

REAR DRIVE

SERVICE TOOLS

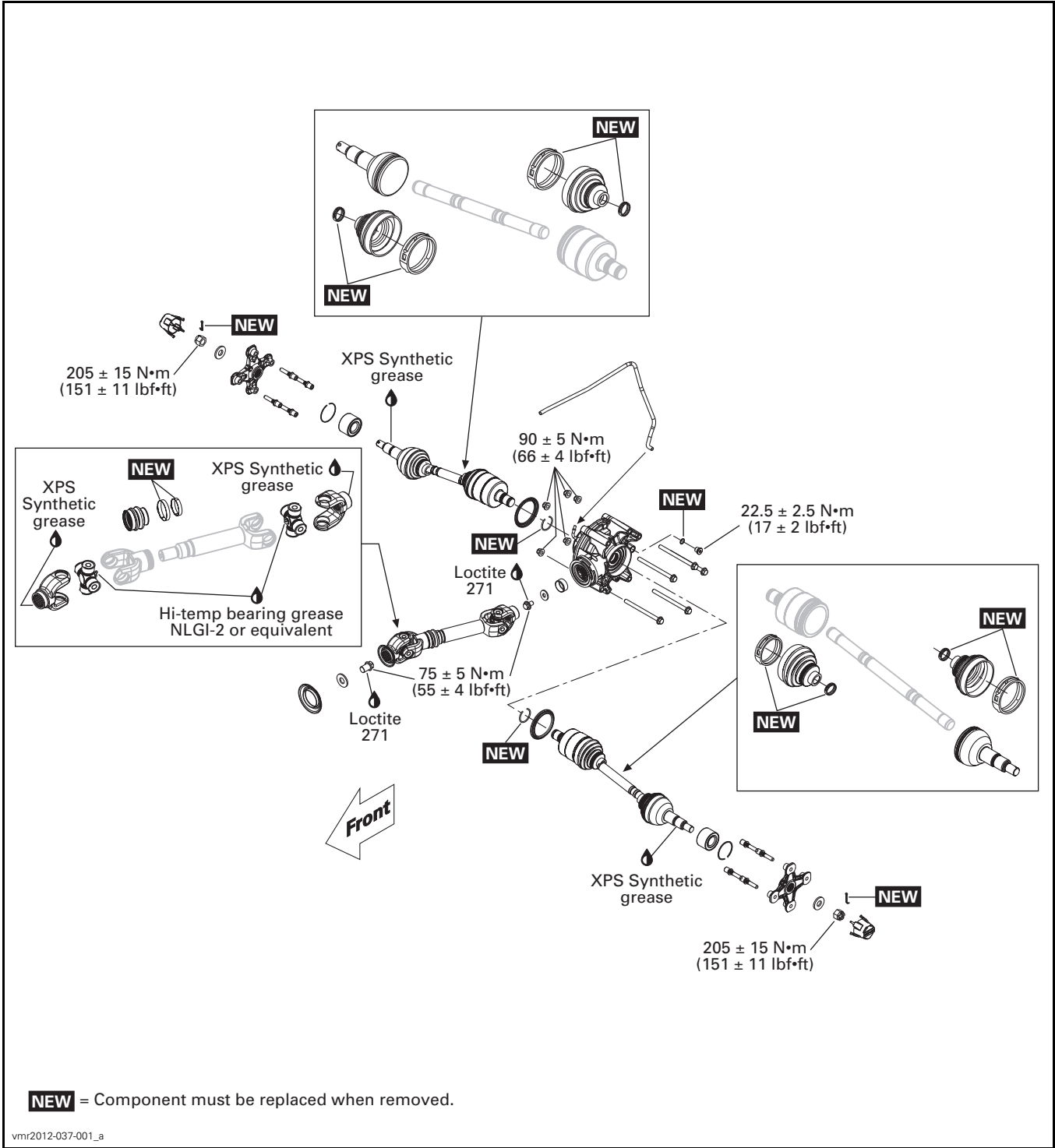
Description	Part Number	Page
BACKLASH MEASUREMENT TOOL.....	529 035 665	436
CV BOOT CLAMP PLIER	529 036 120	432
CV JOINT EXTRACTOR.....	529 036 005	432
SPANNER SOCKET	529 035 649	437

