# Service Guide

**323640-4**
**323640-A1**

# Air Motor

## Description

Air motor Models 323640-4 and 323640-A1 power a variety or fluid and material pumps.

The pump tubes that connect to these motors can be either divorced or of a non-divorced design.

### Divorced and Non-Divorced

#### Overview

Pumps that disassemble into separate air motor and pump tube entities are considered divorced. These assemblies connect via a coupling arrangement that is open to atmosphere. The material outlet on divorced pumps is on the pump tube.

Non-divorced pumps contain a body that fits directly into the motor. This body distributes the product through an outlet in the air motor base. See **Figure 1**.

Separation of this design requires the pump tube to be unthreaded from the base of the air motor.

#### Air Motor for Divorced Design

Air motor Model 323640-A1 is constructed for divorced design and can be purchased separately.

This motor contains the hardware necessary for pump tube attachment.

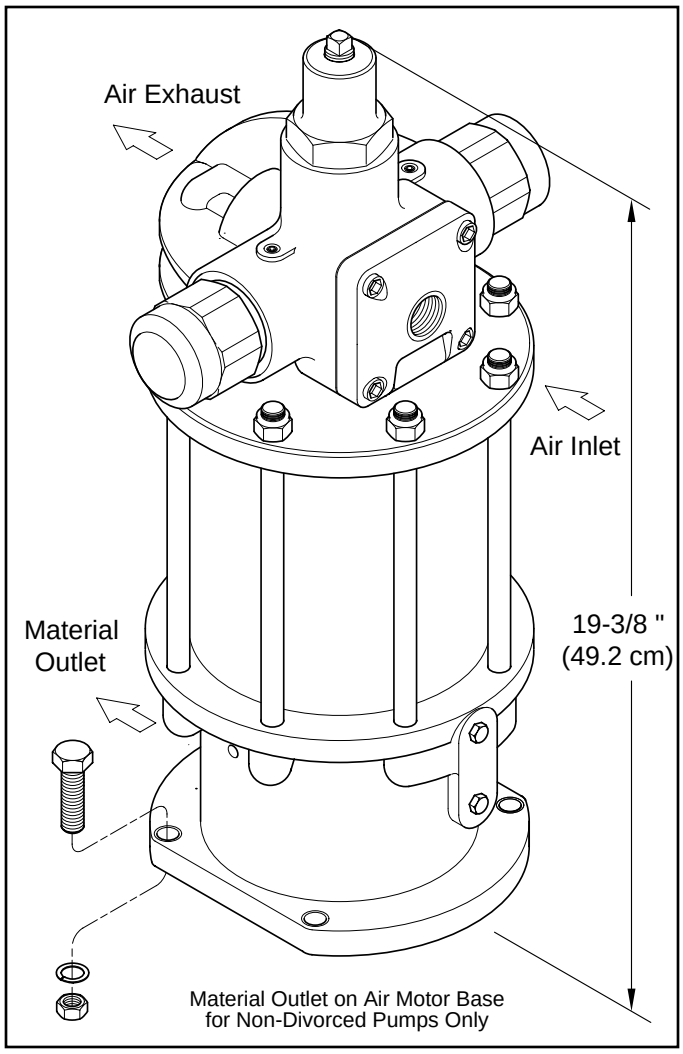



**Figure 1** *Air Motor Models 323640-4 and 323640-A1*

## Specifications

| Piston Diameter x Stroke | | Air Inlet | Air Outlet | Max. Air Pressure |
|---|---|---|---|---|
| Inches | Centimeters | | | |
| 6 x 4 | 15.2 x 10.2 | 3/4 " NPTF (f) | 3/4 " NPTF (f) | * |

**Table 1** *Air Motor Model 323640 Series Specifications*

* For information on the maximum air pressure for the air motor, refer to the pump's Service Guide.

#### Air Motor for Non-Divorced Design

The air motor connected with pump tubes in a non-divorced design is Model 323640-4.

This air motor is available as an assembly with the pump tube.

