

# XL<sup>TM</sup> 10000 Air Motor

334644D

EN

For use with high output reciprocating Graco pumps. For professional use only.



## Important Safety Instructions

Read all warnings and instructions in this manual and in related manuals. Save all instructions.

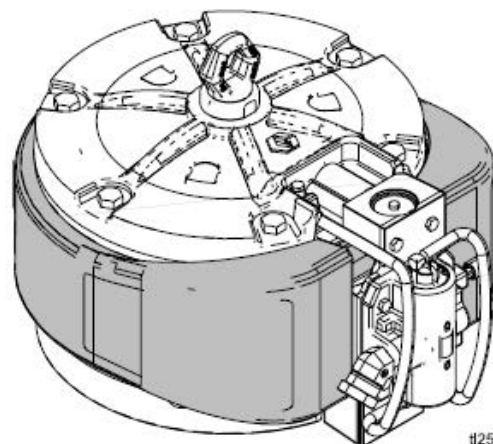
*Model 24X856*

*100 psi (0.7 MPa, 7 bar) Maximum Working Pressure*

*Model 273088*

*100 psi (0.7 MPa, 7 bar) Maximum Working Pressure*

*(For use on XP-hf systems only)*



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## Related Manuals

Manual in English	Description
311762	Xtreme Lowers, Instructions-Parts
311825	Dura-Flo™ Lowers, Instructions-Parts
334645	Xtreme XL Packages, Instructions-Parts
3A4381	XP-hf Proportioner, Operation, Repair, Parts

# 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.

 <b>WARNING</b>	
 	<b>EQUIPMENT MISUSE HAZARD</b> Misuse can cause death or serious injury. <ul style="list-style-type: none"> <li>Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Specifications</b> in all equipment manuals.</li> <li>Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Specifications</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.</li> <li>Do not leave the work area while equipment is energized or under pressure.</li> <li>Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use.</li> <li>Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.</li> <li>Make sure all equipment is rated and approved for the environment in which you are using it.</li> <li>Use equipment only for its intended purpose. Call your distributor for information.</li> <li>Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>Keep children and animals away from work area.</li> <li>Comply with all applicable safety regulations.</li> </ul>
 	<b>MOVING PARTS HAZARD</b> Moving parts can pinch, cut or amputate fingers and other body parts. <ul style="list-style-type: none"> <li>Keep clear of moving parts.</li> <li>Do not operate equipment with protective guards or covers removed.</li> <li>Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> and disconnect all power sources.</li> </ul>

# ⚠ WARNING



## FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive.
- **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.



## SKIN INJECTION HAZARD

High-pressure fluid from gun, 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.**

- Do not spray without tip guard and trigger guard installed.
- Engage trigger lock when not spraying.
- Do not point gun at anyone or at any part of the body.
- Do not put your hand over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop spraying 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.

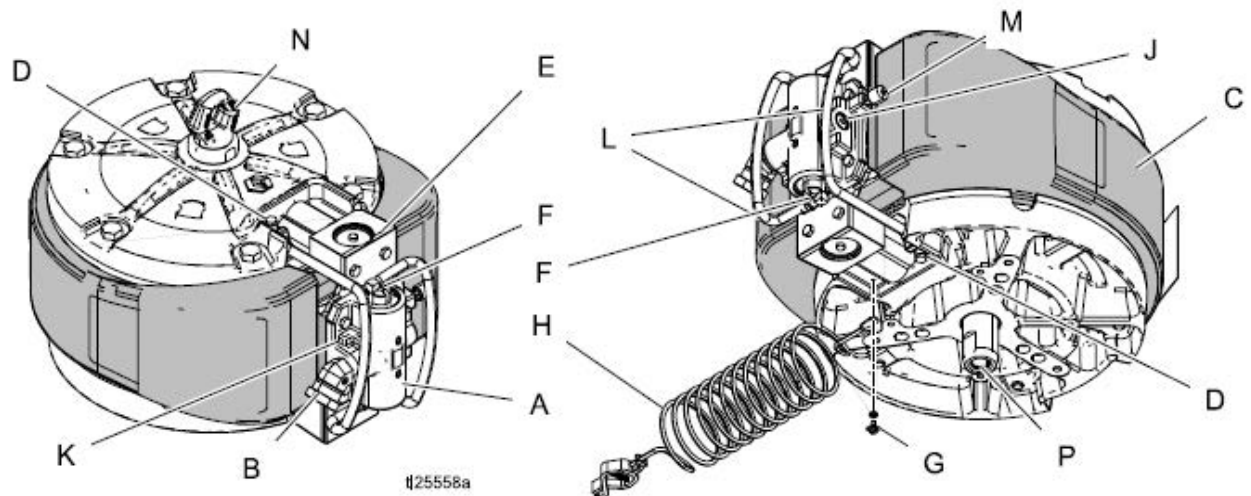


## PERSONAL PROTECTIVE EQUIPMENT

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.

# Component Identification



**FIG. 1**

**Key:**

- A Directional Air Valve
- B Air inlet, 1 in npt (f)
- C Muffler
- D Pilot valve
- E Manifold
- F Manual Shuttle Override Button
- G Ground screw
- H Static ground cable
- J Plug for optional solenoid
- K Optional reed switch mount
- L External pilot lines
- M De-ice bleed air valve
- N Lift ring (800 lb, 363 kg) maximum
- P Pump drive rod

## General Information

The XL 10000 air motor is air piloted with two poppet valves operating a cup and plate main air shuttle valve. Air exhausts around the cylinder, through sound absorption materials, and out the rear bottom of the shroud.

## Application

This motor has 7% larger effective area, and is intended to directly replace, the Graco Premier® motor. The XL will accept the same M16x 2.0 threaded tie rods, the same connecting rods, and the same 3/8-16 mounting studs used with the Premier. The XL motor is physically smaller than the Premier, so it will fit anywhere the Premier is used. The 1 in. air inlet is at a low front position instead of up on the top so a different air hose may be required. There are also threaded cart/shelf type mounting holes in the base which match the ones used on the NXT® motors. The XL motor fits the standard heavy duty Xtreme cart so the larger Premier cart is no longer necessary.

## Reciprocating Signal Poppets

The poppets are identical to the ones used in the Graco Merkur® motors and many air-operated double diaphragm motors. Poppets are fully accessible and can easily be replaced.

## External Pilot Lines

The pilot lines (L) that run from the shuttle end ports to the exhaust poppets are run externally in hydraulic hose. This allows for cold weather operation without running the air through the aluminum manifold, which can sometimes get cold enough for airline moisture to freeze and block the signals.

## Manual Override Buttons

There are manual override buttons (F) on each end of the air valve that allows the internal main shuttle valve to be physically moved from one position to the other. Run the motor manually to:

- Move the valve off center due to ice or debris.
- Flush a pump if a poppet is plugged, stuck in the open position, or the signal is leaking.

See **Run Motor Manually** on page 8.

## Low Pressure Operation

This motor will run at 4–5 psi (20.6–27.5 kPa, 0.21–0.27 bar)

## Performance

The air valve (A), manifold (E), and exhaust are larger than the Premier air handling parts in order to exhaust the 630 in<sup>3</sup> of compressed air from the cylinder after a full stroke. This allows the fluid pressure to come back faster as the piston is driven from the other side. The near square pressure trace that this generates makes for a small change-over pulse, and full pressure output for running multiple guns.

## Minimum Icing

The oversizing of all the air handling parts described in the General Information section mean that normal air motor ice buildup has less effect on the pump output.

