



MP8000-6325 and MP8000-6350 Diaphragm and Seal Kits for MP8000 Series Actuators

Contents of the MP8000-6325 Diaphragm and Seal Kit for MP82 and MP83 Actuators

- One seal, 5/8 in. Internal Diameter (I.D.) x 7/8 in. Outside Diameter (O.D.) x 1/8 in.
- One plastic sleeve, 41/64 in. I.D.
- One diaphragm, 25 sq in. effective area

Contents of the MP8000-6350 Diaphragm and Seal Kit for MP84, MP85, MP86, and MP87 Actuators

- One seal, 5/8 in. I.D. x 7/8 in. O.D. x 1/8 in.
- One plastic sleeve, 41/64 in. I.D.
- One diaphragm, 50 sq in. effective area

Note: Two MP8000-6350 kits are needed to repair MP86 and MP87 actuators.

Tools Required

- MP8000-6012 Diaphragm and Seal Repair Tool Kit:
 - Strap wrench (polyester strap and strap handle)
 - Stem wrench
 - 7/16 in. hex tool
- Retaining ring pliers
- 3/8 in. ratchet wrench
- 7/16 in., 10 mm, and 13 mm sockets
- 7/32 in. Allen wrench
- 200 lb-in torque wrench with socket to fit a 7/16 in. hex
- 3/16 in. open-end wrench for anti-rotation pin on the MP82 and MP83
- 1/4 in. open-end wrench for anti-rotation pin on MP84, MP85, MP86 and MP87 actuators
- 7/16 in. open-end wrench for 1/4 in. jam nut on MP82 and MP83 actuators
- 9/16 in. open-end wrench for the 3/8 in. jam nuts on the MP82 and MP83
- 5/8 in. open-end wrench for stem bolt and 3/8 in. jam nuts on MP84, MP85, MP86, and MP87 actuators
- 3/8 in. open-end wrench for the flange bolts

Seal and Diaphragm Repair Procedure for MP82 and MP84 Spring-Return-Up Actuators

Refer to Figure 1 and proceed as follows:

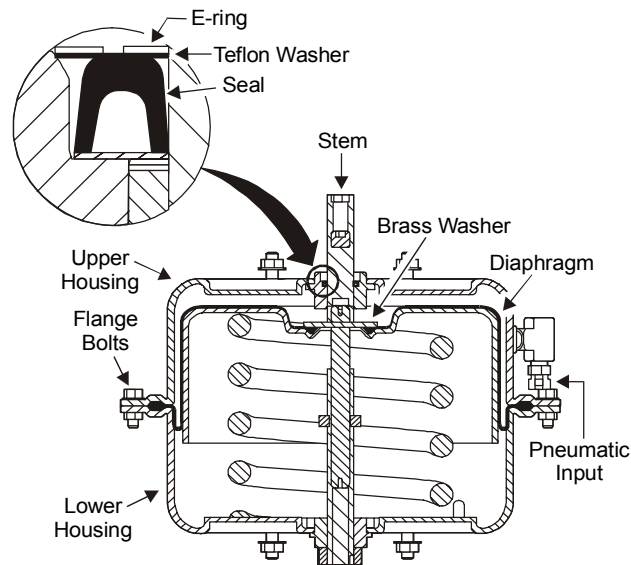


Figure 1: Components of the MP84 Actuator

1. Remove air pressure input to the actuator.
- Note: If the optional stem cover is present, remove it.
2. Remove the E-ring with the retaining ring pliers and set aside.
 3. Apply 15 psig (103 kPa) slowly to the actuator input. The actuator will stroke, which will loosen the seal and Teflon® washer.
 4. Remove the air pressure from the actuator.
 5. Remove the Teflon washer and seal, and retain the washer. (The second stainless steel washer below the seal should remain on the stem.)

IMPORTANT: Be careful not to score the stem or leakage may result.

6. Remove the eight flange bolts from the top actuator housing, using a 7/16 in. socket and 3/8 in. ratchet and 3/8 in. open-end wrenches.
7. Lift off the upper housing. (The stainless steel washer should remain with the housing.)
8. Roll the diaphragm to the top of the piston.

