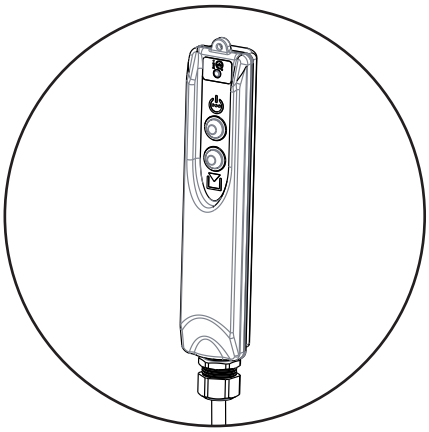
ENERPAC

Instruction Sheet

XC-Series
Cordless Dump and Hold Pump

L4376 **Rev. C** **10/19** **EN**

To protect your warranty, use only ENERPAC hydraulic oil.



Model XC-1302S

• For use with single-acting hydraulic cylinders and tools.

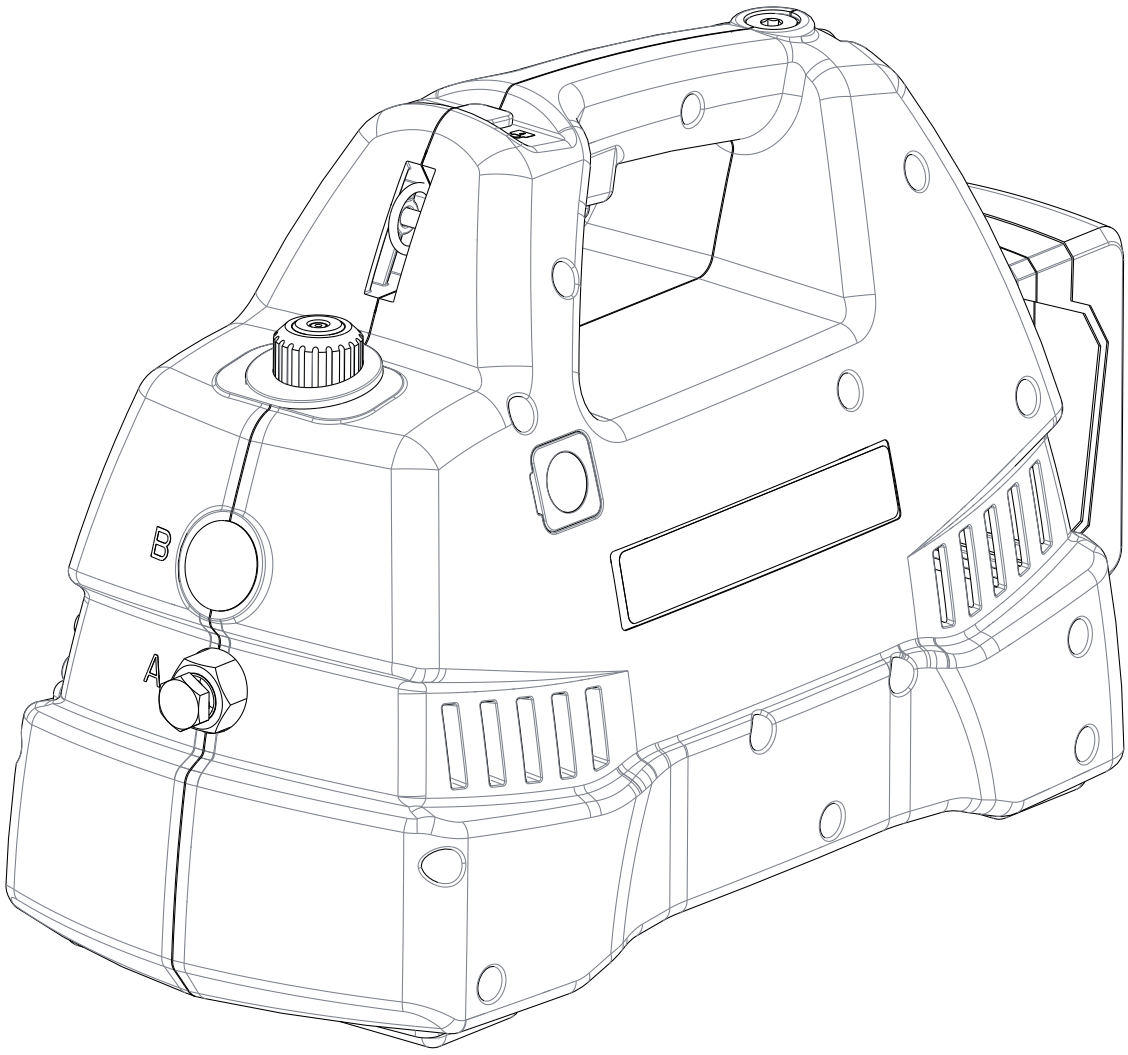


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1.0 SAFETY

1.1 Important Safety Instructions

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.

SAVE THIS INSTRUCTION SHEET FOR FUTURE USE

Appropriate training in the safe use of high pressure, high force hydraulic tools is required prior to the operation of the pump. If training is needed, contact your local Enerpac distributor or authorized service center for information about an Enerpac hydraulic safety training 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.

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

⚠ 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 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

⚠ 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 remove or disable the pressure relief valve.
- Never set the pressure relief valve to a higher pressure than the maximum rated pressure of the pump.
- Stay clear of cylinders and tools while they are being pressurized or in operation. To avoid personal injury, keep hands and feet away from pinch point areas.
- Do not handle pressurized hydraulic hoses. Escaping oil under pressure can penetrate the skin. If oil is injected under the skin, see a doctor immediately.
- Do not pressurize disconnected couplers.
- 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 or tool as a shim or spacer in any 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.
- 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 equipment (P.P.E.) 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.
- Immediately replace worn or damaged parts with genuine ENERPAC parts. Standard grade parts will break causing personal injury and property damage.

⚠ 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 hoses. 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 hydraulic hoses. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.
- 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.

- 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.