Alemite Corporation
PO Box 473515, Charlotte, North Carolina 28247-3515

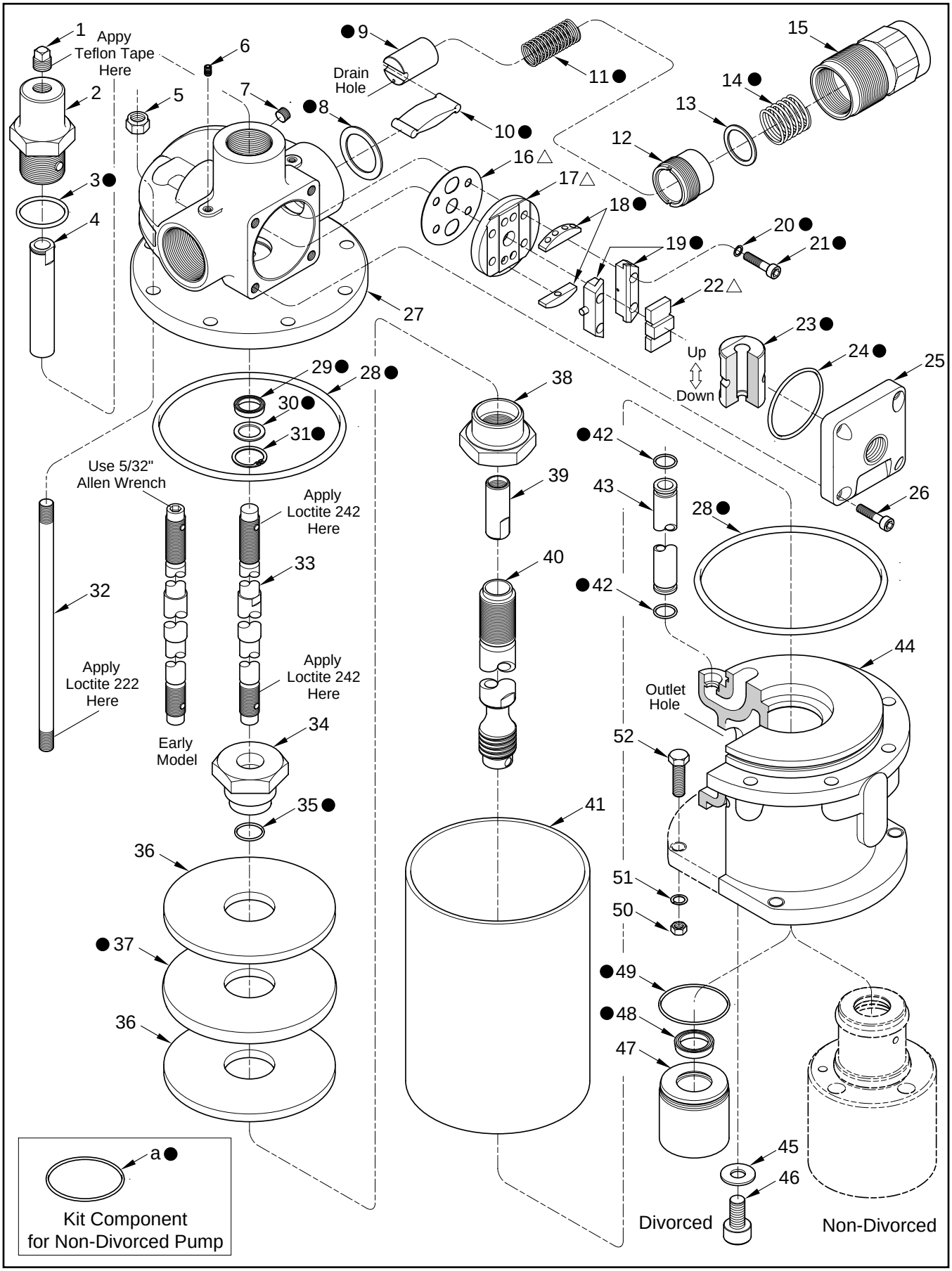



**Figure 2** *Air Motor Models 323640-4 and 323640-A1 - Exploded View*

| Item No. | Part No. | Description | Qty | Notes | | Numeric Order Part # (Item #) |
|---|---|---|---|---|---|---|
| 1 | 48925 | Plug, Pipe, 3/8 " NPT | 1 | | | *11828* (52) |
| 2 | 324076 | Plug,1-3/4 " -12 (m) x 3/8 " NPT (f) | 1 | | | *14546* (45) |
| 3 | 171009-29 | O-Ring, 1-9/16 " ID x 1-3/4 " OD | 1 | ● | | 48925 (1) |
| 4 | 324432 | Nut, Upper Trip Rod, 3-3/8 " Long | 1 | | | *77807* (50) |
| 5 | 171130 | Nut, Elastic Stop, 1/2 " -20 | 8 | | | 171000-12 (42) |
| 6 | 323487 | Setscrew, 5/16 " -18 x 1/2 " | 2 | | | 171003-34 (28) |
| 7 | | Plug, Socket Pipe, 3/8 " NPT | 1 | | | 171006-15 (31) |
| 8 | 323482 | Gasket, 1.646 " OD (Copper) | 2 | ● | | 171009-4 (35) |
| 9 | 323450 | Plunger | 2 | ● | | 171009-29 (3) |
| 10 | 323464 | Toggle | 2 | ● | | 171009-33 (49) |
| 11 | 323486 | Spring, 3.00 " Long | 2 | ● | | 171009-35 (a) |
| 12 | 323481 | Cylinder, 1-5/16 " -20 | 2 | | | 171009-47 (24) |
| 13 | 323484 | Washer, 0.7 " ID | 2 | | | 171130 (5) |
| 14 | 323485 | Spring, 1-5/16 " Long | 2 | ● | | *172013* (21) |
| 15 | 323483 | Cap | 2 | | | *172207-4* (51) |
| 16 | 323468 | Gasket, 2-13/16 " OD (Rubber) | 1 | △ | | *311738* (7) |
| 17 | | Seat, Valve | 1 | △ | | 314632 (48) |
| 18 | 323469 | Stop | 2 | ● | | 323443 (26) |
| 19 | 323830 | Guide, Valve | 2 | ● | | 323444-2 (43) |
| 20 | | Lockwasher, 5/16 " | 4 | ● | | 323466-4 (25) |
| 21 | | Screw, Cap, 5/16 " -18 x 1 " | 4 | ● | | 323450 (9) |
| 22 | | Slide, Valve | 1 | △ | | 323451-3 (40) |
| 23 | 323473 | Shuttle | 1 | ● | | 323459-2 (32) |
| 24 | 171009-47 | O-Ring, 2-11/16 " ID x 2-7/8 " OD | 1 | ● | | 323460 (38) |
| 25 | 323466-4 | Inlet, Air | 1 | | | 323464 (10) |
| 26 | 323443 | Screw, Cap, 3/8 " -16 x 7/8 " | 4 | | | *323467* (17) |
| 27 | 333206-D1 | Head Assembly, Casting | 1 | | | 323468 (16) |
| 28 | 171003-34 | O-Ring, 5-3/4 " ID x 6 " OD | 2 | ● | | 323469 (18) |
| 29 | 324290 | V-Packing | 1 | ● | | *323470* (22) |
| 30 | 323474 | Washer, 0.52 " ID | 1 | ● | | 323473 (23) |
| 31 | 171006-15 | Ring, Retaining, 7/8 " Diameter | 1 | ● | | 323474 (30) |
| 32 | 323459-2 | Rod, Tie, 1/2 " -13 x 1/2 " -20 | 8 | | | 323478 (34) |
| 33 | 326471-1 | Rod, Trip | 1 | | | 323479 (39) |
| 34 | 323478 | Retainer, Piston | 1 | | | 323481 (12) |
| 35 | 171009-4 | O-Ring, 5/8 " ID x 3/4 " OD | 1 | ● | | 323482 (8) |
| 36 | 326476 | Washer | 2 | | | 323483 (15) |
| 37 | 326475 | Packing | 1 | ● | | 323484 (13) |
| 38 | 323460 | Nut, Piston | 1 | | | 323485 (14) |
| 39 | 323479 | Nut, Lower Trip Rod, 1-5/8 " Long | 1 | | | 323486 (11) |
| 40 | 323451-3 | Rod, Piston | 1 | | | 323487 (6) |
| 41 | 326473-2 | Cylinder | 1 | | | 323550 (47) |
| 42 | 171000-12 | O-Ring, 5/8 " ID x 13/16 " OD | 2 | ● | | *323551* (46) |
| 43 | 323444-2 | Tube | 1 | | | 323830 (19) |
| 44 | 326472-B4 | Base, Air Motor (w/ outlet hole) | 1 | | Replacement-Both Models | 324076 (2) |
| 45 | | Washer, 1/2 " | 3 | | Model 323640-A1 | 324290 (29) |
| 46 | | Screw, 1/2 " -13 x 7/8 " | 3 | | Model 323640-A1 | 324432 (4) |
| 47 | 323550 | Retainer, Packing (Brass) | 1 | | Model 323640-A1 | 326471-1 (33) |
| 48 | 314632 | V-Packing | 1 | ● | Model 323640-A1 | 326472-B4 (44) |
| 49 | 171009-33 | O-Ring, 1-13/16 " ID x 2 " OD | 1 | ● | Model 323640-A1 | 326473-2 (41) |
| 50 | | Nut, 1/2 " -20 | 4 | | Model 323640-A1 | 326475 (37) |
| 51 | | Lockwasher, 1/2 " | 4 | | Model 323640-A1 | 326476 (36) |
| 52 | | Screw, Cap, 1/2 " -20 x 2 " | 4 | | Model 323640-A1 | 333206-D1 (27) |
| a | 171009-35 | O-Ring, 1-15/16 " ID x 2-18 " OD | 1 | ● | Model 323640-4 | *384232* (20) |

