Service Guide

7786-A5
7786-C
7786-MA

High-Pressure Grease Pump

Description

The major components of the pump models in the 7786 series consist of an air-operated motor and a pump tube. The air motor connects directly to the double-acting reciprocating pump tube.

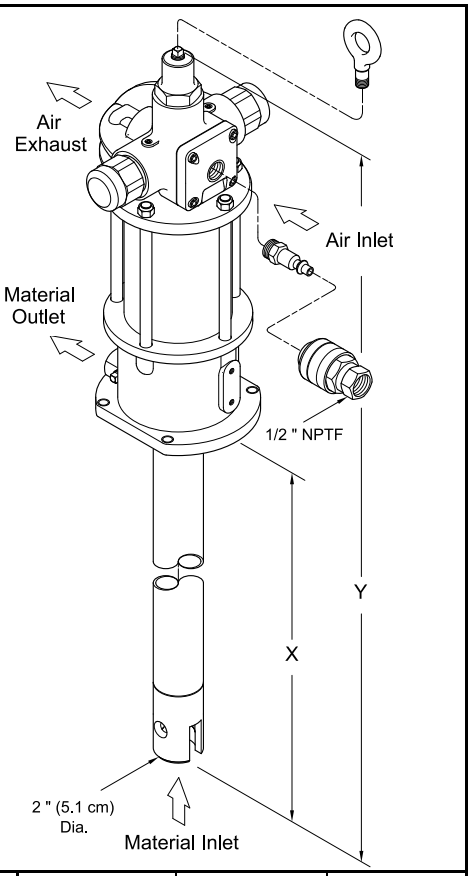
These high-pressure non-divorced grease pumps (75:1 ratio) are designed to deliver a range of greases (up to NLGI # 3) and operate directly from their original drums or bulk containers*.

Models 7786 Series Comparison

Each pump model is designed with a pump tube length to accommodate different size containers. See **Figure 1**.

Model 7786-MA is equipped with an air inlet and a material outlet adapter with BSPP threads. See **Table 1**.

* Pump model 7786-A5 is operated in various type systems, Refer to the section entitled **Alternate Installation** (Page 12) for details.



Pump Model	Container Size		X		Y	
	lbs	kg	Inches	Cm	Inches	Cm
7786-A5	400	-	33-1/8	84	52-1/4	133
7786-MA *	-	180				
7786-C	120	-	25-5/8	65	44-3/4	114
* With BSPP Inlet and Outlet Adapters (See **Table 1**)						

Figure 1 *High-Pressure Pump Model 7786 Series Model 7786-A5 Shown*

Specifications

Air Motor

Pump Model	Air Inlet		Max. Air Pressure	
	Body	Adapter	psi	bar
7786-A5, -C	3/4" NPTF	Not Applicable	100	6.9
7786-MA		3/4" BSPP (f) x 3/4" NPTF (m)		
For additional specifications, refer to Service Guide SER **323440-4**				

Pump Tube

Pump Model	Material Outlet Adapter	Max. Material Pressure		Delivery/Min. (Approximate) **		Displacement per Cycle	
		psi	bar	lbs.	kg	in^3	cm^3
7786-A5 and 7786-C	1/2 " NPTF (f) x 1/2 " NPTF (m)	7500	517	12.5	5.7	1.36	22.3
7786-MA	1/2 " BSPP (f) x 1/2 " NPTF (m)						
** For detailed information, refer to **Figure 3**							