## Bleed Air

Use the de-ice bleed air valve (M) to run warm air through the valve and exhaust for de-icing. This is mainly helpful during warm weather, very high humidity applications, or low pressure high cycle rate applications.

## Extended Capabilities

The XL motor will accept DataTrak™ counting, a runaway stop solenoid, and the top mount linear position transducer used with NXT motors.

## 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>				

Verify that the ground screw (GS) is attached and tightened securely to the air motor. Connect the clamp (U) of the static ground cable (H) to a true earth ground.

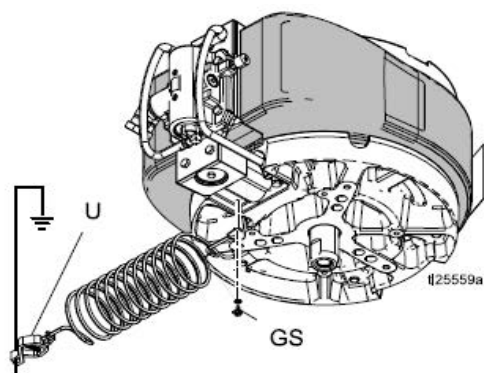


FIG. 2

## Motor Lubrication

Graco does not require lubrication beyond the grease installed at the factory or through regular maintenance. With good quality compressed air and normal ambient conditions, air motors will run millions of cycles without additional lubrication.

However, if any of the following criteria apply to your system, you will benefit from installing an air line lubricator in the air line before the air motor, or from occasionally adding oil to an air filter cup.

- Air supply does not contain any oil.
- Air supply is very wet.
- Air supply is very dry.
- Air motor is run at low air pressure.
- Air motor is run in unusually hot or cold environments.

## Accessories

### Bleed-type master air valve

<p>Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.</p>				

- Required in your system to relieve air trapped between it and the air motor when the valve is closed.
- Be sure the valve is easily accessible from the pump and located downstream from the air regulator.

### Air Regulator

Required in your system to adjust the air pressure to the motor and fluid outlet pressure of pump. Locate it close to the motor. Install a gauge to read air pressure.

### Air Filter

Required in your system to remove harmful dirt and moisture from compressed air supply. The minimum recommended air filtration is 40 micron.

### Air Lubrication

237212 1" npt (f) accessory lubricator with a 16 oz. bowl. See form 308169.

244841 Kit. Modular Lubricator. Use with XL Graco spray packages with modular air controls. See form 3A0293.

## Run Motor Manually

Use the manual override buttons (F) on each end of the air valve to physically move the internal main shuttle valve from one position to the other. Run the motor manually to:

- Move the valve off center due to ice or debris.
  - Flush a pump if a poppet is plugged, stuck in the open position, or the signal is leaking
1. Lower the air pressure to approximately 30–40 psi (2.1 kPa, 210 bar – 280 kPa, 2.8 bar) to manually operation the buttons.
  2. If a poppet is plugged:
    - a. Press the button on the end where the motor stopped. This will cause the motor to run another cycle.
    - b. Press the button again to finish flushing.
  3. If a poppet is stuck in the open position or the signal is leaking:
    - a. Press the button on the opposite end from where the motor stopped and hold it in. This will cause the motor to stroke to the other end.
    - b. Release the button to allow the motor to stroke back.

**NOTE:** For poppet issues, the motor can also be manually operated by disconnecting the pilot hose and controlling the pilot signal exhaust with your finger.



# Troubleshooting



Problem	Cause	Solution
Air motor will not run and there is no obvious exhaust	Check air supply	Supply air to motor inlet.
	Pump is locked up.	Disconnect or remove pump to verify motor operation.
	Ice broke loose in manifold and caught in air valve.	Turn off and exhaust air. Push top and bottom valve shift buttons (118) back and forth until flush with base of valve cap (107). Restart motor.
Air motor doesn't run and large volume of air blows through exhaust outlet on either stroke.	Main piston o-ring (10) has failed or main valve. See below.	Replace piston o-ring (10) See page 10.
Air exhausts from rear outlet continuously when motor is stalled against fluid valve on one stroke or the other.	Shuttle valve cup (112) and plate (105) failure.	Replace shuttle valve cup (112) and plate (105).
Motor stalled at bottom of stroke with no exhaust at bottom pilot. No exhaust at top pilot.	Bottom pilot (15) is not exhausting. Usually ice in the pilot or pilot exhaust port.	Disconnect pilot line (55) for that pilot. If motor changes over, bottom pilot is plugged. Replace pilot valve(55) and/or thaw ice that is blocking air signal.
	Metered air hole in main valve shuttle piston (102) is plugged.	Disconnect pilot line (55). If motor still doesn't change over, shuttle piston metering hole is plugged. Clean or replace shuttle valve piston assembly (102).
Motor stalled at bottom of stroke with exhaust at bottom pilot. Some exhaust at top pilot.	Top pilot or fittings are leaking air when not activated by motor piston.	Tighten fittings leak or replace top pilot valve (15).
Motor stalled at top of stroke with no exhaust at top pilot. No exhaust at top pilot.	Top pilot (15) is not exhausting. Usually ice in the pilot or pilot exhaust port.	Disconnect pilot line (55) for that pilot. If motor changes over, top pilot is plugged. Replace pilot valve(55) and/or thaw ice that is blocking air signal.
	Metered air hole in main valve shuttle piston (102) is plugged.	Disconnect pilot line (55). If motor still doesn't change over, shuttle piston metering hole is plugged. Clean or replace shuttle valve piston assembly (102)
Motor stalled at top of stroke with exhaust at top pilot. Some exhaust at bottom pilot.	Bottom pilot or fittings are leaking air when not activated by motor piston.	Tighten fittings leak or replace bottom pilot valve (15).
Air motor "bounces" at top change over.	Leaking bottom pilot valve or fitting.	Thaw any ice in pilot valve, or replace valve (15) if it is not ice.

Problem	Cause	Solution
Air motor "bounces" at bottom change over.	Leaking top pilot valve or fitting.	Thaw any ice in pilot valve, or replace valve (15) if it is not ice.
Air motor pauses at top change over.	Top pilot valve exhaust restricted by dirt or ice.	Swap pilot valve or clear exhaust port.
Air motor pauses at bottom change over.	Bottom pilot valve exhaust restricted by dirt or ice.	Swap pilot valve or clear exhaust port.
Motor runs slower and pump loses fluid pressure on one stroke only.	Ice has collected in air manifold passages, or valve.	Thaw or remove ice. Lower moisture content of compressed air. Reduce load on motor. See below.
Motor runs slower and pump loses fluid pressure on both strokes equally.	Ice has collected where exhaust expands from the shuttle valve plate manifold (5) into the muffler (12)	Open the bleed air valve (119) on the main shuttle valve. This will bleed some warm air through anytime air is supplied to the motor.

## Ice In Air Motor

When compressed air is exhausted, the sudden drop in pressure causes the air temperature to drop below the freezing point. This causes any water liquid or vapor to turn to ice.

Higher air pressures pack high amounts of air and water vapor in each cycle and create more expansion and ice. Higher cycle rates also build up the ice and lower the motor temperature faster. It is important to select the correct motor and pump size to run at a lower pressure, and cycle slower.

Warm humid climates can produce high levels of icing because of the higher humidity levels. Low ambient temperatures near freezing make it easier for the motor parts to drop below freezing.

To minimize ice build-up:

- **Lower the dew point of the compressed air.** Use a refrigerated air dryer, coalescing filter, or desiccant filter to lower the water vapor content of the air.
- **Raise the compressed air temperature.** Warmer air going in helps the motor parts stay above freezing. Compressed air, especially at these volumes, is warm when compressed. Keep the air warm or stay near the compressor to reduce icing.
- Use the bleed air to clear ice build up.