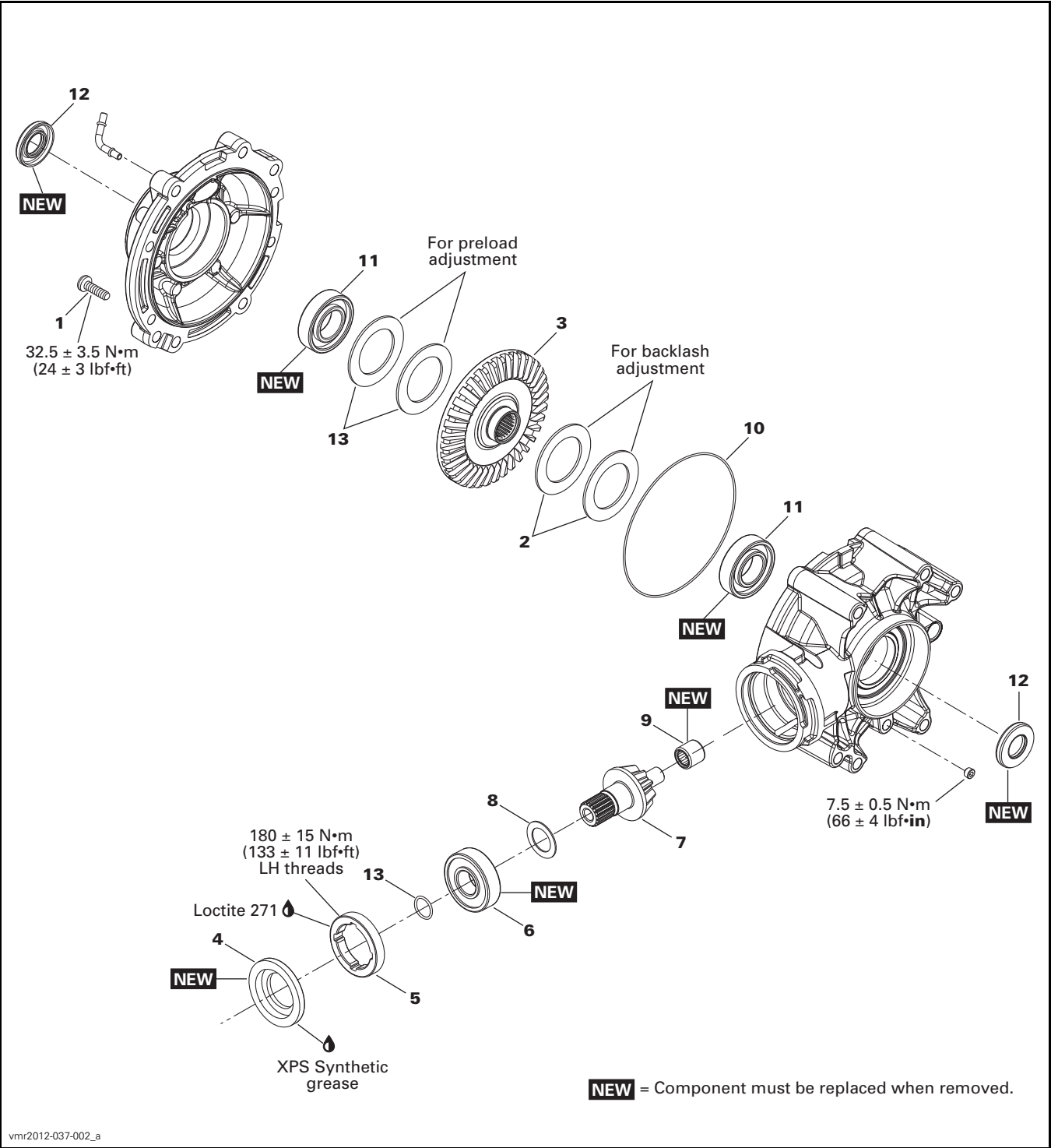
SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 271 (RED).....	293 800 005	434
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XPS SYNTHETIC GREASE.....	293 550 010	430, 434

Section 06 DRIVE SYSTEM

Subsection 02 (REAR DRIVE)





vmr2012-037-002_a

GENERAL

During assembly/installation, use torque values and service products as in the exploded views. Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

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

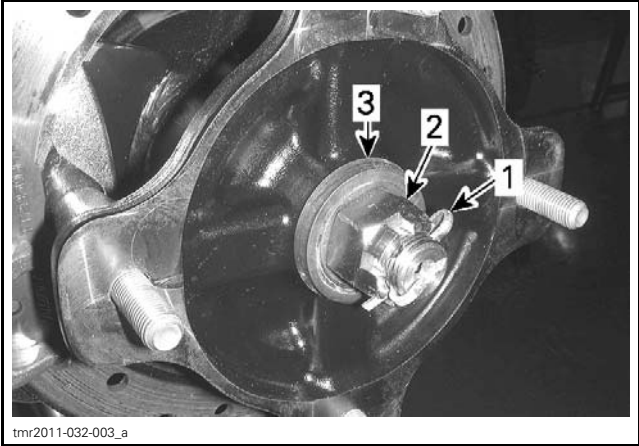
Hoses, cables or locking ties removed during a procedure must be reinstalled as per factory standards.

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.

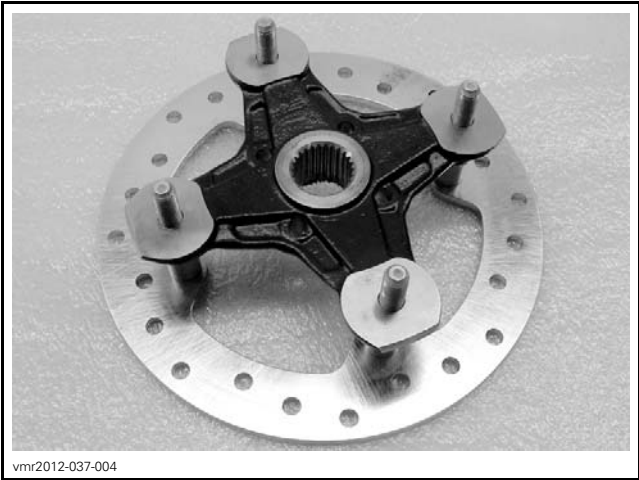


TYPICAL
1. Cotter pin
2. Wheel hub nut
3. Belleville washer

Remove wheel hub.

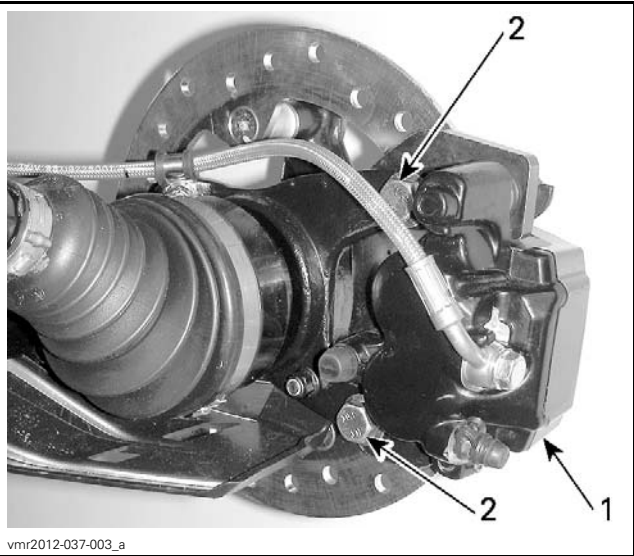
Wheel Hub Inspection

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.

