tool

With an hammer, hit on the tool to separate joint from shaft.

When joint and shaft are separated, remove boot from drive shaft.

Remove and discard the circlip. A new one is included in the boot kit.

Remove drive shaft boot.

Drive Shaft Boot Installation

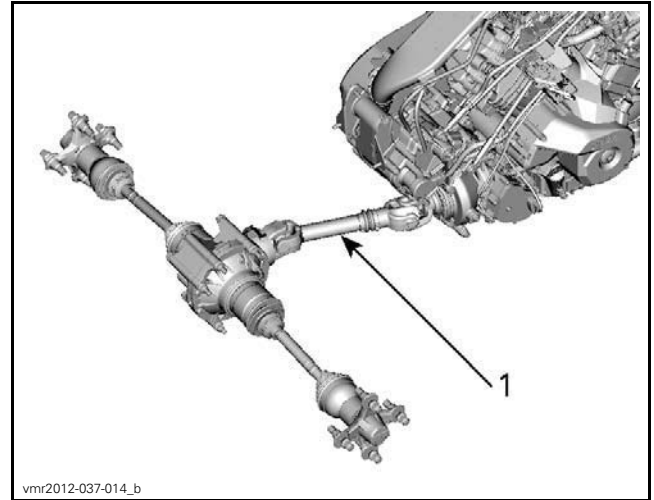
The installation is the reverse of the removal procedure. However, pay attention to the following:

Pack bearing area with grease (included with the new boot kit).

NOTE: Do not use any other grease.

PROPELLER SHAFT

Propeller Shaft Removal



TYPICAL
1. Propeller shaft

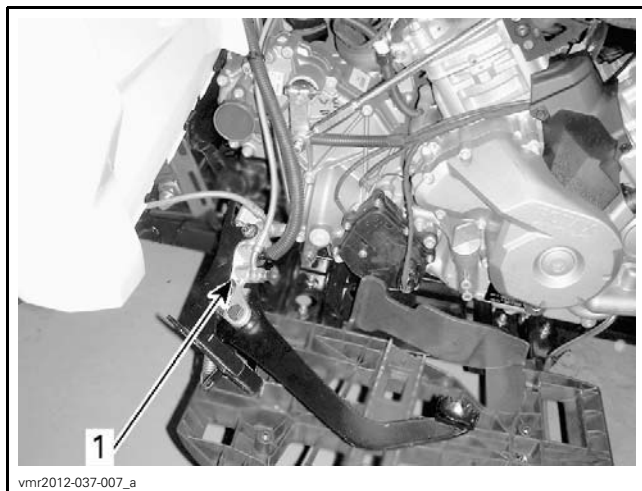
1. Lift and support rear end of vehicle.
2. Remove wheels. Refer to *WHEELS AND TIRES* subsection.
3. Drain oil from rear final drive. Refer to *PERIODIC MAINTENANCE PROCEDURES*.
4. Detach brake master cylinder from frame. Refer to *BRAKES* subsection.



1. Remove retaining screws

Section 07 DRIVE SYSTEM

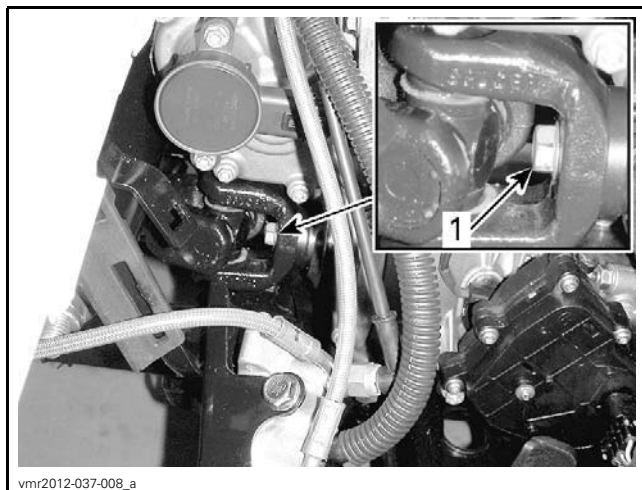
Subsection 03 (REAR DRIVE)



1. Master cylinder moved apart

5. From RH side of vehicle, remove propeller shaft screw from gearbox output shaft.

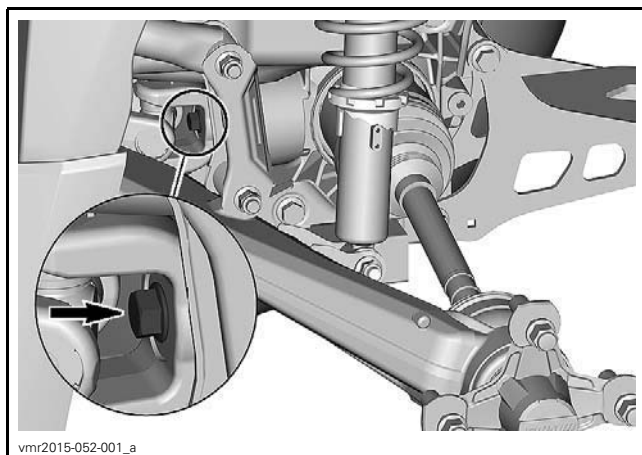
NOTE: Heat screw to break the threadlocker bond prior to removal.



