

ZJ141A

4. With the armature removed from the magnet housing, remove snap ring (D) from the armature. Account for shim (E) and locking plate (F).
5. Using a flat-blade screwdriver, carefully remove the seal from the bearing housing.



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CLEANING AND INSPECTING

1. Thoroughly clean all components except the armature and brushes in parts-cleaning solvent; then dry with compressed air.

CAUTION

Do not wash the armature and brushes in any kind of solvent. Use only compressed air and clean dry, lint-free cloth in cleaning these components.

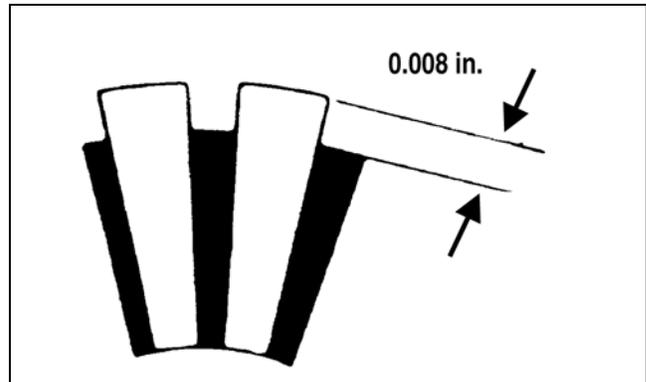
2. Inspect all threaded areas for damaged or stripped threads.
3. Inspect the brush holder assembly and brushes for damage or wear. Using a caliper, measure the length of the brushes. If brush measurement is less than 0.40 in., replace with new brushes and brush springs as a set.
4. Inspect brush leads for cracks, wear, or fraying. If any of these conditions exist, replace with new brushes along with new brush springs as a set.
5. Inspect the rear cover bushing for wear.
6. Inspect the front cover bearing for wear.

7. Inspect the brass commutator end of the armature for any discolored spots or damage. If the commutator is slightly discolored or damaged, the armature must be replaced. This is a molded commutator and no attempt to turn it down in a lathe should be attempted.

CAUTION

Do not use emery cloth to clean the commutator as emery particles will become imbedded in the brass commutator resulting in a short circuit. Use only #200 grit sandpaper.

8. Inspect the commutator end of the armature for buildup in the grooves. Carefully remove any buildup by undercutting using a thinly ground hack-saw blade. Do not cut any deeper than the original groove which can be seen by looking at the end of the commutator.
9. Using a caliper, measure the undercut. Maximum undercut groove must be 0.008 in.

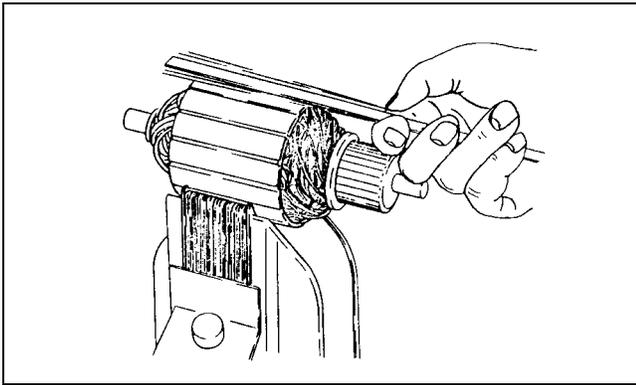


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CAUTION

Buildup in the grooves must be removed to prevent any chance of an electrical arc between individual sections of the commutator.

10. Inspect the commutator for shorting using a multimeter and the following procedure.
 - A. Set the selector to the OHMS position.
 - B. Touch the black lead to the armature shaft.
 - C. Using the red tester lead, probe the commutator end of the armature. The meter indicator should not change. If the indicator shows resistance, the armature is shorted and must be replaced.
11. Inspect the armature for shorting using a "growler" and the following procedure.
 - A. Place the armature in the "growler."
 - B. While holding a metal strip on the armature, rotate the armature an entire revolution. If the metal strip vibrates at any point on the armature, the armature is shorted and must be replaced.



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12. Inspect the ground brushes to make sure they are properly grounded. Use a multimeter and the following procedure.