Table 1 *High-Pressure Pump Model 7786 Series Specifications*

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

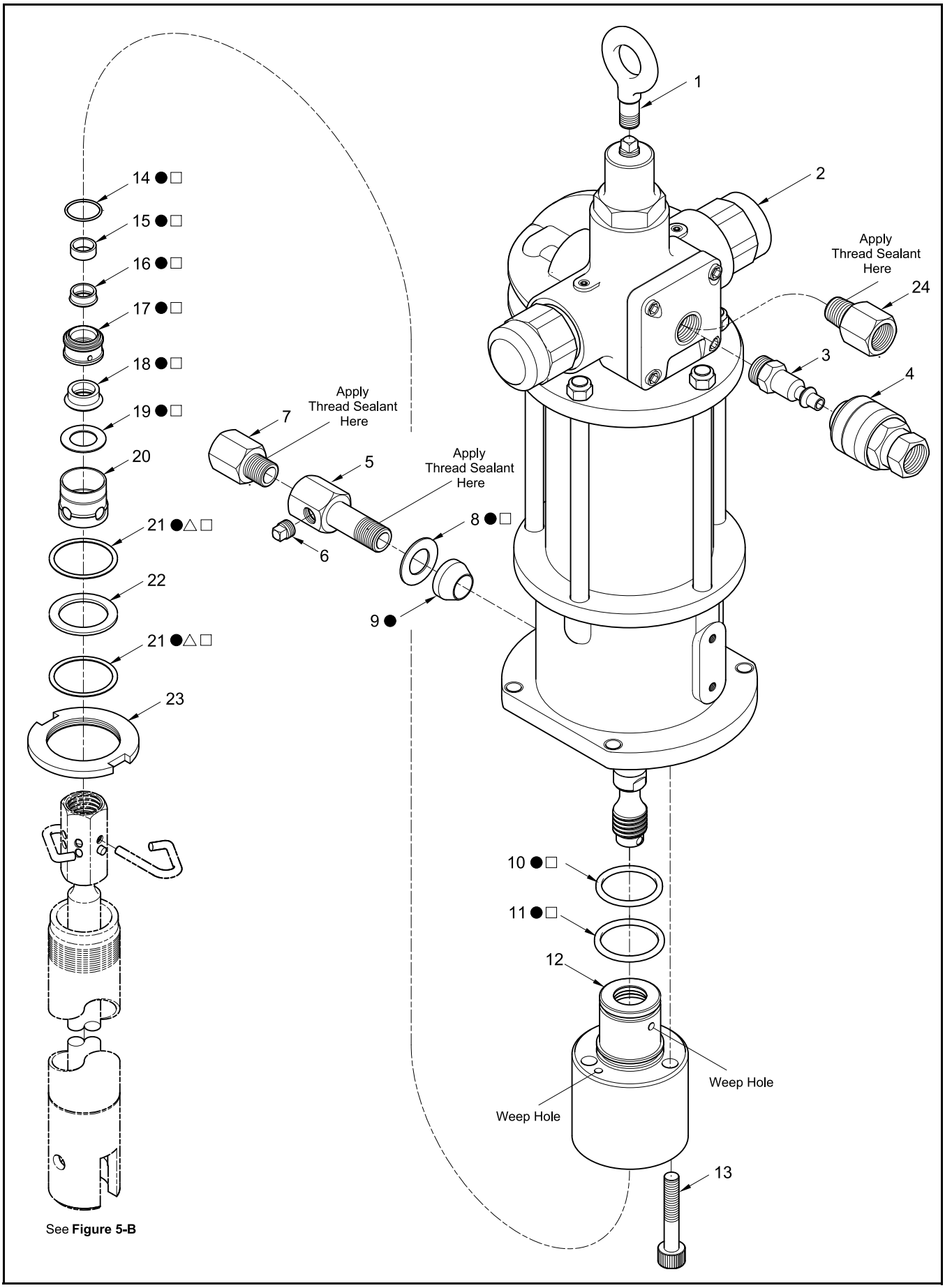


Figure 2-A *High-Pressure Grease Pump Model 7786 Series - Exploded View*

Item No.	Part No.	Description	Qty	Notes		Numeric Order Part # (Item #)
1	323842	Bolt, Eye, 3/8 " NPTF (m)	1			10522 (6)
2		Motor Assembly, Air	1		See SER **323440-4**	*171009-13* (14)
3	328037	Connector, 3/4 " NPTF (m)	1		Model 7786-A5, -C	171009-33 (10)
4	328031	Coupler Air, 1/2 " NPTF (f)	1			171009-35 (11)
5	327706	Adapter, 1/2 " NPTF (f)	1			*172190-5* (16)
6	10522	Plug, Pipe, 1/4 " NPTF (m)	1			*172190-6* (18)
7	340120	Adapter, 1/2 " BSPP (f) x 1/2 " NPTF (m)	1		Model 7786-MA	323419 (8)
8	323419	Washer, 1.29 " OD	1	● □		*323440-4* (2)
9	324274	Bushing (Rubber)	1	●		323693 (21)
10	X171009-33	O-Ring, 1-13/16" ID x 2 " OD	1	● □	Pack of Ten (10)	323786 (12)
11	X171009-35	O-Ring, 1-15/16" ID x 2-1/8 " OD	1	● □		323787 (13)
12	323786	Body	1			323842 (1)
13	323787	Screw, Cap, Socket Head, 1/2 " - 13	3			324274 (9)
14		O-Ring, 1-3/16" ID x 1-5/16 " OD	1	● □		327706 (5)
15		Spacer	1	● □		328031 (4)
16		Seal, 0.812 " ID x 1.062 " OD	1	● □		328037 (3)
17		Ring, Lantern (Brass)	1	● □		332465 (22)
18		Seal, 0.812 " ID x 1.562 " OD	1	● □		332466 (20)
19	337361	Washer, 1.55 " OD	1	● □		333256 (23)
20	332466	Spacer	1			337361 (19)
21	323693	Gasket (Aluminum)	2	● □ △		*337362* (17)
22	332465	Washer, 1.93 " OD	1			*337363* (15)
23	333256	Nut, Jam, 2.00 - 16 UN - 2B	1			340120 (7)
24	340122	Adapter, 3/4 " BSPP (f) x 3/4 " NPTF (m)	1		Model 7786-MA	340122 (24)

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

Repair Kits

Part No.	Kit Symbol	Description	Notes
394747-1	●	Kit, Major Repair	Includes items on **Figure 2-A** and **2-B**
393040-1	□	Kit, Minor Repair (for Body and Seal Group)	
393623	△	Kit, Minor Repair (for Pump Tube Assembly)	Includes items on **Figure 2-A** and **2-B**
393530-5		Kit, Seal [includes five (5) of item number **16**]	
393530-6		Kit, Seal [includes five (5) of item number **18**]	

