

LAT-SERIES BOLTING PUMP INSTRUCTION SHEET

MODEL LA2504TX-QR

L4402

REV. C

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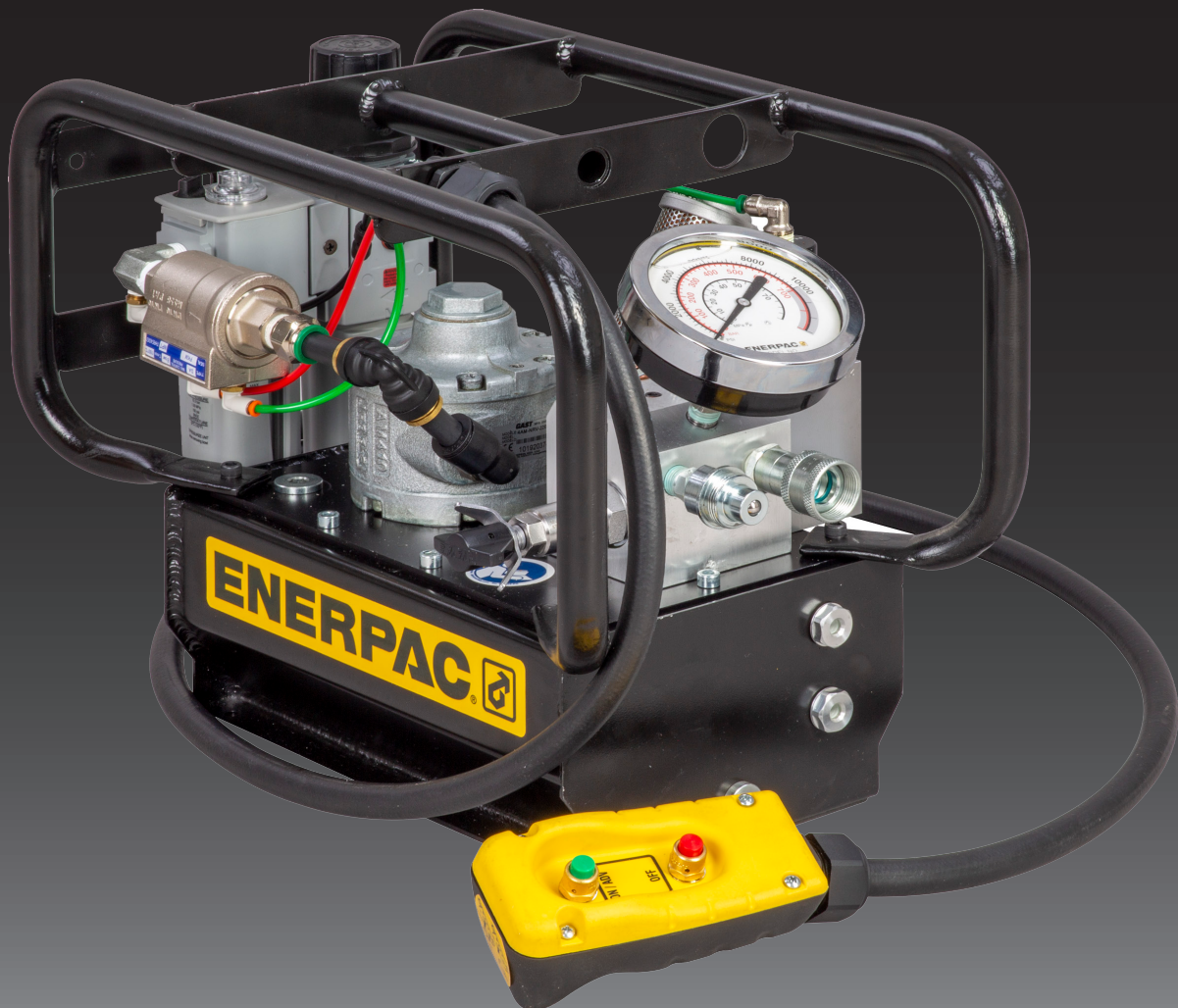


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1.0 INTRODUCTION

Overview & Application

Enerpac LAT-Series bolting pumps are designed for use with hydraulic torque wrenches in industrial bolting applications. Refer to Sections 4.0 and 5.0 of this manual for additional product information and details. Product specifications are contained in Section 3.0.

Delivery Instructions

Upon delivery, all components must be inspected for damage incurred during shipping. If damage is found, the carrier should be notified at once. Shipping damage is not covered by the Enerpac warranty.

Warranty

- Enerpac guarantees the product only for the purpose for which is intended.
- Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty.

Any misuse or alteration invalidates the warranty.

- Observe all instructions as communicated in this manual.
- Modification to any part of the equipment described in this manual should not be attempted.
- When replacement parts are needed, use only genuine Enerpac replacement parts.

Replacement Parts

Refer to the pump repair parts sheet (RPS), available at www.enerpac.com, to order replacement parts when required.

EU Declaration of Conformity & UK Self Declaration of Conformity

Enerpac Bolting Pump - Model LA2504TX-QR



This tool conforms with the requirements for CE and UKCA.

Enerpac declares that the LAT-Series bolting pumps have been tested and conform to applicable standards and are approved to carry the CE and UKCA certification marks.

Copies of the product EU Declaration of Conformity and UK Self Declaration of Conformity are enclosed with each shipment of this product.

ATEX Directive (Equipment for Potentially Explosive Atmospheres)

Enerpac Bolting Pump - Model LA2504TX-QR



This tool conforms with the ATEX directive (shown at left).

Enerpac LAT-Series bolting pumps are tested and certified according to the ATEX Directive 2014/34/EU. For Equipment Group II, Equipment Category 2, (Hazardous Area, Zone 1), in gas and/or dust atmospheres.

2.0 SAFETY

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and / or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance, or incorrect operation. Do not remove warning labels, tags, or decals. In the event that any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

Save these instructions for future use.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for information about Enerpac hydraulic safety courses.

This manual follows a system of safety alert symbols, signals, words, and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.



The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are WARNING, CAUTION and NOTICE.

WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.

CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.

NOTICE Indicates information considered important, but not hazard related (e.g. messages related to property damage). Please note that the Safety Alert Symbol will not be used with the signal word.

2.1 Safety Precautions



Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Read and completely understand the safety precautions and instructions in this manual before operating the pump or preparing it for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.
- Refer to the torque wrench instruction manual (from the torque wrench manufacturer) for important operation, safety and maintenance instructions pertaining specifically to the torque wrench.
- Be sure the operator has completed safety induction training, specific to the work surroundings. The operator should be thoroughly familiar with the pump and the proper use of the torque wrench.

- Ensure all hydraulic components (torque wrench, hoses, fittings, couplers, etc.) are rated to a safe working pressure of 10,000 psi [690 bar].
- Do not overload equipment.
- Never attempt to remove or readjust the pump's internal safety pressure relief valve. Valve is factory set.
- Position the pump on a secure, flat and level surface.
- Rope off working area and place warning signs.
- If air supply to pump is interrupted, turn off pump air shut-off valve.
- Do not use combustible gases to drive the pump air motor.
- Wear hearing protection. Sound level from air motor may exceed 85 db(A).
- Wear personal protective equipment (PPE) when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hats, gloves or hearing protection (used as appropriate) will reduce personal injuries.
- Do not use worn or damaged hoses. Applying pressure to a worn or damaged hose may cause it to rupture.
- Immediately replace worn or damaged parts. Use only genuine Enerpac parts from approved distributors or service centers. Enerpac parts have been engineered for proper fit and function and safe operation.
- To minimize risk of personal injury keep hands and feet away from the wrench and work area during operation.
- Do not handle pressurized hoses; escaping oil under pressure can penetrate the skin, causing serious injury. Seek medical attention immediately if oil penetration is suspected.
- Only pressurize complete and fully connected hydraulic systems. Do not pressurize systems that contain unconnected couplers.
- Do not remove gauge covers (if equipped).
- On pumps with user-calibrated gauges, check the date of the calibration certification. If the recalibration date has passed, the gauge must be recalibrated.
- Be certain that hydraulic circuit is at zero (0) pressure before couplers are disconnected.

CAUTION

Failure to observe and comply with the following precautions could result in minor or moderate personal injury. Property damage could also occur.

- Ensure components are protected from external sources of damage, such as excessive heat, flame, moving machine parts, sharp edges and corrosive chemicals.
- Take care to avoid sharp bends and kinks in hydraulic hoses. Bends and kinks can cause severe back-up pressure and cause hose failure.
- Protect hoses from dropped objects; a sharp impact may cause internal damage to hose wire strands.
- Protect hoses from crush risks, such as heavy objects or vehicles; crush damage can cause hose failure.
- Do not lift hydraulic equipment by the hoses or couplers. Use only the designated carrying handles or lifting points.
- Inspect the pump prior to operation. Repair or replace any worn, damaged or leaking components.
- When performing lubrication and maintenance procedures, use only approved lubricants of high quality, following the lubricant manufacturer's instructions.

NOTICE

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Enerpac Authorized Service Center in your area.
- To help ensure proper operation and best performance, use only Enerpac HF hydraulic oil. Use of other oils may result in damage to pump components and may void the Enerpac product warranty.

2.2 Safe Disposal Procedures

When the pump has reached the end of its useful life, dispose of it as described in the following steps:

1. Shut-off air supply to pump.
2. Be certain that all hydraulic and air pressure is completely relieved.
3. Disconnect compressed air supply line and hydraulic hoses from pump.
4. Drain all oil from hydraulic reservoir. Dispose of oil in accordance with all applicable laws and regulations.
5. Take the pump to an approved industrial recycling facility for disposal.

