

Instruction Sheet

Cordless Torque Wrench Pump
XC-Series

To protect your warranty, use only ENERPAC hydraulic oil.

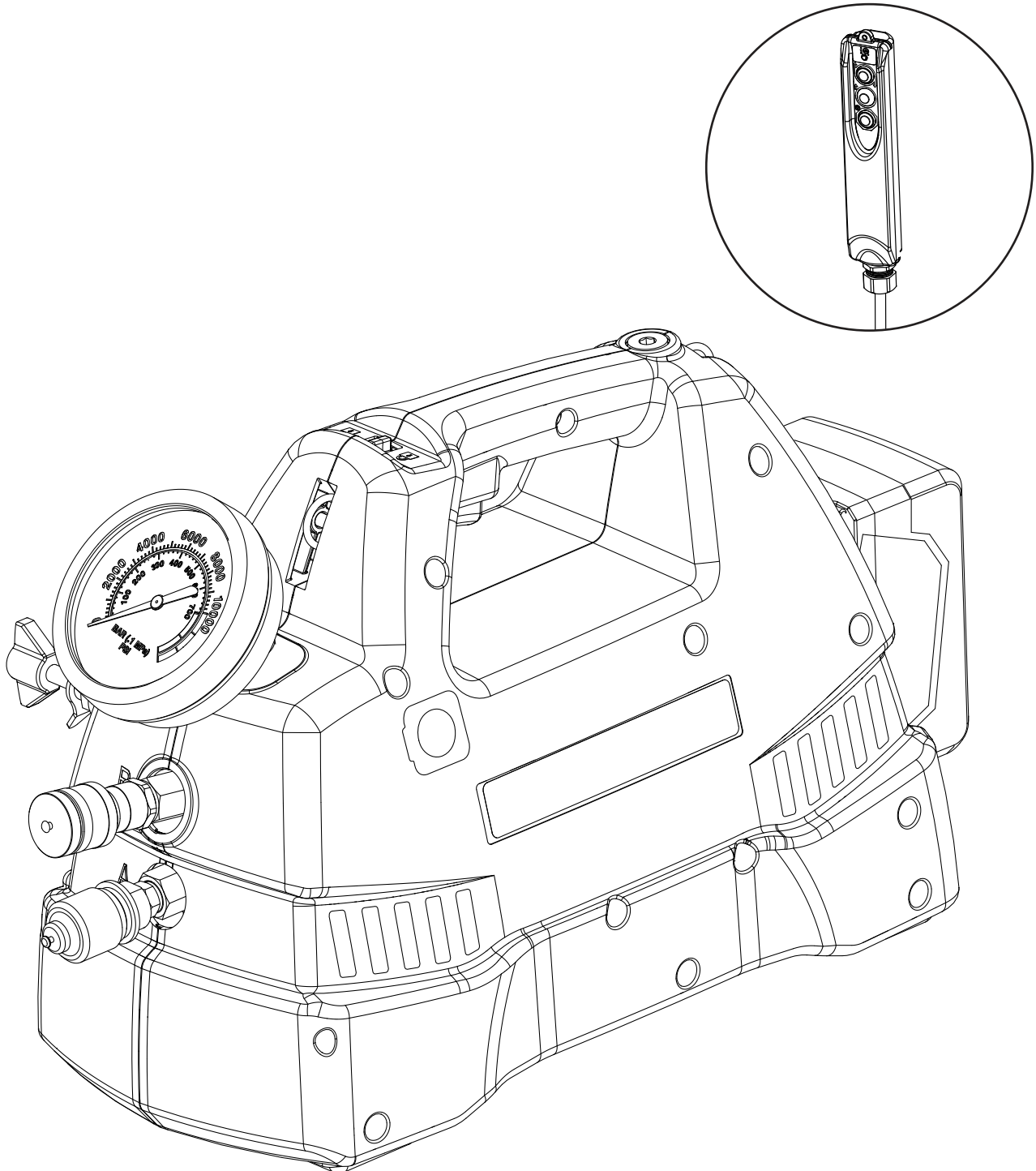


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1.0 IMPORTANT RECEIVING INSTRUCTIONS

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.

2.0 SAFETY

2.1 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 information about an 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.

2.2 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 pressure relief valve.
- Never set the relief valve to a higher pressure than the maximum rated pressure of the pump.
- To avoid personal injury, keep hands and feet away from torque wrench 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.
- Do not pressurize disconnected couplers.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system.
- Do not exceed equipment ratings of 10,000 psi [700 bar]. 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.
- Immediately replace worn or damaged parts with genuine ENERPAC parts. Standard grade parts will break causing personal injury and property damage.



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.
- Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or shoulder strap, if provided.
- Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials. For optimum performance, do not expose equipment to temperatures of 122°F [50°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.

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

2.3 Battery Operated Pump 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 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 and the pendant is disconnected from the pump before transporting the pump. Do not carry the pump with your hand or fingers on the trigger.
- Do not use the pump if the pendant controls and/or trigger switch 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.
- Ensure that the pendant buttons are not accidentally pressed while installing battery.
- Ensure the trigger lock is in the *locked* position before installing battery.
- 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 torque wrench 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.

