



# 2019 SERVICE MANUAL



Wildcat X



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- If compression increases to normal, service the top end (see Engine/Transmission — Servicing Top-Side Components).

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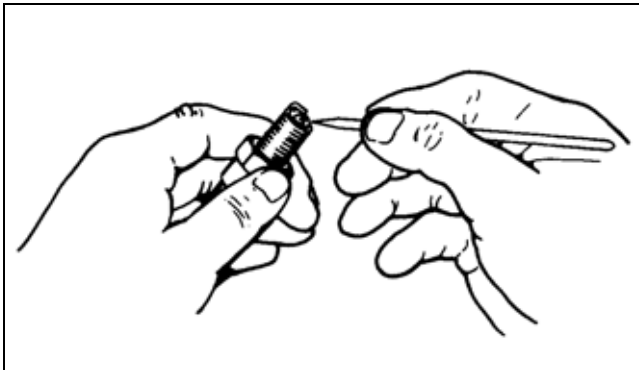


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## Spark Plugs

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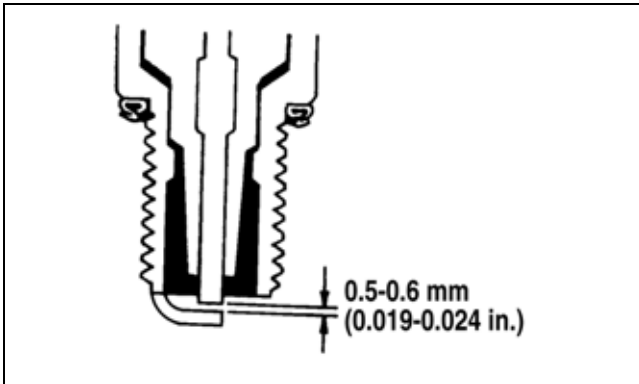
A light brown insulator indicates the plug and fuel/air ratio are correct. A white or dark insulator indicates that the engine may need to be serviced. To maintain a hot, strong spark, keep the plug free of carbon. Adjust the gap to 0.5-0.6 mm (0.019-0.024 in.).



ATV-0051

### CAUTION

Before removing a spark plug, be sure to clean the area around the spark plug. Dirt could enter engine when removing or installing the spark plug.



ATV0052E

A new spark plug should be tightened 1/2 turn once the washer contacts the cylinder head. A used spark plug should be tightened 1/8-1/4 turn once the washer contacts the cylinder head.

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## Muffler/Spark Arrester

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Clean the spark arrester using the following procedure:

### ⚠ WARNING

Wait until the muffler cools to avoid burns.

- Remove the machine screw securing the spark arrester to the muffler.



WC900

- Remove the spark arrester screen; then using a suitable brush, clean the carbon deposits from the screen taking care not to damage the screen.

■NOTE: If the screen is damaged in any way, it must be replaced.

- Install the spark arrester assembly and secure with the machine screw. Tighten the cap screw to 6 ft-lb.

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## Engine/Transmission Oil — Filter

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### OIL — FILTER

Change the engine oil and oil filter at the scheduled intervals. The engine should always be warm when the oil is changed so the oil will drain easily and completely.

- Park the vehicle on level ground.
- Remove the oil level stick/filler plug.

### ⚠ WARNING

Use caution when removing oil level stick. Exhaust components may be extremely hot.



WC895A

- Remove the drain plug from the bottom of the engine and drain the oil into a drain pan. Account for and discard the gasket.

### ⚠ WARNING

Use extreme caution when removing the oil drain plug. Hot oil can cause severe injury and skin burns.



WC321

## Steering Assembly

■NOTE: Thoroughly troubleshoot the EPS system prior to replacing the EPS assembly (see Electrical System) as there are several possible external causes for system failure.

### REMOVING EPS

■NOTE: Before removing the EPS, ensure the front wheels and steering wheel are aligned to the front.

1. Remove two cap screws and two fender screws securing the grille and remove the grille.



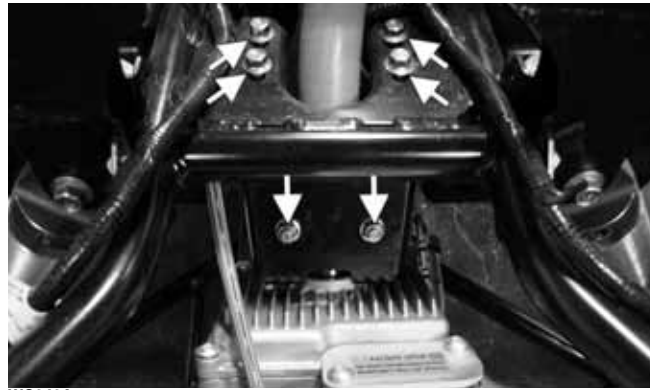
WC081C

2. Remove two fender screws behind the headlights and two fender screws at the rear of the hood; then remove the hood.



WC241A

3. Unplug the two connectors from the EPS unit; then remove four cap screws and two lock nuts from the steering flex-shaft clamp bracket and clamp.

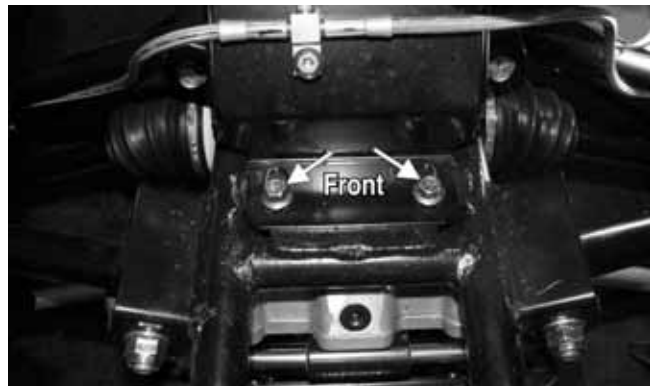


WC242A

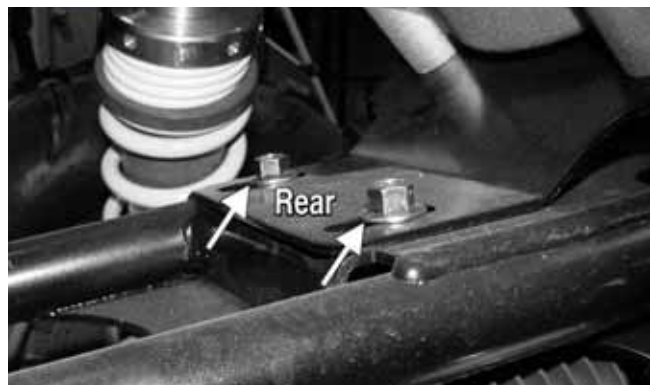
4. Remove the U-clamp; then remove the bracket.
5. Loosen the Allen-head cap screw securing the steering rack input coupler to the shaft; then remove four cap screws securing the EPS mounting bracket to the frame.



