# 2015–2017 RANGER XP/CREW 570/900/1000

Service Manual

Chapter Summary

## MASTER TORQUE LIST

| CHAPTER 2 — MAINTENANCE | |
|---|---|
| **PART DESCRIPTION** | **TORQUE SPECIFICATION** |
| Crankcase Drain Plug (570) | **14 lb-ft (19 Nm)** |
| Crankcase Drain Plug (900) | **12 lb-ft (16 Nm)** |
| Spark Plug (570) | **9 lb-ft (12 Nm)** |
| Spark Plug (900) | **7 lb-ft (10 Nm)** |
| Valve Cover Bolts | **7 lb-ft (10 Nm)** |
| Outer Clutch Cover Screws | **45-50 lb-in (5 Nm)** |
| Tensioner Mounting Bolts | **7 ft-lb (10 Nm)** |
| Plunger Bolt | **15 ft-lb (20 Nm)** |
| Transmission Fill / Drain Plug | **10-14 lb-ft (14-19 Nm)** |
| Front Gearcase Fill / Drain Plug | **8-10 lb-ft (11-14 Nm)** |
| Radiator Hose Clamp | **3 lb-ft (4 Nm)** |
| Wheel Nuts (Steel Wheels) | **60 lb-ft (81 Nm)** |
| Wheel Nuts (Cast Aluminum Wheels) | **120 lb-ft (163 Nm)** |
| Front Wheel Hub Castle Nuts | **80 lb-ft (108 Nm)** |
| Rear Wheel Hub Castle Nuts | **110 lb-ft (149 Nm)** |
| Tie Rod Jam Nut | **13 lb-ft (18 Nm)** |
| Shock Mounting Bolts | **40 lb-ft (54 Nm)** |

| CHAPTER 3 — ENGINE / COOLING SYSTEM (570) | |
|---|---|
| **PART DESCRIPTION** | **TORQUE SPECIFICATION** |
| Thermostat Cover Bolts | **8 lb-ft (11 Nm)** |
| Coolant Bleed Screw | **6 lb-ft (8 Nm)** |
| Water Pump Cover Fastener | **9 lb-ft (12 Nm)** |
| Water Pump Impeller | **Finger Tight** |
| Stater Cover and Water Pump Cover | **9 lb-ft (12 Nm)** |

| CHAPTER 3 — ENGINE / COOLING SYSTEM (570) | |
|---|---|
| **PART DESCRIPTION** | **TORQUE SPECIFICATION** |
| Wheel Nuts (Steel Wheels) | **60 lb-ft (81 Nm)** |
| Wheel Nuts (Cast Aluminum Wheels) | **120 lb-ft (163 Nm)** |
| Rear Engine Coupler Fastener (In Sequence) | **55 lb-ft (75 Nm)** |
| Front Engine Mount Fasteners | **40 lb-ft (54 Nm)** |
| Isolator Center Bolt | **40 lb-ft (54 Nm)** |
| Exhaust Head Pipe Bolts | **18 lb-ft (25 Nm)** |
| Starter Motor Fastener | **7 lb-ft (10 Nm)** |
| CPS Fastener | **9 lb-ft (12 Nm)** |
| Oil Gallery Plug | **11 lb-ft (15 Nm)** |
| Intake Camshaft Sprocket Bolt | **14 lb-ft (19 Nm)** |
| Cam Chain Guide Fasteners | **9 lb-ft (12 Nm)** |
| Camshaft Carrier Bolts | **8 lb-ft (11 Nm)** |
| Cam Chain Tensioner | **30 lb-ft (41 Nm)** |
| Spark Plug - 570 | **9 lb-ft (12 Nm)** |
| Valve Cover Bolts | **9 lb-ft (12 Nm)** |
| Cylinder Head Step 1 | **21 lb-ft (28 Nm)** |
| Cylinder Head Step 2 | **26 lb-ft (35 Nm)** |
| Cylinder Head Step 3 | **Additional 135°** |
| Cylinder Head Step 4 (M6 Bolts) | **8 lb-ft (11 Nm)** |
| Oil Pump Cover Bolt | **8 lb-ft (11 Nm)** |
| Crankcase Breather Fasteners | **9 lb-ft (12 Nm)** |
| Bearing Retainer Fastener | **8 lb-ft (11 Nm)** |
| Crankcase Bolts (In Sequence) | **22 lb-ft (30 Nm)** |
| One Way Clutch Retaining Bolts | **9 lb-ft (12 Nm)** |
| Flywheel Retaining Nut | **133 lb-ft (180 Nm)** |

## 2015-2017 *RANGER* CREW XP 900 / EPS OVERVIEW

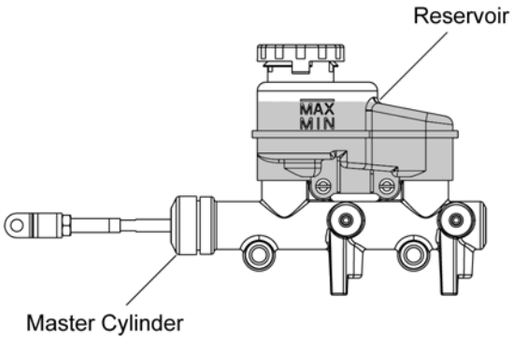
| CATEGORY | DIMENSION / CAPACITY |
|---|---|
| Length | 148 in / 376 cm |
| Width (cargo box) | 60 in / 152.4 cm |
| Width (tires) | 58 in / 147.3 cm |
| Height | 76 in / 193 cm |
| Wheel Base | 113 in / 287 cm |
| Ground Clearance | 12 in / 30.5 cm |
| Turning Radius | 214 in / 543.5 cm |
| Dry Weight | 1570 lb / 712 kg |
| Cargo Box Capacity | *49-State:* 1000 lb / 454 kg<br>*50-State:* 600 lb / 272 kg |
| Cargo Box Dimensions (inside dimensions) | 36 x 50 x 11.5 in<br>(91 x 127 x 29 cm) |
| Vehicle Payload (includes weight of operator, passenger, cargo and accessories) | *49-State:* 1750 lb / 759 kg<br>*50-State:* 1350 lb / 712 kg |
| Hitch Towing Capacity | 2000 lb / 907 kg |
| Hitch Tongue Capacity | 150 lb / 68 kg |


## MAINTENANCE QUICK REFERENCE

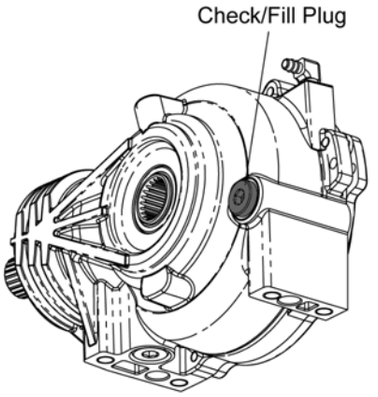
| | ITEM | LUBE REC. | METHOD | FREQUENCY* |
|---|---|---|---|---|
| 3 | Brake Fluid | Polaris DOT 4 Brake Fluid | Maintain fluid level between “MAX and “MIN” lines on the master cylinder reservoir | Check level during pre-ride inspection; change fluid every two years |
| 4 | Front Gearcase | Polaris Demand Drive Fluid | Add lubricant until it is visible at the fill hole threads | Initial level check at 25 hours or 1 month; Change lubricant at 100 hours or every 12 months, whichever comes first |
| 5 | Transmission | Polaris AGL Gearcase Lubricant | | |

* More often under severe use, such as operated in water or under severe loads.

