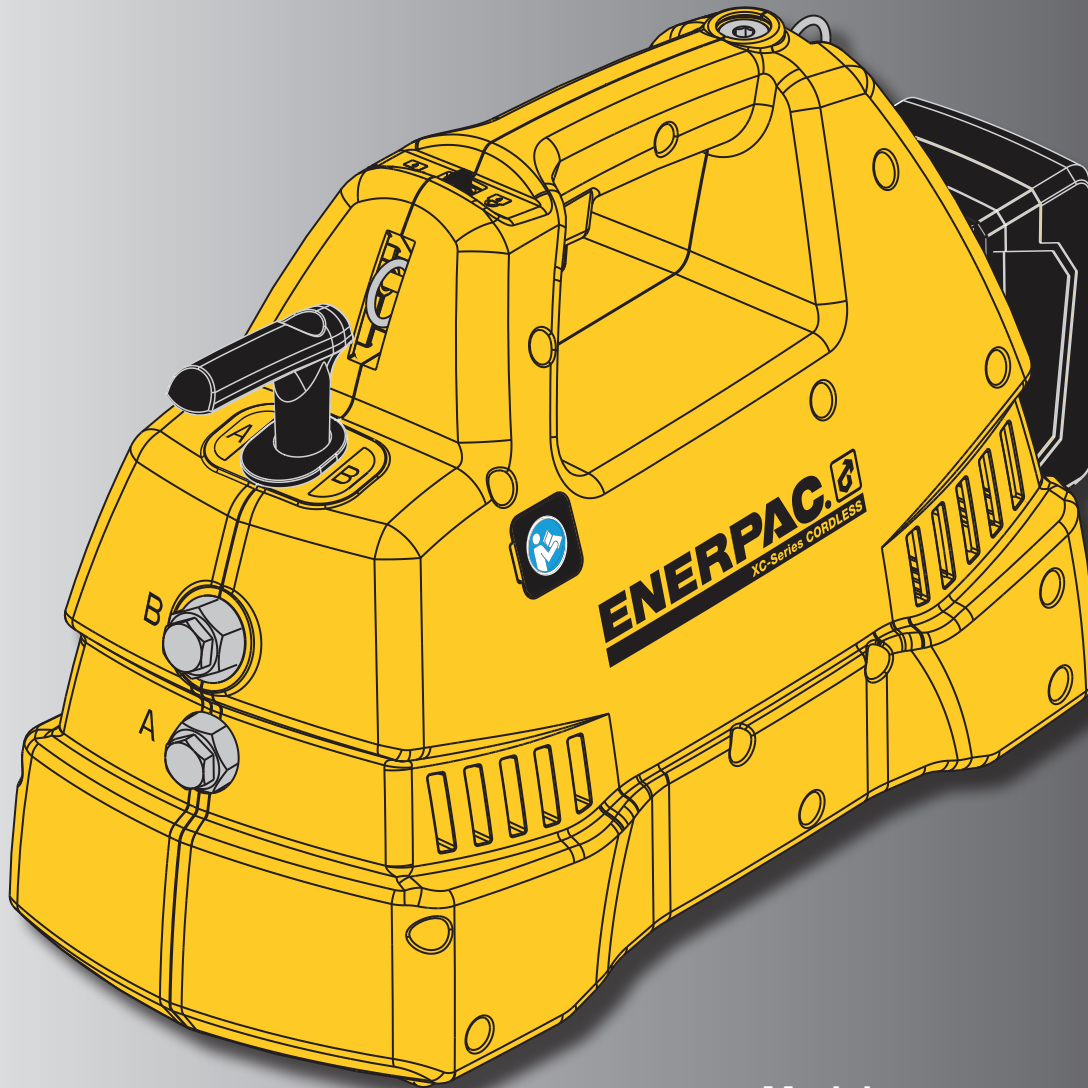


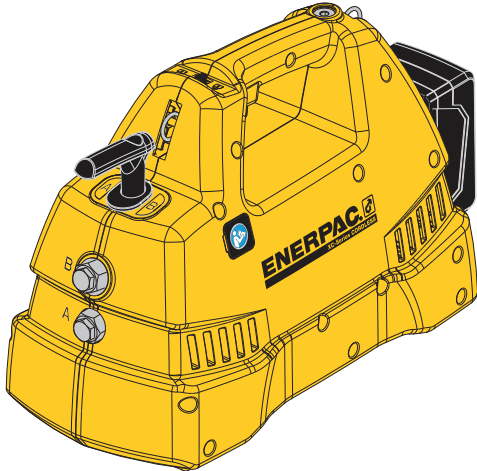
XC-1400 Series Cordless Electric Pump



Models:

- XC-1401MB
- XC-1401ME
- XC-1401M
- XC-1402MB
- XC-1402ME
- XC-1402M

XC-1400 Series Cordless Electric Pump



Models:

- XC-1401MB • XC-1402MB
- XC-1401ME • XC-1401ME
- XC-1401M • XC-1401M

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1.0 SAFETY

1.1 Introduction

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the pump 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 any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for a free Enerpac Hydraulic Safety Course.

This manual follows a system of safety alert symbols, signal 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 personal 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 DANGER, WARNING, CAUTION and NOTICE.



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



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



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



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

1.2 General Hydraulic Safety Precautions



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

- Do not remove or disable the pump relief valve.
- Never set the relief valve to a higher pressure than the maximum rated pressure of the pump.
- Stay clear of loads supported by hydraulics. To avoid personal injury, keep hands and feet away from cylinder and work piece during operation.
- Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin. If oil is injected under the skin, see a doctor immediately.
- A cylinder when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it always must be blocked mechanically.
- Do not pressurize disconnected couplers.
- Only use hydraulic cylinders in a coupled system. Never use a cylinder with uncoupled couplers. If the cylinder becomes extremely overloaded, components can fail catastrophically, causing severe personal injury.
- Use only rigid pieces to hold loads. Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application.
- Avoid situations where loads are not directly centered on the cylinder plunger. Off-center loads produce considerable strain on cylinders and plungers. In addition, the load may slip or fall, causing potential danger.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauge(s) in the system to monitor operating pressure. It is your window to see what is happening in the system.
- Do not exceed equipment ratings. Never attempt to lift a load weighing more than the capacity of the cylinder. Overloading causes equipment failure and possible personal injury.
- Wear personal protective gear when operating hydraulic equipment. Always wear eye protection. Safety equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- Be sure setup is stable before lifting load. Cylinders should be placed on a flat surface that can support the load. Where applicable, use a cylinder base for added stability. Do not weld or otherwise modify the cylinder to attach a base or other support.

 **CAUTION**

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

- Do not use or repair damaged hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose, leading to premature hose failure.
- Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.
- Distribute the load evenly across the entire saddle surface. Always use a saddle to protect the plunger.
- Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or strap.
- Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance, do not expose equipment to temperatures of 150°F [65°C] or higher. Protect all hydraulic equipment from weld spatter
- Immediately replace worn or damaged parts with genuine Enerpac parts. Enerpac parts are designed to fit properly and to withstand high loads. Non-Enerpac parts may break or cause the pump to malfunction.
- Ensure the trigger lock is in the *locked* position before inserting battery pack.
- Recharge battery pack only with the charger specified by the battery manufacturer. A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
- Use the Enerpac XC-1400 Series pump only with *MILWAUKEE* M28™ Li-Ion battery packs. Use of any other battery packs may create a risk of injury and fire.
- When battery pack is not in use, keep it away from other metal objects like paper clips, coins, keys, nails, screws, or other small metal objects that can make a connection from one terminal to another. Shorting the battery terminals together may cause burns or a fire.
- Under abusive conditions, liquid may be ejected from the battery pack. Avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from the battery may cause irritation or burns.
- A separate manual (published by Milwaukee Electric Tool Corp.) is provided with the battery pack and battery charger. Read and understand all information contained in this manual. Observe and comply with all communicated safety precautions. If the manual is lost, obtain a replacement copy before using the battery pack or charger.
- The battery pack and battery charger have no serviceable parts. Do not attempt to disassemble or repair these items.

