



# 2021 SERVICE MANUAL



p/n: 2263-021  
10/20

Alterra 570 / 700



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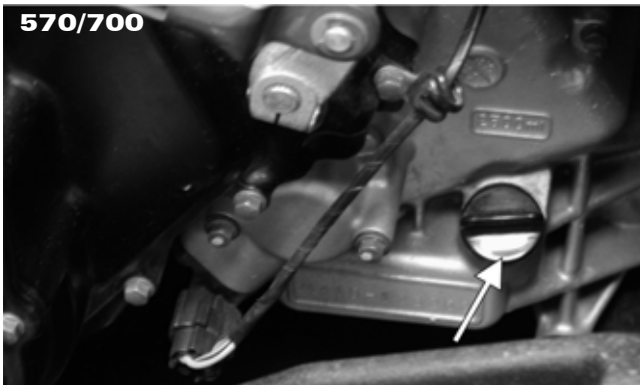
XR196

## Engine/Transmission Oil – Filter

### OIL – FILTER

The engine should always be warm when the oil is changed so the oil will drain easily and completely.

1. Park the ATV on level ground.
2. Remove the oil level stick/filler plug.

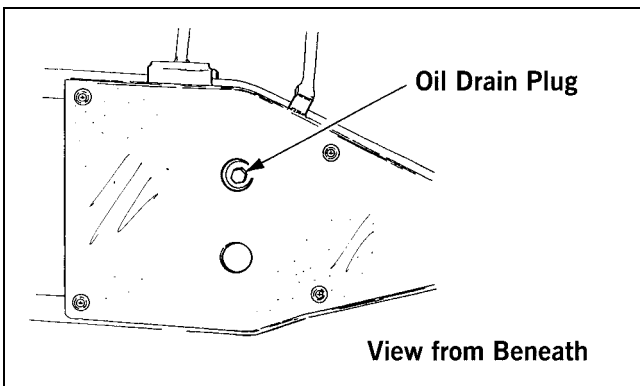


CF109M

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

### **WARNING**

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



733-441A

4. Using the adjustable Oil Filter Wrench and a suitable wrench, remove the old oil filter. Account for and discard the O-ring.

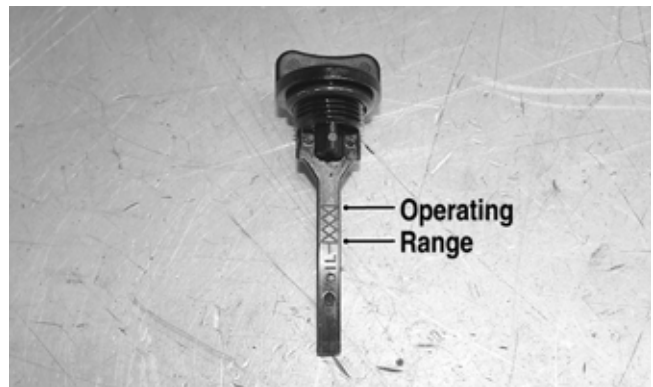
■**NOTE:** Clean up any excess oil after removing the filter.

5. Apply oil to the new filter O-ring and check to make sure it is positioned correctly; then install the new oil filter. Tighten securely.
6. Install the engine drain plug with new gasket and tighten to 16 ft-lb (21.8 N-m). Pour the specified amount of the recommended oil in the filler hole. Install the oil level stick/filler plug.

### **CAUTION**

Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

7. Start the engine (while the ATV is outside on level ground) and allow it to idle for a few minutes.
8. Turn the engine off and wait approximately one minute.
9. Remove the oil level stick and wipe it with a clean cloth.
10. Install the oil level stick and thread into the engine case.
11. Remove the oil level stick; the oil level must be within the operating range but not exceeding the upper mark.



XR075A

### **CAUTION**

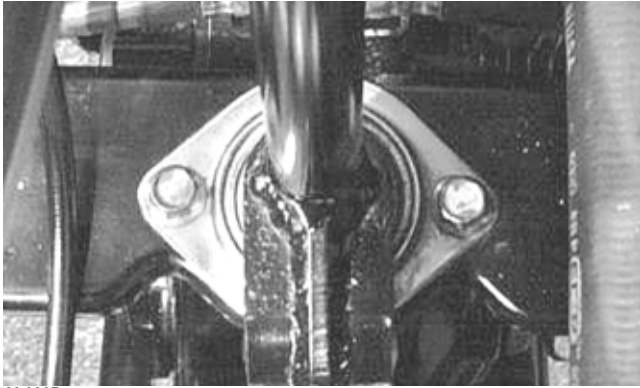
Do not over-fill the engine with oil. Always make sure that the oil level is not above the upper mark.

12. Inspect the area around the drain plug and oil filter for leaks.

7. Inspect the handlebar tube for cracks, wear, or unusual bends.
8. Inspect the handlebar grips for damage or wear.

### **INSTALLING (Models without Electronic Power Steering [EPS])**

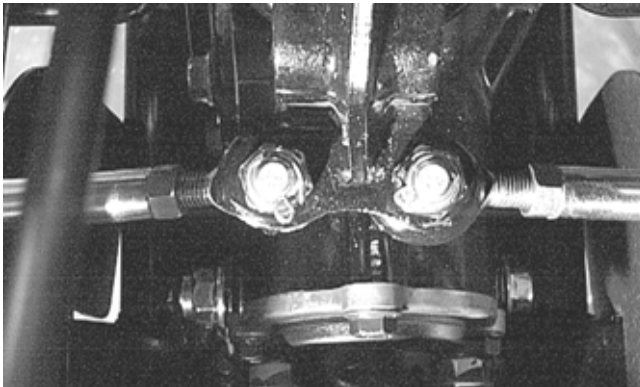
1. Place the steering post into position; then secure the lower bearing flange to the frame with two cap screws. Tighten to 20 ft-lb (27.2 N-m).



AL600D

2. Place the upper steering post housing into position on the steering post and secure the housings and plate to the frame with two cap screws. Tighten to 20 ft-lb (27.2 N-m).
3. Install the tie rods and secure with the slotted nuts. Tighten to 30 ft-lb (40.8 N-m); then install new cotter pins.

■NOTE: If the slots do not align with the holes in the tie rod ends, tighten the nuts just enough to allow installation of the cotter pins.