3.0 PRODUCT DATA

3.1 Specifications - Model LA2504TX-QR

Control Valve Type	Motor Type	Hydraulic Hose Connections*	Air Inlet Connection	Oil Type	Usable Oil Capacity**		Weight (with oil)	
					gal	l	lb	kg
4-Way, 2-Position Torque Wrench	Air (pneumatic)	Enerpac Spin-On hydraulic couplers (1 male, 1 female)	1/2" NPTF (.500-14)	Enerpac HF	0.5	1.9	39.6	18.0

* Enerpac Spin-On hydraulic couplers are included with pump. Pump hydraulic port thread size is 1/4" NPTF.

** Approximate usable oil capacity of pump hydraulic reservoir. Pump total oil capacity (including reservoir and pump element housing) is approximately 0.8 gallons [3.0 liters].

Pump Type	Maximum Hydraulic Working Pressure*		Hydraulic Flow Rate (typical)				User-Adjustable Relief Valve Range	
			At 10.0 psi [0.6 bar] Hyd. pressure		At 10,000 psi [690 bar] Hyd. pressure			
	psi	bar	in³/min	l/min	in³/min	l/min	psi	bar
2-Stage	10,000	690	214	3.5	25	0.4	2000-10,000	138-690

* Maximum pressure setting of pump is limited to approximately 10,300-10,800 psi [710-745 bar] by an internal safety relief valve.

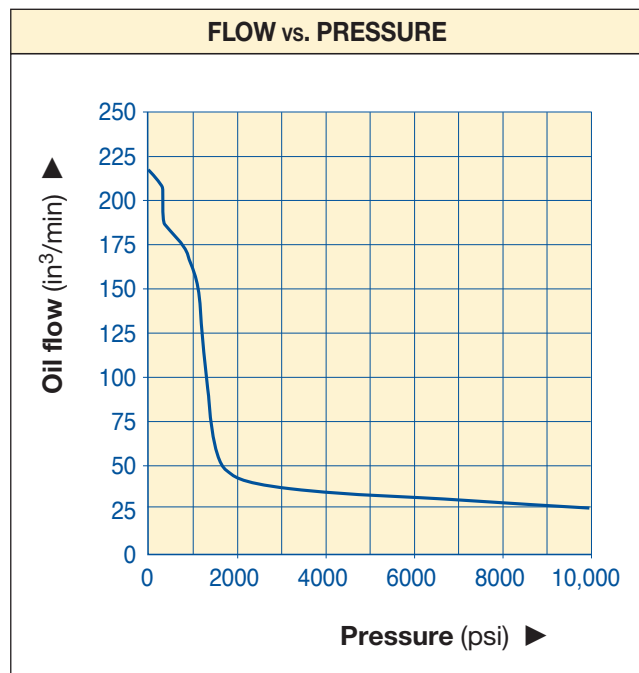
Air Motor Rating		Dynamic Air Pressure Range (at air inlet connection)				Air Consumption (max)		Operating Temperature Range*		Sound Level LWA**
hp	kW	(min)		(max)		scfm	l/min	°F	°C	dB
		psi	bar	psi	bar					
1.7	1.3	65	4.5	100	6.9	65	1389	-19 to +122	-28 to +50	87-90

* At 85% relative humidity.

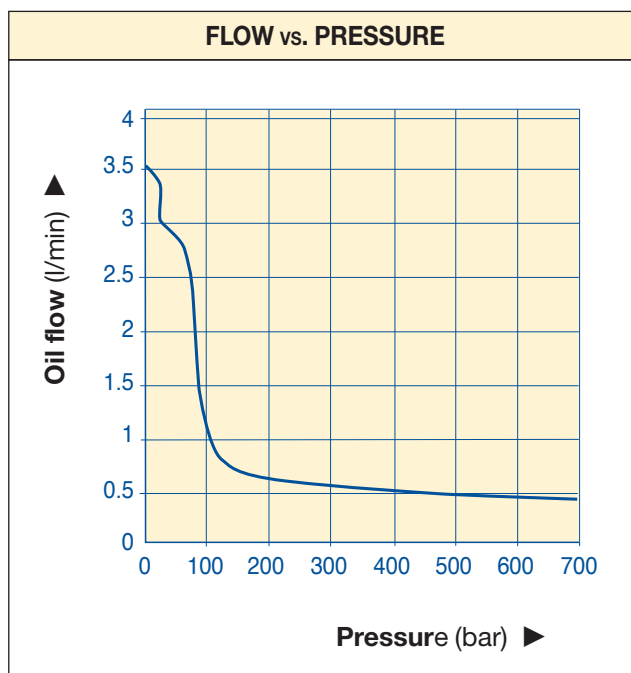
** Typical. Actual sound level will vary depending on pump speed and load.

3.2 Performance Curves - Model LA2504TX-QR

(IMPERIAL)

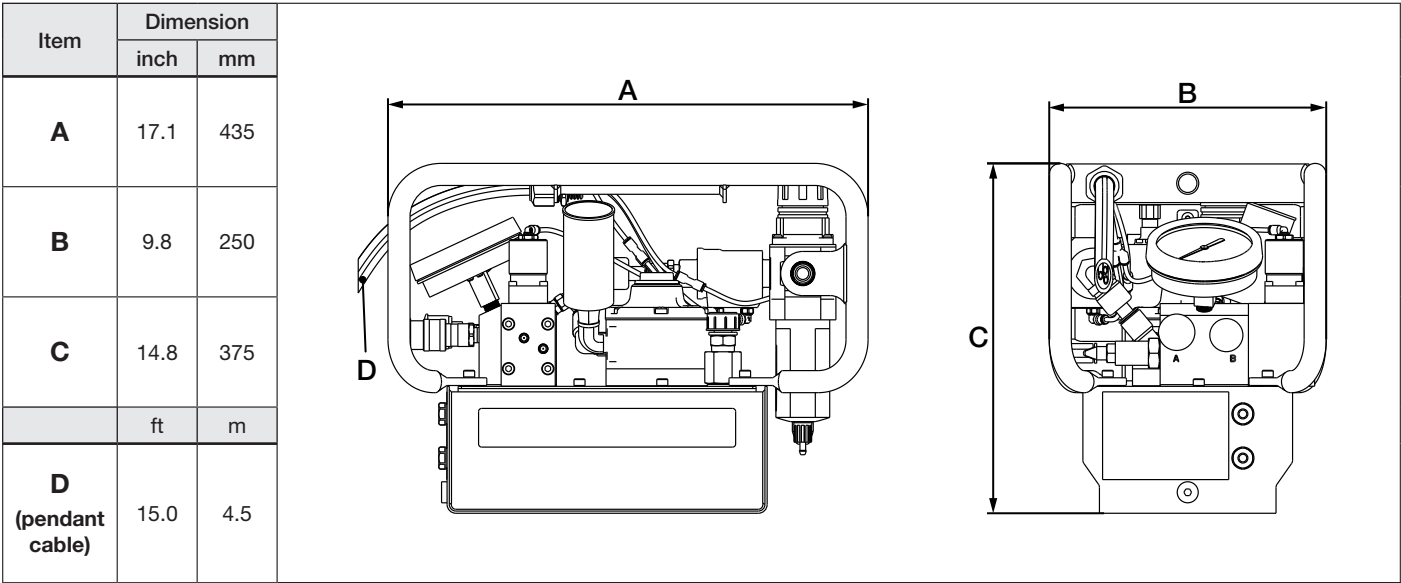


(METRIC)



Note: Curves based on 100 psi [6.8 bar] dynamic air pressure @ 65 scfm [1389 l/min.]

