

**393496-1 Kit Contents**

Part No.	Description	Qty.
51017	Aluminum Gasket, 13/16" I.D. x 15/16" O.D.	1
171000-14	"O" Ring, 3/4" I.D. x 15/16" O.D.	2
171003-11	"O" Ring, 2-7/8" I.D. x 3-1/8" O.D.	1
171006-15	Steel Retaining Ring, 7/8" Diameter (Internal)	1
171009-19	"O" Ring, 15/16" I.D. x 1-1/8" O.D.	2
171009-29	"O" Ring, 1-9/16" I.D. x 1-3/4" O.D.	1
171013-12	"O" Ring, 1-1/8" I.D. x 1-1/4" O.D.	2
171636	Hex-Head Cap Screw, 10-32 x 3/8" Long	4
■ 172190-2	Seal, 7/16" I.D. x 13/16" O.D.	1
■ 172190-3	Seal, 7/16" I.D. x 11/16" O.D.	1
■ 172190-11	Seal, 7/16" I.D. x 15/16" O.D.	1
314670	Block "V" Packing, 3/4" O.D.	1
314671	Leather Washer, 3/4" O.D.	1
317524	Spring, 1-7/16" Long - 14 Coils	2
▲ 320726	Slide Valve, 45/64" x 1/2"	1
▲ 320730	Valve Seat, 1" O.D.	1
▲ 320731	Gasket, 1" O.D. (Rubber-Coated Fabric)	1
320736	Shuttle (Steel)	1
320737	Toggle (Steel)	2
320971	Pin, 5/64" Diameter x 5/8" Long	1
321082	Packing, 3-1/32" O.D. (Rubber)	1
321457	Plunger, 9/16" O.D. (Steel)	2
321458	Gasket, 1" O.D. (Alclad Aluminum)	2
330842	Valve Retaining Spring (Beryllium Copper)	1
330843	Valve Retainer, 1-11/16" O.D. (Spring Steel)	1
337093	Ring, 1-1/8" O.D. (Zinc-Plated Steel)	1
337096	Adapter, 1-7/64" O.D. (Brass)	1
337097	Back-up Ring, 1-7/64" O.D. (Nylon)	1
337142	Protective Sleeve, 7/16" I.D. (PVC Tubing)	1
337386	Lantern Ring, 15/16" O.D. (Brass)	1
337394	Washer, 7/16" I.D. x 15/16" O.D. (Steel)	1

▲ Comprises 398439

■ These parts can be purchased separately only in packs of five for minor repairs.  
Order replacement seal kit 393530-2, 393530-3 or 393530-11 (Five each of 172190-2, 172190-3 or 172190-11 respectively).

**DESCRIPTION**

**SERVICE**

Major Repair Kit 393496-1 contains all the necessary parts to complete a major overhaul of all models of Series 324400 Air Motors.