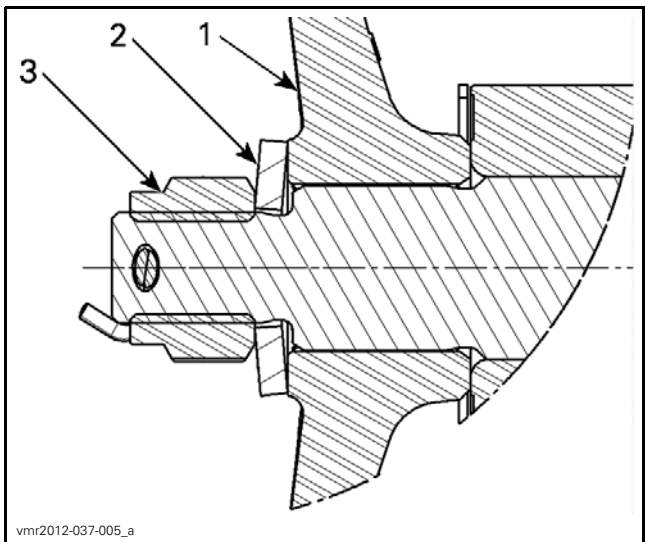


Wheel Hub Installation

The installation is the reverse of removal procedure. 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.



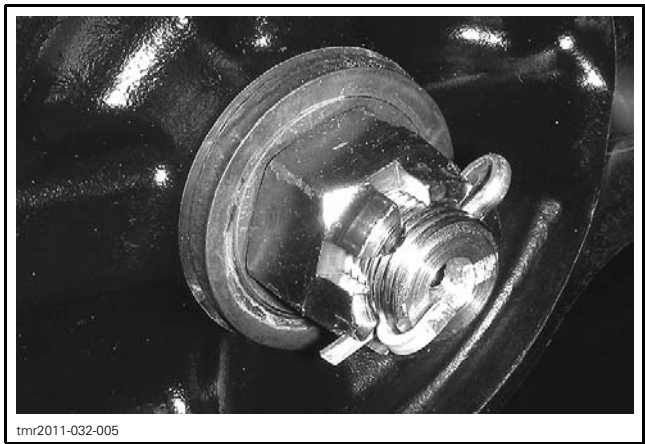
1. Caliper
2. Remove bolts



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

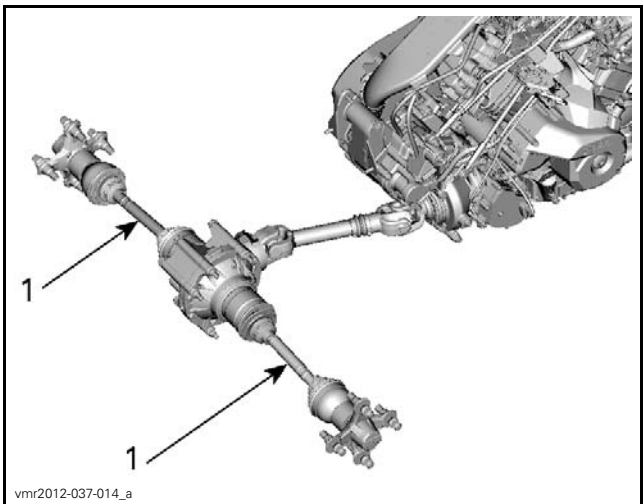
PART	TORQUE
Wheel hub nut	205 N•m ± 15 N•m (151 lb•ft ± 11 lb•ft)

NOTE: If required, tighten castellated nut further to align grooves with drive shaft hole.
Install a **NEW** cotter pin.



DRIVE SHAFT

Drive Shaft Removal



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.

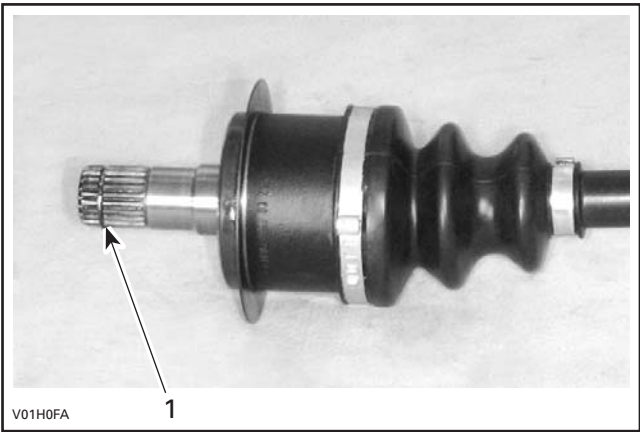
Drive Shaft Inspection

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.

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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)	

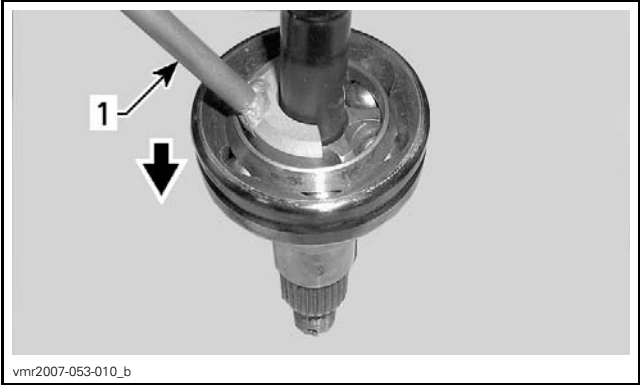
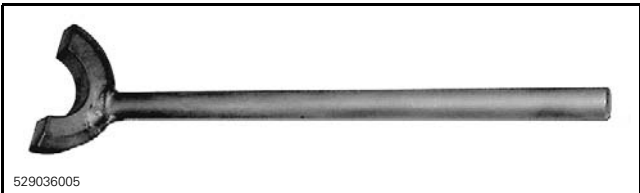
Dislodge the large boot end.
Separate the joint from the shaft. Two procedures can be done.