 **NOTICE**

- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Enerpac Authorized Service Center in your area.

1.3 Battery Operated Pump Safety Precautions

 **WARNING**

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

- Do not operate the pump in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. The pump creates sparks which may ignite the dust or fumes.
- Do not expose the pump to rain or wet conditions. Water entering the pump will increase the risk of electric shock and may damage the motor and other components.
- Allow sufficient time for the pump to cool between operations. To help prevent automatic motor shutdown, do not exceed the pump's rated duty cycle of 25%.
- To avoid accidental starting, ensure that the trigger safety lock is in the *locked* position before carrying or moving the pump. Do not carry the pump with your hand or fingers on the trigger.
- Do not use the pump if the trigger switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired before being used.
- Remove the battery pack from the pump before making any adjustments, performing maintenance or storing the pump. Such preventative safety measures reduce the risk of starting the pump accidentally.

2.0 PRODUCT DATA

2.1 Specifications

Pump Series	Control Valve	For Use With Cylinder or Tool Type:	Hydraulic Connections	Operating Temp Range		Motor Rating		Sound Pressure
				°F	°C	hp	kW	dBA
XC-1400	Manual 4-way, 3-position, with tandem center	Double-acting	3/8" NPTF	+14 to +122	-10 to +50	1/2	0.37	81

Pump Series	Maximum Hyd. Pressure		Flow Rate (See Section 2.2)						Hydraulic Oil Type
	psi	bar	At No Load		At 2000 psi [138 bar]		At 10,000 psi [700 bar]		
			in ³ /min	l/min	in ³ /min	l/min	in ³ /min	l/min	
XC-1400	10,000 [+300 / -50]	700 [+20.7 / -3.4]	125	2.05	30	0.49	15	0.25	Enerpac HF

Pump Model Number	Reservoir Size*		Pump Weight**		Items Included:	Battery Charger Volts (AC)	Battery Pack Volts (DC)
	in ³	l	lb	kg			
XC-1401MB	60	1.0	22.3	10.1	Pump, Charger and 2 Battery Packs	115	28
XC-1402MB	120	2.0	24.2	11.0	Pump, Charger and 2 Battery Packs	115	28
XC-1401ME	60	1.0	22.3	10.1	Pump, Charger and 2 Battery Packs	230	28
XC-1402ME	120	2.0	24.2	11.0	Pump, Charger and 2 Battery Packs	230	28
XC-1401M	60	1.0	22.3	10.1	Pump Only	For pump model numbers ending in "M", the charger and battery packs are not included and must be user-supplied. See table below for additional information.	
XC-1402M	120	2.0	24.2	11.0	Pump Only		

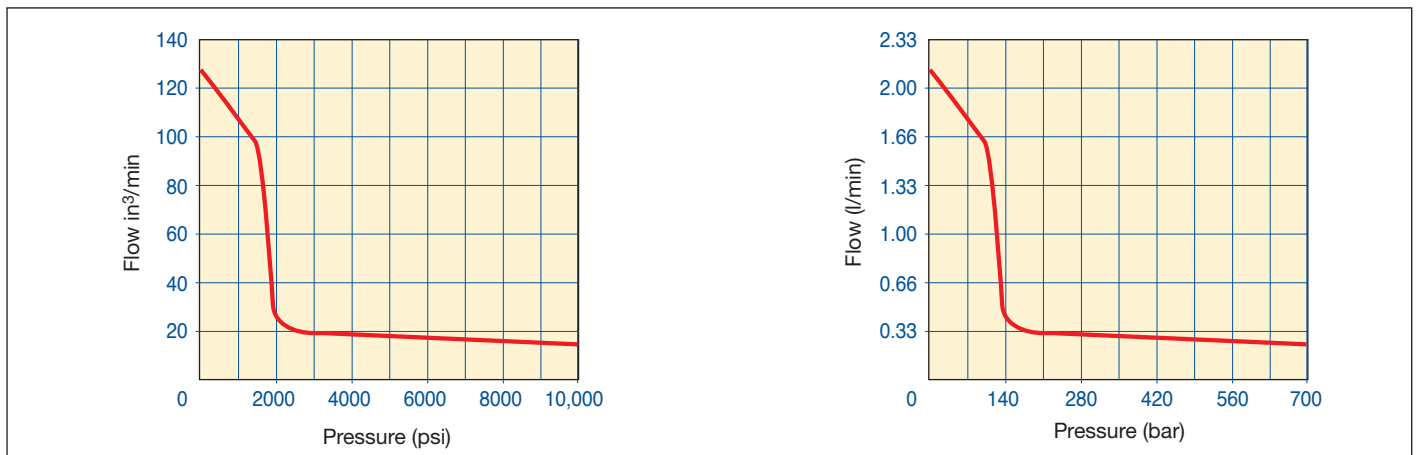
* Reservoir size is approximate. Actual usable oil capacity will be slightly less. All pump models feature a rubber bladder type reservoir.

** Approximate weight of pump with oil in reservoir, and with battery pack installed. Weight of battery pack is approximately 2.4 lb [1.1 kg].

Pump Series	Item	Model Numbers**	
		Enerpac	Milwaukee Electric Tool
XC-1400	Battery Charger, M28™ 115 VAC, 50/60 Hz input	XC115VC	48-59-2819
	Battery Charger, M28™, 230 VAC, 50/60 Hz input	XC230VC	C28C
	Battery Pack, M28™ Lithium-Ion, 28 Volt, 3.0 Ah	XC28V	48-11-2830

** Battery packs and chargers can be purchased from an Enerpac distributor or from a Milwaukee Electric Tool retailer.

2.2 Pressure and Flow Graphs



NOTE: All product data is subject to change without notice. Graphs in Section 2.2 show typical pump pressure/flow curves.

2.3 External Dimensions

Item	Dimension	
	inch	mm
A	8.2	208
B	18.1	460
C	16.6	422
D	11.6	295

3.0 PRODUCT DESCRIPTION

3.1 Introduction

The Enerpac XC-1400 Series cordless pump combines the performance of a powered pump with the portability of a hand operated pump. It is an ideal solution for remote applications, or for locations where the presence of electrical cords or air lines would result in trip hazards.

Designed especially for use with double-acting hydraulic cylinders and tools, the XC-1400 Series consists of a 1/2 hp [0.37 kW] DC motor, two-stage hydraulic pump and a manual 4-way, 3-position control valve. An integral bladder type oil reservoir allows pump operation in any position and helps prevent contamination.

Ample oil capacity is provided. XC-1401 models feature a one liter [60 in³] oil reservoir. XC-1402 models contain a two liter [120 in³] oil reservoir.

The pump's high-strength fiberglass reinforced composite shroud provides superior durability in demanding job site environments. An integrated carrying handle and removable carrying strap allow for easy portability.

Power is supplied by a rechargeable 28 volt Lithium-Ion battery pack manufactured by Milwaukee Electric Tool Corporation. This is the same M28™ series battery pack used with numerous 28 volt Milwaukee Electric Tool products.

The Lithium-Ion battery pack is capable of providing impressive run times, even under extreme job site conditions.