WC244A

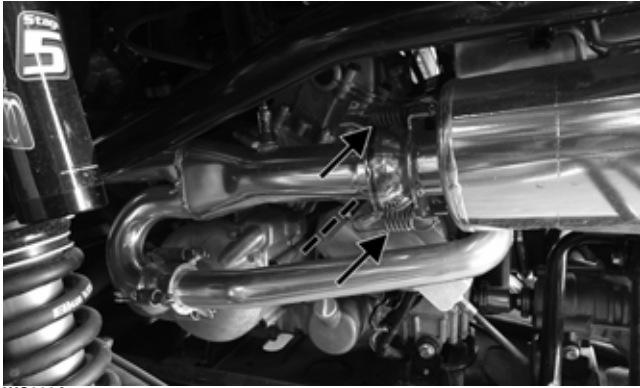


WC245A



WC246A

6. Remove the mounting screw securing the brake line support bracket to the EPS mounting bracket.



WC898A

- Slide the muffler assembly clear of the holder pins. Account for the GRAFOIL seal.

### INSPECTING

- Inspect muffler externally for cracks, holes, and dents.
- Inspect the muffler internally by shaking the muffler back and forth and listening for rattles or loose debris inside the muffler.

■ **NOTE:** For additional details on cleaning the muffler/spark arrester, see *Periodic Maintenance/Tune-Up*.

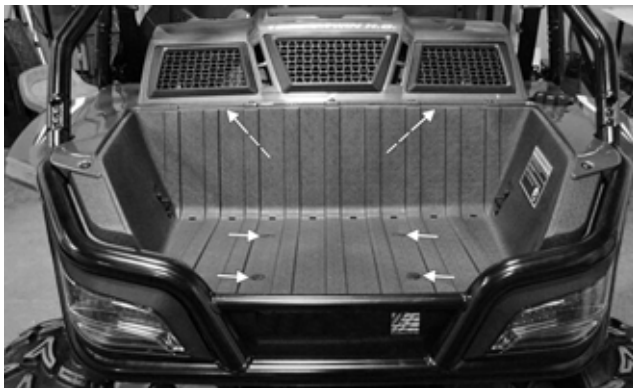
### INSTALLING MUFFLER

- With the GRAFOIL seal in place, place the muffler onto the holder pins and slide into position.
- Secure the muffler to the exhaust pipe with the four exhaust springs.

## Cargo Box

### REMOVING

- Remove the rear body panel.
- Remove the six fender screws (two under rear body panel) securing the cargo box to the mounts and remove the cargo box.



TXR061

### INSTALLING

- Set the cargo box into position on the cargo box mounts; then secure with the six fender screws. Tighten securely.
- Install the rear body panel.

## Seats

### REMOVING/INSTALLING

- To remove a seat, pull the seat lock lever up. Raise the rear of the seat and tilt it forward.



WC017A

- To install a seat, slide the front of the seat into the seat retainers and push down firmly on the rear of seat. The seat should automatically lock into position.

## Doors

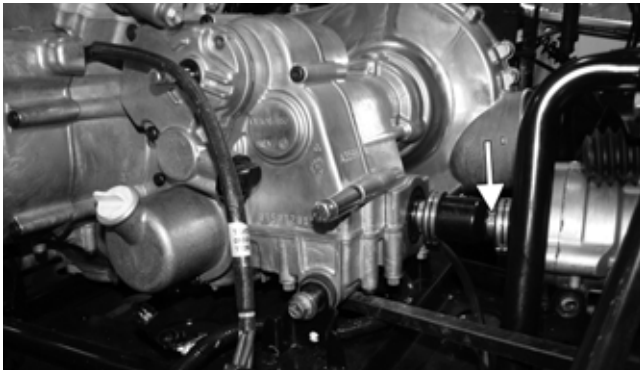
### CHECKING/ADJUSTING (X)

The doors and latches are adjustable for proper latching/unlatching.

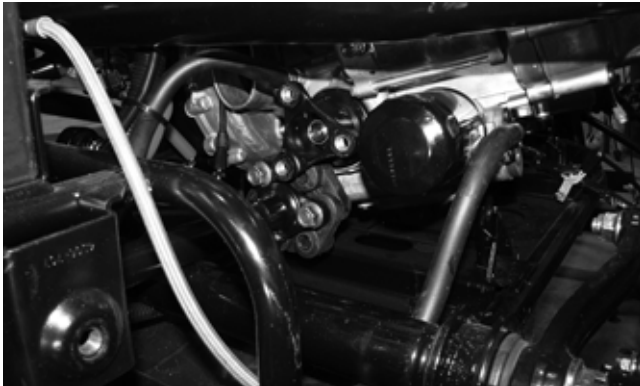
- To raise or lower door-to-latch contact or to move the door forward or backward, loosen the screws on the hinge plate. After adjustment, tighten securely.



WC134A

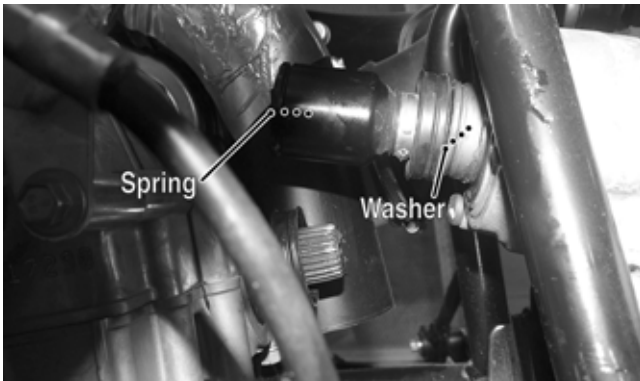


WC172B

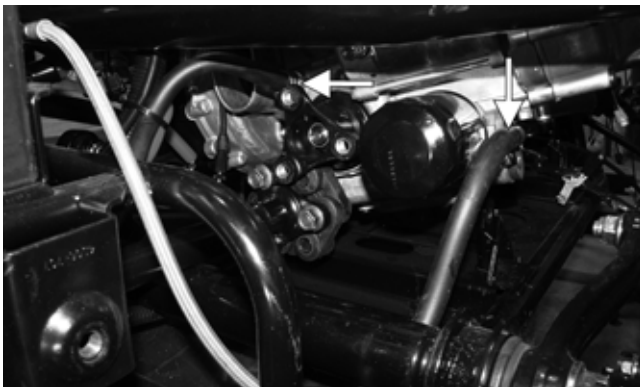


WC174

27. Move the engine forward sufficiently to disengage the spline shaft on the rear drive coupler and lift the engine just free of the mounts; then clamp off the oil cooler hoses and disconnect from the engine. Account for the spring.



