80-4284-03
Rev. 01.2

**MODELS 42-109
42-107
42-105
42-103**

# REBUILD INSTRUCTIONS

## SELF-LOCKING MECHANISM (SLM) REBUILD KIT P/N 12-8064-03
## MOTOR P/Ns 20-2703-50, -51

## PURPOSE

To provide a step-by-step method for rebuilding the Self-Locking Mechanism (SLM) in Group 42 motors. Maintenance should be performed in a clean working environment. If possible, the actuator should be removed from its mounting point and taken to a maintenance room or workstation.

## REQUIRED TOOLS

1/2” socket or wrench
3/16" hex driver
5/16” socket (1/4" drive)
Loctite® Threadlocker 222 or equivalent
Mobiltemp™ SHC 32 or equivalent grease
Feeler gauge
Scotch™ 847 gasket adhesive or equivalent
Torque wrenches appropriate for 10 lb-ft and 23 lb-in

**WARNING**

**Electrical shock hazard—disconnect power before proceeding. Remove the actuator from line voltage and shut off any external power sources feeding the auxiliary switches.**

## PROCEDURE

*Remove the old motor:*

1. Remove power from the actuator.
2. Remove the actuator from its mounting position.
3. Remove the terminal enclosure cover by loosening the (6) 5/16-18 hex head captive screws (on Option 9 actuators) or the (4) 5/16-18 hex head screws from the resistor cover (Option 7, 5, or 3 actuators).
4. Remove the (4) 1/4-20 hex head screws from the capacitor cover and remove the cover.
5. Remove the (4) 5/16-18 hex head screws retaining the motor and carefully pull the motor away from the actuator.
6. The motor wire connections can be accessed through the capacitor cover. There are three wires leading from the motor to connections within the actuator; one black, one red, and one green. Record the connections of each of the three wires for installation purposes.
7. Disconnect the motor wires.

*Disassemble and rebuild the SLM:*

Refer to Figure 1 for component identification.

8. Stand the motor on end with the pinion up.
9. Loosen the 1/4-28 socket cap screw in the bearing clamp nut and unthread the nut from the end of the rotor shaft.
10. Remove the thrust bearing, pinion, spring, and the (4) steel balls from the rotor shaft. Inspect all parts and replace, if necessary.
11. Remove the (4) #10-24 x 8.5" hex head screws and carefully lift the front motor shield from the motor.
12. Remove the locking disc.
13. Remove the additional (4) steel balls from the actuator collar. ***The actuator collar is <u>not</u> field replaceable.***

**NOTE: Do not further disassemble the motor, as it has no other user serviceable parts. Further disassembly will result in demagnetization of the motor and loss of the required torque.**

14. Lightly sand the friction material and then clean the friction material and locking disc flange with alcohol and a lint-free cloth.
15. Brush a thin film of Mobiltemp™ SHC 32 grease (or equivalent) into the ball detents (8 places).
16. Install (4) new steel balls into the detents of the actuator collar.
17. Grease the inside diameter of the locking disc. Ensure the friction material and locking disc flange are not contaminated with grease, and install the locking disc.
18. Install the front motor shield.
19. Lightly coat the threads of the (4) #10-24 x 8.5" hex head screws with Loctite™ Threadlocker 222 (or equivalent).

*Continued*

20. Install the four cap screws and torque the screws to 23 lb-in.

**CAUTION**

**Do not exceed the required torque on screws or damage could result.**

21. Brush a thin film of Mobiltemp™ SHC 32 grease (or equivalent) into the ball detents (8 places).
22. Place the remaining (4) steel balls into the detents of the locking disc.
23. Install the compression spring and motor pinion.
24. Grease the thrust bearing and assemble with larger bearing race diameter towards the motor pinion.