# Repair

## Preventive Maintenance Schedule

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

## Pressure Relief Procedure



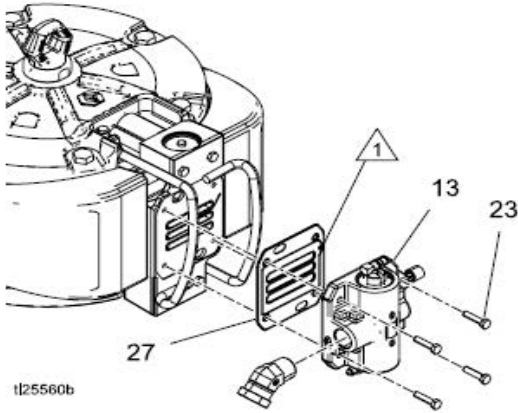
Follow the Pressure Relief Procedure whenever you see this symbol


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

1. Engage trigger lock.
2. Close the bleed-type master air valve.
3. Disengage the trigger lock.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.
5. Engage the trigger lock.
6. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave drain valve(s) open until you are ready to spray again.
7. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved:
  - a. **VERY SLOWLY** loosen tip guard retaining nut or hose end coupling to relieve pressure gradually.
  - b. Loosen nut or coupling completely.
  - c. Clear hose or tip obstruction.

## Repair Air Valve

### Replace Complete Air Valve



**FIG. 3**

1. Stop the pump at the middle of its stroke. Follow **Pressure Relief Procedure**, page 11.
2. Disconnect the air line to the motor and the pilot valve lines to the air valve (13).
3. If installed on air motor, remove reed switch kit and solenoid from air valve (13).
4. Remove screws (23). Remove the air valve (13) and gasket (27).
5. To repair the air valve, go to **Disassemble the Air Valve**, page 12, step 1. To install a replacement air valve, continue with step 6.
6. Align the new air valve gasket (27) on the manifold, then attach the air valve (13).

**NOTE:** Use grease to hold the gasket (27) in place. Be sure the bleed air hole in the gasket aligns with the bleed port in the valve manifold.

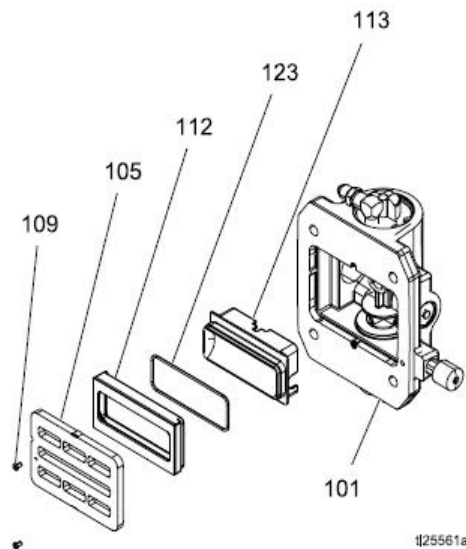
7. Reattach the solenoid bracket and the solenoid.
8. Use screw to attach the reed switch assembly to the new air valve. Be sure the sensor cables are connected properly (see pump or package manual).
9. Reconnect the air line and pilot valve lines to the motor.

### Replace Seals or Rebuild Air Valve

See **Kits and Accessories**, page 21, to order kits for your pump.

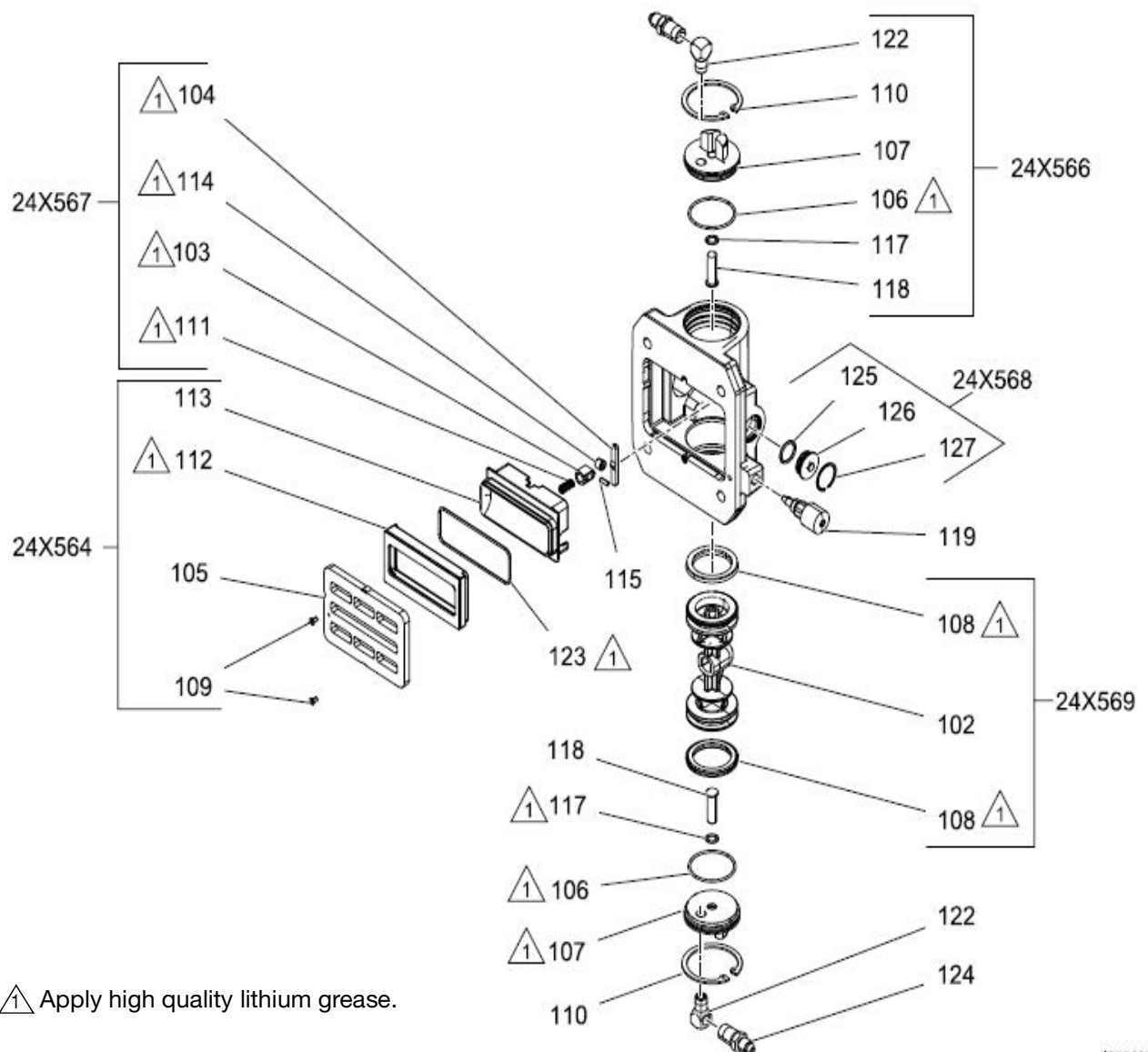
#### Disassemble the Air Valve

1. Perform steps 1–5 from **Replace Complete Air Valve**, page 12.
2. Use a 2mm or 5/64 hex key to remove two screws (109). Remove the valve plate (105).
3. Remove the two-piece cup assembly (112, 113, 123), and spring (111).