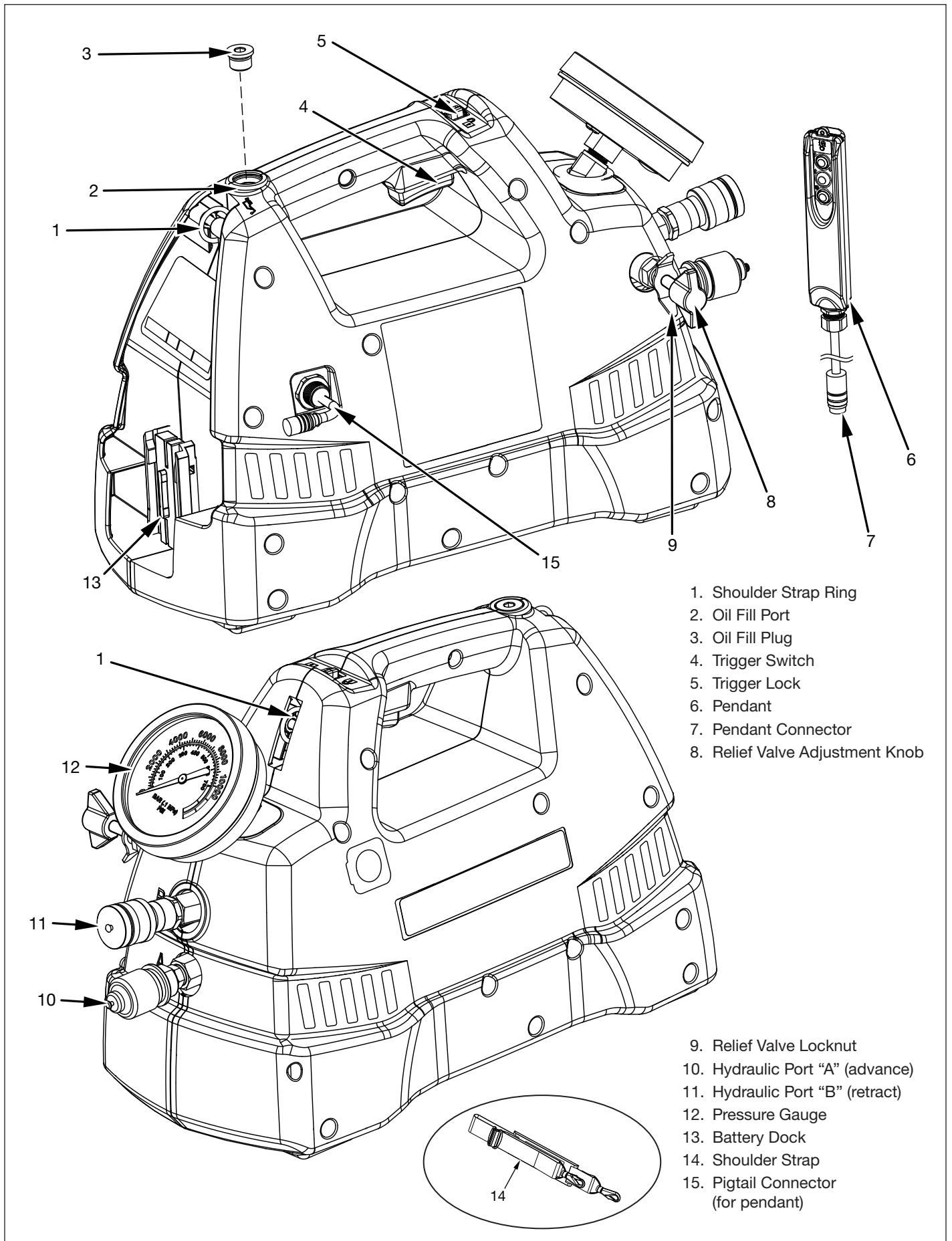
2.4 Bolting Pump Safety Precautions



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

- Never attempt to connect or disconnect hoses while the pump is on and/or the system is pressurized.
- Always be sure that the pump is stopped and all pressure is fully relieved (0 psi/bar) before disconnecting or connecting hydraulic hoses. The sudden and uncontrolled release of pressurized oil could occur if hoses are disconnected while under pressure.
- Be certain that all hose couplers are fully connected at both the pump and wrench ends before applying any hydraulic pressure. If the couplers are not fully connected, oil flow will be blocked, and the drive unit could be subjected to excessive hydraulic pressures. Catastrophic failure of wrench or pump could result.
- Be aware that a nut or bolt that breaks off during operation of the tool/pump may become a high velocity projectile.

3.0 MAJOR FEATURES AND COMPONENTS



4.0 PRODUCT DATA

4.1 External Dimensions

Item	Dimension	
	inch	mm
A	8.22	208
B	11.70	297
C	7.74	197
D	18.32	465

4.2 Specifications

Pump Model	Control Valve	For Use With Cylinder or Tool Type:	Hydraulic* Connections	Operating Temp Range		Motor Rating		Sound Level
				°F	°C	hp	kW	dBA
XC1502T	Internal, Solenoid Operated	Torque Wrench	1/4"-18 NPTF	+14 to +122	-10 to +50	1/2	0.37	81

* Hydraulic port thread size. Enerpac Spin-On hydraulic couplers are included with pump.

Pump Model	Maximum Hyd. Pressure		Flow Rate (See Section 4.3)						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	l	lb	kg
			in ³ /min	l/min	in ³ /min	l/min	in ³ /min	l/min					
XC1502T	10,000 [+300 / -50]	700 [+20.7 / -3.4]	125	2.05	30	0.49	15	0.25	Enerpac HF	120	2.0	26.6	12.0

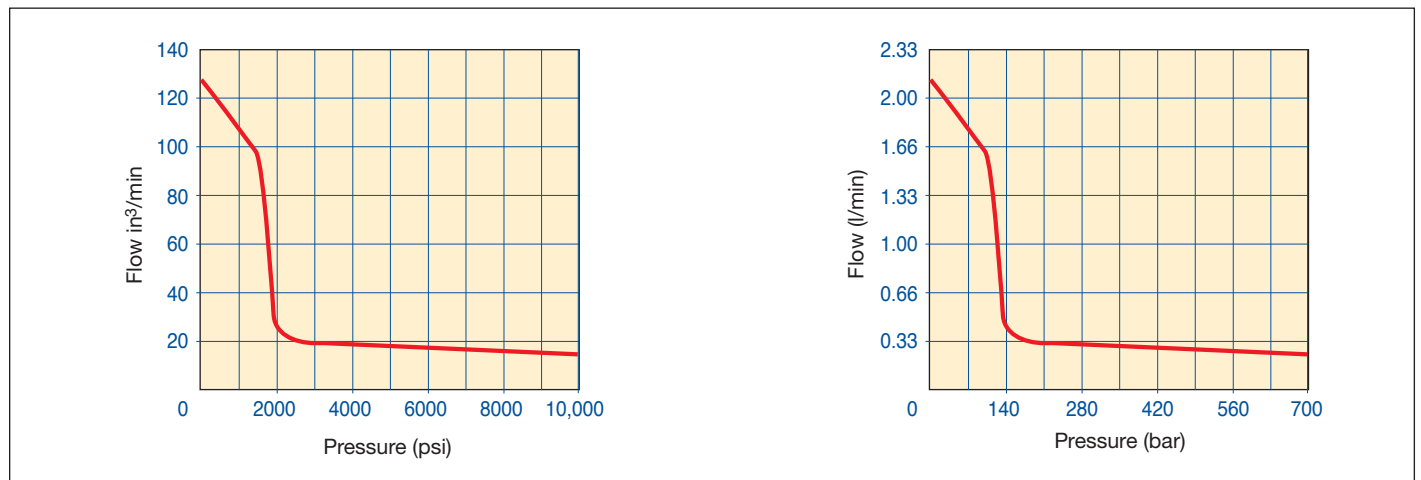
* All pump models feature a rubber bladder type reservoir.

** Approximate weight of pump with oil in reservoir, and with battery not installed. Weight of battery is approximately 2.4 lb [1 kg].

Pump Model	Item	Model Numbers*	
		Enerpac	Milwaukee Electric Tool
XC1502T	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, M28™ Lithium-Ion, 28 Volt, 5.0 Ah	XC28V5	50-11-2855

* Batteries and chargers (sold separately) can be purchased from an Enerpac distributor or from a Milwaukee Electric Tool retailer.

4.3 Pressure and Flow Graphs



Note: All product data is subject to change without notice. Graphs in Section 4.3 show typical pump pressure/flow curves.

5.0 PRODUCT DESCRIPTION

5.1 Introduction

The Enerpac XC-Series cordless torque wrench pump offers the performance of a powered pump with the portability and convenience of a hand operated pump. It is an ideal solution for maintenance applications 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.

Designed especially for use with torque wrenches, 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 set and relieve pressure and to operate the pump in either manual or auto-cycle mode.

Ample oil capacity is provided by the pump's two liter [120 in³] 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, 5 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.

5.2 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.

5.3 Conformance to National & International Standards

Enerpac declares that the XC-Series cordless torque wrench 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.

5.4 Electromagnetic Compatibility (EMC)

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

6.0 HYDRAULIC CONNECTIONS



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.