3.3 External Dimensions - Model LA2504TX-QR



4.0 MAJOR FEATURES AND COMPONENTS

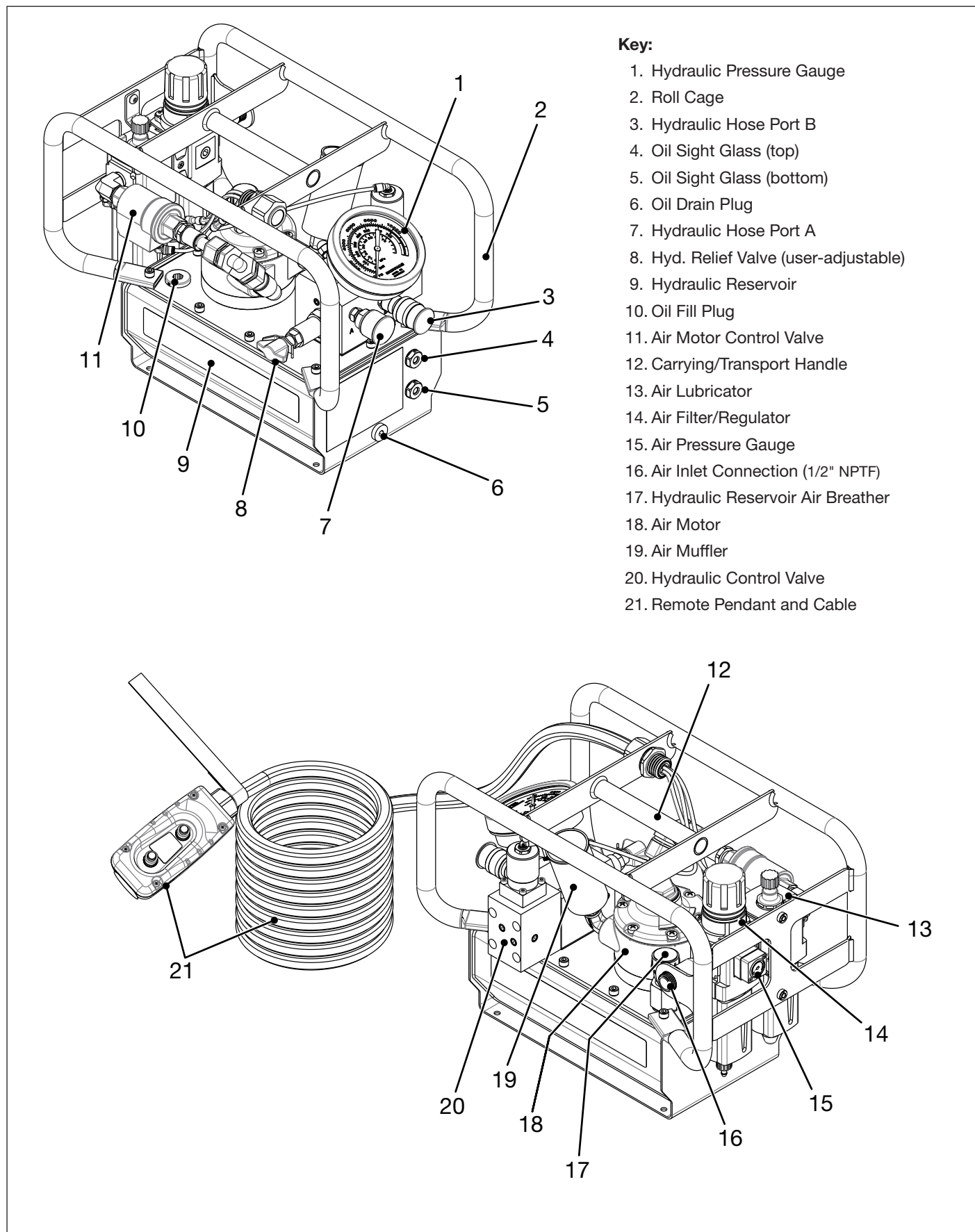


Figure 1: Major Features and Components - LAT-Series Bolting Pump

5.0 PRODUCT DESCRIPTION

5.1 Introduction

The Enerpac LAT-Series air-powered bolting pump is designed for use with hydraulic torque wrenches rated at 10,000 psi [690 bar] maximum operating pressure.

Features include:

- 2-button remote pendant with 15 ft [4.5 m] cord.
- Powerful 1.7 HP [1.3 kW] air motor.
- Durable and lightweight chassis construction with aluminium hydraulic reservoir.
- Two-stage pump design for fast system fills and controlled flow at high pressures.
- Three discreet piston blocks provide even oil flow and smooth operation.
- Integral roll cage and carrying handle.
- Built-in air filter/regulator/lubricator assembly.
- 10,000 psi [690 bar] dial type hydraulic pressure gauge
- User-adjustable pressure relief valve allows quick adjustment of torque wrench force.

The pump is capable of developing 10,000 [690 bar] psi with input air pressure of 65 psi [4.5 bar] and dynamic air flow of 65 scfm [1389 l/min].

See Figure 1 for a diagram of the pump's major features and components.

6.0 PREPARATION FOR USE

6.1 Reservoir Air Breather

The reservoir air breather parts are included separately in the shipment. They must be installed prior to pump use as described in the following steps. See Figure 2.

1. Remove the metal shipping plug (A) from the reservoir cover plate (save for future use).
2. Install adapter fitting (B) reducer fitting (C) and air breather (D). Tighten breather by hand to prevent damage.

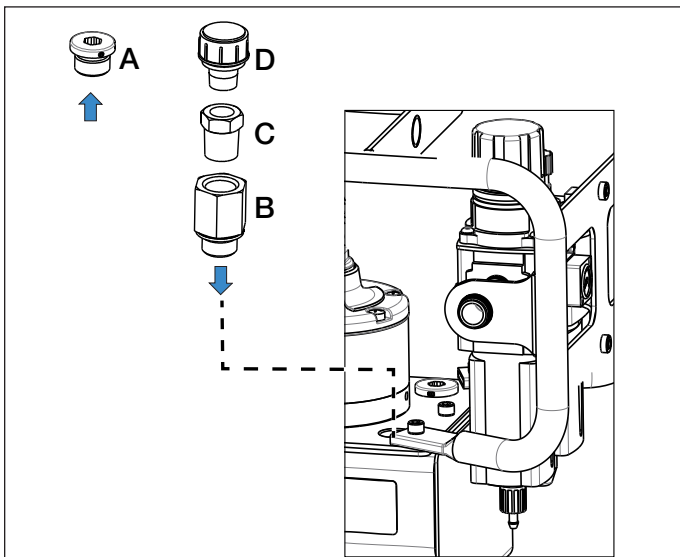


Figure 2: Hydraulic Reservoir Air Breather Installation

6.2 Reservoir Oil Level

The hydraulic reservoir is pre filled with oil at the factory. However, the oil level should always be checked as a precaution before running the pump. See Figure 3 and refer to the following steps:

1. If previously connected, be certain that air supply is shut off. Verify that air pressure gauge on filter/regulator indicates zero (0) psi/bar. Be sure that the hydraulic pressure gauge indicates zero (0) psi/bar.
2. With the pump on a level surface, check the oil level. The reservoir is full when the oil level is up to - but not above - the top oil level sight glass.
3. If oil level is low, loosen and remove the reservoir oil fill plug. Slowly add additional hydraulic oil until the oil level is up to - but not above - the oil level sight glass. DO NOT OVERFILL

NOTICE For optimum performance and to prevent possible invalidation of the product warranty, use only Enerpac HF hydraulic oil.

4. Reinstall the reservoir oil fill plug.
5. Additional oil may need to be added after wrench and hoses are connected and pump is run. Always check oil level with pump off and hydraulic pressure relieved.

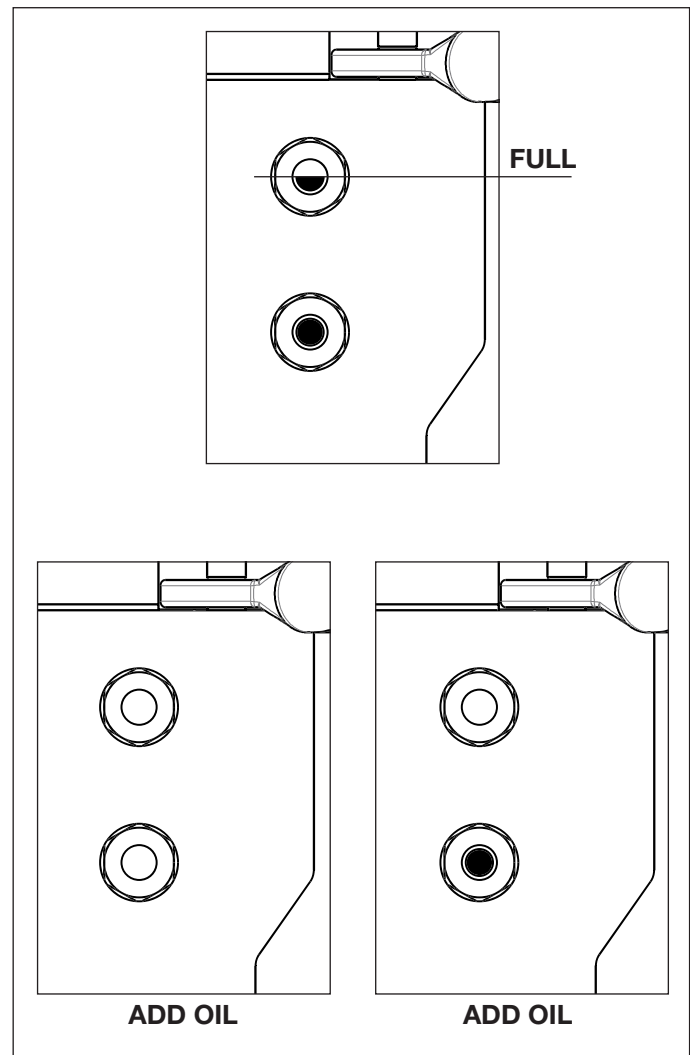


Figure 3: Hydraulic Reservoir Oil Level

6.3 Compressed Air Connection

A 1/2" NPTF connector is located on the pump roll cage frame, near the air filter/regulator. Connect the compressed air supply line to this connector. See Figure 4.

100 psi dynamic air pressure @ 65 scfm air flow [6.9 bar @ 1389 l/min] is required to operate the pump at its maximum working pressure of 10,000 psi [690 bar].

With the pump not running, adjust the air pressure setting using the control knob at the top of the regulator. Pull up on the knob to allow adjustment. Push down on the knob to lock the setting. A gauge located on the regulator housing indicates air pressure. See Figure 6.

Refer to the air filter/regulator manufacturer's instructions for additional information.

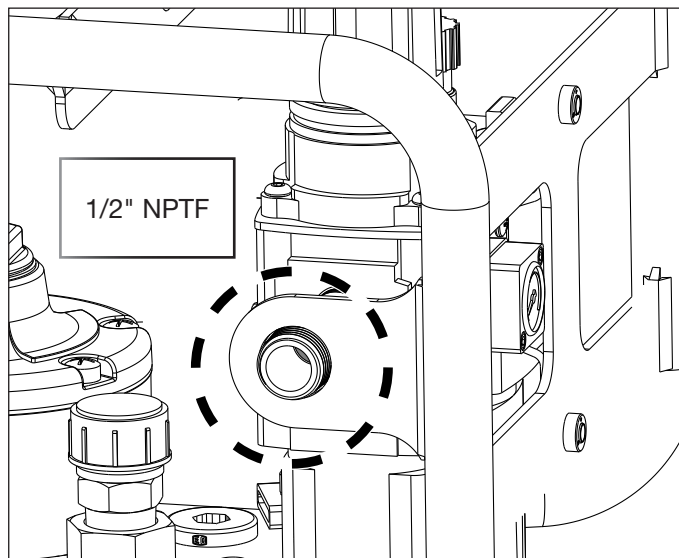


Figure 4: Air Inlet Connection

6.4 Filter Regulator and Air Lubricator Precautions

CAUTION Failure to follow the following precautions and instructions could allow the filter/regulator and/or air lubricator bowl to rupture. Minor or moderate personal injury could result:

- The filter regulator and air lubricator bowls are made of polycarbonate. Synthetic base oils or oils containing phosphate esters or chlorinated hydrocarbons will attack polycarbonate bowls and can result in a rupture of the bowl. Do not connect the pump to a compressed air system which uses these oils.