**FIG. 4**

4. Remove the snap ring (110) from each end. Use the piston (102) to push the end caps (107, 117) out of the ends. Remove end cap o-rings (106, 117).
5. Slide out the piston (102). Remove the u-cup seals (108) from each end and the detent assembly (103) and detent cam (104) from the center.



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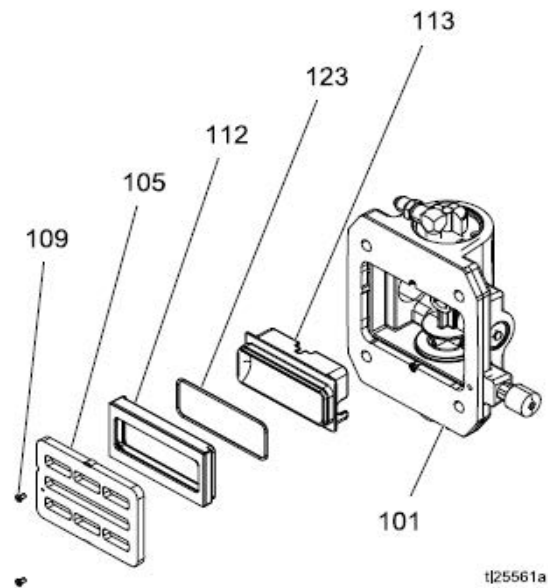
**FIG. 5 Air Valve Assembly**

## Reassemble the Air Valve

1. Lubricate detent cam (104) and install into housing.
2. The piston (102) and u-cup seals (108) come pre-assembled. Lubricate the u-cup seals (108) on both ends of the piston (102) and install it in the housing.
3. Lubricate and install the detent assembly (103) into the piston, with the beveled center toward the detent cam.
4. Lubricate and install new o-ring (106) on bottom end cap (107). Lubricate and install new o-ring (119) and runaway reset button (118) on top end cap (117). Install the end caps (107, 117) into the housing.
5. Install a snap ring (110) on each end to hold end caps in place.
6. Install the spring (111).
7. Lubricate and install the cup o-ring (123) on the cup body (113), then assemble the cup body to the cup base (112c). Lubricate and install the cup

assembly. Align the small round magnet with the air inlet.

8. Install the valve plate (105). Lightly tighten the screws (109) to hold it in place.



## Replace Pilot Valves

1. Stop the pump at the middle of its stroke. Relieve the pressure. See **Pressure Relief Procedure**, page 11.
2. Disconnect the air line to the motor.
3. Use a 10 mm socket wrench to remove the old pilot valves (15) from the top and bottom covers.
4. Lubricate and install the new pilot valves (15). Torque to 95-105 in-lb (11-12 N•m).

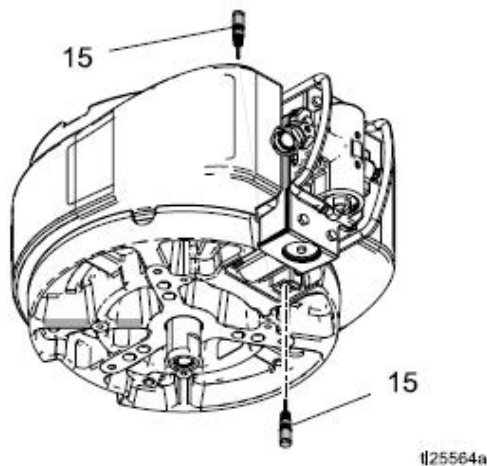


FIG. 6 Pilot Valves

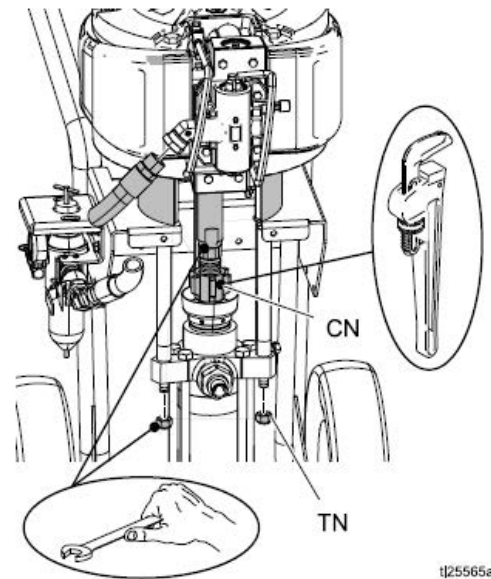
## Repair Air Motor

Refer to applicable system manual for alternate air motor removal steps.

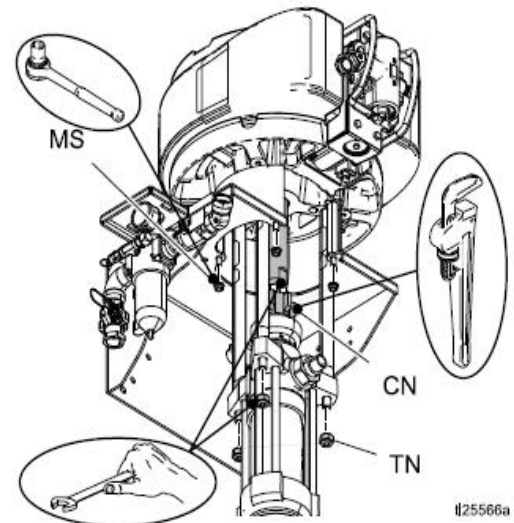
Air Motor Seal Kits are available. See **Kits and Accessories**, page 21 for the correct kit for your motor. Parts included in the kit are marked with an asterisk (\*). For best results, use all the parts in the kit.

### Disconnect the Air Motor

1. Flush the pump, if possible (see package manual). Follow **Pressure Relief Procedure**, page 11.
2. Disconnect the air and fluid hoses and the ground wire.
3. Hold the flats of the air motor piston rod with a wrench. Use another wrench to loosen the coupling nut (CN). Collect the coupling collars and set aside.



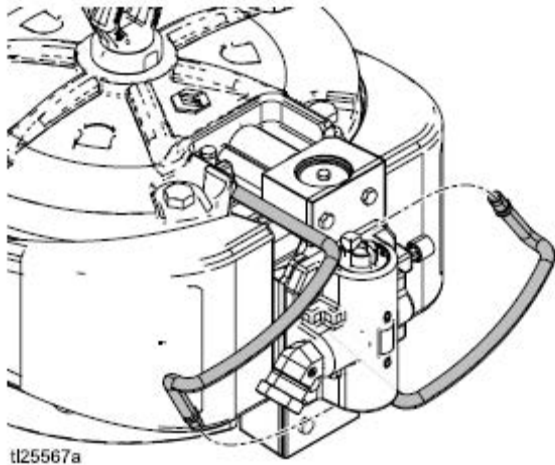
4. Hold the tie rods and remove the tie rod nuts (TN).
5. Use a socket to remove the mounting screws (MS).



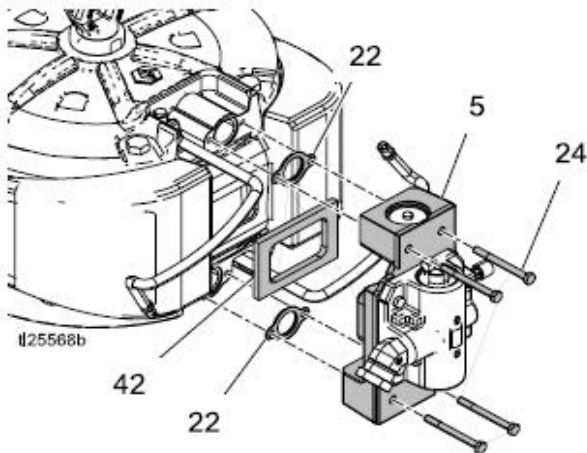
6. Lift up on the air motor to remove it. The tie rods will remain attached.