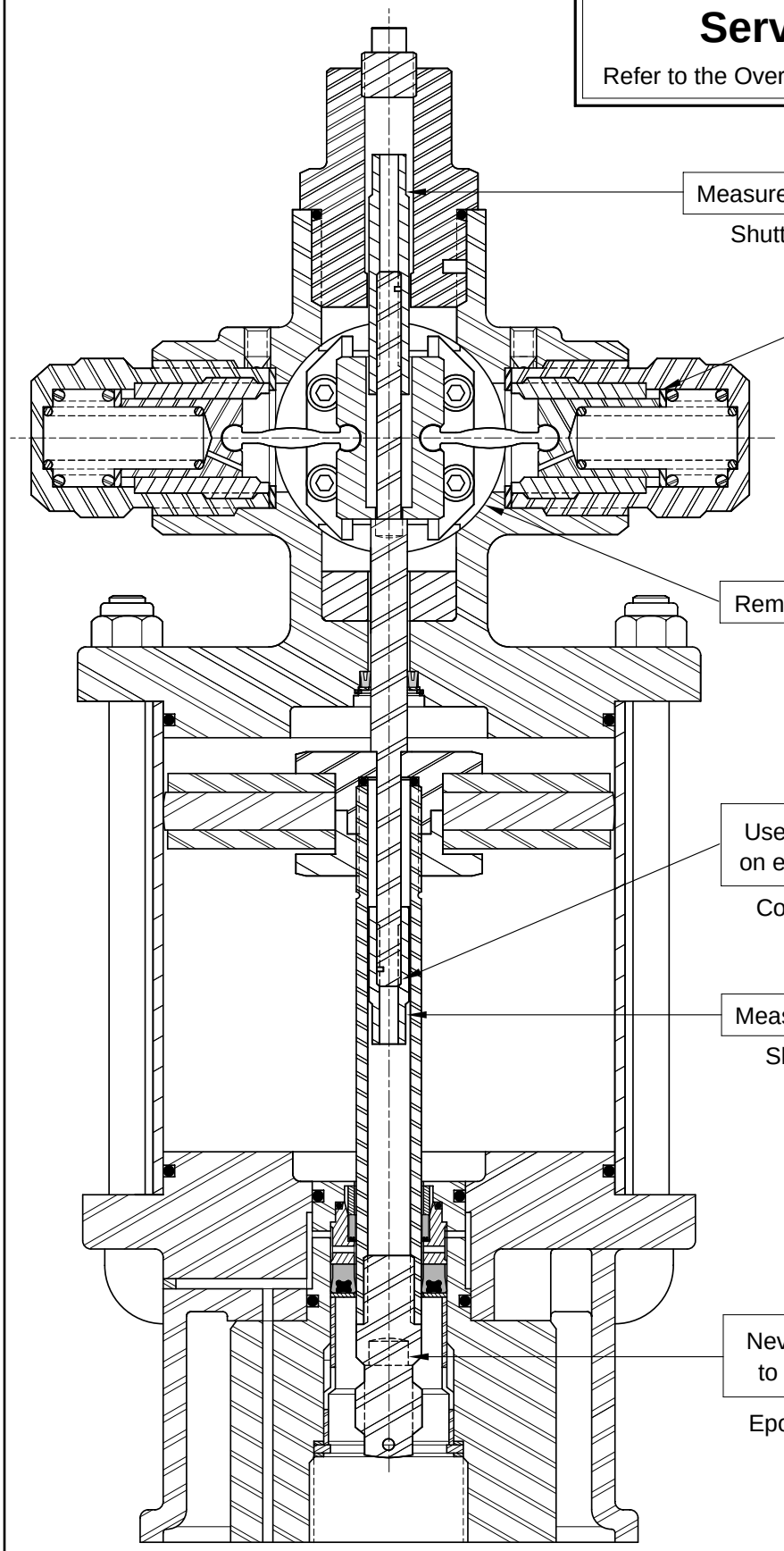
**Legend**:
Part numbers left blank (or in *italics*) are not available separately
● △ designates a repair kit item