WC767A



WC174A

## Top-Side Components

■NOTE: For efficiency, it is preferable to remove and disassemble only those components which need to be addressed and to service only those components. The technician should use discretion and sound judgment.

### AT THIS POINT

To service any one specific component, only limited disassembly of components may be necessary. Note the AT THIS POINT information in each sub-section.

■NOTE: The engine/transmission does not need to be removed for this procedure.

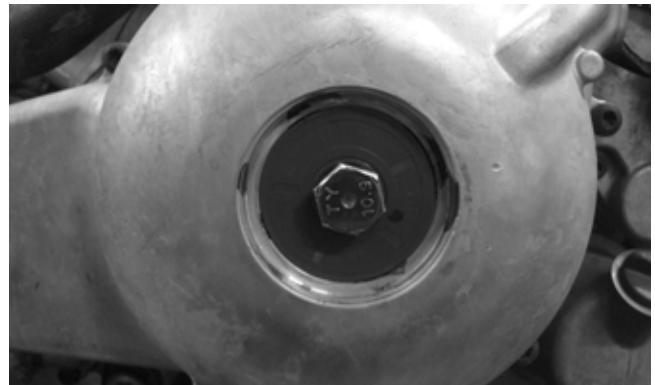
## Removing Top-Side Components

- A. Valve Cover/Rocker Arms
- B. Cylinder Head/Camshaft

1. Remove the timing inspection plug, spark plugs, and magneto housing cover; then install the 10 mm cap screw (left-hand threads) in the crankshaft and rotate the desired cylinder to top-dead-center of the compression stroke.

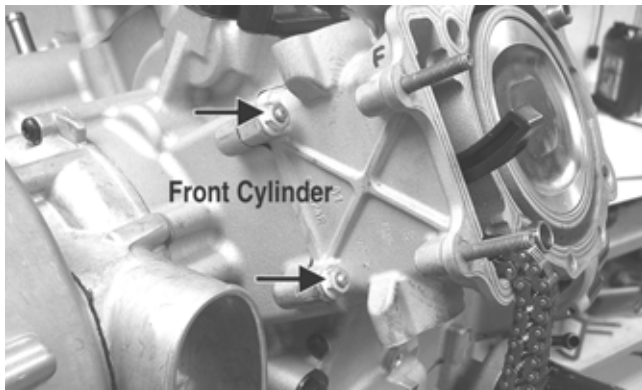


H2-047

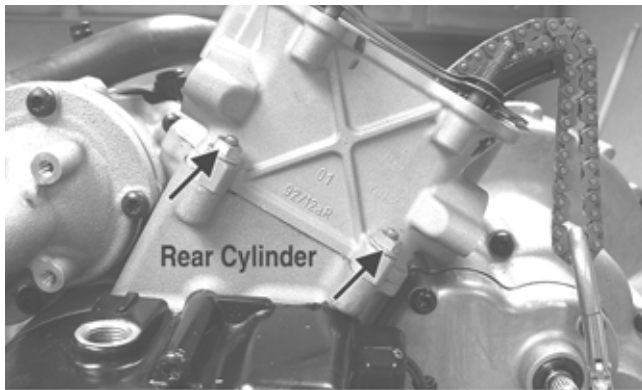


H2-048

■NOTE: Timing marks on the rotor/flywheel are stamped with an "F" (front cylinder) and "R" (rear cylinder) adjacent to the mark.



GZ141A



GZ160A

5. Install the coolant hose onto the crankcase union and tighten the clamp.

### C. Cylinder Head

### D. Valve Cover

■NOTE: Steps 1-5 in the preceding sub-section must precede this procedure.

6. Place the chain guide into the cylinder.

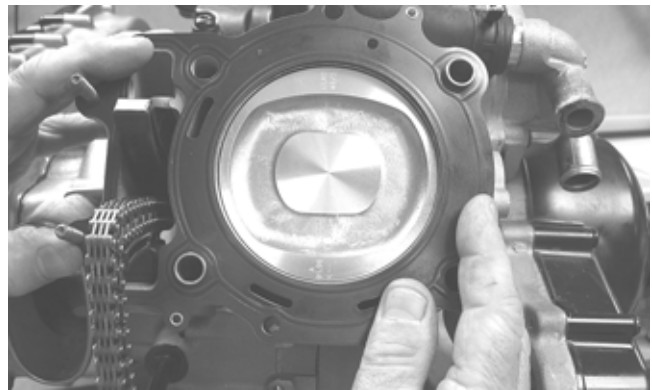
## CAUTION

Care should be taken that the bottom of the chain guide is secured in the crankcase boss.



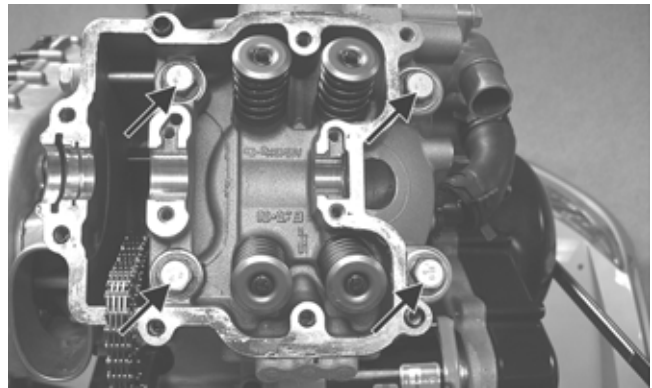
GZ161A

7. Place a new head gasket into position on the cylinder. Place the alignment pins into position; then place the head assembly into position on the cylinder while guiding the cam chain through the cylinder head.