- Do not expose the air filter/regulator or air lubricator bowls to materials such as carbon tetrachloride, trichloroethylene, acetones, paint thinner or cleaning fluids which will cause the plastic to craze or rupture.
- Consult the air filter/regulator manufacturer for additional information if you are uncertain if substances present in the work environment will be harmful to these components.

6.5 Connecting Hydraulic Hoses

Couplers must be polarized per the diagram in Figure 5 for correct wrench operation. All hoses, fittings and components used with the pump must be rated for at least 10,000 psi [690 bar] operation.

WARNING Avoid kinking or tightly bending hoses. Do not exceed the hose manufacturer's stated minimum bend radius. If a hose becomes kinked or otherwise damaged, it must be replaced. Damaged hoses may rupture at high pressure. Serious personal injury may result.

1. To prevent the pump from starting, be sure that the compressed air supply is shut off. Pressure gauge on air filter/regulator must indicate zero (0) psi/bar.
2. Verify that pump hydraulic pressure gauge indicates zero (0) psi/bar. If any pressure is indicated, relieve pressure as described in Section 7.3 of this manual.

WARNING Attempting to couple a hydraulic hose to the pump or torque wrench while coupler is under pressure may result in personal injury and/or fluid leakage.

NOTICE The pump is supplied with coupler halves pre-installed in the pump hydraulic ports. These coupler halves are compatible with Enerpac THQ Series torque wrench hoses.

3. Remove dust caps from pump couplers "A" and "B".
4. Connect the hose from the advance side of the torque wrench to pump coupler "A". Hand tighten the collar on the female coupler until it is fully threaded onto the male collar.
5. Connect the hose from the retract side of the torque wrench to pump coupler "B". Hand tighten the collar on the female coupler until it is fully threaded onto the male collar.

WARNING At each hose connection, be certain that the male and female coupler halves are fully engaged and threaded together. There should be no threads visible at the couplers. Partial coupler engagement can prevent

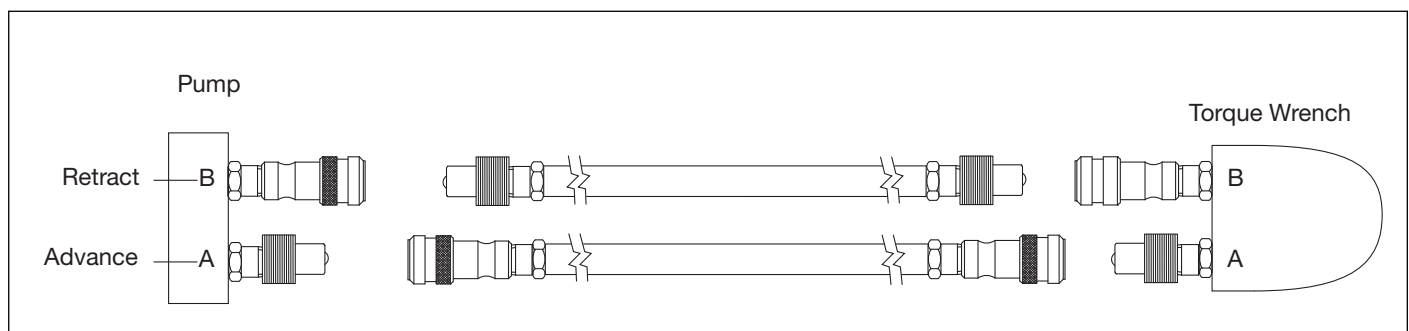


Figure 5: Hydraulic Hose Connections (typical)

proper wrench operation and may result in high pressure oil leakage and/or detachment of the hose under pressure. Skin penetration and serious personal injury could occur.

- When a torque wrench is first connected to the pump, air may be trapped in the hydraulic circuit. Refer to Section 7.4 for air removal procedure.

6.6 Air Lubricator - Adding Lubricant

The air lubricator provides lubrication for the pump's air motor. Prior to pump initial startup, fill the air lubricator bowl with a light misting type oil. See Figure 6.

The recommended air lubricant is a petroleum based oil of 100 to 200 SUS viscosity at 100°F. [38°C] and an aniline point greater than 200°F [93°C].

NOTICE To prevent damage to the air lubricator, DO NOT use oils with additives, compounded oils containing solvents, graphite, detergents or synthetic oils.

If lubricant level is low or if adding lubricant for the first time, refer to the procedure in the following steps:

- Shut off the compressed air supply.
- Remove the fill plug from the top housing of the lubricator.
- Slowly add lubricant as required, until the lubricant level is up to the MAX OIL mark. To prevent spillage, use a funnel or a bottle with a long spout. Fully insert end of spout or funnel into the recessed area of the lubricator fill port.
- Reinstall the fill plug after adding lubricant.

Refer to lubricator manufacturer's instructions for additional information.

NOTICE The air lubricator must be periodically refilled with the proper lubricant. Maintaining the lubricator oil level is critical to the life of the air motor. Premature air motor wear will occur if pump is operated while lubricator oil level is low (below the MIN OIL mark). To ensure proper lubrication, be sure to also adjust the air lubricator drip rate, as described in the following section of this manual.

6.7 Air Lubricator - Oil Drip Rate Adjustment

The air lubricator drip rate must be adjusted before pump start-up. See Figure 6

To make an initial adjustment:

- Be sure that torque wrench is NOT mounted on a nut or bolt.
- Turn on the compressed air supply.
- Press and release the green ON/ADV button on the pendant to start the pump.
- While the pump is running, adjust the user-adjustable relief valve so that the pressure gauge indicates zero (0) psi/bar.
- As the pump continues running, look for oil drops inside the lubricator sight dome (located just below the drip rate adjustment knob).
- Set the oil drip rate to one or two drops per minute. Turn the adjustment knob counter-clockwise to increase the drip rate and clockwise to decrease it.
- Re-check the oil drip rate after the system has been in use and reaches its normal operating temperature. Readjust the drip rate if needed.

Refer to air lubricator manufacturer's instructions for additional information.

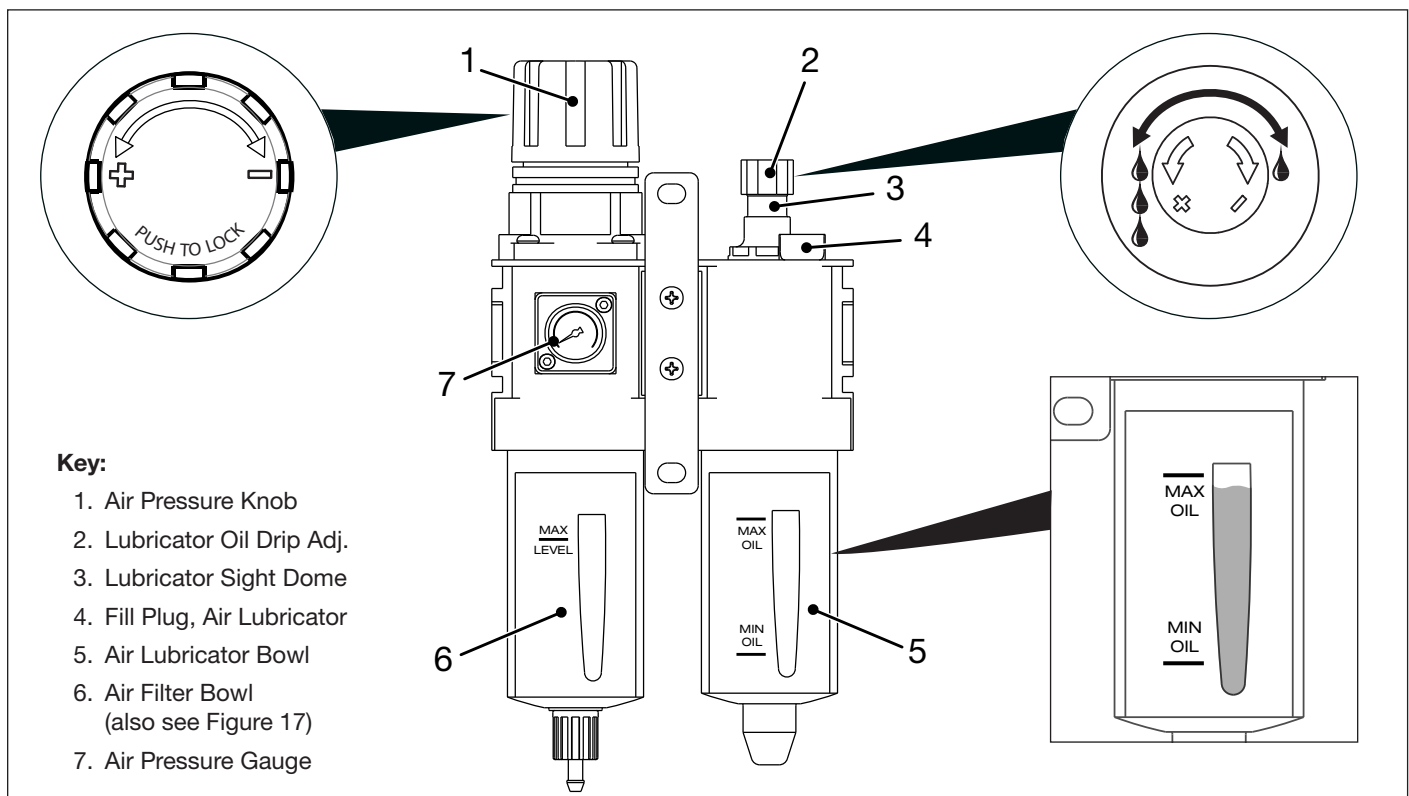


Figure 6: Air Filter/Regulator and Air Lubricator

NOTICE To check for proper air lubrication levels, hold a mirror near the pump air muffler exhaust outlets. If a heavy oil film develops, reduce the drip rate as required.

