

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

66506-B

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(REV. E)

**12" AIR MOTOR
6" STROKE**

66506-B AIR MOTOR



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- 637112 service kit includes the necessary soft parts for normal service of the entire air motor.
- 637113 service kit is a replacement valve kit.

GENERAL DESCRIPTION

The 12" air motor is a power unit used with a two-ball or chop-check pump. It utilizes tie rod construction for easy breakdown and it connects to the lower pump end with tie rods for easy operation. Consult the pump model operator's manual for specific instructions.

OPERATING AND SAFETY PRECAUTIONS

DO NOT EXCEED MAXIMUM AIR INLET PRESSURE OF 90 P.S.I. (6.2 bar) OR 75 CYCLES PER MINUTE.

CAUTION: High pressure equipment - Always disconnect air supply and relieve material pressure before attempting to service.

A ground lug is located on the air motor. This ground lug allows proper grounding of the pump.

AIR AND LUBE REQUIREMENTS

A filter capable of filtering particles larger than 50 microns should be used with a lubricator.

Filtered and oiled air will allow the pump to operate more efficiently and yield a longer life to operating parts and mechanisms.

Use an air line lubricator and keep it supplied with a good grade of S.A.E. #90W non-detergent gear oil set at a rate not to exceed approximately 1 drop per minute.

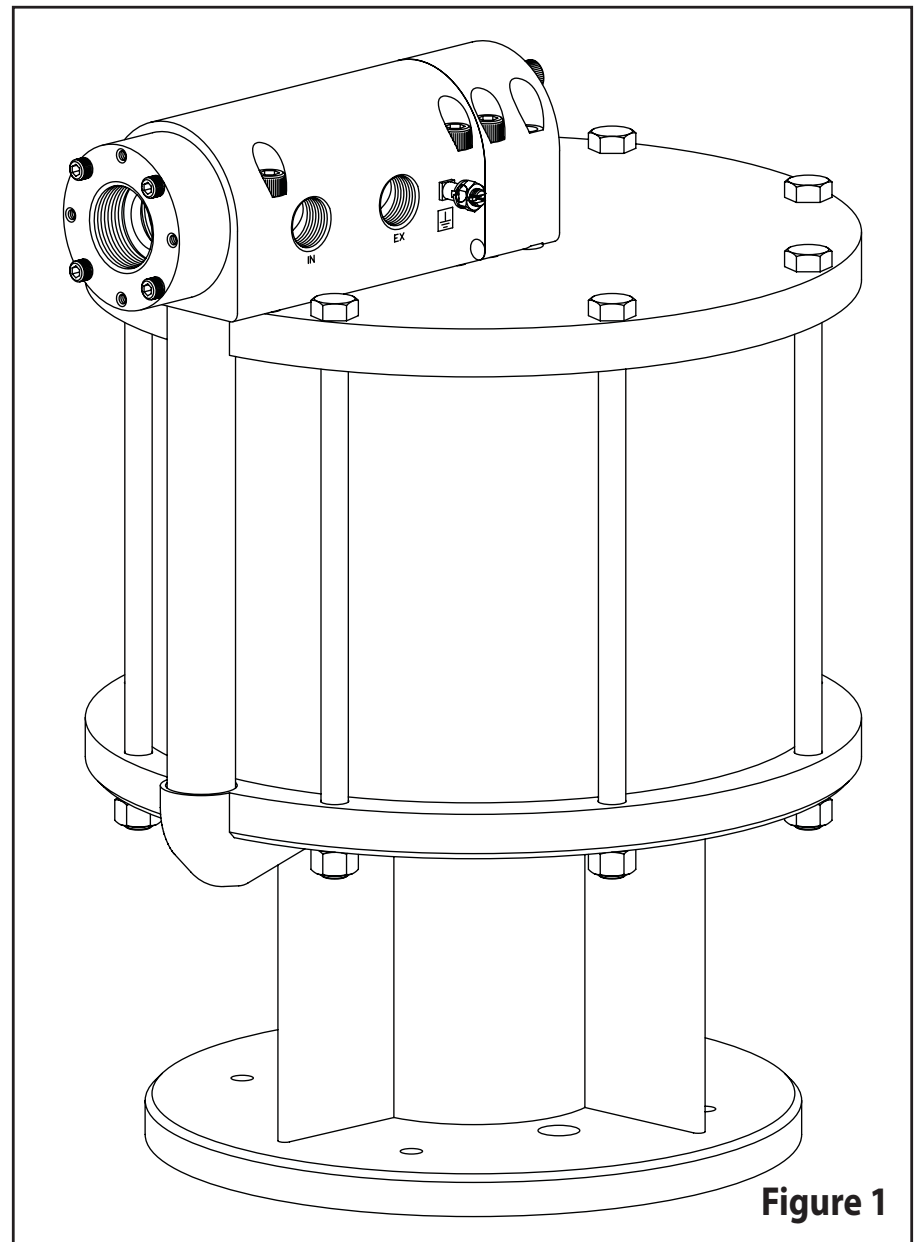
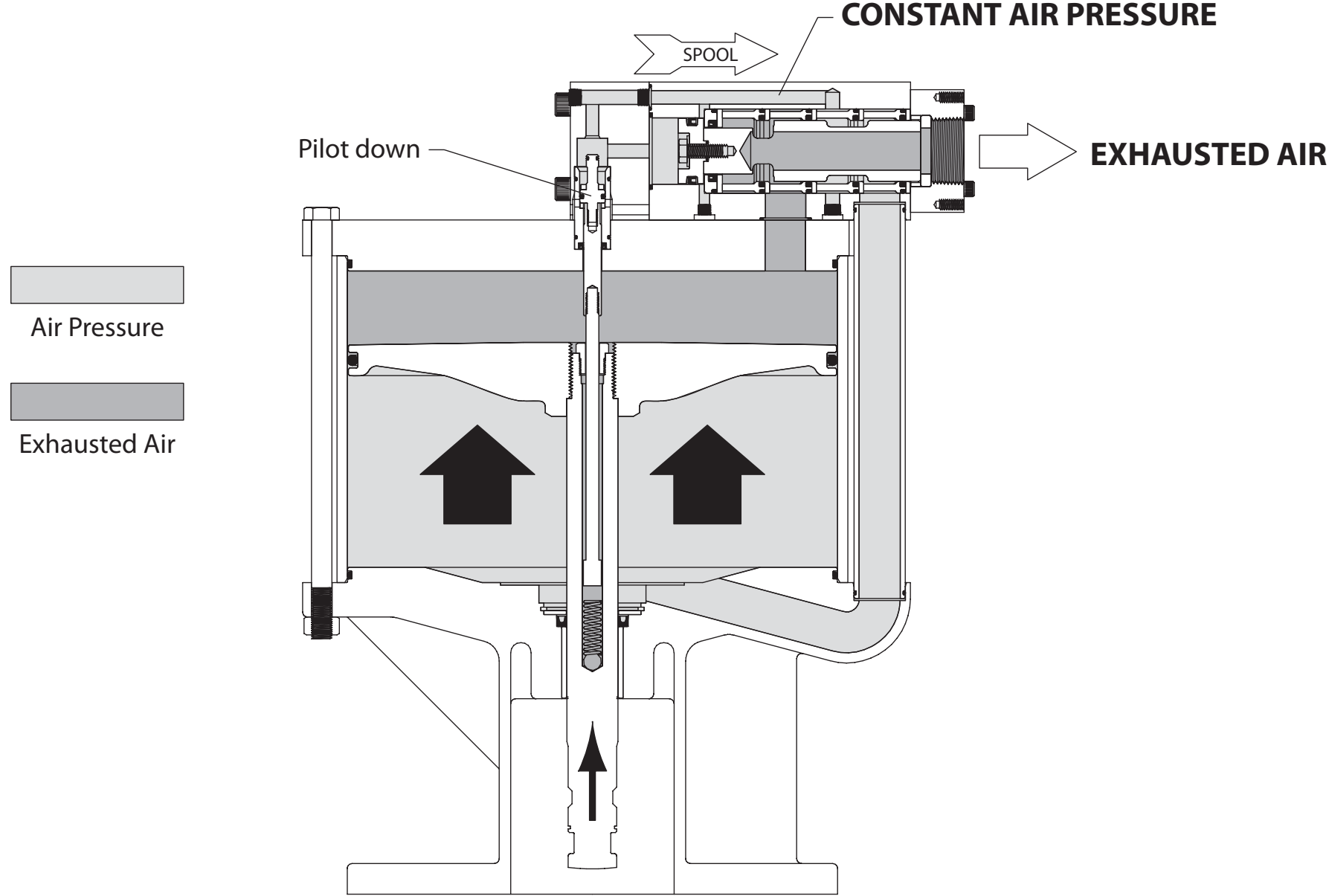