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

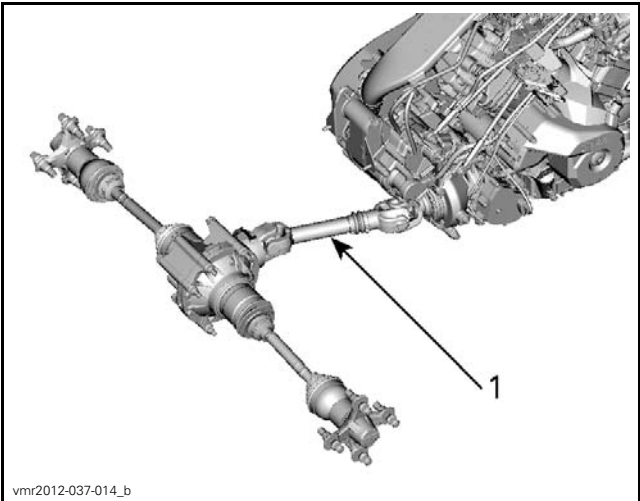
For installation, reverse the removal procedure. Pay attention to the following.

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

NOTE: Do not use any other grease.

PROPELLER SHAFT

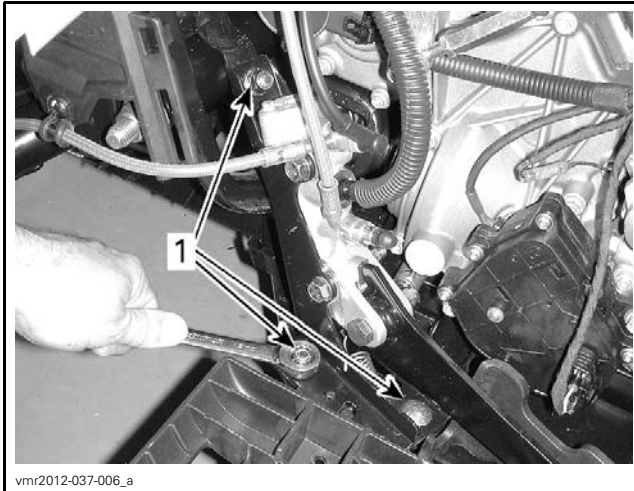
Propeller Shaft Removal



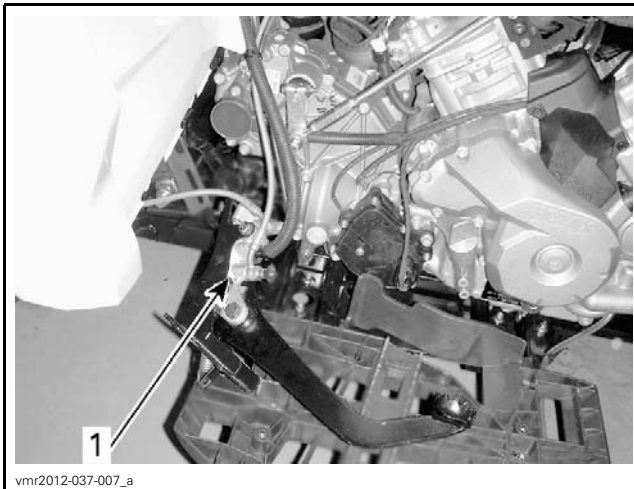
1. Propeller shaft

- 1. Remove wheels. Refer to *WHEELS AND TIRES* subsection.
- 2. Drain oil from rear final drive. Refer to *PERIODIC MAINTENANCE PROCEDURES*.

3. Detach brake master cylinder from frame (Outlander only). Refer to *BRAKES* subsection.

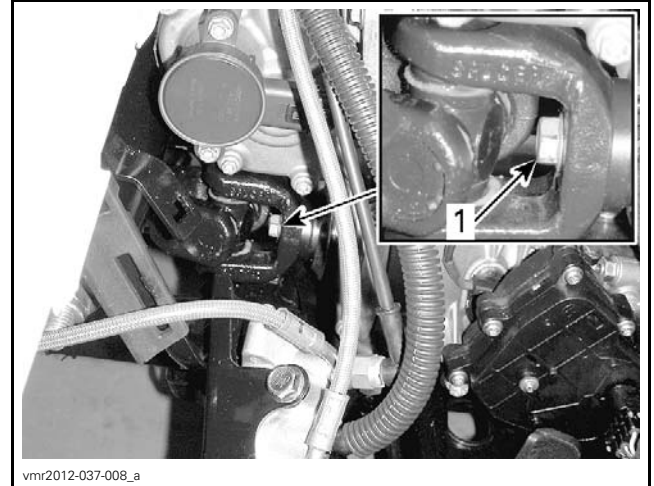


1. Remove retaining screws



1. Master cylinder moved apart

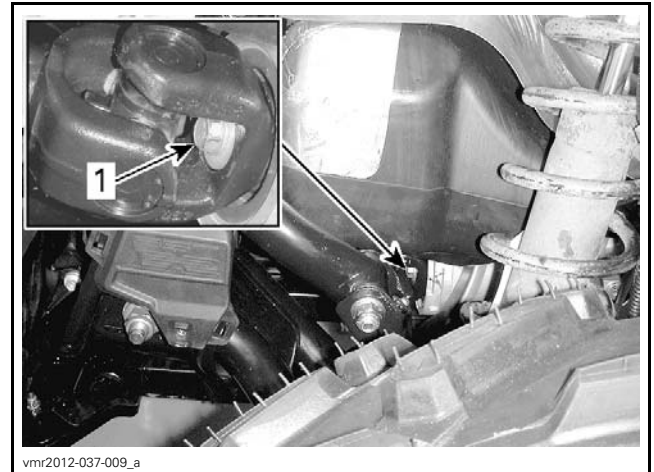
4. Lift and support vehicle.
5. From RH side of vehicle, remove propeller shaft screw from gearbox output shaft.
NOTE: Heat screw to break the threadlocker bond prior to removal.