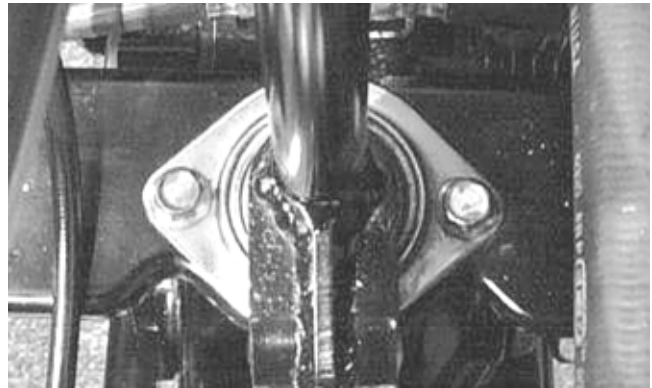


AF778D

4. Install the handlebar and secure with the handlebar caps. Tighten the screws to 25 ft-lb (34 N-m).
5. Install the shock absorber and tighten to 50 ft-lb (68 N-m).
6. Install the handlebar cap; then install the console and gauge.

### **INSTALLING (Electronic Power Steering Models [EPS])**

1. Place the lower steering post into position; then secure the lower bearing flange to the frame with two cap screws. Tighten to 20 ft-lb (27.2 N-m).

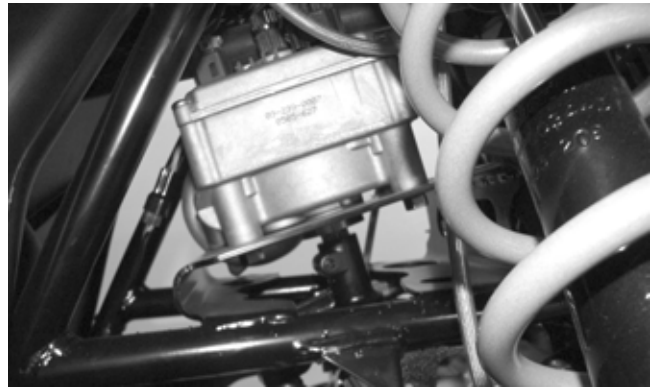


AL600D

2. Making sure the double spline is aligned to the slot in the lower coupler, install the EPS output shaft into the lower coupler; then install the four caps screws securing the EPS housing to the frame. Tighten to 35 ft-lb (47.6 N-m).



EPS008A



EPS007

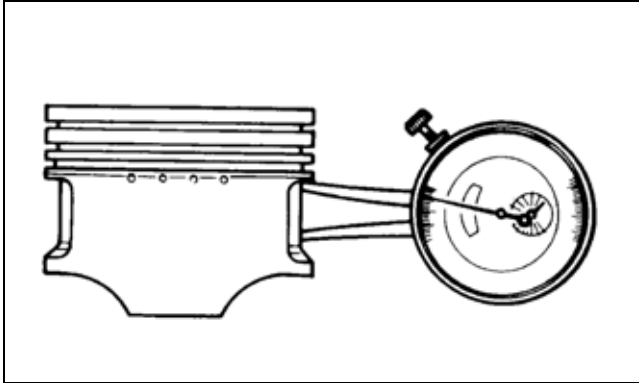
3. Install the tie rods and secure with the slotted nuts. Tighten to 30 ft-lb (40.8 N-m); then install new cotter pins.

■NOTE: If the slots do not align with the holes in the tie rod ends, tighten the nuts just enough to allow installation of the cotter pins.

# Troubleshooting

Problem: Engine will not start or is hard to start	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Battery</b> discharged or defective</li> <li>2. <b>Carbon build-up in combustion chamber</b> excessive</li> <li>3. <b>Gasoline</b> bad — contaminated</li> <li>4. <b>Valve clearance</b> out of adjustment</li> <li>5. <b>Valve guides</b> worn</li> <li>6. <b>Valve timing</b> incorrect</li> <li>7. <b>Piston rings</b> worn excessively</li> <li>8. <b>Cylinder</b> bore worn</li> <li>9. <b>Starter motor</b> cranks too slowly — does not turn</li> </ol>	<ol style="list-style-type: none"> <li>1. Test, charge, and/or replace battery</li> <li>2. Run combustion chamber cleaner or clean combustion chamber</li> <li>3. Drain gas — replace with clean gas</li> <li>4. Adjust clearance</li> <li>5. Replace guides</li> <li>6. Check/set valve timing</li> <li>7. Replace rings</li> <li>8. Replace cylinder</li> <li>9. See Electrical System — Troubleshooting</li> </ol>
Problem: Engine will not start or is hard to start (No spark)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Battery</b> discharged or defective</li> <li>2. <b>Spark plug</b> fouled</li> <li>3. <b>Spark plug</b> wet</li> <li>4. <b>Magneto</b> defective</li> <li>5. <b>ECM</b> defective</li> <li>6. <b>Ignition coil</b> defective</li> <li>7. <b>High-tension lead open</b> — shorted</li> </ol>	<ol style="list-style-type: none"> <li>1. Test, charge, and/or replace battery</li> <li>2. Clean — replace plug</li> <li>3. Clean — dry plug</li> <li>4. Replace stator coil</li> <li>5. Replace ECM</li> <li>6. Replace ignition coil</li> <li>7. Replace high tension lead</li> </ol>
Problem: Engine will not start or is hard to start (No fuel reaching the fuel injector)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Gas tank vent hose</b> obstructed</li> <li>2. <b>Fuel hose</b> obstructed</li> <li>3. <b>Fuel screens</b> obstructed</li> <li>4. <b>Fuel pump</b> defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean vent hose</li> <li>2. Clean — replace hose</li> <li>3. Clean</li> <li>4. Replace fuel pump</li> </ol>
Problem: Engine stalls easily	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Gasoline</b> bad — contaminated</li> <li>2. <b>Spark plug</b> fouled</li> <li>3. <b>Magneto</b> defective</li> <li>4. <b>ECM</b> defective</li> <li>5. <b>Fuel injector</b> obstructed</li> <li>6. <b>Valve clearance</b> out of adjustment</li> </ol>	<ol style="list-style-type: none"> <li>1. Drain gas — replace with clean gas</li> <li>2. Clean plug</li> <li>3. Replace magneto</li> <li>4. Replace ECM</li> <li>5. Replace fuel injector</li> <li>6. Adjust clearance</li> </ol>
Problem: Engine noisy (Excessive valve chatter)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Valve clearance</b> too large</li> <li>2. <b>Valve spring(s)</b> weak — broken</li> <li>3. <b>Rocker arm — rocker arm shaft</b> worn</li> <li>4. <b>Camshaft</b> worn</li> <li>5. <b>Valve tappets</b> worn</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust clearance</li> <li>2. Replace spring(s)</li> <li>3. Replace arm — shaft</li> <li>4. Replace camshaft</li> <li>5. Replace tappets</li> </ol>
Problem: Engine noisy (Noise seems to come from piston)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Piston — cylinder</b> worn</li> <li>2. <b>Combustion chamber</b> carbon buildup</li> <li>3. <b>Piston pin — piston pin bore</b> worn</li> <li>4. <b>Piston rings — ring groove(s)</b> worn</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace — service piston— cylinder</li> <li>2. Clean cylinder head and piston</li> <li>3. Replace — service pin — bore</li> <li>4. Replace rings — piston</li> </ol>
Problem: Engine noisy (Noise seems to come from timing chain)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Chain</b> worn</li> <li>2. <b>Sprockets</b> worn</li> <li>3. <b>Tension adjuster</b> malfunctioning</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace chain</li> <li>2. Replace sprockets</li> <li>3. Repair — replace adjuster</li> </ol>
Problem: Engine noisy (Noise seems to come from crankshaft)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Main bearings</b> worn — burned</li> <li>2. <b>Lower rod-end bearing</b> worn — burned</li> <li>3. <b>Connecting rod side clearance</b> too large</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace bearing(s)</li> <li>2. Replace crankshaft assembly</li> <li>3. Replace crankshaft assembly</li> </ol>
Problem: Engine noisy (Noise seems to come from transmission)	
Condition	Remedy
<ol style="list-style-type: none"> <li>1. <b>Gears</b> worn</li> <li>2. <b>Splines</b> worn</li> <li>3. <b>Primary gears</b> worn</li> <li>4. <b>Bearings</b> worn</li> <li>5. <b>Bushing</b> worn</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace gears</li> <li>2. Replace shaft(s)</li> <li>3. Replace gears</li> <li>4. Replace bearings</li> <li>5. Replace bushing</li> </ol>