Figure 1

THEORY OF OPERATION

AIR MOTOR FUNCTION DURING UPSTROKE



AIR MOTOR FUNCTION DURING DOWNSTROKE

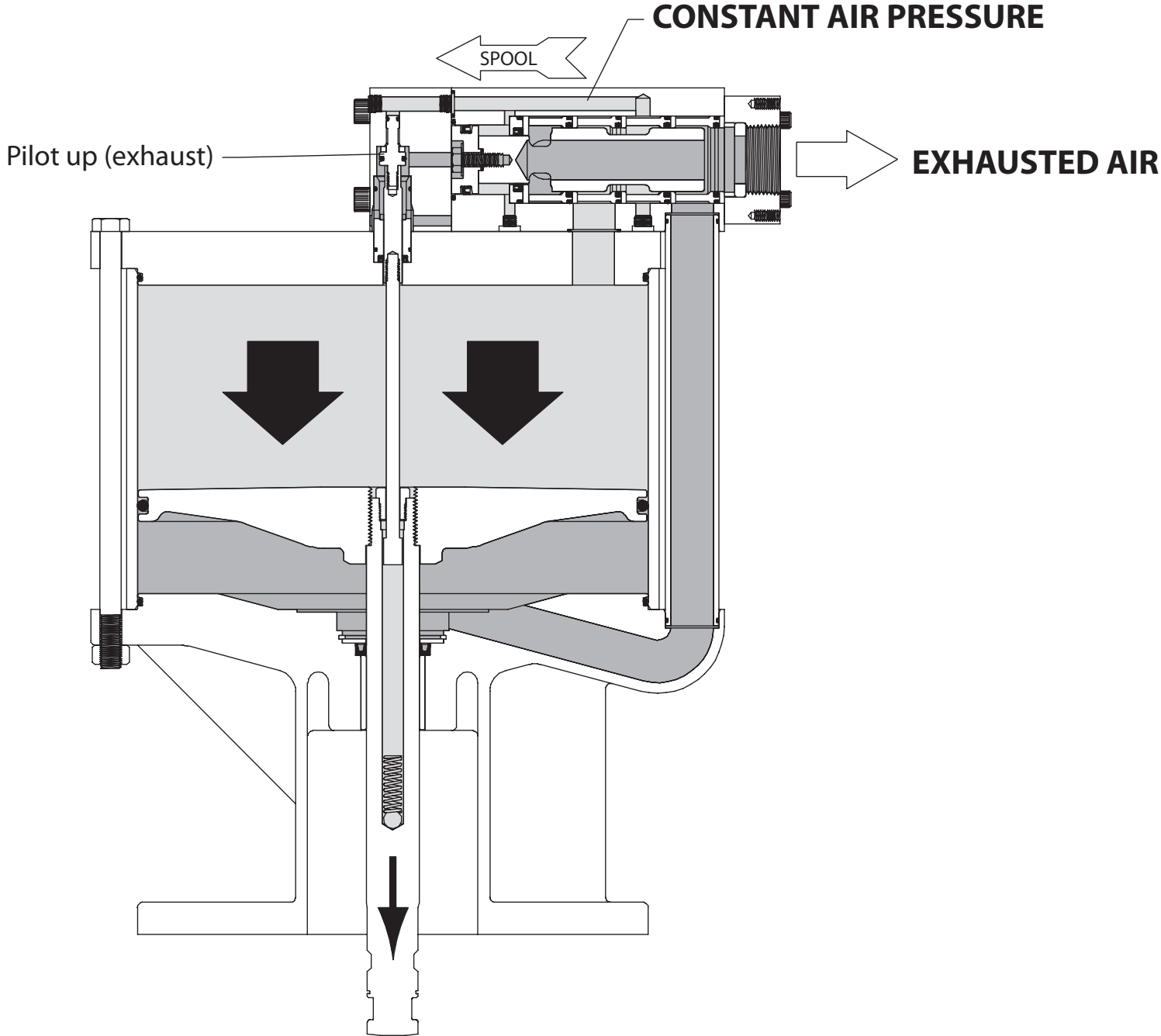


Figure 2

AIR MOTOR DISASSEMBLY

NOTE: All threads are right hand.

1. Place the air motor in an up-stroke position by pushing (43) piston assembly toward the top of the motor.
2. Remove six (26) cap screws from the top of (27 and 30) blocks.
3. Remove (27 and 30) blocks from (22) head plate.
4. Remove (34) tube from (46) base assembly. Remove two (33) "O" rings from (34) tube and one (33) "O" ring from the bottom of (30) block manifold.
5. Remove four (26) cap screws from the end of (27) block.
6. Separate (27) block from (30) block manifold and remove (28 and 29) "O" rings.
7. Remove 3/4 - 14 N.P.T. pipe plugs from the two exhaust ports, if applicable.
8. Using a 1/2" socket on (8) cap screw, turn (20) spool clockwise to align opening or slot in (20) spool with the 3/4 - 14 N.P.T. exhaust port nearest the (8) cap screw.
9. Insert a 1/4" rod or similar device thru the exhaust port of (30) block manifold and into the opening or slot of (20) spool. This rod will prevent rotation of (20) spool when removing (8) cap screw and (9) washer. **CAUTION: Do not permit this rod to rest against (17) spacer legs, which could cause breakage of (17) spacer.**
10. Remove (8) cap screw and (9) washer.
11. Unscrew four (32) cap screws and remove (31) cap assembly.
12. Remove (20) spool out the "exhaust end" of (30) block manifold and remove (11) piston out the other end.
13. From the "exhaust end" of (30) block manifold, remove four (19) washers, four (17) spacers, four (18) "O" rings, five (15) "O" rings, (16) washer, (14) "U" cup, (13) gland and (10) "O" ring.
14. Remove (12) "U" cup from (11) piston.
15. Using the wrench flats provided, remove the (2) piston assembly from the (5) extension rod.
16. Remove (1 and 3) "O" rings from (2) piston assembly.
17. Remove (4) washer, (6) cylinder, two (7) "O" rings and (24) "U" cup from (22) head plate.
18. Remove two (7) "O" rings and (24) "U" cup from (6) cylinder.
19. Remove eight (47) nuts from (49) cap screws.
20. Remove eight (49) cap screws from (22) head plate and (46) air motor base assembly.
21. Remove (22) head plate from (37) air cylinder, then remove (36) "O" ring from (22) head plate.
22. Pull upward on (37) air cylinder until (43) piston assembly separates from the (46) base assembly. If, in this step, the (43) piston assembly is not pulled from the (46) base assembly, then remove it after removing the (37) air cylinder.
23. If the (37) air cylinder and (43) piston assembly are removed as one unit, then remove the (43) piston assembly from the (37) air cylinder.
24. Remove the (36) "O" ring from the (46) base assembly.
25. Remove (40) retaining ring, (44) guide washer and (41) "U" cup from (46) base assembly.
26. Remove the (50) "O" ring from the (43) piston assembly.
27. Unscrew (5) extension rod from (39) valve rod by holding the (39) valve rod with an adjustable type pliers and using a wrench on the wrench flats provided at the top of the (5) extension rod.

