

SECTION 3 — ENGINE-RELATED ITEMS

3

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Axial Fan/Belt

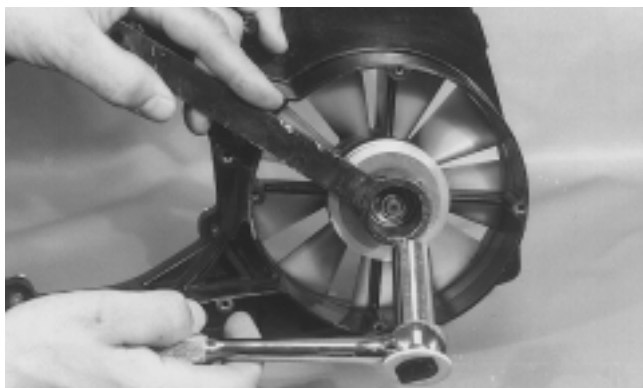
REMOVING FAN

1. Remove the four cap screws securing the recoil starter to the fan case.
2. Remove the three cap screws securing the recoil starter pulley and fan drive pulley to the flywheel; then remove the recoil starter pulley and fan drive pulley.
3. Remove the three cap screws and four flange nuts securing the fan case assembly to the engine; then remove the fan case from the engine compartment.

DISASSEMBLING

1. Remove the fan cover; then remove the belt.
2. Using the Fan Spanner Wrench (p/n 0644-139), remove the nut, lock washer, and washer securing pulley halves.

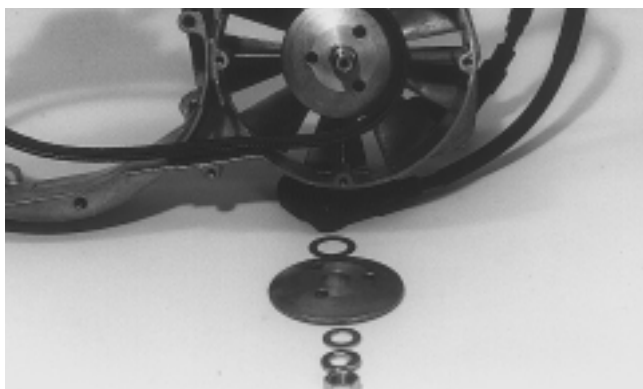
Fig. 3-1



AB102

3. Slide the outer pulley half, shim(s), fan belt, and inner pulley half off the shaft and account for the key and the fan belt.

Fig. 3-2



A908

4. Remove the fan with shaft.

5. Drive the bearings from the fan case and account for the spacer between the bearings.

Fig. 3-3

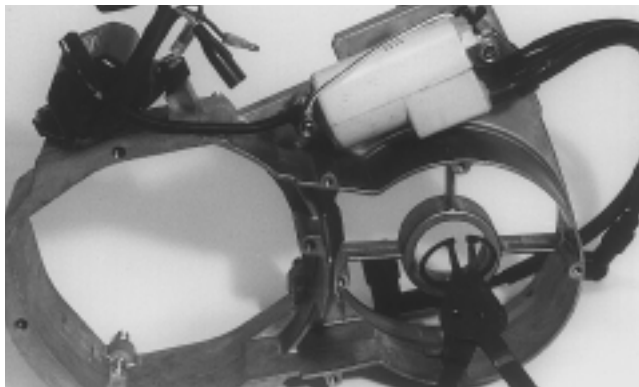


A910

■ **NOTE:** A circlip is positioned between the bearings. The bearings must be driven from the center to the outside of the fan case.

6. Remove the circlip from the fan case.

Fig. 3-4



A911

CLEANING AND INSPECTING

■ **NOTE:** Whenever a part is worn excessively, cracked, or damaged in any way, replacement is necessary.

1. Clean all axial fan components.
2. Inspect the fan case and shaft threaded areas for damage or stripped threads; then check the shaft keyway and key for excessive wear.
3. Inspect the fan for broken, bent, or damaged vanes.
4. Inspect the bearings for smooth rotation.
5. Inspect the pulley halves for cracks, gouges, or other damage.
6. Inspect the fan belt for cracks, tears, or fraying.

ASSEMBLING

Fig. 3-5

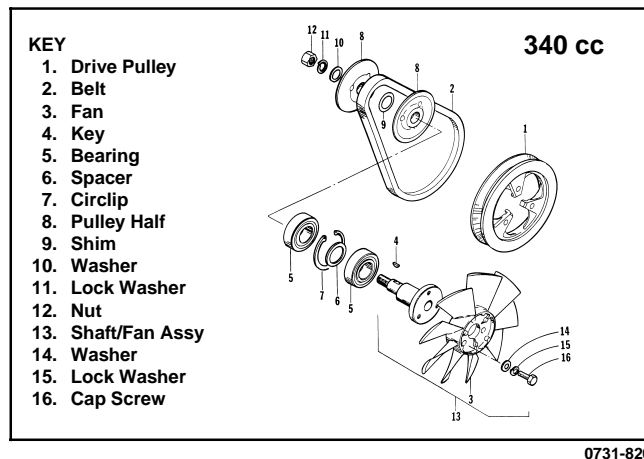
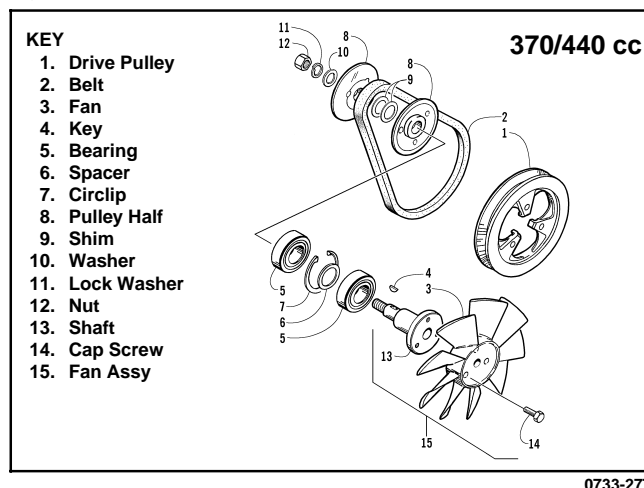
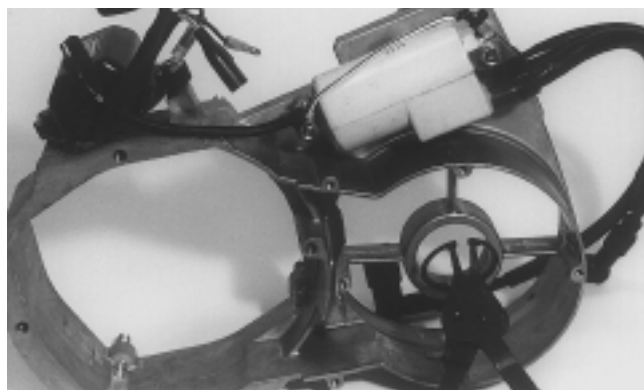


Fig. 3-6



1. Install the circlip into the groove of the fan case.

Fig. 3-7

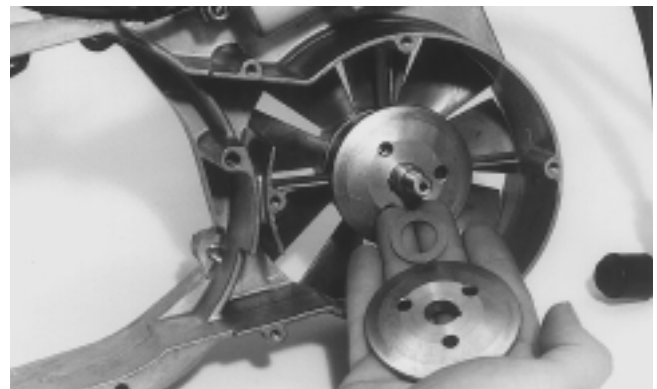


2. Press a bearing into the fan case until it is "seated" against the circlip.
3. From the opposite side of the fan case, install the spacer and press the remaining bearing into the fan case until it is "seated."

NOTE: The spacer is positioned between the two fan-case bearings.

4. Insert the fan with shaft through the fan bearings.
5. Install the key into the shaft.
6. Slide the inner pulley half, required shim(s), fan belt, and outer pulley half onto the shaft.

Fig. 3-8



7. Using the fan spanner wrench, secure the pulley with a washer, lock washer, and nut. Tighten the nut to 2.5-4 kg-m (18-29 ft-lb).

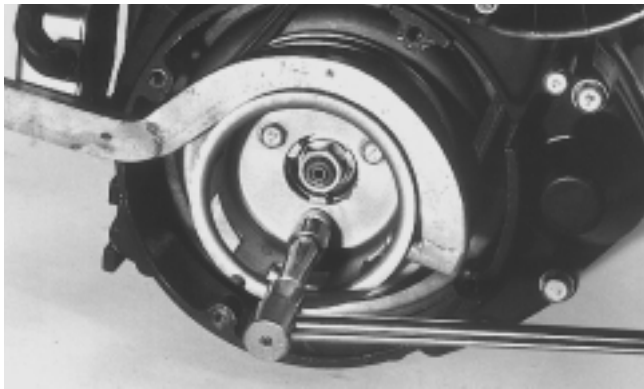
INSTALLING FAN

1. Place the fan case assembly on the engine; then secure with four flange nuts and three cap screws. Tighten the flange nuts and 8 mm cap screw to 1.8-2.2 kg-m (13-16 ft-lb). Tighten the 6 mm cap screws to 0.8-1.2 kg-m (6-9 ft-lb).
2. Place the new fan belt into position on the upper pulley.
3. Place the fan drive pulley onto the fan belt and align one of its holes with one of the mounting holes in the flywheel; then start a cap screw into the aligned holes and finger-tighten.
4. Rotate the fan drive pulley clockwise while observing the other two holes in the pulley. When they align with the two holes in the flywheel, start the remaining two mounting cap screws.
5. Tighten the three cap screws only to position the fan drive pulley on the flywheel; then remove the three cap screws and install the recoil starter pulley. Apply red Loctite #271 to the threads of the three cap screws and install them into the flywheel. Tighten the three cap screws evenly to 0.8-1.2 kg-m (6-9 ft-lb).
6. Check the fan belt tension. Adjust as necessary.
7. Install the fan cover and secure with six screws.
8. Install the recoil starter. Secure with four cap screws.