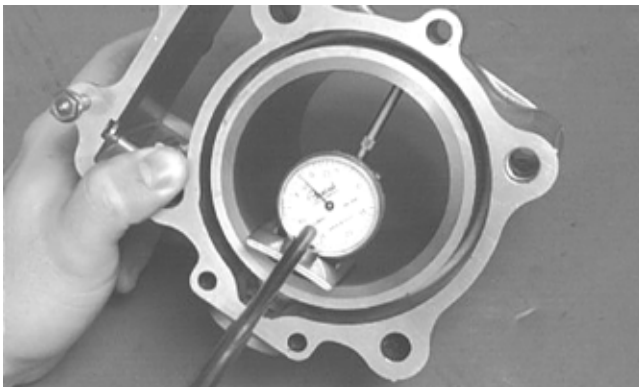
2. Insert an inside dial indicator into the piston-pin bore. The diameter must not exceed specifications. Take two measurements to ensure accuracy.



ATV-1069

### Measuring Piston Skirt/Cylinder Clearance

1. Measure the cylinder front to back in six places.

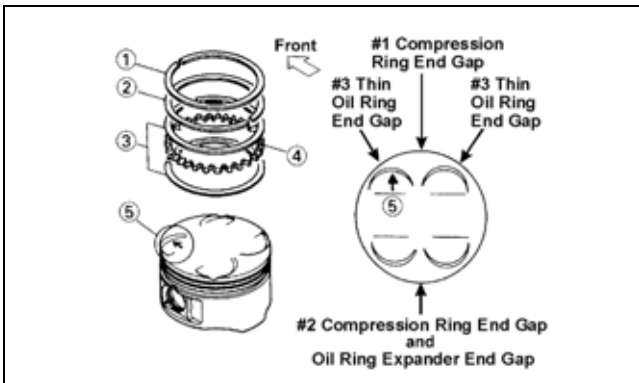


CC127D

2. Measure the corresponding piston diameter at the recommended point above the piston skirt at a right angle to the piston-pin bore. Subtract this measurement from the largest measurement in step 1. The difference (clearance) must not exceed specifications.

### Installing Piston Rings

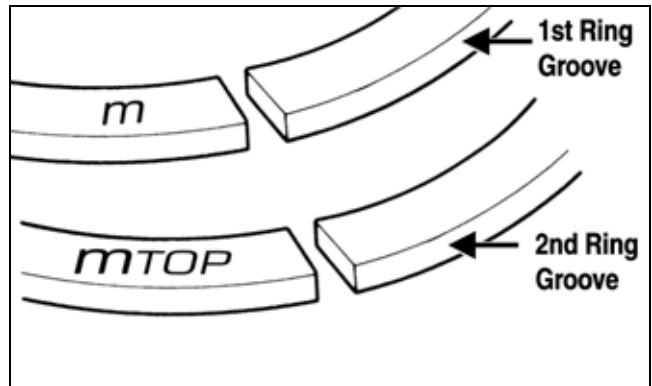
1. Install ring expander (4) in the bottom groove of the piston; then install the thin oil rings (3) over the expander, making sure the expander ends do not overlap. Stagger the end gaps of the upper and lower thin oil rings according to the illustration.



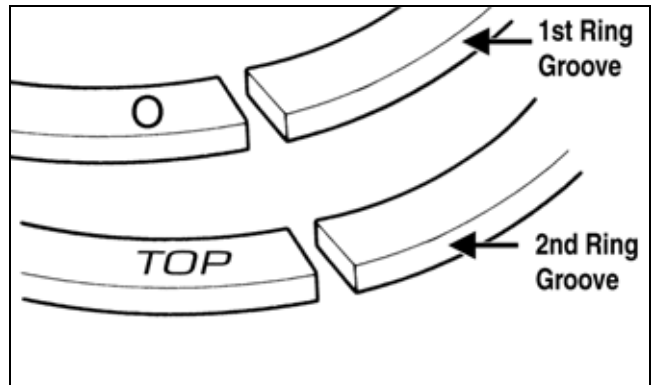
ATV-1085B

■NOTE: Note the direction of the exhaust side of the piston (5) for correct ring end gap orientation.