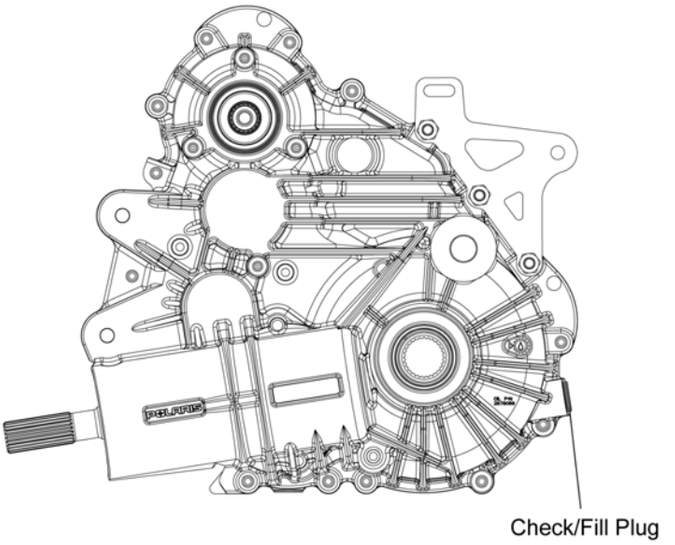
**3. Brake Fluid**
(Front LH Wheel Well)



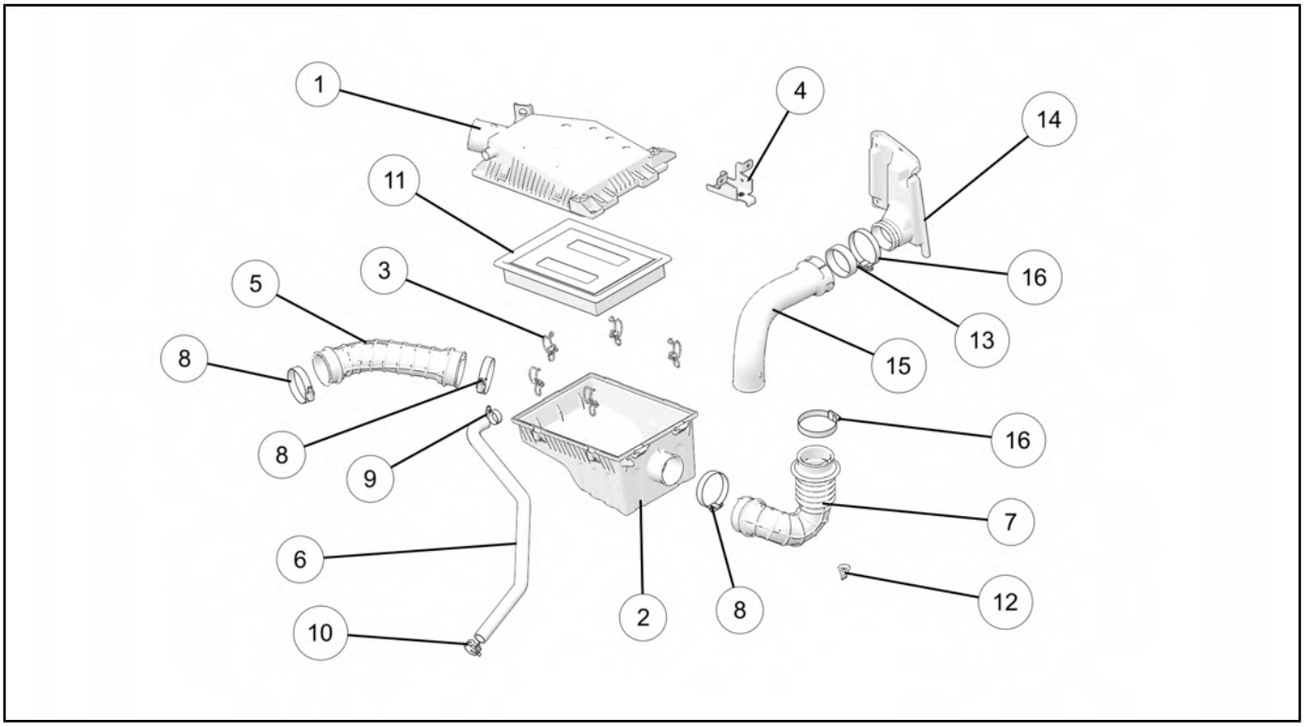

**4. Front Gearcase**
(Front RH Wheel Well)




**5. Transmission**
(Rear of Vehicle)

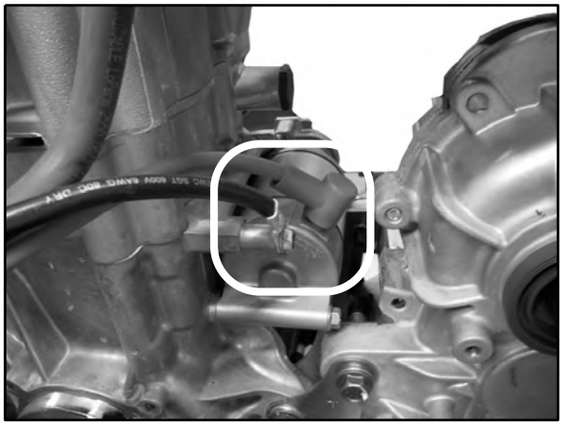


## ENGINE AIR INTAKE EXPLODED VIEW

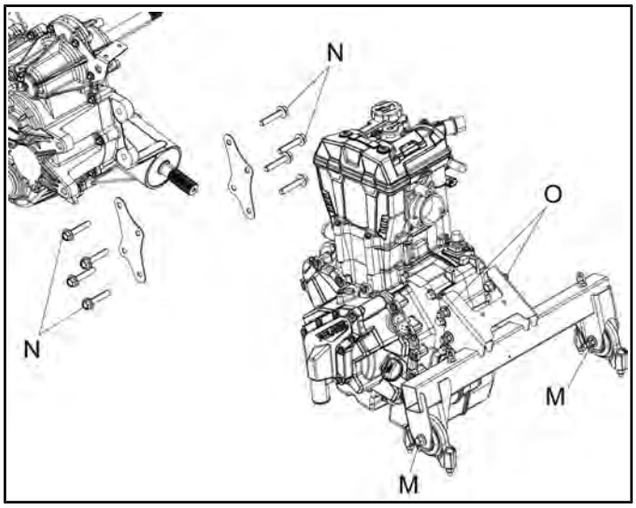



| REF | DESCRIPTION | REF | DESCRIPTION |
|---|---|---|---|
| ① | LID, AIRBOX | ⑨ | CLAMP, HOSE |
| ② | BASE, AIRBOX | ⑩ | CLAMP, SPRINGBAND |
| ③ | CLIP, AIRBOX | ⑪ | FILTER, MAIN AIRBOX |
| ④ | BRACKET, AIRBOX MOUNT | ⑫ | PLUG, DRAIN |
| ⑤ | HOSE, ENGINE INTAKE | ⑬ | HOSE, INTAKE BOOT |
| ⑥ | HOSE, ENGINE VENT | ⑭ | FENDER, INTAKE REAR |
| ⑦ | HOSE, AIRBOX INTAKE | ⑮ | DUCT, AIR INTAKE |
| ⑧ | CLAMP, HOSE | ⑯ | CLAMP, HOSE |