NOTICE The pump is equipped with Enerpac Spin-On coupler halves pre-installed in the pump ports.

6.1 Connecting Hydraulic Hoses

Make hydraulic connections to pump ports "A" and "B" as described in the following steps. Couplers must be polarized as shown in Figure 1 to ensure correct wrench operation.

1. To prevent the pump from starting, be sure that the battery is removed from the pump.
2. Remove dust caps from couplers at pump ports "A" and "B".
3. Connect the hose from the advance side of the torque wrench to pump port "A".
4. Connect the hose from the retract side of the torque wrench to pump port "B".



Be certain that all hose couplers are fully connected at both the pump and wrench ends before applying any hydraulic pressure. If the couplers are not fully connected, oil flow will be blocked, and the torque wrench drive unit could be subjected to excessive hydraulic pressures. Oil leakage and/or catastrophic failure of wrench or pump may occur. Skin penetration by hydraulic oil and other serious personal injuries could result.



- The Spin-on couplers used on Enerpac THQ Series torque wrench hoses (optional accessory - sold separately) are compatible with the Spin-on couplers pre-installed on the pump. Use of THQ Series hoses is strongly recommended.
- At each connection, rotate the threaded collar of the female coupler half by hand, until it is fully threaded onto the male coupler half. Hand tighten only. Do not use tools.
- When a torque wrench is first connected to the pump, air will be trapped in the hydraulic circuit. Refer to Section 8.2 for air removal procedure.

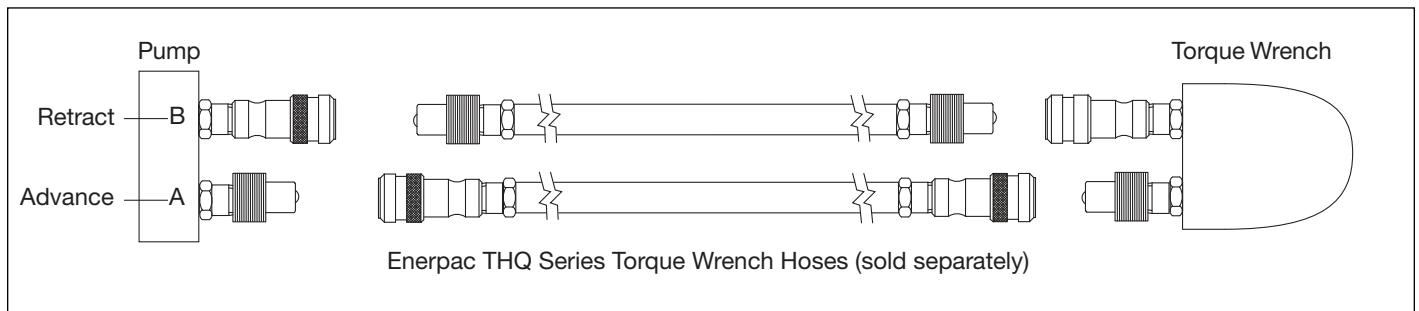


Figure 1, Hydraulic Hose Connections

6.2 Disconnecting Hydraulic Hoses

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

1. Be sure the torque wrench is fully retracted.
2. Verify that the pressure gauge indicates zero (0) psi/bar. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 8.3.
3. Remove battery. Refer to Section 7.2.
4. At pump ports “A” and “B”, loosen the threaded collars on the female couplers. Disconnect hoses from pump.
5. To prevent contamination, place dust caps over couplers.

7.0 BATTERY

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

NOTICE To prevent accidental pump startup, DO NOT press the pendant buttons during battery installation or removal procedures. Also be sure that the trigger lock is in the locked position as shown in Figure 8.

7.1 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.

7.2 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.

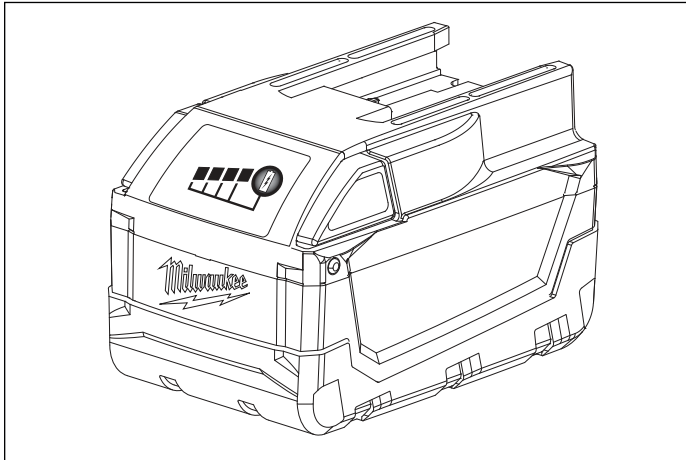


Figure 2, Battery

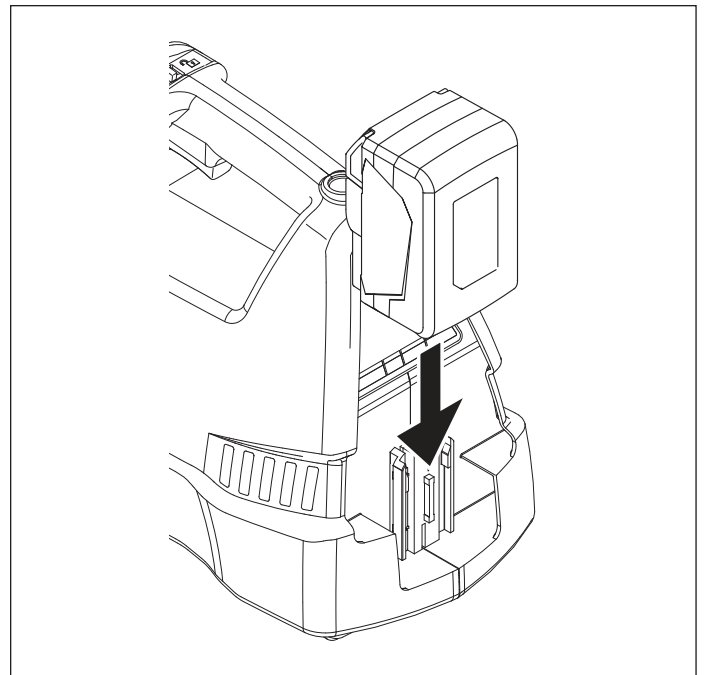


Figure 3, Battery Installation

7.3 Battery Charge Indicator

NOTICE New batteries must be charged before use. Refer to Section 7.1. Also 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.
- Batteries and chargers (sold separately) are available from Enerpac authorized distributors or from Milwaukee Electric Tool retailers.

7.4 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 torque wrench (if possible) or stop the pump motor. Stopping the pump motor will reset the battery.

7.5 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.

7.6 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.

8.0 PREPARATION AND SETUP

8.1 Preparing the Pump for Use

1. Check all system fittings and connections to be sure they are tight and leak free.
2. Check oil level in reservoir and add oil if necessary. Refer to Sections 14.1 through 14.3.
3. Install pump shoulder strap.
4. Connect pendant. Refer to Section 8.5.1.
5. Charge and install battery. Refer to Section 7.1.