**Repair Kits**

| Part No. | Kit Symbol | Description |
|---|---|---|
| **394233-2** | ● | Kit, Major Repair (Includes Tube of **394009** Loctite 242 and **398030** Viscous H Lubricant) |
| **398989** | △ | Kit, Slide Valve, Seat, and Gasket |

# Service Hints

Refer to the Overhaul Procedures for Details



Measure the Depth of the Nut in the Rod

Shuttle may not Operate Properly

Do not Misalign the Washer in the Cap

Toggle Assembly will not Function Properly

Remove and Install Valve Seat with Care

Air Leakage will Occur

Use Loctite 242 and Primer on each End of the Trip Rod

Components will Loosen

Measure the Depth of the Nut in the Rod

Shuttle may not Operate Properly

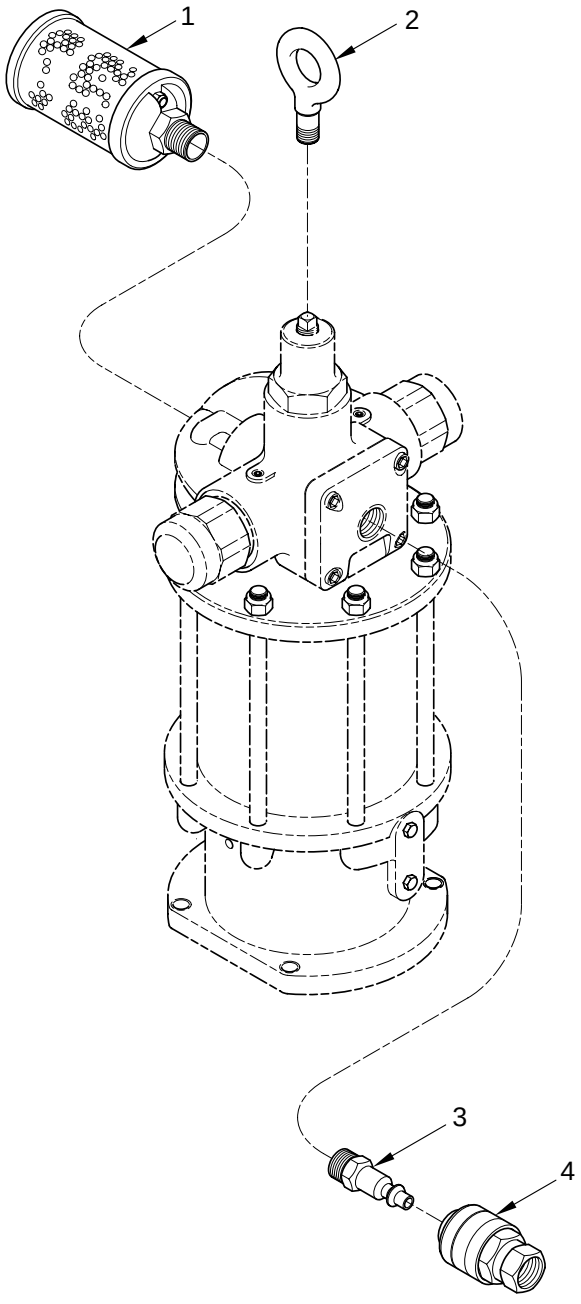
Never Grip Piston Rod Flats to Loosen any Component

Epoxy Seal may be Broken

Non-Divorced

# Accessories

Accessory items applicable to the these motors are illustrated in **Figure 3**.




| Item No. | Part No. | Description |
|---|---|---|
| 1 | 324170 | Muffler, 3/4 " NPTF (m) |
| 2 | 323842 | Eye Bolt, 3/8 " NPTF (m) |
| 3 | 328037 | Connector, 3/4 " NPTF (m) |
| 4 | 328031 | Air Coupler, 1/2 " NPTF (f) |

**Figure 3** *Air Motor Model 323640 Series Accessories*

# Overhaul

*IMPORTANT: Prior to performing any maintenance procedure, the following safety precautions must be observed. Personal injury may occur.*

## WARNING

**Do not use halogenated hydrocarbon solvents such as methylene chloride or 1,1,1-trichlorethane in this motor. An explosion can result within an enclosed device capable of containing pressure when aluminum and/or zinc-plated parts come in contact with halogenated hydrocarbon solvents.**

**Release all pressure within the system prior to performing any overhaul procedure.**

- **Disconnect the air supply line from the motor.**
- **Into an appropriate container, operate the pump's control valve to discharge remaining pressure within the system.**

**Never point a control valve at any portion of your body or another person. Accidental discharge of pressure and/or material can result in injury.**

**Read each step of the instructions carefully. Make sure a proper understanding is achieved before proceeding.**

**NOTE**: Refer to **Figure 2** for component identification on all overhaul procedures.

## Disassembly

### Separate Pump from Motor (Non-Divorced)

1. Clamp the Air Motor vertically in a soft-jaw vise.
2. Loosen the Jam Nut that secures the Pump Tube assembly to the Air Motor assembly.

## CAUTION

**Support the Pump Tube assembly during removal. Damage to components can occur.**

3. Unscrew the Pump Tube [with attached components] from the Air Motor.
4. Pull on the Pump Tube to expose the Coupling.

5. Remove the upper Spring Clip that secures the air motor Piston Rod to the Coupling.

6. Unscrew the Coupling from the air motor Piston Rod.
   • Rotate the entire Pump Tube assembly.

   **NOTE**: For disassembly procedures of the components in Air Motor Base (**44**), refer to the Pump **SER Service Guide** for details.