2. The piston ring with the orientation mark (mTOP or TOP) should be installed in the second (middle) groove and the piston ring with the orientation mark (m or O) should be installed in the first (top) groove.



ATV-1024A



ATV-1024B

### CAUTION

Incorrect installation of the piston rings will result in engine damage.

### CYLINDER/CYLINDER HEAD ASSEMBLY

■NOTE: If the cylinder/cylinder head cannot be trued, they must be replaced as an assembly.

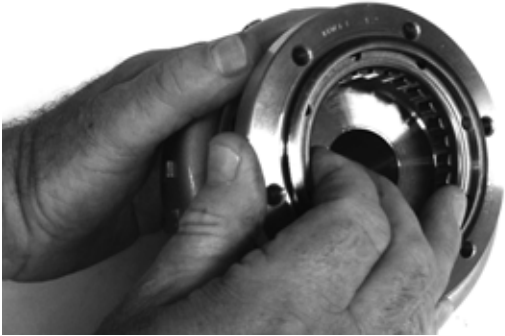
### Cleaning/Inspecting Cylinder Head

### CAUTION

The cylinder head studs must be removed for this procedure.

1. Using a non-metallic carbon removal tool, remove any carbon buildup from the combustion chamber being careful not to nick, scrape, or damage the combustion chamber or the sealing surface.
2. Inspect the spark plug hole for any damaged threads. Repair damaged threads using a "heli-coil" insert.

3. Inspect the one-way bearing for chipped surfaces, missing rollers, or discoloration. If any of the above conditions exist, replace the starter clutch assembly.



FI572

### REPLACING STARTER CLUTCH ASSEMBLY

1. Remove the cap screws securing the starter clutch assembly to the flywheel; then remove from the flywheel.



FI570

2. Thoroughly clean the rotor/flywheel; then install the new clutch and secure with the cap screws after applying a drop of red Loctite #271 to the threads. Tighten to 26 ft-lb (35.4 N-m) using a crisscross pattern. Make sure the one-way bearing is installed with the notches directed away from the rotor/flywheel.



FI576A



FI578

### REPLACING STARTER GEAR BEARING

1. Support the starter clutch gear in a press making sure to support the hub around the entire circumference; then using a suitable bearing driver, press the bearing from the gear.



FI583

2. Thoroughly clean the gear hub; then apply a drop of green Loctite #620 to the bearing outer race and press into the gear hub until even with the lower chamfer radius.



FI580

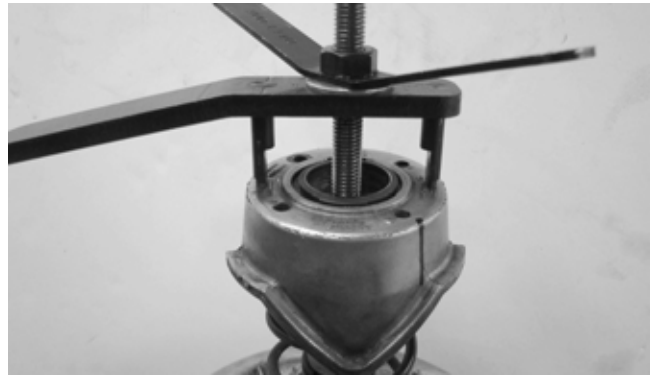
### INSPECTING STATOR COIL/MAGNETO COVER ASSEMBLY

1. Inspect the stator coil for burned or discolored wiring, broken or missing hold-down clips, or loose cap screws.
2. Inspect the bearings in the magneto housing for discoloration, roughness when rotated, and secure fit in bearing bores.



WC388

3. Install the spring over the hub of the movable driven sheave engaging the spring into the previously marked spring anchor hole.



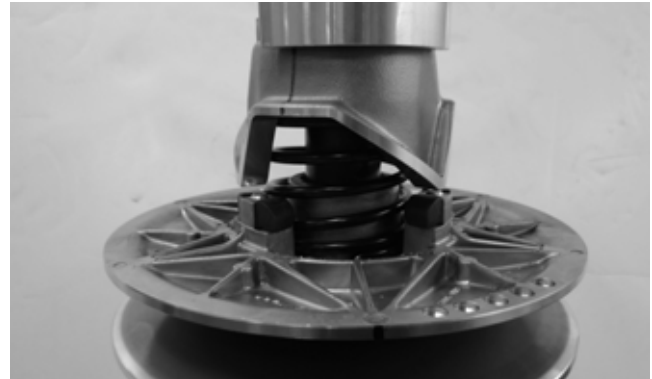
WC414

6. Turn the wing nut clockwise to compress the spring being very careful that the cam correctly engages the fixed driven hub; then continue to tighten until the cam ramps are just above the cam shoes.



WC391A

4. Place the cam over the spring and align the spring tip to the previously marked anchor hole.



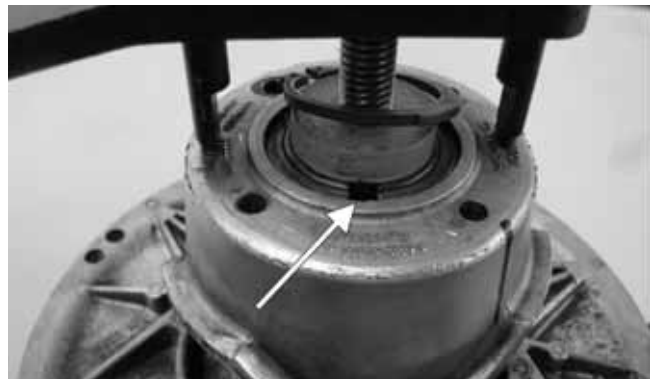
WC398

7. Rotate the cam counterclockwise by hand enough to get the cam ramps on the correct side of the cam shoes; then continue to tighten the wing nut until the keyways align.



WC753

5. Install the centering bushing into the fixed driven hub; then with the sharp side upward, place the snap ring onto the assembly and install the compression yoke and wing nut.



WC411A

8. Install the square key making sure it fits flush and clear of the snap ring groove; then install the snap ring making sure it is seated properly.