TYPICAL — RH SIDE OF VEHICLE

1. Remove screw

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



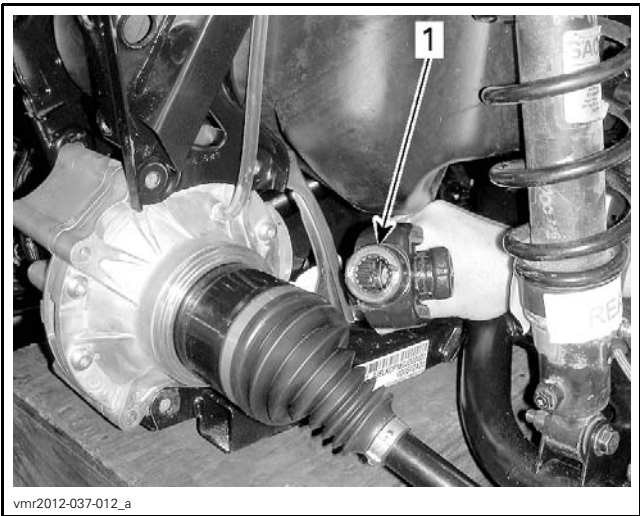
TYPICAL — LH SIDE OF VEHICLE

1. Remove screw

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.

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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

Installation is essentially the reverse of removal procedure. Pay attention to the following details.

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

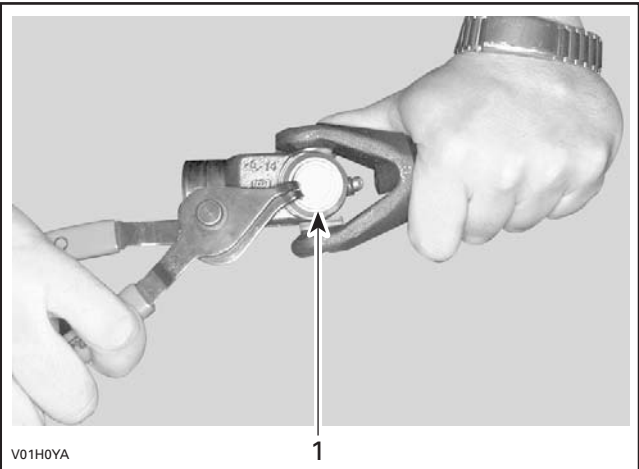
PARTS	TORQUE
Propeller shaft screw (rear final drive side)	75 N•m ± 5 N•m (55 lbf•ft ± 4 lbf•ft)
Propeller shaft screw (gearbox side)	75 N•m ± 5 N•m (55 lbf•ft ± 4 lbf•ft) + LOCTITE 271 (RED) (P/N 293 800 005)

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

PROPELLER SHAFT U-JOINTS

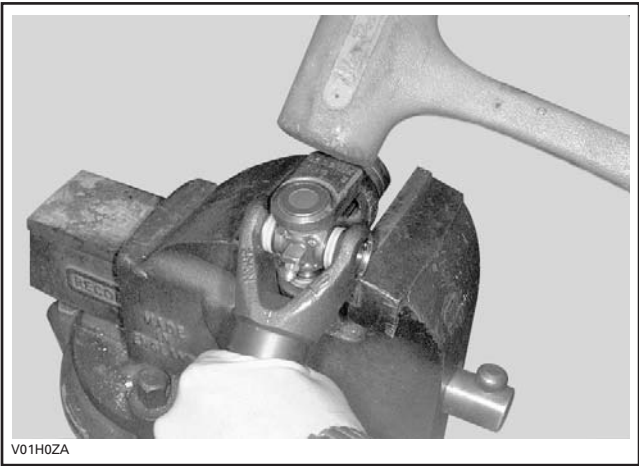
Propeller Shaft U-Joint Removal

Remove internal snap ring from bearing caps.



1. Snap ring

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



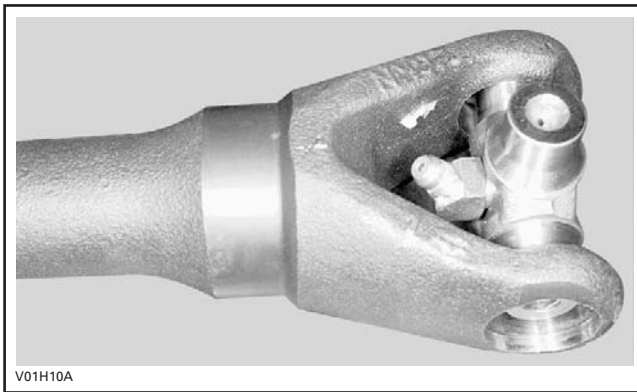
Support U-joint in vice and drive inner yoke down to remove remaining bearing caps.

Remove U-joint cross.

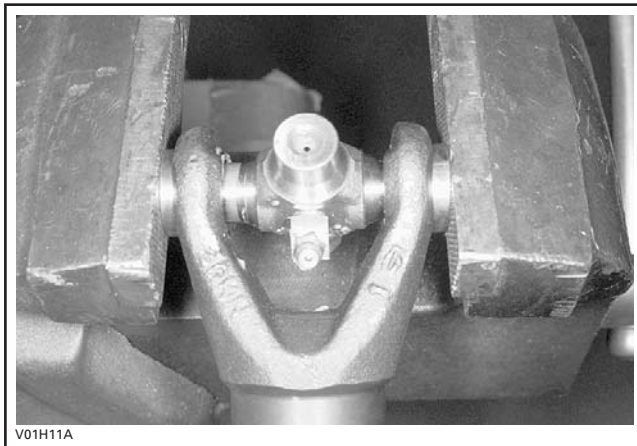
Propeller Shaft U-Joint Installation

Install new U-joint in inner yoke.