17. Remove (-) negative cable from the starter mounting nut.



18. Disconnect the upper engine coolant hose (H), bypass hose (I) and ECT (J) harness connector.
19. Remove the two bolts securing the muffler to the frame. Remove the three hex bolts (K) securing the exhaust head pipe to the engine. Maneuver the exhaust assembly out of the mounting grommet and remove the exhaust assembly as one.
20. Place a support between the main frame and transmission case. Do not pinch any lines.
21. Use an overhead or portable engine hoist and suitable engine straps to secure the engine in its current position.
22. Remove the four bolts and nuts (M) securing the engine to the front motor mount bracket.
23. Remove the eight bolts (N) securing the coupler brackets to the engine and transmission.
24. Loosen the two bolts and nuts (O) so the engine mount bracket can be slightly tilted away from engine.

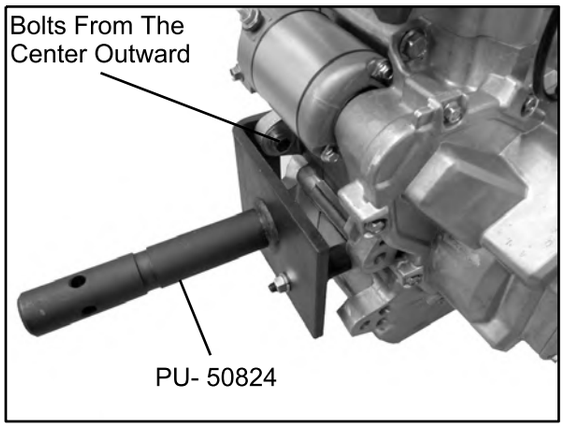



25. With the help of an assistant and the engine hoist, raise the engine vertically out of the vehicle frame.

**NOTE**

Have an assistant help guide the engine in and out of the vehicle while using an engine hoist to prevent personal injury or damage to the vehicle components.

26. Install the engine stand adapter (**PU-50824**) onto the engine PTO side mounting ears as shown below.




27. Select the proper engine stand sleeve adapter and install it onto the engine stand adapter.

- Sleeve adapter for a 2” bore engine stand:
- (**PU-50625**)
- Sleeve adapter for a 2.375” bore engine stand:
- (**PW-47054**)

28. Place engine onto the engine stand (**PU-50624**) for service.

## CYLINDER HEAD INSTALLATION

**NOTE**

Head gasket and surfaces must be DRY and oil free. Use care during assembly to keep oil and finger prints off of gasket.

1. Prepare cylinder head gasket sealing surfaces by cleaning thoroughly to remove all residue. The new head gasket must be installed clean and dry, free from oil or grease.

**NOTE**

Do not touch sealing surfaces of the new head gasket.

2. Guide cam chain (D) through a new head gasket (E) and install the gasket on the cylinder, locating it on the alignment pins.
3. Carefully set the cylinder head (F) in place on alignment pins.

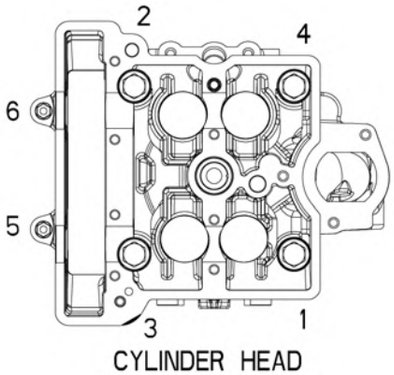
**NOTE**

Install *new* cylinder head bolts.

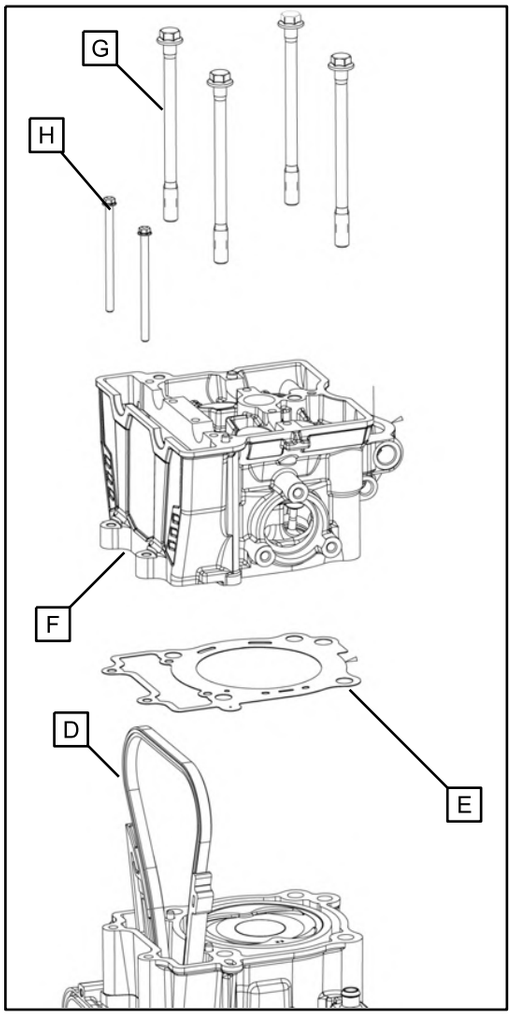
4. Install and finger tighten the four *new* cylinder head bolts (G) evenly.
5. Install and finger tighten the two *new* outer M6 bolts (H) evenly.
6. Torque the *new* cylinder head bolts in sequence to specification.