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

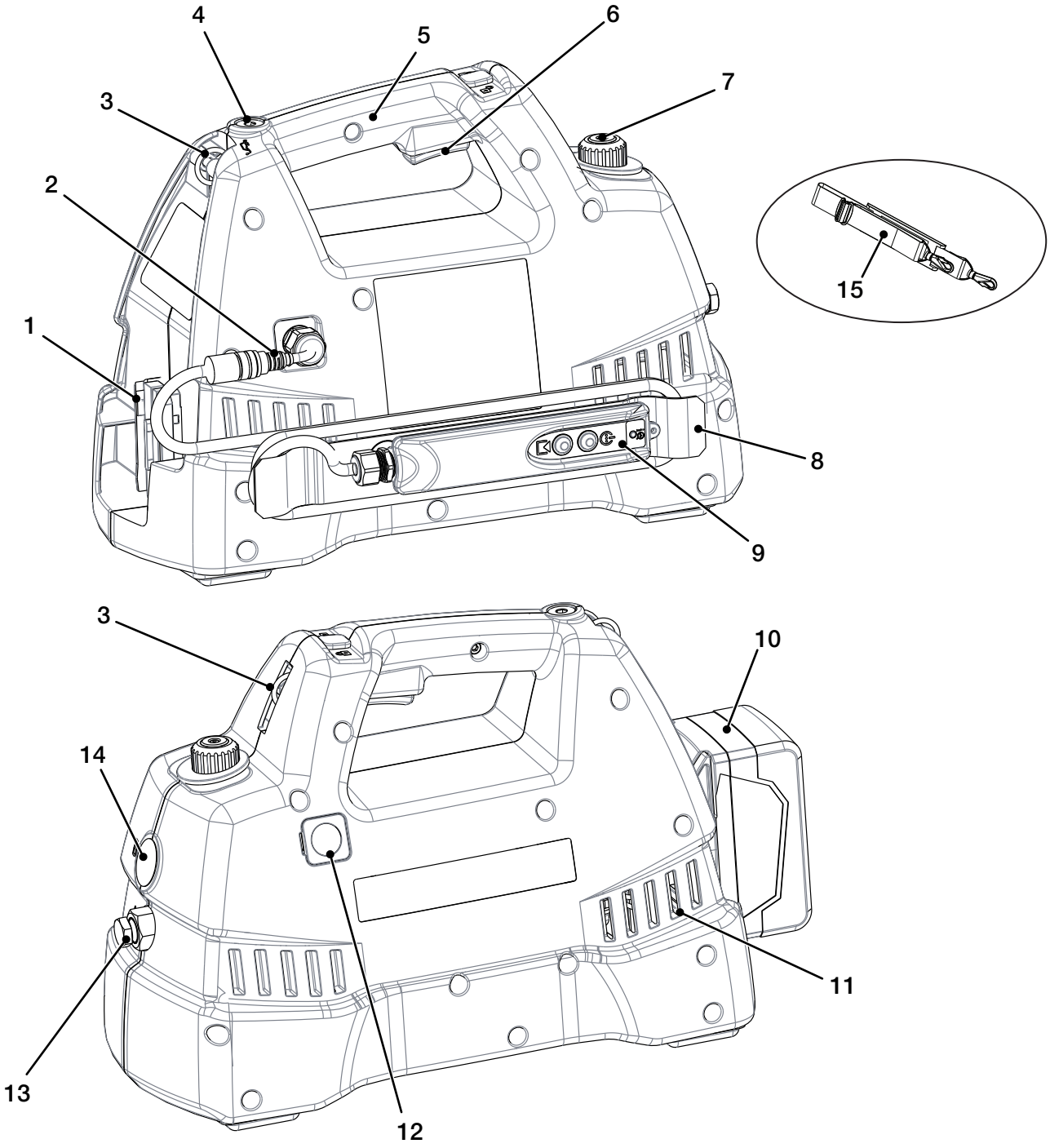
1.3 Battery Operated Pump Safety Precautions

⚠ 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 during use, do not exceed the pump's rated duty cycle of 25%.
- Avoid pressing the pendant buttons when repositioning or transporting the pump.
- Do not use the pump if the pendant controls do not turn the pump on and off. If this malfunction occurs, have the pump inspected and repaired before placing it back into use.
- Remove the battery 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.
- Recharge battery only with the charger specified by the battery manufacturer. A charger that is suitable for one type of battery may create a risk of fire when used with another battery.
- Use the XC-Series cordless dump and hold pump only with *MILWAUKEE* M28™ Li-Ion batteries. Use of any other batteries may create a risk of injury and fire.
- When battery 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. 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 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 manual before using the battery or charger.
- The battery and battery charger do not have any serviceable parts. Do not attempt to disassemble or repair these items.

2.0 MAJOR FEATURES AND COMPONENTS



Key:

1. Battery Dock
2. Pendant Pigtail Connector
3. Shoulder Strap Ring
4. Oil Fill Port
5. Carrying Handle
6. Trigger Cover (**Note:** Trigger is not functional on this pump version.)
7. Manual Pressure Release Button
8. Cable Management Bracket (optional accessory)
9. Pendant
10. Battery
11. Cooling Vent
12. Relief Valve Access Cover
13. Hydraulic “A” Port (pump outlet)
14. Cover Plate
15. Shoulder Strap

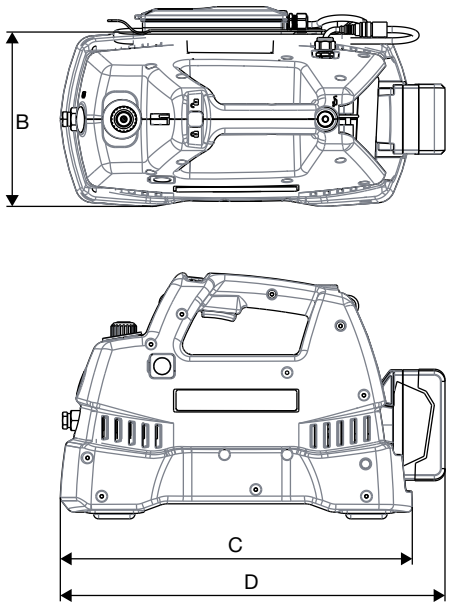
Figure 1, Major Features and Components, XC-Series Cordless Dump and Hold Pump

3.0 PRODUCT DATA

3.1 External Dimensions

Item	Dimension	
	inch	mm
A	11.6	295
B	8.2	208
C	16.6	422
D	18.2	462

Model XC-1302S



3.2 Specifications

Pump Model	Control Valve	For Use With:	Hydraulic Connection	Operating Temp Range		Motor Rating		Sound Level
				˚F	˚C	hp	kW	dBA
XC-1302S	3-way, 2-position Advance/Hold/Retract (solenoid-operated dump)	Single-acting hydraulic cylinders and tools.	3/8" NPTF	+14 to +122	-10 to +50	1/2	0.37	81

Pump Model	Maximum Hyd. Pressure		Flow Rate (See Section 3.4)						Hydraulic Oil Type	Usable Oil Capacity*		Pump Weight**	
	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		in^3	l	lb	kg
XC-1302S	10,000 [+300 / -50]	700 [+20.7 / -3.4]	125	2.05	30	0.49	15	0.25	Enerpac HF	120	2.0	25	11.3

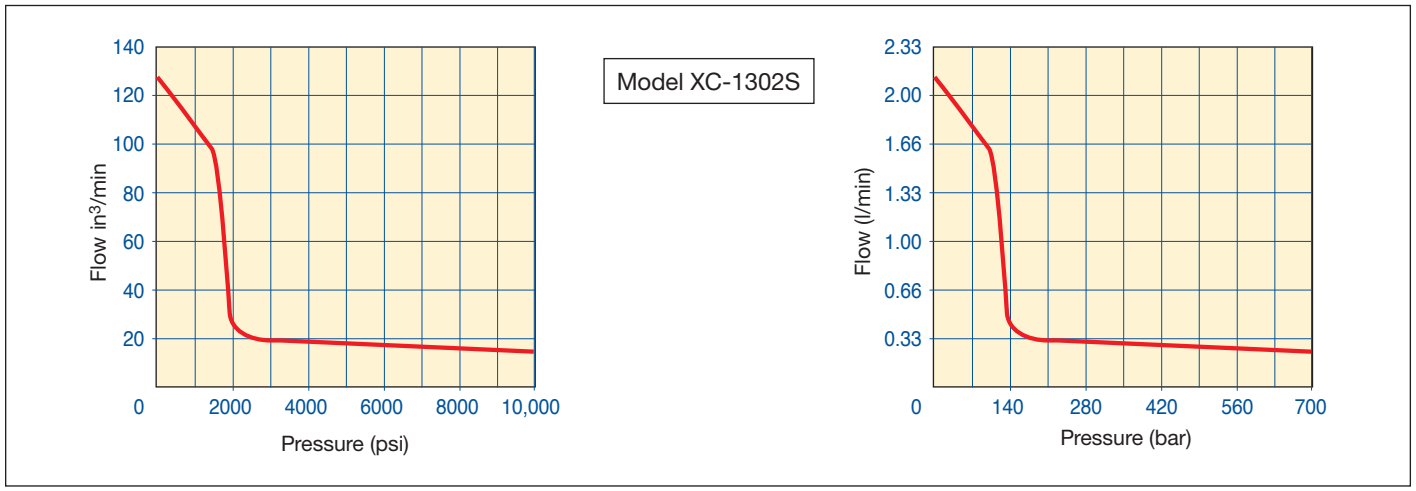
* Reservoir size is approximate. Actual usable oil capacity will be slightly less. The pump contains a rubber bladder type reservoir.
** Approximate weight of pump with oil in reservoir, and with battery installed. Weight of battery is approximately 2.4 lb [1.0 kg].