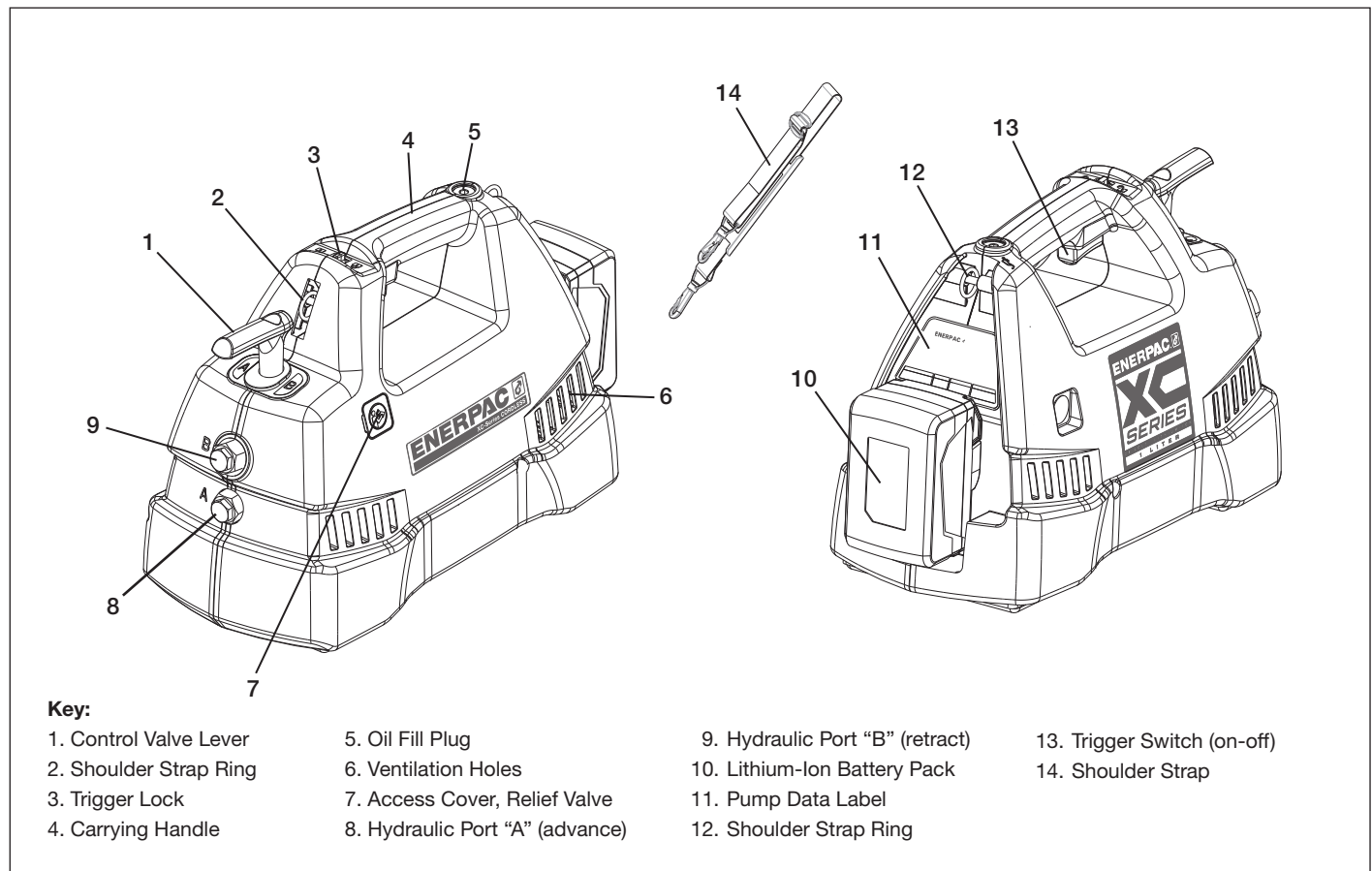


Figure 1, Major Features and Components, Enerpac XC-1400 Series

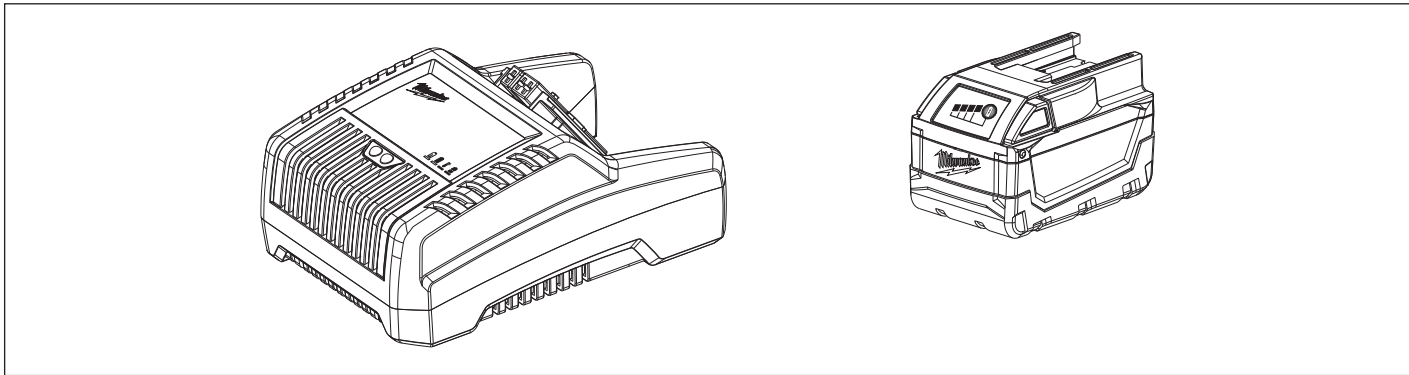


Figure 2, Battery Pack and Charger, M28™ Series (Manufactured by Milwaukee Electric Tool Corp.)

3.2 Additional Information - Battery Pack and Charger

“M28™”, “M28 REDLITHIUM™” and the Milwaukee Electric Tool logo are trademarks and intellectual property of Milwaukee Electric Tool Corporation.

The capitalized and italicized “MILWAUKEE” text used in various places throughout this document denotes products and/or components manufactured by Milwaukee Electric Tool Corporation.

3.3 Conformance to National & International Standards

Enerpac declares that the XC-1400 Series cordless pump has been tested and conforms to applicable standards and is approved to carry the CE, TUV C and US, and FCC certification marks. An EC Declaration of Conformity is enclosed separately.



3.4 Electromagnetic Compatibility (EMC)

The XC-1400 Series cordless pump has been tested and certified to conform to CE-EMC emission and immunity standards and to FCC emission standards.

4.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

The pump can be ordered either with or without battery packs and a compatible AC-powered battery charger. These items will be included in the shipment if ordered.

5.0 HYDRAULIC CONNECTIONS

The pump contains a 4-way, 3-position manual control valve. It is designed for use only with double-acting hydraulic cylinders and devices.

NOTICE Installation of a pressure gauge in each hydraulic line is strongly recommended. All hoses and fittings must be rated to at least 10,000 psi [700 bar].