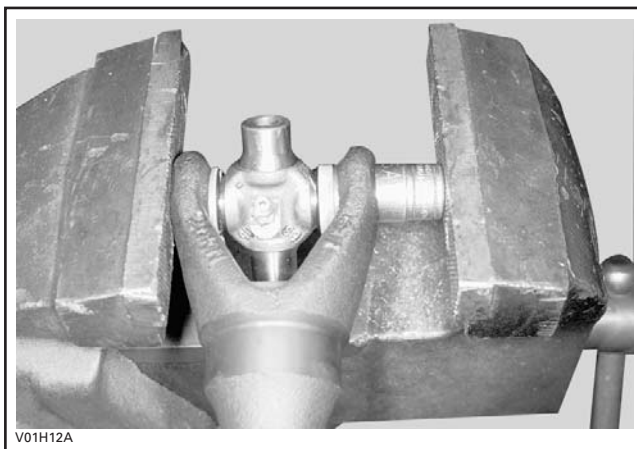
NOTE: Position propeller shaft U-joint as shown for proper grease fitting location.



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



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



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.

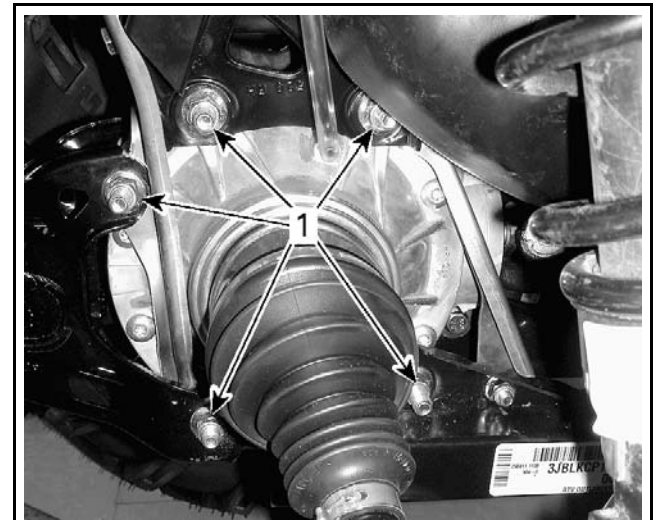
Lift and support vehicle.

Support rear bottom end of frame.

Remove drive shafts. See procedure in this subsection.

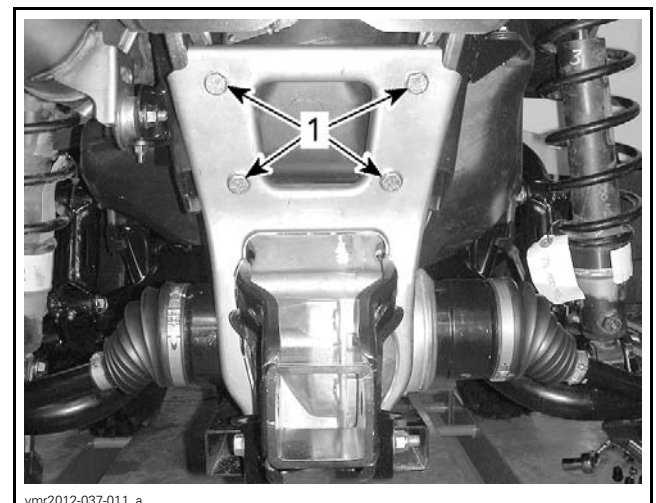
Remove rear propeller shaft screw from the rear final drive yoke. Refer to *PROPELLER SHAFT* in this subsection.

Remove rear final drive bolts.



1. Remove bolts

Remove bolts from rear retaining plate.

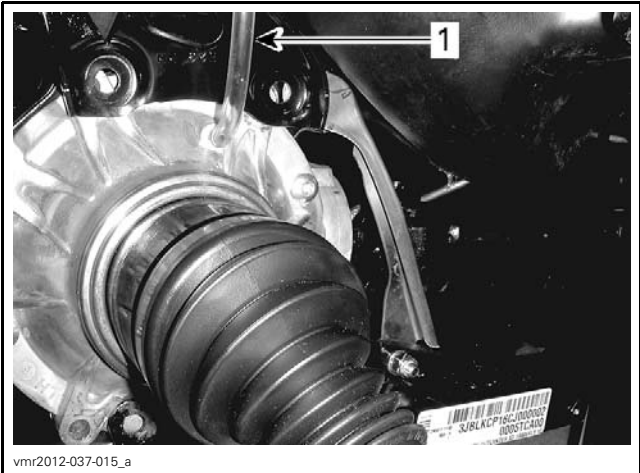


1. Remove bolts

Unplug the vent hose from final drive.

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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.

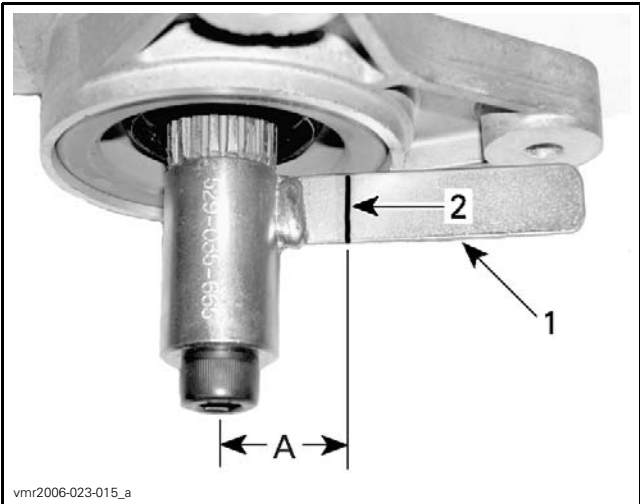
Check if oil seals are brittle, hard or damaged. Replace if necessary.

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.



