

T-Series Intensifier Pump

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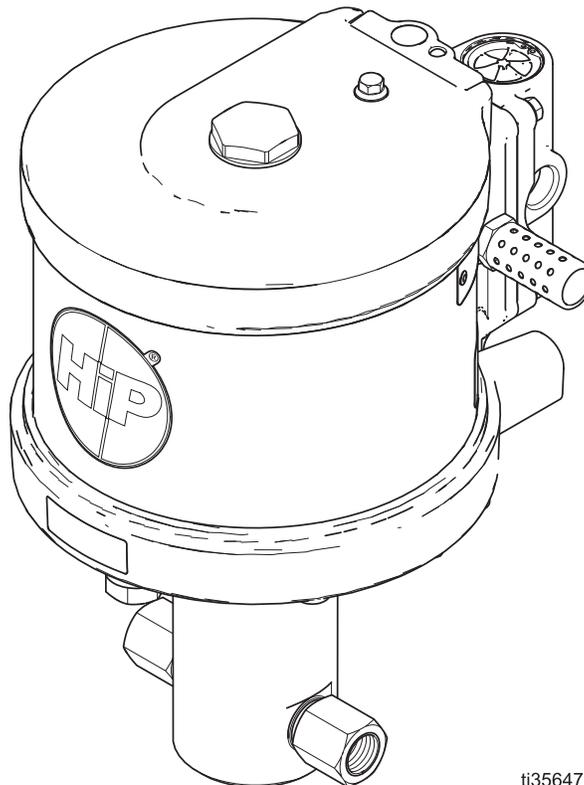
Pneumatic pump for generating high pressure for hydrostatic tests and hydraulically-operated systems. *For professional use only.*

See page 3 for model information, including maximum working pressures.



Important Safety Instructions

Read all warnings and instructions in this manual before using the equipment. Save all instructions.



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Approvals



II 2 G Ex h IIA T6 Gb

NOTE: "h": Type of protection applied is Constructional Safety "c".

Models

6.0 Inch Motor

Part No.	Model	Ratio	Seal Material	Maximum Working Pressure psi (MPa, bar)	Maximum Pneumatic Inlet Pressure psi (MPa, bar)	Displacement / Stroke* in ³ (ml)
T6058-576-NBR-00	T6058	576:1	NBR	58,000 (399.8, 3998)	100 (0.69, 6.9)	0.12 (2.0)
T6058-576-FKM-00			FKM			
T6058-576-FFKM-00			FFKM			
T6058-576-EPR-00			EPR			
T6036-365-NBR-00	T6036	365:1	NBR	36,500 (251.6, 2516)		0.19 (3.2)
T6036-365-FKM-00			FKM			
T6036-365-FFKM-00			FFKM			
T6036-365-EPR-00			EPR			
T6025-254-NBR-00	T6025	254:1	NBR	25,250 (174.0, 1740)		0.28 (4.5)
T6025-254-FKM-00			FKM			
T6025-254-FFKM-00			FFKM			
T6025-254-EPR-00			EPR			
T6016-163-NBR-00	T6016	163:1	NBR	16,250 (112.0, 1120)		0.43 (7.1)
T6016-163-FKM-00			FKM			
T6016-163-FFKM-00			FFKM			
T6016-163-EPR-00			EPR			
T6012-125-NBR-00	T6012	125:1	NBR	12,500 (86.2, 862)		0.56 (9.2)
T6012-125-FKM-00			FKM			
T6012-125-FFKM-00			FFKM			
T6012-125-EPR-00			EPR			
T6010-101-NBR-00	T6010	101:1	NBR	10,000 (68.9, 689)	0.70 (11.5)	
T6010-101-FKM-00			FKM			
T6010-101-FFKM-00			FFKM			
T6010-101-EPR-00			EPR			
T6006-064-NBR-00	T6006	64:1	NBR	6300 (43.4, 434)	1.11 (18.1)	
T6006-064-FKM-00			FKM			
T6006-064-FFKM-00			FFKM			
T6006-064-EPR-00			EPR			
T6005-047-NBR-00	T6005	47:1	NBR	4800 (33.1, 331)	1.49 (24.4)	
T6005-047-FKM-00			FKM			
T6005-047-FFKM-00			FFKM			
T6005-047-EPR-00			EPR			
T6003-032-NBR-00	T6003	32:1	NBR	3200 (22.1, 221)	2.20 (36.0)	
T6003-032-FKM-00			FKM			
T6003-032-FFKM-00			FFKM			
T6003-032-EPR-00			EPR			

* Optimal seal life is achieved at less than 80 cycles per minute.

7.5 Inch Motor

Part No.	Model	Ratio	Seal Material	Maximum Working Pressure psi (MPa, bar)	Maximum Pneumatic Inlet Pressure psi (MPa, bar)	Displacement / Stroke* in ³ (ml)
T7568-900-NBR-00	T7568	900:1	NBR	68,000 (468.8, 4688)	75 (0.52, 5.2)	0.12 (2.0)
T7568-900-FKM-00			FKM			
T7568-900-FFKM-00			FFKM			
T7568-900-EPR-00			EPR			
T7557-571-NBR-00	T7557	571:1	NBR	57,100 (393.6, 3936)	100 (0.69, 6.9)	0.19 (3.2)
T7557-571-FKM-00			FKM			
T7557-571-FFKM-00			FFKM			
T7557-571-EPR-00			EPR			
T7539-397-NBR-00	T7539	397:1	NBR	39,500 (272.3, 2723)		0.28 (4.5)
T7539-397-FKM-00			FKM			
T7539-397-FFKM-00			FFKM			
T7539-397-EPR-00			EPR			
T7525-255-NBR-00	T7525	255:1	NBR	25,500 (175.8, 1758)		0.43 (7.1)
T7525-255-FKM-00			FKM			
T7525-255-FFKM-00			FFKM			
T7525-255-EPR-00			EPR			
T7519-195-NBR-00	T7519	195:1	NBR	19,500 (134.4, 1344)		0.56 (9.2)
T7519-195-FKM-00			FKM			
T7519-195-FFKM-00			FFKM			
T7519-195-EPR-00			EPR			
T7516-158-NBR-00	T7516	158:1	NBR	15,750 (108.5, 1085)	0.70 (11.5)	
T7516-158-FKM-00			FKM			
T7516-158-FFKM-00			FFKM			
T7516-158-EPR-00			EPR			
T7510-100-NBR-00	T7510	100:1	NBR	10,000 (68.9, 689)	1.11 (18.1)	
T7510-100-FKM-00			FKM			
T7510-100-FFKM-00			FFKM			
T7510-100-EPR-00			EPR			
T7507-074-NBR-00	T7507	74:1	NBR	7400 (51.0, 510)	1.49 (24.4)	
T7507-074-FKM-00			FKM			
T7507-074-FFKM-00			FFKM			
T7507-074-EPR-00			EPR			
T7505-050-NBR-00	T7505	50:1	NBR	5000 (34.4, 344)	2.20 (36.0)	
T7505-050-FKM-00			FKM			
T7505-050-FFKM-00			FFKM			
T7505-050-EPR-00			EPR			

* Optimal seal life is achieved at less than 80 cycles per minute.

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <h1 style="margin: 0;">WARNING</h1>	
 	<p>FIRE AND EXPLOSION HAZARD</p> <p>When flammable fluids are present in the work area be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources, such as cigarettes and portable electric lamps. • Ground all equipment in the work area. • Keep work area free of debris, including rags and spilled or open containers of solvent. • Do not plug or unplug power cords or turn lights on or off when flammable fumes are present. • Use only grounded hoses. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
    	<p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read Safety Data Sheet (SDS) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

⚠️ WARNING



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheet (SDS) from distributor or retailer.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment regularly. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.



PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Installation

				
<p>To reduce the risk of injury from ejected ice, do not operate the motor without a plumbed exhaust line or muffler installed.</p> <p>Installation must comply with all local codes and regulations.</p>				

Grounding

				
<p>The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current.</p>				

Pump: ground through electrically conductive pneumatic and fluid lines.

Pneumatic and fluid lines: use only electrically conductive lines.

Air compressor: follow manufacturer's recommendations.

Fluid supply container: follow local code.

Required Accessories

Install the following required accessories in the order shown in FIG. 1, using adapters as necessary.

NOTE: If you supply your own accessories, be sure they are adequately sized and pressure rated for your system.

Pneumatic Line

- **Bleed-type master pneumatic valve (C):** required in your system to relieve air trapped between it and the pneumatic motor when the valve is closed.
 - Be sure the valve is easily accessible from the pump and located downstream from the pneumatic regulator.
- **Pump pneumatic regulator (D):** to control pump speed and outlet pressure. Locate it close to the pump.
- **Pneumatic line filter (B):** removes harmful dirt and moisture from compressed air supply.