3.3 Battery and Charger information

Item Number	Item	Model Numbers*	
		Enerpac	Milwaukee Electric Tool
1	Battery Charger, M28™ 115 VAC, 50/60 Hz input (USA style power plug)	XC115VC	48-59-2819
2	Battery Charger, M28™, 230 VAC, 50/60 Hz input (European style power plug)	XC230VC	C28C
3	Battery, M28™ Lithium-Ion, 28 V, 3.0 Ah	XC28V	48-11-2830

* Compatible batteries and battery chargers can be purchased from an Enerpac distributor or from a Milwaukee Electric Tool retailer.

3.4 Pressure and Flow Graphs



Note: Product data is subject to change without notice. Graphs in Section 3.4 show typical pump pressure/flow curves.

4.0 PRODUCT DESCRIPTION

4.1 Introduction

The Enerpac XC-Series cordless dump and hold pump offers the performance of a powered pump with the portability and convenience of a hand operated pump. It is an ideal solution for powering hydraulic cylinders and tools in remote areas where electrical or air power is not available or where the presence of electrical cords or air lines would result in trip hazards.

The pump consists of a 1/2 hp [0.37 kW] DC motor, two-stage hydraulic pump element and a solenoid operated control valve. An interactive pendant control allows the user to operate the pump a safe distance from the work area.

Ample oil capacity is provided by the pump's two liter [120 in^3] oil reservoir. The bladder type oil reservoir allows pump operation in any position and helps prevent contamination.

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

Power is supplied by a rechargeable 28 volt, 3 Ah lithium-Ion battery manufactured by Milwaukee Electric Tool Corporation. This is the same M28™ series battery used with many 28 volt Milwaukee Electric Tool products.

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

4.2 Intended Use

The XC-Series cordless dump and hold pump is intended for use with single-acting hydraulic cylinders and tools in applications where a hydraulic hold function is required. The hold function is designed to keep the load stationary after lifting or pressing operations have been completed.

The hold function can be used while mechanical load holding devices are being placed under the load. However, the pump contains no safety locking valve and should not be used to hydraulically support a load while persons are working below. Refer to Section 8.5 of this manual for additional load support information and precautions.

⚠ WARNING Never allow any personnel to be under an object that is being supported only by the pump hydraulics. Death or serious personal injury could result if hydraulic pressure is relieved or if leakage occurs and load drops on persons below.

4.3 Additional Information - Battery 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.

4.4 Conformance to National & International Standards

Enerpac declares that the XC-Series cordless dump and hold 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 with the pump.

4.5 Electromagnetic Compatibility (EMC)

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

5.0 BATTERY

The pump is powered by a rechargeable lithium-ion battery. The pump battery dock is located at the rear of the pump housing.

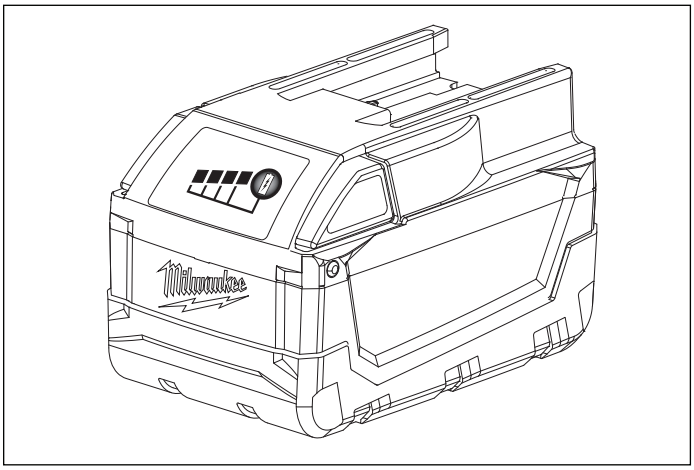


Figure 2, Battery

5.1 Battery Installation

1. Slide the battery down onto the battery dock at the rear of the pump. See Figure 3.
2. Check that battery locks securely into place.

NOTICE To prevent a button fault from occurring (see Table 2 in Section 14.0) DO NOT press the pendant buttons while the battery is being installed.

5.2 Battery Removal

1. Press the release buttons located on each side of the battery.
2. Slide the battery upward and remove it from the pump battery dock.

NOTICE To ensure compatibility and proper operation, use only *MILWAUKEE* M28™ lithium-Ion batteries with the pump.

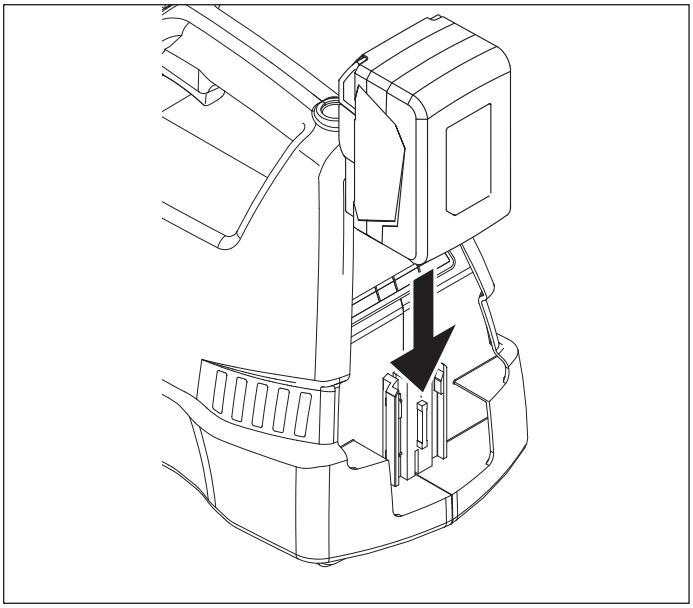


Figure 3, Battery Installation

5.3 Battery Charge Indicator

NOTICE New batteries must be charged before use. Refer to the Milwaukee Electric Tool battery and charger manual for additional information.

Each battery contains a charge indicator consisting of four indicator lights. The indicator lights show the approximate run time remaining before the battery becomes completely discharged. Press the charge indicator button to display the lights. The lights will stay lit for two seconds. Refer to the chart in Figure 4 to determine the level of charge.

	WHEN CHARGE INDICATOR BUTTON IS PRESSED:	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 BLINKS 4 TIMES	< 10%
	LIGHT 1 BLINKS 8 TIMES	0%

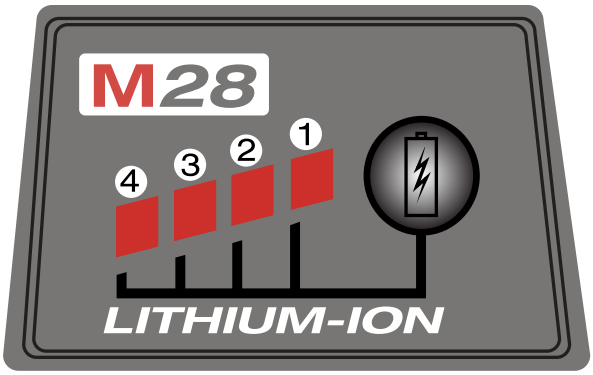


Figure 4, Battery Charge Indicator

NOTICE

- Run time between battery charges is dependent on the application, pump run time, pressure setting and other factors.
- If none of the lights illuminate when the charge indicator button is pressed, place the battery on the charger and charge as needed.
- Use only a genuine Milwaukee Electric Tool charger to charge the battery.
- Compatible batteries and chargers (sold separately) are available from Enerpac authorized distributors or from Milwaukee Electric Tool retailers.