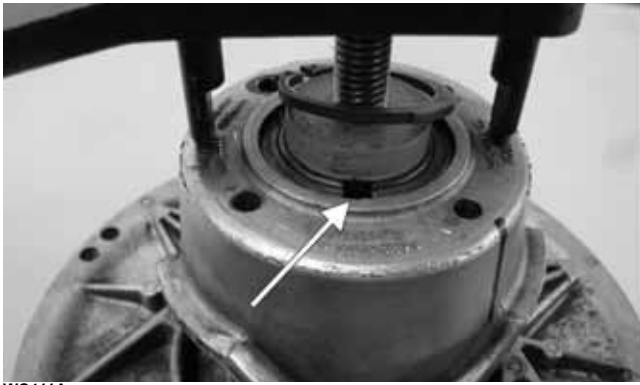
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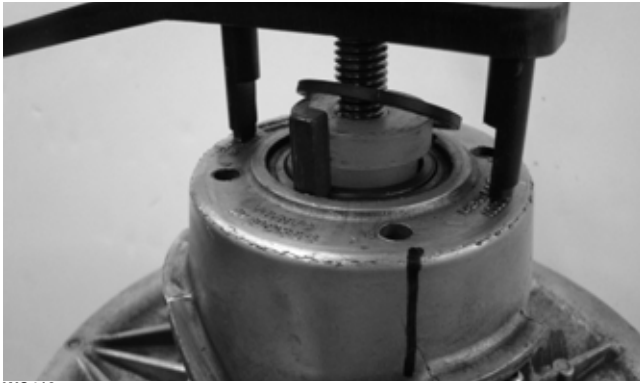
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WC411A

8. Install the square key making sure it fits flush and clear of the snap ring groove; then install the snap ring making sure it is seated properly.



WC412



WC419

9. Turn the wing nut counterclockwise slowly allowing the cam to contact the snap ring; then loosen slightly and tap the cam with a plastic mallet to ensure the snap ring is securely seated.



WC408

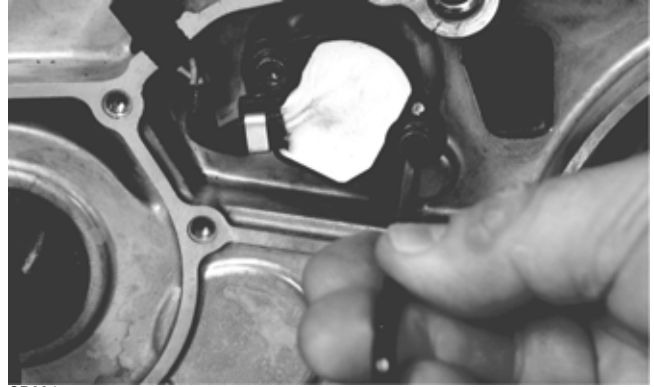
10. Remove the wing nut, compression yoke, and centering bushing; then remove the driven pulley assembly from the Clutch Spring Compressor.

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## Installing Right-Side Components (700)

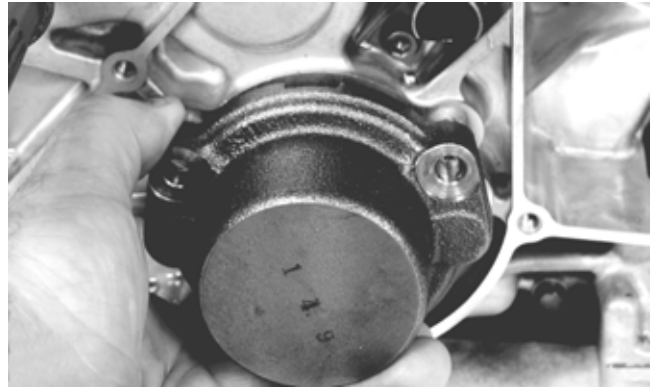
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1. Install the gear position switch. Tighten the cap screws securely.



CD994

2. Install the secondary shaft bearing housing making sure the two alignment pins are properly positioned. Tighten the new "patch-lock" cap screws to 28 ft-lb (38.1 N-m).



CD999

3. Install the oil pump onto the engine; then tighten the screws (coated with red Loctite #271) to 8 ft-lb (10.9 N-m).



CD988

7. Install the two drive gear washers and the shift forks.  
The countershaft is now ready for installation.

■NOTE: When installing the countershaft assembly, account for the washer on each end of the shaft.

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## Assembling Crankcase Half

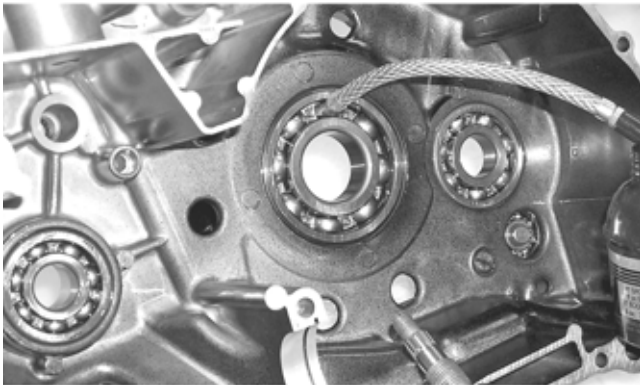
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1. Install the secondary drive gear assembly into the crankcase.

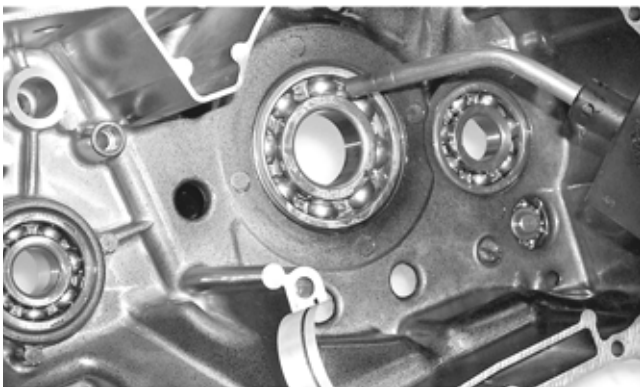


MT014

2. Apply a liberal amount of engine oil to the crankshaft bearing. Using a propane torch, heat the bearing until the oil begins to smoke; then slide the crankshaft assembly into place.