**TORQUE**

**Cylinder Head Torque Procedure:**
Torque in sequence
Step 1: **21 lb-ft (28 Nm)**
Step 2: **26 lb-ft (35 Nm)**
Step 3: **Additional 135°**
Step 4 (M6 bolts): **8 lb-ft (11 Nm)**



CYLINDER HEAD
TORQUE SEQUENCE



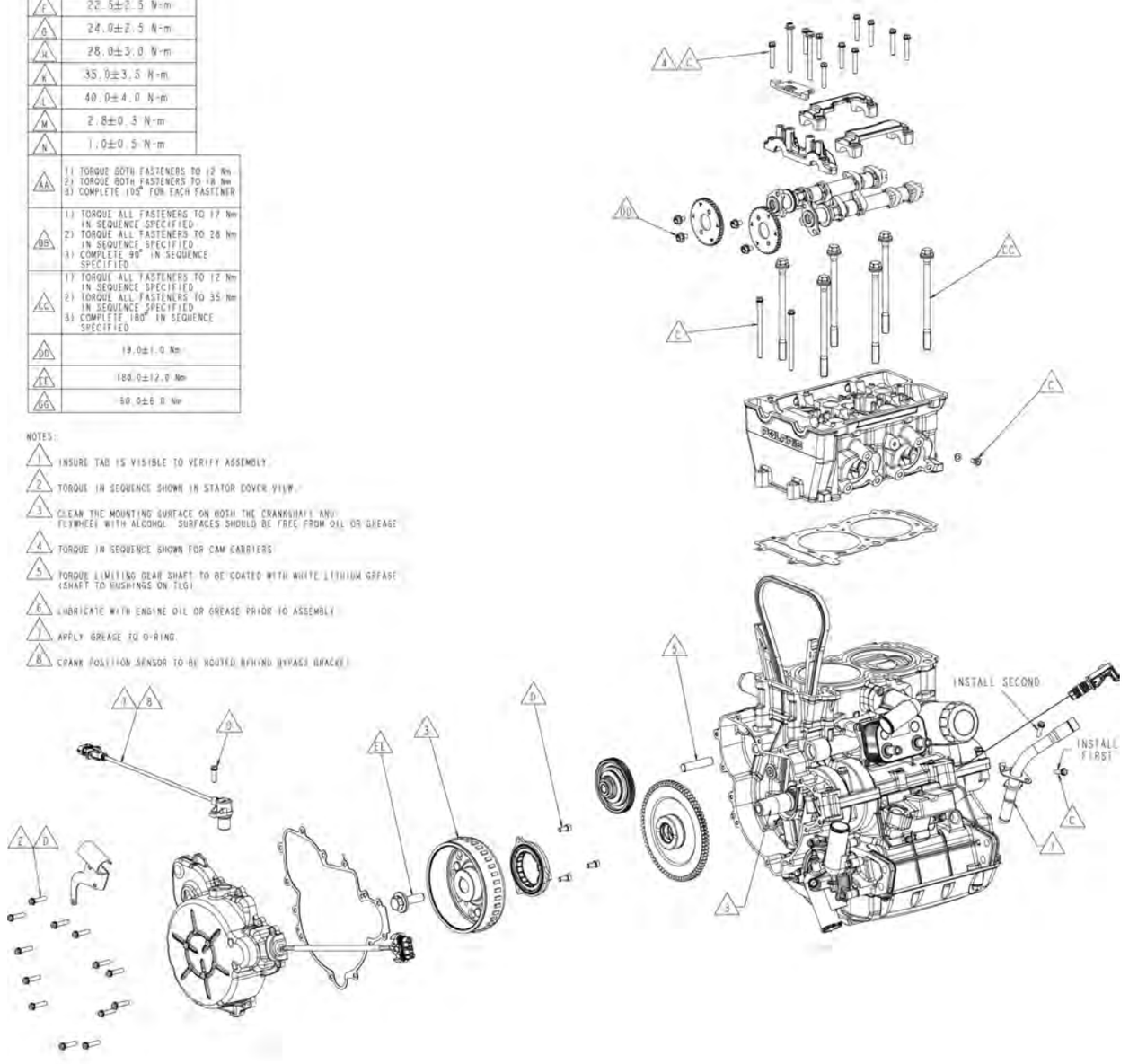
## CAMSHAFTS / CYLINDER HEAD / FLYWHEEL / IDLER GEARS / STATOR COVER



| FASTENER TORQUE TABLE | |
|---|---|
| A | 6.5±1.0 N·m |
| B | 8.0±1.0 N·m |
| C | 10.0±1.0 N·m |
| D | 12.0±1.0 N·m |
| E | 16.0±0.5 N·m |
| F | 22.5±2.5 N·m |
| G | 24.0±2.5 N·m |
| H | 28.0±3.0 N·m |
| K | 35.0±3.5 N·m |
| L | 40.0±4.0 N·m |
| M | 2.8±0.3 N·m |
| N | 1.0±0.5 N·m |
| AA | 1) TORQUE BOTH FASTENERS TO 12 Nm<br>2) TORQUE BOTH FASTENERS TO 18 Nm<br>3) COMPLETE 105° FOR EACH FASTENER |
| BB | 1) TORQUE ALL FASTENERS TO 12 Nm IN SEQUENCE SPECIFIED<br>2) TORQUE ALL FASTENERS TO 28 Nm IN SEQUENCE SPECIFIED<br>3) COMPLETE 90° IN SEQUENCE SPECIFIED |
| CC | 1) TORQUE ALL FASTENERS TO 12 Nm IN SEQUENCE SPECIFIED<br>2) TORQUE ALL FASTENERS TO 35 Nm IN SEQUENCE SPECIFIED<br>3) COMPLETE 180° IN SEQUENCE SPECIFIED |
| DD | 19.0±1.0 Nm |
| EE | 180.0±12.0 Nm |
| GG | 60.0±6.0 Nm |

NOTES:

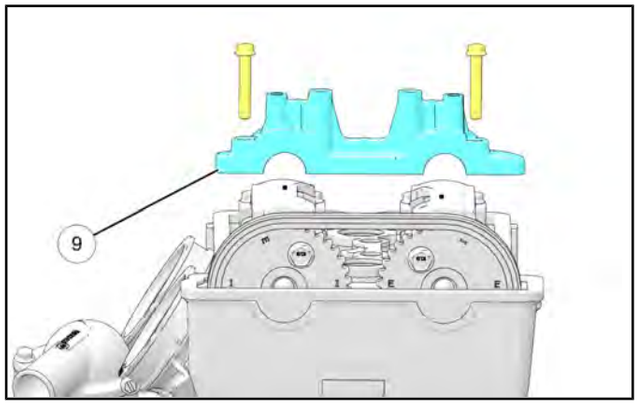
1. INSURE TAB IS VISIBLE TO VERIFY ASSEMBLY.
2. TORQUE IN SEQUENCE SHOWN IN STATOR COVER VIEW.
3. CLEAN THE MOUNTING SURFACE ON BOTH THE CRANKSHAFT AND FLYWHEEL WITH ALCOHOL. SURFACES SHOULD BE FREE FROM OIL OR GREASE.
4. TORQUE IN SEQUENCE SHOWN FOR CAM CARRIERS.
5. TORQUE LIMITING GEAR SHAFT TO BE COATED WITH WHITE LITHIUM GREASE (SHAFT TO BUSHINGS ON TLG).
6. LUBRICATE WITH ENGINE OIL OR GREASE PRIOR TO ASSEMBLY.
7. APPLY GREASE TO O-RING.
8. CRANK POSITION SENSOR TO BE ROUTED BEHIND BYPASS BRACKET.