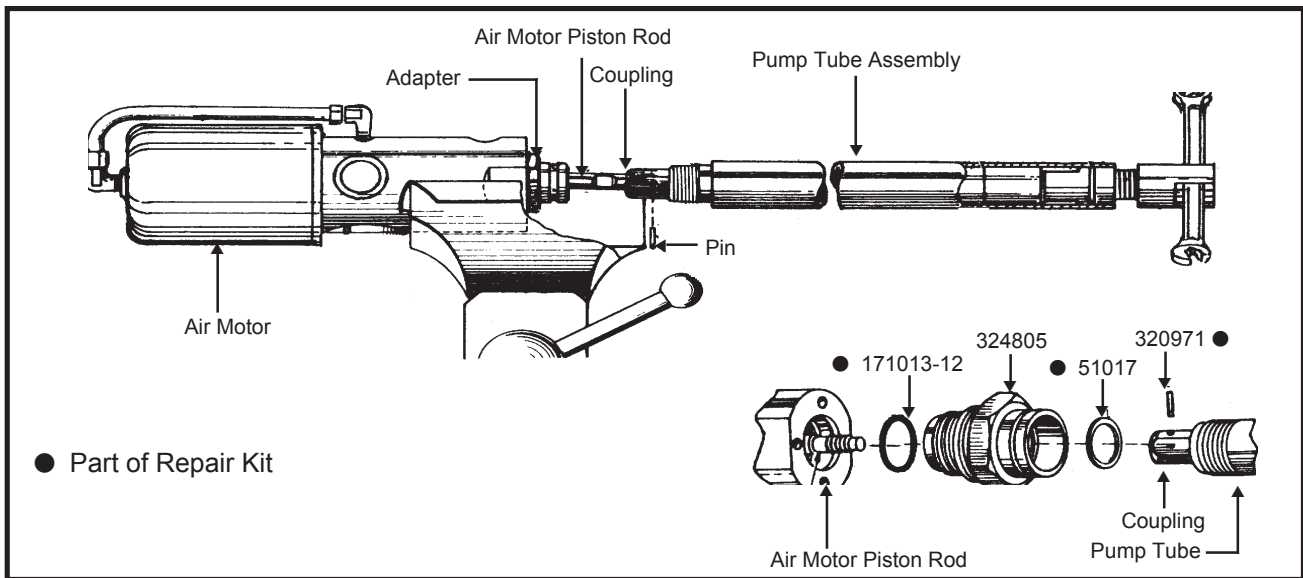
**SEPARATE AIR MOTOR FROM PUMP TUBE:**  
(Figure 1)

**NOTE:** The following instructions for separating air motor from pump tube are to be considered typical and may not be complete for any one particular

FOR FURTHER SERVICE, CONTACT YOUR LOCAL ALEMITE DISTRIBUTION CENTER



Alemite, LLC  
167 Roweland Drive, Johnson City, Tennessee 37601  
www.alemite.com



**Figure 1: Disengaging Air Motor From Tube Rod Assembly**

pump. Refer to instructions supplied with model for further information.

**CAUTION:** Before beginning service or attempting disassembly of any part of unit, shut off air supply, reduce material pressure to zero, disconnect air and material supply lines and remove pump assembly from container or system.

1. Unscrew pump tube assembly from adapter and pull away to expose coupling.
2. Drive out pin using punch of appropriate size. DO NOT lose pin.
3. Unscrew coupling from air motor piston rod. Remove gasket 51017 from adapter.

**DISASSEMBLY OF AIR MOTOR**  
(Figures 2 & 4)

1. Separate the air motor from the pump tube using the following procedure.
2. Unscrew nuts 328301-5 and remove tube 331244 with sleeves 328302-5 and nuts 328301-5.
3. Carefully remove cylinder 331843-4 and "O" ring 171003-11 from adapter 321087.

**NOTE:** Removal of cylinder is often aided by first tapping the cylinder gently at its threaded end with a non-metal mallet. DO NOT use any tool or method to unscrew cylinder which may cause it to become distorted or out-of-round. Use a strap wrench at the top of the cylinder if removal is difficult.

4. Hold spacer 320749 at its upper flats and unscrew piston nut 321086. Remove packing 321082 with two guide plates 131618.
5. Hold piston rod 320746 at its bottom flats and unscrew spacer 320749 from the piston rod.
6. Pull piston rod down and out of air-motor base 327239 or 337387.
7. Unscrew inlet body 320727. Remove "O" ring 171009-29.
8. Unscrew two toggle caps 320724 or 337471. Remove springs 317524 and "O" rings 171000-14 or gaskets 321458.
9. Slide plungers 321457 and toggles 320737 out of shuttle 320736 and remove shuttle.
10. Through the air-inlet body opening, unscrew four screws 171636. Lift out valve retaining spring 330842, slide valve 320726, valve retainer 330843, valve seat 320730, and gasket 320731.
11. From inside of packing nut at top of the air motor base, remove retaining ring 171006-15, brass washer 320748, leather washer 314671 and block "V" packing 314670.