### Separate Motor from Pump (Divorced)

7. With the pump in a soft-jaw vise, remove Screws (**52**), Lockwashers (**51**), and Nuts (**50**) that secure the Pump to the Air Motor Housing.

8. Remove the Spring Clip that secures the air motor Piston Rod to the Coupling.

9. Unscrew the Coupling from the air motor Piston Rod.
   • Rotate the entire Air Motor assembly.

### Air Motor

#### Head Assembly

10. Place the Air Motor vertically in a soft-jaw vise.

11. Unscrew Plug (**2**) from Head Assembly (**27**).
    • Remove O-Ring (**3**) from the Plug.

12. Remove Plug (**1**) from Plug (**2**) as necessary.

13. Remove Screws (**26**) that secure Air Inlet (**25**) to the Head Assembly.
    • Remove the Air Inlet from the Head Assembly.

14. Remove O-Ring (**24**) from the Air Inlet.

15. Loosen Setscrews (**6**) that secure Caps (**15**) to the Head Assembly.
    • Unscrew each Cap from the Head Assembly.

16. Remove Springs (**11**) from each Cap.

17. Remove Gaskets (**8**) from the Head Assembly.

18. Lift Shuttle (**23**) upward and hold Trip Rod (**33**) with an open-end wrench.

    **NOTE**: Early model Trip Rods did not contain a flat. Use a 5/32 " allen wrench to prevent rotation of the Rod. See **Figure 2**.

19. Unscrew Nut (**4**) from the Trip Rod.

20. Unscrew Nuts (**5**) from Tie Rods (**32**).
    • Remove the Head Assembly from the Tie Rods

21. Place the Head Assembly assembly on a flat surface.

22. Remove O-Ring (**28**) from the Head Assembly.

23. Remove the Shuttle, Toggles (**10**), Plungers (**9**), and Slide Valve (**22**) from the Head Assembly.

24. Remove Screws (**21**) and Lockwashers (**20**) that secure Valve Guides (**19**), Stops (**18**), and Valve Seat (**17**) to the Head Assembly.
    • Remove the Valve Guides and Stops.

    *IMPORTANT: Remove the Valve Seat squarely from the Head Assembly. Should the Valve Seat cock during removal, realign and start again.*

25. Remove the Valve Seat from the Head Assembly.

26. Remove Gasket (**16**) from the Head Assembly.

27. Remove Retaining Ring (**31**) that secures Washer (**30**) and V-Packing (**29**) in the Head Assembly.
    • Remove the Washer and the V-Packing.

28. Remove Plug (**7**) from the Head Assembly as necessary.

29. Place each Cap in a soft-jaw vise.

30. Unscrew Cylinder (**12**) from the Cap.
    • Use a drift and a small hammer.

31. Remove Washer (**13**) and Spring (**14**).

#### Air Motor Base

32. Remove Tube (**43**) from the Air Motor Base (**44**).

33. Remove O-Rings (**42**) from each end of the Tube.

34. Remove Cylinder (**41**) from the Air Motor Base.

35. Remove the Trip Rod and Piston Rod assembly from the Air Motor Base.

    *IMPORTANT: Do not grip the flats of the Piston Rod during the following procedure.*

36. Grip Piston Nut (**38**) and Piston Retainer (**34**) and unscrew the Piston Nut until it seats on the shoulder of Piston Rod (**40**).
    • Continue rotation to separate the Piston Retainer from the Piston Rod.

37. Remove the assembly from the Piston Rod.

38. Unscrew Nut (**39**) from Trip Rod (**33**).
    • Separate the Piston Retainer from the Trip Rod.

39. Remove O-Ring (**35**) from the Piston Retainer.

40. Remove Washers (**36**) and Packing (**37**) from the Piston Nut.

41. Remove O-Ring (**28**) from the Air Motor Base.

42. Unscrew the Piston Nut from the Piston Rod as needed.

### Model 323640-A1 Only

43. Remove Screws (**46**) and Washers (**45**) that secure Packing Retainer (**47**) to the Base.
    - Remove the Packing Retainer.

44. Remove V-Packing (**48**) and O-Ring (**49**) from the Packing Retainer.

## Clean and Inspect

**NOTE**: Use the appropriate repair kit for replacement parts. Make sure all the components are included in the kit before discarding used parts.

1. Clean all metal parts in a modified petroleum-based solvent. The solvent should be environmentally safe.

2. Inspect all parts for wear and/or damage.
   - Replace as necessary.

3. Remove old Loctite from threads of Trip Rod (**33**), Upper Trip Rod Nut (**4**), and Lower Trip Rod Nut (**39**).

4. Inspect the large diameter of the Trip Rod and the inside diameter of Cylinder (**41**) closely for score marks.
   - Replace as necessary.

5. Press the Ball on each Valve Guide (**18**) to ensure the Spring operates properly. Replace as necessary.

6. Closely inspect the mating surfaces of Valve Seat (**17**) and Valve Slide (**22**). Ensure a smooth and clean contact is obtained.
   - Replace with a minor kit if necessary.

## Assembly

**NOTE**: Prior to assembly, certain components require lubrication. Refer to **Table 2.**

### Air Motor Base

**NOTE**: Refer to **Figure 2** and **Figure 4** for component identification on all assembly procedures.

### Model 323640-A1 Only

1. Install V-Packing (**48**) [lips upward] into the top of Packing Retainer (**47**).

2. Install O-Ring (**49**) onto the Packing Retainer.

3. Install the Packing Retainer assembly into Air Motor Base (**44**).

4. Install Washers (**45**) and Screws (**46**) into the Air Motor Base.
   - Tighten the Screws securely.

### All Models

5. Install O-Ring (**28**) onto the Air Motor Base.

6. Screw Piston Nut (**38**) [hexagon end downward] onto the top of Piston Rod (**40**).
   - Make sure the Piston Nut bottoms on the Piston Rod.