8.2 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 torque wrench through several complete advance-retract cycles before placing the pump into service. Do this with no load on the torque wrench and with the pump positioned higher than the torque wrench. To allow for air venting, remove the pump oil fill plug and O-ring before beginning this procedure. Refer to instructions in Section 14.1.

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

8.3 Relieving Pressure

The pump automatically relieves system pressure if it has not received any inputs from the trigger switch or pendant for 3 seconds after any retract cycle has successfully completed.

However, if for any reason system pressure becomes trapped, pressure can be manually relieved as described in the following procedure:

NOTICE Battery must be installed for this procedure. Refer to Section 7.1.

1. Be sure that battery is installed and the pump motor is off.
2. Press and hold the red pendant button.
3. While holding the red pendant button, press and hold the green pendant button. Pressure gauge should now show zero (0) psi/bar.
4. After the pressure gauge shows zero (0) psi/bar, release red and green pendant buttons.

8.4 Transporting the Pump

- Before transporting the pump, always move the trigger lock to the *locked* position and disconnect the pendant from the pump. This will help prevent accidental startup of the pump while it is being carried or moved. Refer to diagram in Figure 8 and instructions in Section 8.5.2.
- Always transport the pump using either the built-in carrying handle or the shoulder strap.
- To prevent damage, never attempt to transport or reposition the pump by dragging it by the hoses or the pendant cable.
- As an added precaution, always remove the battery before transporting the pump in a vehicle or trailer, or when shipping the pump.

8.5 Pendant

The pump includes a three-button corded pendant that operates pump functions. It is connected to the pump with a 20 ft [6 m] cable. A multi-color LED indicator light communicates pump status. See Figure 5.

Pendant operation is described in detail in Sections 11 through 13 of this manual.

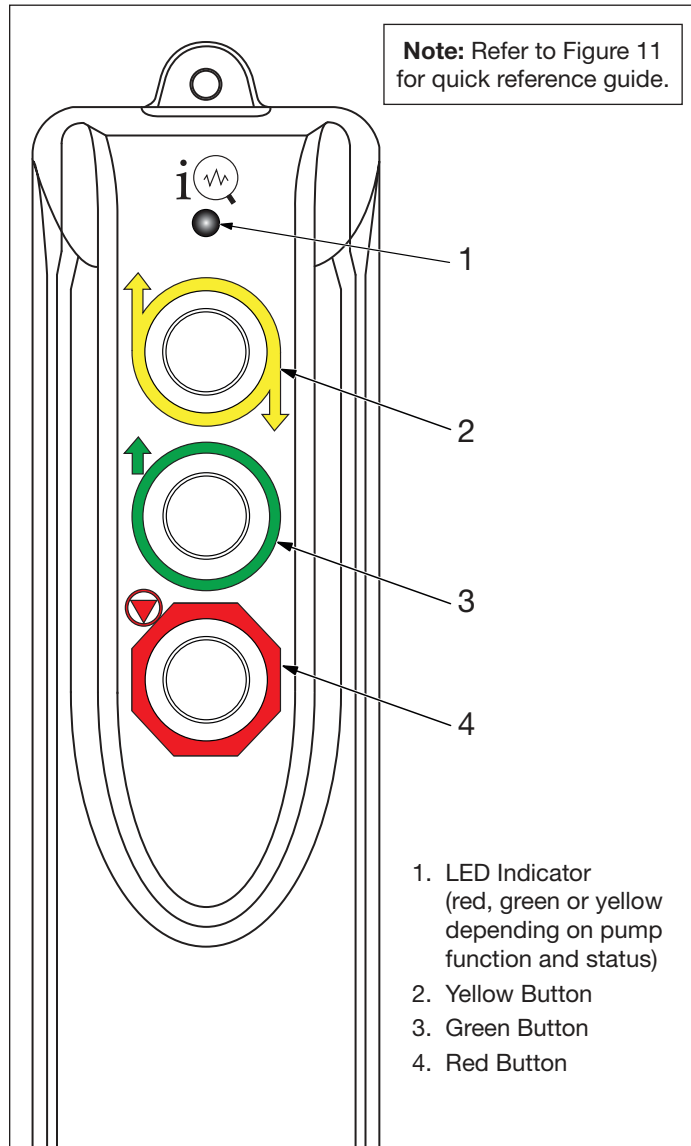


Figure 5, Pendant Controls

8.5.1 Connecting the Pendant

1. If installed, remove the battery from the pump. Refer to Section 7.2.
2. Connect the pendant cable to the pigtail connector on the pump shroud. See Figure 6.
3. Using the threaded ring, secure the pendant cable to the pigtail connector.

8.5.2 Disconnecting the Pendant

1. Verify that the pressure gauge indicates zero (0) psi/bar. Be certain that all hydraulic pressure is fully relieved before continuing with the remaining steps of this procedure. If any pressure remains, relieve pressure as described in Section 8.3.
2. If installed, remove the battery from the pump. Refer to Section 7.2.

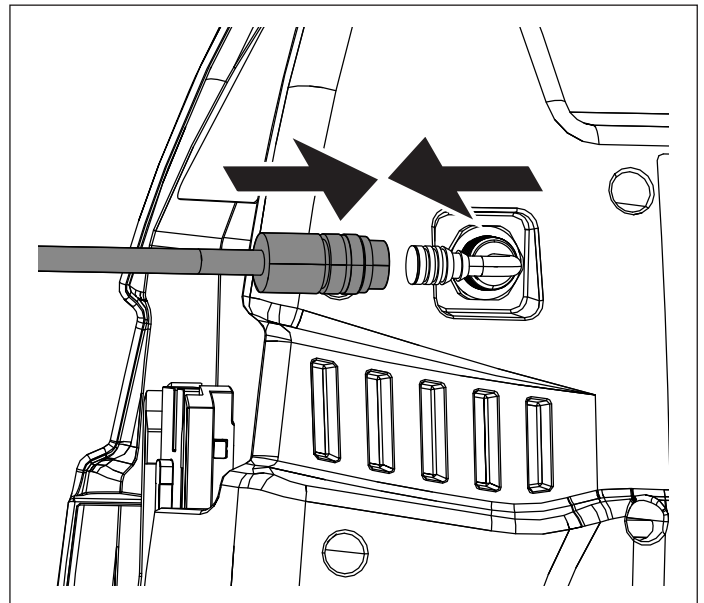


Figure 6, Pendant Connection

3. Loosen the threaded ring securing the pendant cable to the pump pigtail connector.
4. Disconnect the pendant cable from the pigtail connector. See Figure 6.

9.0 PUMP OPERATION

9.1 Run and Sleep Modes

Press and release any pendant button (or install a charged battery) to place the pump into run mode. Run mode must be active before the pump can be operated.

- The pendant LED indicator will illuminate solid green when the pump is in run mode, indicating that the pump is ready for use.
- The pump will enter sleep mode automatically after 5 minutes without use. The green LED indicator will turn off when sleep mode is activated. Sleep mode helps conserve battery power when the pump is not being used.
- The selected pendant button must be pressed *and* released to deactivate sleep mode. The pump will remain in sleep mode if the pendant button is held down and not released.
- A small amount of power is drawn from the battery while the pump is in sleep mode. The battery will remain charged for approximately 2 to 4 weeks if the pump remains in sleep mode and is not operated. However, actual battery life will vary depending on the battery charge level and condition.