**NOTE:** Packing nut 320745 is staked in place and should not be removed unless damaged. If ring is damaged, order either the packing nut 320745 or the entire air-motor base assembly 393533 (See Figure 2a).

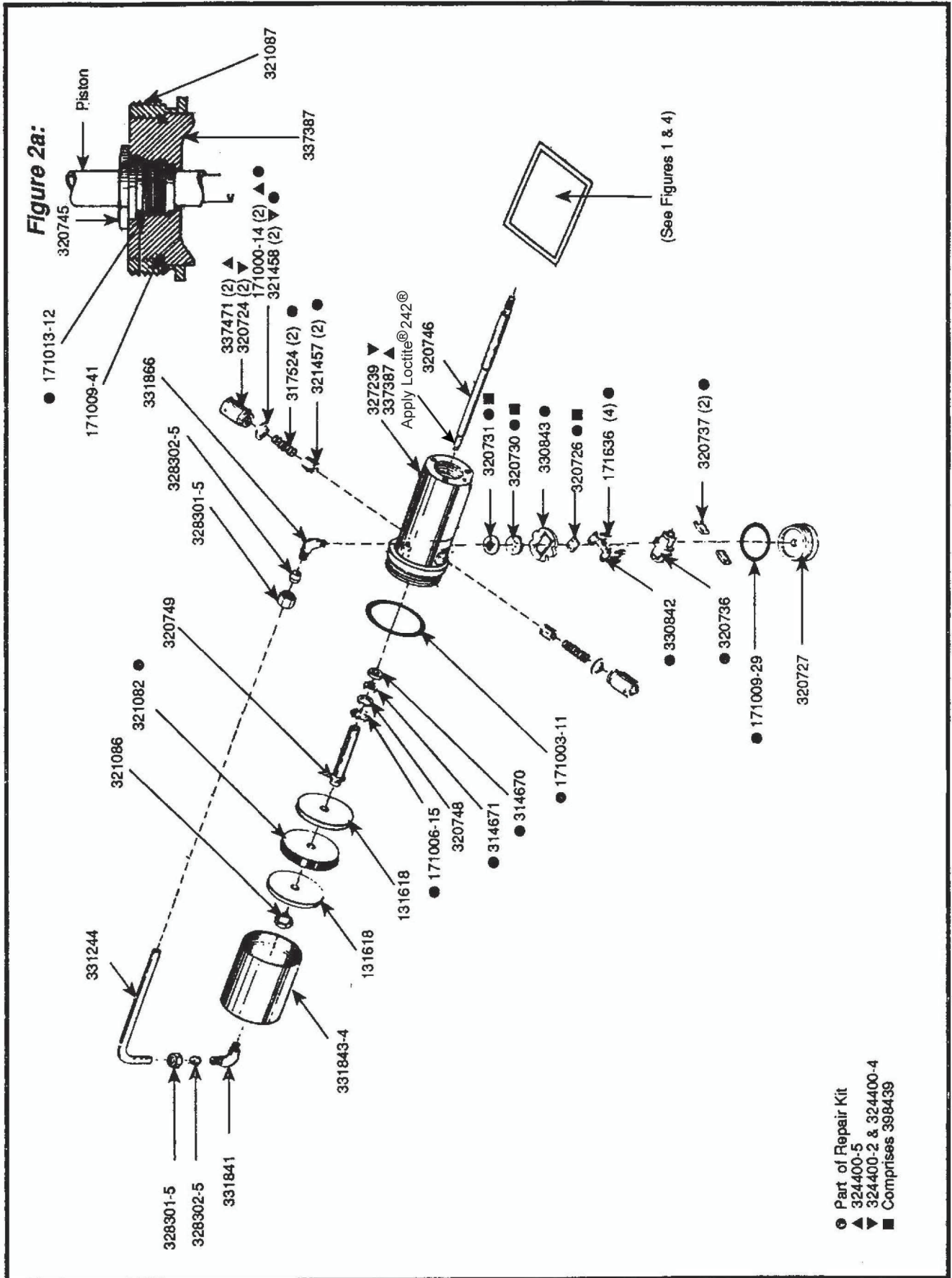


Figure 2: Air Motor Assembly

12. If an adapter is fitted between the pump tube and the air motor base, it must be removed along with "O" ring 171013-12.