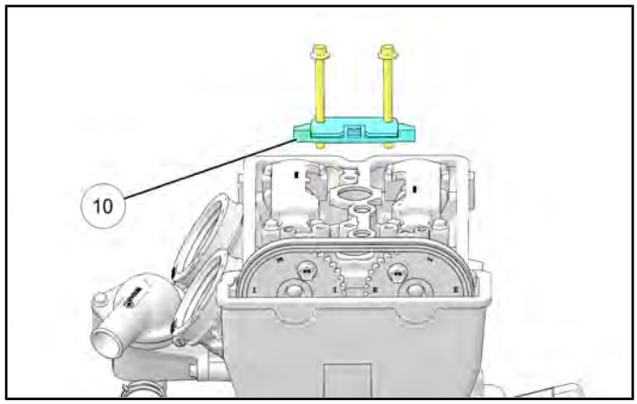
14. If timing marks are not aligned, remove sprockets and correct alignment.
15. Remove the Cylinder Holding & Camshaft Timing Plate (**PU-50563**) from the end of the camshafts.
16. Rotate the engine using the flywheel and install the remaining bolt in each camshaft sprocket. Torque the sprocket bolts to specification.

| TORQUE |
| --- |
| Camshaft Sprocket Bolts:<br>**14 ft-lb (19 Nm)** |

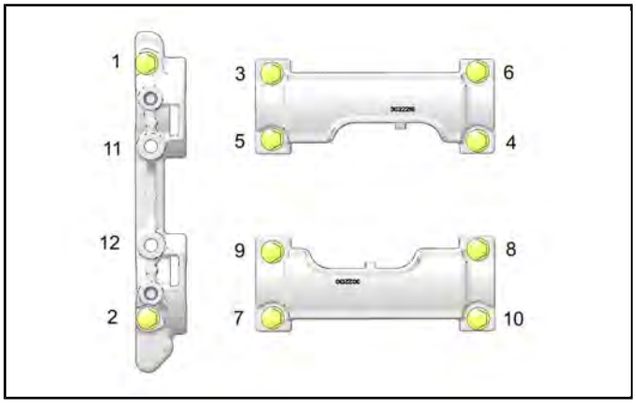
17. Rotate the engine using the flywheel and torque the remaining sprocket bolts to specification.
18. Install the front camshaft carrier ⑨ and two outer retaining bolts.




19. Install the fixed cam chain guide ⑩ and two retaining bolts.

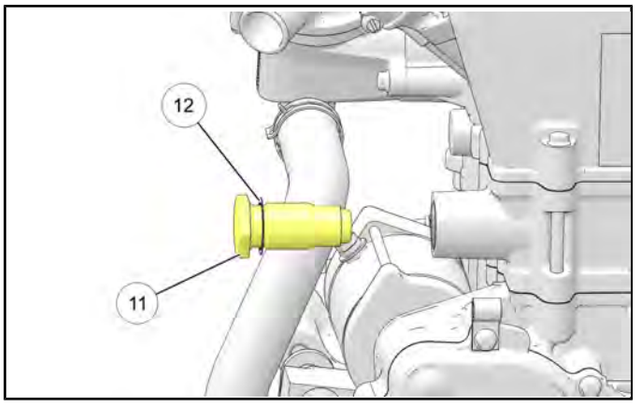



20. Torque the camshaft carriers bolts in sequence to specification.




| TORQUE |
| --- |
| Camshaft Carrier Bolts:<br>**7 ft-lb (10 Nm)** |

21. Apply Polaris PS-4 engine oil to the cam chain tensioner bore prior to assembly. Use a *new* tensioner sealing washer ⑫.
22. Install the hydraulic cam chain tensioner ⑪ into the cylinder and torque to specification.

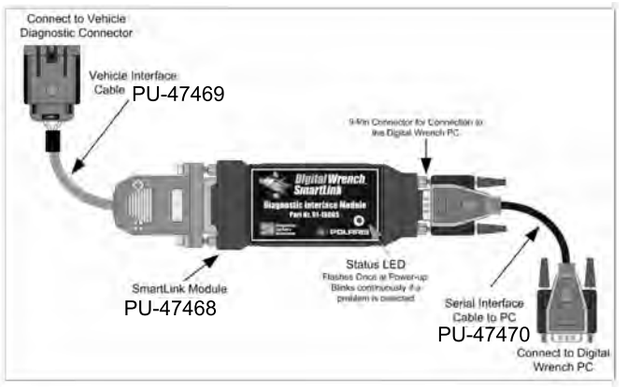



| TORQUE |
| --- |
| Cam Chain Tensioner:<br>**30 lb-ft (40 Nm)** |

23. Rotate crankshaft through two revolutions and verify camshaft timing is correct.

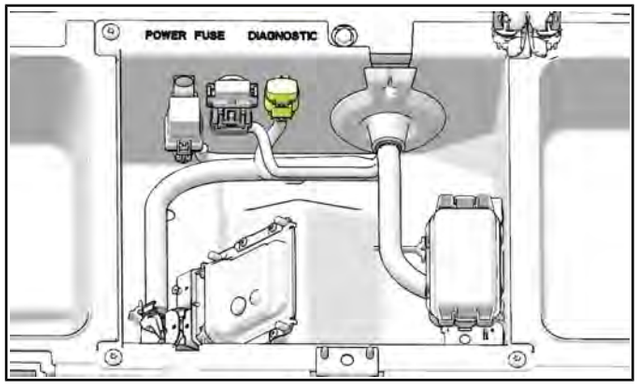
### Digital Wrench® SmartLink Module Kit - PU-47471

This module kit contains the necessary cables and hardware to communicate between the vehicle ECU and the Digital Wrench® diagnostic software. Polaris dealers can also order the following kit components separately: **SmartLink Module PU-47468**, **Vehicle Interface Cable PU-47469** and **PC Interface Cable PU-47470**. This module kit is used on all 8 pin connector-based Polaris EFI systems. This kit is available to Polaris dealers through our tool supplier Bosch Automotive Service Solutions: 1-800-345-2233 or http://polaris. service-solutions.com.



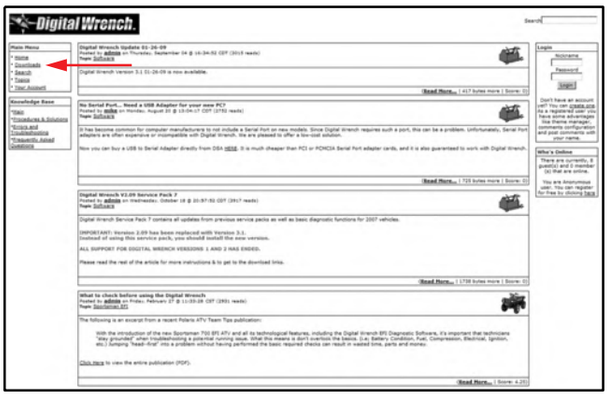

### Digital Wrench® - Diagnostic Connector

The diagnostic connector is located under the passenger seat connected to a sealed plug. To access the diagnostic connector on 2 seat models with a center console the center console must be removed.