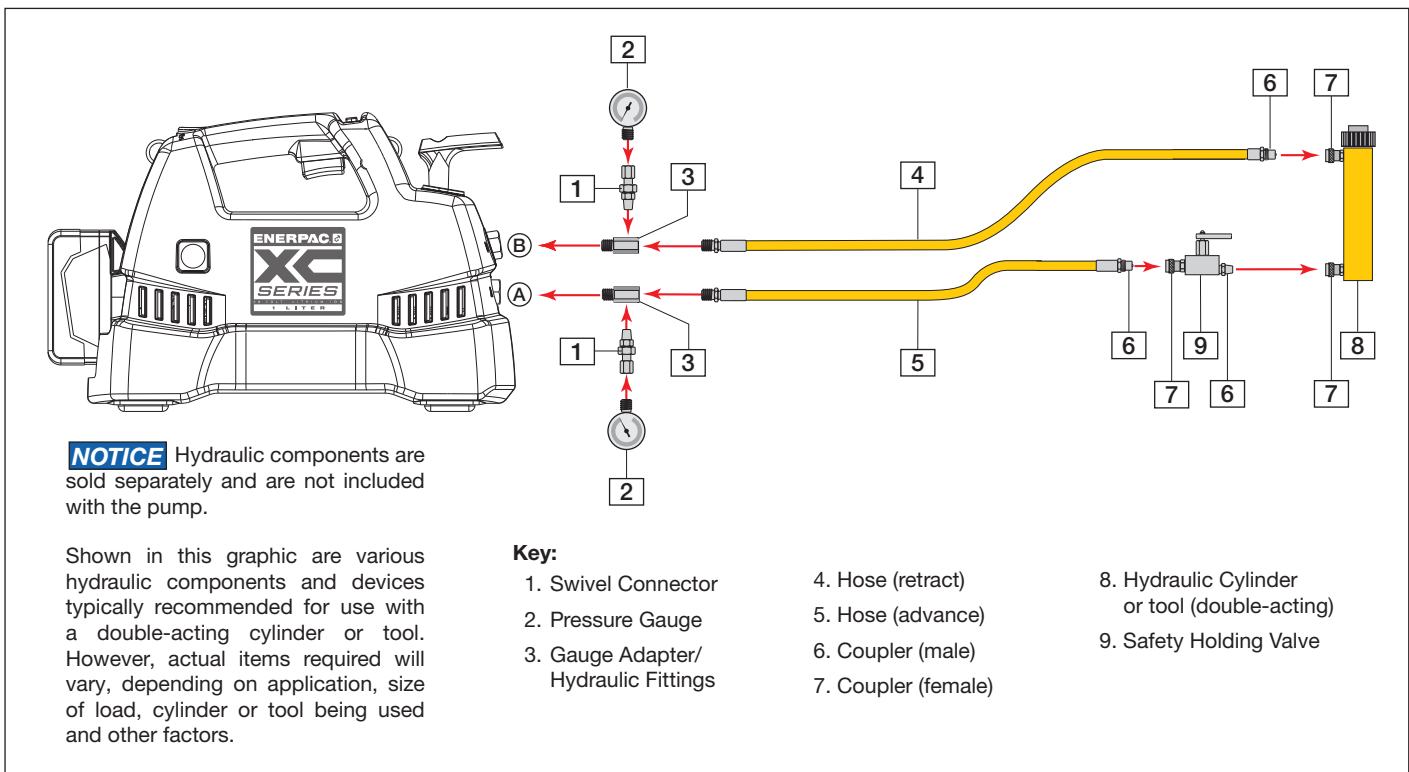


Figure 3, Hose Connections (typical)

As hoses, components and fittings are assembled, apply 1-1/2 wraps of thread sealing tape to all threaded NPT or NPTF fittings, leaving the first complete thread free of tape as shown in Figure 4. Use care to prevent pieces of tape from entering the hydraulic system.

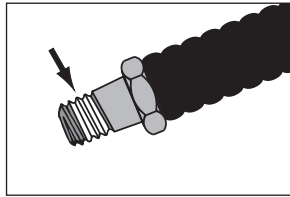


Figure 4, Sealing Tape

Make hydraulic connections to pump ports “A” and “B” as described in the following steps. Refer to Figures 3, 4 and 5.

1. To prevent the pump from starting, be sure that the battery is removed from the pump.
2. Remove the shipping plugs from pump ports “A” and “B”. Use a 15/16" wrench to hold the port fitting in place. Then, use a 11/16" wrench to remove the shipping plug. See Figure 5.
3. Connect the hose from the advance side of the cylinder or tool to pump port “A”.
4. Connect the hose from the retract side of the cylinder or tool to pump port “B”.
5. Install hydraulic fittings at pump ports “A” and “B” so they are finger tight. Then, tighten each fitting two additional full turns. Couplings or other hydraulic fittings (user-supplied) must have 3/8" NPTF threads.

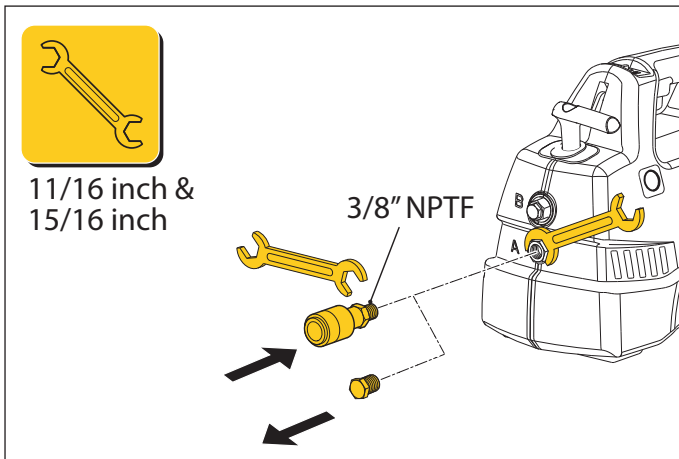


Figure 5, Shipping Plug Removal & Hydraulic Coupling Installation (typical)


WARNING To ensure proper operation, avoid kinking or tightly bending hoses. If a hose becomes kinked or otherwise damaged, it must be replaced. Damaged hoses may rupture at high pressure. Serious personal injury may result.

6.0 BATTERY PACK

6.1 Battery Pack Fuel Gauge

New battery packs must be charged before use. Each battery pack contains a “fuel gauge” with four indicator lights. The indicator lights show the approximate run time remaining before the battery pack becomes completely discharged.

Press the fuel gauge button to display the lights. The fuel gauge will stay lit for two seconds. Refer to the following table to determine the level of charge:

 When fuel gauge button is pressed: (see Fig. 6)	Percent Charge: (approximate)
Lights 1, 2, 3 and 4 ON	78 - 100%
Lights 1, 2 and 3 ON	55 - 77%
Lights 1 and 2 ON	33 - 54%
Light 1 ON	10-32%
Light 1 FLASHES 4 TIMES	< 10%
Light 1 FLASHES 8 TIMES	0%

NOTICE Run time between battery charges is dependent on the application, pump run time, pressure setting and other factors.



Figure 6, Fuel Gauge

NOTICE If none of the fuel gauge lights illuminate when the fuel gauge button is pressed, place the battery pack on the charger and charge as needed.

6.2 Battery Pack Installation and Removal

- Be sure that trigger lock is in the *locked* position before installing or removing battery packs. Refer to Section 7.2.
- **To install battery pack on pump:** Slide the pack down onto the bracket at the rear of the pump. Make sure it latches securely into place. See Figure 7.
- **To remove battery pack from pump:** Press the red release buttons located on each side of the pack. Then, slide the pack upward and remove it from the bracket on pump.

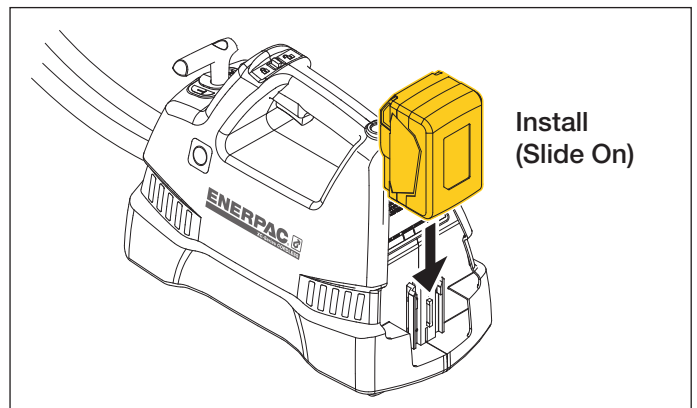


Figure 7, Battery Pack Installation

NOTICE To ensure compatibility and proper operation, use only MILWAUKEE M28™ Lithium-Ion battery packs with the pump.