5.4 Battery Current Draw Protection

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

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

To prevent battery shut-off from occurring, reduce the amount of load on the cylinder or tool being used (if possible) or stop the pump motor. Stopping the pump motor will reset the battery.

5.5 Battery High Temperature Protection

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

If the charge indicator lights blink in an alternating manner when the charge indicator button is pressed, allow time for the battery to cool.

The battery is ready for use again if the charge indicator lights display the remaining run time when the charge indicator button is pressed.

5.6 Battery Cold Weather Operation

The *MILWAUKEE* M28™ battery is designed to operate in temperatures below freezing. However, if the battery is very cold, it may need to warm-up before normal use. To warm-up the battery, 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 and charger) for complete battery use and care information and charging instructions.

6.0 PREPARATION FOR USE

6.1 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.

Note that some residual hydraulic oil may be present within the packaging from product final assembly and testing procedures. A small amount of oil inside the shipment should be considered as normal and not as a cause for concern.

6.2 Connecting the Pendant

1. If installed, remove the battery from the pump to prevent accidental pump startup during the following steps. Refer to Section 5.2.
2. Connect the pendant cable to the pigtail connector on the pump shroud. See Figure 5.
3. Using the threaded ring, secure the pendant cable to the pigtail connector.

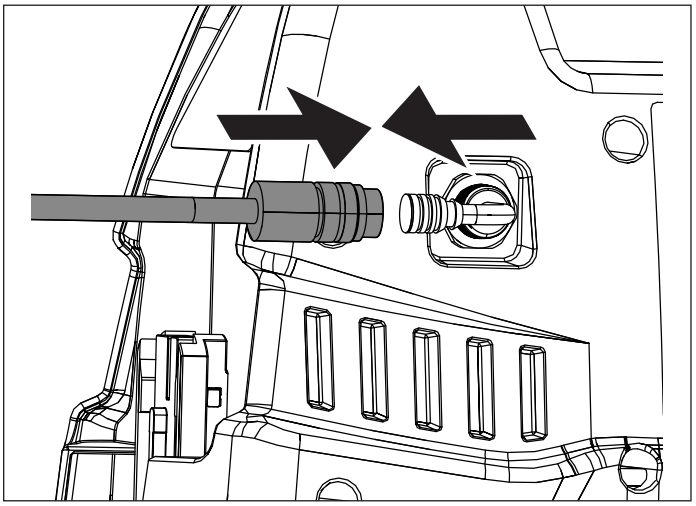


Figure 5, Pendant Connection

6.3 Hydraulic Connections

⚠ WARNING

All hydraulic hoses and fittings used with the pump must be rated for 10,000 psi [700] bar working pressure. Failure to observe and comply could result in death or serious personal injury. Property damage could also occur.

As hydraulic hoses, fittings and components are assembled, apply 1-½ wraps of PTFE thread sealing tape to all threaded NPT or NPTF fittings, leaving the first complete thread free of tape as shown in Figure 6. Use care to prevent pieces of tape from entering the hydraulic system.

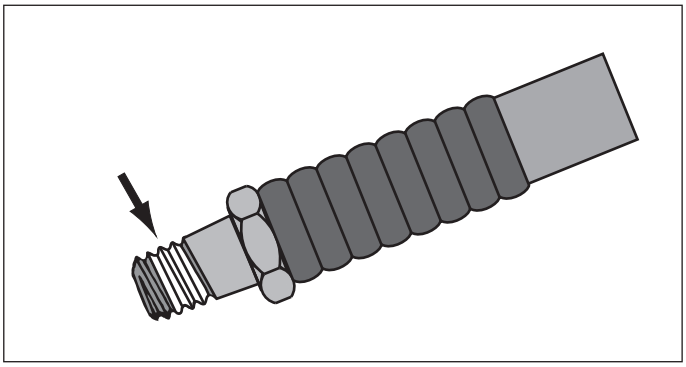


Figure 6, Hydraulic Sealing Tape Application

All hoses, fittings and components used with the pump must be rated for at least 10,000 psi [700 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.

Hydraulic hose port “A” is a ⅜" -18 NPTF female connection. Port “B” is not used on this pump version and is covered by a cap.

Make hydraulic connections as described in the following steps:

1. As a precaution, relieve any residual hydraulic pressure that may be trapped inside the pump hydraulic circuit. Refer to Section 9.0 of this manual for additional instructions.
2. After making sure that all pressure is relieved, remove the battery from the pump to prevent accidental pump startup during the following steps.

⚠ WARNING A small amount of oil leakage or spray may occur when plug is loosened in the following step. To prevent eye injury, keep face away from this area when plug is loosened.

3. Remove the shipping plug from the pump “A” port 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 7.

⚠ 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.

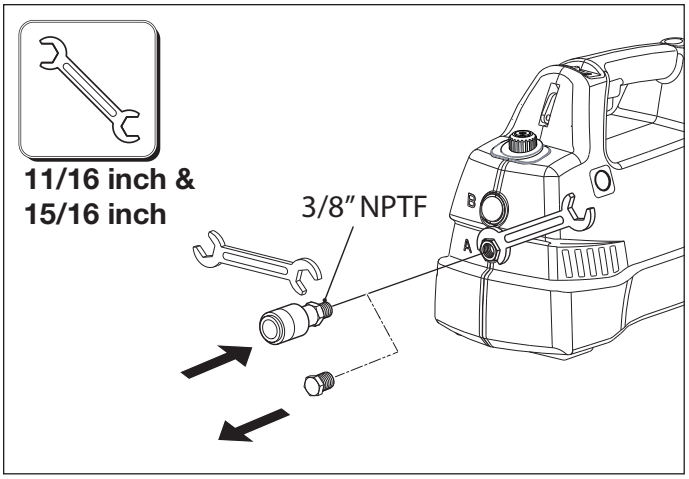


Figure 7, Shipping Plug Removal & Hydraulic Coupler Installation (typical)

4. Install hydraulic coupler or hose fitting at pump "A" port so it is finger tight. Then, tighten the coupler or fitting two additional full turns. Coupler or fitting (user-supplied) must have 3/8" NPTF threads.
5. Connect the hose from the pump "A" port to the cylinder or tool.

NOTICE Hydraulic fittings, couplers and hoses are user-supplied and not included with the pump. Installation of a pressure gauge (user-supplied) is strongly recommended.

7.0 FEATURES AND CONTROLS

7.1 Carrying Handle

Always use the carrying handle when transporting the pump to its desired location or when it is necessary to reposition the pump while it is in use.

NOTICE To prevent possible damage, never attempt to carry or reposition the pump by dragging it by the hydraulic hose or pendant cable.

7.2 Shoulder Strap

A shoulder strap is included with the pump shipment. Attach the ends of the shoulder strap to the shoulder strap rings on the pump housing.

7.3 Pendant Cable Management Bracket (optional)

A pendant cable management bracket is available as an optional accessory. This bracket is shown in Figure 1 and in various other figures in this manual.

7.4 Pendant

A remote control pendant with a 10 foot [3 m] cable is standard equipment on all models. The back of the pendant housing contains a strong rare earth magnet, allowing the pendant to be positioned against most iron and ferrous metal surfaces.

Pump operation is controlled using the two buttons on the pendant. In addition, the pendant also contains a multi-color LED indicator which communicates the pump status via a series of steady or blinking lights.

NOTICE The trigger switch built into the pump carrying handle is NOT FUNCTIONAL for this XC-Series pump version. All pump and valve functions are controlled by the pendant buttons.