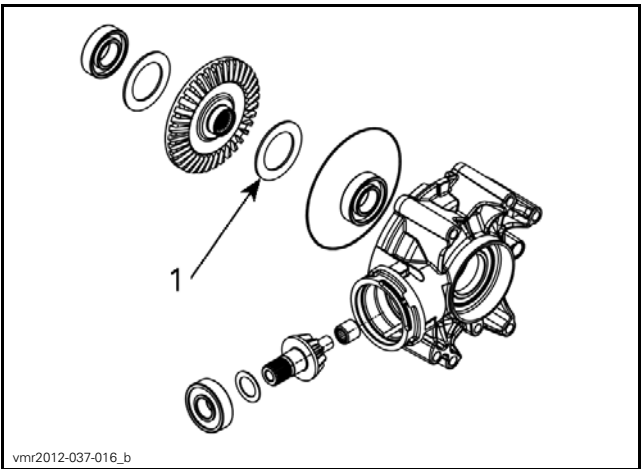
Rotate pinion gear 1/2 turn and recheck backlash. Note the result.

Rotate pinion gear 1 turn and recheck backlash.

BACKLASH SPECIFICATION
0.05 mm (.002 in) to 0.36 mm (.014 in)

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

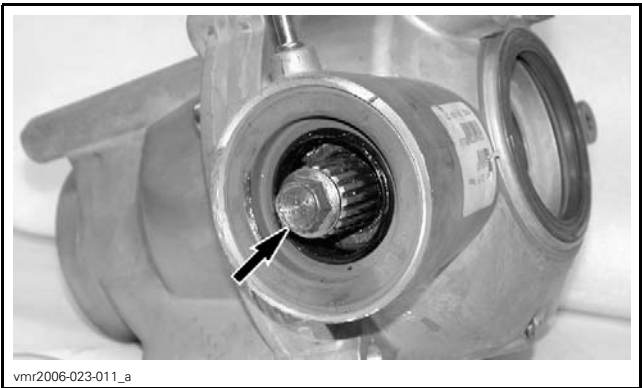
BACKLASH ADJUSTMENT GUIDELINE	
BACKLASH MEASUREMENT	WHAT TO DO
Below 0.05 mm (.002 in)	Add shim(s) and recheck backlash
Above 0.36 mm (.014 in)	Remove shim(s) and recheck backlash



1. Backlash shim

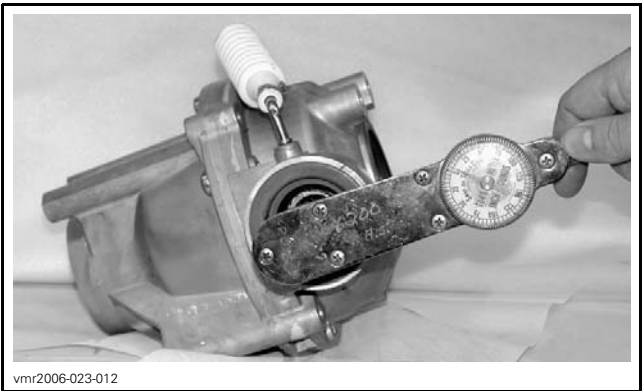
Preload Inspection

Screw the propeller shaft screw in pinion gear.



TYPICAL — FRONT DIFFERENTIAL SHOWN

Using a needle torque wrench, measure the preload.

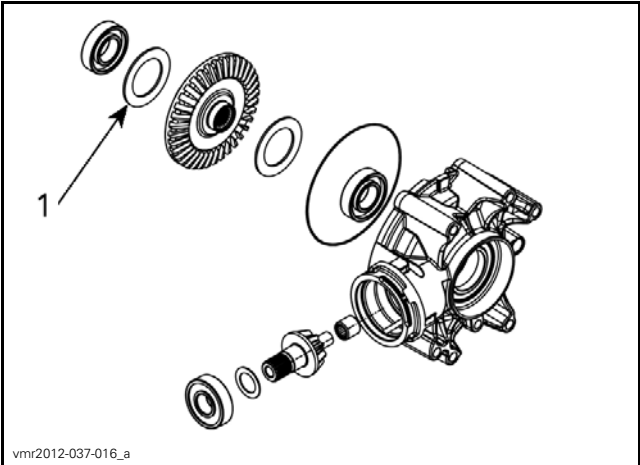


TYPICAL — FRONT DIFFERENTIAL SHOWN

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

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

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

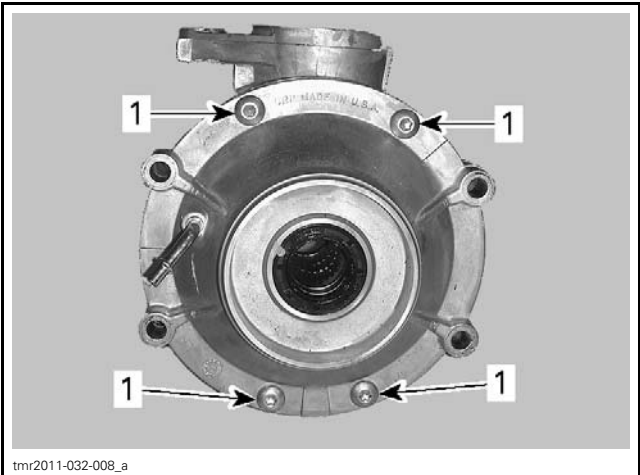


1. Preload shim

Rear Final Drive Disassembly

Ring Gear

Unscrew the final drive housing screws **no. 1**.



1. Housing screws

Split final drive housings.

NOTE: Be careful to keep track of shims **no. 2** and **no. 13** on ring gear **no. 3**.

Extract ring gear out of half housing.

Pinion Gear

Remove and discard oil seal **no. 4**.

Unscrew the pinion nut **no. 5**. Use the SPANNER SOCKET (P/N 529 035 649).



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

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Remove the bearing **no. 6** along with the pinion gear **no. 7**. Be careful to keep track of shims **no. 8**. Discard bearing.

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

PART	QTY
Pipe: 89 mm (3-1/2 in) diameter x 127 mm (5 in)	1
Threaded rod: M12 x 1.25 x 178 mm (7 in)	1
M12 x 1.25 nut	3
Flat bar	1

Remove and discard the needle bearing **no. 9**.