REPLACING FAN BELT

1. Remove the fan cover and the recoil starter.
2. Remove the three cap screws securing the recoil starter pulley and the fan drive pulley to the flywheel.
3. Remove the fan drive pulley and fan belt from the engine.
4. Place the new fan belt into position on the upper pulley.
5. Place the fan drive pulley onto the fan belt and align one of its holes with one of the mounting holes in the flywheel; then start a cap screw into the aligned hole and finger-tighten.
6. Rotate the fan drive pulley clockwise while observing the other two holes in the pulley. When they align with the two holes in the flywheel, start the remaining two cap screws.
7. Tighten the three cap screws only to position the fan drive pulley on the flywheel; then remove the three cap screws and install the recoil starter pulley. Apply red Loctite #271 to the threads of the three cap screws and install into the flywheel. Tighten the three cap screws evenly to 0.8-1.2 kg-m (6-9 ft-lb).

Fig. 3-9



AB040

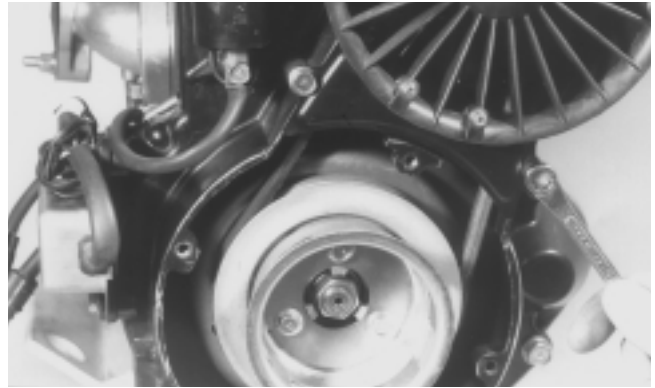
■ **NOTE:** With the new belt installed, check fan belt tension (see Checking Belt Tension).

8. Install the fan cover and recoil starter.

CHECKING BELT TENSION

1. Remove the fan cover.

Fig. 3-10



AB075

2. Squeeze the belt at midspan and observe the belt deflection. The maximum belt deflection on either side must not exceed 6 mm (1/4 in.). If the deflection is not within specifications, adjust the belt tension.

Fig. 3-11



B075

3. Install the fan cover.

ADJUSTING BELT TENSION

1. Remove the fan cover.
2. Using the fan spanner wrench, remove the nut, lock washer, and washer securing the pulley halves.
3. Slide the outer pulley half off the shaft and account for any shim(s).
4. Add or remove shim(s) to attain correct belt tension.

■ **NOTE:** To increase belt tension, remove shim(s); to decrease belt tension, install shim(s).

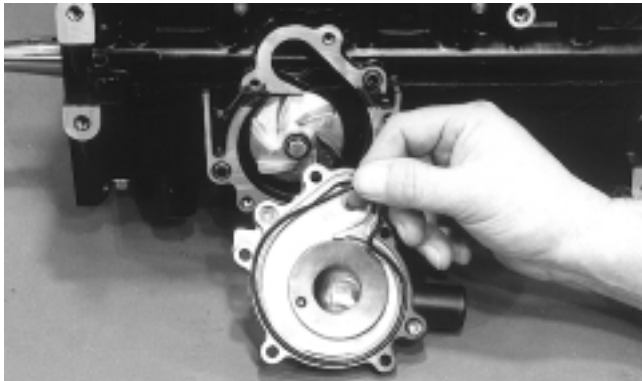
5. Install the fan belt and the outer pulley half on the shaft and, using the fan spanner wrench, secure pulley with a washer, lock washer, and nut. Tighten to 2.5-4 kg-m (18-29 ft-lb).
6. Recheck belt tension; adjust if necessary.
7. Install fan cover.

Repairing Water Pump (Twin)

■ **NOTE:** A bleed hole is located at the bottom of the water pump housing. If there are any signs of coolant leakage from the bleed hole, the water pump seals must be replaced. When servicing the water pump, use Water Pump Bearing and Seal Kit (p/n 0644-084).

1. Remove the expansion chamber from the engine compartment.
2. Attach a long piece of fuel hose to the engine coolant drain valve (located on the front lower half of the crankcase). Route the fuel hose outside the engine compartment and into a container. Open the drain valve and remove the filler cap. Once the coolant stops flowing, remove the hose and tighten the drain valve.
3. Remove the coolant hose from the water pump cover.
4. Remove the screws securing the water pump cover; then remove the cover and account for the O-ring seal.

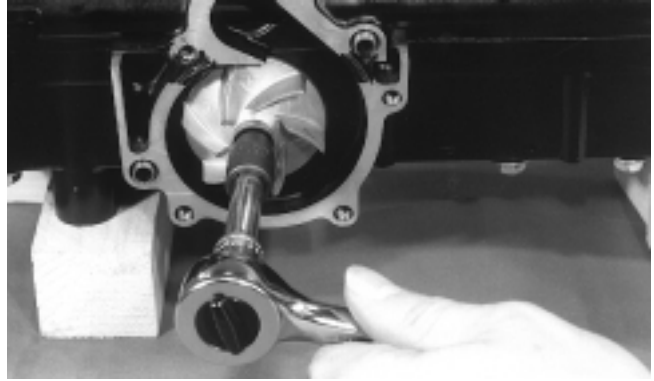
Fig. 3-12



AN180

5. Loosen the throttle body/carburetor flange clamps; then remove the throttle body/carburetors.
6. Remove the mounting hardware securing the engine to the front-end assembly. Remove the hose from the thermostat housing and tip the engine forward.
7. Remove either lower union cap screw securing the lower check valve assembly. Remove the two screws securing the oil-injection pump and pull the oil pump from the engine. Leave the pump hose and cable attached.
8. Remove the cap screw securing the impeller.

Fig. 3-13

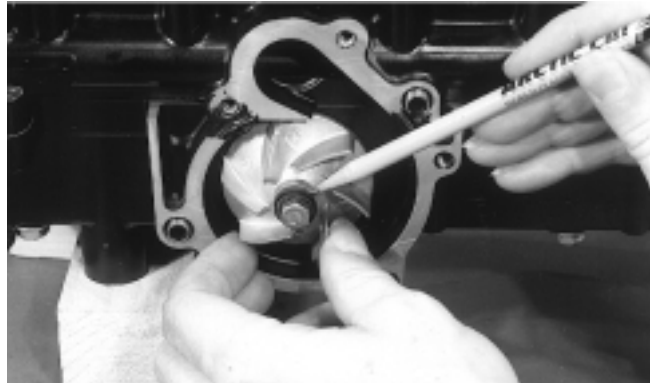


AN233

9. Remove the impeller from the shaft.

■ **NOTE:** If the impeller won't slide off the shaft, start the cap screw into the shaft and tap on the cap screw driving the shaft back out of the impeller.

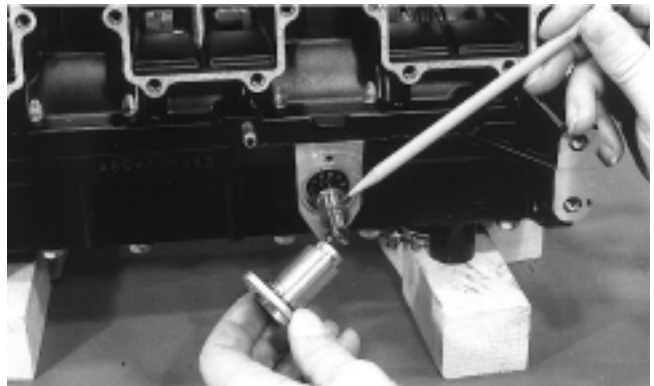
Fig. 3-14



AN232

10. Remove the oil-injection pump retainer and shaft from the opposite side of the crankcase. Account for the thrust washer located between the retainer and shaft flange.