7.4.1 Pendant LED Indicator (Fig. 9, Item 1)

- Steady green: READY
- Blinking green: MOTOR ON
- Steady yellow: DUMP VALVE ENERGIZED
- Blinking red and/or yellow: FAULT CODE ACTIVATED

The pendant LED indicator will glow steady green approximately 3 seconds after battery is installed, indicating that the electronic controls have powered-up and that the pump is ready for use.

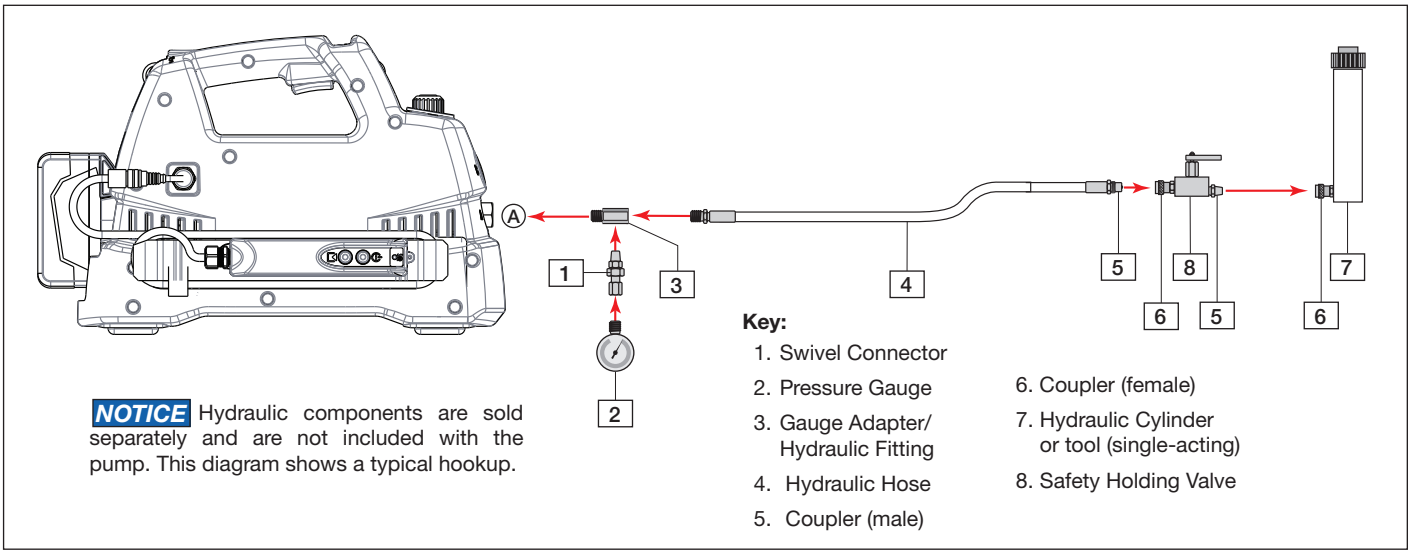
NOTICE A fault code indicates an abnormal condition that will result in immediate pump motor shutdown. Refer to Table 2 in Section 14.0 for a description of the pump's user level fault codes.

7.4.2 Pendant Jog Button (Fig. 9, Item 2)

- Press the jog button and hold it down to start the motor and advance the cylinder or tool.
- Release the jog button to stop the motor and hold the load.

7.4.3 Pendant Dump Button (Fig. 9, Item 3)

- Press and *hold* the dump button to retract the cylinder or tool and relieve hydraulic pressure.
- Release the dump button to stop retracting the cylinder or tool before it is fully retracted.
- Pump motor will *not* start when the dump button is pressed. However, a charged battery *must* be installed to operate the dump/retract function.



NOTICE Hydraulic components are sold separately and are not included with the pump. This diagram shows a typical hookup.

Key:

1. Swivel Connector
2. Pressure Gauge
3. Gauge Adapter/ Hydraulic Fitting
4. Hydraulic Hose
5. Coupler (male)
6. Coupler (female)
7. Hydraulic Cylinder or tool (single-acting)
8. Safety Holding Valve

Figure 8, Hydraulic Connections (typical)

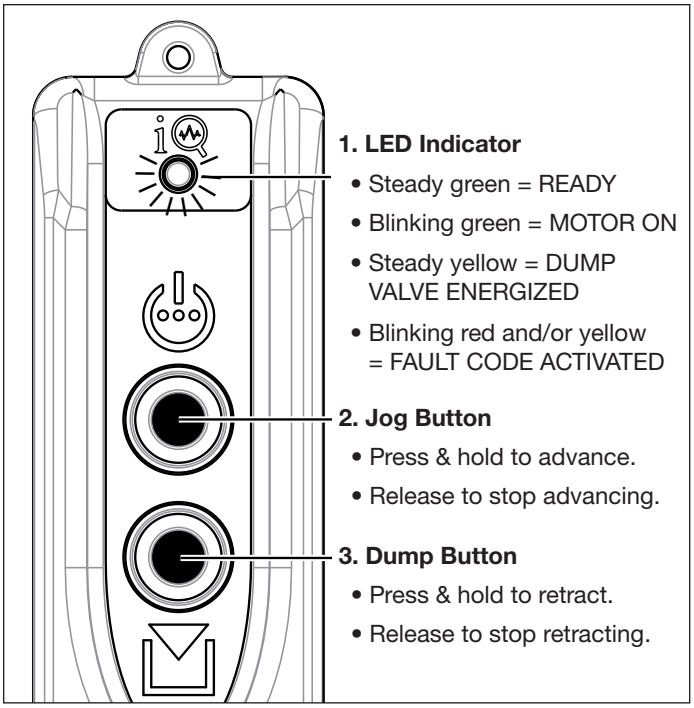


Figure 9, Pendant Features and Controls

NOTICE Pressing both pendant buttons at the same time will stop the pump motor immediately and the pump will automatically return to the *ready* mode (as if no buttons are being pushed).

7.4.4 Pendant Haptic Pulse Feature

- To provide positive confirmation of pump status, the pendant will vibrate haptic pulses as the pendant buttons are depressed and released.
- One haptic pulse will occur when the motor is started or when the dump valve is cycled.
- Two haptic pulses will occur when the motor is stopped.
- The pendant will vibrate haptic pulses In conjunction with the flashing LED indicator to signal when a fault has been triggered. Refer to Section 14.0 for user level fault codes and additional information.

7.4.5 Sleep Mode

To conserve battery life, the pump will automatically enter sleep mode after a period of 5 minutes of inactivity. The green pendant LED indicator will turn off during sleep mode. To exit sleep mode and return to the *ready* mode, press either of the two pendant buttons.

8.0 OPERATION

8.1 Before Start-up

1. Check reservoir oil level and add oil if necessary. Refer to Sections 12.1 through 12.3.
2. Attach pump shoulder strap.
3. Connect pendant cable. Refer to Section 6.2.
4. Connect hydraulic hose to pump as described in Section 6.3.
5. Charge and install battery. Refer to Section 5.1.
6. Remove air from system before placing pump into operation. Refer to instructions in Section 8.2.
7. Check all hydraulic hoses, couplers and fittings. Be sure they are tight and leak free.

8.2 Air Removal

When hydraulic components are connected for the first time, air may be trapped in the system. To ensure smooth, safe operation, run the cylinder or tool through several complete advance-retract cycles before placing the pump into service. Do this with no load on the cylinder or tool and with the pump positioned *higher* than the cylinder or tool.

When the cylinder or tool advances and retracts smoothly and without hesitation, the air has been vented from the system.

8.3 Operating Precautions

⚠ WARNING

Failure to observe the following precautions and instructions may result in death or serious personal injury.