- A. Set the selector to the OHMS position.
- B. Touch the black tester lead to a ground brush.
- C. Touch the red tester lead to the brush holder assembly.

■NOTE: If no resistance is indicated, check the ground connection for tightness and for cleanliness. If there is still no meter indication, replace the brush assembly.

ASSEMBLING

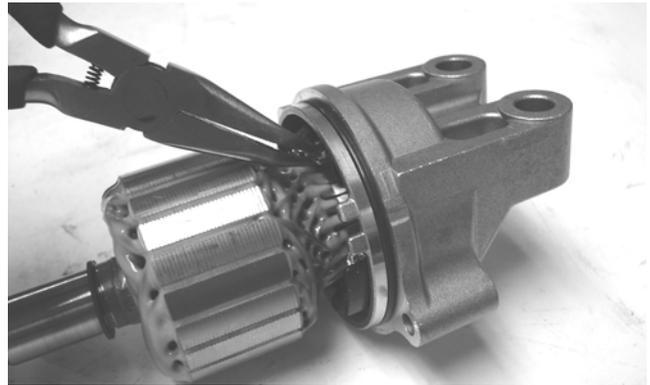
1. With the brush assembly secured in a vise, compress each brush all the way into the housing; then carefully push the brush wire over and down to secure the brush in the fully compressed position.



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■NOTE: The brushes must be fully compressed to allow enough room to install the armature.

2. Install the armature into the brush assembly; then using a small needle-nose pliers, carefully move the brush wires upward allowing the brushes to fully contact the commutator.

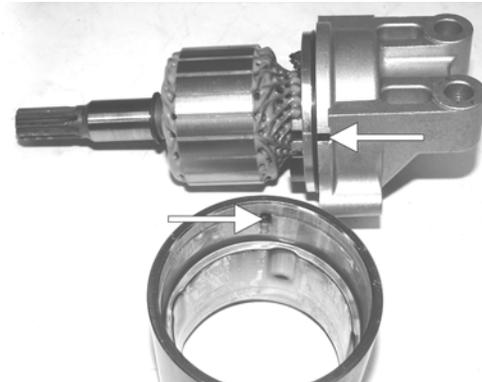


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■NOTE: After completing step 2, ensure that the brushes are properly seated to the commutator.

3. Noting the alignment marks made in disassembling, install the magnet housing; then with the magnet housing properly seated to the brush assembly, install the snap ring, shim, and locking plate to the armature shaft.

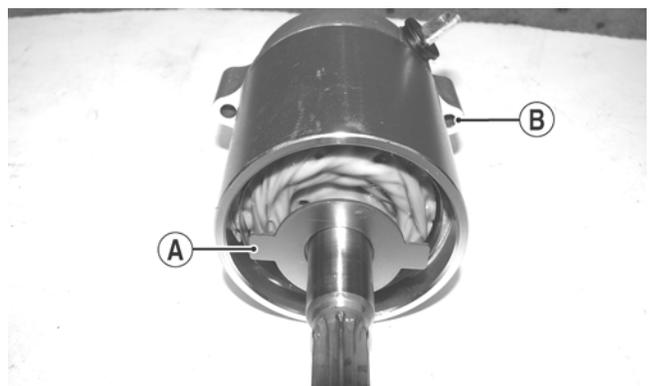
■NOTE: If alignment marks were not made during disassembling, align properly by matching notch on the magnet housing to notch on the brush assembly.



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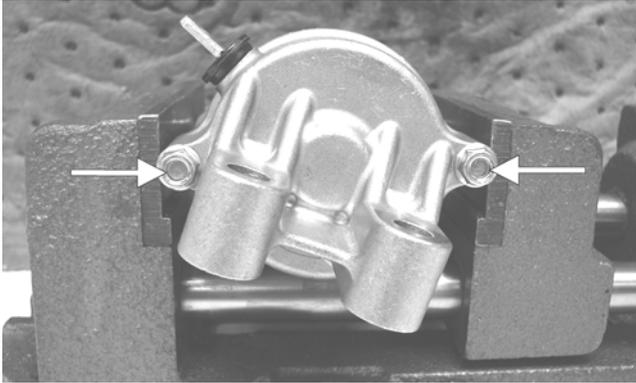
4. With a suitable driving tool, install new seal into the bearing housing; then install the bearing housing.