7.0 OPERATION

7.1 Pre Start-up Checklist

- Check all hydraulic system fittings and connections to be sure they are tight and leak free.
- Check oil level in hydraulic reservoir. Refer to Section 6.2 for instructions.
- Be certain that pump is connected to the air supply line and that compressed air system is turned on.
- Before using the pump and torque wrench on a nut or bolt, remove air from hydraulic lines and components as described in Section 7.4. Then, set the maximum pressure required for your bolting application and the torque wrench being used. Refer to instructions in Section 7.5.

NOTICE Perform air removal and pressure (torque) adjustment at initial start-up and whenever a different torque wrench is connected to the pump.

- Refer to the torque wrench manufacturer's instructions for important safety, operation and maintenance instructions applicable to the wrench being used with the pump.

7.2 Operating Instructions

The pump is operated by a two-button remote control pendant. See Figure 7.

- Press and hold the green ON/ADV button to start the pump and advance the wrench. The button must remain pressed to advance the wrench.
- Release the green ON/ADV button to retract the wrench. The pump will continue running.
- Press the red OFF button to stop the pump.

7.3 Relieving Hydraulic Pressure

To fully relieve hydraulic pressure using the pendant:

- Press and hold the red OFF button while pressing and releasing the green ON/ADV button several times. See Figure 8.
- Verify that the hydraulic pressure gauge indicates zero (0) psi/bar. Then, release the red OFF button.

NOTICE Air pressure must be present at the pump air inlet connection to relieve hydraulic pressure using the pendant.

If compressed air supply is disconnected or not functioning, and trapped hydraulic pressure is present:

- Relieve hydraulic pressure *manually* by turning the user-adjustable relief valve counter-clockwise until pressure is relieved. Refer to Section 7.5 for additional information.
- Verify that the hydraulic pressure gauge indicates zero (0) psi/bar.

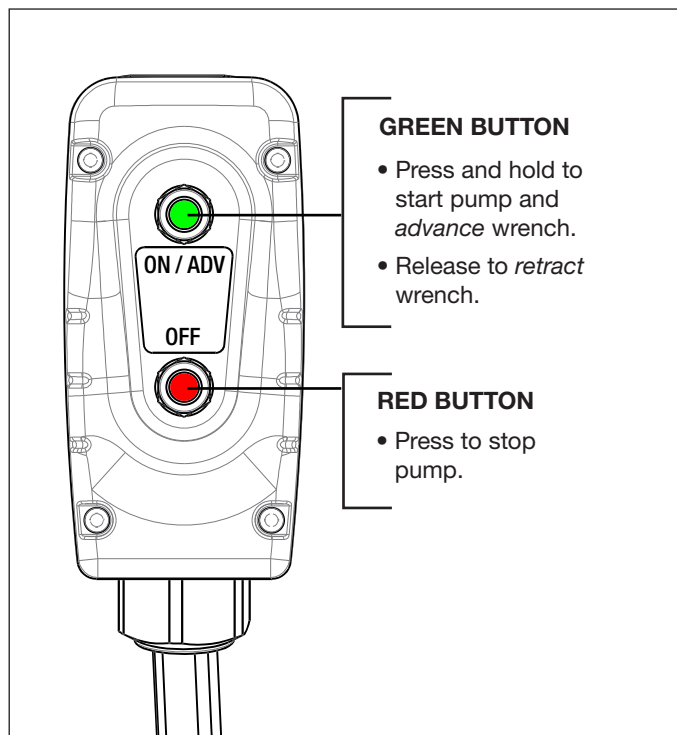


Figure 7: Starting and Stopping Pump

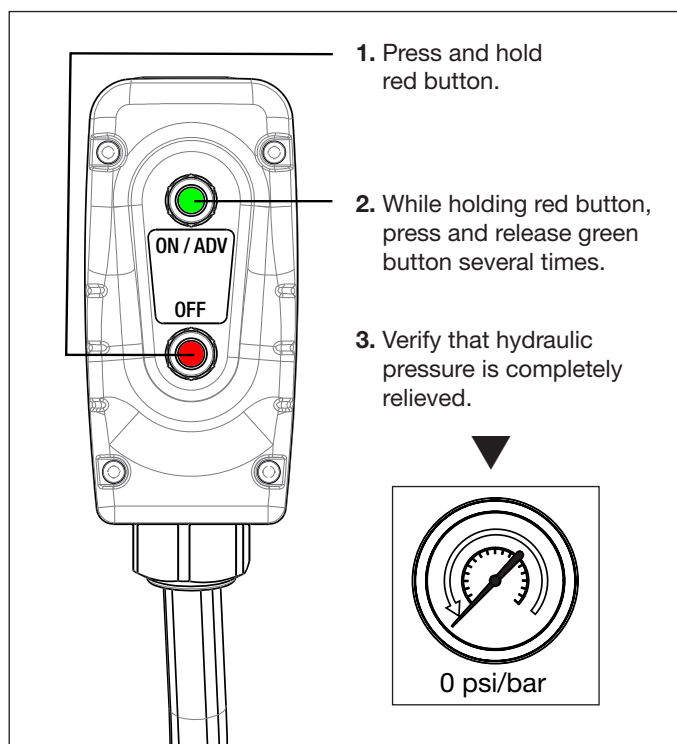


Figure 8: Relieving Hydraulic Pressure

7.4 Removing Air from Hydraulic System

When the torque wrench is first connected to the pump, or after a different torque wrench is connected, air may become trapped in the hoses and components.

To ensure smooth and safe operation, remove air by cycling the torque wrench several times without load. Continue until the wrench advances and retracts without hesitation.

During this procedure, position the pump slightly higher than the torque wrench to facilitate air removal.

7.5 Maximum Pressure (Torque) Adjustment

⚠ WARNING Make pressure adjustments **BEFORE** placing torque wrench on nut or bolt head. The pump pressure setting may need to be adjusted slightly above the calculated pressure needed to provide the required torque for your application. However, significantly exceeding the required torque will cause equipment damage and may result in serious personal injury.

NOTICE Refer to torque wrench manufacturer's instructions for wrench set-up and operation procedures.

The pump is equipped with a user-adjustable relief valve that is used to set the pump maximum hydraulic pressure and the corresponding amount of torque applied to the nut or bolt by the torque wrench.

Adjust this setting as described in the following steps. See Figure 9 for relief valve details.

1. Loosen the relief valve locknut.
2. On the remote pendant, press and hold the green ON/ADV button to start the pump. Observe the hydraulic pressure gauge reading.
3. While continuing to press and hold the green ON/ADV button:
 - Slowly turn relief valve adjustment knob clockwise to increase pressure to the desired amount.
 - Slowly turn relief valve adjustment knob counter clockwise to reduce pressure.

NOTICE The green ON/ADV button must be released and then pressed again to verify the pressure setting when the setting is being decreased.

4. Repeat steps 2 and 3 as required until the correct hydraulic pressure setting is obtained. Then, tighten the relief valve locknut to maintain the setting.
5. Start and stop the pump several times to check the setting.

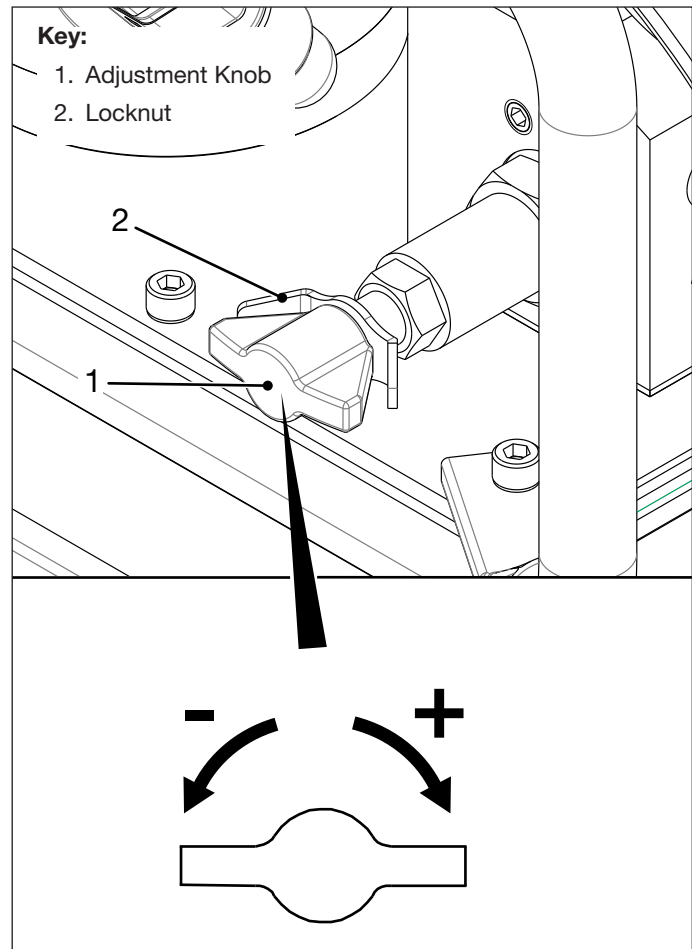


Figure 9: User-Adjustable Pressure Relief Valve (Torque Adjustment)

7.6 Disconnecting Hydraulic Hoses

Disconnect hydraulic hoses after use as described in the following steps:

1. Verify that pump hydraulic pressure gauge indicates zero (0) psi/bar. If any pressure is indicated, relieve pressure as described in Section 7.3 of this manual.
2. Shut off the pump compressed air supply. Be certain that the air filter/regulator pressure gauge indicates zero (0) psi/bar.
3. At pump hydraulic couplers "A" and "B", loosen the threaded collars on the female couplers. Disconnect hoses from pump.
4. To prevent contamination, install dust covers over pump and hose couplers.