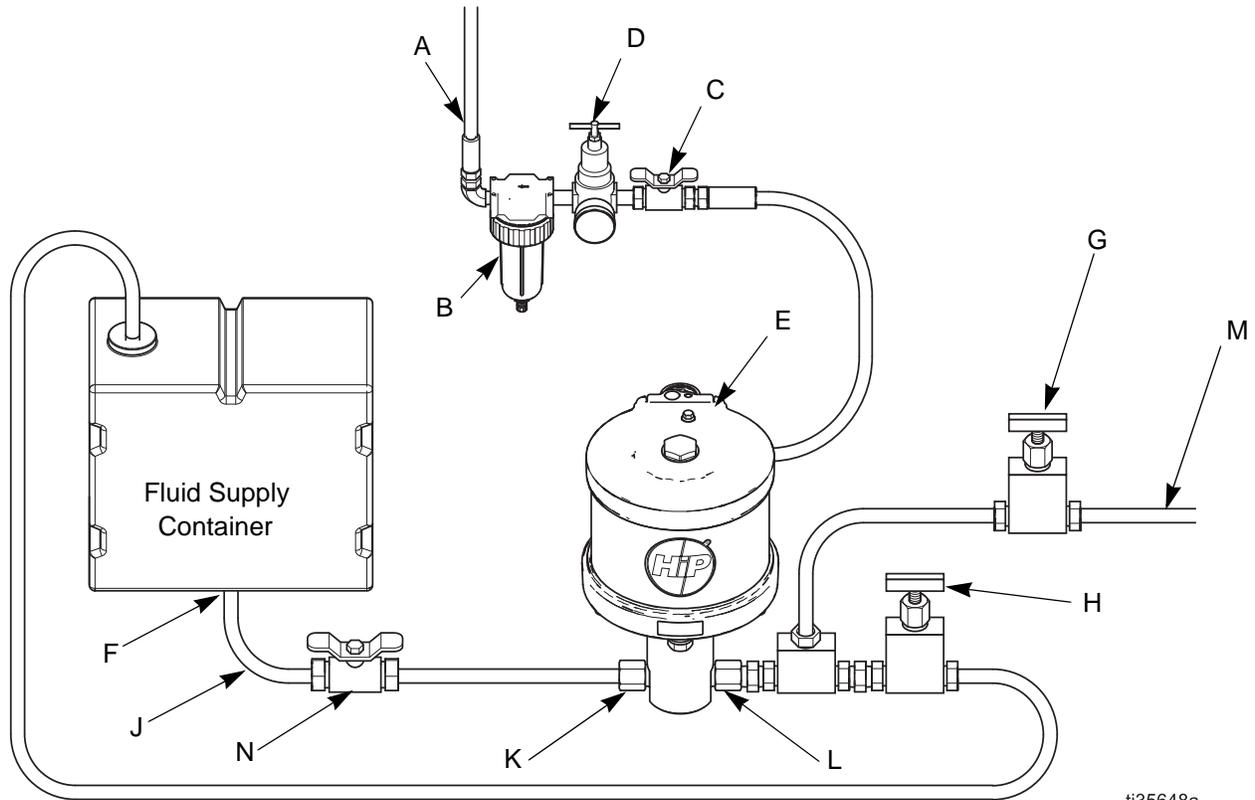
Fluid Line

- **Fluid filter/strainer (F):** with a 60 mesh (250 micron) stainless steel element to filter particles from the fluid before it reaches the pump.
- **Supply fluid shutoff valve (N):** shuts off supply fluid flow.
- **Shutoff/bleed valve (G):** shuts off pump fluid flow to hydraulic system.
- **Fluid pressure relief valve (H):** use to release pressure in outlet lines by redirecting fluid to the fluid supply container.

Flush Before Using Equipment

The equipment was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment. See **Flush the Equipment**, page 10.

Typical Installation



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FIG. 1: Typical Installation

FIG. 1 is an example of an installation with an Intensifier pump. Your installation may differ from what is shown here. (See **Required Accessories**, page 7.) The Intensifier pump (E) is the only component in FIG. 1 supplied by HiP. All other components are available from HiP to be ordered separately.

Key:

- A Main pneumatic supply line
- B Pneumatic line filter
- C Bleed-type master pneumatic valve
- D Pump pneumatic regulator
- E Intensifier pump
- F Fluid filter/strainer (at the fluid supply container)
- G Shutoff/bleed valve (outlet only)
- H Fluid pressure relief valve
- J Fluid inlet line
- K Inlet port
- L Outlet port
- M Fluid outlet line to hydraulic system
- N Supply fluid shutoff valve

Mount the Pump and Connect Fluid Supply



NOTE: A strainer (F) or fluid filter is required before the pump inlet. This will keep debris from the fluid supply container from reaching the pump and check valve seals. For maximum performance, the inlet port (K) should be mounted below the fluid supply container.

1. Mount the pump (E) and connect the fluid inlet line (J).

Connect Pneumatic Supply

1. Install the pressure regulator (D) and gauge to control the inlet pressure. See **Models** on page 3 for your model's maximum pneumatic pressure.
2. Install a pneumatic line filter (B) to keep debris from affecting pump performance and to increase pump life.
3. Connect the outlet of the master valve (C) to the 1/2 in. female NPT port on the Intensifier pump (E).

Connect Fluid Outlet

1. Connect a fluid line from the outlet port (L) to the hydraulic system.
2. Install a fluid pressure relief valve (H) on the outlet side of the pump.

Operation

Pressure Relief Procedure

 Perform the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing fluid, follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing the equipment.

NOTE: Always discharge fluid into an approved container or location.

1. Close the bleed-type master pneumatic valve (C).
2. Use the fluid pressure relief valve (H) to release pressure in system by redirecting the fluid to the fluid supply container.
3. Set the pressure regulator (D) to 0 PSI/MPa/bar.

Flush the Equipment



To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.
1. Perform the **Pressure Relief Procedure**.
 2. Connect inlet to the supply source of the flushing fluid.
 3. Connect outlet to a waste reservoir.
 4. Run the pump until the dispensed fluid is predominately flushing fluid.
 5. Perform the **Pressure Relief Procedure**.

Prime the Pump



1. Perform the **Pressure Relief Procedure** on page 10.
2. Attach the hydraulic system to the fluid outlet line (M) and verify all connections and fluid lines are tight.
 - a. Close the shutoff/bleed valve (G) and open the fluid pressure relief valve (H).
 - b. Set the pressure regulator (D) to 0 PSI/MPa/bar.

NOTE: The pressure regulator (D) and bleed-type master pneumatic valve (C) both affect the pump cycle rate. After the inlet pressure is set, the bleed-type master pneumatic valve (C) can serve as a speed control.

3. Turn on the air at the bleed-type master pneumatic valve (C). Slowly increase the pressure using the pressure regulator (D) to slowly cycle (less than 80 cycles per minute) the Intensifier pump (E).

NOTICE

Pump runaway may occur if the pressure regulator is opened too far for pressure settings, causing damage to the packing seals.

4. Keep the pump cycle rate at less than 80 cycles per minute. The pump is primed when discharge from the pump has transitioned from air, to bubbly fluid, to pure fluid.

Build Pressure

1. Close the fluid pressure relief valve (H) and open the fluid outlet valve (G) that is connected to the hydraulic system. Bleed the hydraulic system of all air per the manufacturer's recommended practice.
2. Turn off the air at the pneumatic valve (C) and set the pressure regulator (D) to 0 PSI/MPa/bar. Seal the hydraulic system per the manufacturer's recommended practice. You are now ready to build pressure.
3. Turn on the air at the bleed-type master pneumatic valve (C) and slowly increase pressure with the pressure regulator (D) until the desired pressure is produced in the hydraulic system.

NOTE: Hydraulic pressure increases proportionally to inlet pressure up to the maximum working pressure of the pump.

4. After pressurization of the hydraulic system is complete, perform the **Pressure Relief Procedure** on page 10.

Maintenance

Preventive Maintenance Schedule

The operating conditions of your particular pump determines how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your pump.

Tighten Threaded Connections

Check that all threaded connections are tight before each use and at routine intervals.

Storage

If the pump is going to be stored for long periods, flush the pump with a light-weight oil or rust inhibitor before storage to protect pump components. Store the pump with protective fluid inside whenever possible.

Troubleshooting



1. Perform **Pressure Relief Procedure**, page 10, before checking or repairing pump.
2. Check all possible problems and causes before disassembling pump.

Problem	Cause	Solution
Air bubbles in fluid.	Fluid inlet line is loose.	Tighten.
Fluid leaking.	Loose fittings.	Tighten fittings.
	Worn seals.	Replace packing.
Pump stroking, but no fluid moving.	Air in pump.	Prime pump. See page 11.
	Worn or damaged check valve seals.	Rebuild check valves.
Pneumatic motor will not run.	Damaged pneumatic valve (217).	Replace or service pneumatic valve (217). See page 17.
	Damaged pilot valve (219).	Replace pilot valves (219). See page 19.
	Fluid valve (K) shut.	Open fluid valve (K). See page 8.
Air continuously exhausting around pneumatic motor plunger.	Damaged u-cups (203 and 233).	Replace plunger u-cups (203 and 233). See page 20.
Air continuously exhausting from muffler.	Damaged pneumatic valve plate (305) or cup (312).	Replace or service pneumatic valve (217). See page 17.
Pneumatic motor “bounces” at top of stroke.	Damaged bottom pilot valve (219).	Replace bottom pilot valve (219). See page 19.
Pneumatic motor “bounces” at bottom of stroke.	Damaged top pilot valve (219).	Replace top pilot valve (219). See page 19.
Icing inside motor.	Pneumatic motor operating at high pressure or high cycle rate.	Reduce pressure, cycle rate, or duty cycle of motor.
	Excessive moisture in pneumatic supply line.	Reduce dew point of compressed air in moisture coalescing filter.
Pump fails to operate.	Restricted line or inadequate air supply; closed or clogged valves.	Clear line or increase air supply. Check that the valves are open.
	Obstructed fluid line; fluid line ID is too small.	Open, clear*; use line with larger ID.
Pump operates, but output is low.	Worn packings in pump.	Replace packings. See page 15.
	Held open or worn check valves or packings.	Clear valve; replace packings. See page 15.
Erratic or accelerated pump speed.	Exhausted fluid supply.	Refill and prime.
	Held open or worn check valves or packings.	Clear valve, replace packings. See page 15.
Fluid being pumped is visible on the packing nut.	Worn packings.	Replace packings. See page 15.

Repair - Pump Lower

				
<p>Before servicing or repairing your pump, verify that pressure is relieved according to the Pressure Relief Procedure, page 10, and that all fluid and pneumatic lines are properly shut off.</p>				

- Always use Genuine Graco Parts and Accessories, available from your Graco distributor.

Disconnect the Pump Lower

				
<p>Threads are very sharp. Use a rag to protect hands when turning or carrying the pump.</p>				

1. Stop the pump.
2. Perform the **Pressure Relief Procedure**, page 10.
3. Disconnect the fluid lines.
4. Remove the screws (5) and remove the pump lower (3). It is not necessary to loosen or remove either the lower bracket (111) or the locking ring (110) from the pump lower (3).