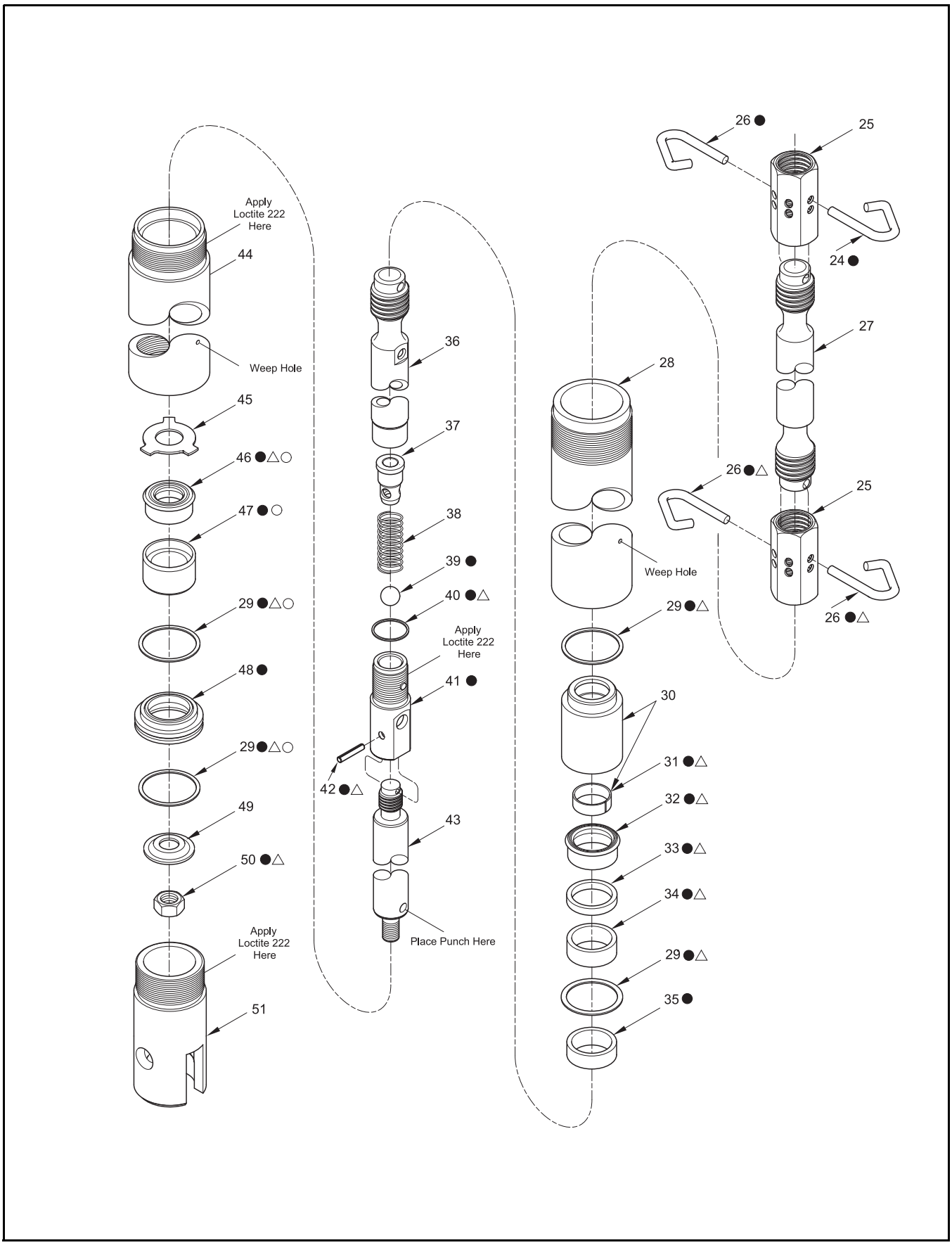


Figure 2-B *High-Pressure Grease Pump Model 7786 Series - Exploded View*

Item No.	Part No.	Description	Qty	Notes		Numeric Order Part #	(Item #)
25	323439	Coupling	2			18850	(50)
26	324648	Clip, Spring	4	●		46584	(40)
27	323438-22	Rod, Pump Tube, 13.25 " Long	1		Model 7786-A5, -MA	131402	(29)
	323438-23	Rod, Pump Tube, 5.75 " Long	1		Model 7786-C	131398-1	(48)
28	333257-1	Tube, Pump, 22.25 " Long	1		Model 7786-A5, MA	171032-8	(42)
	333257-3	Tube, Pump, 14.75 " Long	1		Model 7786-C	*172190-13*	(46)
29	131402	Gasket, 1.68 " OD (Aluminum)	4	● △ ○	Qty 2 in ○ Kit	*172190-14*	(32)
30	337461	Barrel Assembly	1		Includes Item 31	*172270-9*	(39)
31	337465	Ring, Wear (Glass-Reinforced Nylon)	1	● △		319763	(37)
32		Seal, 0.925 " ID x 1.300 " OD	1	● △		323438-22	(27)
33	337464	Ring, Back-Up	1	● △		323438-23	(27)
34	337463	Bearing (Brass)	1	● △		323439	(25)
35	337462	Spacer	1	●		323734	(49)
36	337466	Piston	1			323747-1	(44)
37	319763	Retainer	1			324648	(26)
38	327704	Spring, 1-1/2 " Long Straight	1			326852	(45)
39		Ball, 3/8 " Dia.	1	●		326856	(41)
40	46584	Gasket, 0.64 " OD (Aluminum)	1	● △		327704	(38)
41	326856	Adapter	1	●		333085	(51)
42	171032-8	Pin, Roll, 3/32 Dia. x 11/16 " Long	1	● △		333257-1	(28)
43	333343	Rod, Primer, 21/32 " Dia. x 7-3/16 "	1			333257-3	(28)
44	323747-1	Adapter	1			333343	(43)
45	326852	Washer, Guide	1			337461	(30)
46		Seal, 0.650 " ID x 0.990 " OD	1	● △ ○		337462	(35)
47		Body, Valve	1	● ○		337463	(34)
48	131398-1	Seat, Valve	1	●		337464	(33)
49	323734	Plate	1			337465	(31)
50	18850	Nut, Elastic Stop, 1/4 " - 28	1	● △		337466	(36)
51	333085	Body, Primer	1			*338422*	(47)

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

Repair Kits

Part No.	Kit Symbol	Description	Notes
394747-1	●	Kit, Major Repair	Includes items on **Figure 2-A** and **2-B**
393623	△	Kit, Minor Repair (for Pump Tube Assembly)	Includes items on **Figure 2-A** and **2-B**
394078	○	Kit, Minor Repair (for Lower Pump Tube Packing)	
393530-13		Kit, Seal [includes five (5) of item number **46**]	
393530-14		Kit, Seal [includes five (5) of item number **32**]	

Accessories

Model Number	Follower	Cover	Air Hose	Material Hose	Union	Bung Adapter	Muffler
7786-A5	338912	323847-4	317811-5	317882-7	321155	326750-B1	324170
7786-C	338804	323800-4					
7786-MA	-	-	-	-	-		

Table 2 *Model 7786 Series Accessories*

Performance Curves

A pump's ability to deliver material is based on the pressure (psi/bar) and quantity (cfm/lpm) of air supplied to the motor and the amount of material discharge [back] pressure to be overcome within the system.