7. Install Washer (**36**), Packing (**37**) and additional Washer (**36**) onto the Piston Nut.

8. Install and seat O-Ring (**35**) onto Piston Rod (**40**).

9. Place the Piston Retainer [hexagon end upward] onto the bottom of Trip Rod (**33**).

| Item No. | Description | Item No. | Description |
|---|---|---|---|
| **Clean Oil** | | | |
| 3 | O-Ring, 1-9/16 " ID x 1-3/4 " OD | 35 | O-Ring, 5/8 " ID x 3/4 " OD |
| 24 | O-Ring, 2-11/16 " ID x 2-7/8 " OD | 42 | O-Ring, 5/8 " ID x 13/16 " OD |
| 28 | O-Ring, 5-3/4 " ID x 6 " OD | 48 | V-Packing |
| 29 | V-Packing | 49 | O-Ring, 1-13/16 " ID x 2 " OD |
| **Viscous H Lubricant** | | | |
| 9 | Plunger - Outside Diameter and Toggle Socket | 23 | Shuttle - Inside Diameter and Toggle Sockets |
| 11 | Spring - Coated | 27 | Head Assembly - 1/4 oz. (7 gms) in Cavity |
| 14 | Spring - Coated | 37 | Packing - Outside Diameter |
| 22 | Slide Valve - Surface in Contact with Shuttle | 41 | Cylinder - Inside Bore |

**Table 2** *Lubricated Components*

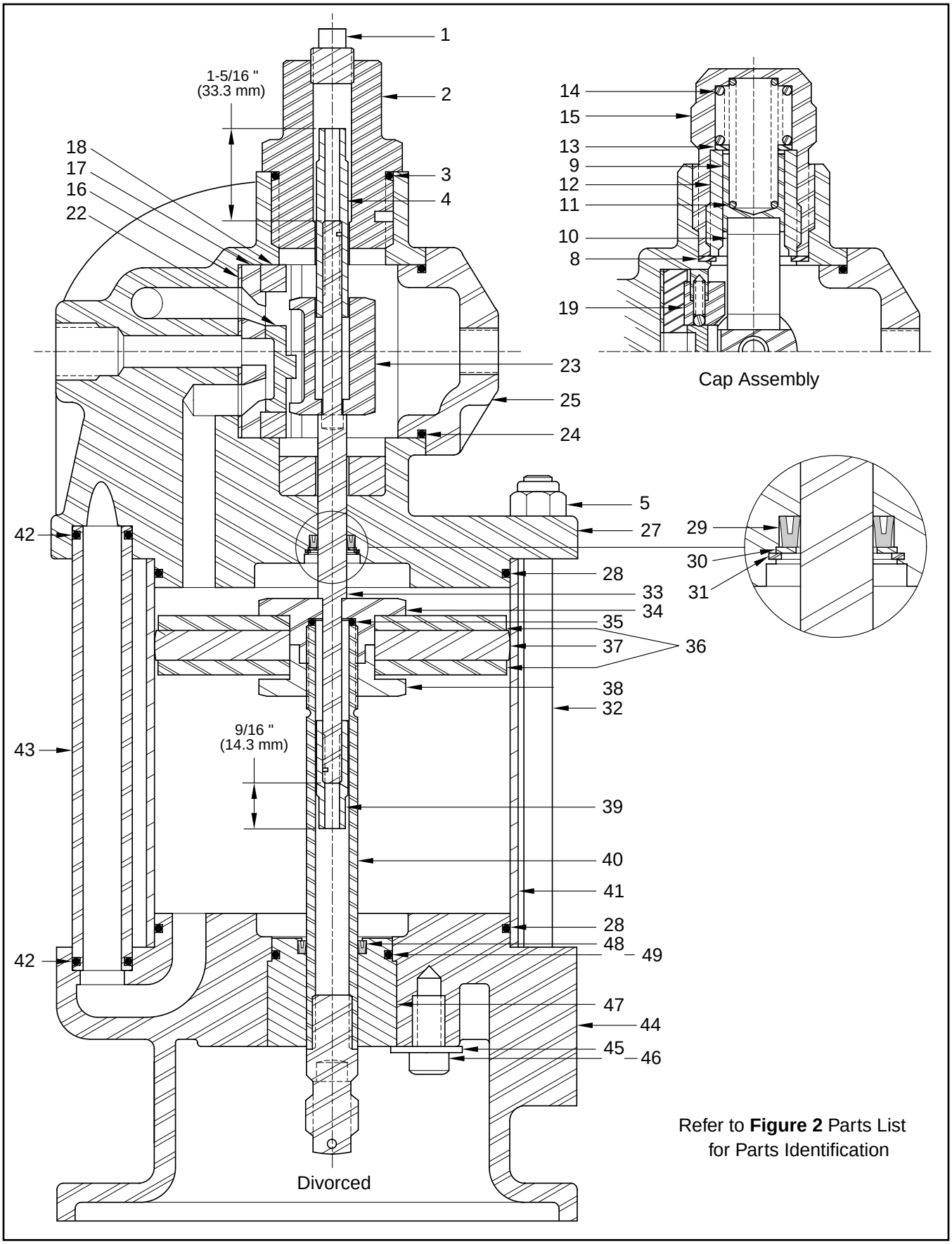



**Figure 4** *Air Motor Model 323640-A1 - Section View*

10. Screw Nut (**39**) into the bottom of the Trip Rod [fewer threads] and tighten from 17-20 ft. lbs. (23 - 27 Nm).
    - Make sure to apply Loctite 242 to the Trip Rod.
    - Follow the thread sealant manufacturer's recommendations.