7.0 OPERATION

7.1 Before Start-up

1. Check all hydraulic fittings and connections to be sure they are tight and leak free.
2. Check the hydraulic oil level. Add oil if necessary. Refer to Sections 8.1, 8.2 and 8.3 for procedures.
3. Install a fully charged battery pack on the pump. See Section 6.2 for additional information.

NOTICE New battery packs must be charged before use. Refer to Section 6.1. Also refer to the Milwaukee Electric Tool battery and charger manual for additional information.

7.2 Trigger Lock

The pump is equipped with a trigger lock that prevents the pump from being started when the control is in the *locked* position. See Figure 8.

1. To engage the trigger lock, slide the trigger lock control to the left, so it is closest to the *locked* icon.
2. To disengage the trigger lock, slide the trigger lock control to the right, so it is closest to the *unlocked* icon.

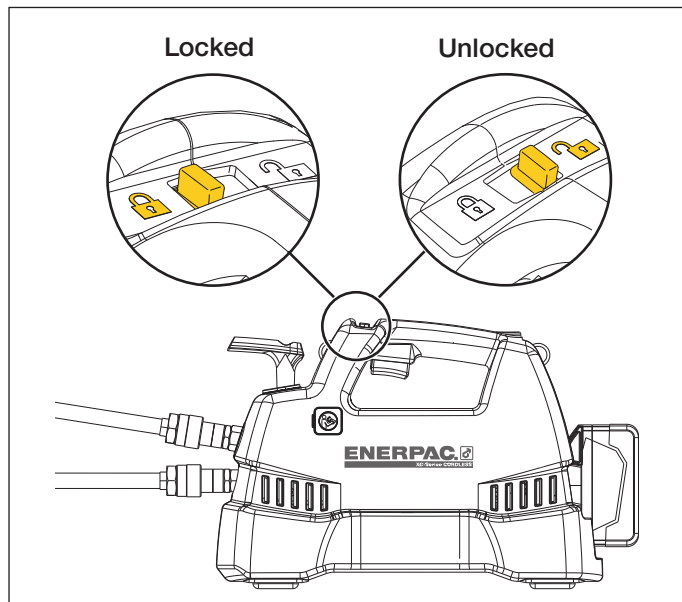


Figure 8, Trigger Lock

7.3 Starting and Stopping the Pump Motor

A trigger switch is used to control the pump motor. See Figure 9.

1. Be sure that the trigger lock is in the *unlocked* position.
2. To start the pump motor, firmly grasp the carrying handle and pull the trigger switch upward.
3. To stop the pump motor, release the trigger switch.

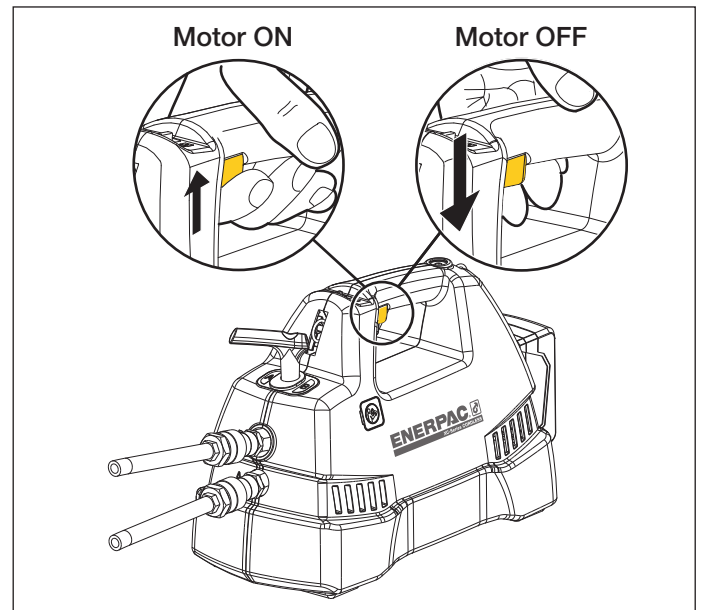


Figure 9, Trigger Switch (on-off control)

7.4 Operating Precautions



Failure to observe the following precautions and instructions could allow load to drop on persons working in the area. Death or serious personal injury could result.

- Keep persons away from area under load during lifting, lowering and whenever the control valve lever is moved.
- To prevent the lifted load from dropping, always immediately support it with jack stands or other mechanical blocking devices of adequate rated capacity.
- Be certain that blocking is fully in place before moving the control valve lever from one position to another. An unsupported load can drop when the control valve is shifted.
- Do not rely on the pump hydraulics to hold lifted loads. The pump is not designed as a load holding device. The pump control valve does NOT contain a safety locking valve in any of its three positions.
- Although in some instances the pump hydraulics may temporarily hold the load, be aware that the load can drift downward or drop suddenly at any time without warning if it is not mechanically supported.

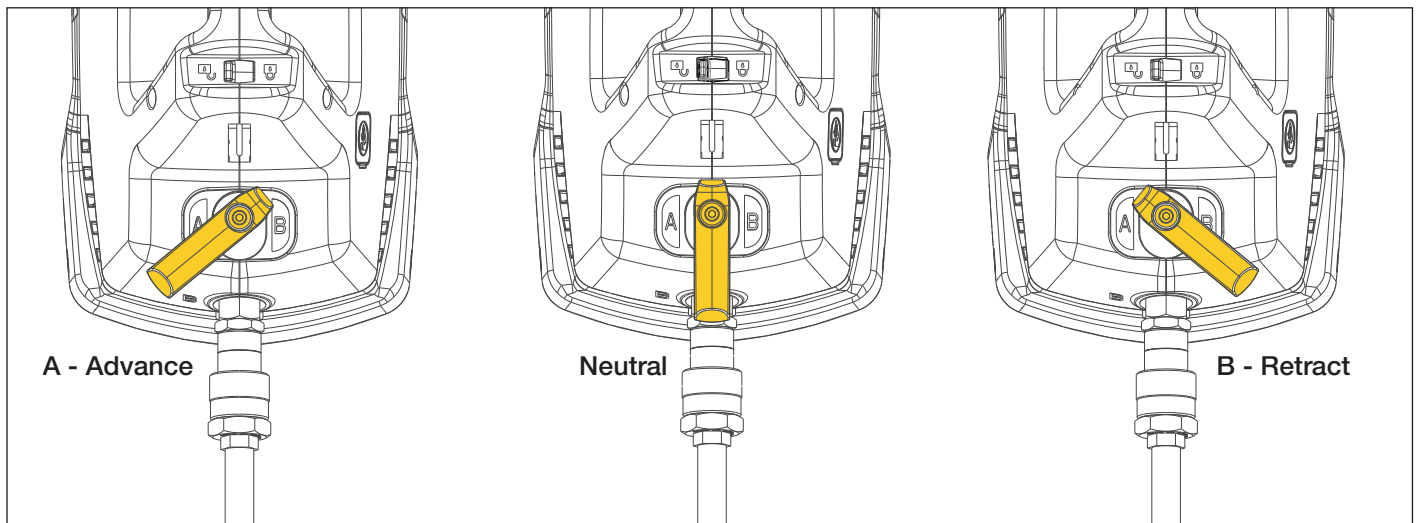


Figure 10, Control Valve Positions

7.5 Control Valve Operation

The control valve is operated by a rotary lever at the front of the pump. See Figure 10 for valve positions.