### Digital Wrench® - Download Website

Located at: *www.polaris.diagsys.com*

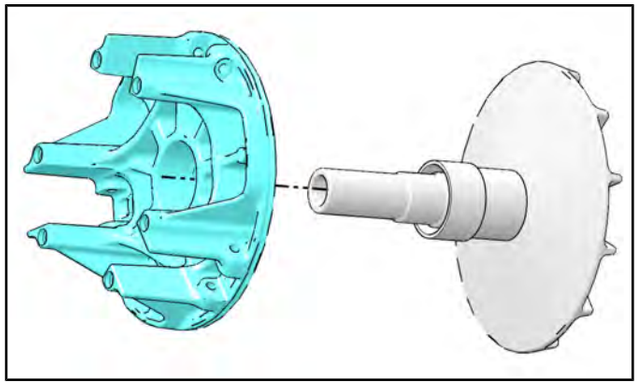



### Download Digital Wrench® Updates:

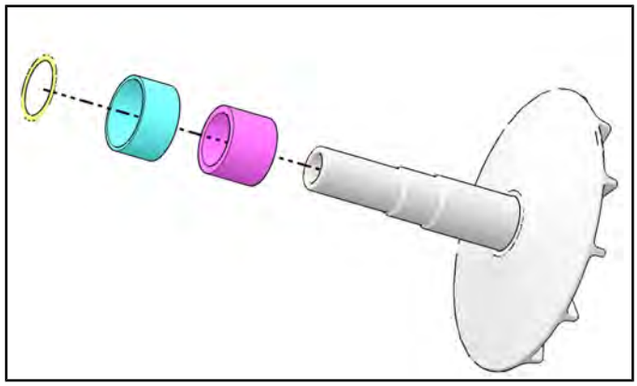

**NOTE**

For the most recent information on Digital Wrench® software and update downloads please visit the website: *www.polaris.diagsys.com*

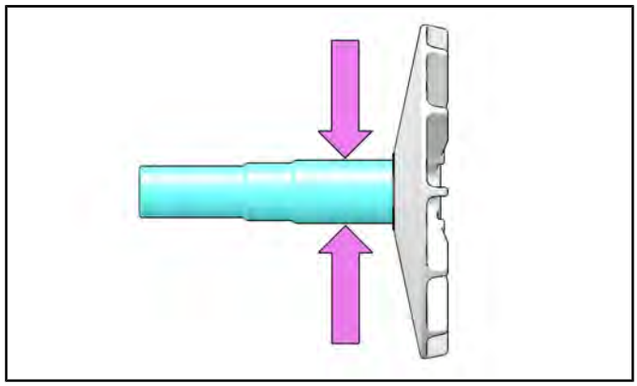
2. Remove the moveable clutch sheave. Inspect for damage or wear.



3. Lift bearing and DuPont™ Vespel® washers off the shaft. Replace as an assembly if worn, damaged, or if problems were noted.



4. Inspect surface of shaft for pitting, grooves, or damage. Measure the outside diameter and compare to specifications. Replace the drive clutch assembly if shaft is worn or damaged.



| MEASUREMENT |
| --- |
| Shaft Diameter:<br>Standard: **1.374” (34.89 mm)**<br>Service Limit: **1.372” (34.86 mm)** |

5. Visually inspect Vespel® thrust washers for damage. Measure the thickness and compare to specification. Replace if worn or damaged.

| MEASUREMENT |
| --- |
| Vespel® Washer Thickness<br>Standard: **0.030” (0.76 mm)**<br>Service Limit: **0.025” (0.64 mm)** |

## MOVEABLE SHEAVE BUSHING INSPECTION

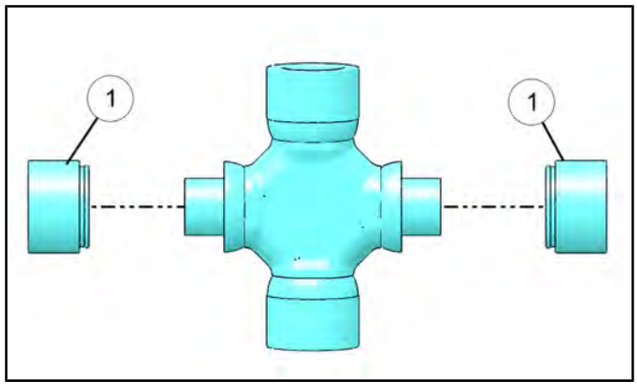
Inspect the Teflon® coating (arrow) on the moveable sheave bushing. Inspect both sheaves for signs of wear, grooving or cracking. De-glaze sheave surfaces with a 3M Scotch-Brite™ Pad if needed.

Moveable Sheave Bushing Inspection:Replace the cover bushing if more brass than Teflon® is visible on the bushing. Refer to **“Bushing Service”, page 5.22** procedure.

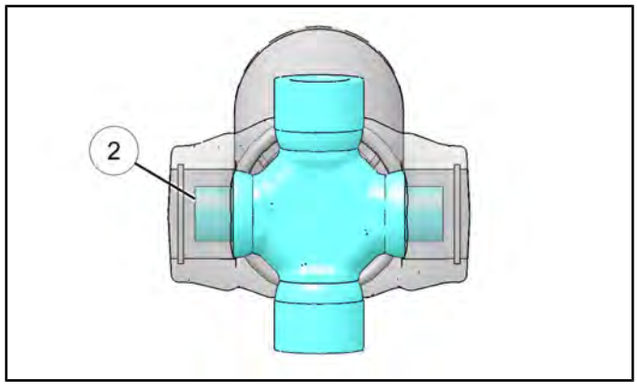
6. Discard and replace all U-joint parts that were removed from the yoke.

## PROPSHAFT U-JOINT ASSEMBLY

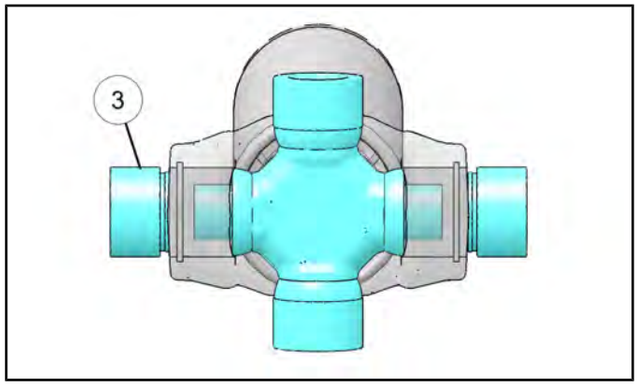
1. With NEW U-joint, remove two opposing caps ① from end of joint to go into yoke and secure other two so they do not fall off during installation.