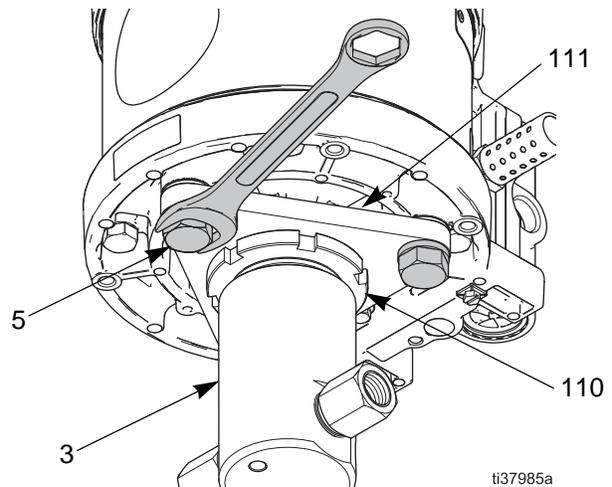


FIG. 2

5. Slide the pump lower (3) off of the pump, with the lower bracket (111) and locking ring (110) still attached to the pump lower.

Pump Repair

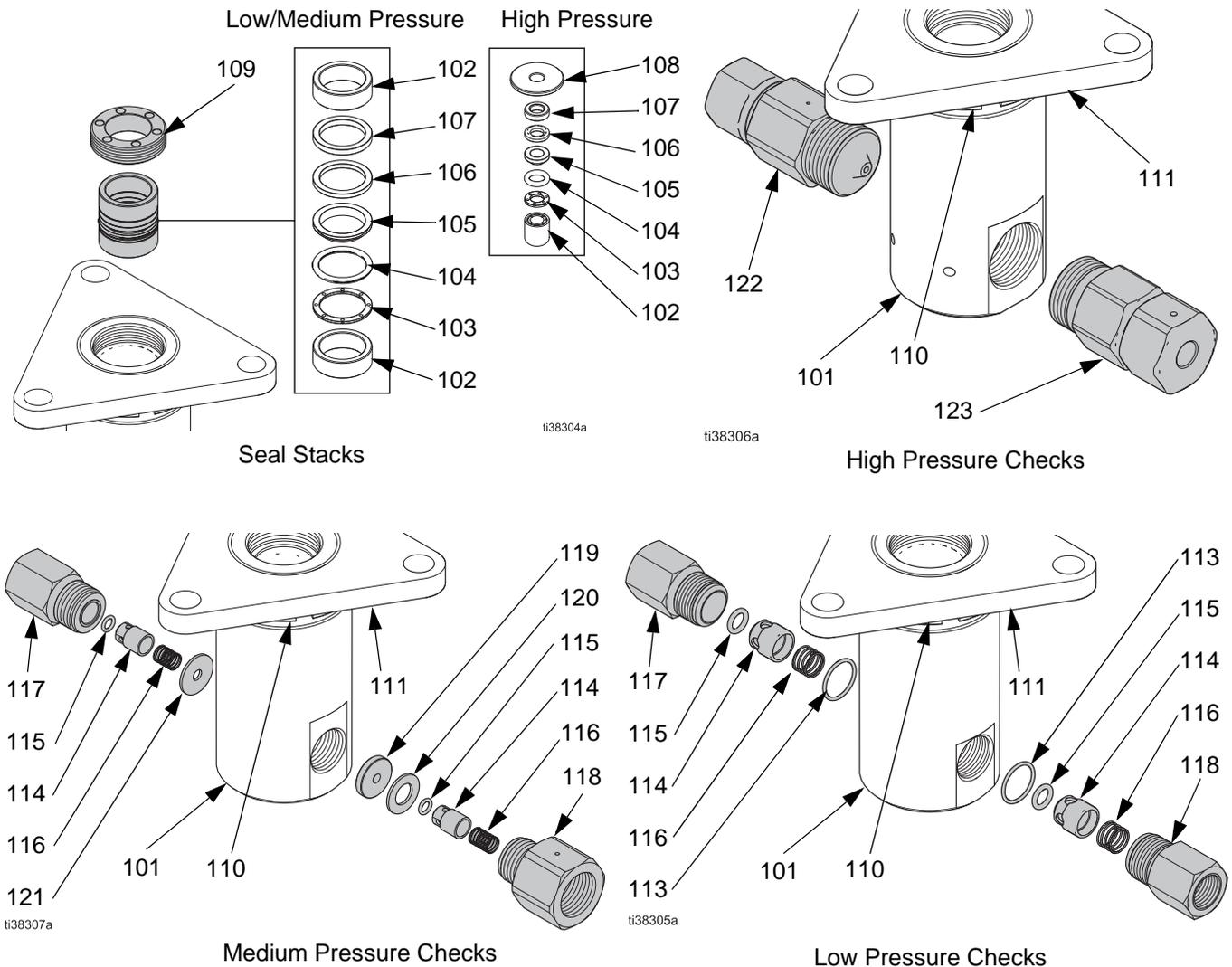


FIG. 3

1. Remove the packing nut (109) from the top of the fluid cylinder (101). Do not remove either the lower bracket (111) or locking ring (110).
2. Remove the seal stack. Inspect seals and rings for damage and wear, and replace as necessary
3. Remove the inlet and outlet check housings (117 and 118; low- and medium-pressure pumps) or inlet and outlet checks (122 and 123; high-pressure pumps).
4. **Medium-pressure pumps only.** Remove the o-rings (115), compression springs (116), and check poppets (114).

5. **Low-pressure pumps only.** Remove the o-rings (113 and 115), compression springs (116), and check poppets (114). Inspect for damage and wear, and replace as necessary.

NOTE: Assuming the orientation shown in FIG. 3, and with the point of lower bracket (111) pointing to the front of the pump when installed, the inlet port will be to the left and the outlet port to the right.

6. **Low- and medium-pressure pumps only.** Install the small o-ring (115) onto the check poppet (114), then install the poppet (115) and compression spring (116) into the inlet check housing (117), as shown.

7. **Low-pressure pumps only.** Install the large o-ring (113) into the inlet port of the fluid cylinder (101), then install the inlet check housing (117).
8. **Medium-pressure pumps only.** Install the spacer (121) into the inlet port of the fluid cylinder (101), then install the inlet check housing (117).
9. **Low- and medium-pressure pumps only.** Install the small o-ring (115) onto the check poppet (114), then install the poppet (114) and compression spring (116) into the outlet check housing (118), as shown.
10. **Low-pressure pumps only.** Install the large o-ring (113) into the outlet port of the fluid cylinder (101), then install the outlet check housing (118).
11. **Medium-pressure pumps only.** Install the spacers (119 and 121) into the outlet port of the fluid cylinder (101), then install the outlet check housing (118).
12. Stack and install the seal stack, as shown. Use grease during installation.
13. Install the packing nut (109) with a medium strength thread locking compound, and torque to 5-10 ft-lbs (7-14 N•m). The packing nut (109) should be flush with the surface of the fluid cylinder (101).

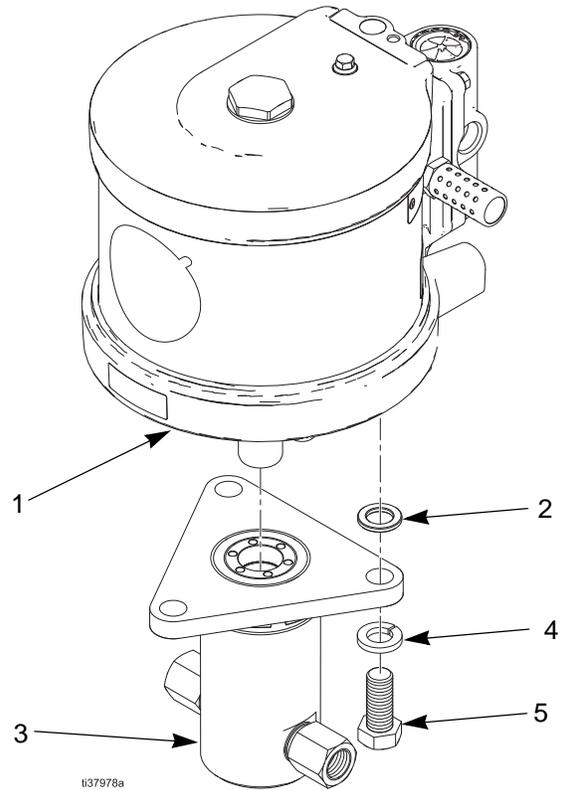


FIG. 4

2. Install the screws (5), lock washers (4), and spacers (2), as shown in FIG. 4, and align with the holes in the bottom of the pump (1), as shown in FIG. 5.

Reconnect the Pump Lower

1. Align the pump lower (3) so that the inlet port is to the left when facing the front of the pump (1).

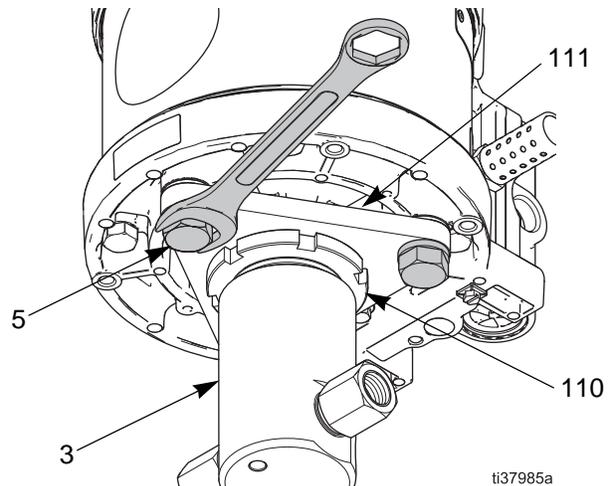


FIG. 5

3. Torque the screws (5) to 50-60 ft-lbs (68-81 N•m).

Repair - Pneumatic Motor



Pneumatic Valve

Replace Complete Pneumatic Valve

1. Stop the pump and perform the **Pressure Relief Procedure**, page 10.
2. Disconnect the pneumatic line to the motor.
3. See the figure on page 26. Use a 10 mm socket wrench to remove four screws (218). Remove the pneumatic valve (217) and gasket (216*♦).
4. To repair the pneumatic valve, go to **Disassemble the Pneumatic Valve**, page 17. To install a replacement pneumatic valve (217), continue with step 5.
5. Align the new pneumatic valve gasket (216*♦) on the manifold, then attach the pneumatic valve (217). Torque screws (218) to 95-105 in-lb (11-12 N•m).
6. Reconnect the pneumatic line to the motor.

Replace Seals or Rebuild Pneumatic Valve

Inspect and replace seals and worn parts while disassembling and reassembling the pneumatic valve on the following pages.