7.7 Pump Priming Procedure

If the pump operates sluggishly or if wrench operation is erratic, first perform the air removal procedure as described in Section 7.4. If problems persist, then perform the pump priming procedure as described in the following steps.

NOTICE As needed during this procedure, refer to previous sections of this manual for detailed information regarding the hydraulic reservoir, air filter/regulator, remote pendant buttons and user-adjustable relief valve.

1. Be sure that hydraulic reservoir is full. Oil level should be up to - but not above - the top oil sight glass. If oil level is low, add additional oil as described in the procedure in Section 6.2.
2. Turn the user-adjustable relief valve counter-clockwise until it is slack. Verify that the pump hydraulic pressure gauge indicates zero (0) psi/bar.
3. Be sure that air supply is connected and that inlet air pressure is approximately 100 psi [6.9 bar].
4. Set the air filter/regulator to 30 psi [2.1 bar].
5. On the remote pendant, press and release the green ON/ADV button.
6. Allow the pump to run for about 10-15 seconds. This will expel trapped air in the hydraulic system.
7. Increase the air pressure at the air filter/regulator to 70 psi [4.8 bar] and allow the pump to run for an additional 10 seconds.
8. Press and hold the green ON/ADV button. As the button remains depressed, allow the pump to run for an additional 5 to 10 seconds to expel air from the system.
9. Increase the air pressure at the air filter/regulator to 100 psi [6.9 bar].
10. Observe the pump hydraulic pressure gauge. Turn the user-adjustable relief valve clockwise until hydraulic pressure increases to 10,000 psi [690 bar].
11. Release the green ON/ADV button and observe the pump hydraulic pressure gauge. The gauge should indicate 2500-2600 psi [172-180 bar].
12. Press the green ON/ADV button and confirm pressure builds to 10,000 psi [690 bar].
13. Press the red OFF button to stop the pump. Verify that the pump hydraulic pressure gauge indicates zero (0) psi/bar.
14. Hold the red OFF button down while pressing and releasing the green ON/ADV button several times. This will release trapped pressure in the retract circuit.

8.0 MAINTENANCE

8.1 Oil Change and Hydraulic Reservoir

Change the oil in the hydraulic reservoir after every 250 hours of operation. If pump is operated in very dusty areas or at high temperatures, oil changes should be performed more frequently.

Refer to the following steps. See Figure 10.

1. Stop the pump and relieve hydraulic pressure. Be sure that hydraulic pressure gauge indicates zero (0) psi/bar.
2. Shut off compressed air supply. Disconnect air supply line from air inlet connection on pump.
3. Place the pump on a workbench or other suitable surface. Place a pan or container under the oil drain plug. Oil reservoir capacity is approximately 0.5 gallons [1.9 litres].
4. Slowly loosen the oil drain plug and remove it. Allow all used oil to drain from the reservoir into the pan or container.

NOTICE Dispose of hydraulic oil in accordance with all applicable laws and regulations.

NOTICE If the used oil is dirty, or if pump performance has been sluggish, clean the interior of the hydraulic reservoir after oil is drained, as described in Section 8.2.

NOTICE When adding oil or refilling the hydraulic reservoir, use only Enerpac HF hydraulic oil. Use of other oils may result in damage to pump components and may void the Enerpac product warranty.

5. Clean and reinstall the reservoir oil drain plug.
6. Remove the reservoir oil fill plug. Slowly add hydraulic oil through the fill hole until oil level is up to - but not above - the top oil level sight glass. DO NOT OVERFILL.

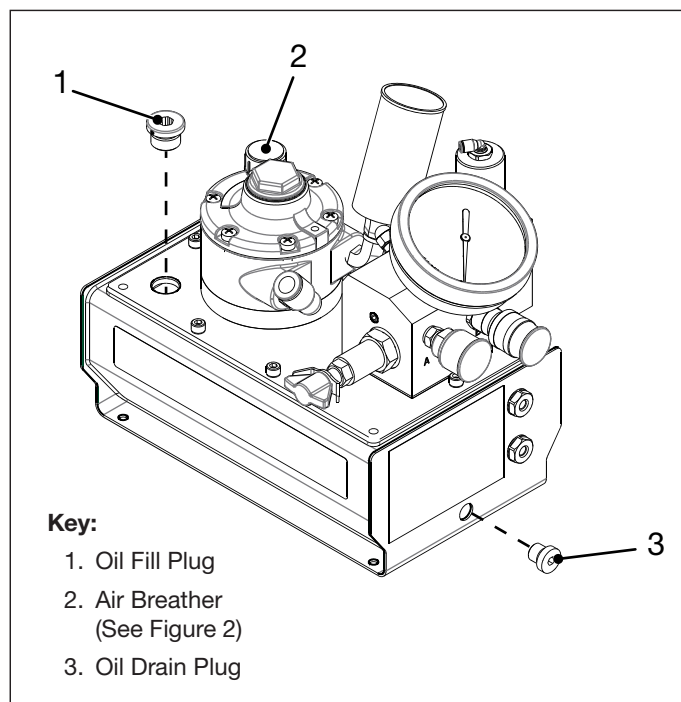


Figure 10: Reservoir Oil Drain, Fill and Vent Locations

7. Clean and reinstall the reservoir oil fill plug.
8. Check that reservoir air breather is not loose, Replace breather if clogged, damaged or missing.
9. Reconnect the compressed air supply line to the pump air inlet connection.
10. Operate the pump without load and check for oil leaks. If leaks are found, immediately stop the pump, relieve all hydraulic pressure and shut off compressed air supply. Repair any leaks before continuing.
11. Remove trapped air in the hydraulic system as described in Section 7.4 of this manual.
12. After air removal procedure is completed, stop the pump and relieve hydraulic pressure. Check the hydraulic reservoir oil level. Refer to Section 6.2.
13. If the oil level has dropped and is not visible in the top oil sight glass: Add additional oil as required, until the oil level is up to - but not above - the top oil sight glass.

8.2 Hydraulic Reservoir Cleaning & Inspection

It is recommended that the hydraulic reservoir be cleaned and inspected when the oil is changed. At this time, the piston block oil intake screens can be cleaned and the pump components can be visually checked for obvious wear or damage.

This procedure is mandatory if it is suspected that the oil is contaminated or if pump performance is sluggish.

1. Completely drain all oil from reservoir. Follow steps 1 through 5 of Section 8.1.
2. Be certain that the compressed air supply line is disconnected from the pump air inlet connection.
3. Disconnect pump air tubes at locations "A" and "B" as shown in Figure 11 and Figure 12.

NOTICE To release each air tube, firmly press down on the connector collar and pull the air tube outward. Disconnect tubes only at locations "A" and "B". The other air tubes can remain connected for this procedure.

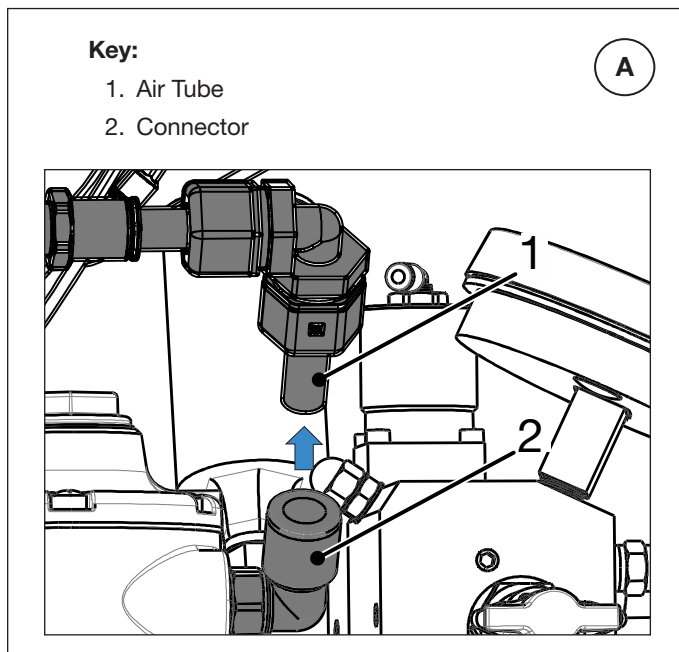


Figure 11: Disconnect Air Tube - Location A

Key:

1. Air Tube
2. Connector

B

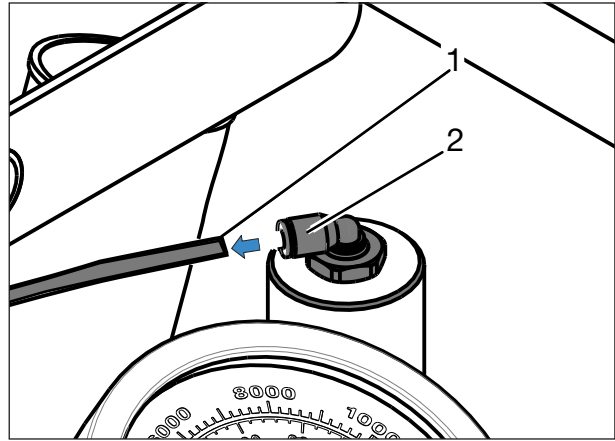


Figure 12: Disconnect Air Tube - Location "B".