28. Remove the (48) screw from the (43) piston assembly.
29. Remove the (39) valve rod, (45) spring and (42) ball from the (43) piston assembly.

AIR MOTOR ASSEMBLY

1. Place the (39) valve rod thru the (48) screw.
2. Clean the threads of the (39) valve rod and the (5) extension rod. Apply Loctite 271 to these threads and screw the (5) extension rod to the (39) valve rod and tighten by holding the (39) valve rod below the threads with an adjustable type pliers and using a wrench on the flats of the (5) extension rod. **CAUTION: Do not mar or damage the finish on the (5) extension rod.**
3. Place the (42) ball and (45) spring into the (43) piston assembly.
4. Place the (39) valve rod and (5) extension rod into the (43) piston assembly. Apply Loctite 271 to the threads of the (48) screw and thread the (48) screw into the (43) piston assembly and tighten.
5. Assemble the (50) "O" ring to the groove in the (43) piston assembly.
6. Assemble the (36) "O" ring to the groove in the (46) air motor base assembly.
7. Assemble the (41) "U" cup (lips up), (44) guide washer and (40) retaining ring into the (46) base assembly.
8. Assemble the (43) piston assembly into the (46) base assembly, being careful not to damage the (41) "U" cup.
9. Lubricate the inside diameter of the (37) air cylinder and slide it down over the (43) piston assembly and onto the (46) air motor base assembly (see figure 4).
10. Assemble the (36) "O" ring to the groove in the (22) head plate.
11. Align the notch in the (22) head plate with the port in the (46) air motor base assembly and press the (22) head plate down until it is seated against the (37) air cylinder.
12. Assemble eight (49) cap screws thru the (22) head plate and (46) air motor base assembly.
13. Assemble eight (47) nuts on the (49) cap screws and tighten alternately and evenly.
14. Assemble two (7) "O" rings to the grooves in the (6) cylinder.
15. Assemble the (24) "U" cup into the (6) cylinder, with the lips facing out.
16. Assemble the (6) cylinder over the (5) extension rod and into the (22) head plate. NOTE: Assemble the (6) cylinder with the "U" cup end onto the (5) extension rod first.
17. Assemble the (4) washer over the (5) extension rod and into the (6) cylinder.
18. Clean the threads on the (2) piston assembly. Apply Loctite 271 to the threads and assemble to the (5) extension rod and tighten, using the wrench flats. **CAUTION: Do not mar or damage the surface of either of these parts.**
19. Assemble the (1 and 3) "O" rings to the grooves in the (2) piston assembly.
20. Assemble the (14) "U" cup into the (13) gland, with the lips pointed into the gland. Lubricate the bore of the (30) block manifold and assemble the (13) gland into the (30) block manifold, with the lips of the (14) "U" cup pointed into the block manifold. NOTE: Be sure the (13) gland is seated squarely against the shoulder in the (30) block manifold.

DISASSEMBLY / ASSEMBLY

21. Assemble one (15) "O" ring and the (16) washer into the (30) block manifold and against the (13) gland (see figure 5).
22. Assemble four (15) "O" rings, four (18) "O" rings, four (17) spacers and four (19) washers into the (30) block manifold (see figure 5). NOTE: Assemble the (19) washers with the i.d. lips toward the (18) "O" ring. Position the (17) spacers so the legs are not aligned with the 3/4 - 14 N.P.T. exhaust ports in the (30) block manifold.
23. Clean the threads in the (20) spool.
24. Apply grease to the exterior of the (20) spool and assemble it into the (30) block manifold. Align the slot in the (20) spool with the 3/4 - 14 N.P.T. exhaust port in the side of the (30) block manifold.
25. Assemble the (51) spacer into the (31) cap assembly and assemble the (31) cap assembly to the (30) block manifold, securing with four (32) cap screws.
26. Assemble the (12) "U" cup into the groove in the (11) piston, with the lips pointed toward the "boss" side of the piston.
27. Assemble the (10) "O" ring onto the boss portion of the (11) piston.
28. Clean the threads on the (8) cap screw.

29. Assemble the (8) cap screw and (9) washer thru the (11) piston.
30. Apply Loctite 271 to the threads of the (8) cap screw then thread it into the (20) spool.
31. Insert a 1/4" rod or similar device thru the 3/4 - 14 N.P.T. exhaust port in the side of the (30) block manifold and thru the slot of the (20) spool to prevent it from rotating, then tighten the (8) cap screw. Remove the 1/4" rod.
32. Assemble the (28 and 29) "O" rings into the (30) block manifold.
33. Assemble the (27) block to the (30) block manifold, securing with four (26) cap screws (hand tight only).
34. Assemble two (33) "O" rings to grooves in the (34) tube.
35. Assemble the (34) tube into the port provided in the (46) air motor base assembly.
36. Assemble one (33) "O" ring to the counterbore in the bottom of the (30) block manifold.
37. Lubricate the bore in the (27) block.
38. Carefully slide the (27 and 30) block assemblies down over the (2) piston assembly and (34) tube and onto the (22) head plate.
39. Assemble six (26) cap screws in the (27 and 30) block assemblies. Tighten the two (26) cap screws in the (27)

(continued on page 6)