## Disassemble the Air Motor

1. Disconnect pilot valve air lines (55) from the air valve (13).



2. Remove four screws (24) and remove the manifold (5) and two gaskets (22). Inspect foam (42) for damage.



3. Use a 15/16 in or 24 mm socket wrench to remove the tie bolts (25).
4. Remove the top cover. Remove the o-ring (14\*).

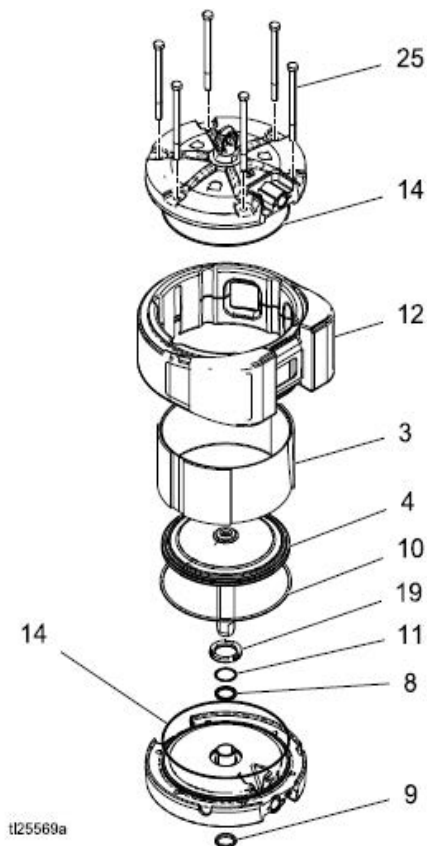
**NOTE:** To break the cover loose, place a pipe or a long wrench handle through the lift ring (17) and hit the pipe.

5. Remove the muffler (12) from around the cylinder. Remove the cylinder (3).

6. Slide the piston assembly (4) straight up off the bottom cover (1).

**NOTE:** The piston and rod are epoxied together and only available as an assembly (4). Do not attempt to take apart the piston and rod assembly (4).

7. Remove the o-ring (10\*) from around the piston (4).
8. Use a flat head screw driver to remove the retaining ring (11) from the bottom cover (1).
9. Remove the u-cup seals (8\*, 9\*), and o-ring (14\*) from the bottom cover (1).

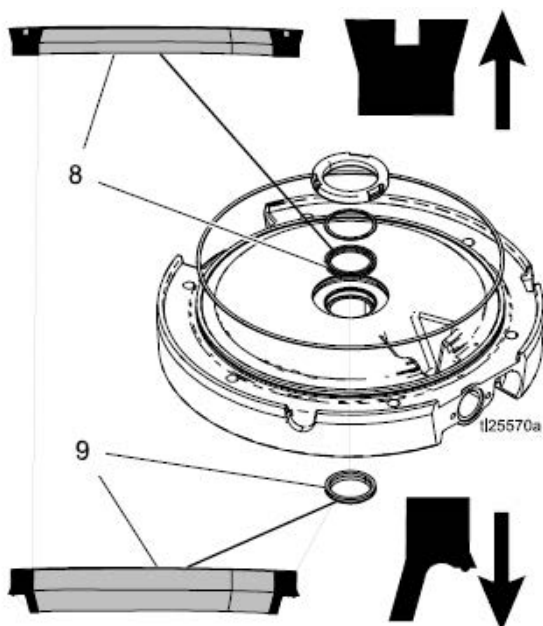




## Reassemble the Air Motor

**NOTE:** The bearing (7) is pressed in the bottom cover (1) and is only available with Bottom End Cap Repair kit 24X559.

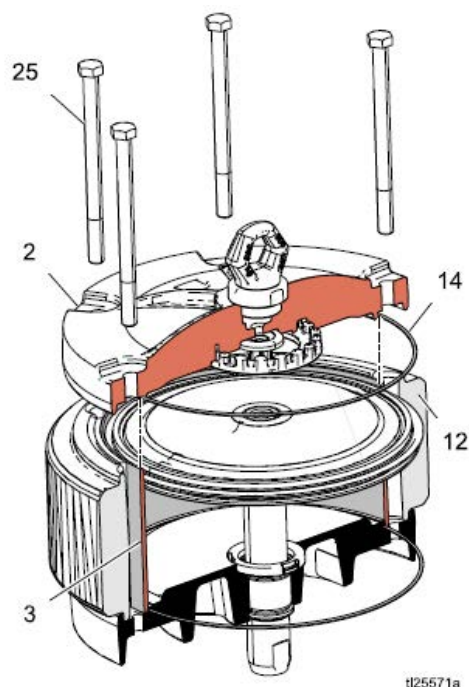
1. Lubricate and install the o-ring (14\*) on the bottom cover (1).
2. Lubricate and install new u-cup seal with flange (9\*), with the lips facing up, in the bottom cover (1) from the bottom. The seal will snap into place.



**FIG. 7 U-cups**

3. Lubricate and install the new u-cup seal (8) over the top of the bearing with the lips facing up. Install retaining clip (11). Snap in the new bumper (19).
4. Lubricate the inside of the cylinder (3). Lower the cylinder (3) onto the bottom cover (1).
5. Lubricate and install the o-ring (10\*) around the piston (4). It will fit loose.
6. Slide the piston assembly (4) down into the cylinder (3). Be sure the o-ring (10\*) stays in place. Work it carefully into the groove.