Fig. 3-15



AN231

11. Using the long seal driver, drive the water pump seal from the crankcase.

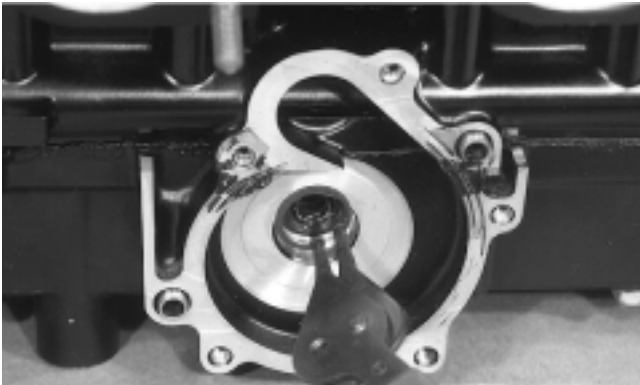
Fig. 3-16



AN250

12. Using a pair of snap ring pliers, remove the snap ring securing the inner seal in the crankcase.

Fig. 3-17



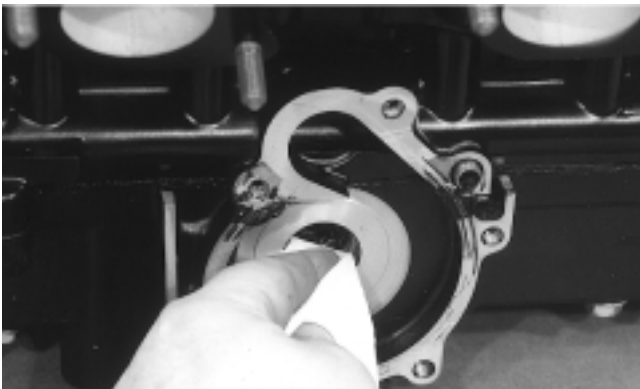
AN249

13. Using the hooked end of the long seal driver, pull the inner seal free of the crankcase.

ASSEMBLING

1. Wipe the seal area clean using a clean rag.

Fig. 3-18



AN248

2. Position the inner seal onto the seal driver (spring side towards the crankshaft). Gently tap into position.

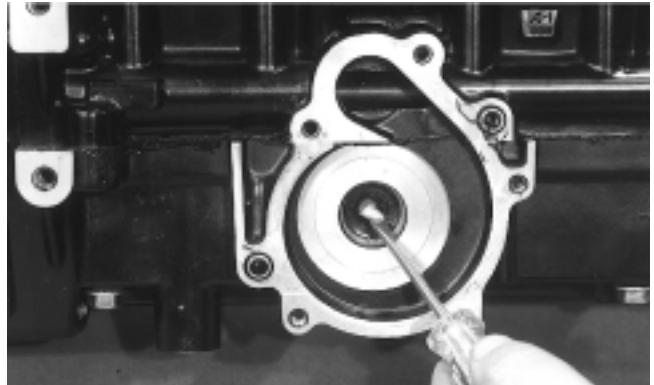
Fig. 3-19



AN259

3. Using a small screwdriver, apply a light coat of grease to the inner seal lips.

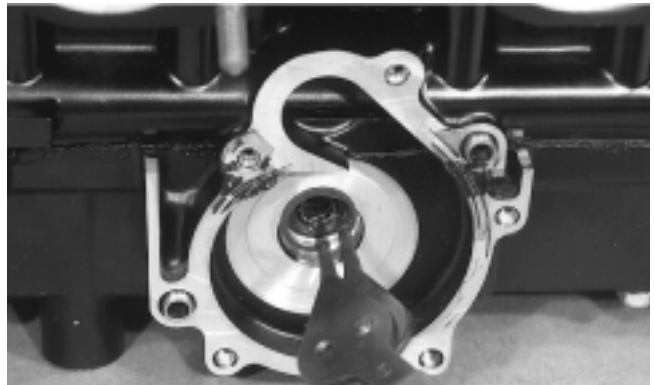
Fig. 3-20



AN262

4. Using a pair of snap ring pliers, install the snap ring securing the inner seal in the crankcase.

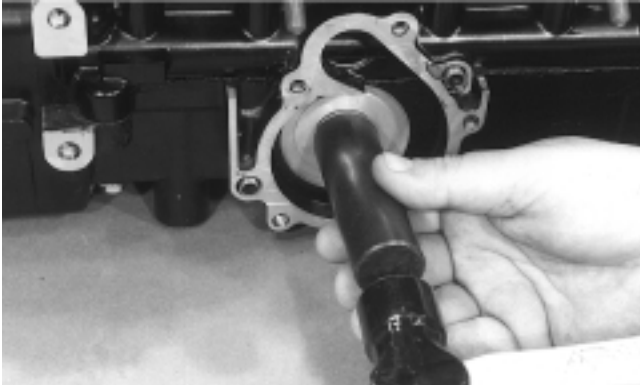
Fig. 3-21



AN249

5. Using the seal driver, carefully install the outer water pump seal. Gently tap the seal down into position until it seats itself against its flange.

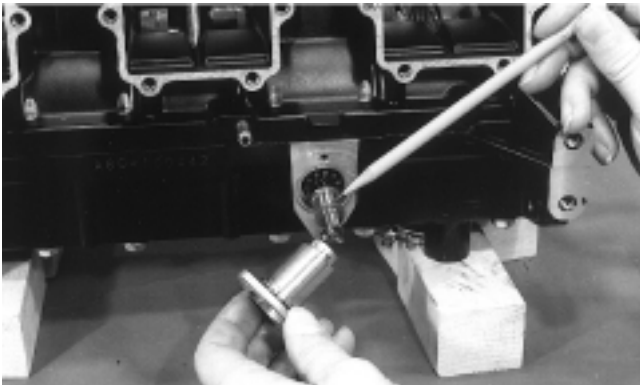
Fig. 3-22



AN261

6. Apply a light coat of grease to the sealing surface of the oil-injection pump driveshaft; then install Oil Seal Installation Tool (p/n 0644-219) at the end of the shaft. Twist the shaft as it is pushed through the oil and water pump seals; then remove the tool. Position the shim on the oil pump end of the shaft.

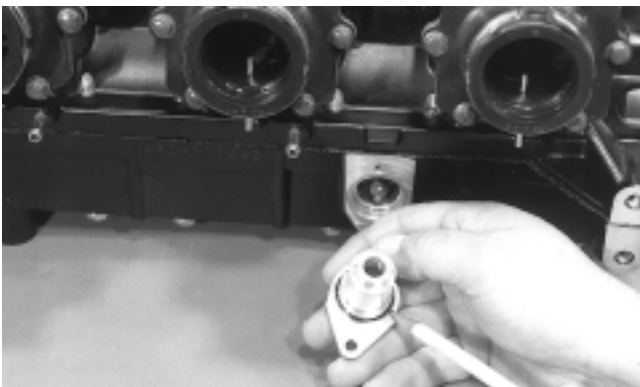
Fig. 3-23



AN231

7. Install the oil-injection pump retainer O-ring and retainer.

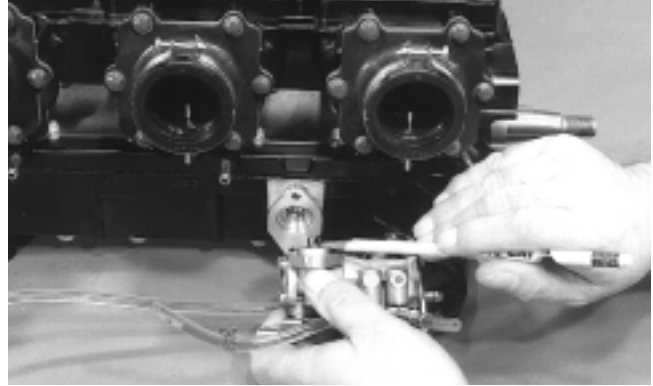
Fig. 3-24



AN184

8. Install the O-ring and the oil-injection pump. Make sure the pump shaft and oil pump align. Secure with two screws and washers. Tighten the two screws to 0.7 kg-m (5 ft-lb).

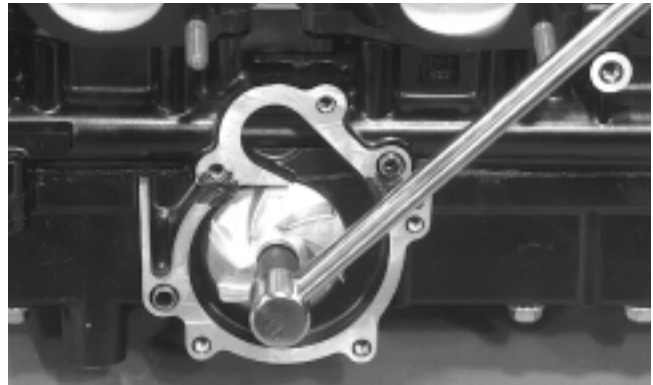
Fig. 3-25



AN183

9. Place the lower check valve into position; then secure with the gaskets and union cap screw. Tighten securely.
10. Place the impeller into position and secure with a cap screw and washer. Be sure the rubber side of the washer is directed towards the impeller. Apply blue Loctite #242 to the threads of the cap screw and tighten to 0.8-1.2 kg-m (6-9 ft-lb).

Fig. 3-26



AN178

11. Apply sealant to the crankcase seam; then install the alignment pins into the crankcase (if removed).

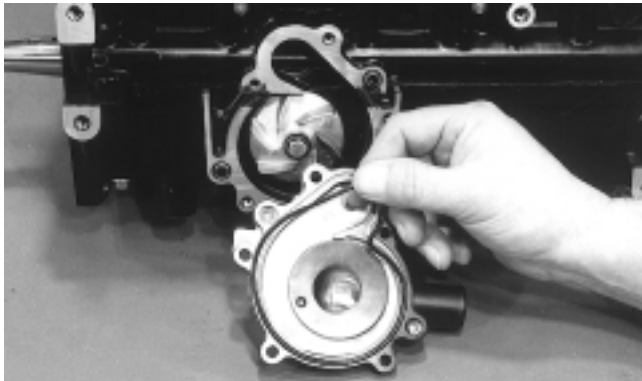
Fig. 3-27



AN179

12. Position the O-ring into the water pump cover; then install the cover. Secure with the screws. Tighten to 1.1 kg-m (8 ft-lb).

Fig. 3-28



AN180

13. Set the engine down into position and secure to the front-end assembly. Tighten to specifications.
14. Connect the coolant hose to the water pump cover and secure with the clamp.
15. Install the throttle body/carburetors and secure with clamps.
16. Install the expansion chamber and secure with springs.

■ **NOTE:** When installing the springs, the long hook portion of the spring must be attached to the exhaust manifold or premature spring failure will result.

17. Install the thermostat hose and fill the cooling system with antifreeze. Start and run the engine. Check for leaks and recheck the cooling system to make sure it has been properly filled.

Repairing Water Pump (600 cc Triple)

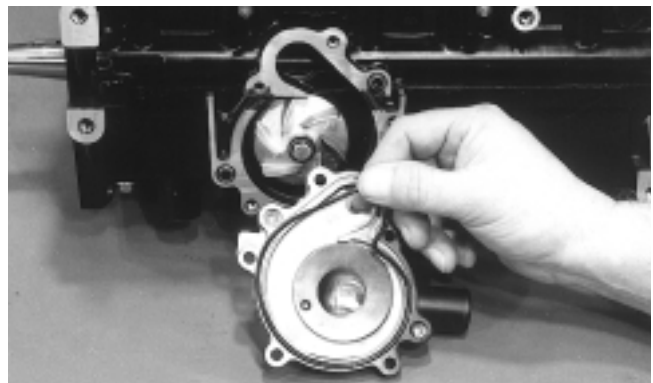
REMOVING AND DISASSEMBLING

■ **NOTE:** A bleed hole is located at the bottom of the water pump housing. If there are any signs of coolant leakage from the bleed hole, the water pump seals must be replaced. When servicing the water pump, use Water Pump Bearing and Seal Kit (p/n 0644-084).

1. Mark the three expansion chambers for assembly purposes; then remove the expansion chambers from the engine compartment.

2. Attach a long piece of fuel hose to the engine coolant drain (located on the front lower half of the crankcase). Route the fuel hose outside the engine compartment and into a container. Open the drain and remove the filler cap. Once the coolant stops flowing, remove the hose and tighten the drain valve.
3. Remove the coolant hose from the water pump cover.
4. Remove the water pump cover and account for the O-ring seal.

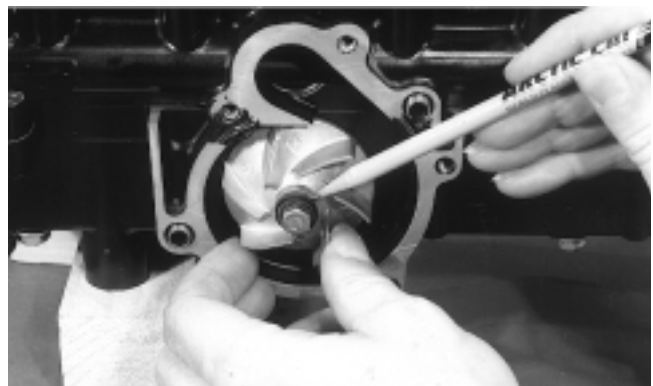
Fig. 3-29



AN180

5. Mark the three carburetors for assembly purposes. Loosen the carburetor flange clamps; then remove the three carburetors and lay to the side.
6. Remove the cap screws securing the engine to the front-end assembly. Remove the hose from the thermostat housing and tip the engine forward.
7. Remove the screws securing the oil pump and pull the oil pump from the engine. Leave the oil pump hose and cable attached.
8. Remove the cap screw securing the impeller.
9. Pull the impeller from the shaft. If the impeller won't slide off the shaft, start the cap screw into the shaft and tap on the cap screw driving the shaft back out of the impeller.