■NOTE: Prior to installing the bearing housing, position the locking plate with the tabs (A) of the locking plate aligned with the cap screw ears (B) of the starter motor.



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5. Install the two long cap screws securing the starter motor together; then tighten the cap screws to 108 in.-lb.



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INSTALLING

1. Install the starter motor to the engine; then with the ground cable positioned to the top mounting hole, install the two cap screws (B) and tighten to 19 ft.-lb.



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2. Install the positive cable (A) to the starter motor and tighten securely. Secure the positive and negative cables with cable ties as noted during disassembling.

■NOTE: To finalize this procedure on the Bearcat/T-Series, install the air silencer. Proceed to appropriate Air Silencer sub-section in Section 3.

3. On the F/M/XF, install the cap screw (threads coated with blue Loctite #243) securing the upper portion of the left rear engine mount to the engine; then install the intake flange, throttle bodies, driven pulley, gas tank, and seat. Tighten to 50 ft.-lb.
4. Install the positive cable to the battery.

Troubleshooting Electric Start

Problem: Hot or Smoking Wires

Condition	Remedy
1. System wired incorrectly	1. Check wiring against wiring diagram

Problem: Starter Does Not Turn Over

Condition	Remedy
1. Battery discharged	1. Check/charge the battery
2. Connection loose	2. Check tightness of all connections
3. Grounding improper	3. Check round connections
4. Fuse blown - not installed	4. Check - replace fuse

Magneto (4-Stroke)

REMOVING

■NOTE: Prior to removing the magneto, the engine oil and cooling system must be drained (see Section 3).

1. Disconnect the connector for the exhaust temperature sensor; then remove the cap screws, nuts, and springs securing the and resonator.
2. On the F/M/XF, remove the cap screws and nuts securing the MAG-side chassis support; then remove all clamps and hoses to gain access to the magneto cover.

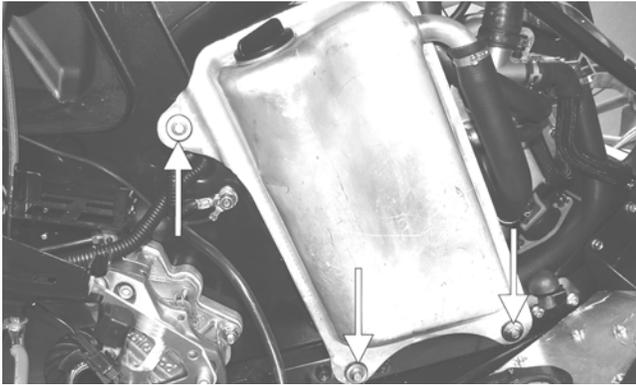


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■NOTE: Steps 3-4 are for the Bearcat/T-Series only.

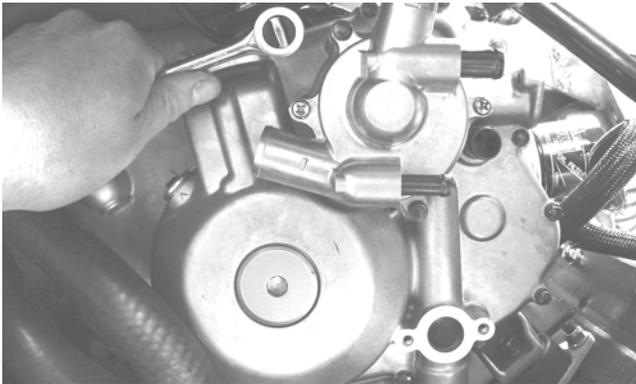
3. Disconnect the connector for the exhaust temperature sensor; then remove the springs securing the exhaust pipe and resonator to the engine and chassis. Remove the exhaust assembly and account for exhaust gaskets and springs.

- Remove the three cap screws securing the oil tank to the chassis; then remove the clamps securing the oil return and oil supply hoses from the magneto cover. Disconnect the hoses (along with the breather hose located at the top of the tank) and remove the oil tank.