Use FIG. 6 and the following table to identify the kits needed for replacements:

Symbol	Kit Description
†	Pneumatic Valve Seal Kits. See page 29.
♦	Pneumatic Valve Repair Kits. See page 29.
⌘	Pneumatic Valve End Cap Kits. See page 29.

Disassemble the Pneumatic Valve

1. Perform steps 1-3 under **Replace Complete Pneumatic Valve**, page 17.
2. See FIG. 6. Use a T10 star screwdriver to remove two screws (309†♦). Remove the valve plate (305♦), cup (312♦), and spring (311♦).
3. See FIG. 6. Remove the snap ring (310♦⌘) from each end. Use the piston (302♦) to push the end caps (307⌘) out of the ends. Remove end cap o-rings (306†⌘♦).
4. Remove the piston (302♦). Remove the u-cup seals (308†♦) from each end, and the detent assembly (303♦) and detent cam (304♦) from the center.

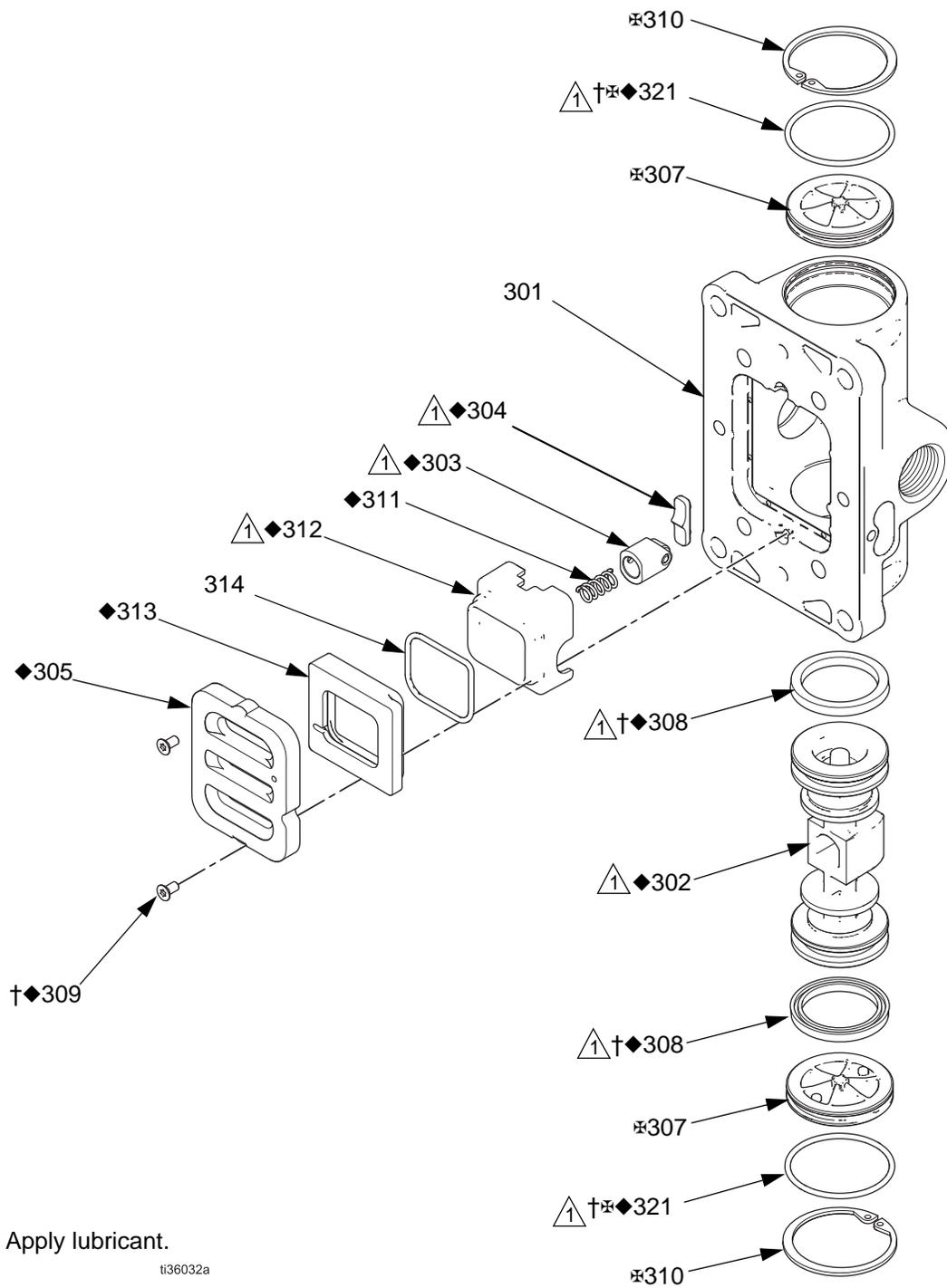


FIG. 6

Reassemble the Pneumatic Valve

1. See FIG. 6. Lubricate detent cam (304♦) and install into housing (301).
2. See FIG. 7. Lubricate the u-cups (308†♦) and install on the piston (302♦) with lips facing toward the center of the piston.

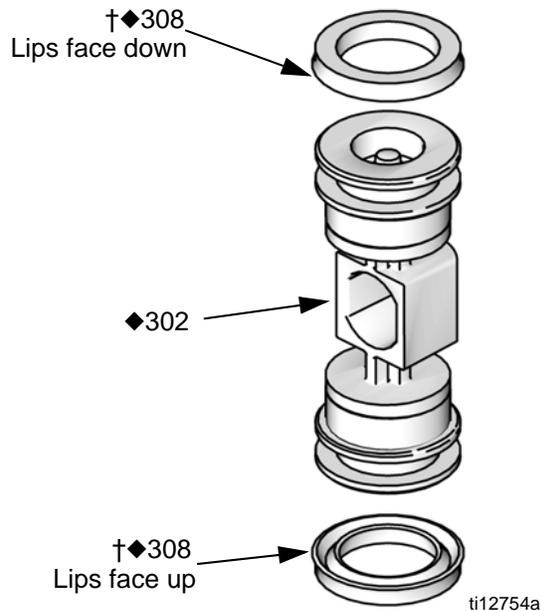


FIG. 7

3. See FIG. 6. Lubricate both ends of the piston (302♦) and install it in the housing (301).
4. Lubricate and install the detent assembly (303♦) into the piston (302♦).
5. Lubricate new o-rings (306†*♦) and install on the end caps (307*). Install the end caps into the housing (301).
6. Install a snap ring (310♦*♦) on each end to hold end caps in place.

7. Install the spring (311♦). Lubricate and install the pneumatic valve cup (312♦), see FIG. 8. Align the small round magnet with the pneumatic inlet.
8. Install the valve plate (305♦). Tighten the screws (309†♦) to hold it in place.

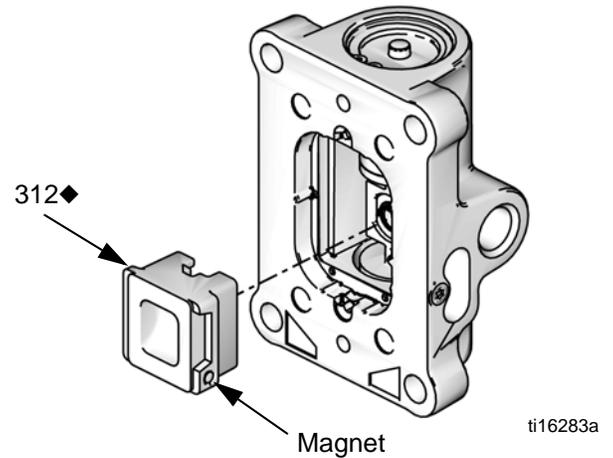


FIG. 8

9. Perform steps 5 and 6 under **Replace Complete Pneumatic Valve**, page 17.

Replace Pilot Valves

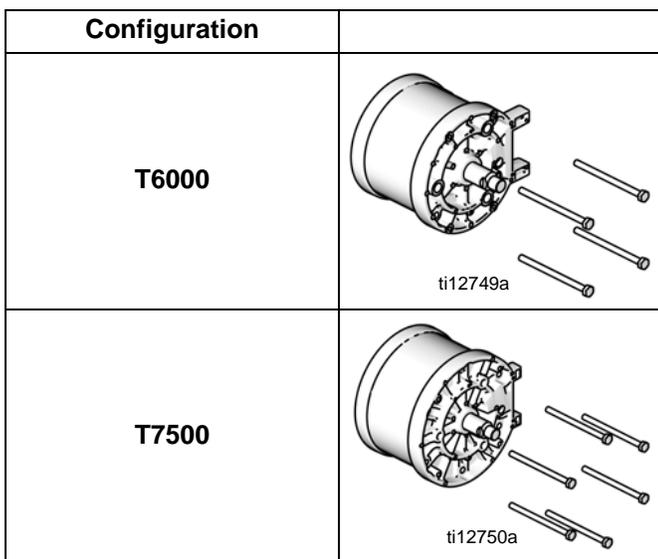
1. Stop the pump and perform the **Pressure Relief Procedure**, page 10.
2. Disconnect the pneumatic line to the motor.
3. Use a 10 mm socket wrench to remove the old pilot valves (219) from the top (213) and bottom (201) covers. See the figure on page 26.
4. Lubricate and install the new pilot valves (219). Torque to 95-105 in-lb (11-12 N•m).
5. Reconnect the pneumatic line to the motor.

Repair Pneumatic Motor

NOTE: Pneumatic Motor Seal Kits are available. See **Pneumatic Motor Parts List**, page 27, for the correct kit for your motor. For best results, use all parts in the kit.

Disassemble the Pneumatic Motor

1. **Disconnect the Pump Lower**, page 14.
2. Use a 10 mm socket wrench to remove the four screws (218), and remove the pneumatic valve (217) and gasket (216). See the figure on page 26.
3. Remove the four screws (218), and remove the manifold (215) and two gaskets (214).
4. Use a 10 mm socket wrench to remove the pilot valves (219), and the top and bottom covers (213 and 201).
5. Use a 17 mm socket wrench to the tie bolts (210). The number of bolts depends on your configuration.