CC688



CC689

■NOTE: If heating the bearing is not possible, the crankshaft can be installed using a crankshaft installing tool.

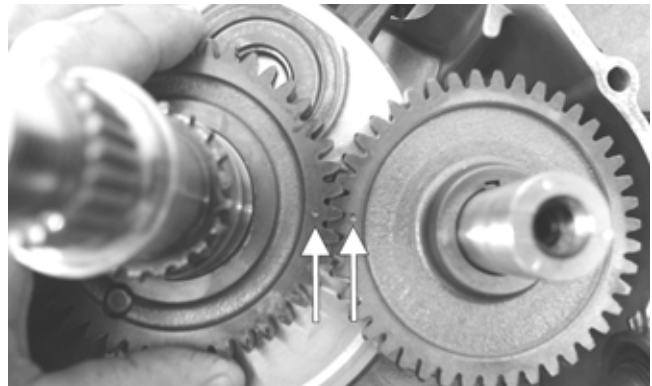
3. Install the crank balancer.



CD832B

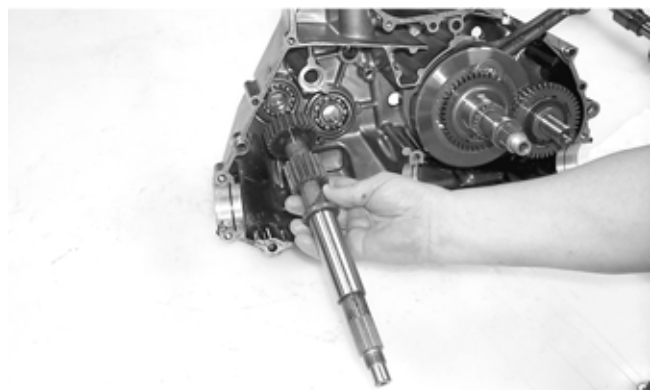
■NOTE: It will be necessary to rotate the crank balancer until the counterweight is facing away from the crankshaft; then rotate the crankshaft clockwise into the journal area to allow the crank balancer to be fully seated.

4. Place the key into the crank balancer keyway; then install the crank balancer gear making sure the alignment dots on the crank balancer gear and the crankshaft gear align.



CD826A

5. Install the driveshaft.



CC675

6. Place a washer on each end of the countershaft assembly; then install the assembly.

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# Electrical System

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The electrical connections should be checked periodically for proper function.

## TESTING ELECTRICAL COMPONENTS

All electrical tests should be made using the CATT II or the Fluke Model 77 Multimeter. The CATT II can return data for certain components which are identified at the beginning of their respective sub-section. If any other type of meter is used, readings may vary due to internal circuitry. When troubleshooting a specific component, always verify first that the fuse(s) are good, that the LED(s) are good, that the connections are clean and tight, that the battery is fully charged, and that all appropriate switches are activated.

■NOTE: For absolute accuracy, all tests should be made at room temperature of 68° F (20° C).

■NOTE: Certain components and sensors can be checked by using the EFI diagnostic system and digital gauge (see EFI Diagnostic System in this section for more information).

## SPECIAL TOOLS

A number of special tools must be available to the technician when performing service procedures in this section. Refer to the current Special Tool Catalog for the appropriate tool description.

■NOTE: When indicated for use, each special tool will be identified by its specific name, as shown in the chart below, and capitalized.

Description	p/n
Diagnostic Harness	0486-219
Fluke Model 77 Multimeter	Common Tool
Fuel Pressure Tester	0644-587
MaxiClips	Common Tool
Tachometer	Common Tool
Timing Light	Common Tool

■NOTE: Special tools are available from the Service Department.

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## Battery

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Component data can be retrieved using the CATT II. Utilize the Sensor Data screen.

■NOTE: Preliminary checks may be performed on this component using the diagnostic mode on the LCD gauge (see EFI Diagnostic System in this section).

6. If using the CTEK Multi US 800, there are no further buttons to push. If using the CTEK Multi US 3300, press the Mode button (A) at the left of the charger until the Maintenance Charge Icon (B) at the bottom

After being in service, batteries require regular cleaning and recharging in order to deliver peak performance and maximum service life. The following procedure is recommended for cleaning and maintaining a sealed battery. Always read and follow instructions provided with battery chargers and battery products.

■NOTE: Refer to all warnings and cautions provided with the battery or battery maintainer/charger.

Loss of battery charge may be caused by ambient temperature, ignition OFF current draw, corroded terminals, self discharge, frequent start/stops, and short engine run times. Frequent winch usage, snowplowing, extended low RPM operation, short trips, and high amperage accessory usage are also reasons for battery discharge.

## Maintenance Charging

■NOTE: It is recommended to use the CTEK Multi US 800 or the CTEK Multi US 3300 for battery maintenance charging. Maintenance charging is required on all batteries not used for more than two weeks or as required by battery drain.



800E

1. When charging a battery in the vehicle, be sure the ignition switch is in the OFF position.
2. Clean the battery terminals with a solution of baking soda and water.

■NOTE: The sealing strip should NOT be removed and NO fluid should be added.

3. Be sure the charger and battery are in a well-ventilated area. Be sure the charger is unplugged from the 110-volt electrical outlet.
4. Connect the red terminal lead from the charger to the positive terminal of the battery; then connect the black terminal lead of the charger to the negative terminal of the battery.

■NOTE: Optional battery charging adapters are available from your authorized dealer to connect directly to your vehicle from the recommended chargers to simplify the maintenance charging process. Check with your authorized dealer for proper installation of these charging adapter connectors.

5. Plug the battery charger into a 110-volt electrical outlet.

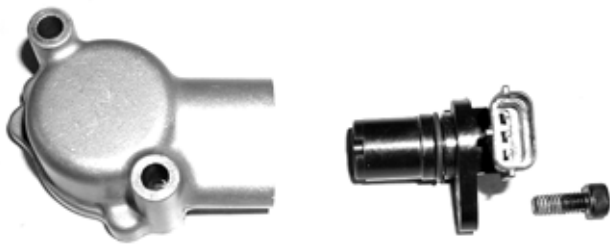
illuminates. The Normal Charge Indicator (C) should illuminate on the upper portion of the battery charger.

4. The meter must show battery voltage.
5. Leave the black tester lead connected; then connect the red tester lead to the pink/white wire.
6. Slowly move the ATV forward or backward; the meter must alternate between 0 volts and battery voltage.