- Keep persons away from the work area during pump operation.
- Continuously monitor the cylinder or tool being operated. Be prepared to stop the pump immediately if a problem or potentially dangerous situation occurs.
- Because the time for the motor to stop can vary depending on load conditions, the cylinder or tool may not stop advancing immediately when the user releases the pendant jog button. There may be a small continued movement of the cylinder or tool while the motor is stopping.
- Avoid continuing to pressurize the cylinder or tool after it has reached its maximum stroke.

8.4 Operating Instructions

- Press and hold the pendant jog button to start the pump motor and begin advancing the cylinder or tool.
- When the cylinder or tool has advanced the desired amount, release the pendant jog button. The cylinder or tool will stop advancing immediately and the hydraulic hold feature will keep the cylinder or tool stationary. The pump motor will stop.
- To retract the cylinder or tool, press and *hold* the pendant dump button. The cylinder or tool will begin retracting immediately and will continue retracting for as long as the button is held down, or until the cylinder or tool is fully retracted.
- To stop the cylinder or tool before it has fully retracted, release the pendant dump button.

NOTICE

Refer to Section 7.4 of this manual for detailed descriptions of the pendant controls and functions.

- Additional flow control devices (optional accessories - refer to Enerpac catalog) may be required to more precisely control the rate of retraction.
- Single-acting cylinders or tools not equipped with a return spring may need to be manually retracted after all hydraulic pressure is relieved.
- Pull type hydraulic cylinders and tools will retract when pendant jog button is pressed and advance when pendant dump button is pressed (opposite of typical operation).

8.5 Supporting the Load

⚠ WARNING

Failure to observe the following precautions and instructions could allow the load to drop and/or become unsupported. Death or serious personal injury could result if the load falls on or crushes persons in the work area.

- After completing a lifting procedure, always immediately support the load with cribbing, metal support stands, jack stands, hoist or other appropriately rated mechanical load support devices. Do not rely on the pump hydraulics to hold lifted loads in place.
- The pump control valve does NOT contain a safety locking valve. Never allow persons to be underneath a lifted load that is supported only by the pump hydraulics.
- Additional flow control devices (optional accessories) may be required to safely hold the cylinder(s) in a stationary position as mechanical load support devices are being installed or removed. Refer to the Enerpac catalog for additional information.
- Although in most applications the pump hydraulics will temporarily hold the load, be aware that a load supported only by hydraulics can move downward or drop suddenly at any time without warning, due to equipment failure or accidental activation of controls.
- When pushing or separating objects, always secure the load with appropriately rated mechanical blocking equipment before allowing persons to reach or work inside the danger zone between the objects. Never rely on hydraulics to hold apart pushed or separated objects while persons are inside the danger zone.

9.0 RELIEVING HYDRAULIC PRESSURE

Relieve hydraulic pressure by pressing and *holding* the pendant dump button until the cylinder or tool is fully retracted and zero (0) psi/bar is indicated on the hydraulic pressure gauge (user-supplied).

Always verify that all hydraulic pressure has been completely relieved before disconnecting hydraulic hoses, loosening hydraulic fittings or performing maintenance procedures. All pressure gauges in the circuit (user-supplied) must indicate zero (0) psi/bar. Hydraulic hose(s) must not be stiff. There must be no other indications of pressure in the system.

A charged battery *must* be installed on the pump to relieve pressure using the pendant dump button.

In the event that the battery has become discharged or a pump malfunction occurs, hydraulic pressure can be relieved manually by using the manual pressure release feature. Refer to Section 10.0 for additional information.

NOTICE If the pump does not relieve hydraulic pressure when the dump button is pressed and held (with fully charged battery installed), discontinue use and take the pump to an Enerpac Authorized Service Center for diagnosis and repair.

10.0 MANUAL PRESSURE RELEASE

The manual pressure release button is located at the front of the pump, above the hydraulic hose connection. This feature allows hydraulic pressure to be relieved manually in the event of complete battery discharge, solenoid coil failure or other similar problem.

⚠ WARNING Cylinder or tool will retract immediately when manual pressure release button is pressed. Be sure no persons are working under the load before pressing the manual pressure release button.

To manually relieve hydraulic pressure, insert a small screwdriver or Allen head wrench into the recessed center area of the manual pressure release housing. Push firmly on the manual pressure release button until spring tension is felt and pressure is relieved. Approximately 11/32" [9 mm] of travel will be required. To prevent damage use only hand force.

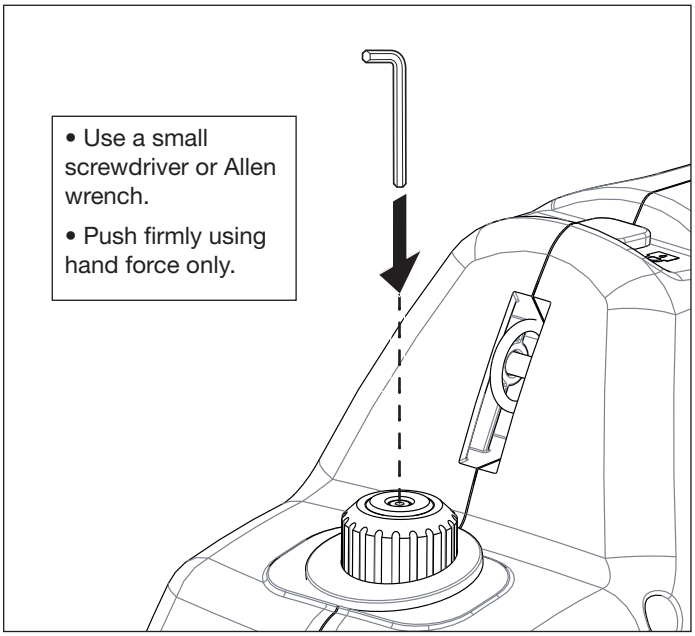


Figure 10, Manual Pressure Release

The button may remain slightly depressed after use and might not return to the fully outward position until the valve is electrically operated. This is normal.

The manual pressure release feature is intended for emergency use only. If the control valve will not operate electrically via the pendant controls, take the pump to an Enerpac authorized service center for diagnosis and repair.

11.0 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 the setting and perform adjustment (if needed) as described in the following steps. See Figure 11.

1. Be sure hydraulic cylinder or tool is fully retracted.
2. Push and hold the pendant dump button to relieve hydraulic pressure. Refer to Section 7.4.3 for additional information.
3. Remove the battery from the pump.
4. Disconnect hydraulic hose from the pump “A” port.
5. Connect a 0-15,000 psi [0-1000 bar] pressure gauge to the pump “A” port.
6. Reinstall the battery on the pump.
7. Press and hold the pendant jog button to start the pump and build pressure.
8. 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.

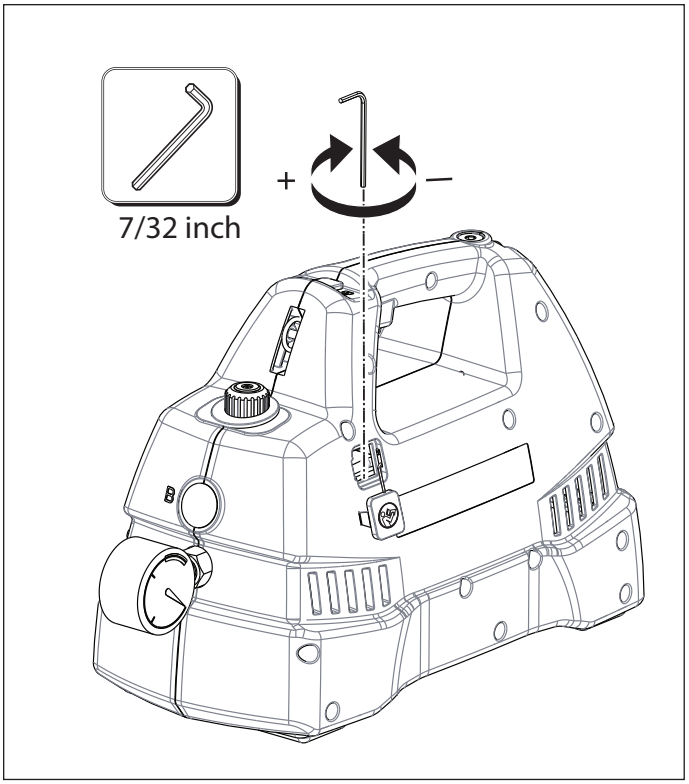


Figure 11, Relief Valve Pressure Adjustment

- If the pressure setting shown on the gauge is correct for your application, and the cylinder or tool being used, skip step 9 and go to step 10.
- If the pressure setting shown on the gauge is not correct, readjust the setting as described in step 9.