GZ151

8. Install the cylinder head cap screws. Tighten only until snug.



GZ132B

9. Loosely install the five cylinder head nuts.

10. In a crisscross pattern, tighten the four cylinder head cap screws (from step 8) initially to 20 ft-lb; then increase to 30 ft-lb, and finally to 37 ft-lb. Tighten the 8 mm nut (from step 9) to 21 ft-lb; then using a crisscross pattern, tighten the 6 mm nuts (from step 9) to 8.5 ft-lb. Tighten the two cylinder-to-crankcase nuts (from step 4) to 21 ft-lb.

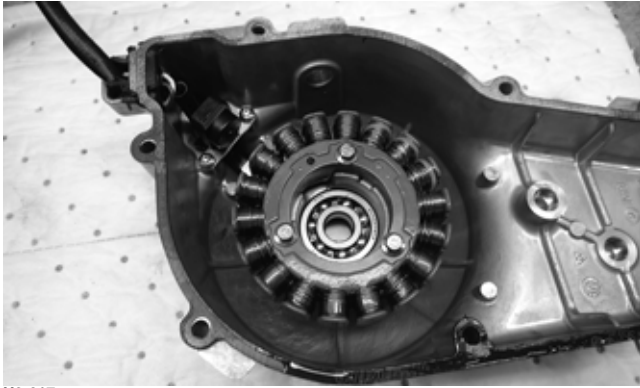
■NOTE: If both cylinders have been removed, repeat steps 1-10 for the remaining cylinder.

11. With the timing inspection plug removed and the front chain held tight, use a cap screw to rotate the crankshaft until the front piston is at TDC indicated by timing mark F.

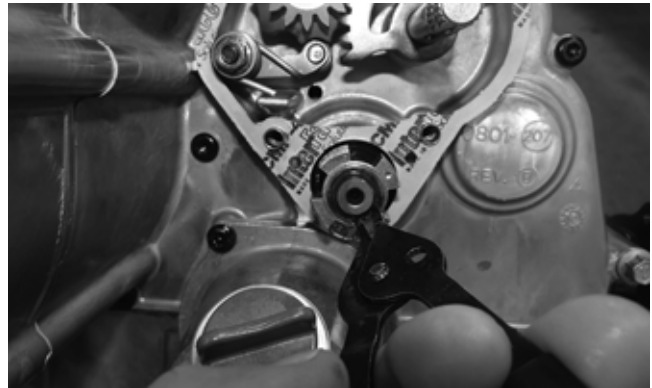


H2-049A

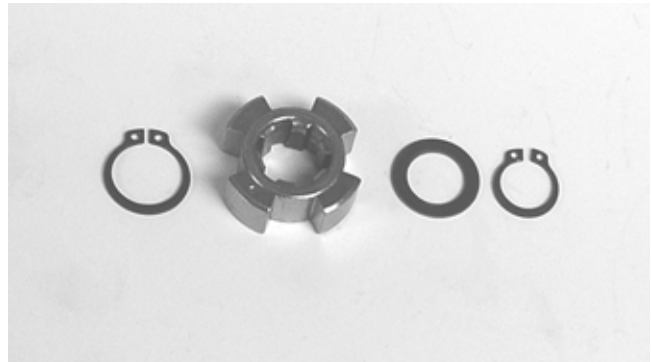
3. Install the new stator coil assembly and secure with three cap screws using a drop of red Loctite #271 on each. If installing the existing magneto cover, tighten the cap screws to 13 ft-lb. If installing a new magneto cover, tighten the cap screws to 15 ft-lb.
4. Place the stator wire harness hold-down into position; then install the crankshaft position sensor and secure with two cap screws. Tighten securely.
5. Install the upper cable hold-down and secure with two cap screws. Tighten securely.



H2-017



H2-023



GZ254

4. If removed, install the shim (E) and cam stopper (F); then with the cam stopper support (B) in place, install the spring (C), washer (D), and nut (A). Tighten to 8 ft-lb.

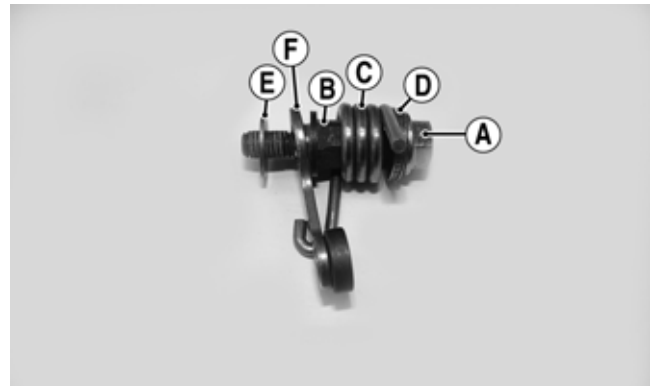
## Installing Left-Side Components

1. Thoroughly clean all gasket material and sealant from mating surfaces.
2. Install a new O-ring on the oil filler cover and coat it with clean engine oil; then install the oil filler cover into the crankcase and secure with the cap screws. Tighten to 8 ft-lb.

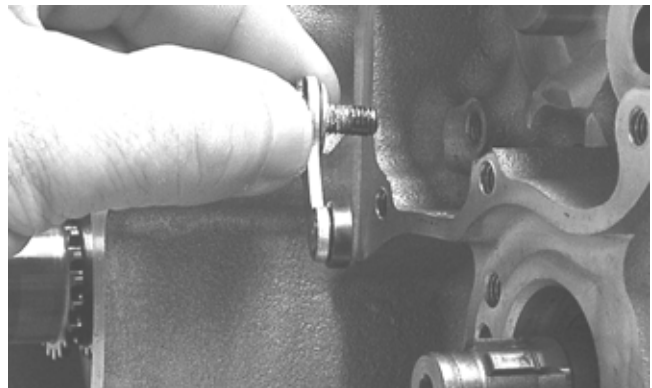


GZ250

3. Clean the countershaft and trigger splines thoroughly and install the inner snap ring onto the shaft; then apply green Loctite #620 to the trigger and countershaft splines and install the trigger. Secure with a flat washer and outer snap ring.



