

REPLACEMENT OF BRUSH/SWITCH ASSEMBLIES FOR 60 SERIES 12 & 24 VOLT PUMP MOTOR

Before beginning, read both this sheet and the Warnings and Safeguards sheet, 035282.

This sheet describes the proper replacement procedure for the motor brush/switch assemblies.

The motor brush/switch assembly replacement kit, S00063 includes the following parts:

Description	Qty	Item # on drawing
Brush Assembly	2	28
Washer	1	21
O-Ring	1	22
Rotating Seal Ring	1	23
Seal Ring	1	24
O-Ring	1	25
Switch (SPST)	1	44

This repair requires the following tools:

- 7/16" wrench/socket wrench
- Phillips screwdriver
- Small blade screwdriver
- Needle nose pliers
- Rubber or nylon mallet
- Continuity tester

IMPORTANT

Before removing pump from the tank, first disconnect the power at the battery and then the power wires in the pump junction box.

Disconnect the hose from the pump. Remove the pump from the tank and move to a suitable clean work area. When working with this unit, be sure to protect the machined surface to prevent any future problems. Numbers in the procedure steps are referenced on the drawing on page 3.

1. Position the unit so that it is standing vertically on the rear of the motor. Remove the pump cover (item 15) and lift out the rotor, fiber key, vanes & springs (items 18, 17, 19 & 20). Carefully place these parts aside to be reassembled later.
2. Reposition the unit to lay on the junction box cover side. Remove the two screws (item 5) holding the nozzle boot (item 60) to the switch cover. Remove the four screws (item 5) retaining the switch cover (item 51). Carefully place these parts aside for future use.
3. Using needle nose pliers, disconnect the brush terminal wire from the top post (for DPST switch replacement), or from the bottom post (for SPST switch replacement) of the motor protector (item 41).
4. Position the unit to lay on the pump cover side with the motor vertical. Remove the two tie rod bolt (item 35) holding the magnet barrel (item 32), lift off the end cover (34). The armature may come off with the end cover. Remove the magnet barrel (item 32). If it has not been removed with the end cover, the armature will come out with the magnet barrel. It may be necessary to gently tap the end cover and/or the magnet barrel using the rubber or nylon mallet to facilitate removal.

IMPORTANT

Do not use a hammer as damage can be caused to the magnets.

Carefully place these parts aside for future use. Care must be taken that the magnets do not pick up stray metal pieces.

5. If you are replacing the switch, follow this step; otherwise skip this step, and go to step 6 for brush assembly replacement. Remove two screws (item 30), and pull out the motor protector, and switch assy (item 37). Now, remove lock nut (item 46), and remove the switch from switch plate (item 45). Refer to the wiring diagrams on page 4 along with the following instructions. If you are replacing a SPST switch (item 44), using the needle nose pliers, disconnect the brush wire from switch terminal **B**, and disconnect the red wire from the switch terminal **A**. Install the new SPST switch with the switch plate using the locknut (item 46). Connect the brush wire to switch terminal **B**, and connect the red power supply wire to switch terminal **A**. If you are replacing a DPST switch, disconnect the brush wires from switch terminal **D**, and from the motor protector. Disconnect the white wire from switch terminal **B**, and motor protector. Disconnect the black and red wires from switch terminals **C & A**. Install the new SPST switch with the switch plate using the lock nut (item 46). Connect the red wire to switch terminal **A**. Next, connect brush wires to switch terminal **B**, and the bottom of the motor protector, and connect black power supply wire to top of the motor protector as shown on wiring diagram on page 4.

NOTE: The white wire is not used with the new SPST switch.

6. Looking down into the motor cavity of the pump housing, the switch terminals are now accessible. If you skipped Step 5, and you have a SPST switch, carefully disconnect the brush wires from the switch terminal **B**, and bottom of the motor protector. Then, remove the red and black power supply wires. If you have a DPST switch, disconnect the brush wires from switch terminal **D**, and from the motor protector. Disconnect the white wire from switch terminal **B**, and motor protector. Disconnect the black and red wires from switch terminals **C & A**. Remove the two Phillips head screws (item 30) holding the brush holder (item 26) to the housing. Care should be taken to observe the position of the brush springs (item 27) and fiber washers (item 29) so that they can be reassembled correctly. Remove the brush holder from the housing and disassemble the springs and brushes.
7. Reassemble the holder assembly using the new brushes (item 28) supplied with this kit. Reinstall this assembly into the housing, making sure that the springs and fiber washers are in the proper position observed previously. Reconnect wires using the wiring diagrams shown on page 4.
8. Observe that the wire connectors are properly fitting the switch terminals. Check that the wire terminals are not in contact with the metal pump housing. If any are excessively close to the housing wall, use the bladed screwdriver to gently bend the terminal to provide clearance.

Continuity Check: Connect one end of the tester to the red wire in the junction box. Touch the black wire and the metal housing with the other end of the tester. There should not be any circuit. Check with the switch in both the **Off** and **On** position. Repeat with the tester connected to the black wire in the junction box.

IMPORTANT

There should not be any circuit. If you are using a light type continuity tester, the light should not light. If there is a circuit, recheck all connections.

9. Reassemble the armature into the housing, taking care to move the brushes out of the way until the armature is in the proper position.
10. Holding the armature down carefully, slide the magnet barrel down over the armature. Position the pin in the housing into the slot in the barrel. Make sure the bearing spring (item 33) is in position and reassemble the end cover (item 34). Before replacing switch cover assembly, add grease on face of junction box to create a water-resistant seal. Then, reinstall the switch cover assembly making sure the slot in the yoke (item 53) fits over the toggle switch item.
11. Assemble the new seal components supplied with this kit (item 21, 22, 23, 24, & 25) on the pump shaft. Place the spring on the shaft and add the rotor. Check for proper fit. Press the rotor down until the top edge is flat with the machined surface of the housing. Install the five vanes making sure the outer edge of the vanes slope away from the direction of rotor rotation – counterclockwise. Replace the pump cover making sure the O-Ring seal is in place.
12. The pump is now ready to be reinstalled on the tank.