4. Remove four cap screws and washers. Carefully lift roll cage and air filter/regulator/lubricator off of the hydraulic reservoir as an assembly. See Figure 13.
5. Remove the remaining six capscrews and washers securing the pump cover plate. Lift the cover plate, hydraulic control valve, air motor and pump element off of the reservoir as an assembly. See Figure 14.
6. Inspect the reservoir interior. Using a clean lint free cloth, remove any dirt or sludge from interior surfaces.
7. Remove the reservoir magnet and wipe it with a clean, lint free cloth. Remove any metal shavings or sludge. Then, reinstall the magnet on the side of the piston block, in the preferred location shown in Figure 15.

Additional notes:

- The reservoir magnet is secured only by magnetic force. For this reason, its exact location may vary.
- To prevent possible oil flow restrictions, do not place the magnet on the oil intake screens or place it loose inside the hydraulic reservoir.
- Avoid placing the magnet near the oil return tube, where oil turbulence may reduce its ability to collect metallic particles.
- If the magnet is missing, order a replacement magnet from your Enerpac distributor. Refer to the pump repair parts sheet for part number

NOTICE Operation of pump without magnet installed may result in excessive wear and damage to pump hydraulic components.

8. Inspect the piston blocks and other exposed pump components for obvious signs of wear or damage. Verify that there are no loose components.
9. Inspect the high pressure tube connecting the pump element to the hydraulic control valve. Tighten or replace any loose or damaged fittings or components as required.

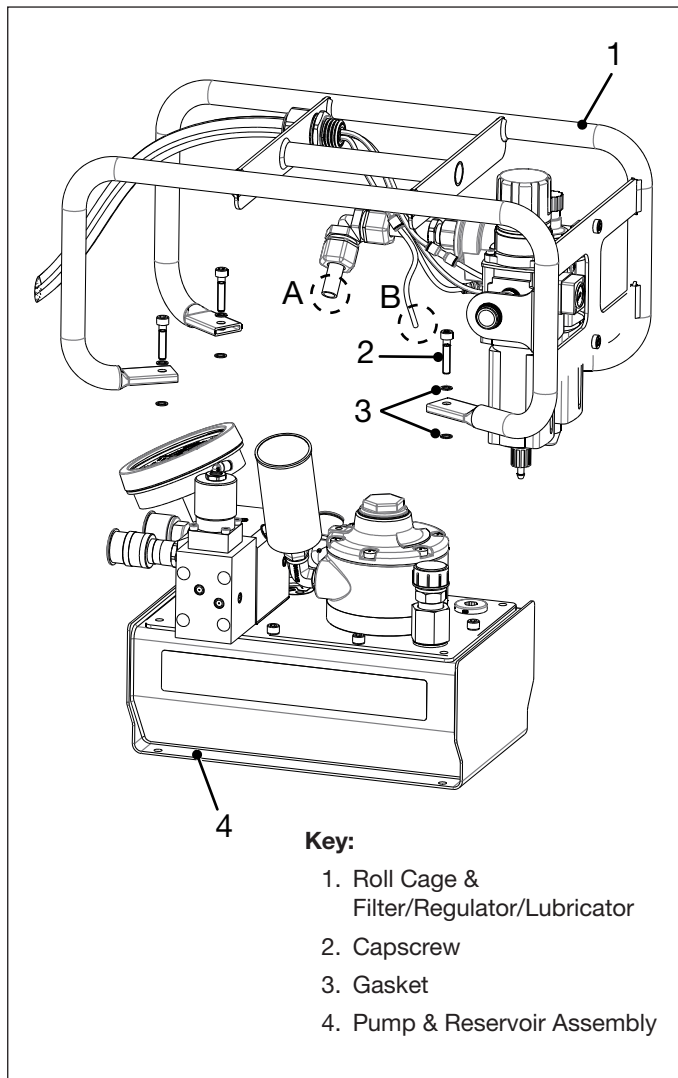


Figure 13: Reservoir Inspection & Cleaning (View 1 of 2)

10. Using a clean lint free rag, wipe the oil intake screen on each of the three piston blocks. Remove any dirt or sludge.
11. Inspect the reservoir gasket. Replace it with a new gasket if worn or damaged.
12. After cleaning is completed, reassemble the pump following steps 4 and 5 in reverse order. Apply Loctite 243 thread sealant to all cover plate mounting bolts and torque them to 60-75 lb-in [6.8-8.5 Nm].
13. Reconnect the pump air tubes. See Figure 11 and Figure 12.
14. Refill the hydraulic reservoir and check for leaks as described in steps 6 through 13 of Section 8.1.

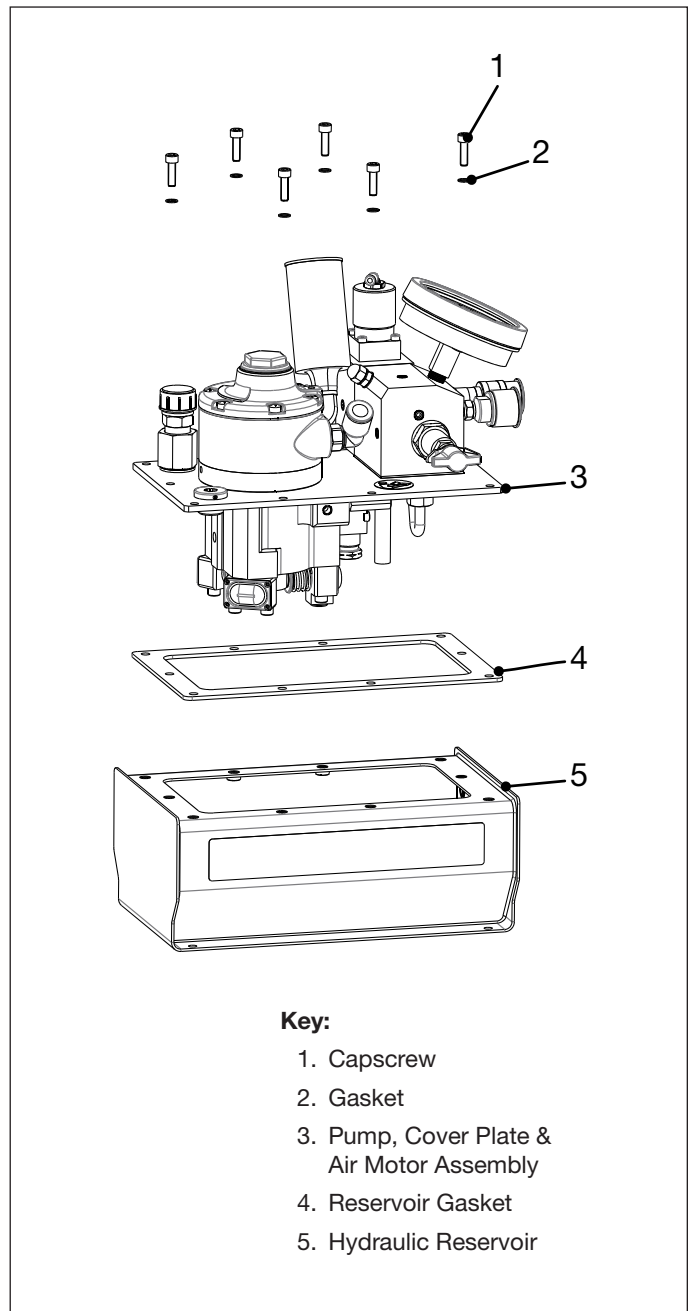


Figure 14: Reservoir Inspection & Cleaning (View 2 of 2)

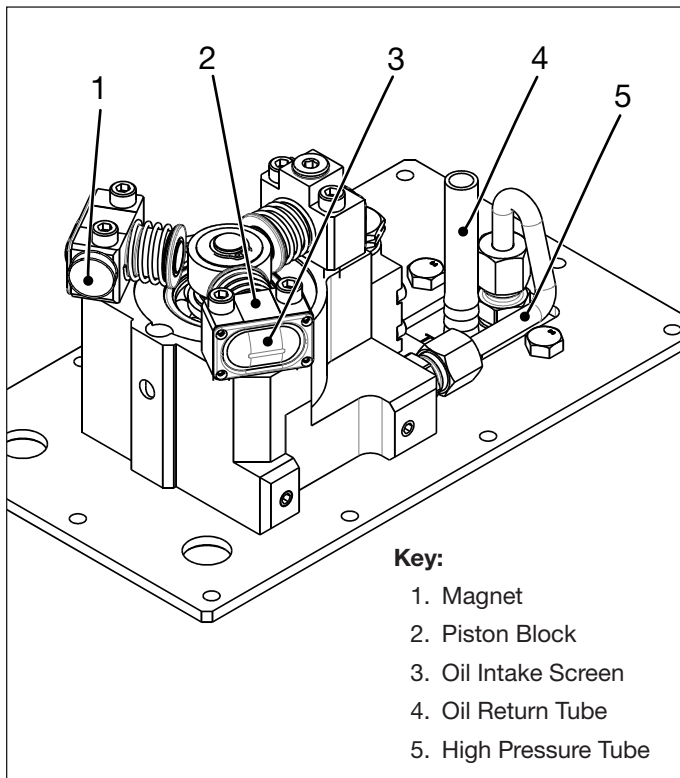


Figure 15: Inspection and Cleaning - Pump Element

8.3 Air Muffler

See Figure 16.