9. Use the strap wrench and the 3/8 in. ratchet wrench to hold the piston in place.
- Note: To prevent the strap handle from scratching the piston, wrap the strap around the piston once before inserting the end of the strap into the handle.
10. Insert the 7/16 in. hex tool into the top of the stem, and use the 7/16 in. open-end wrench to remove the stem.
11. Remove the brass washer and the diaphragm.
12. Install the new diaphragm and the brass washer, making sure the diaphragm O-ring seal bead is against the piston.
13. Use the strap wrench and 3/8 in. ratchet wrench to hold the piston in place.
1. Insert the 7/16 in. hex tool into the top of the actuator stem and tighten the stem between 144 and 168 lb-in (16 and 19 N·m), using the torque wrench.
15. Roll the diaphragm back into place over the piston.
16. Replace the upper housing and the stainless steel washer, and tighten the flange bolts in a cross pattern between 115 and 125 lb-in (13 and 14 N·m), using the torque wrench.
17. Place the plastic sleeve over the stem, and slide the new seal over the sleeve (both supplied in the kit).
- Note: Make sure the groove side of the seal is facing the actuator.
18. Hold the seal on the stem, while pulling the plastic sleeve off the stem, so the seal remains on the stem.

IMPORTANT: Be careful not to damage the seal on the flats located on the upper part of the stem.

19. Install the Teflon washer on the stem.
20. Place the plastic sleeve over the stem, and push down firmly to seat the washer and seal.
21. Install the E-ring, using the retaining ring pliers.
- Note: If the E-ring cannot be installed, the seal is not completely seated. Repeat Step 20.
22. Apply 15 psig (103 kPa) to stroke the actuator and to ensure the air seal is properly installed. If the actuator does not stroke correctly, repeat Steps 2 through 4 and 20 through 22.
23. If the actuator has the optional stem cover, install it now.

Seal and Diaphragm Repair Procedure for MP86 Spring-Return-Up Actuators

Two MP8000-6350 Seal Kits are required for the MP86 and MP87 actuators. Refer to Figure 2 and proceed as follows:

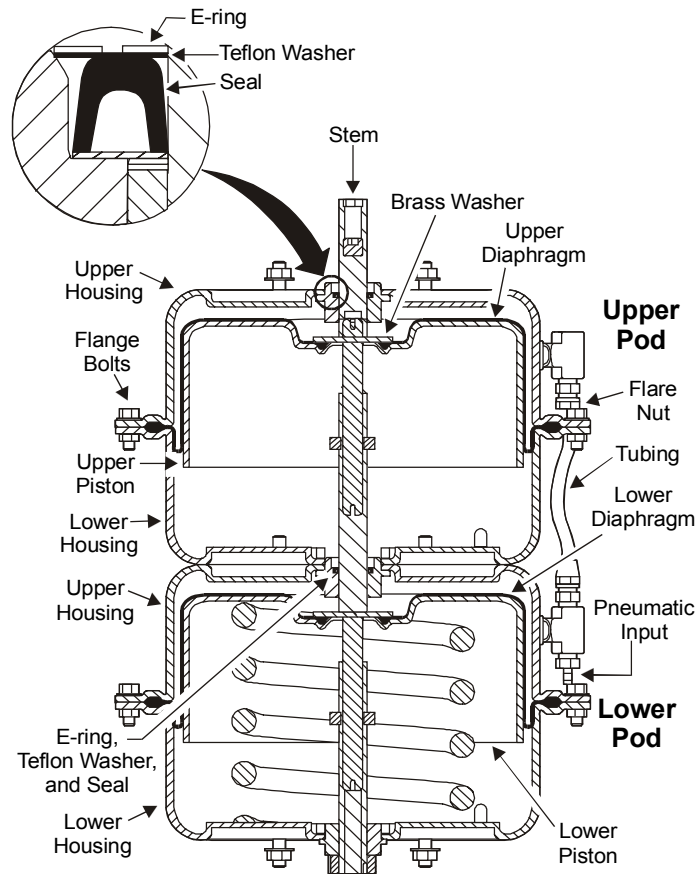


Figure 2: Components of the MP86 Actuator

1. Remove the air pressure input to the actuator.
- Note: If the optional stem cover is present, remove it.
2. Unscrew the flare nut from the copper tubing at the upper pod.
 3. Remove the eight flange bolts from the upper housing of the upper pod, using a 7/16 in. socket and 3/8 in. ratchet and 3/8 in. open-end wrenches.
 4. Lift off the upper housing. (This will also disconnect the copper tubing from the upper pod.)
 5. Insert the 7/16 in. hex tool into the top of the upper pod stem, and use the 7/16 in. open-end wrench to remove the stem assembly (includes the piston, diaphragm, and stem).

6. Remove the eight flange bolts from the lower pod, and lift off the connected housing halves.
7. Roll the diaphragm to the top of the lower piston.
8. Use the strap wrench to hold the lower piston in place and use the 7/16 in. hex tool with the 7/16 in. open-end wrench to remove the lower stem.