■NOTE: If the sensor tests are within specifications, the LCD gauge must be replaced (see Steering/Body/Controls).

To replace a speed sensor, use the following procedure:

1. Disconnect the three-wire connector from the speed sensor harness or from the speed sensor; then remove the Allen-head cap screw securing the sensor to the sensor housing.
2. Remove the sensor from the sensor housing accounting for an O-ring.
3. Install the new speed sensor into the housing with new O-ring lightly coated with multi-purpose grease; then secure the sensor with the Allen-head cap screw (threads coated with blue Loctite #242). Tighten securely.



CD071

## FUEL PUMP/FUEL LEVEL SENSOR



Component data can be retrieved using the CATT II. Utilize the Sensor Data screen.

■NOTE: Preliminary checks may be performed on this component using the diagnostic mode on the LCD gauge (see EFI Diagnostic System in the Electrical System section).

■NOTE: The electric fuel pump, fuel level sensor, and fuel pump float are only serviceable as assemblies.

### Testing

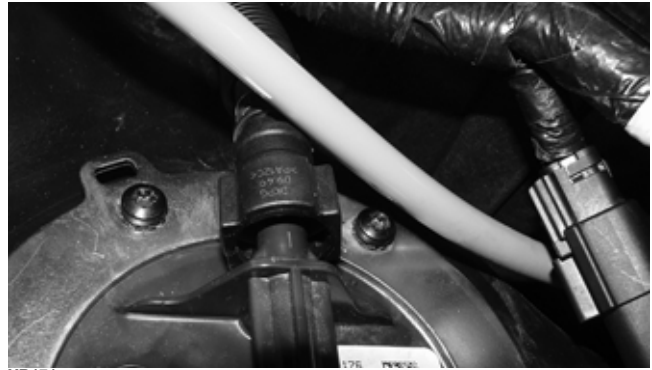
#### ⚠ WARNING

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.

#### 👉 AT THIS POINT

Prior to removing the electric fuel pump, the following check should be performed to determine that removal is necessary.

1. Blow any debris from the fuel pump connection using compressed air.
2. Disconnect the quick connect fitting by pushing it toward the fuel pump fitting; then press the quick connect button(s) and remove the gasoline hose.



XR171

#### CAUTION

Failure to push the fitting toward the fuel pump will result in damage to the fitting causing the gasoline hose to be replaced.

#### ⚠ WARNING

Gasoline may be under pressure. Place an absorbent towel under the connector to absorb any gasoline spray when disconnecting.

3. Install Fuel Pressure Tester in-line between the fuel pump and the gasoline hose.
4. Turn the ignition switch to the ON position. The fuel pressure should build until the pump shuts off. Pressure should read 3.0 kg/cm<sup>2</sup> (43 psi).



XR172

■NOTE: The fuel pump will cycle 5-10 seconds after the ignition key is turned on.

5. If the pump is producing fuel pressure that is out of specification, check all electrical connectors and verify the pump is getting proper voltage (battery voltage).
6. Connect a multimeter to the power supply leads with the red tester lead to the red wire and the black tester lead to the black wire; then turn the ignition switch to the ON position. The meter should read battery voltage.

■NOTE: Low voltage will produce a low fuel pressure reading.

# Troubleshooting

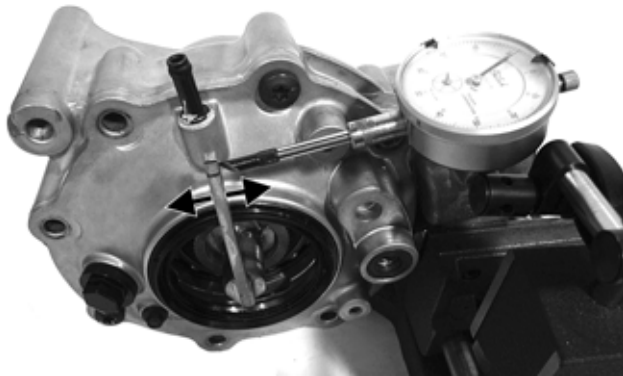
<b>Problem: Spark absent or weak</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Ignition coil</b> defective</li> <li>2. <b>Spark plug</b> defective</li> <li>3. <b>Magneto</b> defective</li> <li>4. <b>ECM</b> defective</li> <li>5. <b>Pick-up coil</b> defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace ignition coil</li> <li>2. Replace plug</li> <li>3. Replace stator coil</li> <li>4. Replace ECM</li> <li>5. Replace stator coil</li> </ol>
<b>Problem: Spark plug fouled with carbon</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Gasoline</b> incorrect</li> <li>2. <b>Air cleaner element</b> dirty</li> <li>3. <b>Spark plug</b> incorrect (too cold)</li> <li>4. <b>Valve seals</b> cracked — missing</li> <li>5. <b>Oil rings</b> worn — broken</li> </ol>	<ol style="list-style-type: none"> <li>1. Change to correct gasoline</li> <li>2. Clean element</li> <li>3. Replace plug</li> <li>4. Replace seals</li> <li>5. Replace rings</li> </ol>
<b>Problem: Spark plug electrodes overheat or burn</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Spark plug</b> incorrect (too hot)</li> <li>2. <b>Engine</b> overheats</li> <li>3. <b>Spark plug</b> loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace plug</li> <li>2. Service cooling system</li> <li>3. Tighten plug</li> </ol>
<b>Problem: Battery does not charge</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Lead wires/connections</b> shorted — loose — open</li> <li>2. <b>Magneto coils</b> shorted — grounded — open</li> <li>3. <b>Regulator/rectifier</b> defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair — replace — tighten lead wires</li> <li>2. Replace magneto coils</li> <li>3. Replace regulator/rectifier</li> </ol>
<b>Problem: Battery charges, but charging rate is below the specification</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Lead wires</b> shorted — open — loose (at terminals)</li> <li>2. <b>Stator coil (magneto)</b> grounded — open</li> <li>3. <b>Regulator/rectifier</b> defective</li> <li>4. <b>Cell plates (battery)</b> defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair — tighten lead wires</li> <li>2. Replace stator coil</li> <li>3. Replace regulator/rectifier</li> <li>4. Replace battery</li> </ol>
<b>Problem: Battery overcharges</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Internal battery</b> short circuited</li> <li>2. <b>Regulator/rectifier</b> resistor damaged — defective</li> <li>3. <b>Regulator/rectifier</b> poorly grounded</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace battery</li> <li>2. Replace resistor</li> <li>3. Clean — tighten ground connection</li> </ol>
<b>Problem: Charging unstable</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Lead wire</b> intermittently shorting</li> <li>2. <b>Magneto</b> internally shorted</li> <li>3. <b>Regulator/rectifier</b> defective</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace lead wire</li> <li>2. Replace stator coil</li> <li>3. Replace regulator/rectifier</li> </ol>
<b>Problem: Starter button not effective</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Battery</b> charge low</li> <li>2. <b>Switch</b> contacts defective</li> <li>3. <b>Starter relay</b> defective</li> <li>4. <b>Emergency stop — ignition switch</b> off</li> <li>5. <b>Wiring connections</b> loose — disconnected</li> </ol>	<ol style="list-style-type: none"> <li>1. Charge — replace battery</li> <li>2. Replace switch</li> <li>3. Replace relay</li> <li>4. Turn on switches</li> <li>5. Connect — tighten — repair connections</li> </ol>
<b>Problem: Battery “sulfation” (Acidic white powdery substance or spots on surfaces of cell plates)</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Charging rate</b> too low — too high</li> <li>2. <b>Battery</b> run-down — damaged</li> <li>3. <b>Electrolyte</b> contaminated</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace battery</li> <li>2. Replace battery</li> <li>3. Replace battery</li> </ol>
<b>Problem: Battery discharges too rapidly</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Charging system</b> not charging</li> <li>2. <b>Cell plates overcharged</b> — damaged</li> <li>3. <b>Battery</b> short-circuited</li> <li>4. <b>Electrolyte</b> contaminated</li> </ol>	<ol style="list-style-type: none"> <li>1. Check magneto — regulator/rectifier — circuit connections</li> <li>2. Replace battery — correct charging system</li> <li>3. Replace battery</li> <li>4. Replace battery</li> </ol>
<b>Problem: Battery polarity reversed</b>	
<b>Condition</b>	<b>Remedy</b>
<ol style="list-style-type: none"> <li>1. <b>Battery</b> incorrectly connected</li> </ol>	<ol style="list-style-type: none"> <li>1. Reverse connections — replace battery — repair damage</li> </ol>