TYPICAL — RH SIDE OF VEHICLE

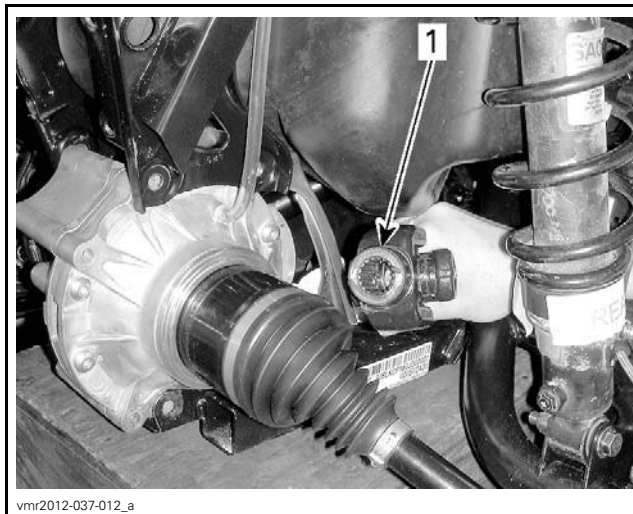
1. Remove screw

6. From LH side of vehicle, remove propeller shaft screw from rear final drive yoke.



LH SIDE OF VEHICLE

7. Remove rear final drive retaining bolts. Refer to *REAR FINAL DRIVE* in this subsection.
8. Remove bolts from rear retaining plate. Refer to *REAR FINAL DRIVE* in this subsection.
9. Move the rear final drive rearward to allow dislodging the propeller shaft.
10. Dislodge the propeller shaft from the gearbox.
11. Remove the propeller shaft.



1. Pull out propeller shaft

Propeller Shaft Inspection

Inspect if propeller shaft is not bent or twisted.

Check propeller shaft splines for wear or damage.

Check if propeller shaft bellow is cracked, pierced or brittle.

Propeller Shaft Installation

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

Apply XPS SYNTHETIC GREASE (P/N 293 550 010) to splines.

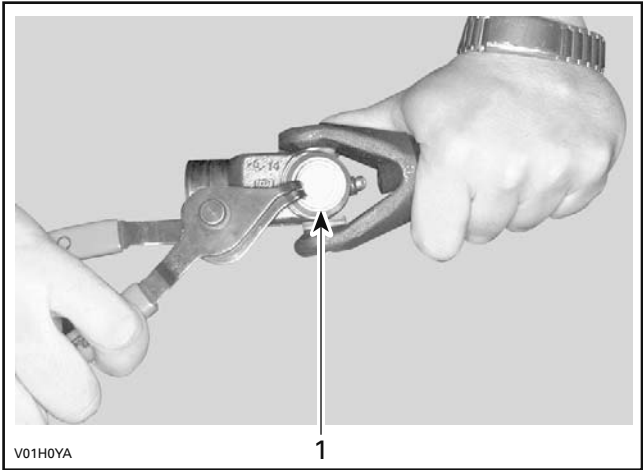
PARTS	TORQUE
Propeller shaft screw (rear final drive side)	75 N•m ± 5 N•m (55 lbf•ft ± 4 lbf•ft) + LOCTITE 648 (GREEN) (P/N 413 711 400)
Propeller shaft screw (gearbox side)	75 N•m ± 5 N•m (55 lbf•ft ± 4 lbf•ft) + LOCTITE 648 (GREEN) (P/N 413 711 400)

Refill rear final drive. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

PROPELLER SHAFT U-JOINTS

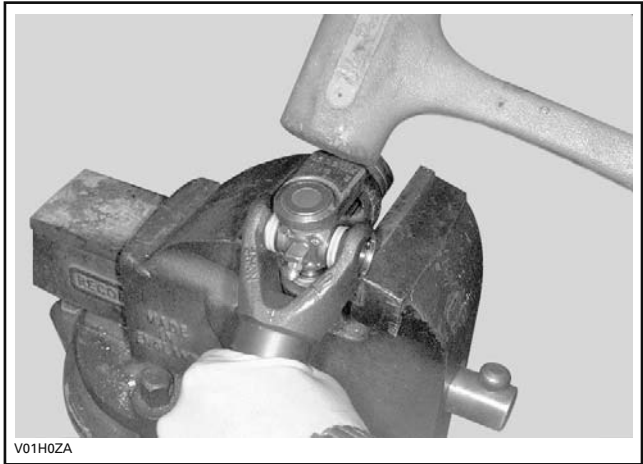
Propeller Shaft U-Joint Removal

Remove internal snap ring from bearing caps.



1. Snap ring

Support inner yoke in vice and drive other yoke down with a soft hammer.