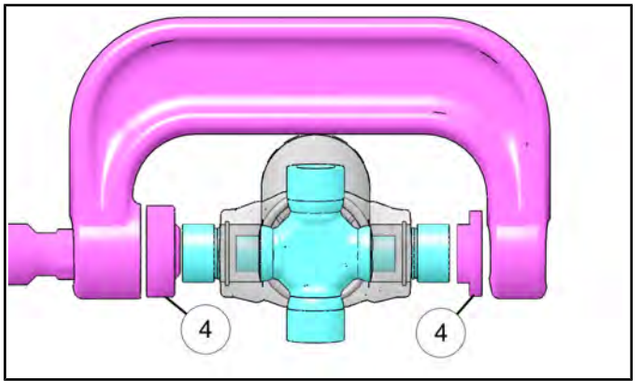

2. Ensure yoke bores and ring grooves are clean before installing new U-joint.
3. Place U-joint ends ② without caps into yoke bores.



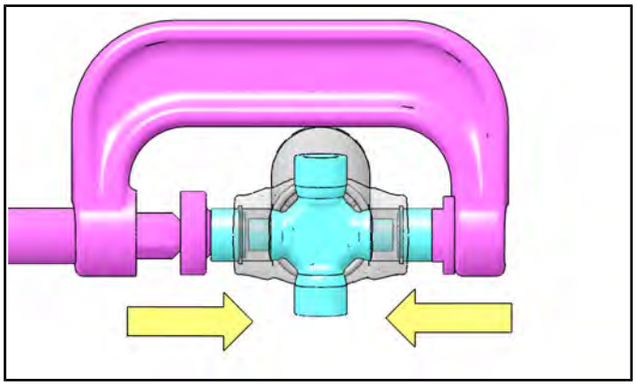

4. Place caps ③ into yoke bores and align with U-joint ends by hand.



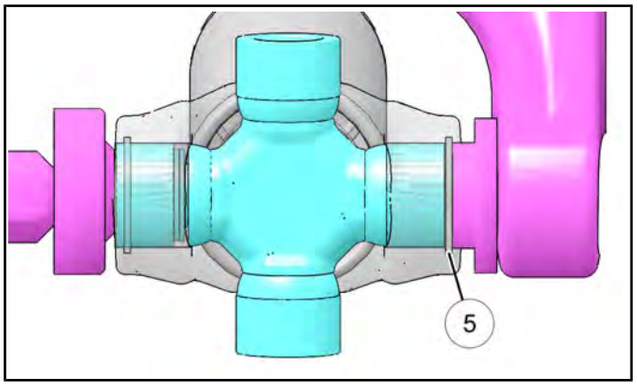

5. Place clamp and installer adapters ④ with smaller OD than caps over each cap.




6. Tighten clamp to install caps simultaneously into yoke bores.



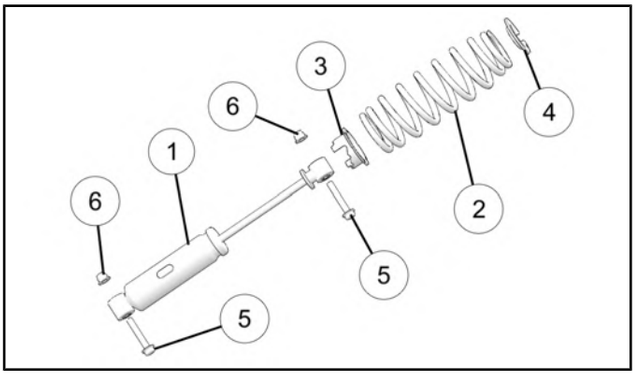
7. Push U-joint side to side during clamping to seat into caps properly.
8. Tighten clamp until both caps are flush with yoke and one cap is past retaining ring groove ⑤.




7

# SHOCK / SPRING SERVICE

## SHOCKS ASSEMBLY VIEW




| REF | DESCRIPTION |
|---|---|
| 1 | SHOCK |
| 2 | SPRING |
| 3 | CAM, ADJUSTING |
| 4 | RETAINER, SPRING |
| 5 | BOLT |
| 6 | NUT |

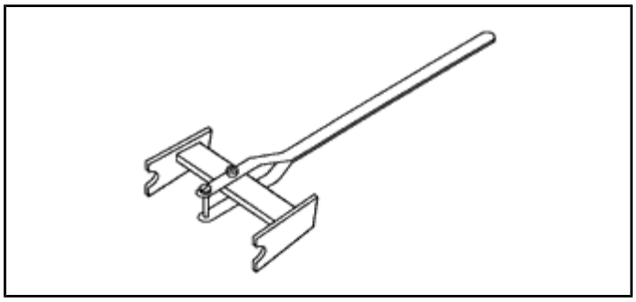
## SHOCK REMOVAL / INSTALLATION

1. Elevate the vehicle far enough off the ground to relieve the suspension load and support the A-arm.
2. Remove the upper and lower fasteners retaining the shock and remove the shock from the vehicle. Discard nuts and replace with new upon installation.
3. Reverse the procedure to reinstall the shock. Torque new shock mounting fasteners to specification.

| TORQUE |
|---|
| Shock Mounting Bolts:<br>**40 lb-ft (54 Nm)** |

## SPRING REPLACEMENT

1. Remove the shock and note the spring preload cam setting.
2. Using spring compressor, compress the shock spring far enough to remove spring retainer.



| Spring Compressor:<br>**2870623** |
|---|

3. Remove the spring and adjusting cam from the existing shock and install components onto the new shock.
4. Install the spring retainer. If needed, use the spring compressor to compress the spring far enough to install the retainer.

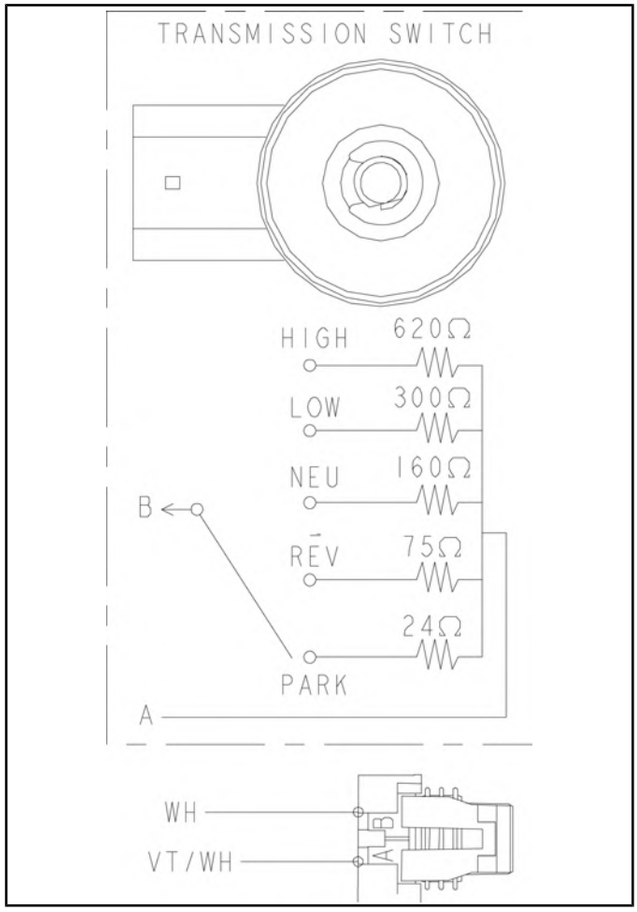
| NOTE |
|---|
| The spring retainer gap should be 180° from the end of the spring upon installation. |

5. Turn adjustment cam to set preload distance noted in Step 1.
6. Reinstall shock onto vehicle and torque new fasteners to specification.