6. Remove the top cover (213) and the o-ring (209).
7. Remove the shield (212) from around the cylinder (211), and remove the cylinder.
8. Slide the piston assembly straight up off the bottom cover (201).

NOTE: There is no need to take apart the piston assembly. If any part is worn or damaged, the individual pistons and plungers are available as kits and should be replaced.

9. Remove the o-ring (208) from around the piston (205).
10. Remove the retaining ring (204), u-cup seals (203 and 233), and the o-ring (209) from the bottom cover (201).

Reassemble the Pneumatic Motor

NOTE: For easier reassembly, start with the top cover (213) turned over on the workbench and assemble the pneumatic motor upside-down.

1. Lubricate and install the o-ring (209) on the top cover (213). See the figure on page 26.
2. Install the upper bumper (229) on the top cover.
3. Lubricate the inside of the cylinder (211). Lower the cylinder onto the top cover (213).
4. Lubricate and install the o-ring (208) around the piston (205).
5. Slide the piston assembly down onto the cylinder (211). Be sure the o-ring (208) stays in place.
6. Install the shield (212) around the cylinder (211) and in the groove on the top cover (213).
7. **High-pressure pumps only.** Lubricate and install the u-cups (203 and 233) into the seal housing (240).
8. The arrange the seal stack as shown in FIG. 9. (low- and high-pressure pumps have different seal stack arrangements), then lubricate and install into the bottom cover (201).
9. Install the spacer (202) and retaining ring (204).

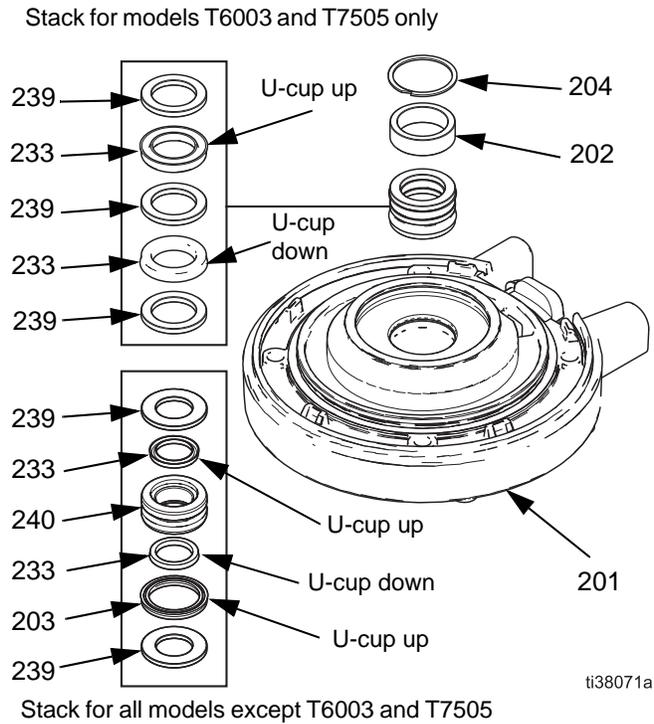


FIG. 9

10. Lubricate and install the o-ring (209) in the bottom cover (201).
11. Install the piston bumper (228) on the bottom cover (201).
12. Carefully place the bottom cover (201) on the cylinder (211), sliding the plunger (206) through the seal stack. The manifold surfaces of the top and bottom covers must align. Be sure the shield (212) is in the groove on both the top and bottom covers. See FIG. 10.

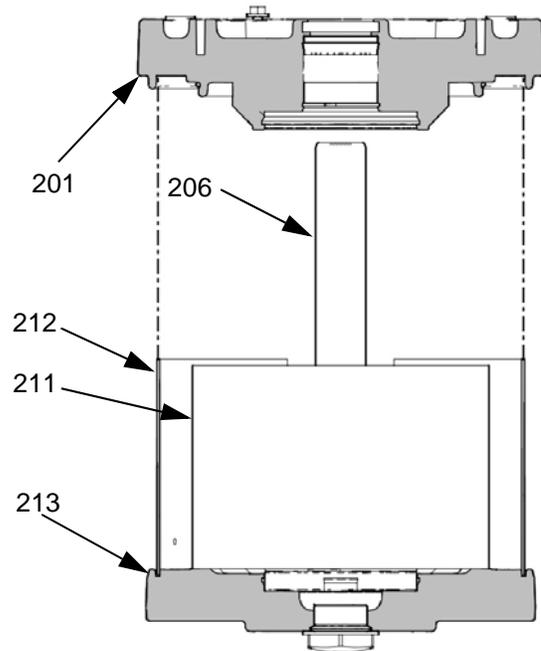


FIG. 10

13. Install the tie bolts (210) hand tight. See the figure on page 26.
14. Install two gaskets (214) on the manifold (215), and install the manifold. Torque bolts to 95-105 in-lb (11-12 N•m).
15. Align the pneumatic valve gasket (216) on the manifold (215), then attach the pneumatic valve (217).
16. Tighten the bolts (210) halfway. Work in a criss-cross pattern while tightening the tie bolts. Check that the shield remains in the grooves on both covers. Continue tightening the bolts in pattern and torque to 25-30 ft-lb (34-40 N•m).
17. Lubricate and install the pilot valves (219) in the top and bottom covers. Torque to 95-105 in-lb (11-12 N•m).
18. See **Reconnect the Pneumatic Motor** on page 22.

Reconnect the Pneumatic Motor

1. With the lower bracket (111) and locking ring (110) still attached to the pump lower (3), slide the pump lower onto the bottom of the pump.
2. Orient the lower bracket (111) as shown in FIG. 11.
3. Insert the screws (5) and torque to 50-60 ft-lb (68-81 N•m)

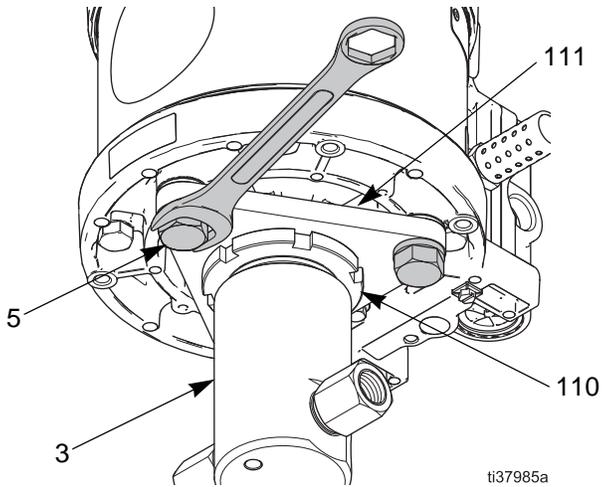
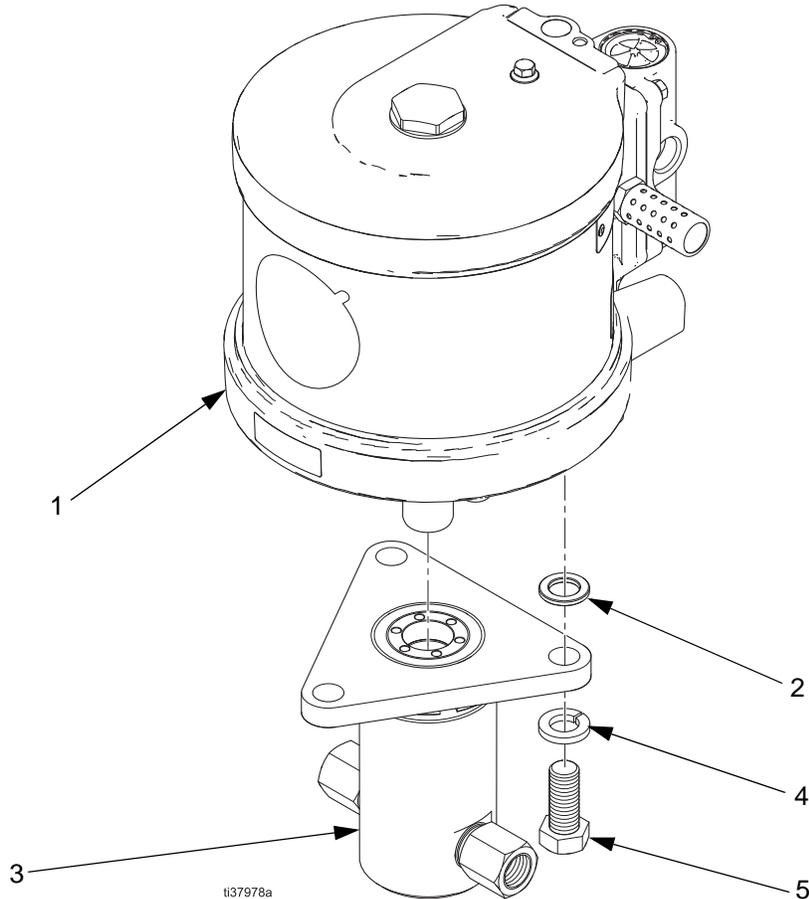