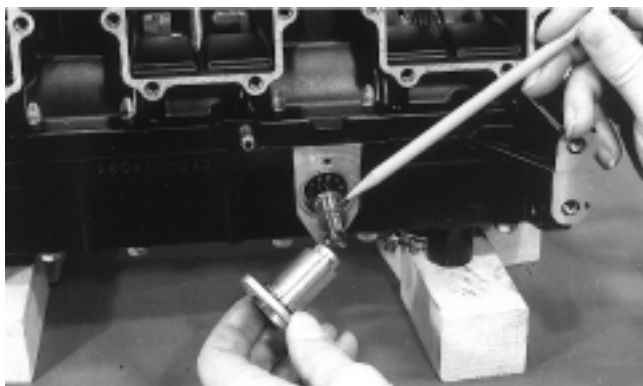
Fig. 3-30



AN232

10. Remove the oil pump retainer and shaft from the opposite side of the crankcase. Account for the thrust washer located between the retainer and shaft flange.

Fig. 3-31



AN231

11. Using the long seal driver, drive the water pump seal from the crankcase.

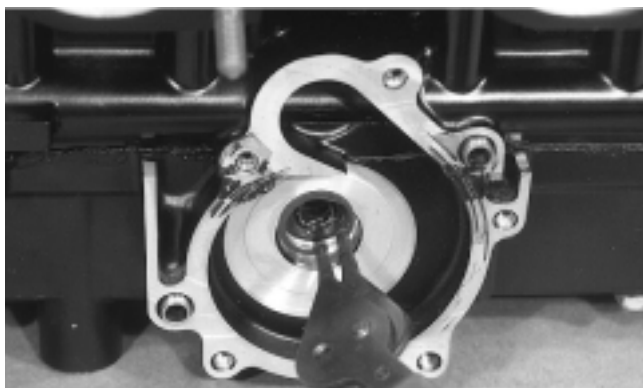
Fig. 3-32



AN250

12. Remove the snap ring securing the inner seal in the crankcase.

Fig. 3-33



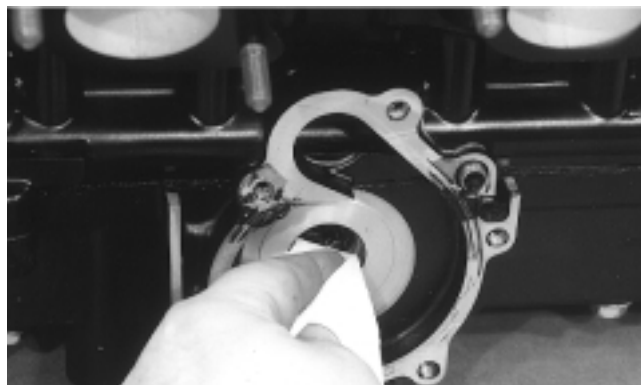
AN249

13. Using the hooked end of the long seal driver, pull the inner seal free of the crankcase.

ASSEMBLING AND INSTALLING

1. Wipe the seal area clean using a clean rag.

Fig. 3-34



AN248

2. Position the inner seal onto the seal driver (spring side towards the crankshaft). Gently tap into position.

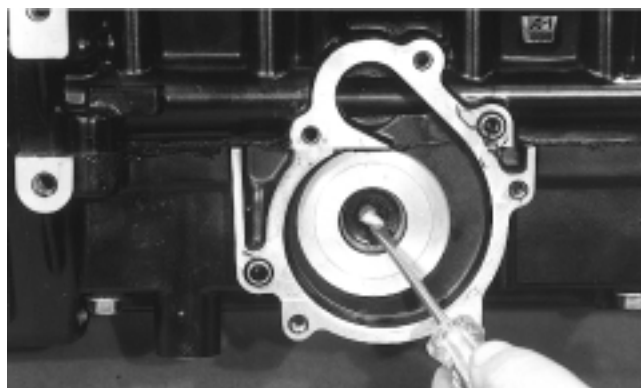
Fig. 3-35



AN259

3. Apply a thin coat of grease to the inner seal lips.

Fig. 3-36

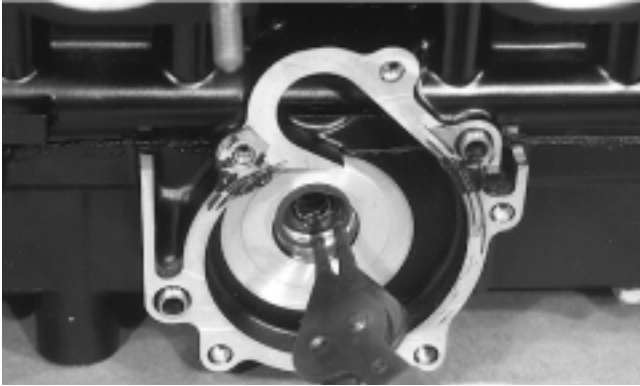


AN262

4. Install the snap ring securing the inner seal in the crankcase.

3

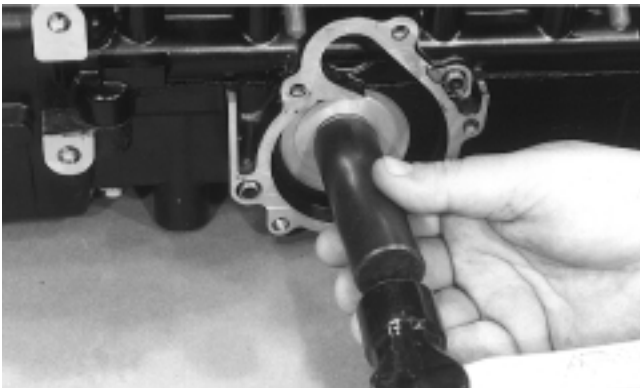
Fig. 3-37



AN249

5. Using the seal driver, carefully install the outer water pump seal. Gently tap the seal down into position until it seats itself against its flange.

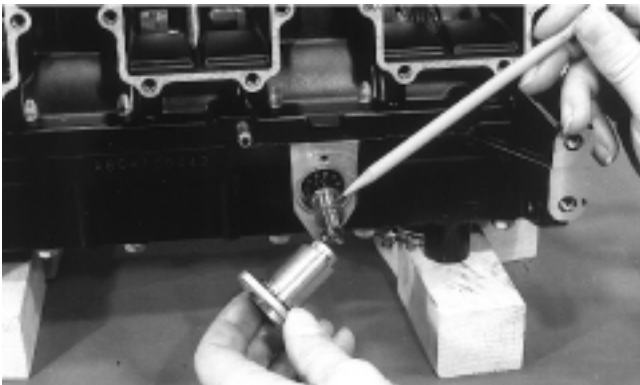
Fig. 3-38



AN261

6. Apply a light coat of grease to the sealing surface of the oil pump driveshaft; then install Oil Seal Installation Tool (p/n 0644-219) at the end of the shaft. Twist the shaft as it is pushed through the oil and water pump seals; then remove the tool. Position the shim on the oil pump end of the shaft.

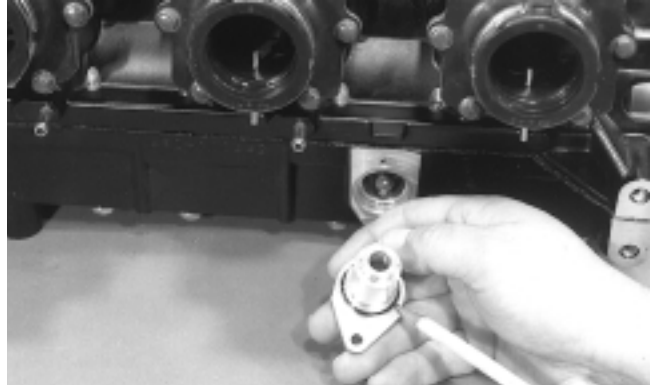
Fig. 3-39



AN231

7. Install the oil-injection pump retainer O-ring and retainer.

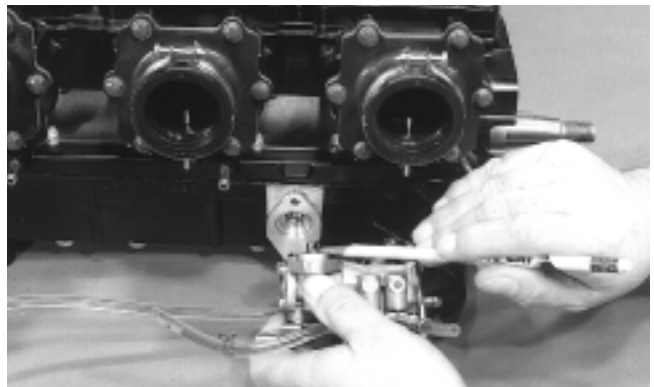
Fig. 3-40



AN184

8. Install the O-ring and the oil-injection pump. Make sure the oil-pump shaft and oil pump align. Secure with two screws and washers. Tighten the two screws securely.

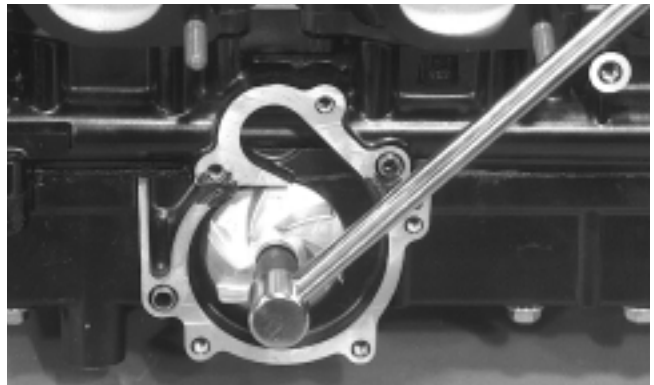
Fig. 3-41



AN183

9. Place the impeller into position and secure with a cap screw and washer. Be sure the rubber side of the washer is directed towards the impeller. Apply blue Loctite #242 to the threads of the cap screw and tighten to 0.8-1.2 kg-m (6-9 ft-lb).