## TRANSMISSION (GEAR POSITION) SWITCH

The transmission switch is located on the right side of the transmission. The switch can be accessed through the right rear wheel well opening.

1. Disconnect the transmission switch harness by lifting the connector lock and pulling on the 2-pin connector. Do not pull on the wiring.
2. Test transmission switch for continuity in each gear position and compare to the specifications below.

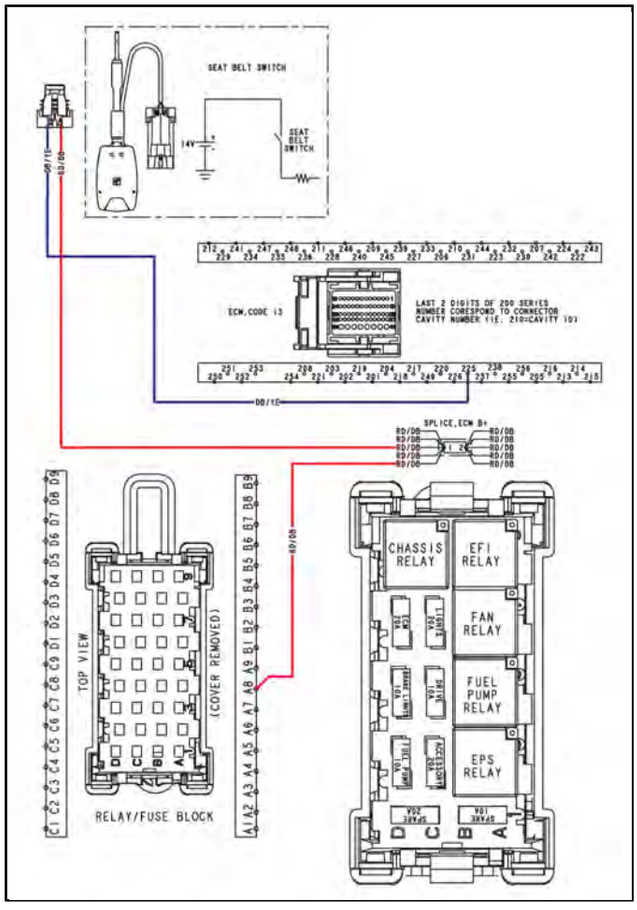



## SEAT BELT SWITCH

The vehicle is equipped with a seat belt interlock switch to prevent the vehicle from exceeding 15 MPH (24 KPH) unless the driver seat belt is secured in the seat belt lock. The switch is powered by the EFI Relay, sending a signal to the ECU.

1. Disconnect the seat belt switch harness by depressing the connector locks and pulling on the connector. Do not pull on the wiring.
2. Test for continuity between the EFI Relay and the switch.
3. Test for continuity between the switch and the ECU pin.
4. Test for continuity across the switch.

| Seat Belt Switch: **Normally Open** |
|---|

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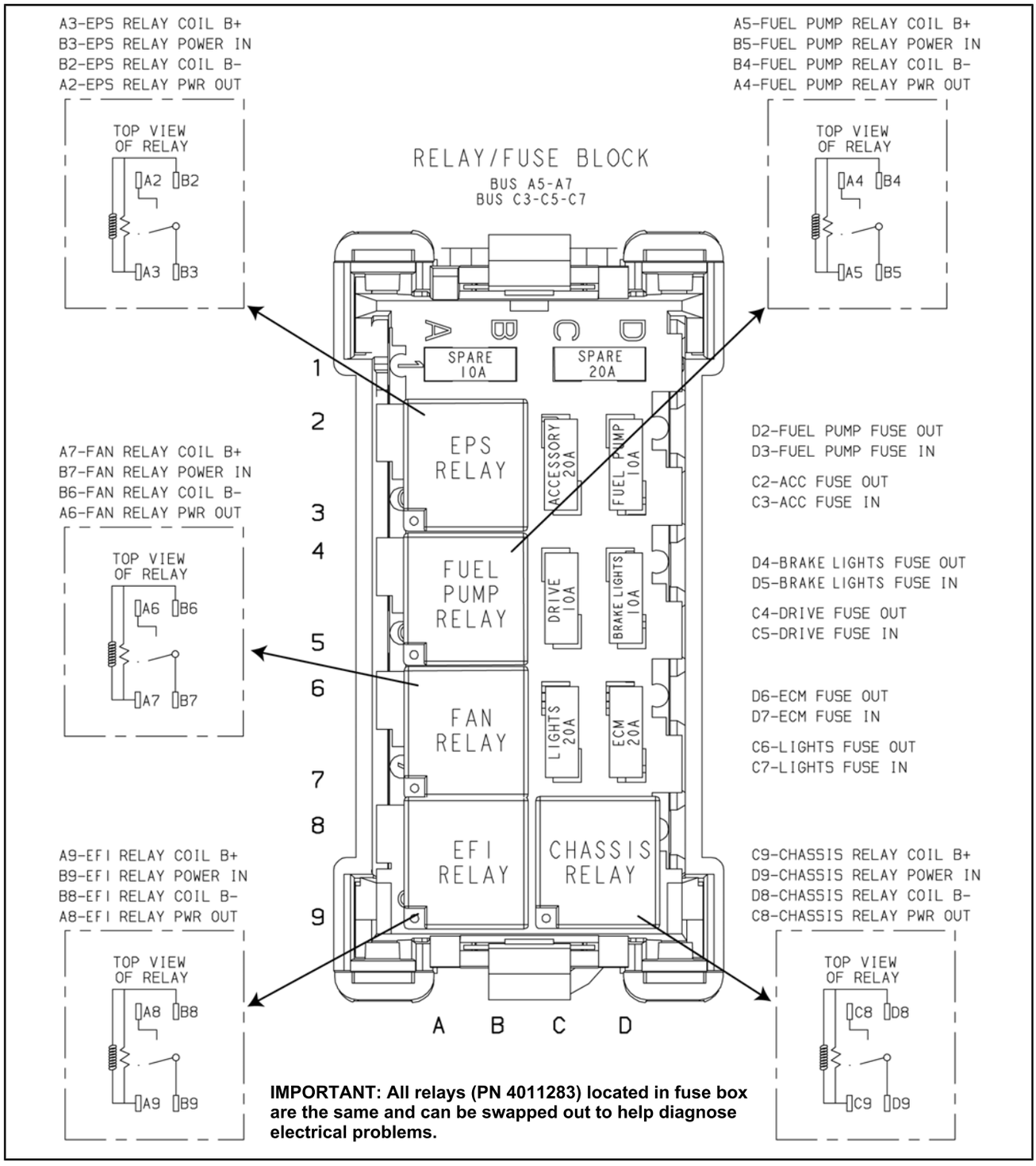
## FUSE BOX DETAIL VIEW

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