This chart contains curves based on four different air pressures. The curves relate delivery in pounds (kilograms) per minute (X axis) to air consumption in cubic feet (liters) per minute (right Y axis) and to material discharge pressure in psi/bar (left Y axis).

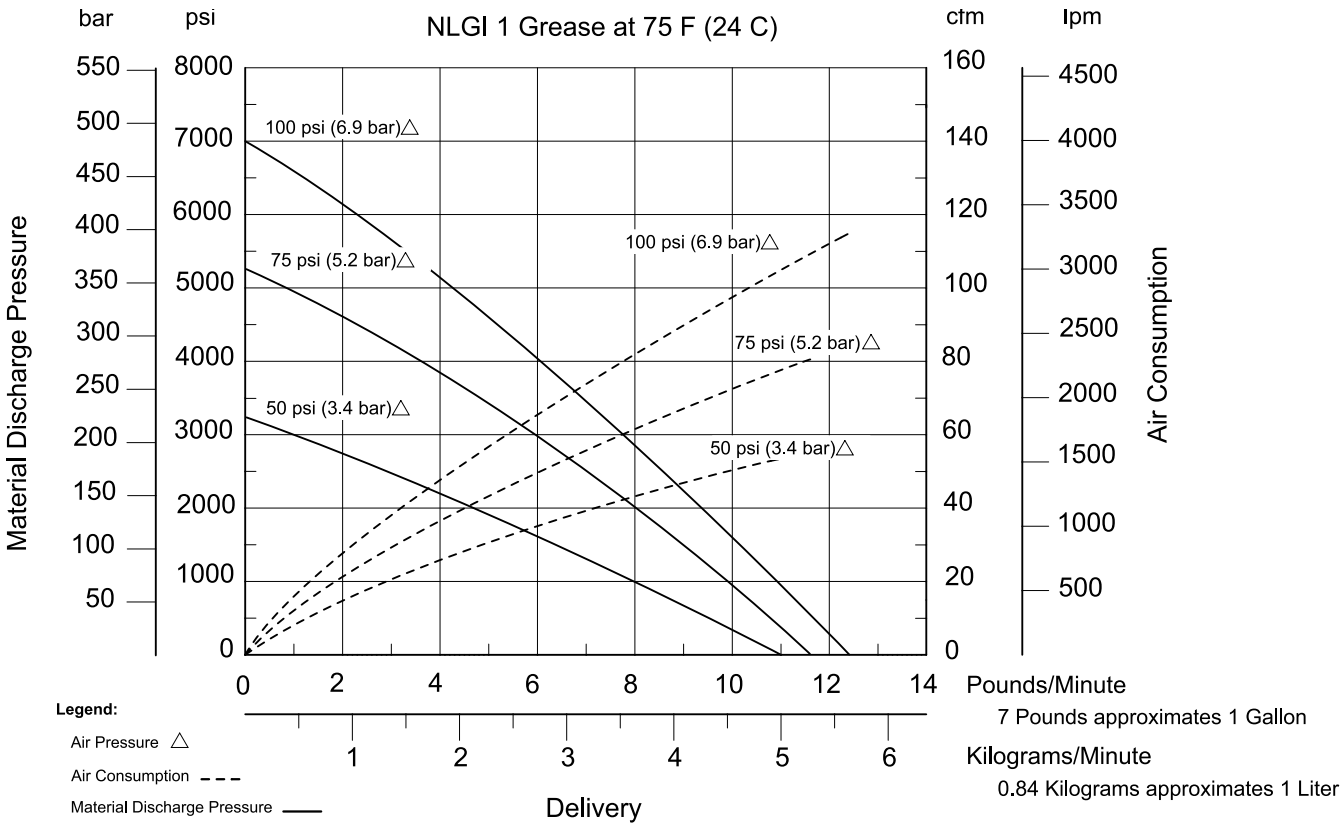
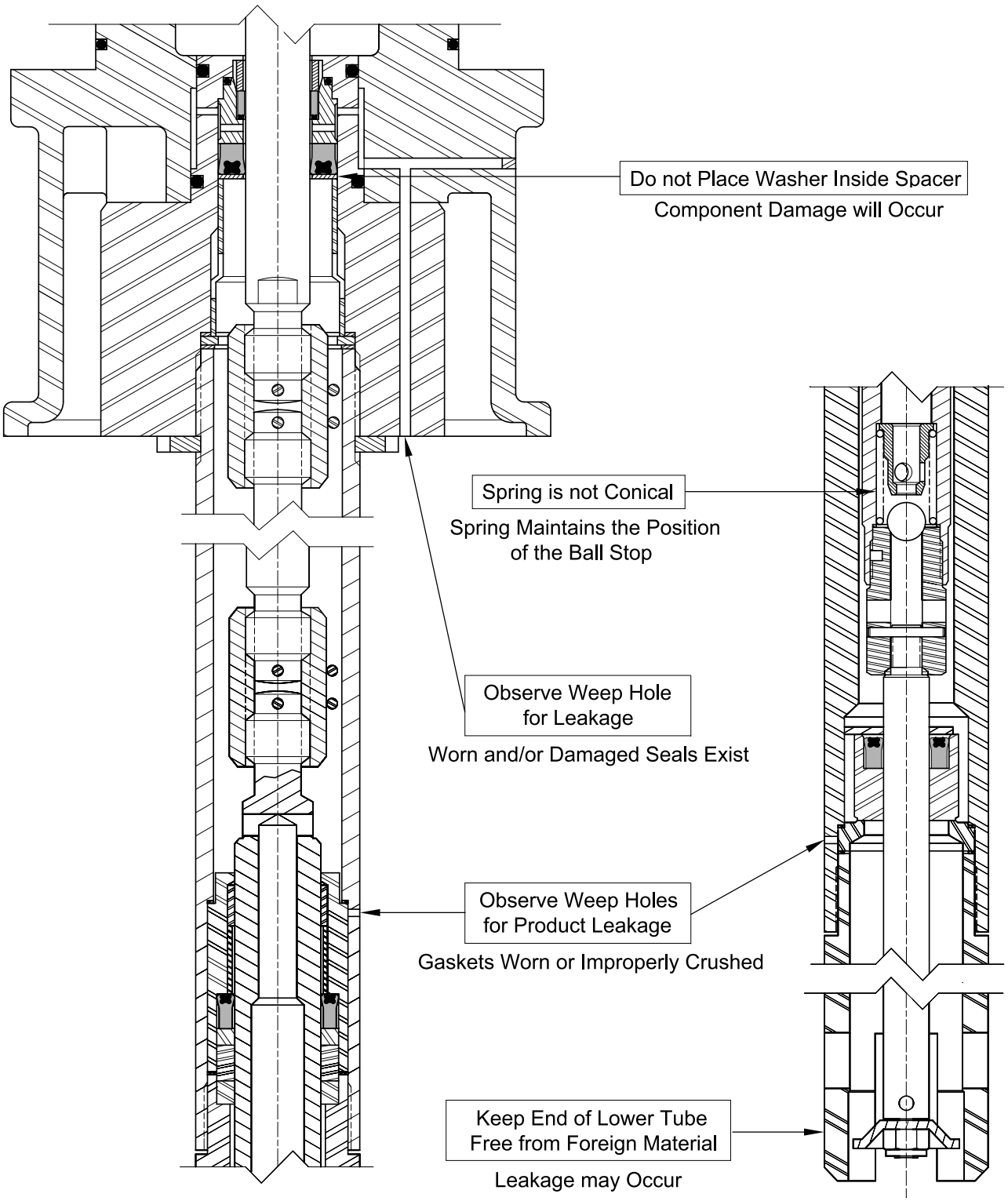