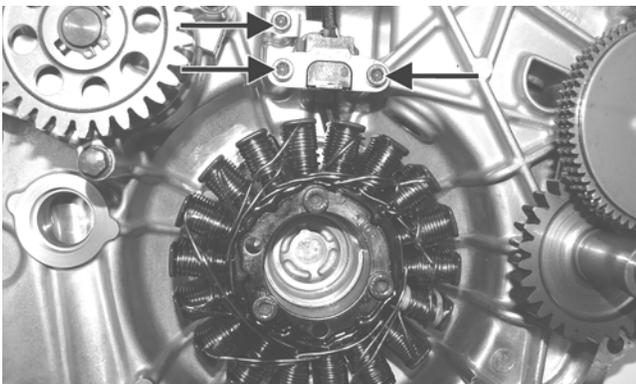
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- To gain access to the magneto cover, remove the remaining coolant hoses from the water pump, oil cooler, and separator tank.
- Remove the eighteen cap screws securing the magneto cover to the engine; then remove the cover and account for the dowel pins, the oil pump seal, and the gasket.



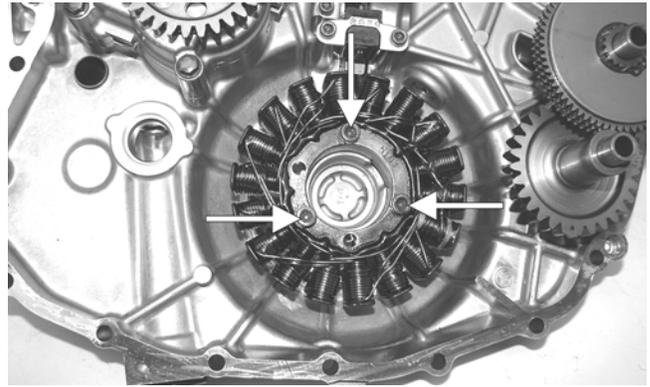
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- Remove the cap screws securing the harness clamp and timing sensor to the magneto cover.



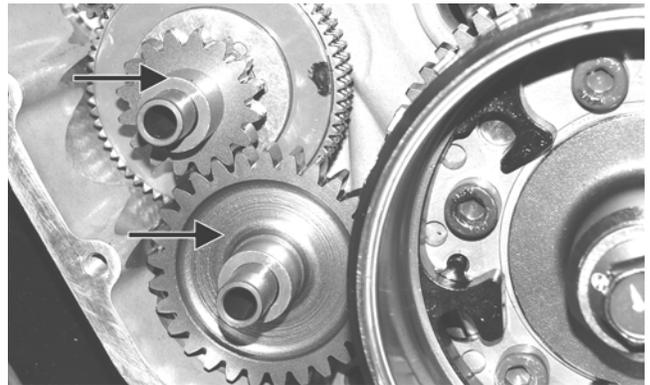
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- Remove the three cap screws securing the magneto to the cover; then remove the magneto assembly.



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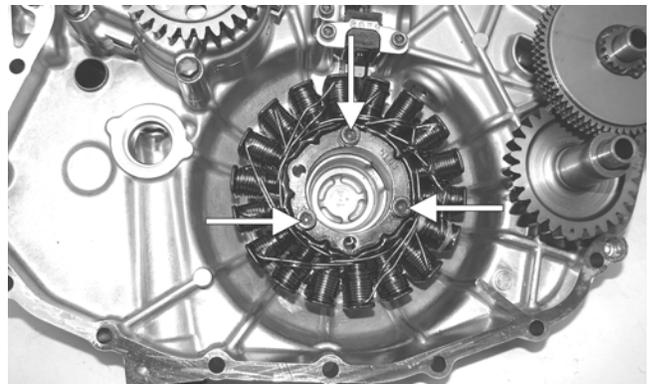
- Remove the torque limiter/idler gear assembly from the magneto cover. For installing purposes, note the location of the spacers.