FW-017B



GZ256

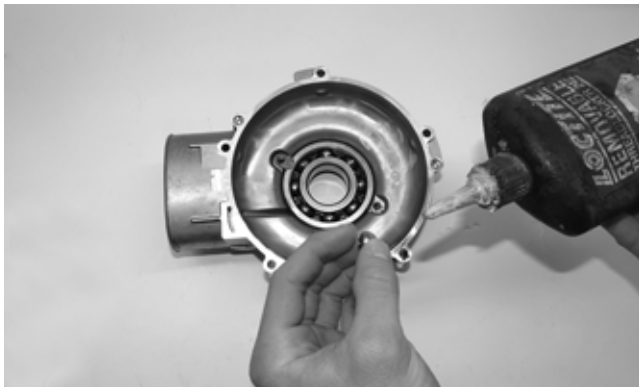
5. Install the shift cam stopper spring onto the shift cam stopper and secure with a flat washer and flange nut. Tighten to 8 ft-lb.



GZ501

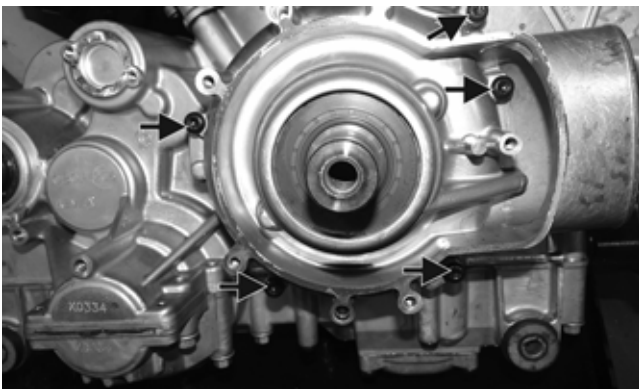
■NOTE: It is critical to verify the seal on the bearing faces the clutch cover seal before pressing in a new bearing.

- Secure the bearing in the clutch cover using the existing bearing retainers and machine screws (threads coated with blue Loctite #242). Tighten to 8 ft-lb.



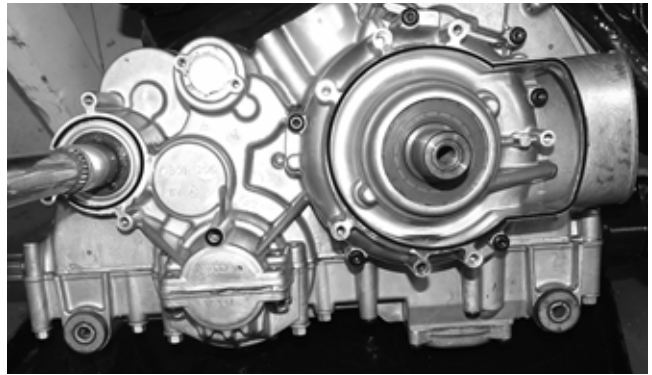
GZ508

- With the gasket and alignment pins in position, install the clutch cover and secure with the existing cap screws. Tighten to 8 ft-lb.

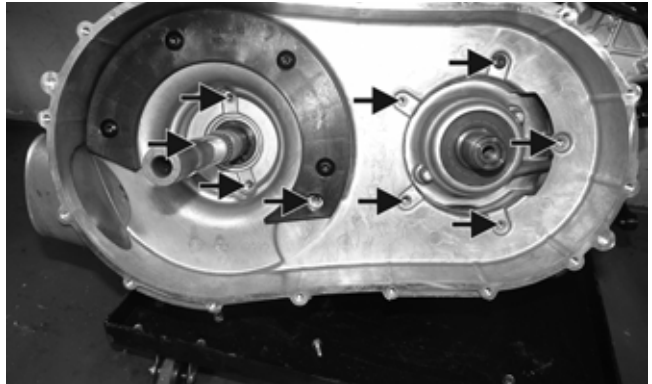


GZ528A

- Making sure the alignment pins are correctly installed, place a bead of silicone sealant on the mating surfaces of the V-belt housing and install the housing. Using new "patch-lock" cap screws, secure the housing and tighten the screws to 8 ft-lb.



GZ532A

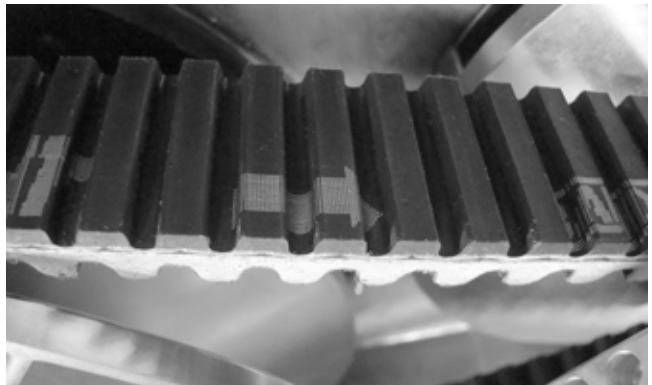


GZ531A

- Place the fixed driven sheave onto the driveshaft; then install the V-belt making sure the directional arrow is facing the direction of engine rotation.



WC809



WC667

- Making sure the "X" marks are properly aligned, install the movable drive sheave and secure with the cap screw (A), washer (B), and shim(s) (C). Tighten to 60 ft-lb.

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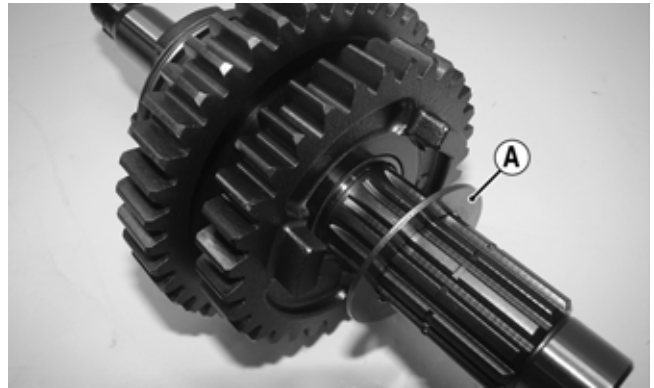