⚠ 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.

9. If needed, adjust the relief valve pressure setting as described in the following steps:

   a. Using a flat blade screwdriver, remove the relief valve 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. Press and hold the pendant dump button 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 DO NOT fully unscrew the pressure adjustment screw. Top of screw head must remain flush with or below the surrounding metal valve housing. Use a small flashlight to view this area through the relief valve access hole.

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. Press and hold the pendant jog button to start the pump and build pressure.

   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 pendant jog button to stop the motor.

   h. Push and hold the pendant jog button again and re-check the pressure gauge to verify that the setting remains correct.

NOTICE If pressure is too high or too low, stop the pump and repeat steps 9c through 9h. Note that it will first be necessary to relieve any residual pump pressure as described in step 9c before performing step 9d.

10. After verifying that the desired pressure setting has been achieved, remove the Allen wrench and reinstall the access cover.
11. Press and hold the pendant dump button to relieve pressure. Verify that the pressure gauge indicates 0 psi/bar. Refer to Section 7.4.3 for additional information.
12. Remove the battery from the pump.
13. Disconnect pressure gauge from the pump “A” port.
14. Reconnect hydraulic hose to the pump “A” port.
15. Reinstall the battery on the pump.

12.0 MAINTENANCE

12.1 Checking Oil Level

1. Be sure that hydraulic cylinder or tool is fully retracted and that pump is off.
2. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 9.0.
3. Remove the battery from the pump. Refer to Section 5.2.
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 oil fill plug. See Figure 12.

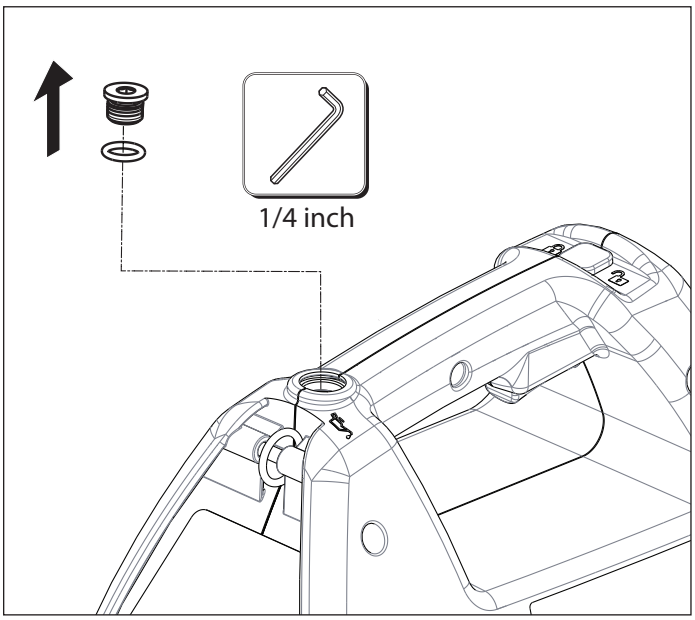


Figure 12, Oil Fill Plug Removal

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), then proceed to Step 7.
- If oil level is low, then add oil as described in Section 12.3. Refer to Section 12.2 for oil requirements.

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

12.2 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.

12.3 Adding Oil

⚠ CAUTION Be certain that the hydraulic cylinder is fully retracted before adding any oil to the reservoir. If an oil-filled hydraulic cylinder 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 12.2.
- 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 from the pump before adding oil. This will prevent accidental pump start-up and will also prevent any spilled oil from contacting the battery during filling.
- Pour oil slowly to avoid spillage. If oil begins to flow from the concentric vents 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.

Add oil as described in the following steps:

1. Be sure hydraulic cylinder is fully retracted and that pump is off.
2. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 9.0.
3. Remove the battery from the pump. Refer to Section 5.2.
4. Remove the oil fill plug and O-ring from the fill opening. Use a 1/4" Allen wrench. Be sure that the O-ring is removed with the plug. Replace O-ring if worn or missing.
5. Place a funnel (maximum 1/2" [12 mm] stem diameter) through the fill opening and into the oil fill tube. Be sure the area around the fill opening is not obstructed by dirt or sludge. Venting will occur in this area as oil is added in step 6.
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].

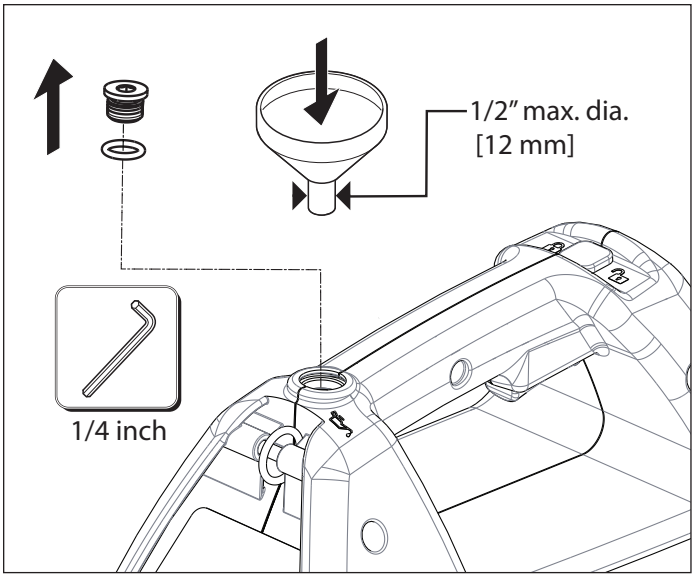


Figure 13, Adding Oil

12.4 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, perform the following procedure:

1. Be sure hydraulic cylinder or tool is fully retracted and that pump is off.
2. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 9.0.
3. Disconnect hydraulic hose from pump "A" port.
4. Attach an open-ended hose to the pump "A" port. Place the open end of the hose in a suitable pan or container. See Figure 14.

NOTICE Usable oil capacity of the pump reservoir is 120 in^3 [2 l]. Be sure the pan or container is large enough to hold all the drained oil.