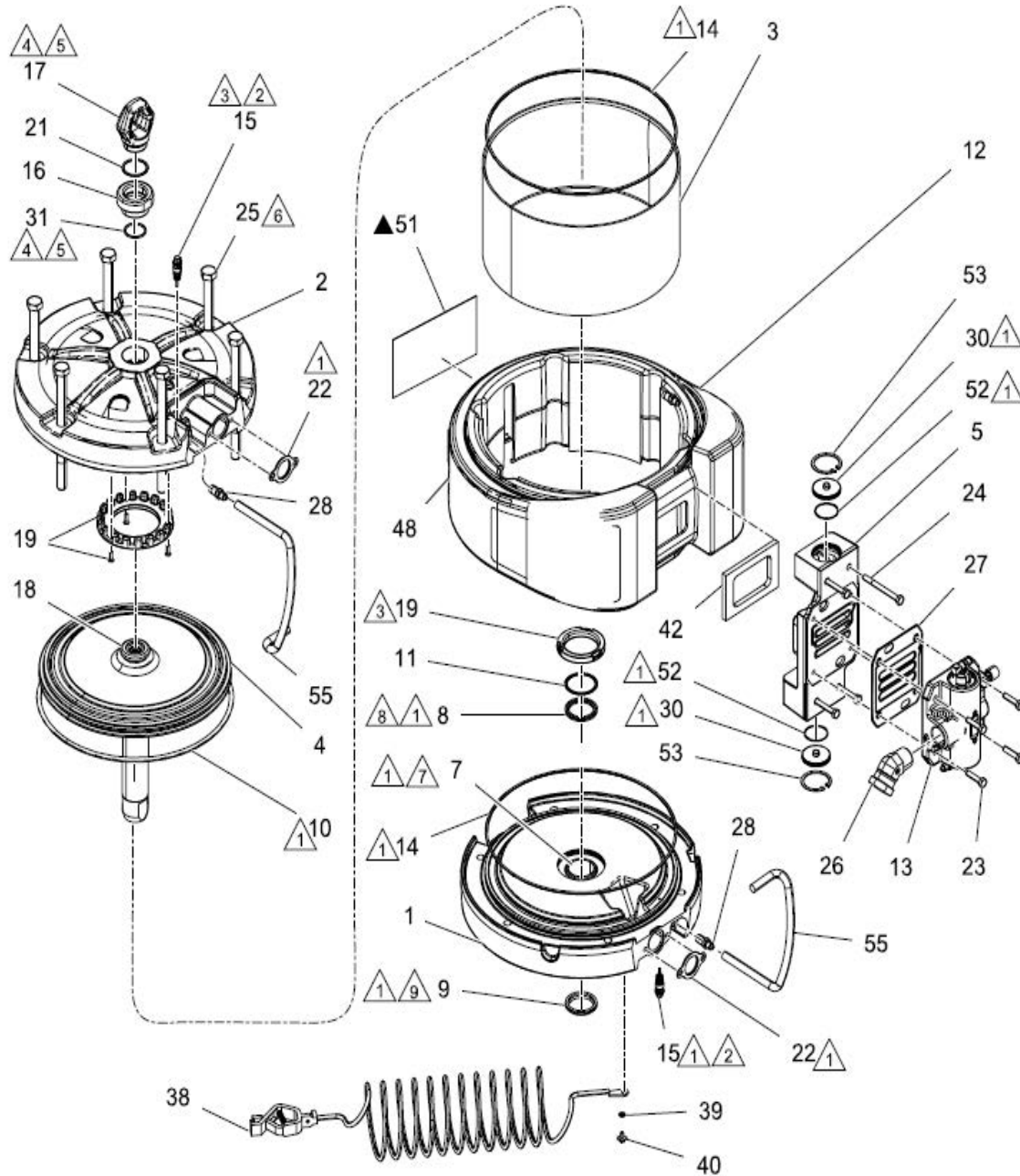
7. Install the muffler (12) around the cylinder (3) and in the groove on the bottom cover (1). Be sure the front opening is lined up with the flat on the bottom cover (1).
8. Lubricate and install the o-ring (14\*) on the top cover (2).
9. Carefully place the top cover (2) on the cylinder (3) and muffler (12). The flat vertical manifold surfaces of the top and bottom covers must align. Be sure the muffler (12) is in the groove on both the top and bottom covers.



10. Install the tie bolts (25) hand tight.
11. Tighten the tie bolts (25) halfway. Work in a crisscross pattern. Then torque to 60 ft-lb (81 N•m).
12. Install two gaskets (22) on the top and bottom caps with grease. Install the manifold (5). Torque bolts to 95-105 in-lb (10.7-11.9 N•m).
13. Reconnect the pilot valve air lines (55) to the air valve (13).

# Parts

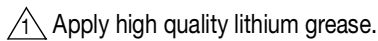
## Part 24X856 and 273088



t25572c

- |  |  |
|--|--|
| △1 Apply lithium grease.                     | △6 Torque to 60 +/- 2 ft-lbs. (81 +/- 2.7 N•m)                 |
| △2 Torque to 95-105 in-lb (11-12 N•m).       | △7 Piston rod (6) must move through bearing (7) without force. |
| △3 Press to snap fit.                        | △8 Lips face up.   |
| △4 Apply medium thread locker.               | △9 Wiper faces down.   |
| △5 Torque to +/- 3 ft-lbs. (44.7 +/- 4 N•m). |  |

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1★	24X559	COVER, bottom	1	39	111307	WASHER, lock, external	1
	17R815	COVER, bottom, motor, XP-hf (For model 273088)	1	40	116343	SCREW, ground	1
2	24W584	COVER, top	1	42	17C776	GASKET, muffler	1
3★	24X561	KIT, cylinder	1	51▲	15F674	LABEL, safety, motor	1
4★	24X557	KIT, piston, motor	1	52	104010	PACKING, o-ring	2
	24Z920	KIT, piston and rod (For model 273088)	1	53	557832	RING, retainer -187basic int	2
5	16Y968	MANIFOLD, exhaust, XL	1	55	128090	HOSE, coupled	2
7★	---	BEARING, sleeve, 1.750 ID, 2.000 OD	1	▲ Replacement Warning labels, signs, tags, and cards are available at no cost.			
8★	---	PACKING, u-cup, 1.750 ID, 2.125 OD	1	★ See <b>Kits and Accessories</b> , page 21.			
9★	---	SEAL, rod, wiper, 1.75" rod	1				
10★	---	O-RING, piston	1				
11★	---	RING, retaining	1				
12	24X560	COVER, muffler, complete	1				
13	24X562	VALVE, air, XL; see <b>Air Valve Parts, page 20</b>	1				
14	109486	PACKING, o-ring	2				
15	24A366	VALVE, pilot (includes 15a-15c)	2				
-15a	155685	PACKING, o-ring, middle	1				
-15b★	---	PACKING, u-cup, shaft	1				
-15c	154741	PACKING, o-ring, bottom	1				
-15d	197650	O-RING, buna, top	1				
16	16D001	ADAPTER, lift ring	1				
17	15F931	RING, lift, sst 1 9/16 thrd	1				
18	NXT106	BUMPER, piston (with magnet)	1				
19★	24A915	KIT, bumper, top and bottom (with screws)	1				
21	108014	PACKING, o-ring	1				
22★	---	GASKET, end cap	2				
23	110036	BOLT, M8 x 1.25 x 45 mm	4				
24	17B389	SCREW, M8 x 1.25 x 85 mm	4				
25	127582	SCREW, 5/8–11 x 8.5 in	6				
26	---	FITTING, swivel, 45°, 1npt x 1 npsm	1				
27	24X565	GASKET, valve, 2 pack	1				
28	555749	FITTING, adapter, 1/8 npt(m) x JIC (#4); 1/2 hex	2				
30	17C974	CAP, manifold, air, XL	2				
31	C20987	PACKING, o-ring	1				
38	244524	CABLE, ground, with clamp (includes 38a)	1				
38a▲	290079	TAG, warning, grounding (not shown)	1				



Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
101	---	HOUSING, valve, air, XL	1	119	16Y668	NEEDLE, valve, assembly	1
102★	---	PISTON, valve, air, XL	1	122	15K783	FITTING, elbow, street, 1/8-27 npt	2
103★	---	PISTON, detent, small	1	123★	295640	O-RING	1
104★	---	CAM, detent, XL	1	124	555749	CONNECTOR, #4 JIC 1/8	2
105★	---	PLATE, valve, air, xl, lapped	1	125★	104130	PACKING, o-ring	1
106★	104010	PACKING, o-ring	2	126★	---	PLUG, valve	1
107★	---	CAP, valve, air, XL	2	127★	---	RING, retaining	1
108★	---	PACKING, u-cup	2	★ See <b><i>Kits and Accessories, page 21.</i></b>			
109★	---	SCREW, m3, thread forming	2				
110★	557832	RING, retainer -187basic int	2				
111★	---	SPRING, detent	1				
112★	---	BASE, cup, valve, air, xl, lapped	1				
113★	---	CUP, valve, air, xl, zinc	1				
114★	---	ROLLER, detent, small	1				
115★	---	PIN, detent, small	1				
117★	154741	PACKING, o-ring	2				
118★	---	BUTTON, reset	2				