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H1-049A



H1-045A

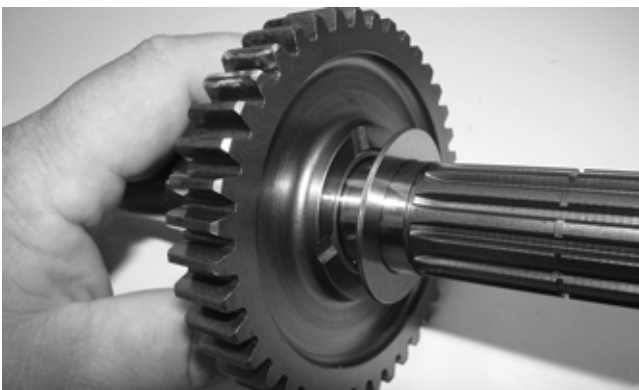


H1-048



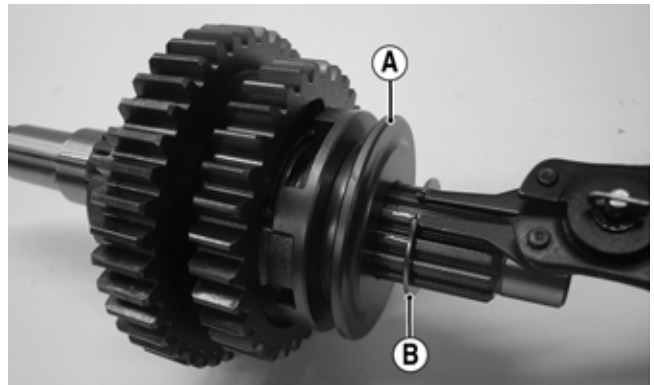
H1-044

4. Install the reverse driven dog (A) onto the countershaft and secure with a new snap ring (B).



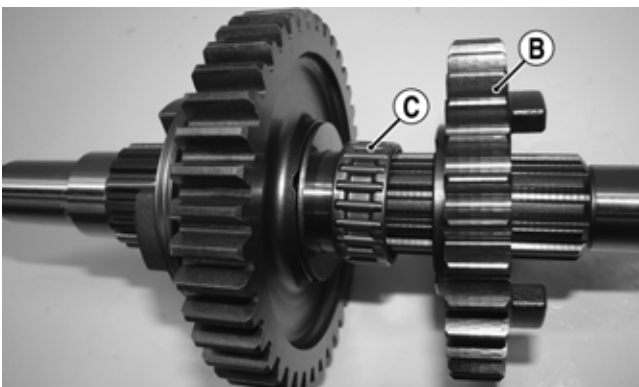
H1-047

2. Install the reverse driven gear needle bearing (C); then the reverse driven gear (B).



H1-043A

5. Install the drive gear.



H1-046A

3. Install the outer reverse driven gear washer (A); then secure the reverse driven gear assembly with a new snap ring.



GZ296

6. From the opposite end of the countershaft, install the high/low driven gear dog (A), thrust washer (B), bearing (C), high driven gear (D), and spacer washer (E).



WC179B

6. Remove the cargo box supports and the heat shield; then wrap a shop cloth around the gas line connector to catch any fuel spray and disconnect from the fuel pump.
7. Remove the gas tank hold-down bracket and remove the gas tank.

## INSTALLING

### **WARNING**

Whenever any maintenance or inspection is made on the fuel system during which there may be fuel leakage, there should be no welding, smoking, open flames, etc., in the area.

1. Place the gas tank into position on the cradle and secure with the hold-down bracket. Tighten the fasteners until the bracket is snug on the tank but not distorting it.
2. Place the heat shield into position; then install the cargo box supports and start but do not tighten all fasteners. After all fasteners are started, tighten securely.
3. Press the wiring harness anchors into the proper locations on the cargo supports and secure nylon ties where removed; then connect taillight/brake light connectors and fuel pump/fuel level connector.



WC179B

4. Install the muffler and secure with the four springs.
5. Install the cargo box; then install the rear body panel.
6. Connect the negative battery cable and install the battery cover; then set the seats in and lock into position.

## Oil Pump

■NOTE: Whenever internal engine components wear excessively or break and whenever oil is contaminated, the oil pump should be replaced.

### TESTING OIL PUMP PRESSURE

■NOTE: The engine must be warmed up to operating temperature (cooling fan cycling) for this test.

1. Remove the oil hose from the fitting nearest the oil filter base.



WC222A

2. Using a suitable "T" fitting, connect Oil Pressure Test Kit to the oil fitting and hose. Tighten all clamps securely.

■NOTE: Some oil seepage may occur when installing the oil pressure gauge. Wipe up oil residue with a cloth.

3. Place the transmission in park and start the engine. Allow the engine to warm up to operating temperature (with cooling fans cycling). Press and hold the brake pedal; then shift into neutral.
4. Set the speedometer/tachometer to RPM. With the engine running at 3000 RPM, the pressure gauge must show 1.05-1.2 kg/cm<sup>2</sup> (15-17 psi).
5. Remove the test kit from the vehicle and install the oil hose. Tighten the clamps securely.

■NOTE: If oil pressure is lower than specified, check for an oil leak, clogged oil filter, or defective oil pump.

■NOTE: If oil pressure is higher than specified, check for too heavy engine oil weight (see General Information/Foreword), clogged oil passage, or improper installation or type of the oil filter.

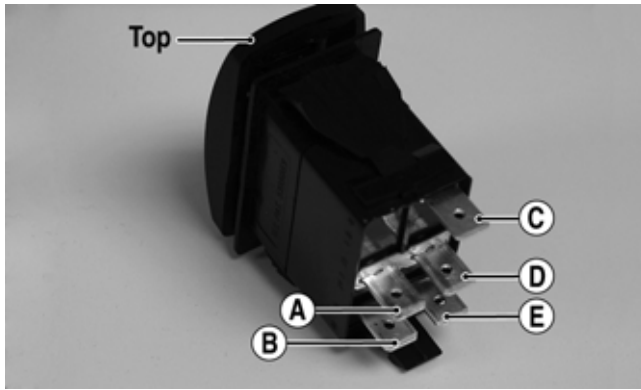
### REMOVING/DISASSEMBLING

1. Remove the oil pump from the engine (see Center Crankcase Components in Engine/Transmission).
2. Remove oil pump components from crankcase.