11. Measure the depth the Nut extends beyond the Trip Rod. The measurement must be 9/16 " (14.3 mm). See **Figure 4**.

    *IMPORTANT: The O-Ring must seat on the Piston Rod or leakage occurs.*

12. Screw and seat the Piston Retainer assembly tight onto the Piston Rod.

13. Screw the Piston Nut against the Piston Retainer.
    - Tighten securely.

    **NOTE**: It is normal for the Washers and Packing to wobble on the Piston Nut and Piston Retainer.

## CAUTION

**Use care installing the Trip Rod and Piston Rod assembly into the Packing Retainer. Damage to the Packing can occur (Model 323640-A1 Only).**

14. Install the Trip Rod and Piston Rod assembly into the Air Motor Base.

15. Install Cylinder (**41**) onto the Air Motor Base.
    - Use care passing the O-Ring.

    **NOTE**: Make sure Packing (**37**) contacts the Cylinder evenly.

16. Install O-Rings (**42**) onto each end of Tube (**43**).

17. Install the Tube into the Air Motor Base.

18. Install Tie Rods (**32**) into the Air Motor Base.
    - Make sure to apply Loctite 222 to the bottom threads of the Tie Rod.
    - Follow the thread sealant manufacturer's recommendations.

### Head Assembly

19. Install O-Ring (**28**) onto Head Assembly (**27**).

20. Install and seat V-Packing (**29**) [lips upward] into the bottom of the Head Assembly.

21. Install Washer (**30**) and Retaining Ring (**31**).
    - Make sure the Retaining Ring seats properly in the groove.

22. Install Gasket (**16**) into the Head Assembly.

    *IMPORTANT: Install the Valve Seat squarely into the Head Assembly. Should the Valve Seat cock during installation, realign and start again.*

23. Install Valve Seat (**17**) into the Head Assembly.

24. Install Stops (**18**), and Valve Guides (**19**) into the Head Assembly.

25. Install Lockwashers (**20**) and Screws (**21**) that secure the Valve Guides and Seat to the Head Assembly.
    - Tighten the Screws from 45 to 50 in. lbs (5.1 - 5.7 Nm) in a crisscross pattern.

26. Install Slide Valve (**22**) onto the Valve Seat.

    *IMPORTANT: Make sure the drain hole on Plungers (**9**) and the smaller diameter on Shuttle (**23**) point downward. See **Figure 2**.*

27. Install one Toggle (**10**) and Plunger (**9**) to Shuttle (**23**).
    - Install the assembly into the Head Assembly.

### Head Assembly Caps

28. Place each Cap (**15**) vertically in a soft-jaw vise.

29. Install Spring (**14**) and Washer (**13**) into each Cap.
    - Make sure the Washer centers and seats properly.

30. Screw Cylinder (**12**) into each Cap.
    - Use a drift and a small hammer.

    *IMPORTANT: Temporarily install the remaining Plunger into each Cap. Press down on the Plunger to ensure the Washer is seated properly. If the Spring does not move, remove the Cylinder and reinstall the Washer.*

31. Install Springs (**11**) into each Cap.

### Head Assembly (Continued)

32. Install the remaining Toggle and Plunger to the Shuttle.

33. Install Gaskets (**8**) into the Head Assembly.

34. Screw each Cap assembly loosely into the Head Assembly.
    - Make sure Springs (**11**) align with the Plunger.

35. Install and seat the Head Assembly assembly onto Tie Rods (**32**) and Cylinder (**41**).
    - Make sure the Shuttle aligns with the Trip Rod and Tube (**43**).

36. Screw Nuts (**5**) onto the Tie Rods.
    • Tighten the Nuts securely in a crisscross pattern.

37. Lift the Shuttle upward and hold the Trip Rod with an open-end wrench (grip earlier model Trip Rod with a 5/32 " allen wrench).

38. Screw Nut (**4**) onto the Trip Rod (with Loctite 242) and tighten from 17-20 ft. lbs. (23 - 27 Nm).
    • Follow the thread sealant manufacturer's recommendations.

39. Measure the depth the Nut extends beyond the Trip Rod. The measurement must be 1-5/16 " (33.3 mm). See **Figure 4**.

    **NOTE**: Check to ensure the Toggles are centered in the Shuttle prior to securing the Caps into the Head Assembly.

40. Tighten each Cap assembly into the Head Assembly.
    • Tighten sufficiently to properly crush Gaskets (**8**).

41. Install Setscrews (**6**) that secure the Caps to the Head Assembly.
    • Tighten the Setscrews securely.

42. Install O-Ring (**24**) onto Air Inlet (**25**).

43. Install the Air Inlet into the Head Assembly.
    • Make sure the O-Ring seats properly.

44. Install Screws (**26**) that secure the Air Inlet to the Head Assembly.
    • Tighten the Screws securely in a crisscross pattern.

45. Install O-Ring (**3**) onto Plug (**2**).

46. Screw the Plug into the Head Assembly.
    • Tighten the Plug securely.

47. Install Plug (**1**) into Plug (**2**).
    • Use Teflon tape and tighten the Plug securely.

48. Install and secure Plug (**7**) into the Head Assembly.

    **NOTE**: For assembly procedures of the components in the base of the air motor, refer to the Pump **SER Service Guide** for details.

## Motor Operation

### Bench Test

Apply 10 psi (0.7 Bar) air pressure to the motor.
• The motor should cycle.

If the motor does not cycle, refer to the **Troubleshooting Chart** for details.