Figure 3 *Delivery versus Discharge Pressure and Air Consumption*

Service Hints

Refer to the Overhaul Procedures for Details



NOTE: Depiction of air motor base is typical

Overhaul

NOTE: Refer to **Figure 2-A** and **2-B** for component identification on all overhaul procedures.

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 trichloroethane in this pump. An explosion can result within an enclosed device capable of containing pressure when aluminum and/or zinc-plated parts in the pump 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 pump motor.**
- **Into an appropriate container, operate the 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.

Disassembly

Separate Pump Tube from Air Motor

1. Clamp the motor housing horizontally in a vise.
2. Loosen Jam Nut (**23**) that secures the Pump Tube assembly to Air Motor Assembly (**2**).

CAUTION

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

3. Unscrew Pump Tube (**28**) [with attached components] from the Air Motor.
4. Pull on the Pump Tube to expose Coupling (**25**).
5. Remove upper Spring Clip (**26**) that secures the Coupling to the air motor piston rod.
6. Unscrew the Coupling from the air motor piston rod.
   - Rotate the entire Pump Tube assembly.

Pump Tube Upper Packing

7. Unscrew Adapter (**5**) from the Air Motor Assembly.
8. Remove Washer (**8**) and rubber Bushing (**9**).
9. Unscrew Cap Screws (**13**) that secure Body (**12**) to the Air Motor.
   - Do not remove the Cap Screws from the Body.
10. Remove the Body from the Air Motor.
    - Use the Cap Screws as levers.
11. Position the Body on the bench with the larger diameter facing upward.
12. Remove aluminum Gasket (**21**), Washer (**22**), and additional Gasket (**21**) from the Body.
13. Remove Spacer (**20**), Washer (**19**), and Seal (**18**).
14. Remove Lantern Ring (**17**) with Seal (**16**), and Spacer (**15**).
    - Remove the Seal from the Lantern Ring.
15. Remove O-Ring (**14**), O-Ring (**10**), and O-Ring (**11**) from the Body.

Pump Tube

16. Clamp the pump tube assembly at Adapter (**44**) securely in a soft-jaw vise.
17. Unscrew and remove Pump Tube (**28**) from the Adapter.
18. Remove Spring Clips (**26**) that secure Pump Tube Rod (**27**) to upper and lower Couplings (**25**).
19. Unscrew the Rod from both Couplings.

    *IMPORTANT: Should the pump contain the obsolete piston (see **Figure 5**), and stall properly, certain parts within the major repair kit are discarded. If the new piston is required, order Barrel Assembly (**30**) and Piston (**36**) separately.*

20. Remove Spring Clip (**26**) that secures Piston (**36**) to lower Coupling (**25**).
21. Unscrew the Coupling from the Piston.
22. Remove Barrel Assembly (**30**) from the Piston.

23. Remove both aluminum Gaskets (**29**).

24. Remove brass Bearing (**34**), Back-Up Ring (**33**), and Seal (**32**) from the Barrel Assembly.

    NOTE: Inspect the inside diameter of nylon Wear Ring (**31**). Remove the Wear Ring if rough or worn.

25. Remove Spacer (**35**) from top of Adapter (**44**).

26. Unscrew Primer Body (**51**) from the Adapter.

27. Remove the Primer Rod (with attached components) from the bottom of the Adapter.

28. Remove Stop Nut (**50**) from Primer Rod (**43**).
    • Support the Primer Rod through the hole as needed.

29. Remove Plate (**49**), Gasket (**29**), Valve Seat (**48**), and additional Gasket (**29**) from the Primer Rod assembly.

CAUTION

Support the Piston and Primer Rod assembly during Roll Pin (42) removal. Damage to components can occur.

30. Remove Roll Pin (**42**) that secures Adapter and Insert Assembly (**41**) to Primer Rod (**43**).
    • Use a punch and a small hammer.