### CLEANING AND INSPECTING

1. Clean all oil-pump components.
2. Inspect the rotors for scoring and gouges.

- Using an ohmmeter, the following readings must be observed ( $\pm 5\%$ ):



PR566A

2WD	4WD	DIFFERENTIAL LOCK
A to D <1 ohm	A to D <1 ohm	A to D <1 ohm
C to E 48 ohms	C to E 48 ohms	C to E 48 ohms
A to B Open	A to B <1 ohm	A to B <1 ohm
A to C Open	A to C Open	A to C 48 ohms
A to E Open	A to E Open	A to C <1 ohm

### VOLTAGE (Drive Select)

■NOTE: Voltage tests must be made with the switch and the actuator connected. The meter can be connected at the actuator connector using a break-out harness or MaxiClips.

- Connect the black tester lead to the black wire; then turn the ignition switch to the ON position.
- Select the DC Volts position on the tester and observe the meter readings for each of the three switch positions.

WIRE COLOR	2WD	4WD	DIFFERENTIAL LOCK
Red to Orange	12.0 DC Volts	12.0 DC Volts	12.0 DC Volts
Red to White/Green	11.5 DC Volts	0 DC Volts	0 DC Volts
Red to White/Orange	11.5 DC Volts	11.5 DC Volts	0 DC Volts

■NOTE: If the meter does not show voltages according to the chart, make sure the front drive actuator is plugged in; then troubleshoot the switch, ignition fuses, battery connections, or wiring harness.

■NOTE: If the meter does not show 0 DC volts, rock the vehicle to help engage the differential lock; then troubleshoot the drive select switch.

### VOLTAGE (Reverse Override)

■NOTE: To perform the following tests, the ignition switch must be in the ON position and the transmission shifted into reverse gear.

- Connect the red meter lead to the red/green wire and the black meter lead to a suitable ground; then select 2WD on the drive select switch. The meter will typically show battery voltage.
- Depress the reverse override switch. The meter must show less than 1 DC volt.
- Select 4WD on the drive select switch. The meter will typically show battery voltage.

- Depress the reverse override switch. The meter must show less than 1 DC volt.

## Fan Motor



This component can be tested using the CATT II. Utilize the Test screen.

■NOTE: To determine if the fan motor is good, connect the red wire from the fan connector to a 12 volt battery; then connect the black wire from the fan connector to ground. The fan should operate.

### WARNING

Care should be taken to keep clear of the fan blades.



WT558A

■NOTE: Fan motor resistance checks are not recommended. Resistance values change with the motor commutator position.

## Lights

### VOLTAGE (Headlights)

The connectors are the two 3-prong ones secured to the headlight assemblies (one on each side).

- Set the meter selector to the DC Voltage position.
- Set the light switch to the correct position for the affected light; then connect the black tester lead to the black wire using a MaxiClip.
- Connect the red tester lead to the yellow/black wire (high beam) or white wire (low beam) using a Maxi-Clip. The meter must show battery voltage.

■NOTE: If battery voltage is not shown in any test, inspect the LIGHTS fuse on the power distribution module, headlight switch, ignition switch, switch connectors, or wiring harness.



EF1033A

■NOTE: The display on the gauge will display in SAE (speedometer in MPH mode) or Metric (speedometer in km/h mode), For example to read temperature in degrees Celsius, select km/h mode on the gauge or to read Fahrenheit, select MPH mode.

3. Cycle the display by depressing either the Set or Mode button to step to the desired function.



EF1025A

■NOTE: The gauge can be utilized dynamically (engine running/vehicle moving) or statically (engine/vehicle stopped).

Examples of Static checks: Battery voltage, fuel gauge/sensor, and TPS (0% @ closed throttle, 95-100% @ WOT).



EF1028

Examples of Dynamic checks: Battery charging, coolant temperature including fans ON/OFF, MAP/IAT, tachometer, and speedometer signal.



EF1032

### Coolant (COOL) Diagnostic Mode



EF1032

Display: Engine coolant temperature as measured by the ECT sensor.

DTC: P0116, P0117, P0118, P0119

Usage: Monitor coolant temperature to verify the following:

1. ECT sensor signal.
2. High Temperature indicator (on @ 230° F.)
3. Thermostat opening @ approximately 180° F, indicated by a momentary drop or pause in the rising temperature reading.
4. Left fan ON @ 194° F, OFF @ 185° F; right fan ON @ 203° F, OFF @ 194° F.
  - A. fan motor
  - B. fan relay
  - C. fan fuse
  - D. wiring connections
5. High Temperature Rev Limiter 5000 RPM @ 230° F.

- Using a seal removal tool, remove the input shaft seal. Account for a spacer.

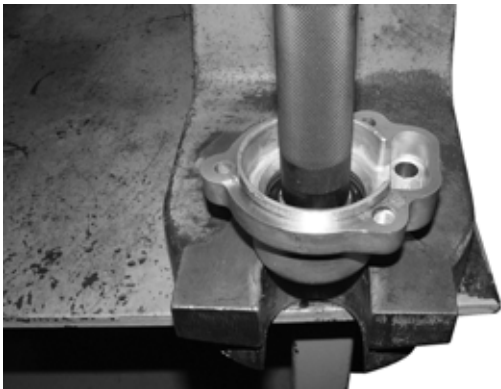


GC010

- Remove the snap ring securing the input shaft bearing; then place the pinion housing in a press and remove the bearing.



GC011



XR350



XR351

## Assembling Input Shaft

- Place the pinion housing in a press and install the input shaft bearing. Secure the bearing with the existing snap ring making sure the sharp edge of the snap ring faces to the outside.



GC012



GC011

- Install the input shaft seal making sure it is fully seated in the edge of the housing.

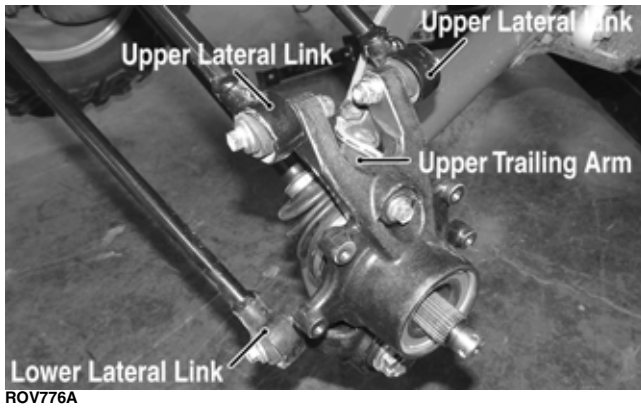


GC014

- Lubricate the input shaft with High-Performance #2 Molybdenum Disulfide Grease packing the boot ribs and splines; then assemble allowing excess grease to freely escape. Slight pressure on the boot will be present during assembly. Secure with new clamps.