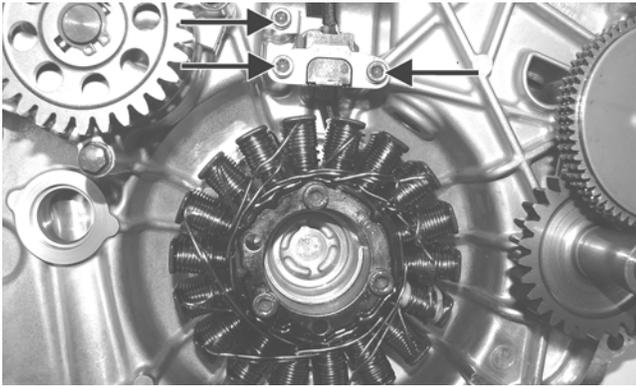
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INSTALLING

- Place the magneto into position on the cover; then install and tighten the three cap screws to 84 in.-lb. With the harness routed properly, install the timing sensor and harness clamp and tighten to 84 in.-lb.

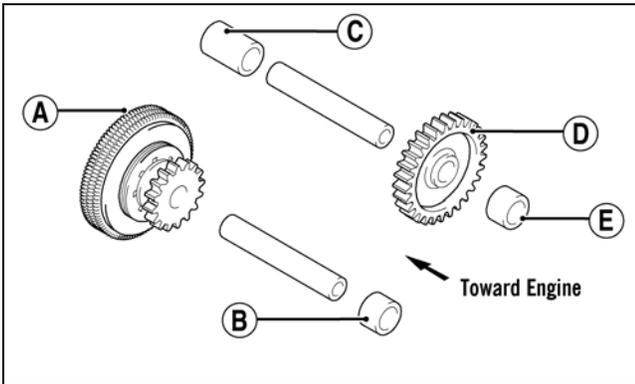


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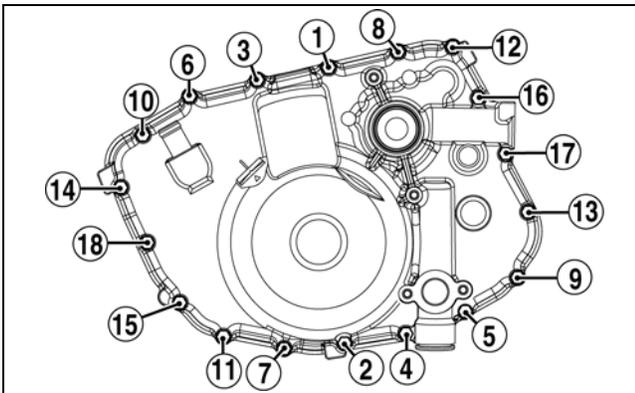
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2. With the two dowel pins installed in the engine case, install the torque limiter (A) and spacer (B); then install the inner spacer (C), idler gear (D), and outer spacer (E).



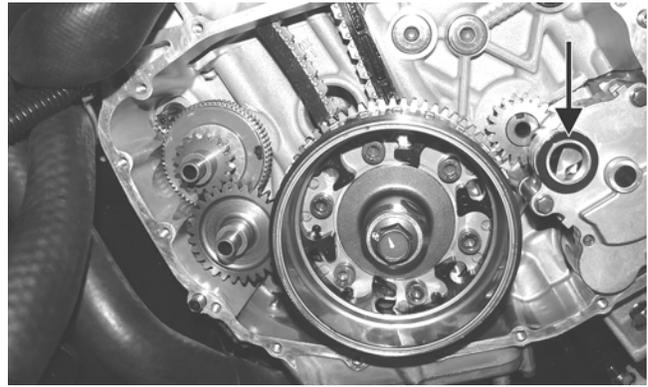
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3. Install the two alignment pins in the engine for the magneto cover; then with a new gasket, install the cover and with the pattern shown, tighten the 18 cap screws to 84 in.-lb.



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■NOTE: Assure the oil pump seal is in place prior to installing the magneto cover.



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4. Install the coolant hoses to the water pump, oil cooler, and separator tank; then secure the hoses with the clamps.

■NOTE: Steps 5-6 are for the Bearcat/T-Series only.

5. Place the oil tank into position in the chassis and install the breather hose; then secure with the clamp. With the hoses routed properly, install the supply/return oil hoses to the tank; then secure the hoses with new clamps.

■NOTE: Assure the O-rings are properly seated in the supply/return oil hose fittings.



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6. Secure the oil tank to the chassis with the three cap screws; then tighten securely.



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7. On the F/M/XF, secure all coolant hoses and oil hoses using the existing clamps; then secure the left-side support using the existing cap screws and nuts. Tighten securely.