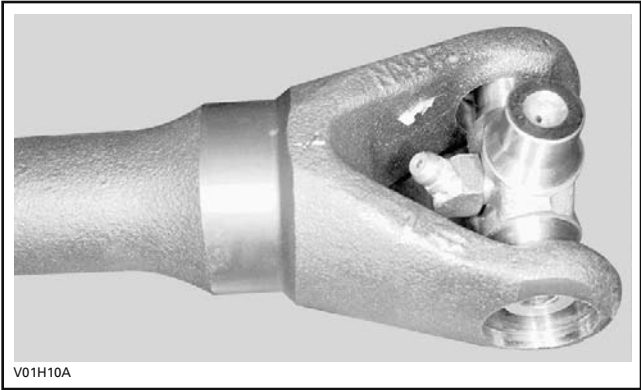
Support U-joint in vice and drive inner yoke down to remove remaining bearing caps.

Remove U-joint cross.

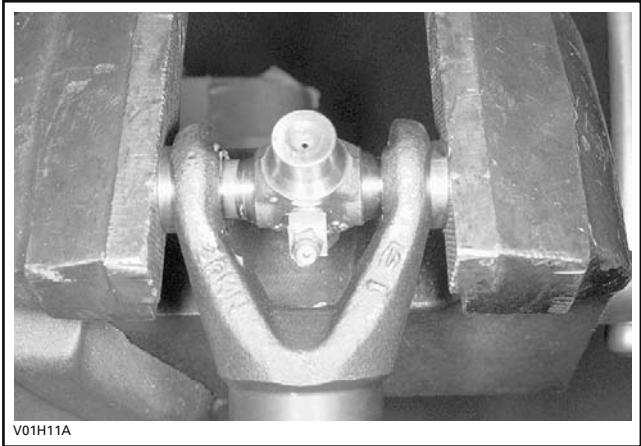
Propeller Shaft U-Joint Installation

Install a **NEW** U-joint in inner yoke.

NOTE: Position propeller shaft U-joint as shown for proper grease fitting location.



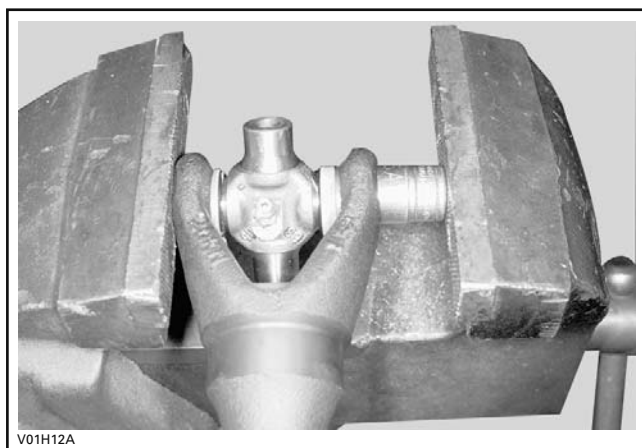
Install bearing caps. Use a vise to push bearing caps.



Using a suitable pusher, fully seat bearing cap on one side.

Section 07 DRIVE SYSTEM

Subsection 03 (REAR DRIVE)



Install snap ring.

Complete installation for the other bearing caps.

Grease U-joint. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

REAR FINAL DRIVE

Rear Final Drive Removal

Drain oil. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

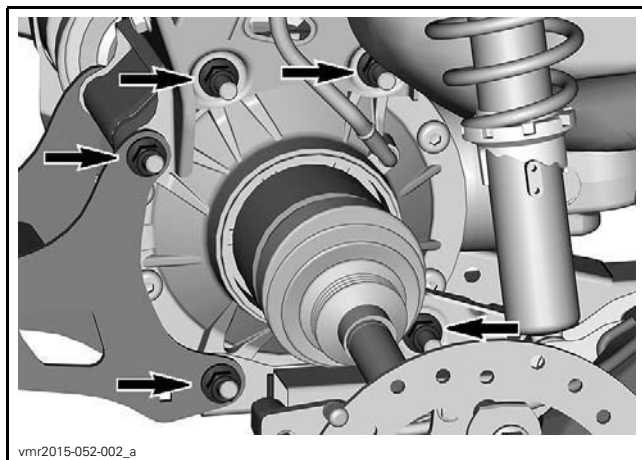
Lift and support vehicle.

Support rear bottom end of frame.

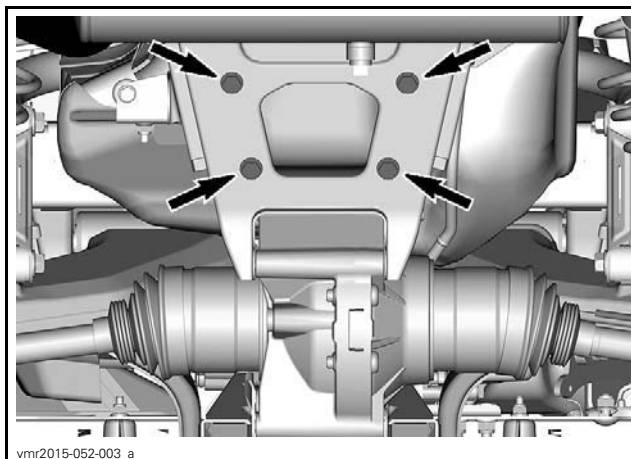
Remove drive shafts. See procedure in this subsection.