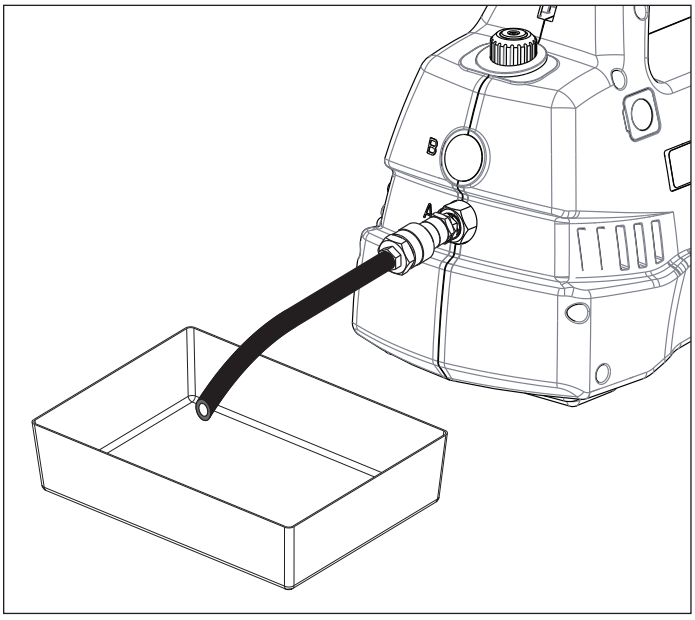


Figure 14, Oil Draining (typical)

5. 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.
6. Push and hold the pump jog button to start the pump motor. Continue running the motor until oil stops flowing from the open-ended hose. Then, release the jog button to stop the motor.
7. Remove the battery from the pump. Refer to Section 5.2.
8. 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.
9. Slowly fill the reservoir with new Enerpac oil. Refer to Section 12.2 for hydraulic oil requirements and Section 12.3 for detailed oil fill instructions. Usable oil capacity will be slightly less than the rated reservoir size for your pump model.
10. After adding oil, reconnect the hydraulic hose from the cylinder to the pump “A” port. Then, reinstall the battery. Refer to Sections 6.3 and 5.1.
11. Remove trapped air from the system. Refer to Section 8.2 for additional information.
12. Check oil level again after cycling the hydraulic cylinder. With the cylinder fully retracted, verify that oil level has not dropped. Add additional oil if level is low. Refer to Sections 12.1 through 12.3.

12.5 Priming the Pump

If the cylinder or tool does not advance or advances erratically even after the air removal process is performed (see Section 8.2), the pump may require priming. Refer to the procedure in the following steps:

1. Be sure hydraulic cylinder or tool is fully retracted.
2. Press and hold the pendant dump button to relieve any hydraulic pressure. Refer to Section 9.0 for additional information.
3. Remove the battery from the pump.
4. Disconnect the hydraulic hose from the pump “A” port.
5. Connect a 0-15,000 psi [0-1000 bar] pressure gauge to the pump “A” port.
6. Reinstall the battery on the pump.

NOTICE It is recommended that two persons perform the procedures in steps 7 through 10.

7. Press and hold the manual pressure release button. Refer to Section 10.0 for location and additional instructions.
8. As the manual pressure release button remains depressed, press and hold the pendant jog button to start the pump.
9. With the motor running and while continuing to press and hold the manual pressure release button, gently rock the pump from side-to-side several times to complete the priming process.

NOTICE Verify that the pressure gauge indicates zero (0) psi/bar. Pressure should *not* build during the priming process.

10. Stop the pump.
11. Be sure that the pressure gauge indicates zero (0) psi/bar. If any residual pressure is shown, press and hold the pendant dump button to relieve it.
12. Disconnect the pressure gauge and reconnect the hydraulic hose.
13. Operate the pump with no load and verify that the cylinder or tool advances smoothly.

13.0 TROUBLESHOOTING

The information in the Troubleshooting Guide (Table 1) is intended as an aid to help diagnose and correct various possible problems that may occur. Refer to Table 2.

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 from pump before performing any maintenance or repair procedures.

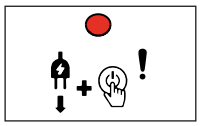
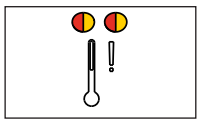
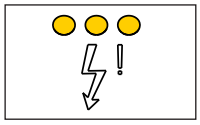
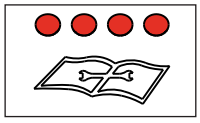
Table 1 - Troubleshooting Guide		
Symptom	**Possible Cause**	**Action**
1. Pump will not start.	a. Battery not installed.	Install battery.
	b. Electrical contacts dirty or corroded.	Clean contacts on the battery, pump and charger.
	c. Battery discharged.	Charge battery.
	d. Battery shut-off.	Refer to Milwaukee Electric Tool battery/charger instruction manual.
	e. Motor damaged.	Contact Enerpac Authorized Service Center.
2. Pump clicks when pendant jog button is pushed, but does not start.	a. Electrical contacts dirty or corroded.	Clean contacts on the battery, pump and charger.
	b. Battery discharged.	Charge battery.
	c. Battery 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 damaged or not functioning.	Replace battery.
	e. Pump jammed due to obstruction or possible internal damage to pump.	Contact Enerpac Authorized Service Center.
3. Pump slows down and stops.	Battery discharged.	Charge battery.
4. Low fluid output.	a. Pump needs priming.	Prime the pump. Refer to Section 12.5 for procedure.
	b. Bypass valve malfunction.	Contact Enerpac Authorized Service Center.
	c. Oil intake screen clogged with debris.	Contact Enerpac Authorized Service Center.
	d. Internal damage to pump.	Contact Enerpac Authorized Service Center.
5. Cylinder will not advance or retract.	a. Low oil level.	Add oil until reservoir is completely full.
	b. Loose hydraulic couplers.	Check couplers and tighten if needed.
	c. Pump needs priming.	Prime the pump. Refer to Section 12.5 for procedure.
	d. Oil intake screen clogged with debris.	Contact Enerpac Authorized Service Center.
	e. Internal damage to pump.	Contact Enerpac Authorized Service Center.
6. Cylinder advances and retracts erratically.	a. Air in the system.	Advance and retract the cylinder until operation is smooth. Refer to Section 8.2.
	b. External hydraulic leak.	Tighten connections. Replace damaged components.
	c. Valve Internal leakage and/or damage.	Contact Enerpac Authorized Service Center.
	d. 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 pendant jog button to prevent battery from shutting off. Allow time for battery to cool before restarting pump. **NOTICE** If battery shuts off, place battery on charger to reset.
8. Pump does not build pressure.	Relief valve pressure is set too low.	Adjust relief valve pressure. Refer to Section 11.0.
9. Noisy pump operation.	a. Pump element piston sticking.	Contact Enerpac Authorized Service Center.
	b. Motor or gear damaged.	Contact Enerpac Authorized Service Center.

14.0 PUMP FAULT CODES (user level)

Pump fault codes are displayed by the pendant LED indicator.

- Refer to Table 2 for pump fault code information.
- See Figure 9 for pendant LED indicator location.

Table 2 - Pump Fault Codes (user level)

Fault	Pendant LED Indicator	Cause	Action
BUTTON FAULT 	1 red blink followed by a 1 second pause. Sequence repeats until problem is corrected.	Pendant buttons pressed while battery is being installed.	• Remove battery. • Ensure that pendant buttons are not being pressed. • Reinstall battery and try to start pump again. • If problem persists, contact Enerpac Authorized Service Center.
		Damage to pendant and/or cable wiring.	Check pendant and pendant cable for obvious signs of damage or wear. Contact Enerpac Authorized Service Center if repairs are needed.
TEMPERATURE FAULT 	2 fast red/yellow blinks followed by a 1 second pause. Sequence repeats until pump cools to an acceptable temperature.	Motor, electrical or internal ambient temperature too high.	Allow time for pump temperature to decrease (as required).
LOW BATTERY FAULT 	3 yellow blinks followed by a 1 second pause. Sequence repeats until battery is fully discharged.	Low battery voltage. Battery almost fully discharged.	Replace with fully charged battery.
SERVICE REQUIRED FAULT 	4 red blinks followed by a 1 second pause. Sequence repeats until problem is corrected.	Mechanical or electrical failure.	Additional diagnostic procedures required to determine problem. Contact Enerpac Authorized Service Center.

Notes:

- The pendant LED indicator will continue to repeat the fault code until the problem is corrected. A 1 second pause will occur in between the repeated fault codes.
- Pendant haptic pulses (vibration) will occur simultaneously when the LED indicator begins flashing a fault code. After the LED indicator has repeated the fault code 3 times, the haptic pulses will stop.

Notes:

Notes:

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