Fig. 3-42



AN178

10. Apply sealant to the crankcase seam; then install the alignment pins into the crankcase if removed.

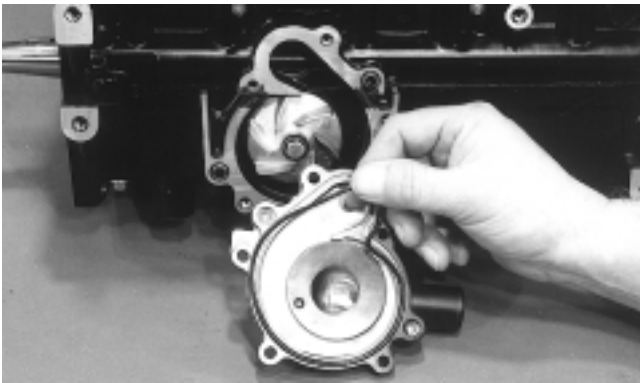
Fig. 3-43



AN179

11. Position the O-ring into the water pump cover; then install the cover. Secure with five screws. Tighten securely.

Fig. 3-44



AN180

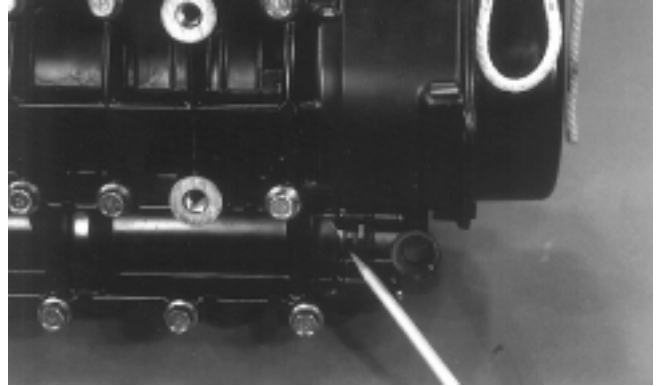
12. Fill the cooling system with antifreeze. Start and run the engine. Check for leaks and recheck the cooling system to make sure it has been properly filled.

Repairing Water Pump (800/1000 cc)

REMOVING AND DISASSEMBLING

■ **NOTE:** A bleed hole is located at the bottom of the water pump housing. If there is any sign of coolant leakage from the bleed hole, the water pump seals must be replaced. When servicing the water pump, use Water Pump Bearing and Seal Kit (p/n 0644-084).

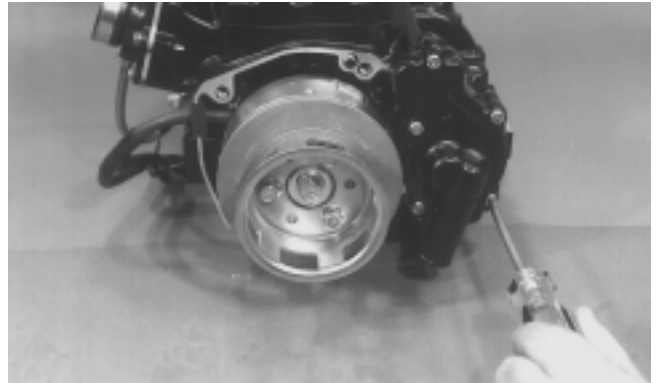
Fig. 3-45



AQ104

1. Remove the recoil starter and magneto housing; then remove the water pump cover.

Fig. 3-46



AQ095

2. Secure the crankshaft using a spanner wrench; then remove the cap screw securing the impeller. Remove the impeller from the shaft.

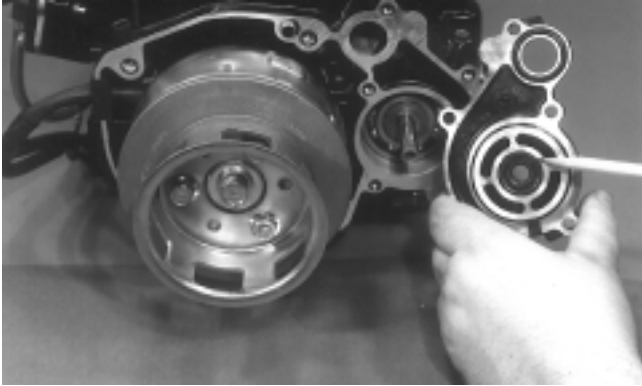
Fig. 3-47



AQ096

3. Slide the center section of the water pump from the shaft. Inspect both the rear and front seals. If either appear in poor condition, replacement is necessary.

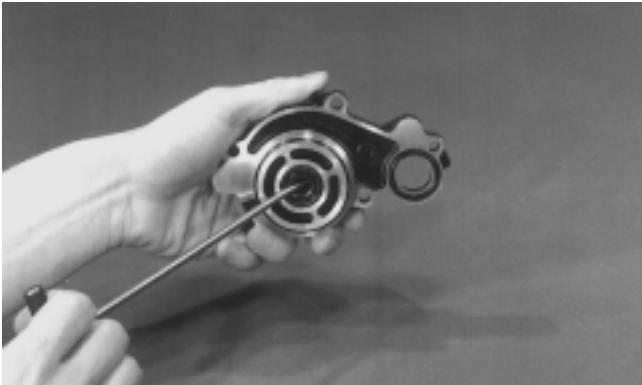
Fig. 3-48



AQ112

4. To remove seals, pull the rear seal from the center section using the puller.

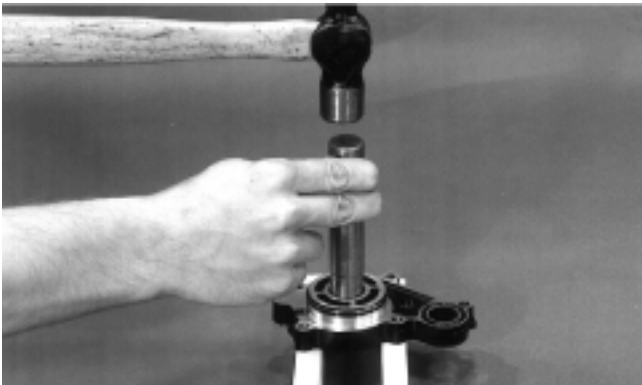
Fig. 3-49



AQ011

5. Using the seal driver, drive the front seal from the center section.

Fig. 3-50



AQ012

ASSEMBLING AND INSTALLING

■ **NOTE:** Shown are the seals and O-rings required to rebuild the water pump. Clean the center section seal area and inspect the center section for any signs of wear or scoring in the impeller area.

Fig. 3-51



AQ013

1. Using the seal driver, install the front mechanical seal. Drive the seal down into the center section until it is firmly seated against its metal flange.

Fig. 3-52



AQ014

2. Using the driver, install the rear seal. The spring side of the seal must face outward. The seal outer surface must be flush with the case.

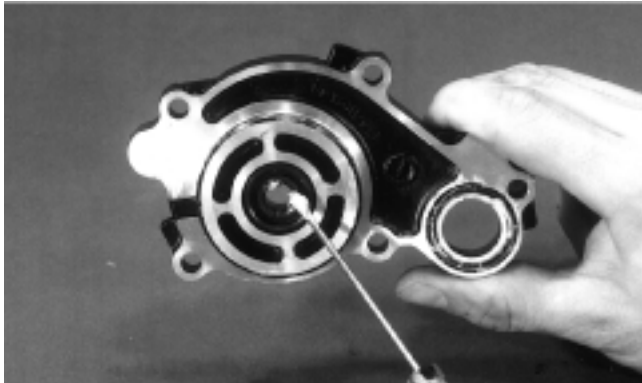
Fig. 3-53



AQ015

3. With the rear seal installed, apply a generous amount of grease to the seal lips; then install the O-rings and coat with grease.

Fig. 3-54



AQ016

4. Install the water pump center section on the crankcase. Install the new impeller sealing ring on the backside of the impeller.

Fig. 3-55



AQ008

5. Install the impeller and secure with a cap screw (coated with blue Loctite #242) and flat washer. The washer has a rubber coated side which must face the impeller. Tighten the cap screw to 0.8-1.2 kg-m (6-9 ft-lb).
6. Install the outer water pump cover and O-ring seal. Secure the cover with five screws.

Fig. 3-56



AQ005

7. Install the magneto housing and recoil starter.
8. Fill the cooling system with antifreeze. Start and run the engine. Check for leaks and recheck the cooling system to make sure it has been properly filled.

Pressure Testing Engine

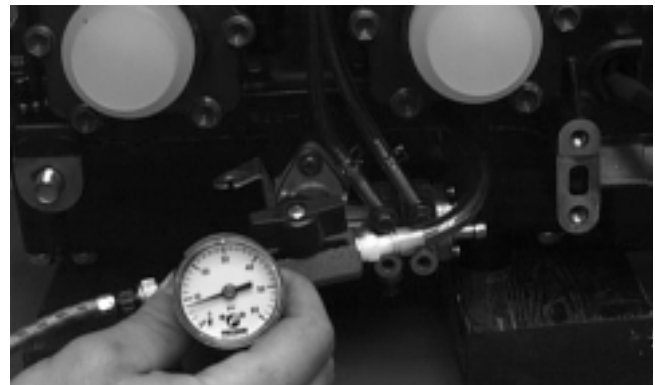
1. Test the engine for air leaks using the following procedure and Pressure Testing Kit (p/n 0144-127).
 - a. Install a plug into each intake-manifold port and tighten the flange clamps securely.
 - b. Place a rubber plug and cover on each exhaust port and secure.
 - c. Connect the tester pump to an impulse fitting on the crankcase; then plug any remaining impulse fittings and pressurize the crankcase to 8 psi and close the valve.

3

CAUTION

DO NOT exceed 8 psi pressure or damage to the seals will result.

Fig. 3-57



AN128D

- d. Monitor the pressure gauge. The pressure must not drop at a rate of more than 1 psi per minute.
- e. If the pressure drops faster than specified, inspect for an air leak with soapy water or by completely submerging the pressurized engine in clean fresh water. Repair as needed.

CAUTION

When submerging the engine to test for air leaks, all external electrical components must be removed to avoid damage.

Liquid Cooling System

The liquid cooling system consists of heat exchangers, water pump, and thermostat. The system should be inspected for leaks or damage whenever an overheating problem is experienced.

FILLING COOLING SYSTEM

CAUTION

Be sure the cooling system is thoroughly filled using the following procedure.

1. Elevate the front of the snowmobile 30-60 cm (12-14 in.).
2. Remove the coolant tank cap and check coolant level. The coolant tank should be filled to the coolant level line.
3. Install the coolant tank cap; then start the engine. Run the engine at 3000-3500 RPM until the bottom heat exchangers become hot to the touch. Stop the engine and allow the system to cool.
4. Lower the front of the snowmobile and elevate the rear of the snowmobile 12-14 in. Repeat the procedures in step 3.
5. Check the coolant level. Add coolant as required to the coolant tank (coolant tank should be filled to coolant level line). Repeat procedure until coolant level stabilizes in the coolant tank.

■ **NOTE:** If coolant is required, mix coolant for a temperature of -36°C (-34°F). Follow mixing recommendations of the manufacturer of the coolant.

CAUTION

It is extremely important that the Filling Cooling System procedure is followed very closely and the cooling system is properly filled. If the system isn't properly filled, piston damage will occur.

INSPECTING COOLANT HOSES AND CLAMPS

All coolant hoses and connections should be checked annually for deterioration, cracks, and wear.

All coolant hoses and clamps should be replaced every four years.