Remove rear propeller shaft screw from the rear final drive yoke. Refer to *PROPELLER SHAFT* in this subsection.

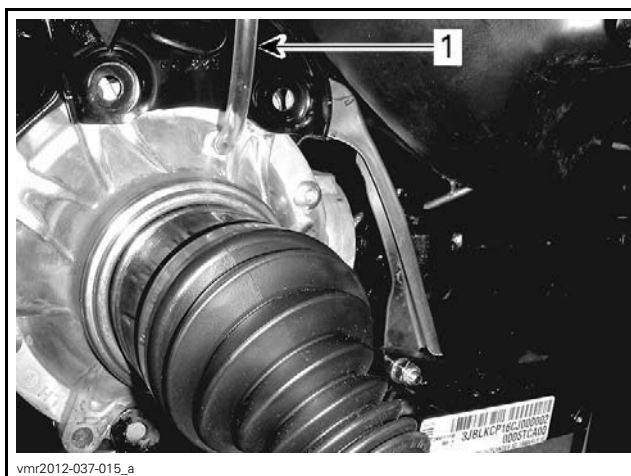
Remove rear final drive screws (5x).



Remove bolts from rear retaining plate.



Unplug the vent hose from final drive.



1. Pull out

Remove the final drive.

Rear Final Drive Inspection (Assembled)

Manually turn rear final drive gear; it should turn smoothly. Repair if necessary.

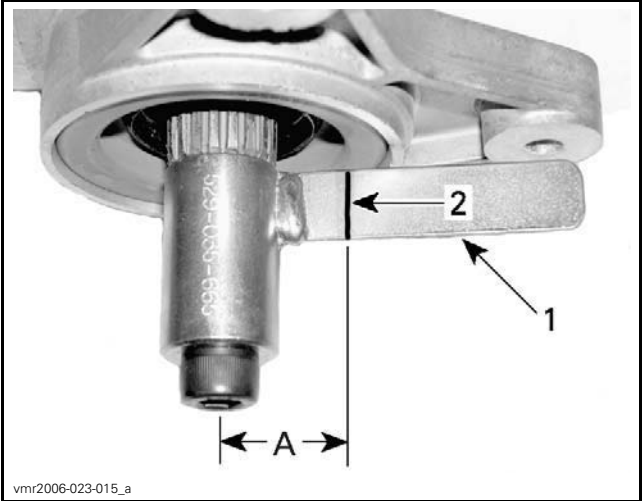
Check if oil seals are brittle, hard or damaged. Replace if necessary.

Backlash Inspection

Using a dial indicator and the BACKLASH MEASUREMENT TOOL (P/N 529 035 665), measure the backlash.

Place the backlash measurement tool at the end of pinion gear.

From center of tool bolt, measure 25.4 mm (1 in) and scribe a mark on the tab.



1. Tab of backlash measurement tool
2. Mark on tab
A. 25.4 mm (1 in)

Position the dial indicator tip against the tab at a 90° angle and right on the previously scribed mark. Gently, move the tool tab back and forth. Note the backlash result.

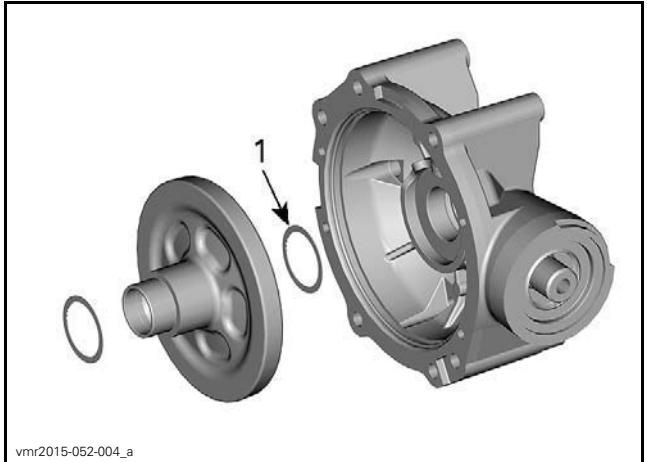


Rotate pinion gear 1/2 turn and recheck backlash. Note the result.
Rotate pinion gear 1 turn and recheck backlash.

BACKLASH SPECIFICATION
0.1 mm (.004 in) to 0.35 mm (.014 in)

If backlash is out of specification, split final drive housing and adjust shim thickness as per following guideline.