## Connection

### Connect Pump to Motor (Non-Divorced)

49. Clamp the Air Motor vertically in a soft-jaw vise.

50. Pull on the Pump Tube to expose the Coupling as necessary.

**CAUTION**

**Support the Pump Tube assembly during installation. Damage to components can occur.**

51. Screw the Coupling into the air motor Piston Rod.
    • Rotate the entire Pump Tube assembly.

52. Install the upper Spring Clip that secures the air motor Rod to the Coupling.

53. Screw the Pump Tube into the Air Motor.

54. Tighten the Jam Nut that secures the Pump Tube assembly to the Air Motor assembly.

### Connect Motor to Pump (Divorced)

55. Clamp the Pump in a soft-jaw vise.

56. Screw the Coupling into the pump tube Piston Rod.
    • Rotate the entire Air Motor assembly.

57. Install the Spring Clip that secures the Pump Tube Rod to the Coupling.

58. Install Screws (**52**), Lockwashers (**51**), and Nuts (**50**) that secure the Pump to the Air Motor Housing.
    • Tighten the Screws securely.

## Pump Operation

### Bench Test and Prime

With air pressure at zero:

1. Place the pump in the product to be dispensed.

   **NOTE**: Do not allow the pressure to exceed 50 psi (3.4 Bars).

2. Slowly supply air pressure to the pump's motor.

3. Allow the pump to cycle slowly until the system and product is free of air.

If the pump assembly does not prime, refer to the **Troubleshooting Chart** for details.

Stall Test

**WARNING**

**Should leakage occur anywhere within the system, disconnect air to the motor. Personal injury can occur.**

With air pressure at zero:

4. Attach a control valve to the outlet hose of the pump.
5. Set the air pressure to 100 psi (6.9 Bar).
6. Operate the control valve into a container.
7. Allow the pump to cycle until the system and product is once again free of air.
8. Shut off the control valve.
   - The pump should not cycle.

If the pump cycles more than once or twice an hour, refer to the Pump **SER Service Guide** for details.

9. Check the motor for air leakage.

If the motor leaks, refer to the **Troubleshooting Chart** for details.

## Installation

Additional items that should be incorporated into the air piping system are listed in **Table 3**.

| Part Number | Description |
|---|---|
| 338862 | Moisture Separator/Regulator & Gauge Combination |
| 5608-2 | Moisture Separator |
| 7608-B | Regulator and Gauge |
| 5908-2 | Lubricator * |

**Table 3** *Air Line Components*

* Although the air motor is lubricated at the factory, the life of the motor can be extended with the use of a lubricator.

# Troubleshooting Chart

| Indications | Possible Problems | Solution |
|---|---|---|
| Air Motor and/or Pump does not cycle | 1. Insufficient air pressure<br>2. Pump tube jammed and/or contains loose components | 1. Increase air pressure<br>2. Rebuild pump tube |
| **Pump Assembly** | | |
| Pump will not prime | 1. Excessive cycling speed<br>2. Air leak before pump tube<br>3. Pump leaking internally | 1. Reduce air pressure<br>2. Tighten connection<br>3. See Pump **SER Service Guide** |
| Pump cycles rapidly | Product source empty | Replenish product and inspect Air Motor |
| **Air Motor** | | |
| **External Leaks** | | |
| Air leakage at top or bottom of Cylinder (**41**) | 1. Worn or damaged O-Rings (**28**)<br>2. Worn or damaged Cylinder (**41**) | 1. Replace O-Rings (**28**)<br>2. Replace Cylinder (**41**) |
| Air leakage at Tube (**43**) | 1. Worn or damaged O-Rings (**42**)<br>2. Worn or damaged Tube (**43**) | 1. Replace O-Rings (**42**)<br>2. Replace Tube (**43**) |
| Air leakage at Plug (**2**) | 1. Worn or damaged O-Ring (**3**)<br>2. Initial tightening of Plug (**2**) to Head Assembly (**27**) not sufficient | 1. Replace O-Ring (**3**)<br>2. Tighten Plug (**2**) to Head Assembly (**27**) |
| Air leakage at Plug (**1**) | Initial tightening of Plug (**1**) to Plug (**2**) not sufficient and/or improper or no sealant | Apply Teflon Tape to Plug (**1**) and tighten |
| Air leakage at Air Inlet (**25**) | 1. Worn or damaged O-Ring (**42**)<br>2. Initial tightening of Screws (**26**) to Head Assembly (**27**) not sufficient | 1. Replace O-Ring (**42**)<br>2. Tighten Screws (**26**) |
| Air leakage at Cap (**15**) | 1. Initial tightening of Cap (**15**) to Head Assembly (**27**) not sufficient<br>2. Damaged Gasket (**8**) | 1. Tighten Cap (**15**) to Head Assembly (**27**)<br>2. Replace Gasket (**8**) |
| Air leakage at Packing Retainer (**48**) | 1. Worn or damaged V-Packing (**48**)<br>2. Worn or damaged O-Ring (**49**)<br>3. Initial tightening of Screws (**46**) to Air Motor Base (**44**) not sufficient | 1. Replace V-Packing (**48**)<br>2. Replace O-Ring (**49**)<br>3. Tighten Screws (**46**) |
| **Internal Leaks** | | |
| Air leakage felt at Exhaust | 1. Worn or damaged V-Packing (**29**)<br>2. Worn or damaged Packing (**37**)<br>3. Damaged Gasket (**16**)<br>4. Worn or damaged Valve Slide (**22**)<br>5. Worn or damaged Valve Seat (**17**)<br>6. Worn or damaged O-Ring (**35**)<br>7. Initial tightening of Piston Retainer (**34**) to Piston Rod (**40**) improper and/or not sufficient | 1. Disassemble air motor, clean, inspect, and replace worn or damaged components.<br>2. Screw and seat Piston Retainer (**34**) onto Piston Rod (**40**). Screw and seat Piston Nut (**38**) into the Piston Retainer. |

**Changes Since Last Printing**

Made Pump SER responsible for Air Motor's Max. Air Pressure Specification