Note: To prevent the strap handle from scratching the piston, wrap the strap around the piston once before inserting the strap end into the handle.

9. Remove the brass washer and the diaphragm from the lower piston.
10. Install the new lower pod diaphragm, brass washer, and the stem. Make sure the O-ring seal bead seats against the top of the piston.
11. Use the strap wrench and the 3/8 in. ratchet wrench to hold the piston in place.
1. Insert the 7/16 in. hex tool into the top of the actuator stem, and tighten the stem between 144 and 168 lb·in (16 and 19 N·m), using the torque wrench.
13. Replace the connected housing halves, and tighten the flange bolts in a cross pattern between 115 and 125 lb·in (13 and 14 N·m), using the torque wrench.
14. Remove the E-ring with the retaining ring pliers and retain.
15. Block the open end of the tubing (end disconnected from the upper pod) to temporarily seal it.
16. Apply up to 15 psig (103 kPa) pressure slowly to the lower pod. The actuator will stroke, which will loosen the seal and the Teflon washer.
17. Remove the air pressure from the actuator.
18. Remove the Teflon washer and seal, and retain the washer. (The second stainless steel washer below the seal should remain on the stem.)

IMPORTANT: Be careful not to score the stem or leakage may result.

19. Place the plastic sleeve over the stem, and slide the new seal over the sleeve (both supplied in the kit).

Note: Make sure the groove side of the seal is facing the actuator.

20. Hold the seal on the stem, while pulling the plastic sleeve off the stem, so the seal remains on the stem.

IMPORTANT: Be careful not to damage the seal on the flats located on the upper part of the stem.

21. Install the Teflon washer on the stem.
22. Place the plastic sleeve over the stem, and push down firmly to seat the washer and seal.
23. Install the E-ring, using the retaining ring pliers.

Note: If the E-ring cannot be installed, the seal is not completely seated. Repeat Step 22.

24. Check that the air seal is properly installed by applying 15 psig (103 kPa) to the lower pod to stroke the actuator. If the actuator does not stroke correctly, repeat Steps 14 through 17 and 22 through 24.
 24. Install the piston and diaphragm in the upper pod, and secure the assembly between 21 and 26 lb-in (2 and 25 N·m), using the 7/16 in. hex tool and the torque wrench.
 26. Roll the diaphragm to the top of the piston.
 27. Use the strap wrench to hold the piston in place and use the 7/16 in. hex tool with the 7/16 in. open-end wrench to remove the top stem.
- Note: To prevent the strap handle from scratching the piston, wrap the strap around the piston once before inserting the strap end into the handle.
28. Remove the brass washer and the old diaphragm.
 29. Install the new diaphragm and the brass washer, making sure the diaphragm O-ring seal bead is against the piston.
 24. Tighten the top stem between 144 and 168 lb-in (16 and 19 N·m), using the 7/16 in. hex tool and the torque wrench. (Use the strap wrench to prevent the piston from turning while tightening.)
 31. Install the upper housing and the eight bolts, nuts, and lock washers. Tighten the nuts in a cross pattern between 115 and 125 lb-in (13 and 14 N·m), using the torque wrench.
 32. Reconnect the copper tubing to the upper pod.
 33. Remove the E-ring with the retaining ring pliers and retain.
 34. Apply up to 15 psig (103 kPa) pressure slowly to the actuator input. The actuator will stroke, which will loosen the seal and the Teflon washer.
 35. Remove the air pressure from the actuator.
 36. Remove the Teflon washer and seal, and retain the washer. (The second stainless steel washer below the seal should remain on the stem.)

IMPORTANT: Be careful not to score the stem or leakage may result.

37. Place the plastic sleeve over the stem, and slide the new seal over the sleeve (both supplied in the kit).

Note: Make sure the groove side of the seal is facing the actuator.

38. Hold the seal on the stem, while pulling the plastic sleeve off the stem, so the seal remains on the stem.

IMPORTANT: Be careful not to damage the seal on the flats located on the upper part of the stem.

39. Install the Teflon washer on the stem.
40. Place the plastic sleeve over the stem, and push down firmly to seat the washer and seal.
41. Install the E-ring, using the retaining ring pliers.

Note: If the E-ring cannot be installed, repeat Step 41.

42. Check that the air seal is properly installed by applying 15 psig (103 kPa) to the lower pod to stroke the actuator. If the actuator does not stroke correctly, repeat Steps 33 through 35 and 40 through 42.