13a. Model 324400-2 and Early Model 324400-4:

Remove five packings 320739, lantern ring 321218 and two washers 320742 from the air-motor base. (See Figure 4a).

**NOTE:** These items are no longer available as replacement parts.

13b. Late Model 324400-4:

Remove seal 172190-2, adapter 337096, "O" ring 171009-19, back-up ring 337097, seal 172190-3, ring 337093 and second "O" ring 171009-19 from the air-motor base. (See Figure 4b).

13c. Model 324400-5:

Remove washer 337394, seal 172190-11, lantern ring 337386 and seal 172190-3 from the air-motor base. (See Figure 4c).

14. Clean all parts and inspect for wear or damage.

**CAUTION:** Worn or damaged parts present a threat to personnel and property. REPLACE any worn or damaged parts. If using repair kit, use all replacement parts in kit.

### REASSEMBLY OF AIR MOTOR

**NOTE:** Before reassembling air motor, lubricate the following parts:

- Lubricate all "O" rings, seals and packings with oil.
- Brush a coat of grease containing molybdenum (moly) in toggle sockets of shuttle 320736 and plungers 321457, inside bore of shuttle, outside diameter of plungers, and on slide valve 320726.
- Dip gasket 320731 and springs 317524 in a mixture of 3 parts (Fiske) Lubriplate #8 to 1 part N.L.G.I. #1 Calcium Base (Viscous "H") Lubricant. Use this mixture in step 10 also.
- Soak leather washer 314671 in SAE No. 30 Oil for a minimum of eight hours.

1. Position block "V" packing 314670, leather washer

314671 and brass washer 320748 into packing nut and secure with retaining ring 171006-15.

**NOTE:** Open end of "V" from block "V" packing 314670 must face bottom of air motor base.

2. Place gasket 320731, valve seat 320730, valve retainer 330843, slide valve 320726 and valve retaining spring 330842 into air motor base. Secure with four screws 171636.

**NOTE:** Tighten screws 171636 evenly, then torque alternately (criss-cross) to 25-30 inch lbs. Retorque to insure same torque on all screws. Valve should move from one position to the other with a force of 12 to 14 ozs. Force must be applied in same direction as shuttle applies force in normal operation. Adjust spring to meet load, if necessary.

3. Position shuttle 320736 in the air-inlet body opening base. The end of the shuttle with larger opening must face top of the air motor, and the flat side must be facing valve retaining spring 330842.

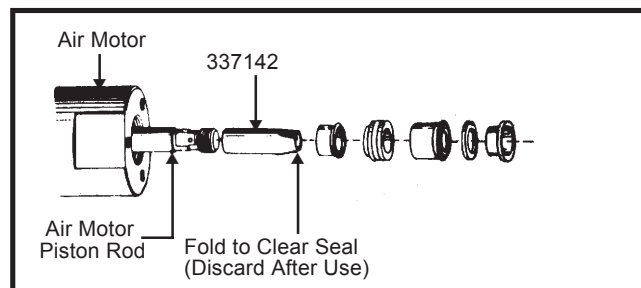
4. Holding one toggle 320737 with pliers, insert it through the toggle-cap opening in side of air motor base and slide it into socket in shuttle 320736. Repeat for the other toggle.