Rear Final Drive Assembly

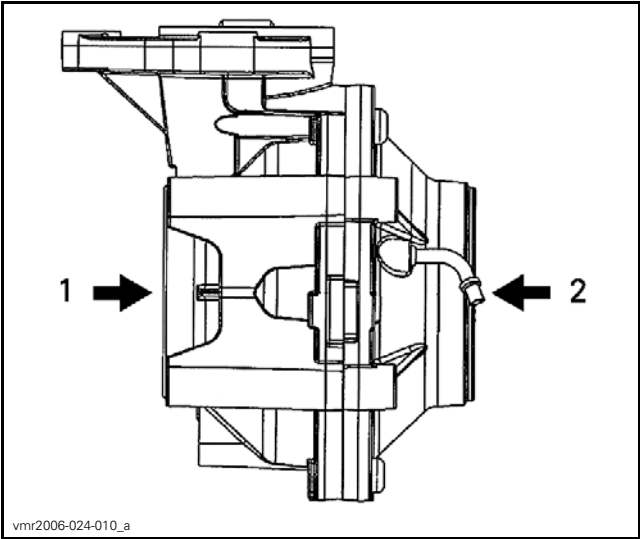
Adjustment is required when any of the following part is changed.

- Pinion gear
- Ring gear
- Housing.

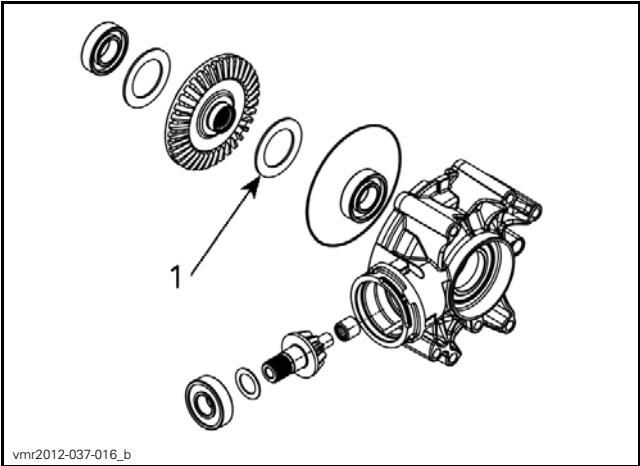
As a preliminary setup, install shims according to the following table.

RECOMMENDED SHIM THICKNESS	
PINION GEAR (1)	1.67 mm ± 0.04 mm (.066 in ± .002 in)
BACKLASH	0.5 mm (.02 in) (as a preliminary adjustment)
PRELOAD	

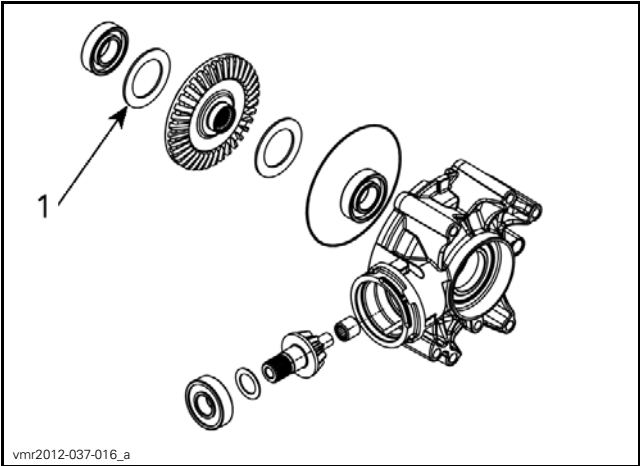
(1) The pinion gear shim thickness (**no. 8**) should never be altered. Any adjustment should be done on preload and/or backlash shims (**no. 8** and **no. 13**).



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

For the assembly, reverse the removal procedure. Pay attention to the following.

Check condition of seal **no. 10**. Replace if damaged.

Install new bearings **no. 11**.

Tighten final drive housing screws **no. 1**.

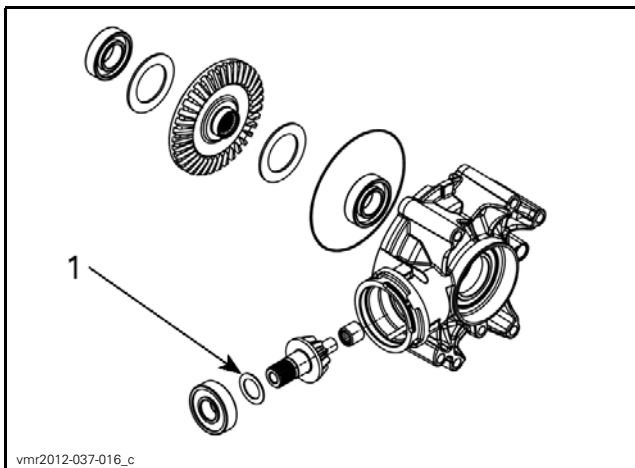
PART	TORQUE
Final drive housing screws	32.5 N•m ± 3.5 N•m (24 lbf•ft ± 3 lbf•ft)

Pinion Gear

To install, reverse the removal procedure. Pay attention to the following.

Replace the O-ring **no. 13**.

Install the shim(s) **no. 8** then a new ball bearing **no. 6**.



1. Shim **no. 8**

Install a new needle bearing **no. 9**.

Apply LOCTITE 277 (P/N 293 800 073) to pinion nut **no. 5**.

NOTE: If a new pinion nut is used, a self-locking product is already applied, do not use Loctite 277.

Install and tighten the pinion nut.

PART	TORQUE
Pinion nut (LH THREADS)	180 N•m ± 15 N•m (133 lbf•ft ± 11 lbf•ft)

Lubricate oil seal **no. 4**.

Finalize assembly:

- Apply thread locker products where applicable.
- Torque fasteners as per tables.

Rear Final Drive Installation

The installation is the reverse of the removal procedure.

INSTALLATION TIPS	
Begin by installing the lowest rear final drive retaining bolt.	
Pay attention to inserting rear final drive retaining bolts through all the bracket holes. At some places there is 2 brackets thick.	
Loosely install all bolts prior to tightening bolts.	

PART	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.