GC039A

6. Zero the dial indicator; then while holding the pinion stationary, rock the ring gear assembly forward and back and record the backlash. Backlash must be 0.011-0.015 in. (0.28-0.38 mm). If backlash is within specifications, proceed to Ring Gear End-Play. If backlash is not within specifications, increase shim thickness to increase backlash or decrease shim thickness to decrease backlash.

■NOTE: Higher backlash settings usually result in quieter gear operation.



GC037A

### Ring Gear End-Play

After correcting backlash, ring gear end-play can be adjusted. To adjust end-play, use the following procedure:

1. Secure the gear case in a holding fixture with the cover side up; then install a dial indicator contacting the ring gear axle flange.



GC035

2. Zero the dial indicator; then push the ring gear toward the dial indicator and release. End-play should be 0.004-0.008 in. (0.1-0.2 mm).

3. To increase end-play, decrease the shim thickness. To decrease end-play, increase the shim thickness.

■NOTE: Once proper backlash and end play are established, the gear case can be assembled (see Assembling Differential Assembly in this sub-section).

### Assembling Differential Assembly

1. With the pinion gear and new bearings installed, place the selected (backlash) shim on the gear case side of the ring gear with the chamfered side toward the ring gear; then install into gear case/differential housing.



GC031A



GC020

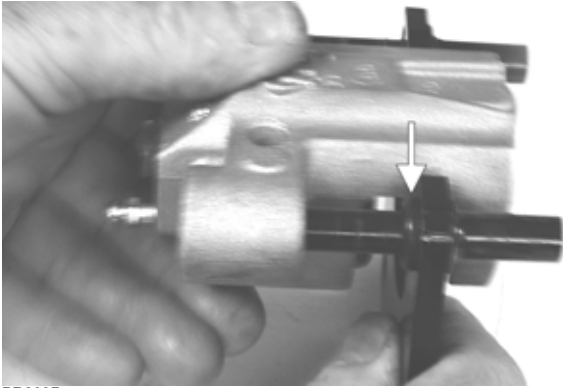
2. Place the selected (end-play) shim, chamfered side toward the gear, onto the cover side of the ring gear.



GC036B

■NOTE: The spider and ring gear assembly must be replaced as a complete unit.

3. Assemble the fork and sliding collar into the cover assembly; then install the left bearing flange/bearing assembly and seat firmly into the cover.



PR239B

■NOTE: The O-ring is used for shipping purposes and provides no function in operation.

6. Cover the piston end of the housing with 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 two seal rings in the housing.



PR713A



PR715

**⚠ WARNING**

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

7. 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.

**CLEANING AND INSPECTING**

1. Clean all caliper components (except the brake pads) with DOT 4 brake fluid. Do not wipe dry.

2. Inspect the brake pads for damage and excessive wear.

■NOTE: For measuring brake pads, see Periodic Maintenance/Tune-up.

3. Inspect the brake caliper housings for scoring in the piston bores, chipped seal ring grooves, or signs of corrosion or discoloration.
4. Inspect the piston surface for scoring, discoloration, or evidence of binding or galling.
5. Inspect the caliper holder for wear or bending.

**ASSEMBLING/INSTALLING**

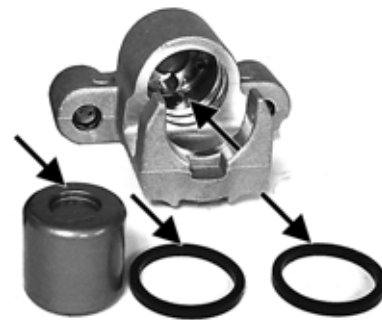
1. Install new seals into the brake caliper housing and apply a liberal amount of DOT 4 brake fluid to the cylinder bore of the housing, seals, and brake piston.

**CAUTION**

**Make sure the seals are properly in place and did not twist or roll during installation.**



PR715



PR717A

2. Press the piston into the caliper housing using hand pressure only. Completely seat the piston; then wipe off any excessive brake fluid.

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