FIG. 11

4. Reconnect the pneumatic and fluid hoses.

Parts

T-Series Intensifier Pump

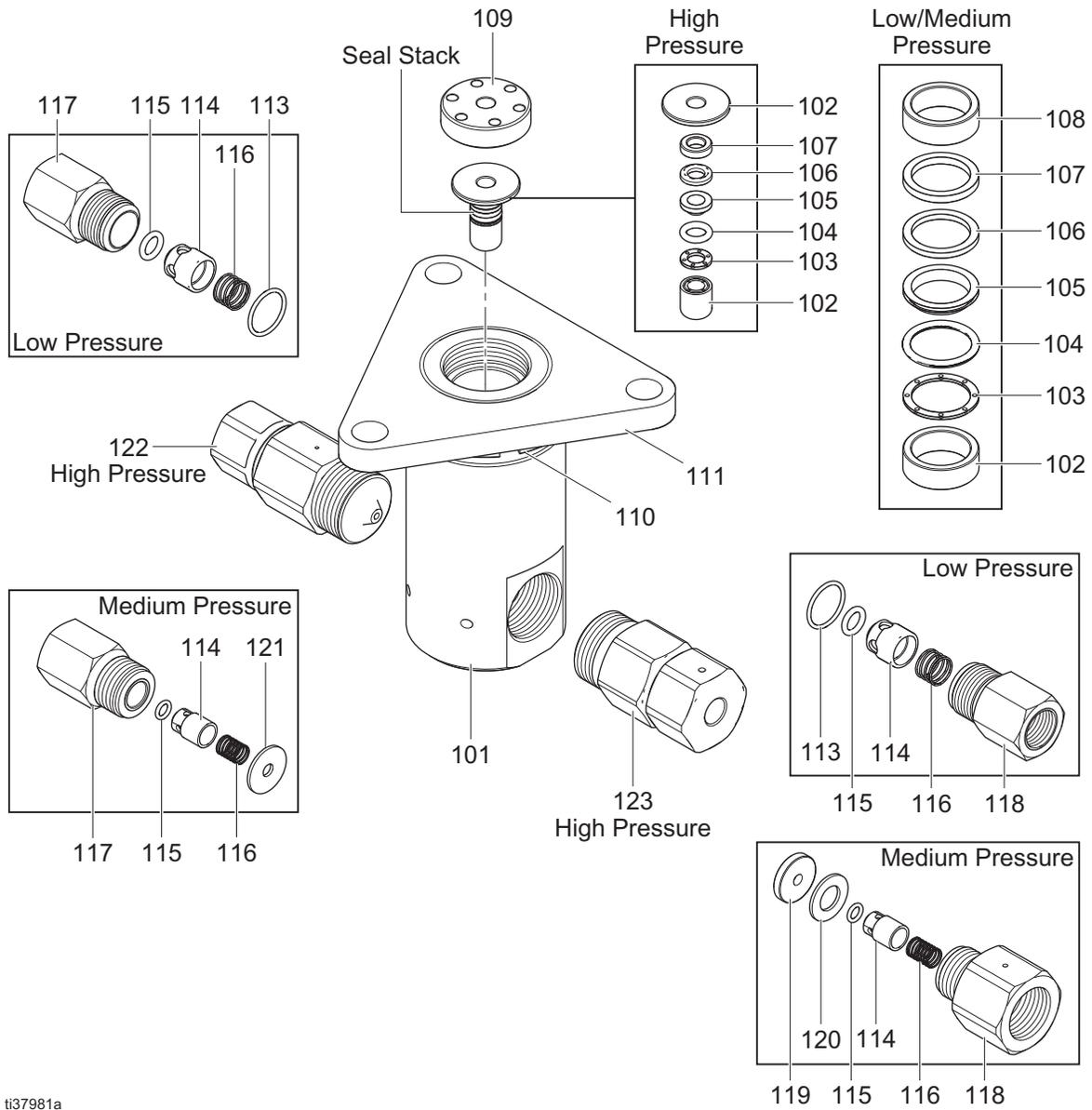


T-Series Intensifier Pump Parts List

Ref.	Part	Description	Qty
1	See Air Motor Replacement , pg 31	Pneumatic motor, 6.0 in.	1
		Pneumatic motor, 7.5 in.	1
2	---	Spacer; (included with ref. 3)	3
3	See Pump Lower Replacement , pg 31	Pump lower	3
4	---	Lock washer; (included with ref. 3)	3
5	---	Cap screw, hex head; (included with ref. 3)	3
11▲	25T172	Warning label, multi-language	1

▲ Replacement safety labels, tags, and cards are available at no cost.

Pump Lower



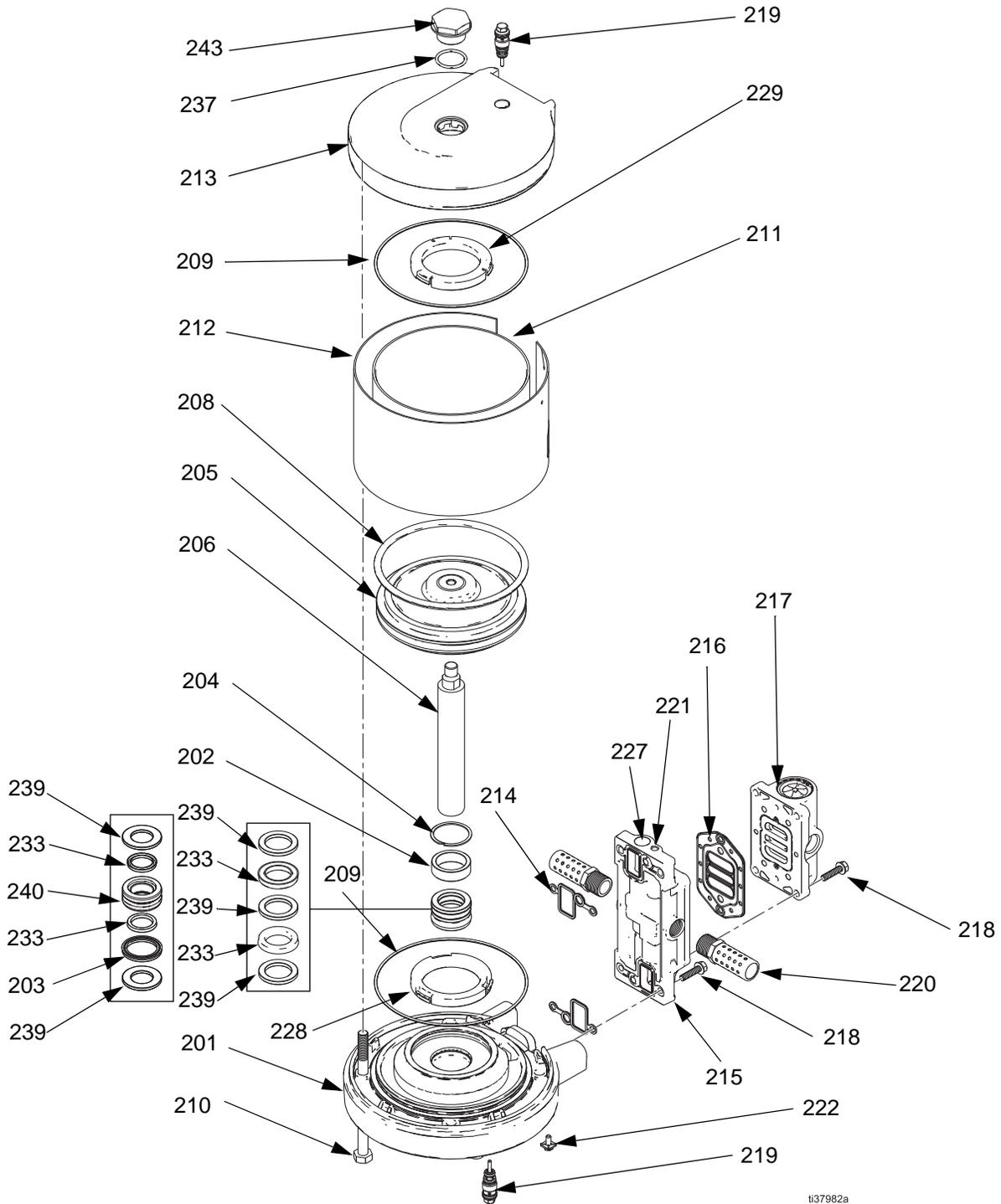
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Pump Lower Parts List

Ref.	Part	Description	Qty
101	See Pump Lower Replacement , pg 31	Fluid cylinder	1
102	See Seal Stacks , pg 30	Bearing; low/medium-pressure pump	2
		Bearing; high-pressure pump	1
103		Washer	1
104		O-ring	1
105		Seal	1
106		Back-up ring	1
107		Packing ring	1
108		Spacer (high-pressure pumps only)	1
109			Packing nut
110		Locking ring	1
111		Lower bracket	1
113	See Check Valves , pg 30	O-ring	2
114		Check poppet	2
115		O-ring	2
116		Compression spring	2
117		Inlet check housing; 1/2 npt	1
118		Outlet check housing; 1/2 npt	1
119		Spacer; medium-pressure pump	1
120		Spacer; medium-pressure pump	1
121		Spacer; medium-pressure pump	1
122	25T000	Inlet check valve	1
123	25T001	Outlet check valve	1

Pneumatic Motor

T60xx, 6.0 in. (152.4 mm); T75xx, 7.5 in. (190.5 mm), shown



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Pneumatic Motor Parts List

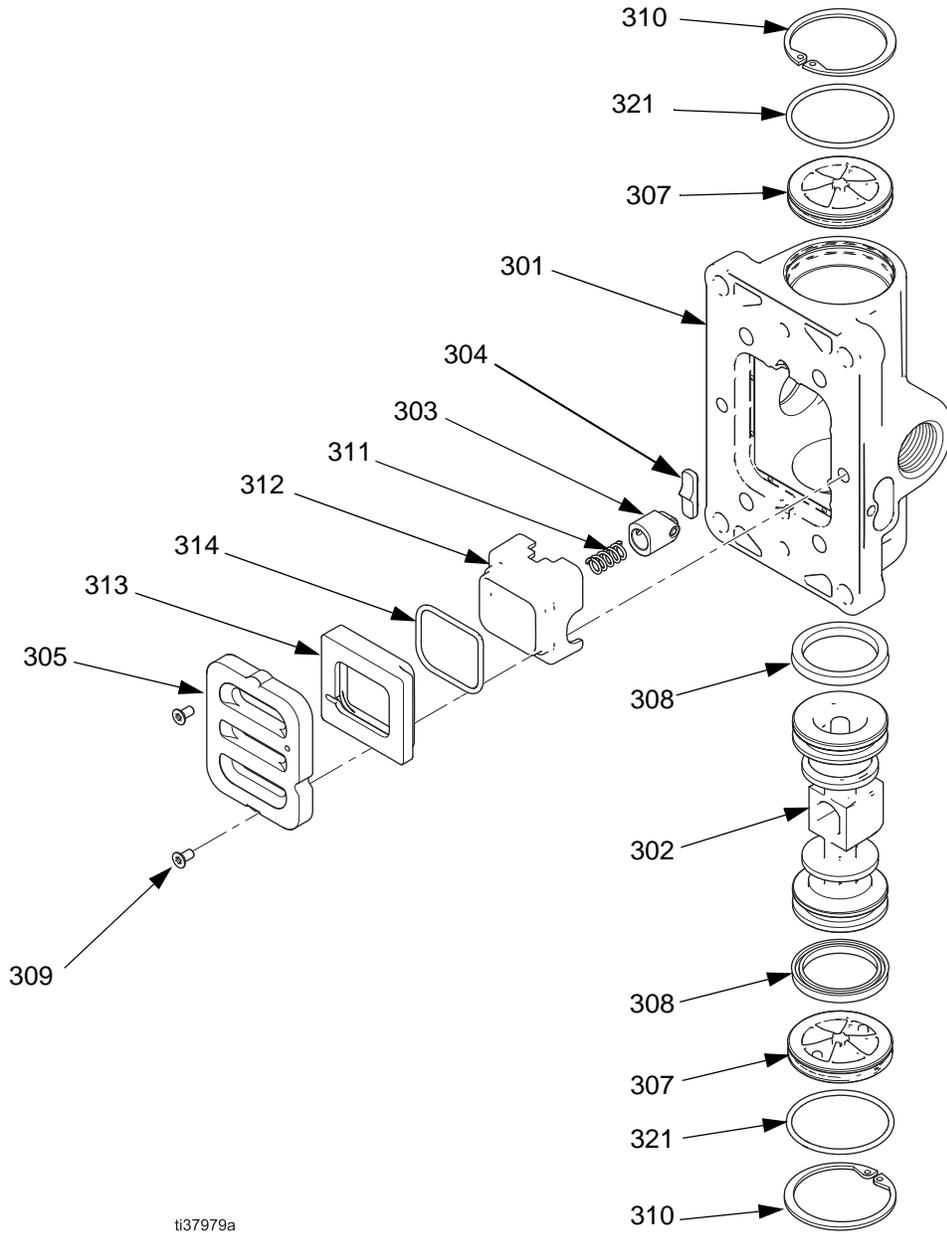
Part number shown:

T60xx: 6.0 in. (152.4 mm)

T75xx: 7.5 in. (190.5 mm)

Ref.	Part	Description	Qty
201	See Lower Air Motor Covers , pg 31	Lower cover; T6000	1
		Lower cover; T7500	1
202	--	Spacer; (included with ref. 201)	1
203	--	U-cup packing; (included with ref. 201)	1
204	--	Retainer ring; (included with ref. 201)	1
205	25T170	Motor piston; T6000	1
	25T171	Motor piston; T7500	1
206	See Plunger Replacements , pg 30	Plunger	1
208	--	Packing o-ring; (included with ref. 205)	1
209	--	End cap o-ring	2
210	B33169	Hex cap screw; T6000	4
	B33170	Hex cap screw; T7500	6
211	--	Motor cylinder; T6000	1
	--	Motor cylinder; T7500	1
212	B33167	Bolt cover; T6000	1
	B33168	Bolt cover; T7500	1
213	25T085	Upper cover; T6000	1
	25T086	Upper cover; T7500	1
214	--	Manifold gasket; (included with ref. 215)	2
215	24A580	Motor manifold	1
216	--	Pneumatic valve gasket; (included with ref. 215)	1
217	24A352	Pneumatic valve	1
218	--	Screw; M6; (included with ref. 215)	8
219	24A366	Pilot valve	2
220	25T105	Muffler	2
221	--	Ball; (included with ref. 215)	2
227	--	Expansion plug; (included with ref. 215)	2
228	24A914	Bumper; T6000	1
	24A915	Bumper; T7500	1
229	--	Upper bumper; (included with ref. 228)	1
230	--	Screw; M5; (included with ref. 228)	3
233	--	U-cup packing	2
237	--	O-ring packing; (included with ref. 213)	1
239	--	Washer; (included with ref. 201)	2
240	--	Seals housing; (included with ref. 201)	1
243	--	Plug	1

Pneumatic Valve



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Pneumatic Valve Parts List

Pneumatic valve parts are not sold individually. The table below show possible kit options for each part.

Ref.	Description	Qty	Pneumatic Valve Repair Kit 24A538	Pneumatic Valve Seal Kit 24A536	Pneumatic Valve End Cap Kit 24A361
301	Housing	1			
302	Pneumatic valve piston	2	✓		
303	Detent piston	1	✓		
304	Detent cam	1	✓		
305	Pneumatic valve plate	1	✓		
307	Cap	2			✓
308	U-cup packing	2	✓	✓	
309	Screw; M3	2	✓	✓	
310	Snap ring	2	✓		✓
311	Detent Spring	1	✓		
312	Casting cup	1	✓		
313	Base cup	1	✓		
314	Casting cup gasket	1	✓		
321	O-ring	1	✓	✓	✓

Replacement screws (309) are available in a pack of 10. Order Kit 24A359.

Kits and Accessories

Repair Kits

Check Valves

Type / Material	Models							
	0305	0507	0610	1016	1219	1625	2539	3657/5868
Inlet 68K	---	---	---	---	---	---	---	25T000
Inlet EPR	25T002			25T010				---
Inlet FFKM	25T003			25T011				---
Inlet FKM	25T004			25T012				---
Inlet NBR	25T005			25T013				---
Outlet 68K	---	---	---	---	---	---	---	25T001
Outlet EPR	25T006			25T014			25T018	---
Outlet FFKM	25T007			25T015			25T019	---
Outlet FKM	25T008			25T016			25T020	---
Outlet NBR	25T009			25T017			25T021	---

Seal Stacks

(includes bearing)

Material	Models								
	0305	0507	0610	1016	1219	1625	2539	3657	5868
EPR	25T022	25T026	25T030	25T034	25T038	25T042	25T046	25T050	25T054
FFKM	25T023	25T027	25T031	25T035	25T039	25T043	25T047	25T051	25T055
FKM	25T024	25T028	25T032	25T036	25T040	25T044	25T048	25T052	25T056
NBR	25T025	25T029	25T033	25T037	25T041	25T045	25T049	25T053	25T057

Plunger Replacements

Air Motor	Models								
	T6003	T6005	T6006	T6010	T6012	T6016	T6025	T6036	T6058
6.0 inch	25T058	25T059	25T060	25T061	25T062	25T063	25T064	25T065	25T066
	T7505	T7507	T7510	T7516	T7519	T7525	T7539	T7557	T7568
7.5 inch	25T161	25T162	25T163	25T164	25T165	25T166	25T167	25T168	25T169

Air Motor Soft Seals

(Includes plug o-ring, cylinder o-rings, piston o-ring, manifold gaskets, air valve gasket, plunger u-ring, and retaining ring)

Air Motor	Models								
	T6003	T6005	T6006	T6010	T6012	T6016	T6025	T6036	T6058
6.0 inch	25T087	25T088	25T089	25T090	25T091	25T092	25T093	25T094	25T095
	T7505	T7507	T7510	T7516	T7519	T7525	T7539	T7557	T7568
7.5 inch	25T096	25T097	25T098	25T099	25T100	25T101	25T102	25T103	25T104

Air Motor Replacement

Air Motor	Models								
	T6003	T6005	T6006	T6010	T6012	T6016	T6025	T6036	T6058
6.0 inch	25T087	25T088	25T089	25T090	25T091	25T092	25T093	25T094	25T095
	T7505	T7507	T7510	T7516	T7519	T7525	T7539	T7557	T7568
7.5 inch	25T096	25T097	25T098	25T099	25T100	25T101	25T102	25T103	25T104

Pump Lower Replacement

(Includes spacers, lock washers, and bolts)

Material	Models								
	0305	0507	0610	1016	1219	1625	2539	3657	5868
EPR	25T125	25T129	25T133	25T137	25T141	25T145	25T149	25T053	25T057
FFKM	25T126	25T130	25T134	25T138	25T142	25T146	25T150	25T054	25T058
FKM	25T127	25T131	25T135	25T139	25T143	25T147	25T151	25T055	25T059
NBR	25T128	25T132	25T136	25T140	25T144	25T148	25T152	25T056	25T060

Lower Air Motor Covers

(Includes seal stack, pilot valve, bumper, cylinder o-ring, and ground screw)

Air Motor	Models								
	T6003	T6005	T6006	T6010	T6012	T6016	T6025	T6036	T6058
6.0 inch	25T067	25T068	25T069	25T070	25T071	25T072	25T073	25T074	25T075
	T7505	T7507	T7510	T7516	T7519	T7525	T7539	T7557	T7568
7.5 inch	25T076	25T077	25T078	25T079	25T080	25T081	25T082	25T083	25T084

Upper Air Motor Covers

(Includes top plug and seal, cylinder o-ring, and pilot valve)