## Kits and Accessories

**Table 1 XL Air Motor Repair Kits**

Part	Description	Air Motor Parts Ref.
<b>NXT103</b>	<b>Lift Ring</b>	<b>(17)</b>
<b>24X557</b>	<b>Piston/Rod Assembly Repair Kit</b>	
-- 15G478	Bumper	(18)
---	Piston	(4)
---	Shaft, Piston, Rod	(4)
<b>24Z920</b>	<b>Piston/Rod Assembly Repair Kit</b>	
--- 15G478	Bumper	(18)
---	Piston	(4)
---	Shaft, Piston, Rod	(4)
<b>24X558</b>	<b>Air Motor Soft Parts Repair Kit</b>	
---	O-ring, Cylinder (2)	(14)
-- 155685	Packing, O-ring, middle	(15a)
---	Packing, U-cup, shaft	(15b)
-- 154741	Packing, O-ring, bottom	(15c)
-- 197650	O-ring, Buna, top	(15d)
---	O-ring, piston	(10)
---	Packing, U-cup	(8)
---	Seal, Rod	(9)
---	Ring, Retaining	(11)
---	Gasket, End Cap (2)	(22)
---	Gasket, Muffler	(42)
<b>24X559</b>	<b>Bottom End Cap Repair Kit</b>	
---	Bumper	(19)
---	Bearing, Sleeve	(7)
---	Packing, U-cup	(8)
---	Seal, Rod	(9)
---	Ring, Retaining	(11)
---	Cover, Bottom	(1)
<b>24X560</b>	<b>Muffler Repair Kit</b>	
-- 15F674	Label, warning	(51)
---	Cover, Muffler	(12)
---	Gasket, Muffler	(42)
<b>24X561</b>	<b>Cylinder Repair Kit</b>	
---	O-ring	(14)
---	Foam, Dampers	(46)

Part	Description	Air Motor Parts Ref.
---	Cylinder, Motor	(3)
<b>24A915</b>	<b>Bumper Kit</b>	
---	Bumper, bottom	(19)
---	Bumper, top	(20)
---	Screw, top (3)	(29)

**Table 2 XL Air Motor Repair Kits**

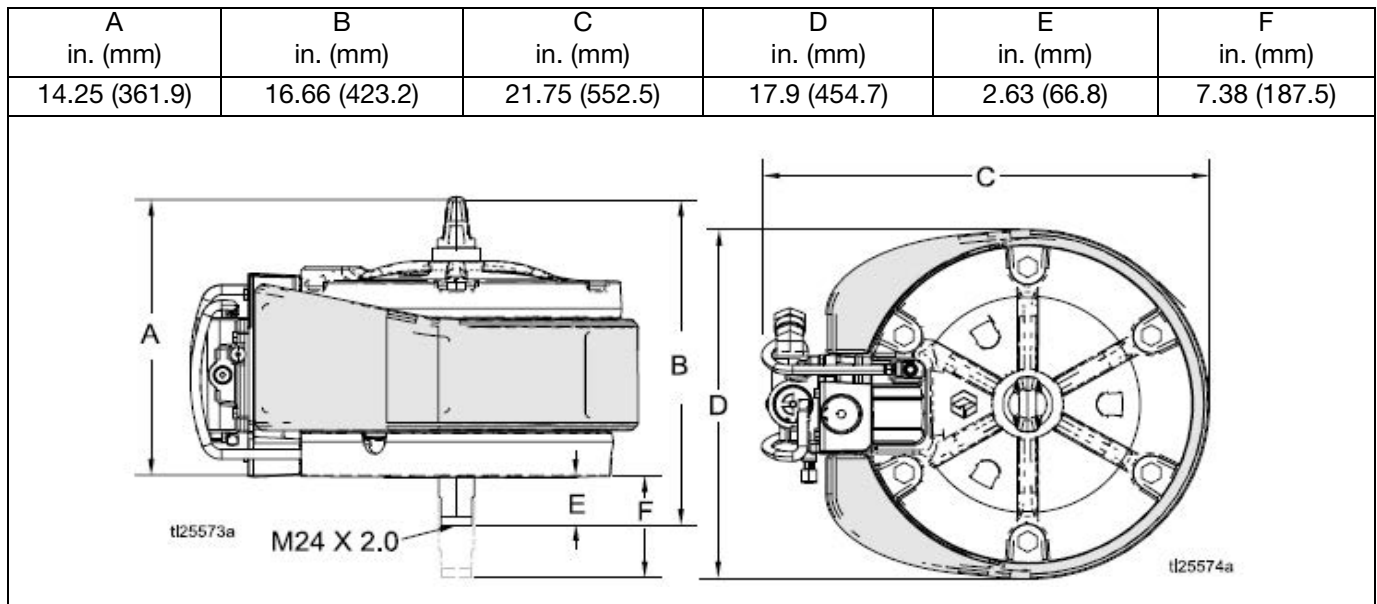
Part	Description	Air Motor Parts Ref.
<b>24X562</b>	<b>Repair, Complete Valve Assembly</b>	
---	Valve, Air, XL	(13)
24X565	Kit, gasket, valve (2 pack)	(27)
<b>24X563</b>	<b>Repair. Valve O-rings</b>	
-- 104010	O-ring (2)	(106)
-- 154741	O-ring (2)	(117)
-- 295640	O-ring (1)	(123)
-- 104130	O-ring (1)	(125)
<b>24X564</b>	<b>Repair, Base/Cup Assembly</b>	
---	Base	(112)
---	Cup	(113)
-- 295640	O-ring	(123)
---	Plate, valve	(105)
---	Screw, M3 (2)	(109)
<b>24X565</b>	<b>Valve to Manifold Gasket (2 Pack)</b>	(27)
<b>24X566</b>	<b>Cap with Push Button assembly</b>	
-- 104010	Packing, O-ring	(106)
---	Cap, Valve	(107)
-- 557832	Ring, Retaining	(110)
-- 154741	Packing, O-ring	(117)
---	Button, Reset	(118)
-- 15K783	Fitting, Elbow, Street, 1/8	(122)
-- 555749	Connector, #4 JIC	(124)
<b>24X567</b>	<b>Roller Assembly</b>	
---	Piston, Detent	(103)
---	Cam, Detent	(104)
---	Spring, Detent	(111)
---	Roller, Detent	(114)
---	Pin, Detent	(115)
<b>24X568</b>	<b>DataTrak Plug Assembly</b>	
-- 104130	Packing, O-ring	(125)
---	Plug, Valve	(126)
---	Ring, Retaining	(127)
<b>24X569</b>	<b>Valve Piston w/Seals Repair Kit</b>	
---	Piston, Valve	(102)
---	Packing U-Cup	(108)

Part	Description	Air Motor Parts Ref.
<b>16Y668</b>	<b>Needle Valve</b>	(119)