To advance the cylinder: Move the valve lever to the “A” position. Then, pull the trigger switch upward to start the motor. The cylinder will continue to advance until the trigger switch is released or the cylinder reaches its maximum travel.

To retract the cylinder: Move the valve lever to the “B” position. Then, pull the trigger switch upward to start the motor. The cylinder will continue to retract until the trigger switch is released or until the cylinder is fully retracted.

The control valve blocks flow in both cylinder hoses when the lever is moved to the neutral (center) position. However, the XC-1400 Series pump is not designed for holding loads. After lifting is completed, the load must be mechanically supported (refer to warning statement and related information in Section 7.4).

7.6 Air Removal

When hydraulic components are connected for the first time, air will be trapped in the components. To ensure smooth, safe operation, run the cylinder through several complete advance-retract cycles before placing the pump into service. Do this with no load on the cylinder and with the pump positioned higher than the cylinder. To allow for air venting, remove the pump oil fill plug and O-ring before beginning this procedure (See Fig 11).

When the cylinder advances and retracts smoothly and without hesitation, the air has been vented from the system. Fully retract the cylinder and re-install oil fill plug and O-ring after completing procedure.

NOTICE Trapped air purged from system components will return to reservoir. Oil level may drop. Add additional oil (if required) to reservoir after purging air. Refer to Section 8.3.

7.7 Battery Pack Current Draw Protection

To protect the MILWAUKEE M28™ battery pack from damage and extend its life, the battery pack’s intelligent circuit monitors both current draw and temperature.

In extremely high torque, binding, stalling, and short circuit situations, the battery pack will shut-off if the current draw becomes too high. The fuel gauge lights will flash 8 times, indicating that battery pack shut-off has occurred

To prevent battery pack shut-off from occurring, reduce the amount of load on the cylinder or tool (if possible) or release the trigger switch. Releasing the trigger switch will reset the battery pack.

7.8 Battery Pack High Temperature Protection

Under extreme circumstances, the internal temperature of the MILWAUKEE M28™ battery pack can become too high, resulting in battery pack shut-off.

If the lights flash in an alternating manner when the fuel gauge button is pressed, allow time for the battery pack to cool.

The battery pack is ready for use when the fuel gauge lights display the remaining run time when the fuel gauge button is pressed.

7.9 Battery Pack Cold Weather Operation

The MILWAUKEE M28™ battery pack is designed to operate in temperatures below freezing. However, when the battery pack is very cold, it may need to warm-up before normal use. To warm-up the battery pack, install it on the pump and operate the pump with little or no load.

NOTICE Refer to the Milwaukee Electric Tool manual (provided with the battery pack and charger) for complete battery pack use and care information and charging instructions.

7.10 Disconnecting Hydraulic Hoses

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

1. Fully retract the cylinder or tool. Be sure that the load is completely removed from the device.
2. Move the control valve lever back and forth between the “A” and “B” positions several times to relieve any trapped pressure.
3. If pressure gauges have been installed, verify that the gauges indicate zero (0) psi/bar.
4. Disconnect hoses from pump.
5. To prevent contamination, cap or plug pump ports “A” and “B”.

7.11 Transporting the Pump

Always move the trigger lock to the LOCK position before transporting the pump. This will prevent accidental pump start-up.

Always transport the pump using either the built-in carrying handle or the carrying strap.

Never attempt to transport or reposition the pump by dragging it by the hoses. Damage to the pump and/or hoses may result.

8.0 MAINTENANCE

8.1 Check Oil Level

1. Be sure hydraulic cylinder or other tool is fully retracted.
2. Rotate the control valve lever back and forth several times between the "A" and "B" positions to remove any trapped pressure.
3. Remove the battery pack from the pump.
4. Place the pump on a level surface.
5. Remove the oil fill plug and O-ring from the fill opening. Use a 7/8" Allen wrench. Be sure that the O-ring is removed with the plug. See Figure 11.

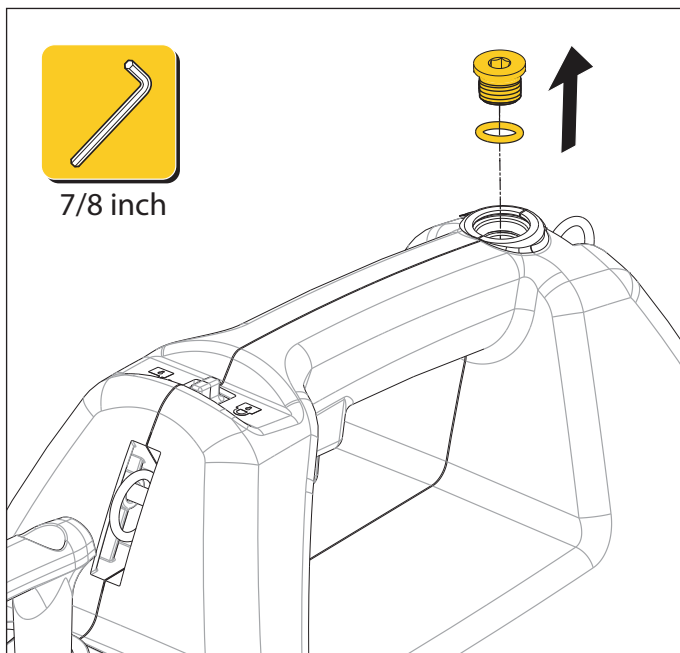


Figure 11, Checking Reservoir Oil Level

6. Visually check the oil level. Reservoir is FULL when oil level is at the top of the oil fill tube.

If oil level is OK (reservoir full):

- Reinstall O-ring and oil fill plug.
- Be sure fill plug is fully installed so that top of plug is recessed below the flange around the fill opening. Torque to 40 - 50 in-lbs [4.5 - 5.7 Nm].

If oil level is low:

- Add oil as described in Section 8.3. Refer to Section 8.2 for oil requirements.

8.2 Hydraulic Oil Information

Use only Enerpac HF hydraulic oil when adding additional oil or when performing an oil change. Enerpac HF hydraulic oil is available from Enerpac distributors and Enerpac authorized service centers.

NOTICE Use only Enerpac HF hydraulic oil. Use of other oils may result in damage to pump components. Such damage is not covered under the Enerpac product warranty.

8.3 Adding Oil

CAUTION Be certain that cylinder or tool is fully retracted before adding any oil to the reservoir. If an oil-filled cylinder or tool is retracted after additional oil has been added to the reservoir, the reservoir could become overfilled and burst. Minor or moderate personal injury and/or property damage could occur.

NOTICE

- Use only Enerpac HF hydraulic oil. Refer to Section 8.2.
- To avoid spillage and to allow proper venting, always use a funnel of the proper size when adding oil. Spillage will occur if a funnel is not used.
- Use only new oil poured from a clean container.
- Always remove the battery pack from the pump before adding oil. This will prevent accidental pump start-up and will also prevent any spilled oil from contacting the battery pack during filling.
- Pour oil slowly to avoid spillage. If oil begins to flow from the concentric vent openings around the oil fill opening, stop pouring immediately to avoid spillage.
- Remove and dispose of any spilled oil in accordance with all applicable laws and regulations.