PARTS LIST

Item	Description (size)	Qty	Part No.
★ ✓ 1	"O" Ring (1/16" x 5/16" o.d.)	(1)	Y325-8
2	Piston Assembly (includes items 2a and 2b)	(1)	66654
2a	Washer	(1)	92524
2b	Piston	(1)	92520
★ ✓ 3	"O" Ring (3/32" x 5/8" o.d.)	(1)	Y325-111
✓ 4	Washer	(1)	92517
5	Extension Rod	(1)	92519
6	Cylinder	(1)	92513
★ ✓ 7	"O" Ring (1/16" x 7/8" o.d.)	(2)	Y325-18
★ 8	Cap Screw, Hex Head (5/16" - 18 x 7/8")	(1)	Y6-54-C
★ 9	Washer	(1)	F15-44-C
★ ✓ 10	"O" Ring (1/16" x 1/2" o.d.)	(1)	Y325-12
★ 11	Piston	(1)	92521
★ ✓ 12	"U" Cup Packing (3/16" x 1-5/8" o.d.)	(1)	Y186-53
★ 13	Gland	(1)	94789
★ ✓ 14	"U" Cup Packing (3/16" x 1-1/2" o.d.)	(1)	Y186-52
★ ✓ 15	"O" Ring (3/32" x 2-1/16" o.d.)	(5)	Y325-134
★ 16	Washer	(1)	94790
★ 17	Spacer	(4)	93250
★ ✓ 18	"O" Ring (1/8" x 1-3/4" o.d.)	(4)	Y325-222
★ 19	Washer	(4)	93251
★ 20	Spool	(1)	92522
22	Head Plate	(1)	90056-1
✓ 24	"U" Cup Packing (1/8" x 11/16" o.d.)	(1)	Y186-46
★ 25	Pipe Plug (1/8 - 27 N.P.T.)	(2)	Y227-2-L
★ 26	Cap Screw, Socket Head (3/8" - 16 x 2-1/2")	(10)	Y99-68
★ 27	Block	(1)	92514
★ ✓ 28	"O" Ring (1/16" x 5/8" o.d.)	(1)	Y325-14
★ ✓ 29	"O" Ring (3/32" x 1-7/8" o.d.)	(1)	Y325-131
★ 30	Block Manifold	(1)	92515
★ 31	Cap Assembly (includes items 31a and 31b)	(1)	66655

Item	Description (size)	Qty	Part No.
★ 31a	Cap	(1)	92531
★ 31b	Washer	(1)	92516
★ 32	Cap Screw, Socket Head (1/4" - 20 x 1-3/4")	(4)	Y99-45
★ ✓ 33	"O" Ring (1/16" x 1-1/4" o.d.)	(3)	Y325-24
34	Tube	(1)	92518
★ 35	Pipe Plug (1/8 - 27 N.P.T.)	(1)	Y227-2-L
✓ 36	"O" Ring (1/8" x 11-3/4" o.d.)	(2)	Y325-277
37	Air Cylinder	(1)	90035
★ 38	Pipe Plug (1/16 - 27 N.P.T.)	(1)	Y227-1-L
39	Valve Rod	(1)	92527
40	Retaining Ring (2.630" o.d.)	(1)	Y147-237
✓ 41	"U" Cup Packing (1/4" x 1-3/4" o.d.)	(1)	Y186-24
42	Ball (0.4375" dia.)	(1)	Y16-14
43	Piston Assembly	(1)	62111-B
44	Guide Washer	(1)	92216
45	Spring	(1)	24143-B
46	Air Motor Base Ass'y (includes items 46a and 46b)	(1)	66507-1
46a	Air Motor Base	(1)	90034
46b	Bushing	(1)	92511
47	Nut (1/2" - 20)	(8)	Y11-8-C
48	Screw	(1)	92525
49	Cap Screw, Hex Head (1/2" - 20 x 10-1/4")	(8)	94046-1
✓ 50	"O" Ring (1/4" x 12" o.d.)	(1)	Y325-452
★ 51	Spacer	(1)	92860
★ 52	Connector	(1)	93006
❖ ✓	Cotter Pin (1/8" x 2")	(1)	Y15-47-C
❖ ✓	Gadus® S2 U1000 Grease Packet (1/4 oz.)	(1)	94833
✓	Items included in service kit		637112
★	Service Kit (entire valve section)		637113
❖	Items not included with 66506-B air motor		