5. Insert piston rod 320746 into lower end of air motor base and through shuttle and packing nut.

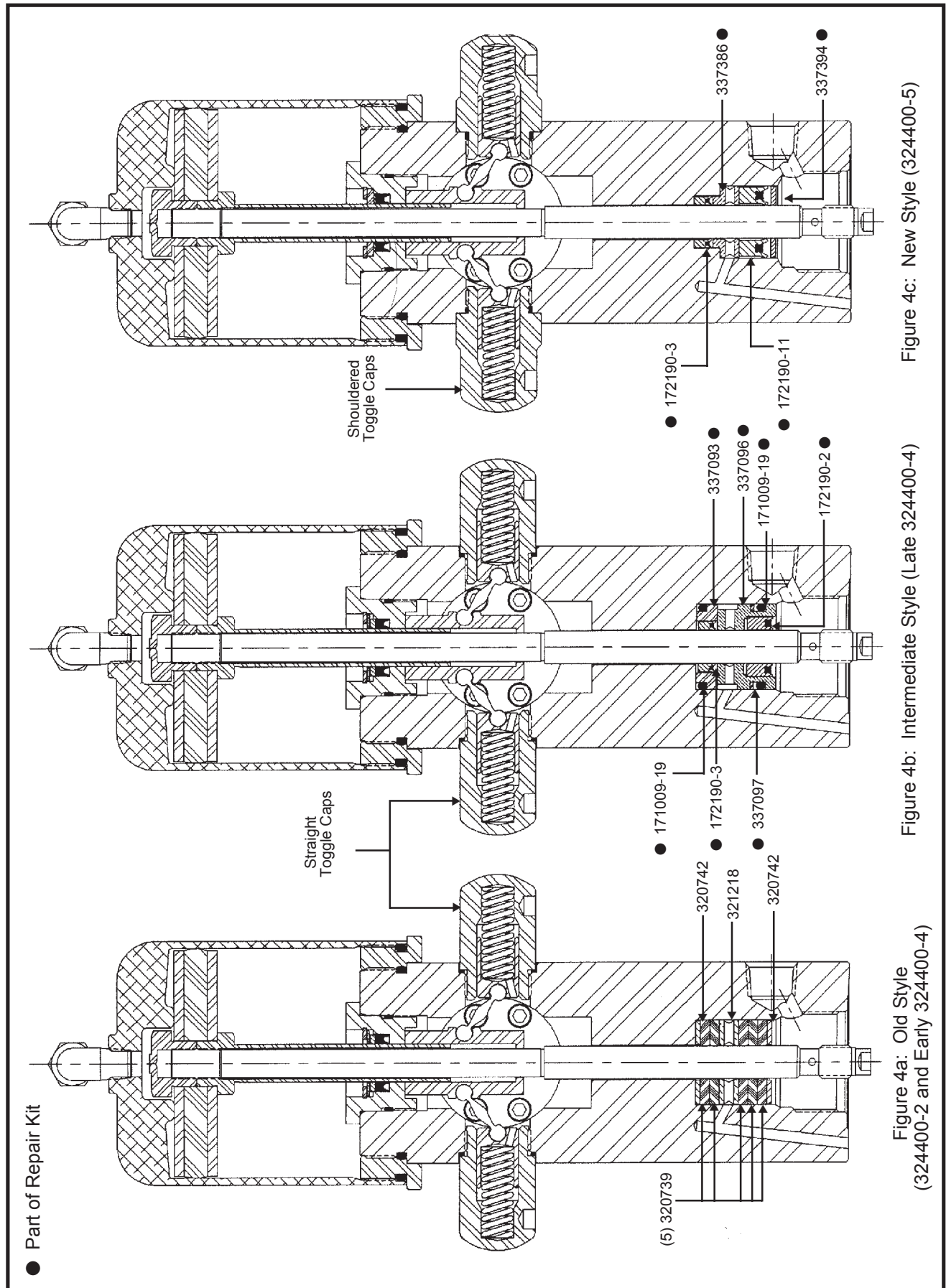
**CAUTION:** Never insert the seals into the air motor base before piston rod 320746. If this is done, the rod will cut the seals when it is inserted and the pump will leak from the air-motor base.

6. Apply Loctite<sup>®</sup> 242<sup>®</sup> to the threads at the top of the top of the piston rod and slide spacer 320749 over piston rod end. Feed it through packing in the upper end of the shuttle. Hold the piston rod at the bottom flats and screw the spacer onto the piston rod as far as it will go .