9.2 Operational Modes

The pump has three operational modes:

1. Auto-Cycle Mode (using the pendant)
2. Manual Mode (using the pendant)
3. Manual Mode (using the trigger switch)

These modes are fully described in sections 11, 12 and 13 of this manual.

Auto-cycle mode can be operated only with the pendant. Manual mode can be operated using either the pendant or the pump trigger switch.

Note that the trigger switch provides limited functionality and is intended only for temporary use in the event that the pendant becomes lost or damaged.

9.3 Additional Functions and Features

- The pendant will vibrate at various times and its LED indicator will blink to indicate pump status and to acknowledge programming inputs.
- The pump includes an automatic motor shut-off feature. Shut-off time after the final retract cycle will vary from 1 to 20 seconds, depending on operational mode.
- Whenever automatic shut-off occurs, or if the pump is shut-off manually, the valve will automatically dump system pressure to reservoir.
- To stop the pump immediately at any time before automatic shut-off occurs: Press the red pendant button.
- To manually dump system pressure to reservoir: Press and hold the red pendant button. Then, while continuing to hold the red pendant button, press and hold the green pendant button. This manual dump feature is generally needed only in the event that the battery is removed before the auto dump cycle is completed, or if a malfunction occurs that results in trapped pressure.

NOTICE A charged battery must be installed to allow operation of the manual dump feature.

10.0 OPERATING PRECAUTIONS



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

- Be sure the nut threads properly engage with the threads of the bolt, and that cross-threading has not occurred.
- Avoid making sudden start-stop movements (“shock loading”). Failure to observe this precaution may cause a catastrophic failure of the wrench to occur, and wrench components under high tension could become dangerous projectiles.
- If the torque wrench stalls at any point: Release yellow pendant button to stop auto-cycle mode. Release green pendant button or trigger switch to stop manual mode.
- Continuously monitor the torque wrench and fastener during pump operation. Stop torquing procedures immediately if any problems occur.
- Refer to the manufacturer's manuals provided with the torque wrench for wrench operation instructions, maintenance procedures and safety precautions.



- Be sure that threads and the bearing surface are liberally coated with the correct bolt lubricant or anti-seize compound.
- Be sure the nut or bolt to be fastened is clean and free of loose dust or dirt.
- Make all torque calculations based on the bolt lubricant's (or anti-seize compound's) stated coefficient of friction. Failure to do so may result in the required bolt load not being achieved.

11.0 AUTO-CYCLE MODE

11.1 Pressure Adjustment - Auto-Cycle Mode



Always make pressure adjustments before putting torque wrench on nut or bolt head. Pressure setting must be adjusted to provide the correct torque and to ensure that excessive torque is not applied. Failure to observe and comply with this precaution could result in death or serious personal injury. Property damage could also occur.

1. Ensure that the trigger lock is in the *locked* position. See Figure 8.
2. Press and hold the red pendant button. See Figure 5.
3. While holding the red pendant button, press and hold the yellow pendant button. The pendant LED indicator will blink red twice and the pendant will vibrate twice.

NOTICE Steps 1 and 2 reset the stored pressure to zero (0) psi/bar if a stored pressure had been previously set.

4. Loosen the relief valve locknut and turn the relief valve adjustment knob counterclockwise until there is a light drag when turning. See Figure 7.
5. Press and hold the green pendant button to start pump motor. Pendant will vibrate when pump turns on.

NOTICE The green pendant button must be held down during the entirety of steps 6 through 9. Releasing the green pendant button will stop pump motor.

6. Allow pump pressure to build.
7. Turn the relief valve adjustment knob clockwise to increase pressure to desired value.

NOTICE To obtain an accurate setting, decrease the pressure to a point below the final setting and then slowly increase the pressure until it reaches the final setting.

8. Tighten the relief valve locknut when the pressure gauge reading is stable and is at the desired pressure.
9. Release the green pendant button.
10. Recheck the final pressure setting by holding the green pendant button and pressurizing the system.
11. If the final pressure setting is not at the desired setting, then repeat the procedure described in steps 4 through 10. If the final pressure setting is at the desired setting, then proceed to step 12.

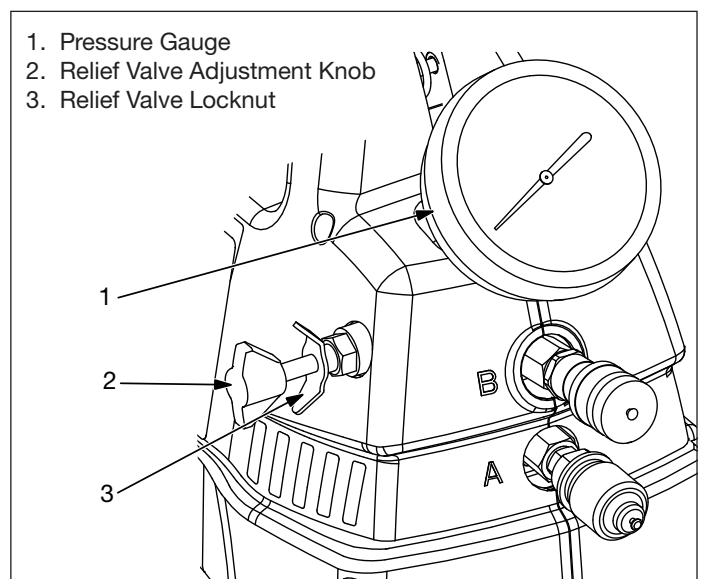


Figure 7, Relief Valve Adjustment

12. Press and hold the green pendant button. When the pump reaches the previously set pressure, press the yellow pendant button.
13. The pendant LED indicator will turn yellow for 1.5 seconds and the pendant will vibrate three times when the stored pressure is recorded. The pump will shut-off.
14. Release the yellow and green pendant buttons.

NOTICE The pump will save the stored pressure (within the available range of 1000 to 10,000 psi [70 to 700 bar]) even after long periods of non-use or if the battery has been replaced.

11.2 Auto-Cycle Mode - Important Operation Information

NOTICE

- To stop auto-cycle mode at any time, release the yellow pendant button. If immediate motor shutdown is required, press the red pendant button.
- The trigger switch cannot be used for auto-cycle operation.
- Variables such as ambient temperature, pump internal temperature and hydraulic hose length may cause the pressure gauge to show a slightly lower reading than the stored pressure setting before the retract cycle is activated. This is normal.
- The internal pressure transducer and pump microprocessor precisely control the switching between advance and retract cycles, assuring that the stored pressure has been met.
- Auto-cycle mode will function properly only if the relief valve pressure setting is equal to or higher than the stored pressure setting.
- If the stored pressure is achieved before the torque wrench fully advances, then desired torque has been achieved.
- If relief pressure is not achieved before the torque wrench fully advances, then the desired torque has not been achieved and further cycles are required.

11.3 Torquing - Auto-Cycle Mode

To torque in auto-cycle mode perform the following steps:

1. Place torque wrench on nut or bolt.
2. Press and hold the yellow pendant button. Pendant will vibrate when pump turns on.
3. The pump and torque wrench will continuously perform advance and retract cycles. The LED indicator will blink yellow during operation. At the end of an advance cycle, the pendant will vibrate.