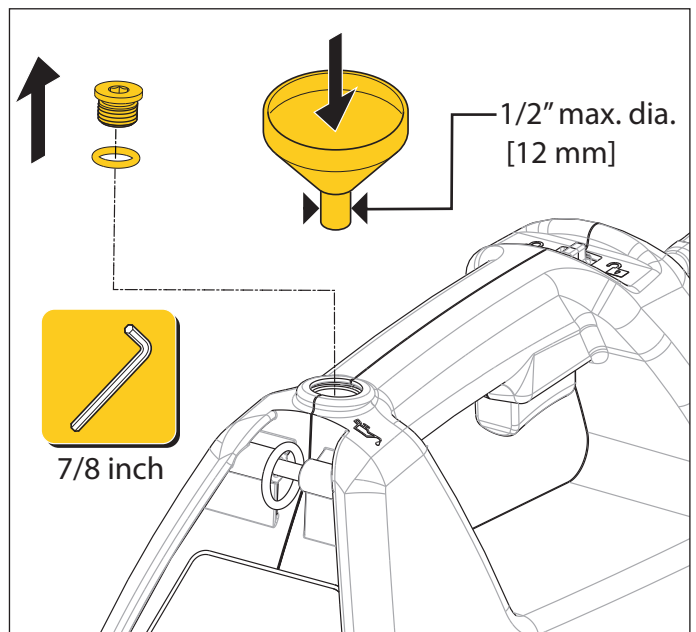


Figure 12, Adding Oil

Add oil as described in the following steps. See Figure 12.

1. Be sure hydraulic cylinder or other tool is fully retracted.
2. Rotate the control valve lever back and forth several times between the "A" and "B" positions to remove any trapped pressure.
3. Remove the battery pack from the pump.
4. Remove the oil fill plug and O-ring from the fill opening. Use a 7/8" Allen wrench. Be sure that the O-ring is removed with the plug.
5. Place a funnel (maximum 1/2" [12 mm] stem diameter) through the fill opening and into the oil fill tube. Be sure

the concentric vent openings around the fill opening are not plugged with dirt. Venting will occur through these openings as oil is added in step 6.

NOTICE Refer to Section 8.2 for hydraulic oil requirements.

6. SLOWLY add Enerpac oil while watching the oil level through the funnel stem. To avoid spillage, stop pouring immediately when oil level reaches the top of the oil fill tube.
7. Remove funnel from oil fill opening.
8. Reinstall O-ring and oil fill plug. Be sure fill plug is fully installed. Torque to 40 - 50 in-lbs [4.5 - 5.7 Nm].
9. Reinstall the battery pack.

8.4 Oil Change

Change the hydraulic oil in the pump reservoir at least once a year, or whenever it is suspected that the oil has become contaminated.

The pump contains a rubber bladder style reservoir. To properly drain and refill the reservoir, change the oil as described in the following steps. See Figure 13.

1. Be sure hydraulic cylinder or tool is fully retracted.
2. Rotate the control valve lever back and forth several times between the "A" and "B" positions to remove any trapped pressure.
3. Move the trigger lock to the *locked* position.
4. Disconnect hoses from ports "A" and "B" of pump.
5. Attach an open-ended hose to the pump "A" port. Place the open end of the hose in a suitable pan or container that is large enough to collect all the used oil.

NOTICE XC-1401 models have a one liter [60 in³] reservoir. XC-1402 models have a two liter [120 in³] reservoir. Be sure the pan or container is large enough to hold all the drained oil.

6. To prevent dirt entry, seal the pump "B" port with a metal plug or closed coupler.
7. Be sure that oil fill plug is fully installed in the pump oil fill opening. It will be removed later, but must remain installed at this time.

8. Move the trigger lock to the *unlocked* position.
9. Move the control valve lever to the "A" advance position.
10. Pull the trigger switch upward to start the pump motor. Continue running the motor until oil stops flowing from the open-ended hose. Then, release the trigger switch.

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

11. Remove the battery pack from the pump.
12. Remove the open-ended hose from the pump "A" port. To prevent dirt entry, seal the "A" port with a metal plug or closed coupler.
13. Slowly fill the reservoir with new Enerpac oil. Refer to Section 8.2 for hydraulic oil requirements and Section 8.3 for detailed oil fill instructions. Usable oil capacity will be slightly less than the rated reservoir size for your pump model.
14. After adding oil, reconnect the cylinder or tool and reinstall the battery pack. Run the pump and cycle the cylinder or tool several times to bleed any trapped air from the system. Refer to Section 7.6 for additional information.
15. Check oil level again after cycling the cylinder or tool. With the cylinder or tool fully retracted, verify that oil level has not dropped. Add additional oil if level is low.

8.5 Relief Valve Pressure Adjustment

The pump contains a user-adjustable pressure relief valve that is factory set at 9950-10,300 psi [686-710 bar]. Check and adjust the setting as described in the following steps. See Figure 14.

1. Be sure hydraulic cylinder or tool is fully retracted.
2. Rotate the control valve lever back and forth several times between the "A" and "B" positions to remove any trapped pressure.
3. Remove the battery from the pump.
4. Remove hydraulic hoses from pump ports "A" and "B".
5. Connect a 0-15,000 psi [0-1000 bar] pressure gauge to the pump "A" port.