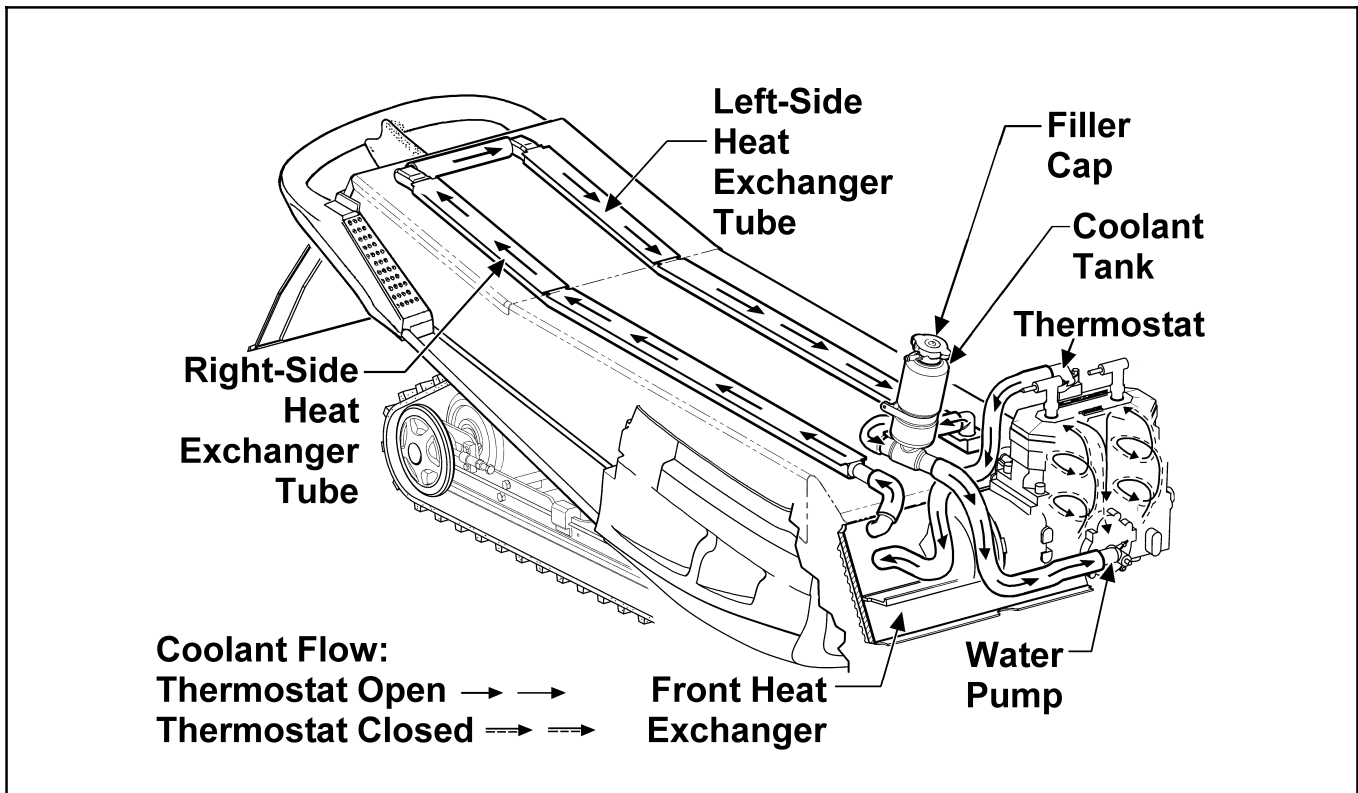
INSPECTING THERMOSTAT

1. Inspect the thermostat for corrosion, wear, or spring damage.
2. Using the following procedure, inspect the thermostat for proper operation.
 - a. Suspend the thermostat in a container filled with water.
 - b. Heat the water and monitor the temperature with a thermometer.
 - c. The thermostat should open at 50°C (122°F). Once the thermostat starts to open, IMMEDIATELY remove the thermostat as it will lock in the open position if allowed to open fully.

■ **NOTE:** The thermostat is of the lock-open type. If the thermostat is ever allowed to fully open, it will remain open and replacement will be necessary.