NOTICE If relief valve pressure is less than the stored pressure, the pump will auto-dump after 10 seconds and the stored pressure will be cleared. Then, the LED indicator will turn solid red and the pendant will vibrate.

4. When desired torque is reached, release the yellow pendant button.
5. After the yellow pendant button is released, the pump will do a final retract cycle.
6. The pump will shut-off and relieve all remaining system pressure if no additional inputs from the trigger switch or pendant are received within the applicable time period after full retract. Refer to the following notice statement for additional information.

NOTICE

- If relief valve pressure is set > 2000 psi [138 bar], the pump will automatically shut-off 1 second after full retract when the yellow pendant button is released. If the button remains depressed, the pump will cycle to advance after a 1 second delay.

- If relief valve pressure is set < 2000 psi [138 bar], the pump will automatically shut-off 20 seconds after full retract when the yellow pendant button is released. If the button remains depressed, the pump will cycle to advance after a 5 second delay.
- Pressing the red button will turn off the pump immediately.

12.0 MANUAL MODE WITH PENDANT

12.1 Pressure Adjustment - Manual Mode with Pendant



Always make pressure adjustments before putting torque wrench on nut or bolt head. Pressure setting must be adjusted to provide the correct torque and to ensure that excessive torque is not applied. Failure to observe and comply with this precaution could result in death or serious personal injury. Property damage could also occur.

1. Ensure that the trigger lock is in the *locked* position. See Figure 8.
2. Press and hold the red pendant button. See Figure 5.
3. While holding the red pendant button, press and hold the yellow pendant button. The pendant LED indicator will blink red twice and the pendant will vibrate twice.

NOTICE Steps 1 and 2 reset the stored pressure to zero (0) psi/bar if a stored pressure had been previously set.

4. Loosen the relief valve locknut and turn the relief valve adjustment knob counterclockwise until there is a light drag when turning. See Figure 7.
5. Press and hold the green pendant button to start pump motor. Pendant will vibrate when pump turns on.

NOTICE The green pendant button must be held down during the entirety of steps 6 through 9. Releasing the green pendant button will stop pump motor.

6. Allow pump pressure to build.
7. Turn the relief valve adjustment knob clockwise to increase pressure to desired value.

NOTICE To obtain an accurate setting, decrease the pressure to a point below the final setting and then slowly increase the pressure until it reaches the final setting.

8. Tighten the relief valve locknut when the pressure gauge reading is stable and is at the desired pressure.
9. Release the green pendant button.
10. Recheck the final pressure setting by holding the green pendant button and pressurizing the system.
11. If the final pressure setting is not at the desired setting, then repeat the procedure described in steps 4 through 10. If the final pressure setting is at the desired setting, then proceed to step 12.
12. Press and hold the green pendant button. When the pump reaches the previously set pressure, press the yellow pendant button.
13. The pendant LED indicator will turn yellow for 1.5 seconds and the pendant will vibrate three times when the stored pressure is recorded. The pump will shut-off.
14. Release the yellow and green pendant buttons.

NOTICE The pump will save the stored pressure (within the available range of 1000 to 10,000 psi [70 to 700 bar]) even after long periods of non-use or if the battery has been replaced.

12.2 Torquing - Manual Mode with Pendant

1. Place torque wrench on nut or bolt.
2. Press and hold the green pendant button to begin an advance cycle. Pendant will vibrate when pump turns on. The LED indicator will blink green until the stored pressure is achieved. The LED indicator will then blink yellow and the pendant will vibrate until the green button is released.

NOTICE

- If the stored pressure was reset to zero and a new setting was not entered, the pump will continue to build pressure until the relief valve setting (Section 12.1 step 8) is reached. The user will NOT see the yellow LED indicator or feel the pendant vibrate.
 - If stored pressure exists and pump is run in manual mode, then:
 - Pendant LED indicator light blinks green if pressure is *below* stored pressure value.
 - Pendant LED indicator light blinks yellow if pressure is *equal* to stored pressure value.
 - Pendant LED indicator light blinks red if pressure is *above* stored pressure value.
 - If the actual pressure exceeds the stored pressure, the LED indicator will blink red. This indicates that the actual pressure is set higher than the stored pressure.
 - If the stored pressure is achieved before the torque wrench fully advances, then desired torque has been achieved.
3. Release green pendant button to start a retract cycle. The pendant will vibrate to indicate the start of the cycle.
 4. Repeat steps 2 and 3 until target torque is achieved.
 5. The pump will shut-off and relieve all remaining system pressure if no additional inputs from the trigger switch or pendant are received within the applicable time period after full retract. Refer to the following notice statement for additional information.

NOTICE

- If relief valve pressure is set > 2000 psi [138 bar], the pump will automatically turn off 1 second after full retract.
- If relief valve pressure is set < 2000 psi [138 bar], the pump will automatically shut-off 20 seconds after full retract.
- Pressing the red button will shut-off the pump immediately.

13.0 MANUAL MODE USING TRIGGER SWITCH

The trigger switch can be used to provide temporary use of the pump if the remote pendant is missing or not operational. Note that the auto-cycle mode is NOT functional when the trigger switch is used. Use of the remote pendant is required for auto-cycle operation and special features.

13.1 Pressure Adjustment - Manual Mode Using Trigger Switch

WARNING

Always make pressure adjustments before putting torque wrench on nut or bolt head. Pressure setting must be adjusted to provide the correct torque and to ensure that excessive torque is not applied. Failure to observe and comply with this precaution could result in death or serious personal injury. Property damage could also occur.

1. Disengage the trigger lock by sliding the trigger lock control to the right, so it is closest to the unlocked icon. See Figure 8.

2. Loosen the relief valve locknut and turn the relief valve adjustment knob counterclockwise until there is a light drag when turning. Refer to Figure 7.
3. Start the pump motor and allow pressure to build by firmly grasping the carrying handle and pulling the trigger switch upward. Refer to Figure 9.

NOTICE Releasing the trigger switch will stop pump motor. Trigger switch must be held down during the entirety of steps 4 through 6.

4. Turn the relief valve adjustment knob clockwise to increase pressure to desired value.

NOTICE To obtain an accurate setting, decrease the pressure to a point below the final setting and then slowly increase the pressure until it reaches the final setting.