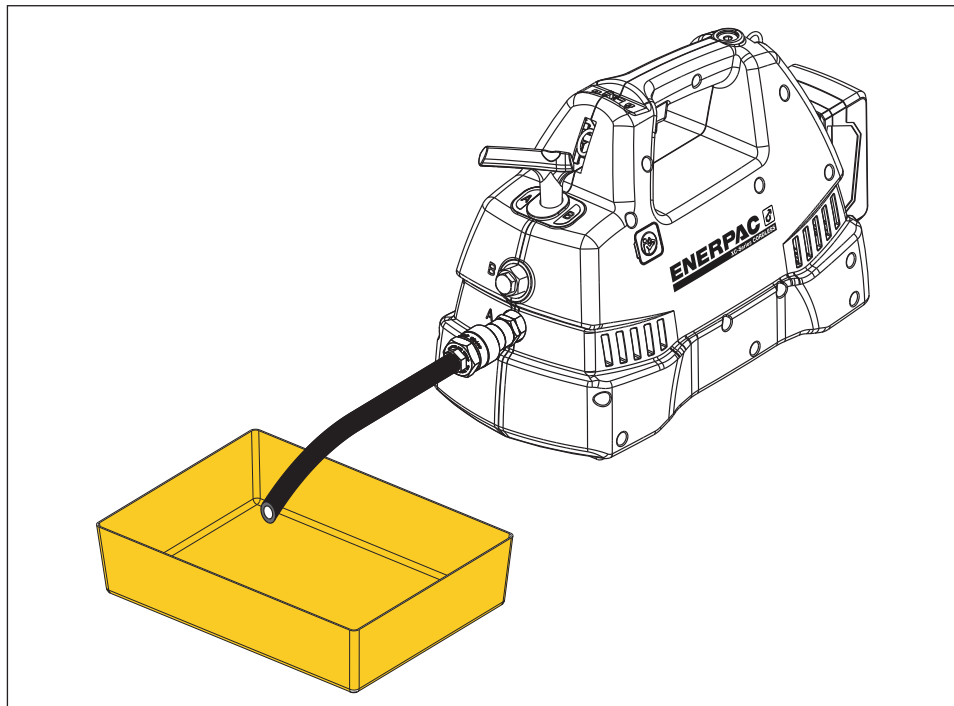


Figure 13, Draining the Oil Reservoir

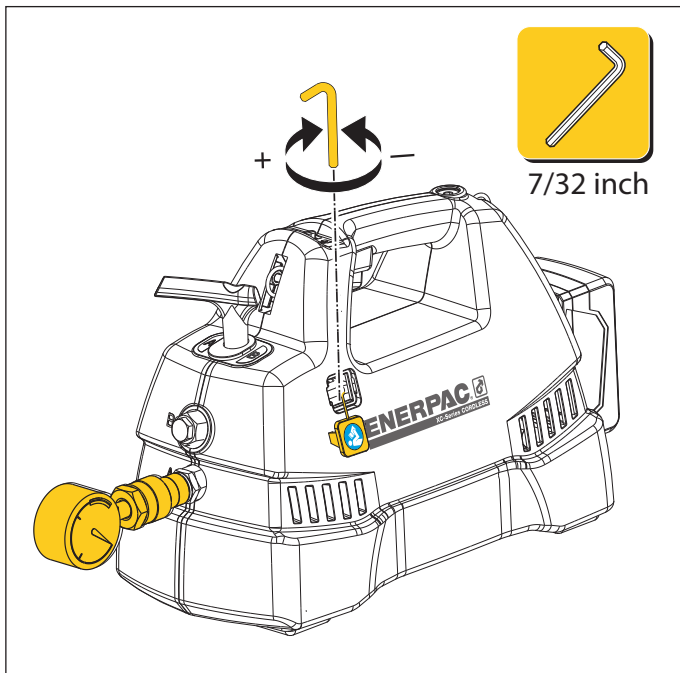


Figure 14, Relief Valve Pressure Adjustment

6. Seal the pump “B” port with a metal plug or closed coupler.
 7. Reinstall the battery on the pump.
 8. Move the control valve to the “A” position.
 9. Be sure that the trigger lock is in the *unlocked* position.
 10. Pull the trigger switch upward to start the pump motor. While the motor is running, check the gauge reading to determine the relief valve pressure setting. The relief valve is factory set at 10,000 psi, +300/-50 psi [700 bar, +20.7/-3.4 bar]. However, the setting can be adjusted lower if desired.
- If the pressure setting shown on the gauge is correct for your application, and the cylinder or tool being used, skip step 11 and go to step 12.
 - If the pressure setting shown on the gauge is not correct, readjust the setting as described in step 11.

⚠ WARNING

Never adjust the relief valve pressure setting above 10,300 psi [712 bar]. Be certain that the pressure setting does not exceed the maximum rated pressure of the cylinder (or tool) being used. Failure to observe these precautions may result in failure of cylinder or tool and related components. Death or serious personal injury could occur.

11. If needed, adjust the relief valve pressure setting as described in the following steps:
 - a. Using a flat blade screwdriver, remove the rectangular access cover from the side of the pump.
 - b. Place a long 7/32" Allen wrench straight down through the opening until it engages with the socket head of the pressure adjustment screw.
 - c. Rotate the control valve lever between the “A” and “B” positions to relieve any residual pressure in the pump. Verify that the pressure gauge indicates zero (0) psi/bar.
 - d. Only if pressure setting is to be decreased: Using the Allen wrench, turn the pressure adjustment screw about two turns counter-clockwise.

NOTICE To help ensure an accurate final pressure setting, always start from a lower setting and gradually increase the pressure to the final setting.

- e. Pull the trigger switch upward to start the pump motor.
- f. With the motor running, slowly turn the Allen wrench clockwise to increase the pressure setting to the desired setting (10,300 psi [712 bar] maximum). Observe the pressure gauge to determine when this setting has been reached.
- g. After adjusting the pressure setting, release the trigger switch to stop the motor.
- h. Pull the trigger switch upward again and re-check the pressure gauge reading.

NOTICE If pressure is too high or too low, stop the pump and repeat steps 11c through 11h. Note that it will first be necessary to relieve any residual pump pressure as described in step 11c before performing step 11d.

12. After verifying that the desired pressure setting has been achieved, remove the Allen wrench and reinstall the access cover.
13. Rotate the control valve lever between the “A” and “B” positions to relieve any residual pressure in the pump. Verify that the pressure gauge indicates zero (0) psi/bar.
14. Remove the battery pack from the pump.
15. Disconnect pressure gauge from the pump “A” port.
16. Remove metal plug or closed coupler from the pump “B” port.
17. Reconnect hydraulic hoses to pump ports “A” and “B”.
18. Reinstall the battery pack on the pump.

9.0 TROUBLESHOOTING

The information in the Troubleshooting Guide (see next page) is intended as an aid to help diagnose and correct various possible problems that may occur.

For repair service, contact your nearest Enerpac Authorized Service Center. Only an Enerpac Authorized Service Center should be permitted to service the pump and its components.

⚠ WARNING

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

- Never tighten or loosen hydraulic fittings while the pump hydraulic system or connected components are pressurized. Escaping oil under pressure can penetrate the skin, causing serious personal injury.
- Keep hands, fingers and other body parts clear of pinch points and moving parts when observing operation during troubleshooting.
- To prevent accidental start-up of pump during servicing, always remove battery pack from pump before performing any maintenance or repair procedures.

Troubleshooting Guide		
Symptom	Possible Cause	Solution
1. Pump will not start.	a. Battery pack not installed.	Install battery pack.
	b. Electrical contacts dirty or corroded.	Clean contacts on the battery, pump and charger.
	c. Battery pack discharged.	Charge battery pack.
	d. Battery pack shut-off.	Refer to Milwaukee Electric Tool battery/charger instruction manual.
	e. Motor brushes worn.	Contact Enerpac Authorized Service Center.
	f. Trigger lock engaged.	Move trigger lock to the <i>unlocked</i> position.
	g. Motor damaged.	Contact Enerpac Authorized Service Center.
2. Pump clicks when trigger switch is pulled, but does not start.	a. Electrical contacts dirty or corroded.	Clean contacts on the battery, pump and charger.
	b. Battery pack discharged.	Charge battery pack.
	c. Battery pack too cool or too warm.	Allow the battery temperature to return to operating range. Refer to Milwaukee Electric Tool battery/charger instruction manual.
	d. Battery pack damaged or not functioning.	Replace battery pack.
	e. Pump jammed due to obstruction. Possible internal damage to pump.	Contact Enerpac Authorized Service Center.
3. Low fluid output.	a. Pump needs priming.	To prime the pump, be sure that the pump reservoir is filled with oil. Then, run the pump with the control valve in the neutral position while gently rocking the pump from side-to-side.
	b. Bypass valve malfunction.	Contact Enerpac Authorized Service Center.
	c. Oil intake screens clogged with debris.	Contact Enerpac Authorized Service Center.
	d. Internal damage to pump.	Contact Enerpac Authorized Service Center.
4. Cylinder will not advance or retract.	a. Oil level low.	Add oil until reservoir is completely full.
	b. Pump needs priming.	To prime the pump, be sure that the pump reservoir is filled with oil. Then, run the pump with the control valve in the neutral position while gently rocking the pump from side-to-side.
	c. Oil intake screens clogged with debris.	Contact Enerpac Authorized Service Center.
	d. Valve handle in wrong position.	Move valve handle to the "A" (pressure) position to advance. Move valve handle to the "B" (return) position to retract.
5. Pump slows down and stops.	Battery pack discharged.	Charge battery pack.
6. Cylinder advances and retracts erratically.	a. Air in the system.	Advance and retract the cylinder until operation is smooth.
	b. External hydraulic leak.	Tighten connections. Replace damaged components.
	c. Internal leakage in valve.	Contact Enerpac Authorized Service Center.
	d. Internal damage to valve.	Contact Enerpac Authorized Service Center.
	e. Internal damage to pump.	Contact Enerpac Authorized Service Center.
7. Pump pulses and/or stops during prolonged or heavy operation.	Excessive current draw.	Immediately release the trigger to prevent battery from shutting off. Allow time for battery pack to cool before restarting pump. NOTICE If battery pack shuts off, place pack on charger to reset.
8. Pump does not build pressure.	User-adjustable relief valve set too low.	Adjust relief valve pressure. Refer to Section 8.4.
9. Noisy pump operation.	a. Pump element piston sticking.	Contact Enerpac Authorized Service Center.
	b. Motor or gear damaged.	Contact Enerpac Authorized Service Center.