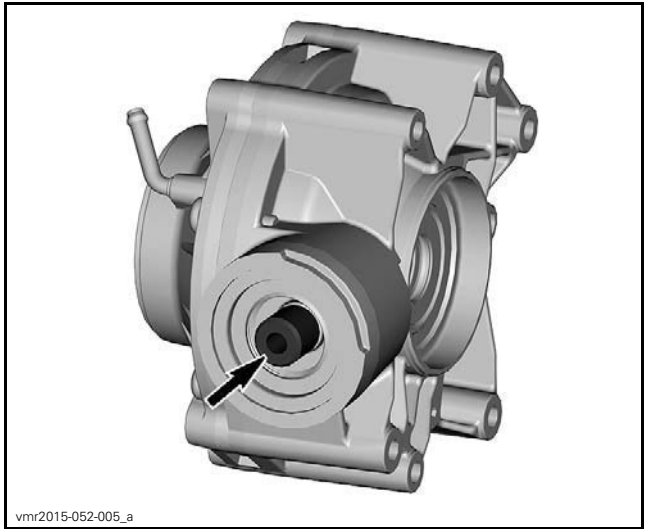
BACKLASH ADJUSTMENT GUIDELINE	
BACKLASH MEASUREMENT	WHAT TO DO
Below 0.1 mm (.004 in)	Add shim(s) and recheck backlash
Above 0.35 mm (.014 in)	Remove shim(s) and recheck backlash



1. Backlash shim

Preload Inspection

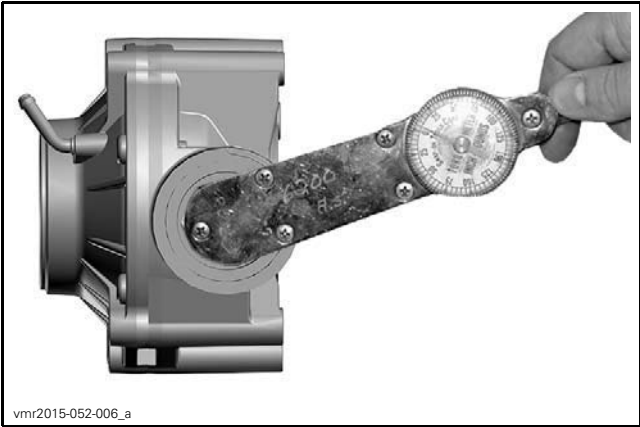
Screw the propeller shaft screw in pinion gear.



Using a needle torque wrench, measure the preload.

Section 07 DRIVE SYSTEM

Subsection 03 (REAR DRIVE)

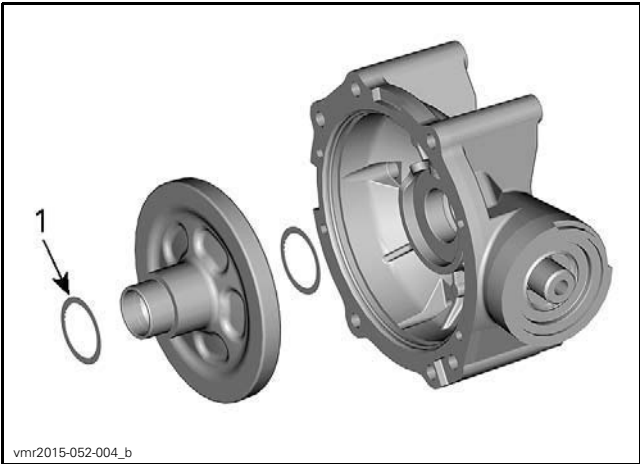


PRELOAD SPECIFICATION

0.06 N•m (.5 lbf•in) to 0.50 N•m (4 lbf•in)

If preload is out of specification, split final drive housings and adjust shim thickness as per following guideline.

PRELOAD GUIDELINE	
PRELOAD MEASUREMENT	WHAT TO DO
Below 0.06 N•m (.5 lbf•in)	Add shim(s) and recheck preload
Above 0.50 N•m (4 lbf•in)	Remove shim(s) and recheck preload

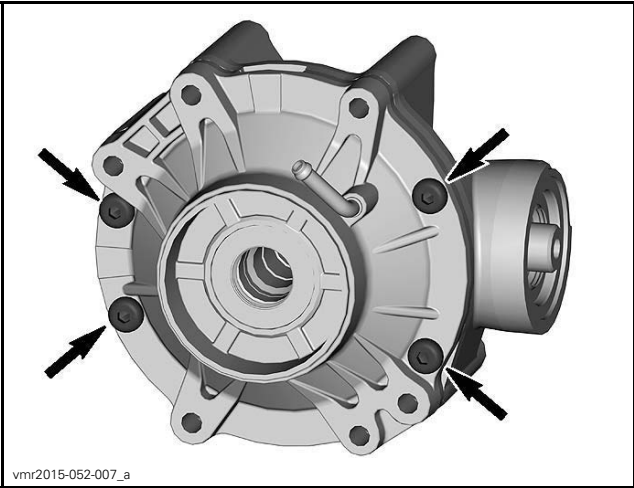


1. Preload shim

Rear Final Drive Disassembly

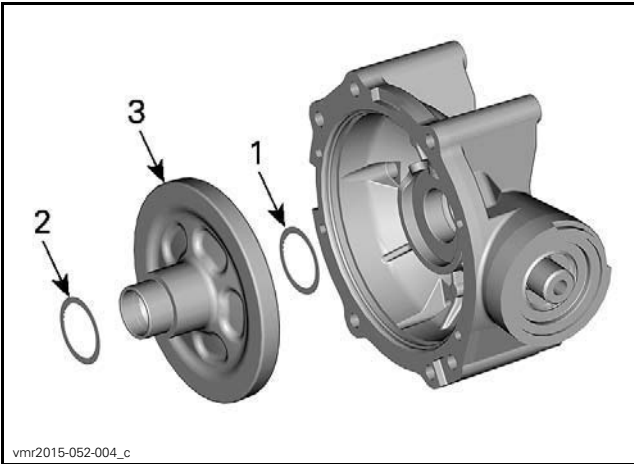
Ring Gear

Remove the final drive housing screws.