*Set the SLM gap:*

25. With the shield side towards the bearing, screw the clamp nut onto the shaft while compressing the spring as far as the locking disc and pinion allow.
26. Adjust the SLM gap by backing off the clamp nut. Holding down on the pinion, set the gap to between 0.020" and 0.030". Back the nut off sixty degrees or use a feeler gauge.
27. Tighten the clamp nut 1/4"-28 socket head cap screw to 75 lb-in torque. Ensure that the clamp nut does not rotate during the tightening process.
28. Inspect the motor gasket, terminal enclosure cover (or resistor cover), and the capacitor cover and replace them if necessary. If the gaskets are in good condition, skip to step 33.
29. Clean the mating face on the actuator body to remove all gasket material and adhesive. Ensure that the mating surface is free of defects such as dents or gouges.
30. If replacing the terminal enclosure cover gasket, peel the backing off the replacement gasket and carefully apply to the actuator body and skip to step 32. For all other gaskets, apply a thin film of gasket adhesive (Scotch™ 847 or equivalent) to the mating face of the actuator body.
31. Firmly press the new gasket into place and allow time for the adhesive to set before continuing.
32. Repeat steps 29–31 to replace any additional gaskets, if necessary.
33. Reinstall the motor wire connections on the actuator. Refer to the connections recorded in Step 6.
34. Reinstall the motor. Turn the Handwheel as necessary to allow the pinion to slide into and mesh with the gearing. Be careful not to pinch the motor wires between the actuator body and the motor during installation. Screw the (4) 5/16-18 hex head screws into the mounting holes and tighten them to 10 lb-ft torque in a crosswise pattern.
35. Reinstall the capacitor cover and torque the (4) 1/4-20 hex head screws to 72 lb-in.
36. Reinstall the terminal enclosure cover on Option 9 actuators, or the resistor cover on Option 7, 5 or 3 actuators, and torque the 5/16-18 hex head screws to 10 lb-ft.
37. If the actuator has been removed from its mounting position, remount the actuator.
38. Restore power to the actuator.
39. Use the Handswitch to observe the motor and actuator for proper operation.
40. If the actuator responds correctly, restore the actuator to service.

**Table 1: SLM Rebuild Kit**

| Part No. | Description |
|---|---|
| 30-0319-36 | Bearing Clamp Nut |
| 14-9400-15 | Thrust Bearing |
| 14-9980-26 | Compression Spring |
| 14-9940-50 | Motor Pinion |
| 14-9420-03 | Steel Ball (8) |
| 14-9330-50 | Locking Disc |
| 20-0660-76 | Terminal Enclosure Gasket |
| 20-0661-35 | Motor Gasket |
| 20-0661-36 | Capacitor Compartment Gasket |
| 20-0661-37 | Resistor Cover Gasket |

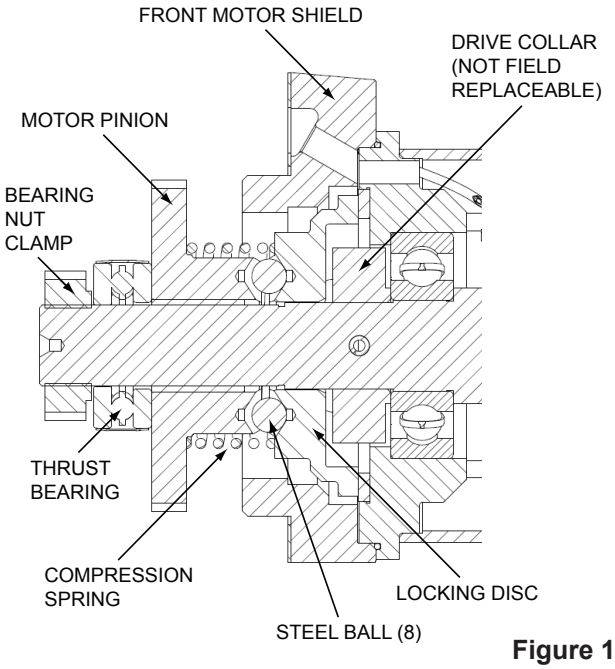


**Figure 1**


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