31. Unscrew Primer Rod from Adapter and Insert Assembly.

32. Remove Valve Body (**47**) [with Seal] and Guide Washer (**45**) from the upper end of the Primer Rod assembly.

33. Remove Seal (**46**) from the Valve Body.

34. Unscrew the Adapter (**41**) from Piston (**36**).

35. Remove aluminum Gasket (**40**), Ball (**39**), Spring (**38**), and Retainer (**37**) from the Piston.

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. Inspect Piston (**36**) and Primer Rod (**43**) closely. Use a magnifying glass to detect any score marks.
   • Replace as necessary.

4. Closely inspect the mating surfaces of all check valve components for any imperfections Ensure a smooth and clean contact is obtained when assembled.

Assembly

NOTE: Prior to assembly, certain components require lubrication in clean oil. Refer to **Table 4** for details.

Pump Tube Upper Packing

NOTE: Refer to **Figure 4** for a section view of the upper packing components.

1. Install O-Ring (**10**) and O-Ring (**11**) onto Body (**12**).

2. Position the Body with the large diameter upward.

3. Install O-Ring (**14**) into the Body.

4. Install Spacer (**15**) into the Body.
   • Make sure the Spacer centers and seats properly.

5. Install Seal (**16**) [lip end first] into Lantern Ring (**17**).

6. Install the Lantern Ring assembly into the Body.
   • Make sure the assembly centers and seats properly.

7. Install and seat Seal (**18**) [heel end first] into the Body.

Item No. on **Figure 2-A**	Description	Item No. on **Figure 2-B**	Description
10	O-Ring, 1-13/16 " ID x 2 " OD	31	Ring, Wear (Glass-Reinforced Nylon)
11	O-Ring, 1-15/16 " ID x 2-1/8 " OD	32	Seal, 0.925 " ID x 1.300 " OD
14	O-Ring, 1-3/16 " ID x 1-5/16 " OD	46	Seal, 0.650 " ID x 0.990 " OD
16	Seal, 13/16 " ID x 1-1/16 " OD		
18	Seal, 13/16 " ID x 1-9/16 " OD		

Table 4 *Components Lubricated in Clean Oil*

CAUTION

Do not place Washer (19) inside Spacer (20). Damage to components will occur.

8. Install Washer (**19**) and Spacer (**20**) into the Body.
9. Lubricate the air motor piston rod with grease.
10. Install the Body assembly (while holding the Spacer in place) onto the piston rod.
    - Use a small hammer or other suitable tool.
11. Rotate the Body to align the product outlet with the hole in the air motor housing.

    NOTE: Refer to **Figure 2-A** for steps 12 and 13.

12. Install Washer (**8**) and Bushing (**9**) onto Adapter (**5**).
13. Install the Adapter assembly (w/ thread sealant) into the Body.
    - Do not tighten the Adapter at this time.
14. Install Cap Screws (**13**) that secure the Body to the air motor.
    - Tighten each Cap Screw securely.
15. Tighten the Adapter assembly into the Body.

Steps for Model 7786-MA Only

16. Install Adapter (**7**) [w/ thread sealant] into Adapter (**5**) as required.
    - Tighten the Adapter securely.
17. Install Adapter (**24**) [w/ thread sealant] into Air Motor Assembly (**2**) as required.
    - Tighten the Adapter securely.

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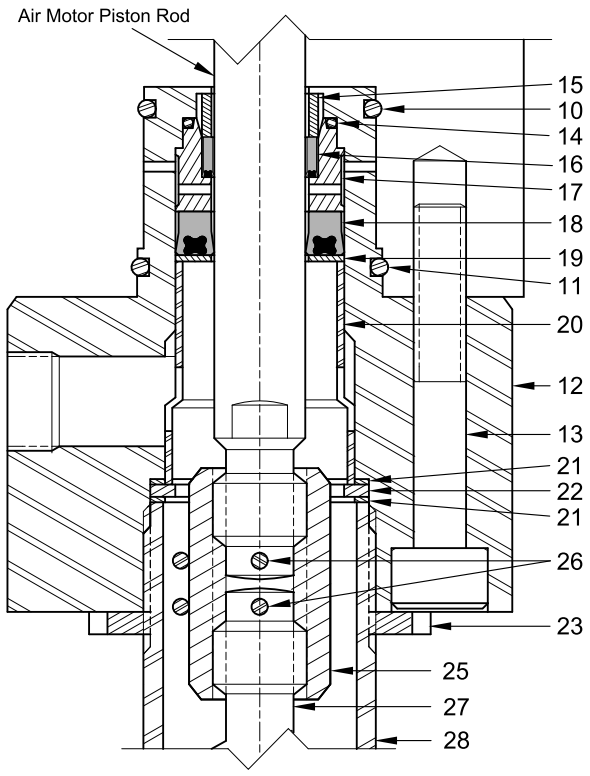
18. Install aluminum Gasket (**21**), Washer (**22**), and additional Gasket (**21**) into the Body.
    - Make sure the components maintain their position.