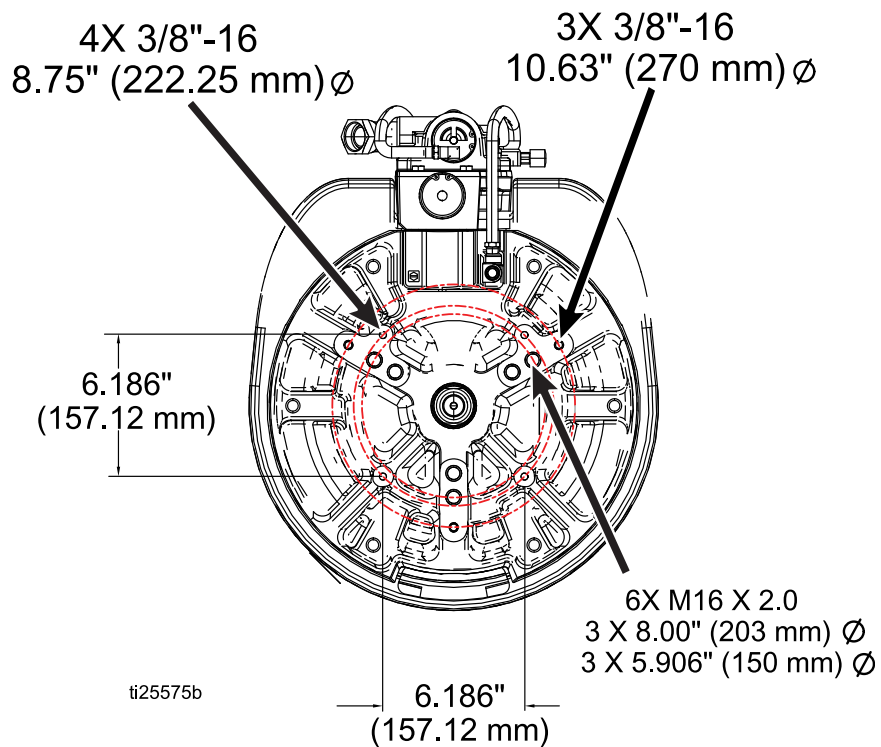
**Table 3 Accessories**

Part	Description
256893	Linear Sensor, potted, XM
287839	Linear Sesnor, HLS motors
24X550	Kit, Reed Switch and Solenoid, DataTrak, XL bracket
24X552	Kit, Reed Switch, DataTrak, XL bracket

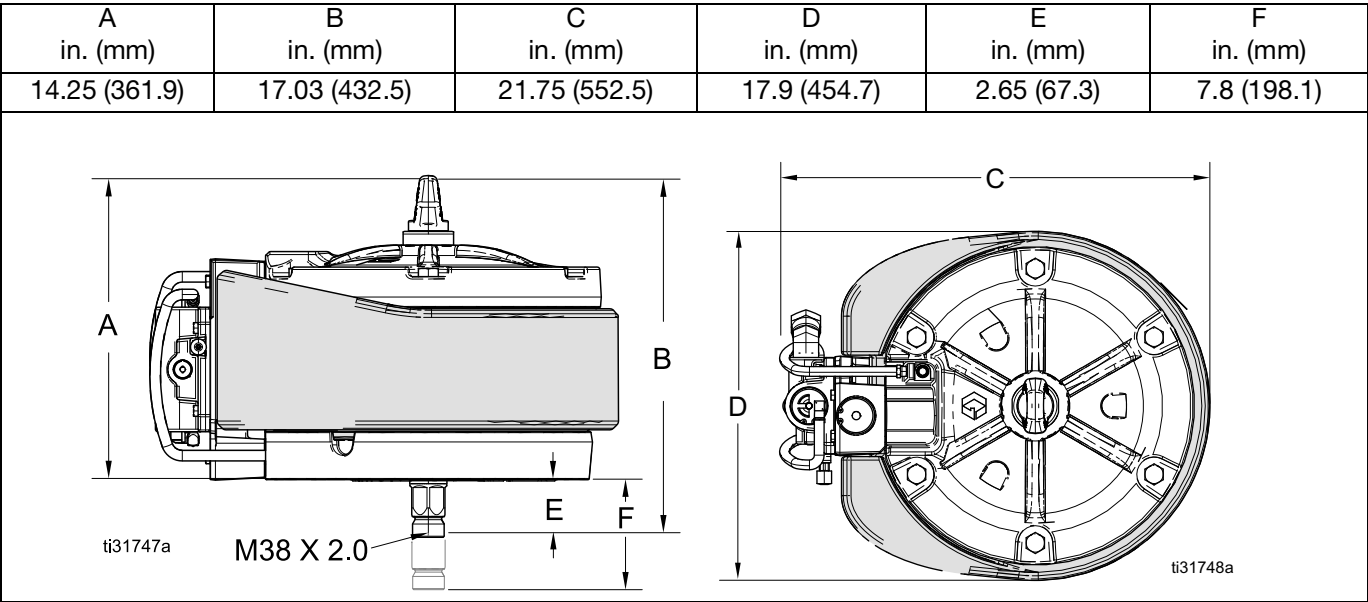
## Dimensions (Model 24X856)



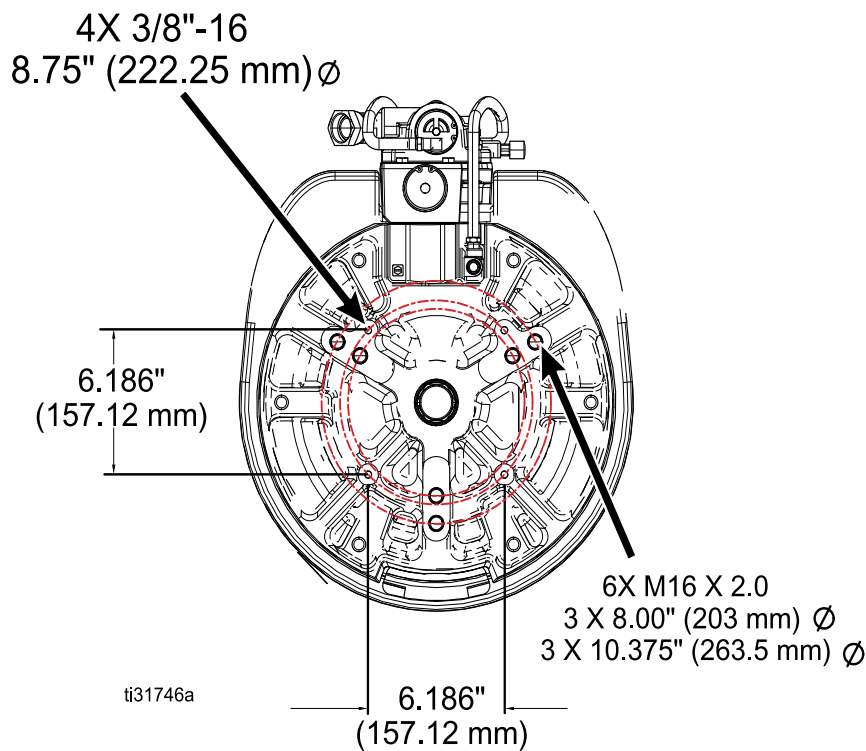
## Mounting Hole Diagram



Dimensions (Model 273088)



Mounting Hole Diagram





# Technical Specifications

XL 10000 Air Motor		
	US	Metric
Maximum Air Inlet Pressure	100 psi	0.7 MPa, 7 bar
Stroke Length (Nominal)	4.8 in.	122 mm
Motor Effective Area	132.7 in. <sup>2</sup>	856 cm <sup>2</sup>
Motor Cylinder Inside Diameter	13 in.	330 mm
Minimum Filtration Size	0.0016 in.	40 micron
Weight	104 lbs	47.2 kg
Air Inlet Size	1 in. npt (f)	
Maximum Motor Speed (Do not exceed maximum recommended speed of fluid pump, to prevent premature pump wear.)	60 cpm	
Sound Data		
Sound Power Measured at 70 psi (0.48 MPa, 4.8 bar), 20 cpm, per ISO-9614-2.	96 dBA	
Sound Pressure Tested 3.28 ft (1 m) from equipment.	86.8 dBA	

## California Proposition 65

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