PARTS LIST

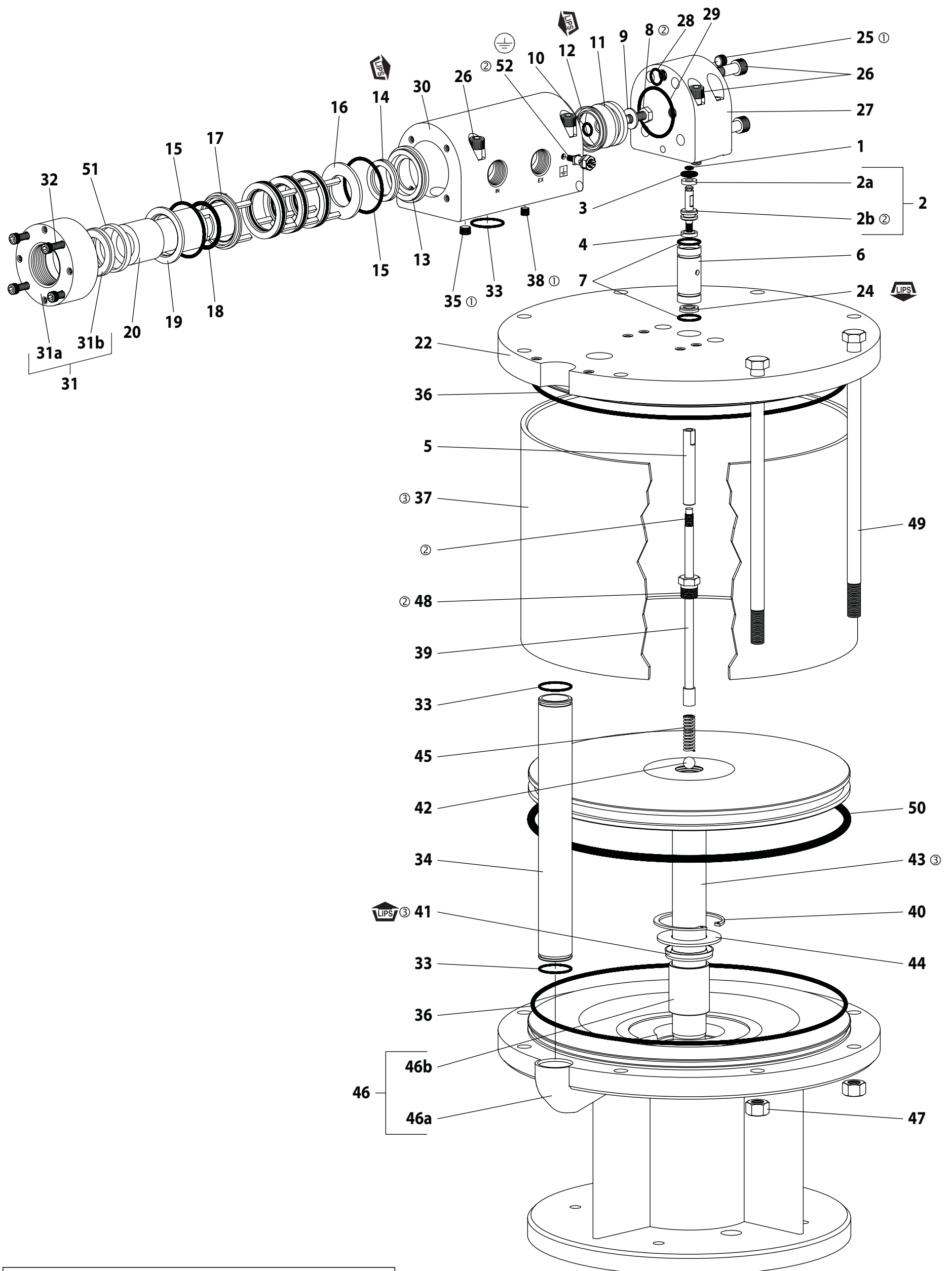


Figure 3

LUBRICATION / SEALANTS

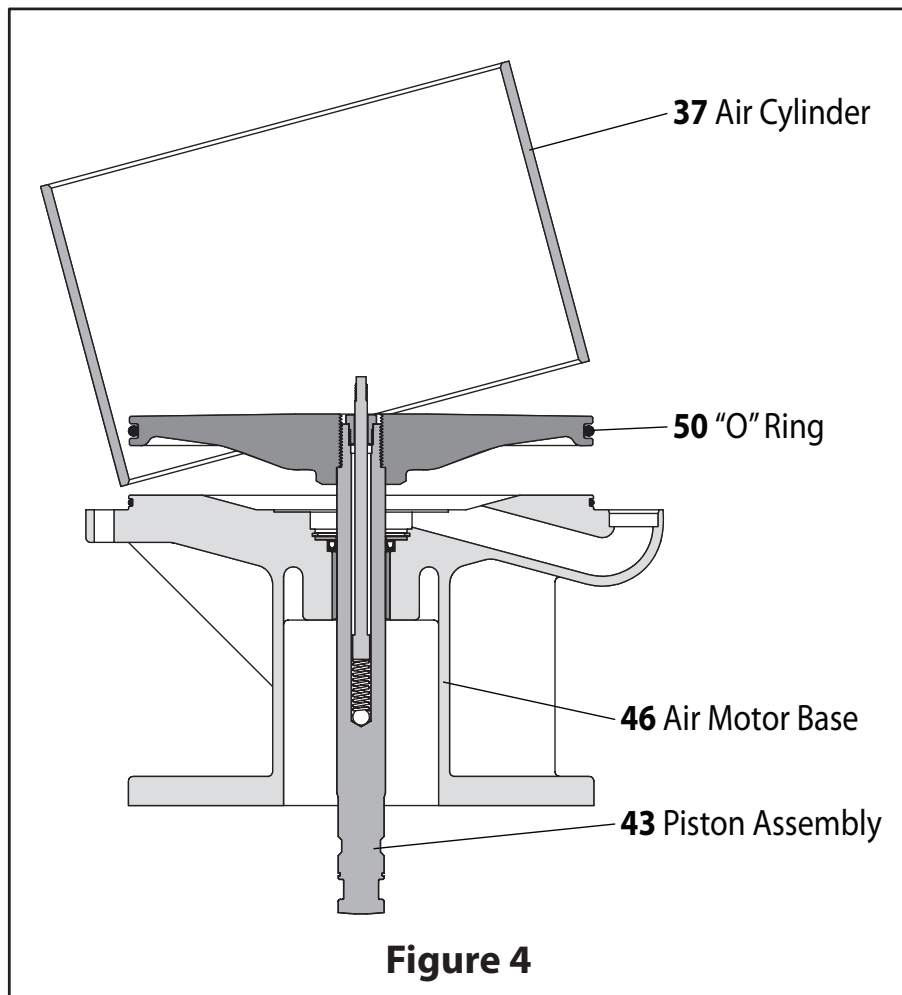
- ① Apply thread sealant to all pipe threads.
- ② Apply Loctite® 271™ to threads when assembling.
- ③ Lubricate (43), (41), i.d. of (37) and all upper valve parts with Gadus S2 U1000 grease.