Refer to **Figures 2-A** and **3-B** Parts for Parts Identification

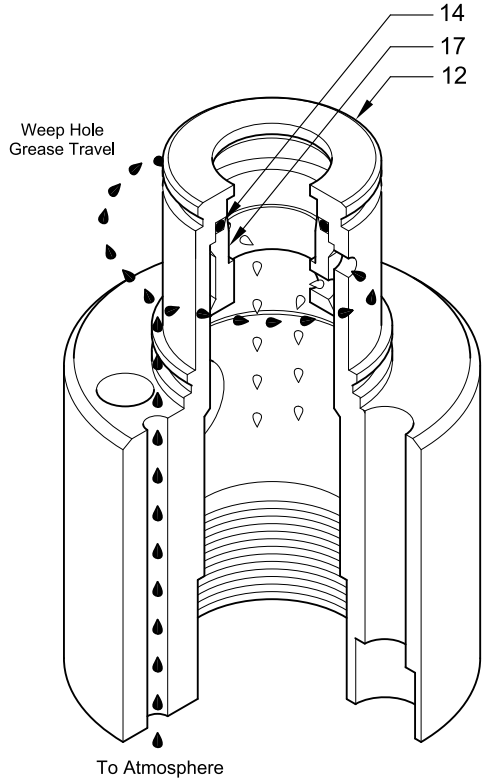


Figure 4 *Pump Tube Upper Packing - Section View*

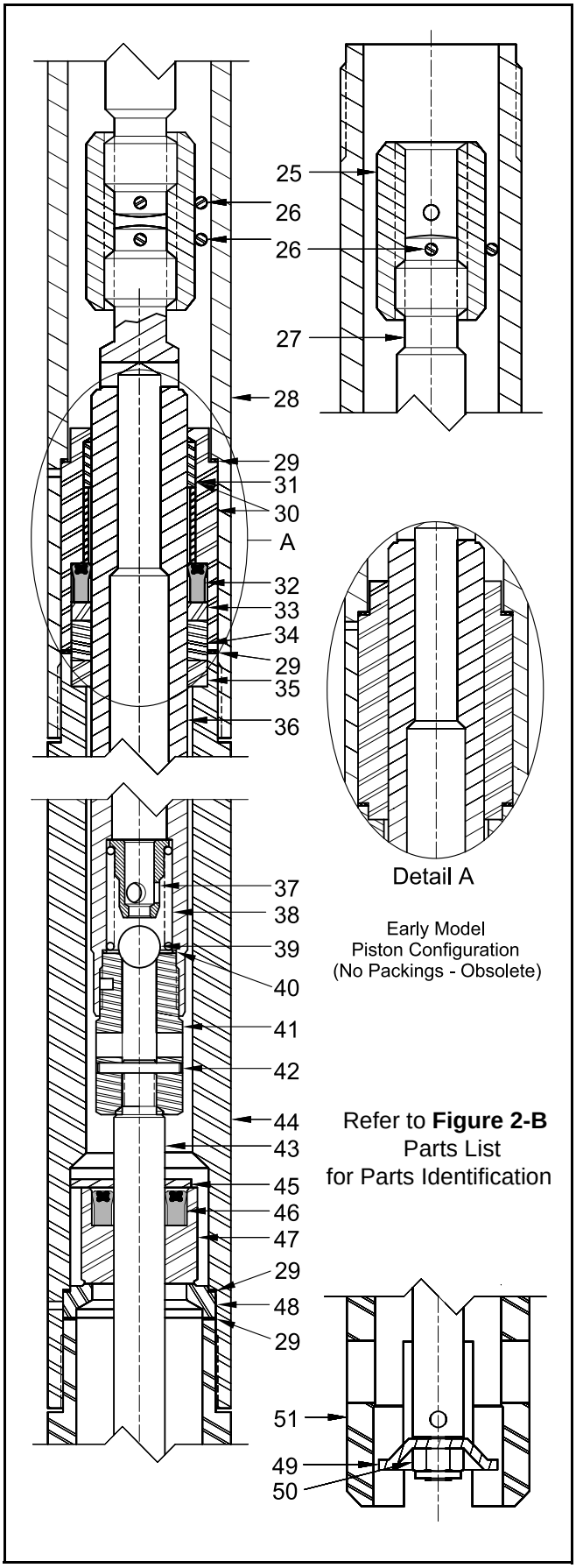


Figure 5 *Pump Tube Assembly - Section View*

Pump Tube

NOTE: Refer to **Figure 5** for section view of pump tube components.

19. Clamp the flats of Piston (**36**) into a soft-jaw vise.
    - Make sure the Piston bore points upward.
20. Install Retainer (**37**) [flange end first] into the Piston.
    - Make sure the Retainer centers and seats properly.
21. Install Spring (**38**) into the Piston.
22. Install Ball (**39**) into the Spring.
23. Install Gasket (**40**) onto Adapter and Insert Assembly (**41**).
24. Screw the Adapter (**41**) (with Loctite 222) into the Piston. See **Figure 2-B**.
    - Follow the thread sealant manufacturer's recommendations.
    - Tighten securely.
25. Install and seat Seal (**46**) [heel end first] into Valve Body (**47**).
26. Lubricate Primer Rod (**43**) with grease.
27. Install the Valve Body assembly onto the upper end of the Primer Rod.
    - Use a small hammer or other suitable tool.
28. Install Guide Washer (**45**) onto the Primer Rod.
29. Screw the Primer Rod assembly into the Adapter until the roll pin holes align.

CAUTION

Support the Primer Rod and the Adapter during Roll Pin (42) installation. Damage to components can occur.

30. Install Roll Pin (**42**) that secures the Primer Rod to the Adapter.
    - Use a small hammer.
31. Install Valve Seat (**48**), Plate (**49**), and Stop Nut (**50**) onto the Primer Rod.
    - Tighten the Stop Nut securely.
    - Place a small punch into the hole of the Primer Rod to prevent its rotation. See **Figure 2-B**.
32. Position Adapter (**44**) horizontally into the vise.

Internally-Threaded End of Adapter

33. Install Gasket (**29**) into the internally-threaded end of the Adapter.

34. Install the Primer Rod and Piston assembly (Piston end first) into the Adapter.
    - Center and seat all components properly. Pull on the Piston as necessary. Use care to ensure the Gasket does not move.

35. Install the additional Gasket (**29**) onto Valve Seat (**48**).

Externally-Threaded End of Adapter

36. Install Spacer (**35**) into the externally-threaded end of the Adapter.
    - Make sure the Spacer centers and seats properly.

37. Position Barrel Assembly (**30**) with the large diameter pointing upward.

38. Install Wear Ring (**31**) into the Barrel Assembly.

39. Install and seat Seal (**32**) [lip end first] into the Barrel Assembly.

40. Install Back-Up Ring (**33**) and brass Bearing (**34**) into the Barrel Assembly.

41. Install Gasket (**29**) onto the Adapter.

CAUTION

Use care installing the Barrel Assembly over the threads of Piston (36). Damage to the Seal can occur.