Air Motor	
6.0 inch	25T085
7.5 inch	25T086

Motor Manifold

24A580; all models and sizes

Motor Air Valve

24A352; all models and sizes

Pilot Valve

24A366; all models and sizes

Muffler - Small

25T105; all models and sizes

Muffler - Large

25T106 (includes adapter); all models and sizes

Dimensions

T-Series Pump Dimensions

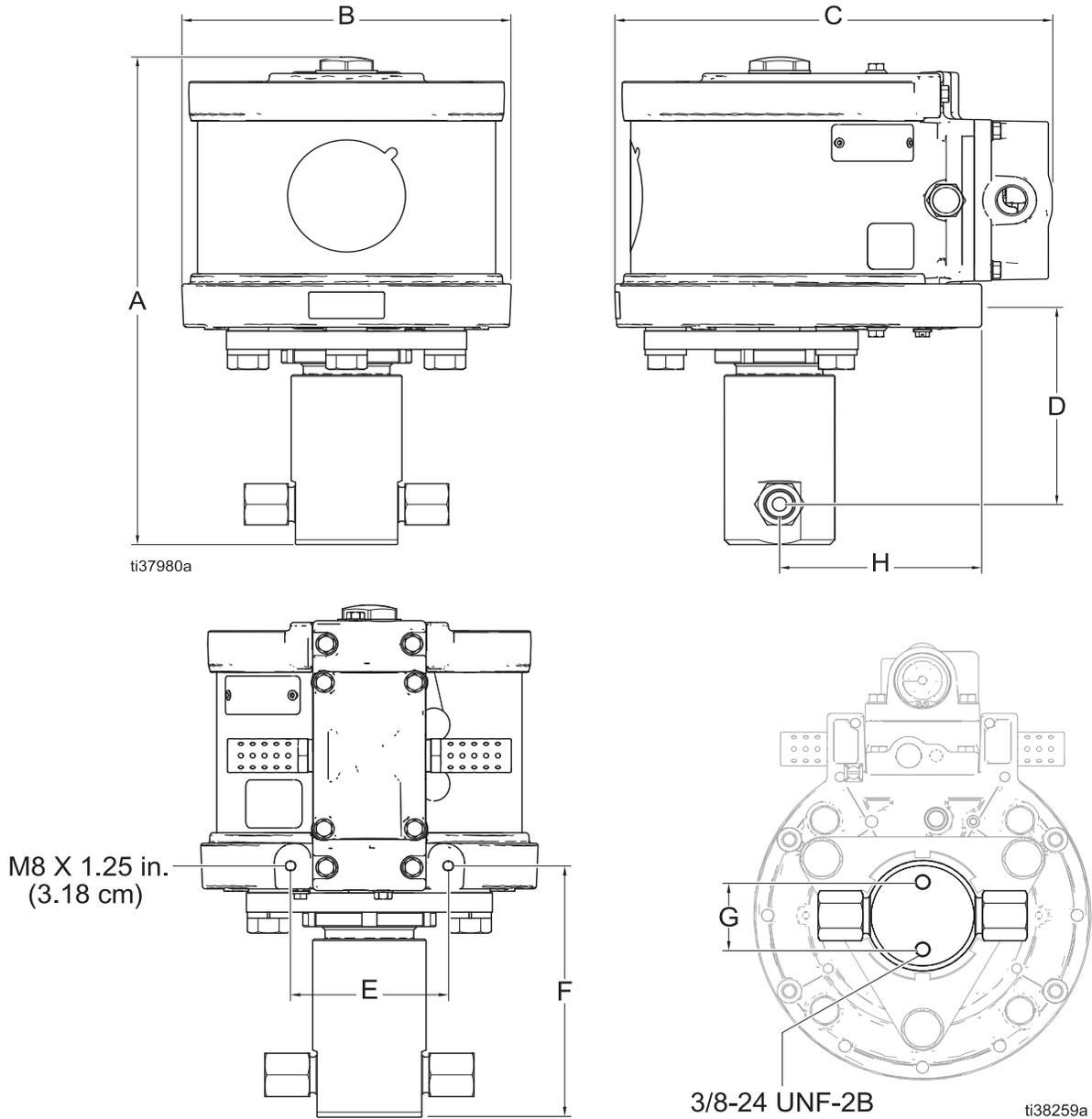


FIG. 12 T-Series Pump Dimensions and Mounting Holes

Size	A	B	C	D	E	F	G	H
6000	13.5 in. (34.3 cm)	8.75 in. (22.2 cm)	11.5 in. (29.2 cm)	5.4 in. (13.7 cm)	4.0 in. (10.2 cm)	6.5 in. (16.5 cm)	1.75 in. (4.4 cm)	5.25 in. (13.3 cm)
7500		10.0 in. (25.4 cm)	13.0 in. (33.0 cm)					

Pneumatic Mounting Hole Diagrams

T6000 (6 in. motor)

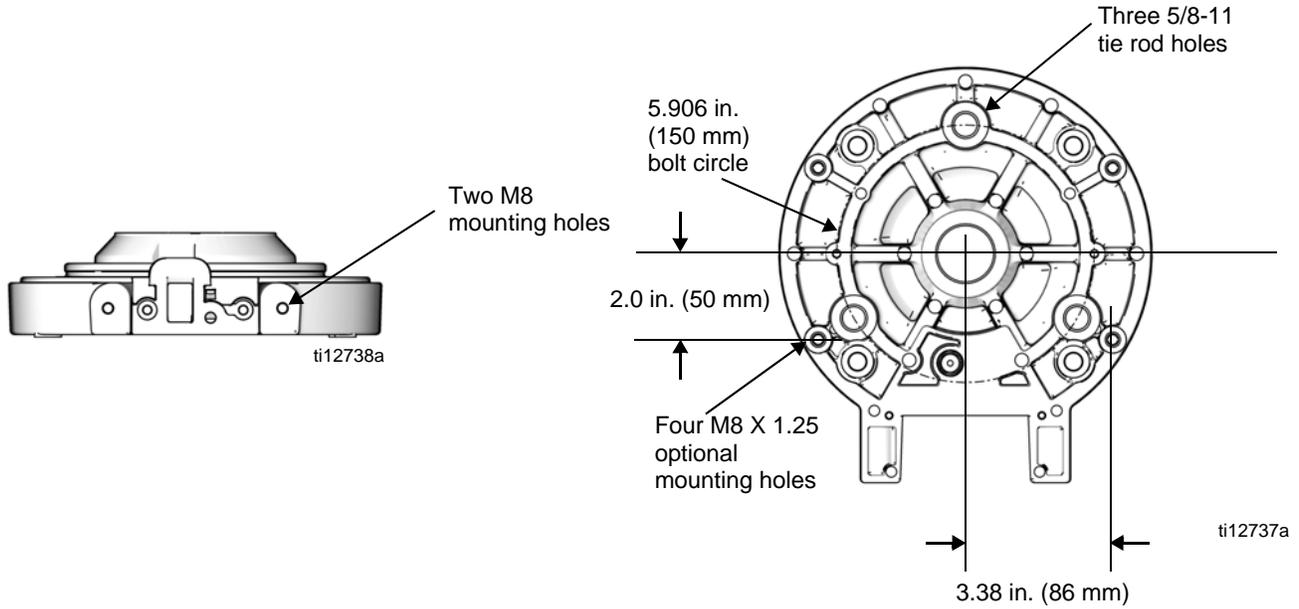


FIG. 13

T7500 (7.5 in. motor)

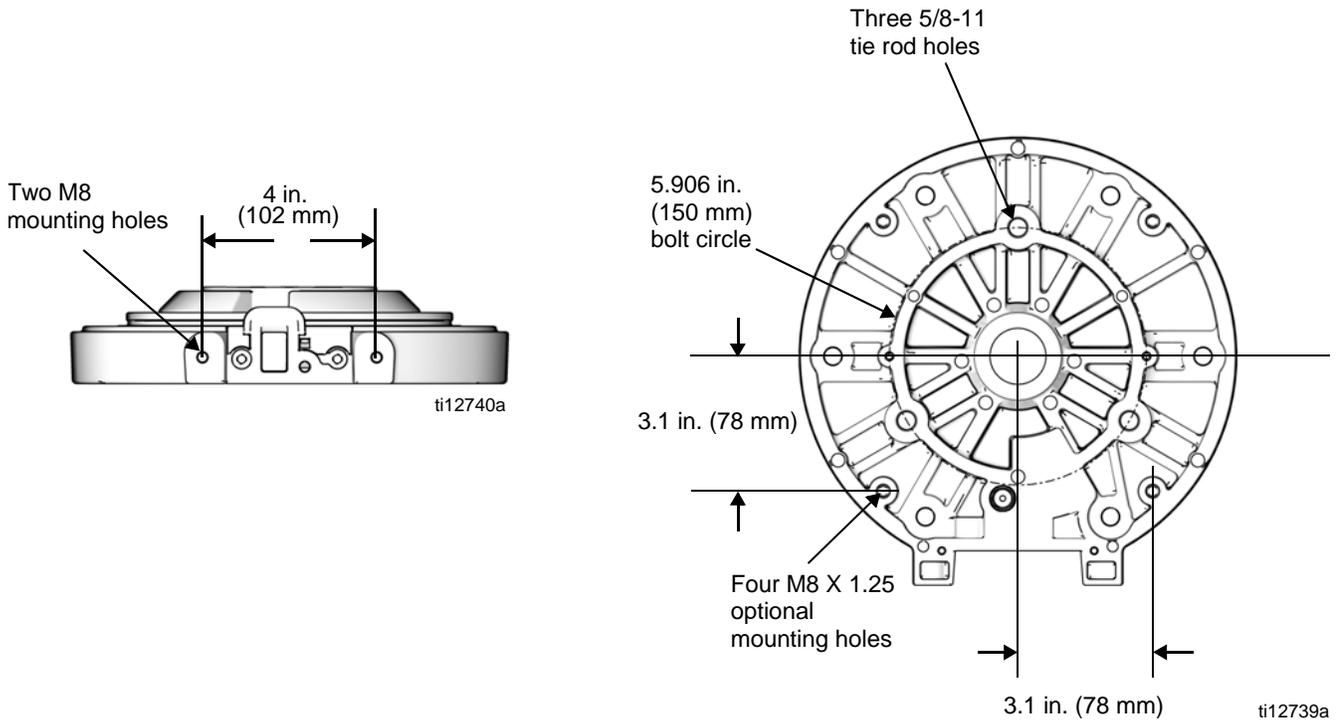


FIG. 14

Technical Specifications

T-Series Intensifier Pump		
	US	Metric
Maximum Fluid Working Pressure	Varies by model. See Models on page 3.	
Environmental Temperature Range	35°–130°F	2°–54°C
Maximum Pump Speed	180 cycles per minute*	
Noise		
Pneumatic Motor Sound Power	85 dB	
Pneumatic Motor Sound Pressure	78 dB	
Inlet/Outlet Sizes		
Fluid Inlet Size (all models)	1/2 NPT	
Fluid Outlet Size (T6003, T6005, T6006, T7505, T7507, T7510)	1/2 NPT	
Fluid Outlet Size (T6010, T6012, T6016, T7516, T7519, T7525)	HF9	
Fluid Outlet Size (T6025, T6036, T6058, T7539, T7557, T7568)	HF4	
Wetted Materials of Construction		
Plunger Seal	NBR, FKM, EPR, or FFKM	
Check Valve	17-4, 316 SST	
Pump Body (T6003, T6005, T6006, T7505, T7507, T7510)	303 SST	
Pump Body (T6010, T6012, T6016, T6025, T6036, T6058, T7516, T7519, T7525, T7539, T7557, T7568)	17-4	
Pump Piston	17-4 PH	
Weight		
All Models	<28 lb.	<12.7 kg

* Optimal seal life is achieved at less than 80 cycles per minute.

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This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco High Pressure Equipment Company distributor for verification of the claimed defect. If the claimed defect is verified, Graco High Pressure Equipment Company will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Original instructions. This manual contains English. MM 3A6823

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