When the pump is run for long periods of time, ice may form on the muffler element and can be removed (while air motor is off) using a clean rag. Be certain that the muffler exhaust holes remain unobstructed.

If the air pressure is within the normal range, and the pump runs slowly or stops unexpectedly, the muffler may be clogged and need replacement. Refer to the pump repair parts sheet for air muffler part number.

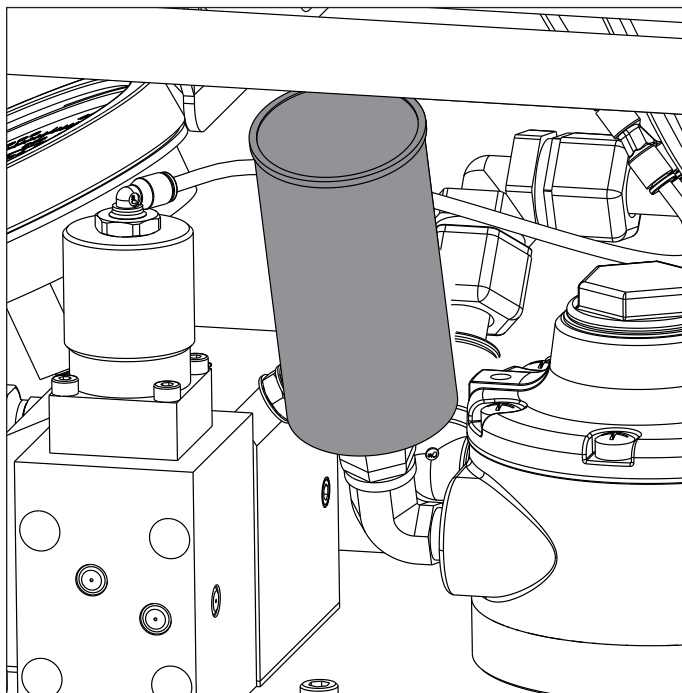


Figure 16: Air Muffler

8.4 Air Filter/Regulator

See Figure 17.

- Periodically check the filter bowl for water. If water is visible in the bowl window, turn the drain valve at bottom of filter bowl to drain the water.
- Replace the filter bowl if it becomes damaged, crazed or cracked
- Keep the filter bowl clean to maintain efficiency. **USE MILD SOAP AND WATER ONLY! DO NOT** use cleansing agents such as acetone, benzene, carbon tetrachloride, gasoline, toluene, etc., which will damage the bowl.
- Replace air filter (5μ element - located inside filter bowl) before it becomes dirty or clogged.
- Refer to the air filter/regulator manufacturer's instructions for complete maintenance and replacement parts information.

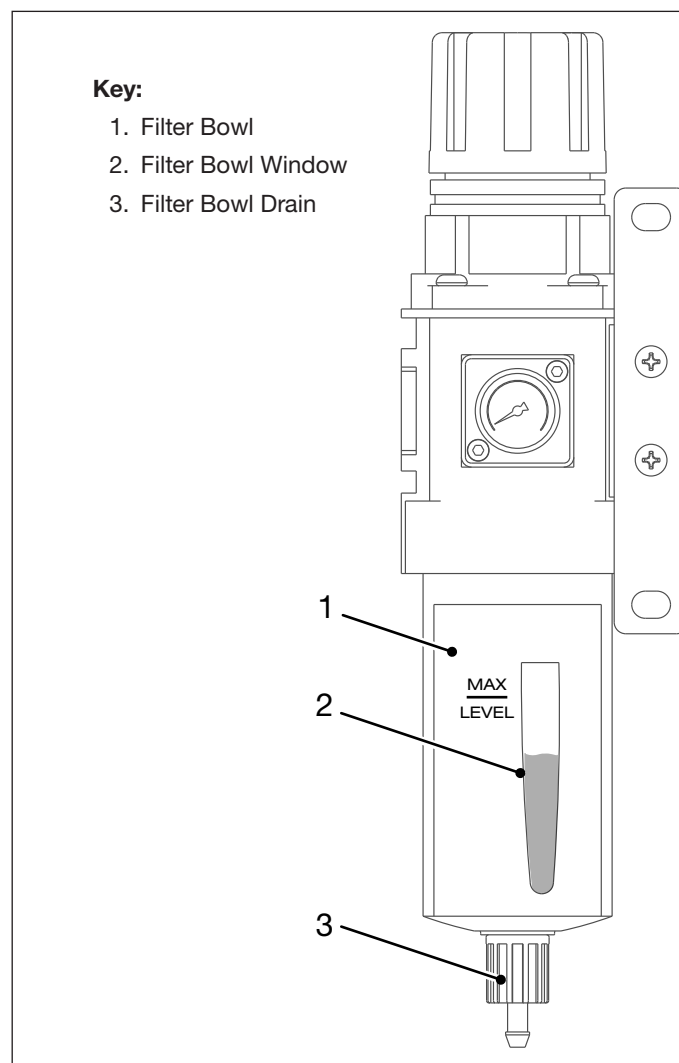


Figure 17: Air Filter/Regulator

8.5 Air Lubricator

- Periodically check the lubricant level in the air lubricator bowl. If it drops to below half full, add additional lubricant as required. Refer to Section 6.6 for lubricant specifications and filling procedure.

- Periodically clean the air lubricator bowl. USE MILD SOAP AND WATER ONLY! DO NOT use cleansing agents such as acetone, benzene, carbon tetrachloride, gasoline, toluene, etc., which will damage the bowl.
- Replace the air lubricator bowl if it becomes damaged crazed or cracked.
- Refer to the air lubricator manufacturer's instructions for complete maintenance and replacement parts information.

9.0 TROUBLESHOOTING

Only qualified hydraulic maintenance personnel with appropriate skills and training should be permitted to service the pump or system components. The *Troubleshooting Chart* is not all inclusive but is intended to be used as a guide to help diagnose and resolve the most common problems which may occur.

Troubleshooting Chart		
Symptom	Possible Cause	Solution
1. Pump will not start.	a. Air turned off or air supply line blocked.	Turn on air. Verify that gauge on air filter/regulator indicates pressure.
	b. Low air pressure and/or flow.	Increase air pressure as required. Verify that air system is capable of producing the minimum required pressure and flow. Refer to Section 3.1.
	c. Air motor control valve malfunction.	Check for proper operation of the air motor control valve. Replace if required.
	d. Mechanical damage to pump and/or air motor.	Troubleshoot pump air motor and pump element components to determine cause. Check pendant controls and air lines.
2. Pump stops under load.	a. Low air pressure. or Minimum required air flow rate is insufficient.	Increase air pressure as required. Use a larger diameter air supply line and/or adequate air source.
	b. Air muffler clogged by ice or dirt.	Check air muffler exhaust vents. Remove ice if present. Replace air muffler if clogged.
	c. Pump bypass valve out of adjustment or malfunctioning.	Readjust or repair pump bypass valve.
	d. Mechanical damage to pump and/or air motor.	Troubleshoot pump air motor and pump element components to determine cause.
3. Pump fails to build pressure or builds less than full pressure.	a. User-adjustable relief valve open or set too low.	Increase relief valve pressure setting. Refer to Section 7.5.
	b. Pump needs priming.	Perform pump priming procedure. Refer to Section 7.7.
	c. External leak in system.	Check entire hydraulic system for leaks. Tighten, repair or replace components as required.
	d. Oil needs changing. Piston block oil intake screens clogged.	Drain, clean and inspect the hydraulic reservoir per instructions in Section 8.1 and Section 8.2. Remove any dirt or sludge. Clean the oil intake screens.
	e. Internal leak in hydraulic control valve or pump element. Worn or damaged internal components.	Troubleshoot hydraulic control valve and pump element components. Tighten, repair or replace components as required.

(continued on next page)

Troubleshooting Chart (continued)		
Symptom	Possible Cause	Solution
4. Low oil flow.	a. Low air pressure and/or flow.	Increase air pressure as required. Verify that air system is capable of producing the minimum required pressure and flow. Refer to Section 6.3.
	b. Dirty air filter element(s).	Replace filter element(s) inside the air filter/lubricator. Refer to filter/lubricator manufacturer's instructions and parts lists.
	c. Internal leak in hydraulic control valve or pump. Worn or damaged internal components.	Troubleshoot hydraulic control valve and pump element components. Tighten, repair or replace components as required.
	d. Oil needs changing. Piston block oil intake screens clogged.	Drain, clean and inspect the hydraulic reservoir per instructions in Section 8.1 and Section 8.2. Remove any dirt or sludge. Clean the oil intake screens.
5. Torque wrench advances or retracts erratically.	a. Air in the hydraulic system.	Advance and retract the torque wrench until operation is smooth. Refer to Section 7.4.
	b. Low air pressure and/or flow.	Increase air pressure as required. Verify that air system is capable of producing the minimum required pressure and flow. Refer to Section 3.1.
	c. External leak in hydraulic system.	Check entire hydraulic system for leaks. Tighten, repair or replace components as required.
	d. Torque wrench internal leakage. Worn or damaged internal components.	Troubleshoot torque wrench. Tighten, repair or replace components as required. Refer to torque wrench manufacturer's repair and overhaul instructions.
	e. Internal leak in hydraulic control valve or pump element. Worn or damaged internal components.	Troubleshoot pump hydraulic control valve and pump element. Tighten, repair or replace components as required.

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