42. Install the Barrel Assembly (large diameter first) onto Piston (**36**).
    - Make sure the Barrel Assembly seats properly against the Spacer.

43. Install Gasket (**29**) onto the Barrel Assembly.

44. Screw the upper and lower Couplings (**25**) onto each end of Pump Tube Rod (**27**) until the Spring Clip holes align.

45. Install Spring Clips (**26**).

46. Screw the Rod and Coupling assembly onto the Piston.
    - Install the Spring Clip.

    IMPORTANT: If a primer is used with Loctite 222, the curing time is greatly reduced.

47. Screw Pump Tube (**28**) onto Adapter (**44**) [with Loctite 222]. See **Figure 2-B**.
    - Do not tighten.

48. Screw Primer Body (**51**) [with Loctite 222] into the opposite end of the Adapter. See **Figure 2-B.**
    - Do not tighten.

49. Screw Jam Nut (**23**) onto the Pump Tube.

50. Push on Plate (**49**) to expose Coupling (**25**) from the Pump Tube as necessary.

Attach Pump Tube to Air Motor

51. Screw the Coupling onto the air motor piston rod until the Spring Clip holes align.
    - Rotate the entire pump tube assembly.

52. Install the Spring Clip.

53. Screw the pump tube assembly into Body (**12**).

54. Place a large wrench or other suitable tool into the slot of Primer Body (**51**).
    - Tighten all the components of the assembly securely. Crush all gaskets.

55. Tighten Jam Nut (**23**).

Operation

Bench Test and Prime

NOTE: Perform the following procedures at a pressure not to exceed 20 psi (1.4 Bars).

1. Make sure air pressure at the regulator reads zero.

2. Connect a product hose to the pump's material outlet.

3. Place the hose into an appropriate collection container.

4. Install air Connector (**3**) to the inlet of the air motor.

5. Connect Air Coupler (**4**) to the Connector.

6. Slowly supply air pressure to the pump's motor.
    - The pump assembly should cycle.

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

Priming

With air pressure at zero:

7. Place the pump in the product to be dispensed.
8. Slowly supply air pressure to the pump's motor.
9. 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:

10. Attach a control valve to the outlet hose of the pump.
11. Set the air pressure to 100 psi (6.9 Bar).
12. Operate the control valve into a container.
13. Allow the pump to cycle until the system and product is once again free of air.
14. Shut off the control valve.
    - The pump should not cycle.
15. Check the motor for air leakage.

If the motor leaks, refer to the **Air Motor Service Guide** for details.

If the pump cycles slowly (once or twice an hour) or continuously, refer to the **Troubleshooting Chart** for details.

Installation

Additional items that should be incorporated into the air piping systems are listed in **Table 5**.

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

Table 5 *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.

Alternate Installations

Pump model 7786-A5 is often mounted:
- from either a single- or dual-post hoist
- in bulk grease distribution systems

When either of these type arrangements are employed, alternate accessory items must be purchased. See **Table 6**.

Application	Followers	Adapter Kit	Primer Body
Single-Post Hoist	327242	327247	
Dual-Post Hoist	327690		
Bulk Grease			333693*
* 1-1/2 " NPTF (m)			

Table 6 *Accessory Items for Alternate Installations*

Troubleshooting Chart

Pump Indications	Possible Problems	Solution
Pump does not cycle	1. Air motor not operating properly 2. Pump tube jammed and/or contains loose components 3. Insufficient air pressure	1. Inspect air motor and rebuild or replace as necessary 2. Rebuild pump tube 3. Increase air pressure
Pump will not prime	1. Excessive cycling speed 2. Pump leaking internally	1. Reduce air pressure 2. See **Internal Leaks**
Pump cycles rapidly	Product source empty	Replenish product
Pump cycles continuously, or slowly (once or twice/hour)	1. Pump leaking internally 2. Pump leaking externally 3. Distribution system leaking	1. See **Internal Leaks** 2. See **External Leaks** 3. Correct leak
External Leaks		
Product leakage visible at weep hole in Body (**12**)	1. Damaged Seal (**18**) 2. Damaged air motor piston rod.	1. Separate pump tube from air motor and replace Seal (**18**) 2. Inspect piston rod and replace as necessary
Product leakage visible at bottom of Body (**12**)	1. Pump tube not sufficiently tight 2. Damaged Gasket(s) (**21**)	1. Tighten pump tube assembly 2. Separate pump tube from air motor and replace Gaskets (**21**)
Air leakage at weep hole in Body (**12**)	Damaged Seal (**16**)	Separate pump tube from air motor and replace Seal (**16**)
Product leakage visible at weep hole in Pump Tube (**28**) and/or Adapter (**44**)	1. Pump tube not sufficiently tight 2. Damaged Gasket(s) (**29**)	1. Tighten pump tube assembly 2. Disassemble pump tube and replace Gaskets (**29**)
Internal Leaks		
Pump does not prime or cycles continuously, or slowly (once or twice/hour)	1. Foreign material between Ball (**39**) and Adapter (**41**) 2. Foreign material between Valve Body (**47**) and Valve Seat (**48**) 3. Worn or damaged Ball (**39**) 4. Worn or damaged Adapter (**41**) 5. Worn or damaged Valve Body (**47**) 6. Worn or damaged Valve Seat (**48**) 7. Worn or damaged Seal (**32**) 8. Worn or damaged Piston (**36)** 9. Worn or damaged Seal (**46**) 10. Worn or damaged Primer Rod (**43**)	Locate and eliminate source of foreign material. Disassemble pump tube, clean, inspect and replace worn or damaged components.

Changes Since Last Printing

Changed 394623 to 393623