Split final drive housings.

NOTE: Be careful to keep track of shims on ring gear.

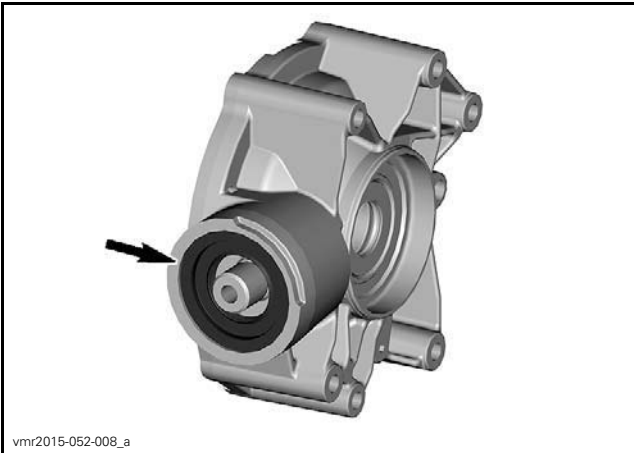


- 1. Backlash shim
- 2. Preload shim
- 3. Ring gear

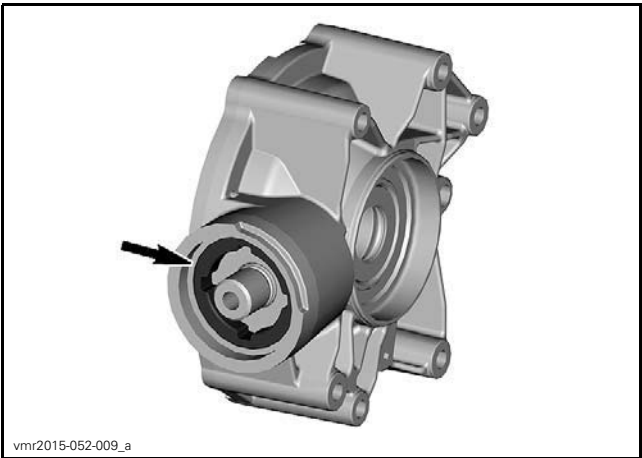
Extract ring gear out of half housing.

Pinion Gear

Remove and discard oil seal.

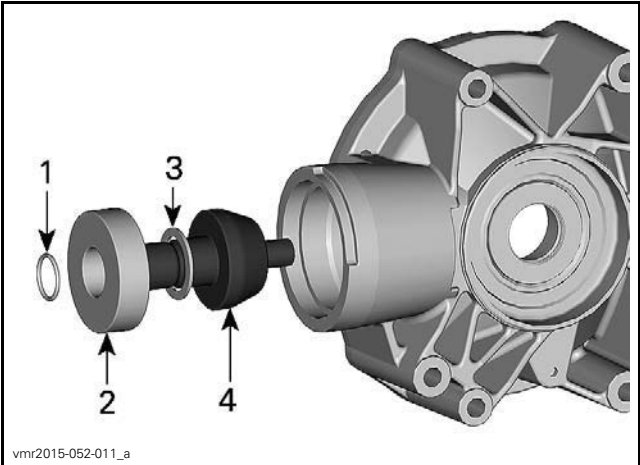
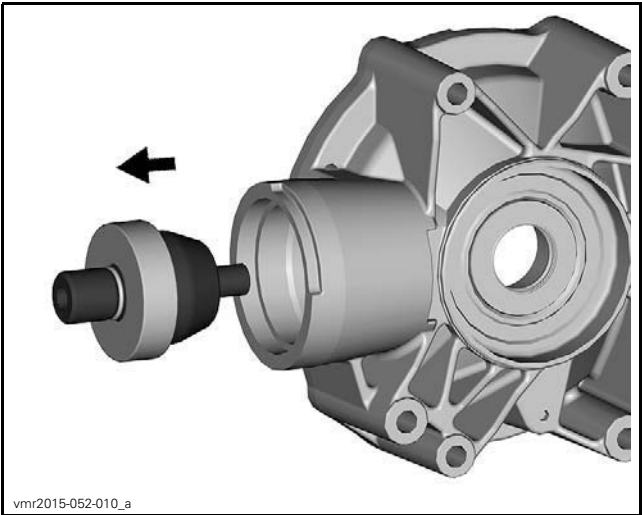


Unscrew the pinion nut. Use the SPANNER SOCKET (P/N 529 035 649).



NOTE: The pinion nut is left hand threaded. Unscrew by turning clockwise.

Remove the bearing along with the pinion gear. Be careful to keep track of shims. Discard bearing.