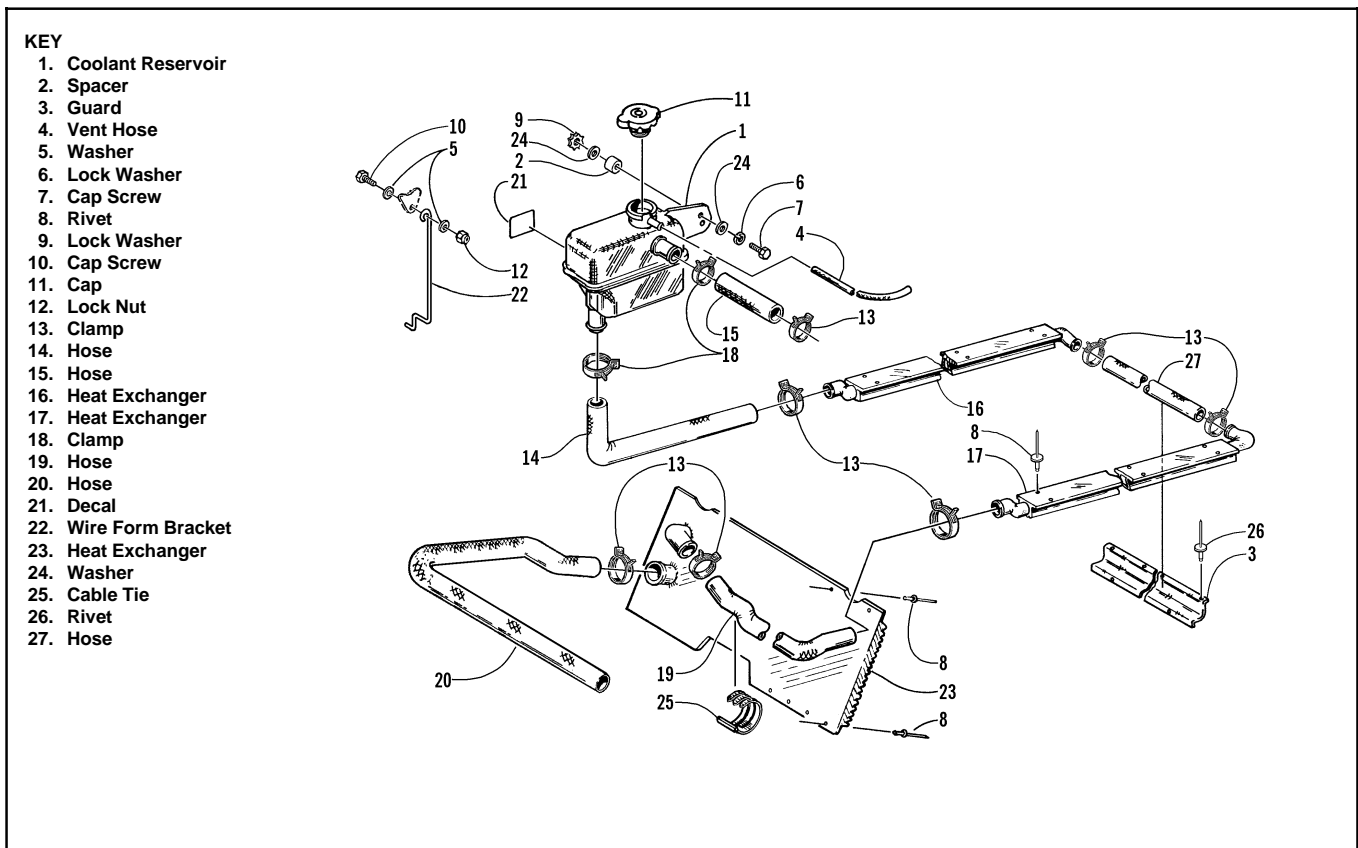
COOLING SYSTEM SCHEMATICS

Fig. 3-58



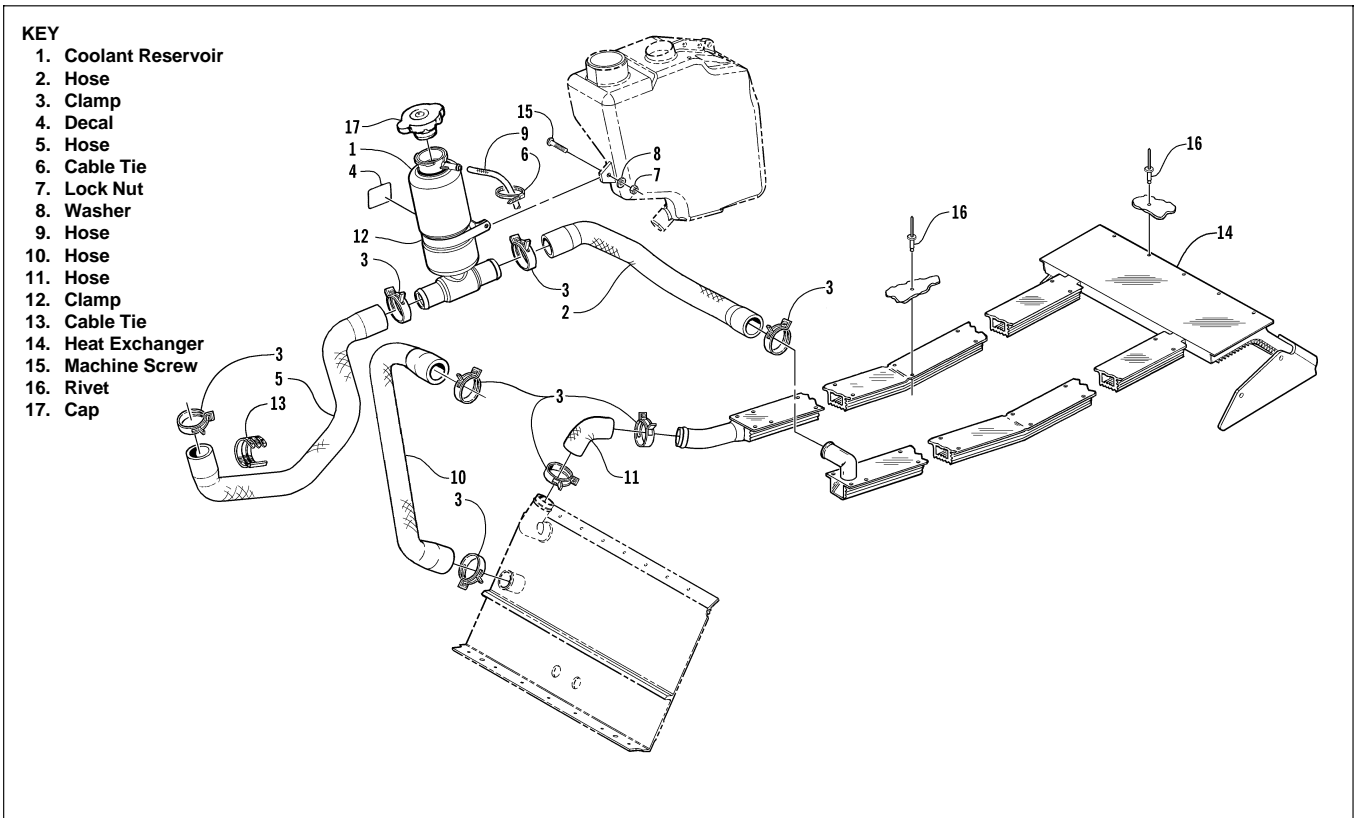
0734-451

Fig. 3-59



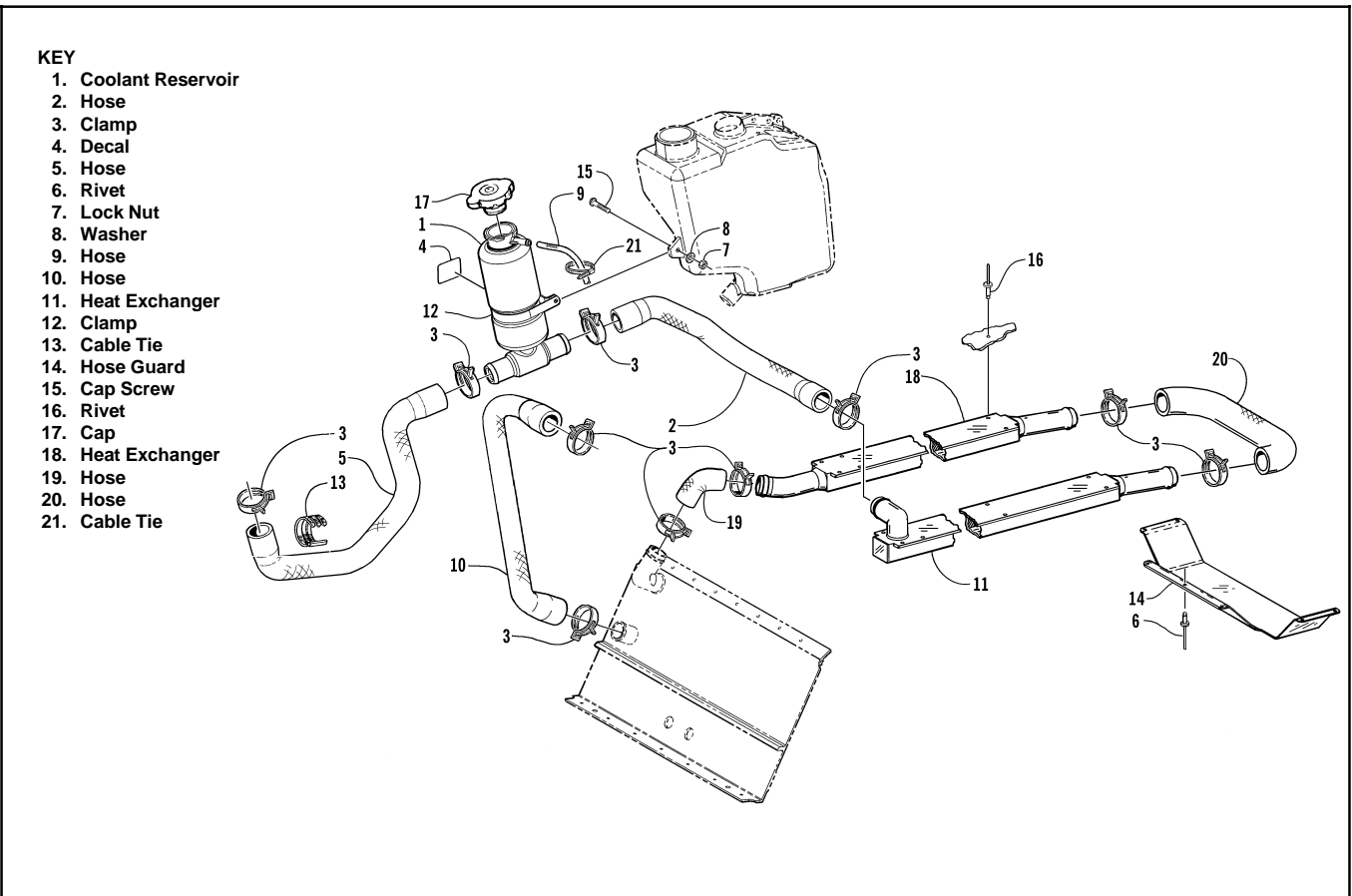
0734-956

Fig. 3-60



0735-278

Fig. 3-61

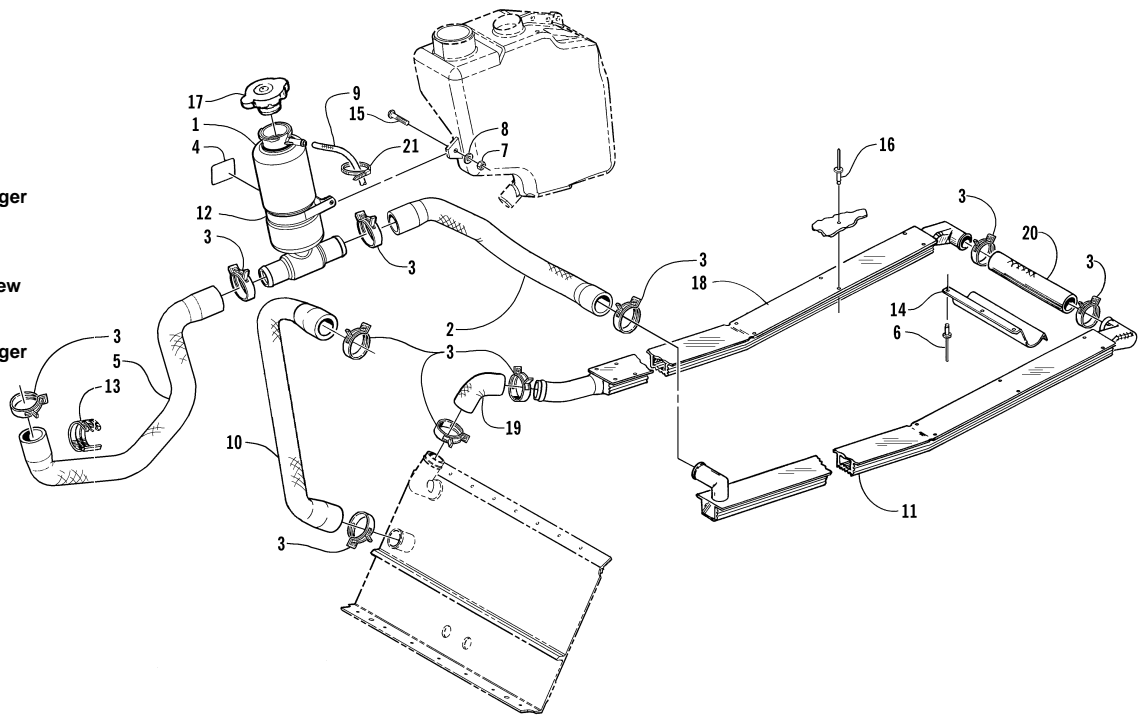


0734-388

Fig. 3-62

KEY

1. Coolant Reservoir
2. Hose
3. Clamp
4. Decal
5. Hose
6. Rivet
7. Lock Nut
8. Washer
9. Hose
10. Hose
11. Heat Exchanger
12. Clamp
13. Cable Tie
14. Hose Guard
15. Machine Screw
16. Rivet
17. Cap
18. Heat Exchanger
19. Hose
20. Hose
21. Cable Tie

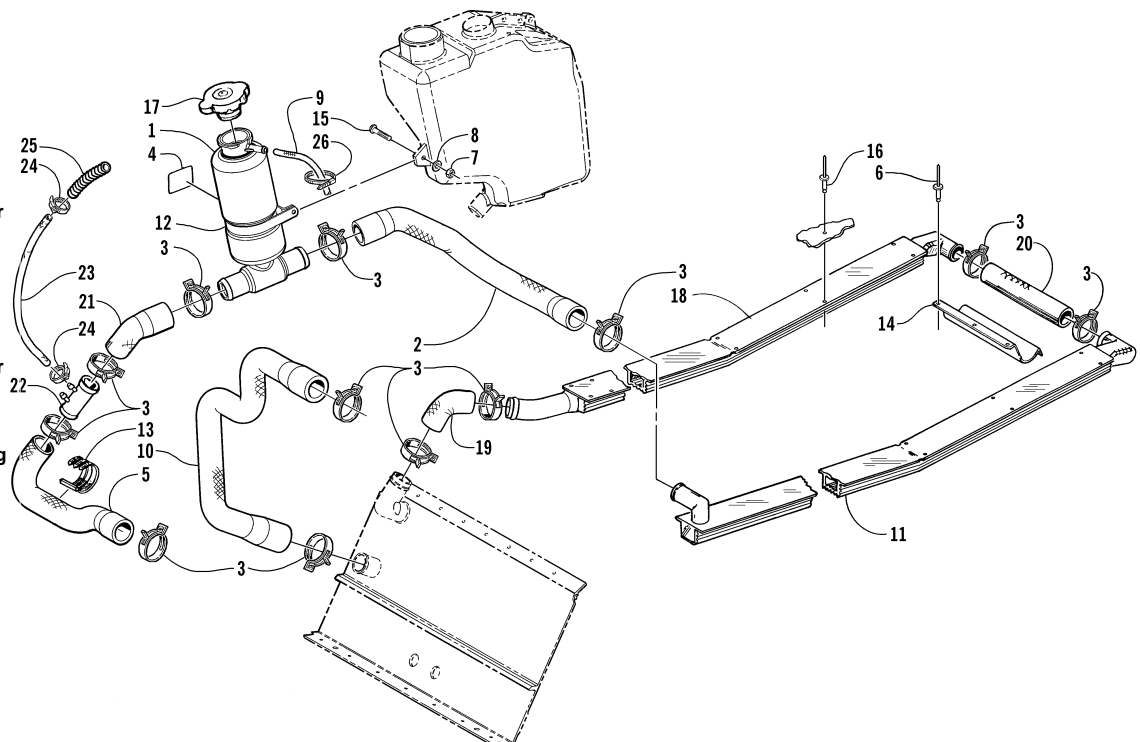


0734-334

Fig. 3-63

KEY

1. Coolant Reservoir
2. Hose
3. Clamp
4. Decal
5. Hose
6. Rivet
7. Lock Nut
8. Washer
9. Hose
10. Hose
11. Heat Exchanger
12. Clamp
13. Cable Tie
14. Guard
15. Machine Screw
16. Rivet
17. Cap
18. Heat Exchanger
19. Hose
20. Hose
21. Hose
22. Double T-Fitting
23. Hose
24. Clamp
25. Conduit
26. Cable Tie



0734-305

Recoil Starter

REMOVING

1. Tie a slip-knot in the starter rope below the console and allow the rope to slowly retract against the starter case.
2. Remove the knot at the handle, remove the handle, and account for the handle cap; then thread the rope through the bushing in the console.
3. Remove the four cap screws and lock washers securing the starter assembly to the magneto case; then remove the starter assembly.