DISASSEMBLY / REASSEMBLY

block, making sure it rests squarely on the (22) head plate.

40. Snug up the other four (26) cap screws in the top of the (30) block manifold just enough to draw the (30) block manifold against the (22) head plate.

41. Tighten the four (26) cap screws which secure the (27) block to the (30) block manifold. Now, tighten the four (26) cap screws in the top of the (30) block manifold.



TROUBLE SHOOTING

Air leakage out of the main exhaust.

- Check for worn or damaged (18) "O" rings on spool.
- Check for worn or damaged (14) "U" cup packing.
- Check for worn or damaged (20) spool.
- Check for worn or damaged (50) "O" ring on (43) piston assembly.

Air leakage around (43) piston assembly.

- Check for worn or damaged (12) "U" cup packing.

Fluid leakage out of the pilot exhaust hole.

- Check for worn or damaged (3) "O" ring.
- Check for worn or damaged inside diameter of (6) cylinder.
- Check for worn or damaged (1) "O" ring.
- Check for worn or damaged (24) "U" cup packing.
- Check for worn or damaged (12) "U" cup packing on (11) piston.

CROSS SECTION

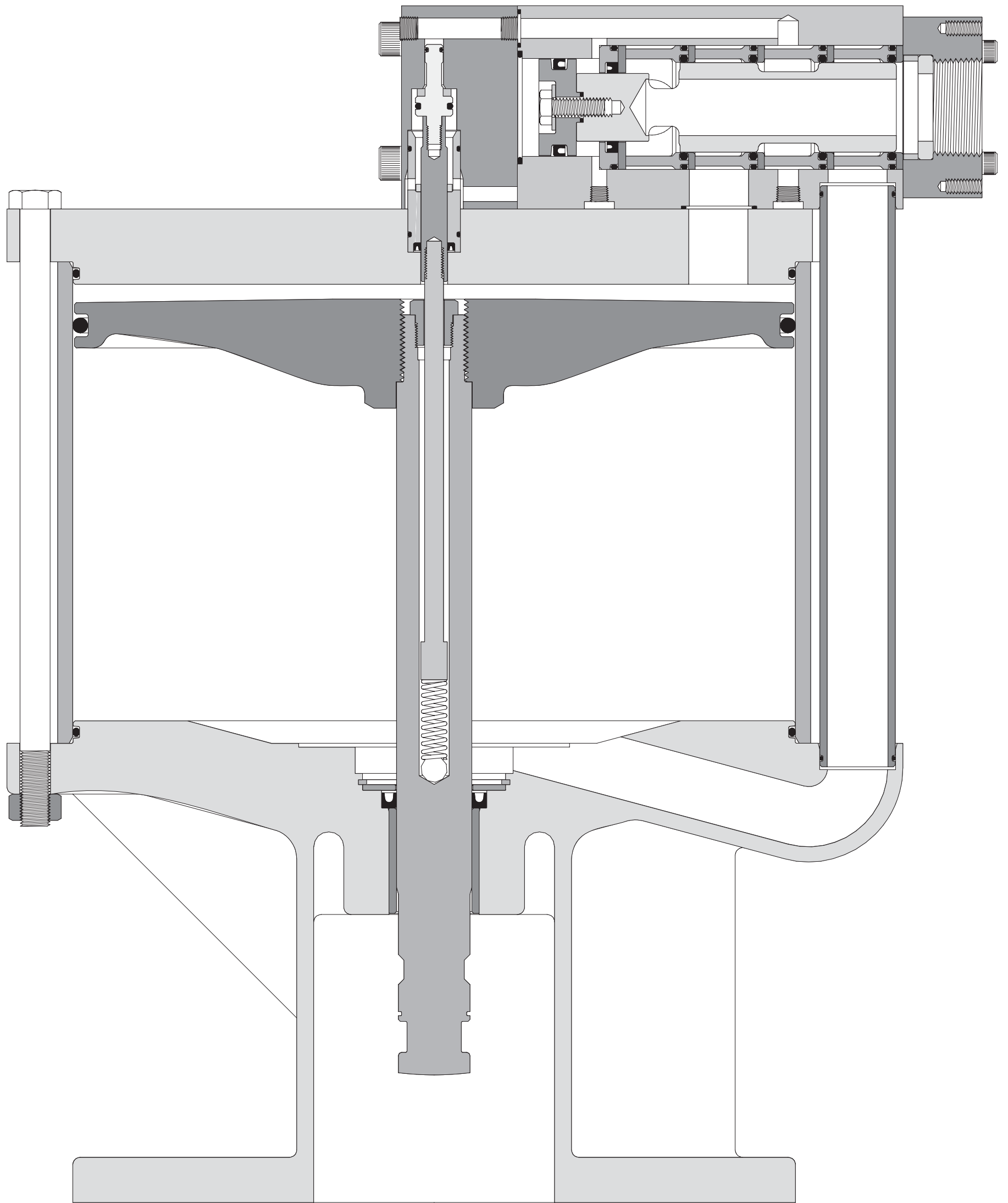


Figure 5

OPTIONAL 66718 MUFFLER ASSEMBLY

MUFFLER INSTALLATION

NOTE: Secure fittings after all components have been positioned.