43. If the actuator has the optional stem cover, install it now.

Seal and Diaphragm Repair Procedure for MP83, MP85, and MP87 Spring-Return-Down Actuators

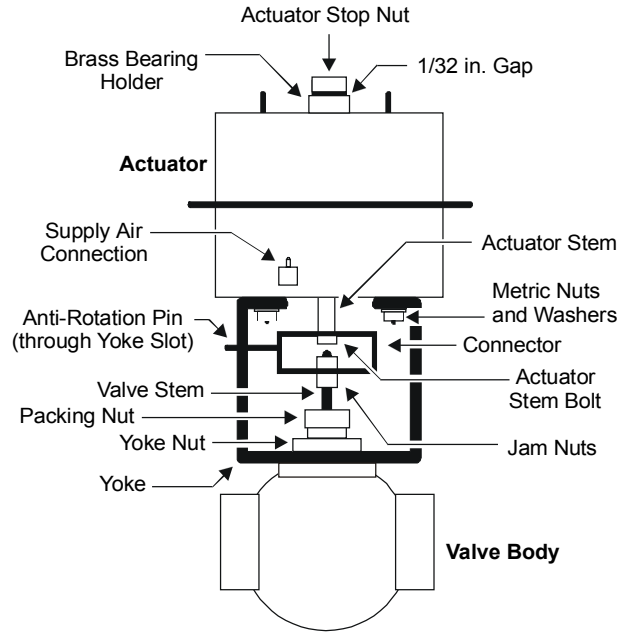


Figure 3: Components of a Spring-Return-Down Actuator

Before the seals can be replaced, the actuator will have to be removed from the valve. Proceed as follows:

1. Remove the stem cover (if present), and the anti-rotation pin using a 3/16 or 1/4 in. open-end wrench.
2. Loosen the yoke nut and the lower jam nut.
3. Remove the upper jam nut from the stem.
4. Apply air pressure to the actuator, and stroke the valve approximately 1/8 in.
5. Loosen the actuator stem bolt.

IMPORTANT: Use the stem wrench to hold the stem in place while loosening the stem bolt. Rotation of the stem could cause the diaphragm to wrinkle, affecting the actuator's performance.

Note: The stem wrench fits on the actuator stem just above the connector where the stem has two flat sides.

6. Remove the air pressure, and make sure the valve stem is fully down.
7. Remove the four metric nuts holding the actuator to the yoke. (Use the 10 mm socket for the MP83 and the 13 mm socket for the MP85 and MP87.)
8. Remove the actuator stem bolt and the connector from the actuator stem, and remove the actuator from the yoke.

To install a seal and diaphragm kit on a MP83 or MP85 actuator, refer to the *Seal and Diaphragm Repair Procedure for MP82 and MP84 Spring-Return-Up Actuators* section. For an MP87 actuator, refer to the *Seal and Diaphragm Repair Procedure for MP86 Spring-Return-Up Actuators* section.

After completing the previous procedures, remount the actuator onto the valve as follows:

1. Make sure the lower jam nut is still on the valve.
2. Attach the connector to the actuator stem using the actuator stem bolt and lock washer, and hand tighten.

Note: Orient the connector so the anti-rotation pin holes on the connector are closest to the valve body.

3. Locate the four threaded studs on the bottom of the actuator housing adjacent to the actuator stem, and install the yoke onto the threaded studs.
4. Secure the actuator to the yoke with the four metric nuts so the valve stem engages the connector, and tighten the nuts securely.
5. Position the valve stem to fully close the valve.
6. Align the connector with the yoke slot, and insert the anti-rotation pin.
7. Tighten the anti-rotation pin securely with a 3/16 or 1/4 in. open-end wrench.
1. Tighten the actuator stem bolt between 95 and 105 lb·in (11 and 12 N·m).

IMPORTANT: Use the stem wrench to hold the stem in place while tightening the actuator stem bolt, or rotation of the stem could cause the diaphragm to wrinkle and affect actuator performance.
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9. Thread the lower jam nut against the connector, and tighten it until there is a 1/32 in. gap between the actuator stop nut and the brass bearing holder at the top of the actuator. (See Figure 3.)

Note: This ensures the valve stem is in the full down position.

10. Thread the upper jam nut against the connector and tighten.
11. Tighten the yoke nut.
12. Apply up to 20 psig (138 kPa) air supply to the actuator to make sure the unit is operating properly.
13. Remove the supply air.
14. If the actuator has the optional stem cover, install the cover now.