DISASSEMBLING

WARNING

Always wear safety glasses when servicing the recoil starter.

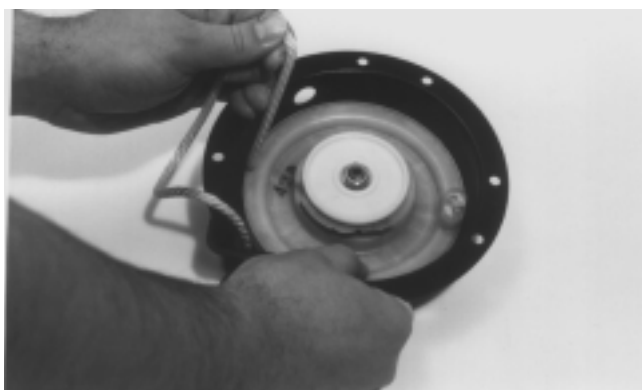
1. Secure the recoil starter in a vise.

WARNING

During the disassembly procedure, continuous downward pressure must be exerted on the reel so it does not accidentally disengage and cause injury.

2. Rotate the roller counterclockwise until the notch of the roller is near the rope guide in the case. Guide the rope into the notch and slowly allow the roller to retract until all recoil spring tension is released.

Fig. 3-64



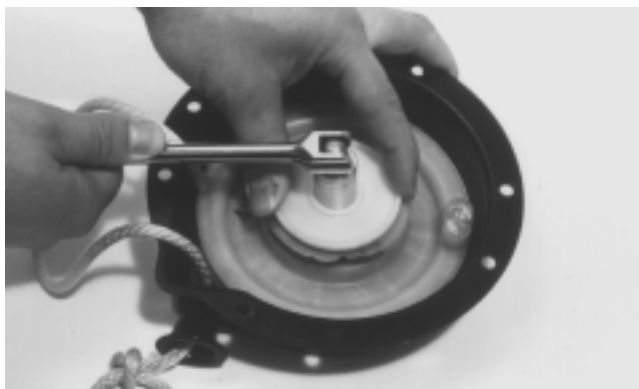
B522

WARNING

Care must be taken when allowing the recoil roller to unwind. Make sure all spring tension is released before continuing.

3. While exerting downward pressure on the drive plate, remove the nut and washer.

Fig. 3-65



B523

4. Slowly release the drive plate and lift the drive plate with friction spring free of the recoil roller.
5. Remove the friction spring from the drive plate.

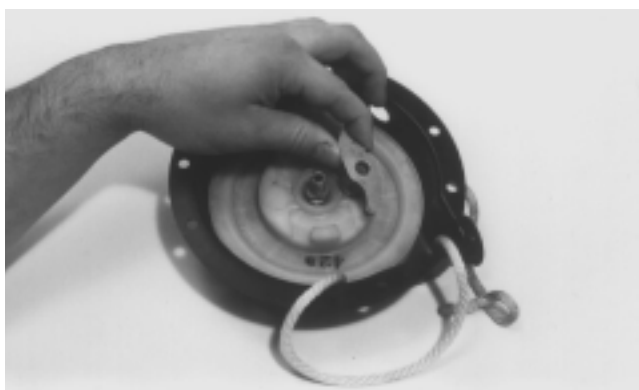
Fig. 3-66



B524

6. Remove the pawl; then remove the return spring.

Fig. 3-67



B525

7. Carefully lift the roller free of the case making sure the main spring does not accidentally disengage from the case.

WARNING

Care must be taken when lifting the roller free of the case.

8. Remove the main spring from the case by lifting the spring end up and out. Hold the remainder of the spring with thumbs and alternately release each thumb to allow the spring to gradually release from the case.

■ **NOTE:** Do not remove the main spring unless replacement is necessary. It should be visually inspected in place to save time.

9. Unwind the rope from the roller, untie the slip-knot, and remove the rope.

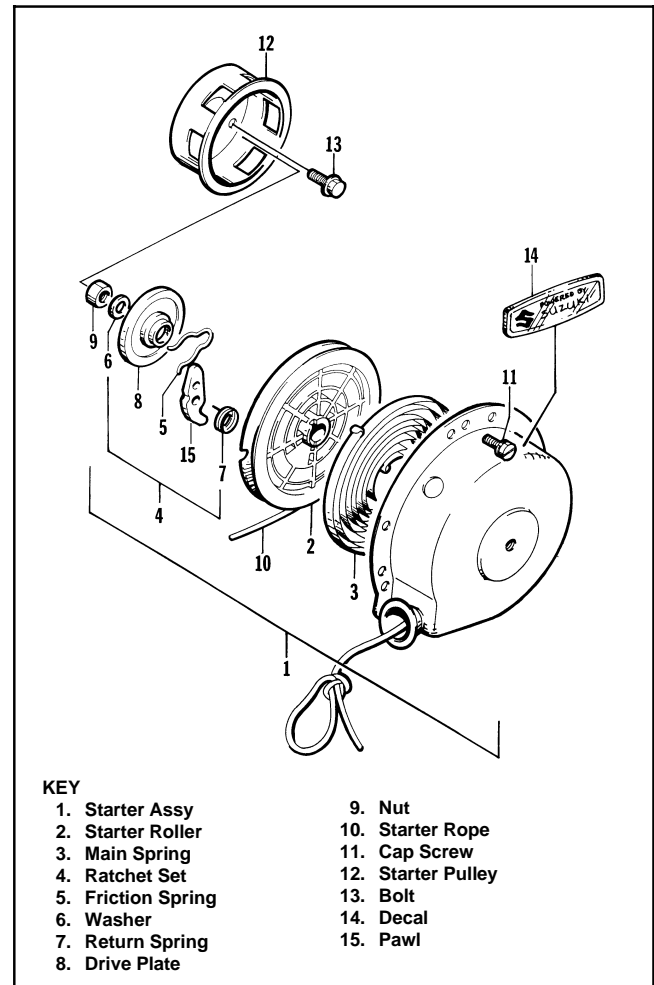
CLEANING AND INSPECTING

■ **NOTE:** Whenever a part is worn excessively, cracked, or damaged in any way, replacement is necessary.

1. Clean all recoil starter components.
2. Inspect all springs, washers, and pawl for wear or damage.
3. Inspect the roller and case for cracks or damage.
4. Inspect the center hub for wear, cracks, or damage.
5. Inspect the rope for breaks or fraying.
6. Inspect the main spring for cracks, crystallization, or abnormal bends.
7. Inspect the handle for damage, cracks, or deterioration.

ASSEMBLING

Fig. 3-68



732-515A

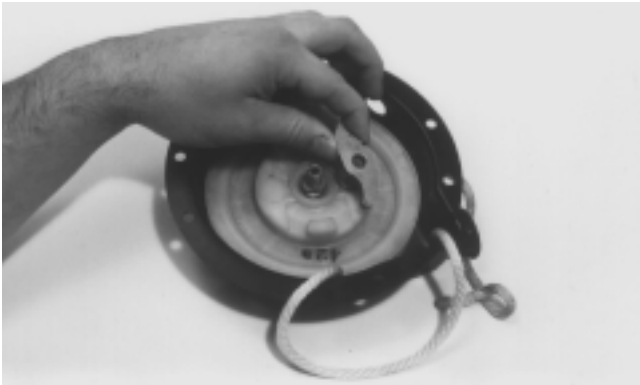
1. Hook the end of the main spring around the mounting lug in the case.
2. Insert the main spring into the case; then wind it in a counterclockwise direction until the complete spring is installed.

■ **NOTE:** The main spring must seat evenly in the recoil case.

3. Insert the rope through the hole in the roller and tie a knot in the end; then wrap the rope counterclockwise around the roller leaving approximately 50 cm (20 in.) of rope free of the roller.
4. Apply low-temperature grease to the main spring and hub.
5. Align the hook in the end of the main spring with the notch in the roller.
6. Carefully slide the roller over the hub and engage the spring with the roller.

7. Install the return spring making sure the end is properly installed in the hole in the roller; then install the pawl making sure the return spring is properly preloaded.

Fig. 3-69



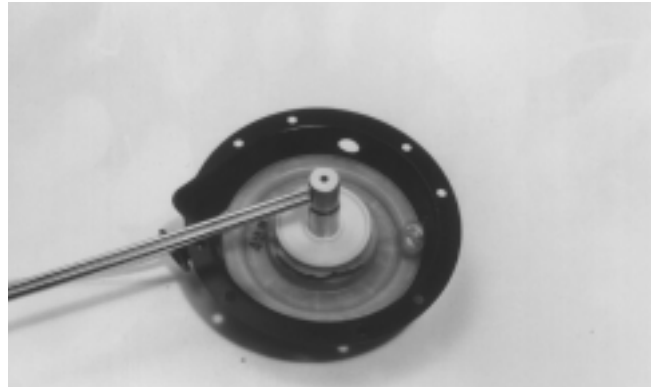
8. Slide the end of the rope through the rope guide of the case; then tie a slip-knot in the rope.
9. Place the friction spring into position on the drive plate making sure the head of the spring is opposite the flat of the inner hole. Apply a low-temperature grease to the drive plate.

Fig. 3-70



10. Place the drive plate into position making sure the flat of the inner hole is correctly positioned in the hub. Apply blue Loctite #242 to the threads; then secure the drive plate with a washer and nut. Tighten to 1 kg-m (7 ft-lb).

Fig. 3-71



11. With 50 cm (20 in.) of rope exposed, hook the rope in the notch of the roller.
12. Rotate the roller four or five turns counterclockwise; then release the rope from the notch and allow the rope to retract.
13. Pull the rope out two or three times to check for correct tension.

■ **NOTE:** Increasing the rotations in step 12 will increase spring tension.

INSTALLING

1. Place the starter assembly into position against the magneto case.
2. Secure the starter with four cap screws and lock washers. Tighten to 0.7 kg-m (5 ft-lb).

■ **NOTE:** Before tightening the cap screws, slowly pull the recoil rope until the pawl engages; then tighten the cap screws. This will center the recoil against the magneto case.

3. Thread the rope through the bushing in the console; then install the handle and secure with a knot. Seat the cap.
4. Release the slip-knot in the rope.