- 1. Remove nut and sleeve from the (1) 90° short angle elbow.
- 2. Insert and install the 3/4 - 14 N.P.T. end of the (1) elbow to the air motor (back off the retaining nut a few turns).
- 3. Insert the (5) pipe plug into the air motor secondary exhaust port.
- 4. Slide the sleeve and nut onto the (2) tube and insert the tube into the (1) elbow.
- 5. Locate the (3) muffler on the collar of the air motor while aligning the (2) tube with the hole provided in the muffler.
- 6. Secure the muffler to the air motor collar with four (4) cap screws.
- 7. Secure all connections.

66718 PARTS LIST			
Item	Description (size)	Qty	Part No.
1	90° EMT Short Angle Elbow	(1)	79294
2	Tube	(1)	79293
3	Muffler	(1)	79295
4	Cap Screw (1/4" - 20 x 4")	(4)	Y6-417
5	Pipe Plug (3/4 - 14 N.P.T.)	(1)	Y17-14-C

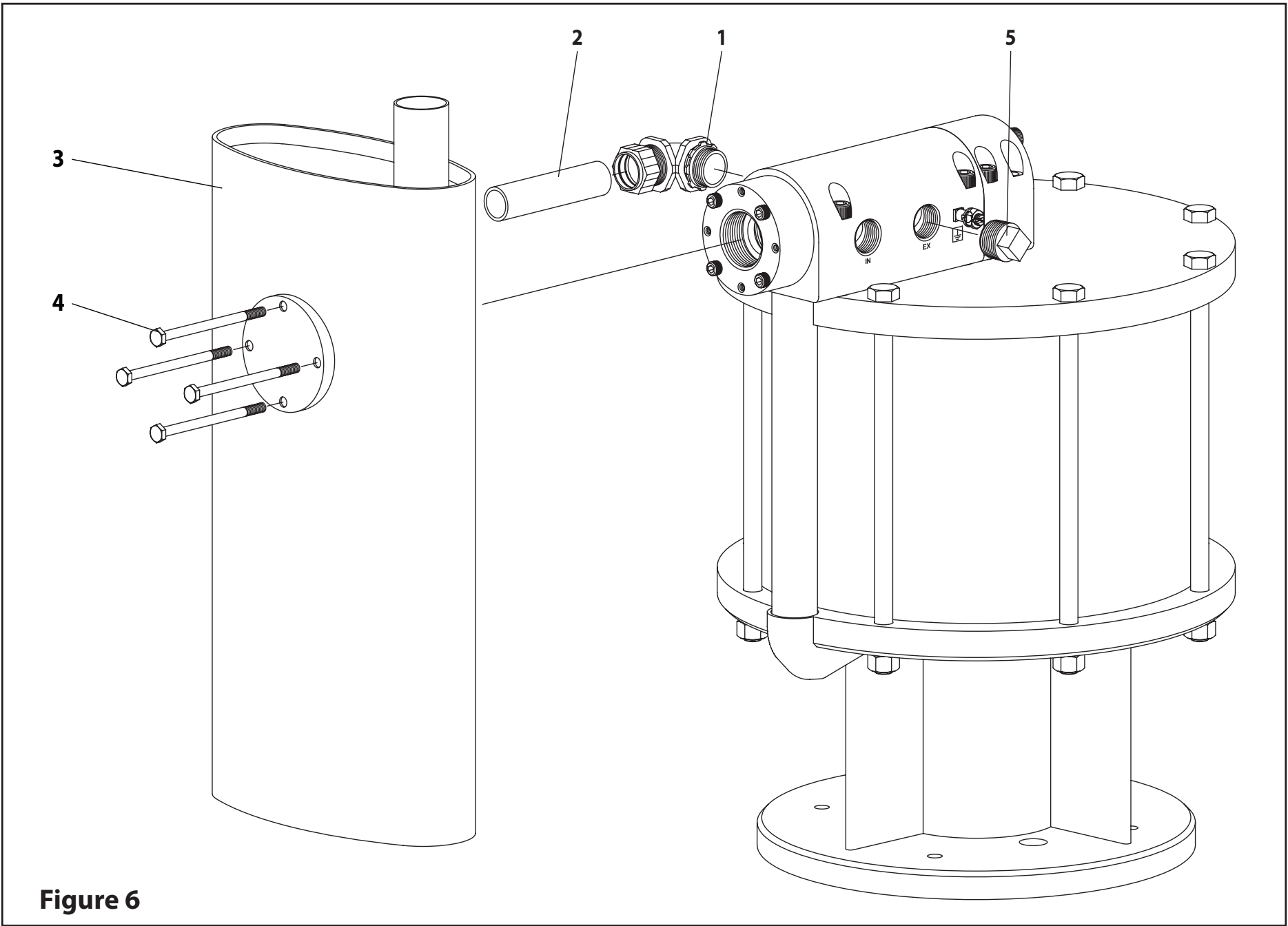


Figure 6