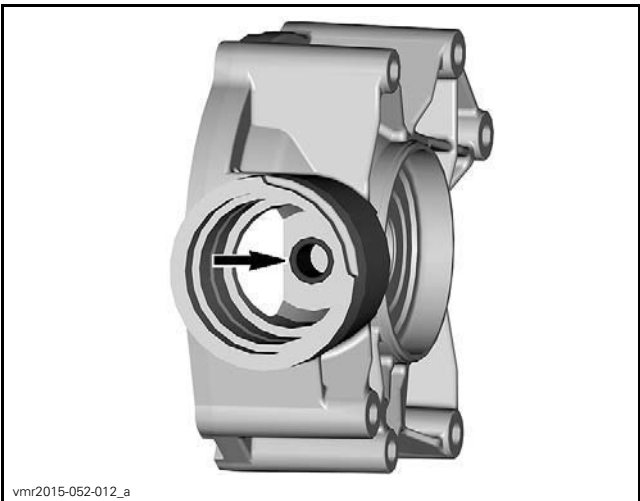


1. O-ring
2. Ball bearing
3. Pinion gear shim
4. Pinion gear

The pinion gear and bearing can be easily removed using the following suggested tool:

PART	QTY
Pipe: 83 mm (3-1/4 in) diameter x 127 mm (5 in)	1
Threaded rod: M10 x 1.25 x 178 mm (7 in)	1
M10 x 1.25 nut	3
Flat bar	1

Remove and discard the needle bearing.



Rear Final Drive Assembly

Adjustment is required when any of the following part is changed.

- Pinion gear
- Ring gear
- Housing.

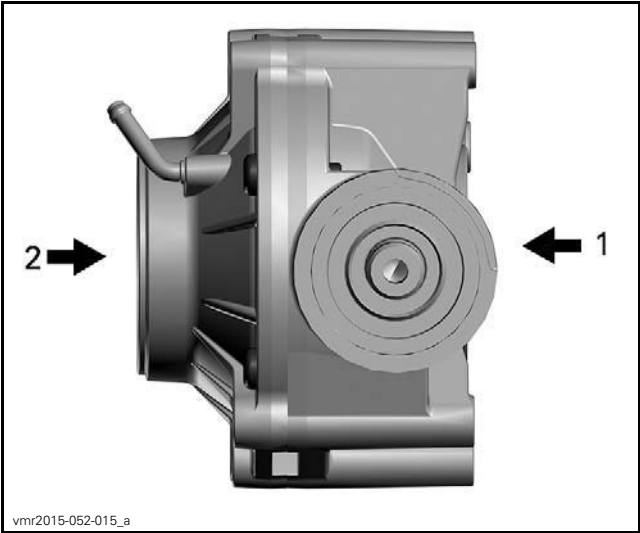
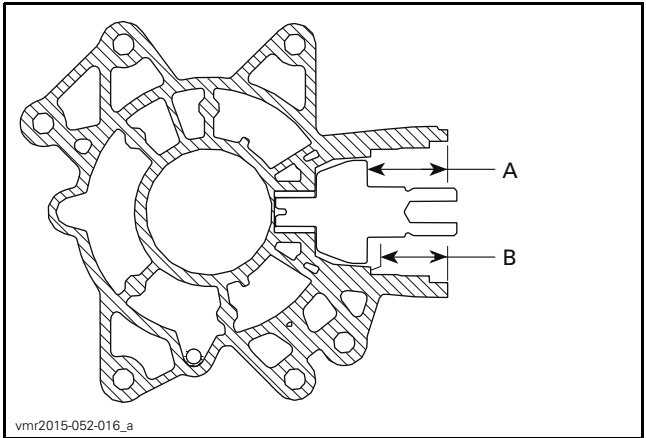
As a preliminary setup, install shims according to the following table.

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Subsection 03 (REAR DRIVE)

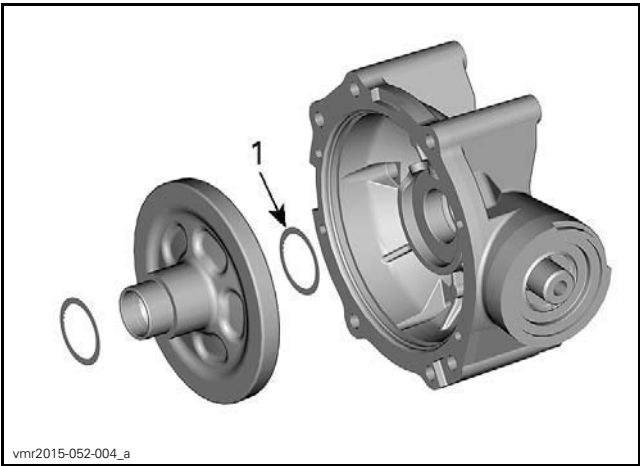
RECOMMENDED SHIM THICKNESS	
PINION GEAR	See procedure for pinion gear shim thickness
BACKLASH	0.5 mm (.02 in)
PRELOAD	(as a preliminary adjustment)

Procedure for pinion gear shim thickness:

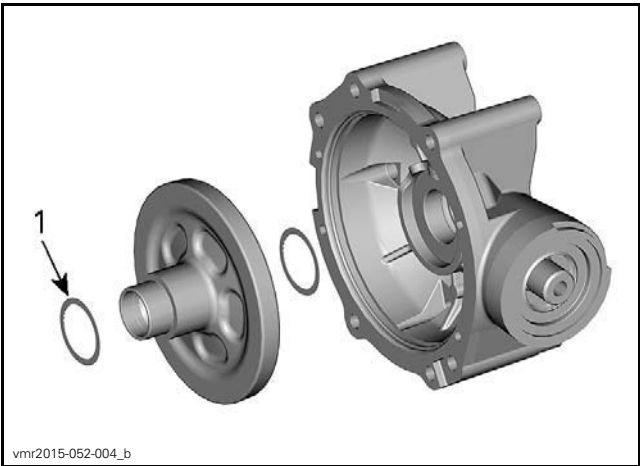
1. Remove the old pinion gear and install the new one without the ball bearing. The new pinion will be located at the "zero" location.
2. Measure the distance "A" between outside surface of the gear case and the shim surface of pinion.
3. Measure the distance "B" between outside surface of the gear case and the bearing shoulder of the gear case.
4. The shim thicknesss will be "A-B-0.53 mm (.021 in)".
5. Select the good combination of shim to match the thickness calculated on step 4.



1. Backlash side
2. Preload side



1. Backlash shim



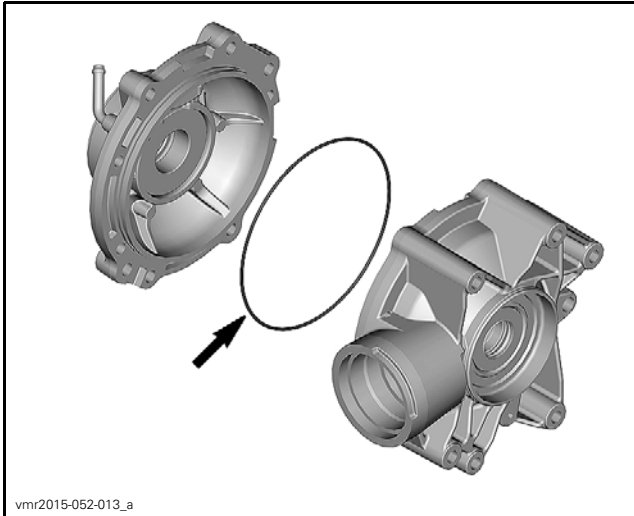
1. Preload shim

- Prior to finalizing assembly, proceed in this order:
- Temporarily assemble final drive using recommended torques.
 - Do not apply thread locker product.
 - Do not install a new pinion nut.

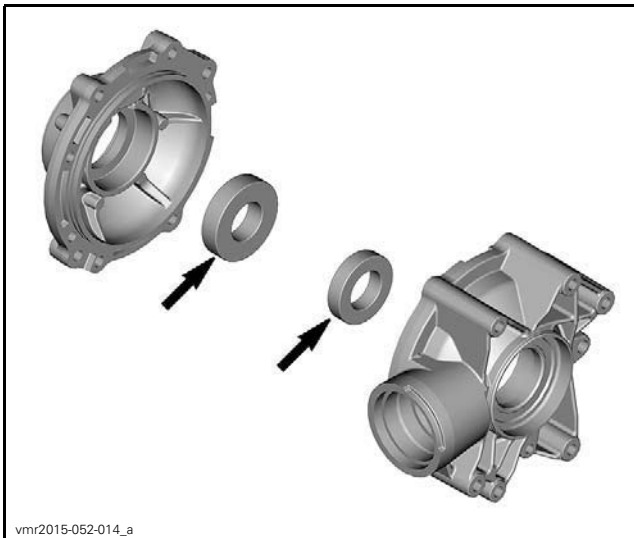
- Check backlash.
- Check preload.

Ring Gear

The installation is the reverse of the removal procedure. However, pay attention to the following:
 Check condition of seal. Replace if damaged.



Install **NEW** bearings.



Tighten final drive housing screws as per specification.

TIGHTENING TORQUE	
Final drive housing screws	32 N•m ± 3 N•m (24 lbf•ft ± 2 lbf•ft)

Pinion Gear

The installation is the reverse of the removal procedure. However, pay attention to the following:
 Install a **NEW** needle bearing.

Install the shim(s) then a **NEW** ball bearing.
 install a **NEW** O-ring.

Apply LOCTITE 277 (P/N 293 800 073) to pinion nut.
 Install and tighten the pinion nut as per specification.

TIGHTENING TORQUE	
Pinion nut (LH THREADS)	180 N•m ± 15 N•m (133 lbf•ft ± 11 lbf•ft) + LOCTITE 277 (P/N 293 800 073)

Lubricate and install a **NEW** oil seal.

Rear Final Drive Installation

The installation is the reverse of the removal procedure. However, pay attention to the following:
 Install the lowest rear final drive retaining screws first.

Install all screws and nuts prior to tighten.

Tighten nuts to specification.

TIGHTENING TORQUE	
Final drive retaining nuts	90 N•m ± 5 N•m (66 lbf•ft ± 4 lbf•ft)

Refill the final drive with recommended oil. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.