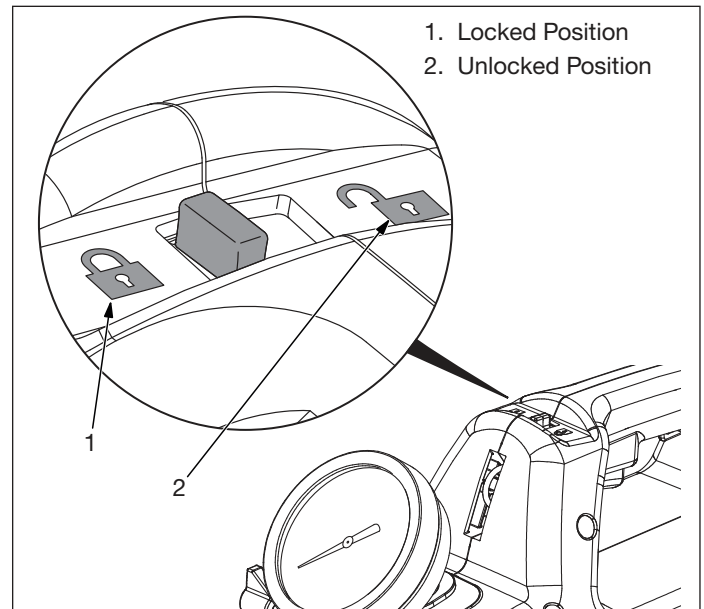


Figure 8, Trigger Lock

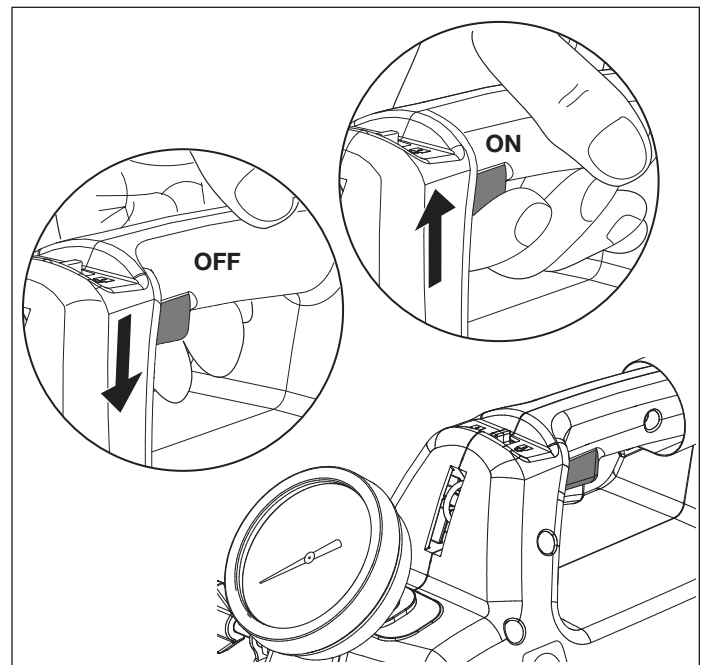


Figure 9, Trigger Switch

5. Tighten the relief valve locknut when the pressure gauge reading is stable and is at the desired pressure, then release the trigger switch.
6. Recheck the final pressure setting by holding the trigger switch and pressurizing the system.
7. If the final pressure setting is not at the desired setting, then repeat the procedure described in steps 2 through 6.

13.2 Torquing - Manual Mode Using Trigger Switch

NOTICE

- Pressure will increase until the relief pressure setting is reached.
 - If relief pressure is achieved before the torque wrench fully advances, then desired torque has been achieved.
 - If pendant remains connected, blinking green LED will be visible (same as manual mode operation with pendant). However, red and yellow LED's will NOT be visible.
1. Place torque wrench on nut or bolt.
 2. Press and hold the trigger switch to begin an advance cycle. Pump will continue to build pressure until pressure in Section 13.1, step 6 is reached.
 3. Release trigger switch to start a retract cycle.
 4. Repeat steps 2 and 3 until target torque is achieved.
 5. The pump will shut-off and relieve all remaining system pressure if no additional inputs from the trigger switch (or pendant - if connected) are received within the applicable time period after full retract. Refer to the following notice statement for additional information.

NOTICE

- If relief valve pressure is set > 2000 psi [138 bar], the pump will automatically shut-off 1 second after full retract.
- If relief valve pressure is set < 2000 psi [138 bar], the pump will automatically shut-off 20 seconds after full retract.

14.0 MAINTENANCE

14.1 Checking Oil Level

1. Be sure torque wrench is fully retracted and that pump is off.
2. Verify that the pressure gauge indicates zero (0) psi/bar. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 8.3.
3. Remove the battery from the pump. Refer to Section 7.2.
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 10.
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 14.3. Refer to Section 14.2 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].

14.2 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.

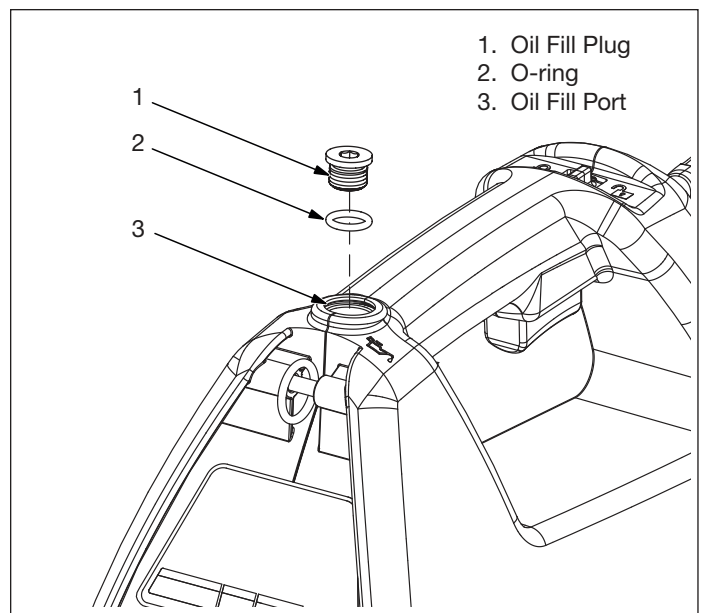


Figure 10, Oil Fill Plug

14.3 Adding Oil

CAUTION Be certain that the torque wrench is fully retracted before adding any oil to the reservoir. If an oil-filled torque wrench 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 14.2.
- 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 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.

Add oil as described in the following steps:

1. Be sure torque wrench is fully retracted and that pump is off.
2. Verify that the pressure gauge indicates zero (0) psi/bar. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 8.3.
3. Remove the battery from the pump. Refer to Section 7.2.
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.

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].
12. Slowly fill the reservoir with new Enerpac oil. Refer to Section 14.2 for hydraulic oil requirements and Section 14.3 for detailed oil fill instructions. Usable oil capacity will be slightly less than the rated reservoir size for your pump model.
13. After adding oil, reconnect the torque wrench and reinstall the battery. Refer to Section 7.1.

14.4 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 torque wrench is fully retracted and that pump is off.
2. Verify that the pressure gauge indicates zero (0) psi/bar. Be certain that all hydraulic pressure is fully relieved before continuing this procedure. If any pressure remains, relieve pressure as described in Section 8.3.
3. Move the trigger lock to the *locked* position. See Figure 8.
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 Usable oil capacity of the pump reservoir is 120 in³ [2 l]. 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. See Figure 8.
9. 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. See Figure 9.
10. Remove the battery from the pump. Refer to Section 7.2.
11. 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.

14. Remove trapped air from the system. Refer to Section 8.2 for additional information.
15. Check oil level again after cycling the torque wrench. With the torque wrench fully retracted, verify that oil level has not dropped. Add additional oil if level is low. Refer to Sections 14.1 through 14.3.

15.0 TROUBLESHOOTING

The information in the Troubleshooting Guide 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.