**NOTE:** Any time drive splines are separated, clean all splines with parts-cleaning solvent and dry with compressed air; then lubricate with recommended grease.

- Install the input shaft into the pinion housing; then secure in the bearing with a circlip.



ROV776A



WC286A

6. Remove the rear axles from the rear drive gear case by pushing the axle shaft toward the gear case and pulling the CV/spline shaft out. Account for one O-ring on each axle shaft.



PR729C

### REMOVING FRONT DRIVE AXLE

■NOTE: For removing a front drive axle, see Front Differential sub-section.

### CLEANING AND INSPECTING AXLES

■NOTE: Always clean and inspect the drive axle components to determine if any service or replacement is necessary.

1. Using a clean towel, wipe away any oil or grease from the axle components.



CD019

2. Inspect boots for any tears, cracks, or deterioration.

■NOTE: If a boot is damaged in any way, it must be replaced with a boot kit.

### DISASSEMBLING AXLES

■NOTE: Only the boots are serviceable on the axles; if any other component is worn or damaged, the axle must be replaced.

1. Using CV Boot Clamp Tool, remove and retain both clamps for assembly purposes.



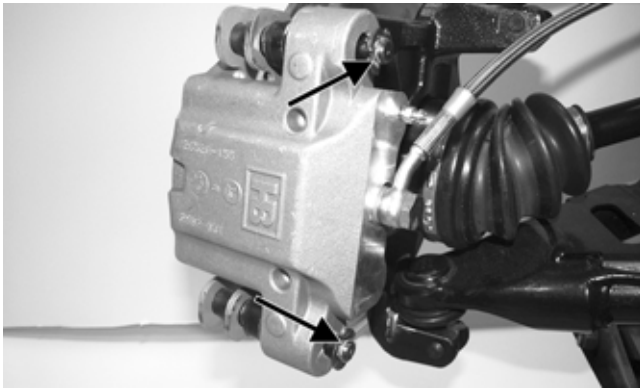
CF337

2. Place the end of the CV joint into a vise as shown.



CF335

3. To disengage the axle from the CV joint, sharply pull back on the axle; then slide the boot off of the axle.



WC611A



WC606

■NOTE: If brake pads are to be returned to service, do not allow brake fluid to contaminate them.

4. Remove the brake pads from the caliper.



WC694

5. Cover the piston end of the housing with cardboard or a shop towel; then keeping fingers clear of piston travel, apply compressed air to the fluid port to blow the piston free of the housing. Account for four seal rings in the housing.

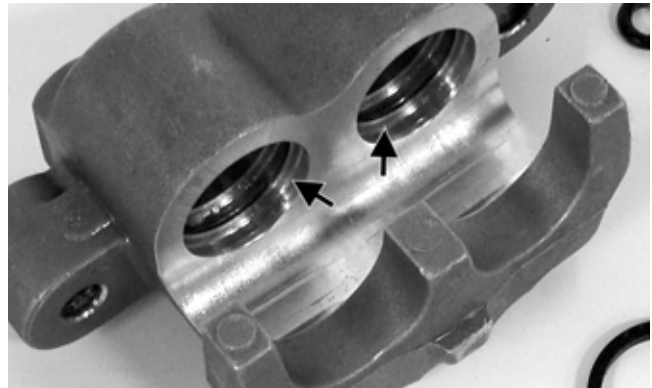


WC941

### ⚠ WARNING

Make sure to hold the caliper firmly in place or the piston could be ejected from the housing causing injury.

6. Using an appropriate seal removal tool, carefully remove the seals from the brake caliper housing; then remove four O-rings from the brake caliper housing noting the location of the different sized O-rings. Discard all seals, O-rings, and crush washers.



WC725A

### REMOVING/DISASSEMBLING (Rear)

1. Secure the vehicle on a support stand to elevate the wheel; then remove the wheel.

### ⚠ WARNING

Never let brake fluid contact the eyes. Damage to the eyes will occur. Always wear appropriate protective safety goggles and latex gloves when handling brake fluid.

2. Drain the brake fluid from the caliper, hose, and master cylinder through the bleed screw by pumping the brake pedal.

### CAUTION

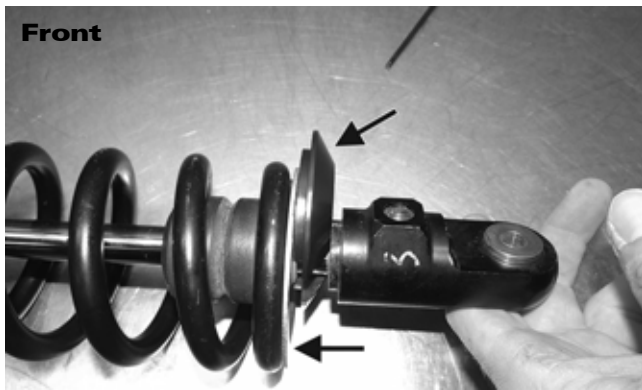
Brake fluid is highly corrosive. Do not spill brake fluid on any surface of the vehicle and do not reuse brake fluid.

■NOTE: Whenever brake components are removed, disassembled, or repaired where brake fluid is exposed to air, drain all fluid and replace with new DOT 4 brake fluid from an unopened container. Brake fluid readily absorbs moisture from the air significantly lowering the boiling point. This increases the chance of vapor lock reducing braking power and increasing stopping distance.



WC789B

3. Remove the spring retainer and spring support plates.



WC781A



WC793

4. Remove the main spring, spring coupler, and retaining plates.



WC783

■NOTE: Note the orientation of the spring retainer for installing purposes.

5. Remove the top spring.
6. Clean all of the shock absorber components in a parts-cleaning solvent.
7. Inspect each shock rod for nicks, pits, rust, bends, and oil residue.
8. Inspect all of the spring retainers, shock rods, spring couplers, shock bodies, and eyelets for cracks, leaks, or bends.

## ASSEMBLING (X Limited)

### Front

1. With the proper orientation, slide the top spring, spring coupler, and spring support plate up to the lock ring.



WC786B

2. Install the main spring up to the spring support plate.
3. With the lower support plate in position, install the spring retainer.



WC795

4. Install the shocks using the two cap screws and nuts. Tighten the screws to 40 ft-lb.

### Rear

1. With the proper orientation, slide the top spring and spring support plate up to the lock ring.

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