7. Place washer 131618, packing 321082 and then



**Figure 3:** Installation of Seals using the protective sleeve.



**Figure 4: Different Styles of Series 324400 Air Motors**

Loctite and 242 are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

second washer 131618 onto piston rod and spacer.

8. Screw piston nut 321086 onto piston rod. Torque to 10 ft.-lbs. Rotate spacer counter-clockwise until it is secure against the piston nut. Torque to 20 ft.-lbs.

9. Install plungers 321457 onto toggles with the drain holes on the bottom. Insert springs 317524 into the plungers and slide gaskets 321458 or "O" rings 171000-14 over the ends of toggle caps 320724 or 337471. Screw toggle caps into place by hand.

**NOTE:** Care must be exercised when screwing toggle caps into place. If toggle is not centered when cap is tightened, applying force will break toggle. If difficulty is encountered while tightening toggle caps by hand, loosen toggle cap, reposition toggle and retighten cap. Final tightening of cap should be done carefully.

10. Pack approximately 1/4 oz. of lubricant mixture (See step c on page 4) into the air-motor valve cavity. Install "O" ring 171009-29 onto air inlet body 320727. Install air inlet body to air motor base.

11. Position "O" ring 171003-11 onto air-motor base and screw cylinder 331843-4 onto air motor.

12a. Model 324400-2 and Early Model 324400-4: (Figure 4a)

**NOTE:** If any of these lower base seals in the air motor need to be replaced, the parts in this kit must be used. Although the seals are different from those in the late Model 324400-4, the air motor bases of both models are identical, so the replacement parts from this repair kit can be used. Follow the procedure outlined in section 12b for this replacement. Discard all of the old components, including the washers.

12b. Late Model 324400-4: (Figures 3 & 4b)

- a. Insert "O" ring 171009-19 and ring 337093 into air-motor base.
- b. Install protective sleeve 337142 (from kit) on end of piston rod 320746 to cover the threads.
- c. Apply a thin coat of Alemite Viscous "H" Lubricant or equivalent on the protective sleeve, the piston rod and seals 172190-2 and 172190-3.

**IMPORTANT:** Protective sleeve 337142 and Alemite Viscous "H" Lubricant or equivalent must be used in order to protect seals 172190-2 and 172190-3 against damage from the threads on the piston rod.

- d. Slide small seal 172190-3 over the sleeve and into ring 337093. The lips of the seal must be facing out. Remove the sleeve.
- e. Install back-up ring 337097 and second "O" ring 171009-19 in the groove of adapter 337096. Apply a thin coat of Viscous "H" Lubricant on the adapter and then install this completed assembly in the air-motor base.
- f. Replace the protective sleeve on the threads of the piston rod and relubricate the sleeve and rod. Install large seal 172190-2 over the sleeve into adapter 337096 with the lips facing out. Remove the sleeve.

12c. Model 324400-5: (Figures 3 & 4c)

- a. Install protective sleeve 337142 (from kit) on end of piston rod 320746 to cover the threads. Apply a thin coat of Alemite Viscous "H" Lubricant or equivalent on the protective sleeve, the piston rod and seals 172190-3 and 172190-11.

**IMPORTANT:** Protective sleeve 337142 and Alemite Viscous "H" Lubricant or equivalent must be used in order to protect seals 172190-3 and 172190-11 against damage from the threads on the piston rod.

- b. Slide seal 172190-3 over the sleeve and into the air-motor base. The lips of the seal must be facing out. Remove the sleeve.
- c. Slide lantern ring 337386 into the air-motor base. Replace the sleeve on the threads piston rod and relubricate sleeve and rod.
- d. Install seal 172190-11 with the lips facing out. Remove the sleeve. Install washer 337394.

13. Install "O" ring 171013-12 on the adapter and install adapter to the air-motor base.

14. Reconnect tube 331244 and tighten nuts 328301-5.

**CHANGES SINCE LAST PRINTING**

Added trademark attribution