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. Trigger lock engaged.	Move trigger lock to the <i>unlocked</i> position.
	f. Trigger lock stuck in the locked position.	Contact Enerpac Authorized Service center if trigger lock will not move into the unlocked 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 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.	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 screen clogged with debris.	Contact Enerpac Authorized Service Center.
	d. Internal damage to pump.	Contact Enerpac Authorized Service Center.
5. Torque wrench 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 screen clogged with debris.	Contact Enerpac Authorized Service Center.
	d. Loose hydraulic couplers.	Check couplers and tighten if needed.
6. Torque wrench advances and retracts erratically.	a. Air in the system.	Advance and retract the torque wrench until operation is smooth Refer to Section 8.2.
	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 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 11.1, 12.1 or 13.1 (as applicable).

(continued on the next page)

Table 1 - Troubleshooting Guide (Continued)		
Symptom	Possible Cause	Action
9. Noisy pump operation.	a. Pump element piston sticking.	Contact Enerpac Authorized Service Center.
	b. Motor or gear damaged.	Contact Enerpac Authorized Service Center.
10. Pump builds pressure, but does not reach recorded pressure.	Stored pressure is higher than user adjustable relief pressure.	Correct relief pressure and reset stored pressure. Refer to Section 11.1 or 12.1 (as applicable).
11. Pump retract timer is extended (20 seconds) and the relief pressure is above 2,000 psi [138 bar].	Faulty or damaged pressure transducer.	Contact Enerpac Authorized Service Center.
12. Auto-cycle function is disabled and/or pendant will not accept a pressure setting.	a. Relief valve pressure setting is below 1000 psi [70 bar].	Adjust relief valve pressure to 1000 psi [70 bar] or above. Auto-cycle operating pressure range is 1000 to 10,000 psi [70 to 700 bar].
	b. Faulty or damaged pressure transducer.	Contact Enerpac Authorized Service Center.
13. LED indicator shows mechanical or electrical failure fault (see Section 16.0) when battery is connected to pump then changes to solid green after 10 seconds.	Faulty or damaged pressure transducer.	Contact Enerpac Authorized Service Center.

16.0 OPERATOR FAULT CODES

Operator fault codes are displayed by the pendant LED indicator. See Figure 5.

Refer to Table 2 for operator fault code information.

Table 2 - Operator Fault Codes		
LED Indicator Blink and Color	Cause	Action
LED indicator blinks RED. Pendant vibrates 5 times.	Button/Pendant Fault	Remove and reinstall battery while ensuring that no pendant buttons are being pressed. If problem persists, contact Enerpac Authorized Service Center.
LED indicator blinks RED and YELLOW. Pendant vibrates 5 times.	Over Temperature	Allow time for pump temperature to cool.
LED indicator blinks YELLOW. Pendant vibrates 5 times.	Low Voltage	Refer to “Pump will not start” or “Pump slows down and stops” in Troubleshooting Guide.
LED indicator blinks RED four times and then pauses for one second. Pendant vibrates 5 times.	Mechanical or Electrical Failure	Contact Enerpac Authorized Service Center.

17.0 QUICK REFERENCE GUIDE - PENDANT CONTROLS

- Refer to Figure 11 for pendant quick reference guide.
- For some functions, two pendant buttons must be pushed simultaneously and/or in a sequence. Refer to sections 11.0 and 12.0 of this manual for detailed instructions.
- A charged battery must be installed on pump. Pendant buttons are not functional when battery is removed or discharged.

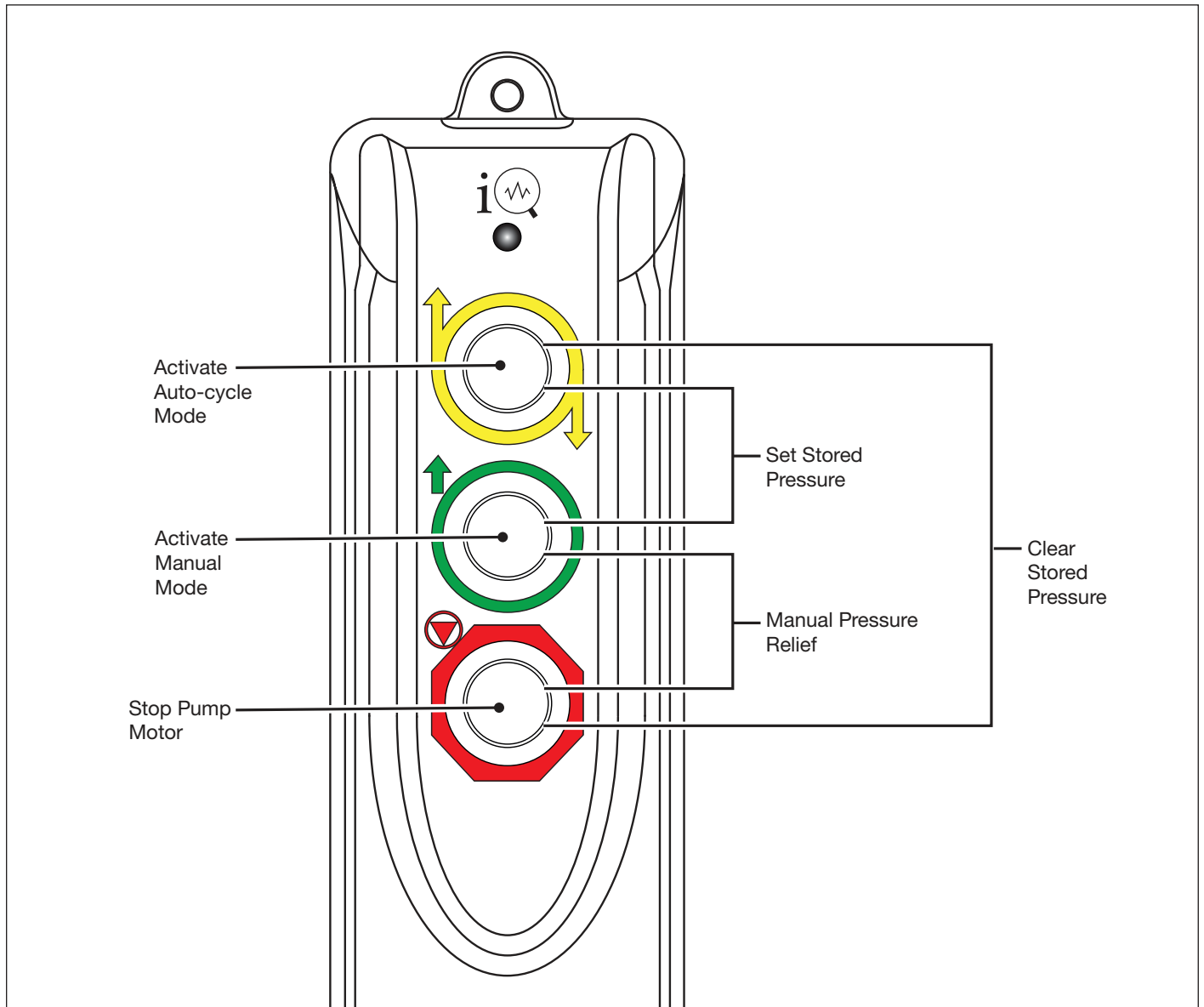


Figure 11, Quick Reference Guide - Pendant Controls

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