ENERPAC

Operation and Maintenance Manual

XC2 Series Cordless Hydraulic Pumps
Models XC2202M and XC2204M

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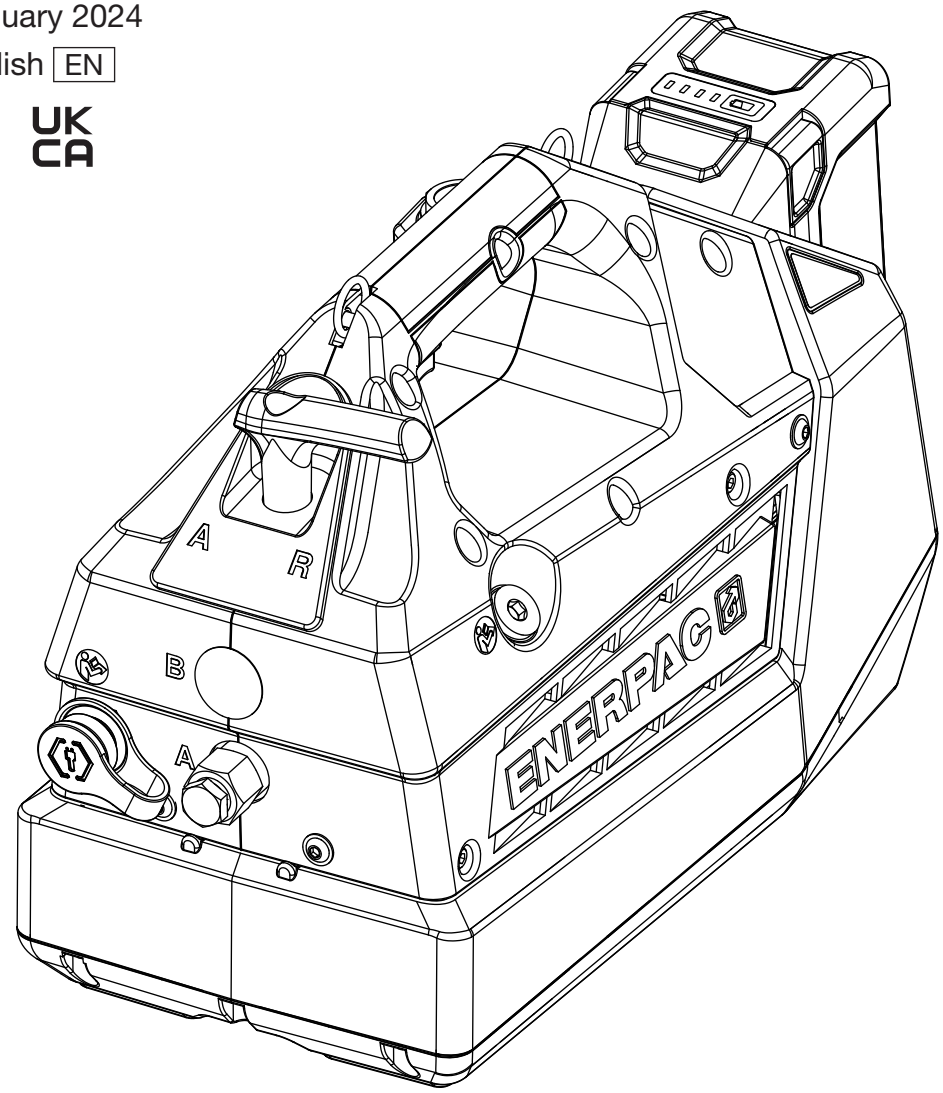

⚠ To reduce the risk of injury, user must read and understand this document before use.

ABOUT US

Enerpac is a global market leader in high pressure hydraulic tools, controlled force products, portable machining, on-site services and solutions for precise positioning of heavy loads. As a leading innovator with over a 100-year legacy, Enerpac has helped move and maintain some of the largest structures on earth. When safety and precision matters, elite professionals in industries such as aerospace, infrastructure, manufacturing, mining, oil & gas and power generation rely on Enerpac for quality tools, services and solutions. For additional information, visit www.enerpac.com.

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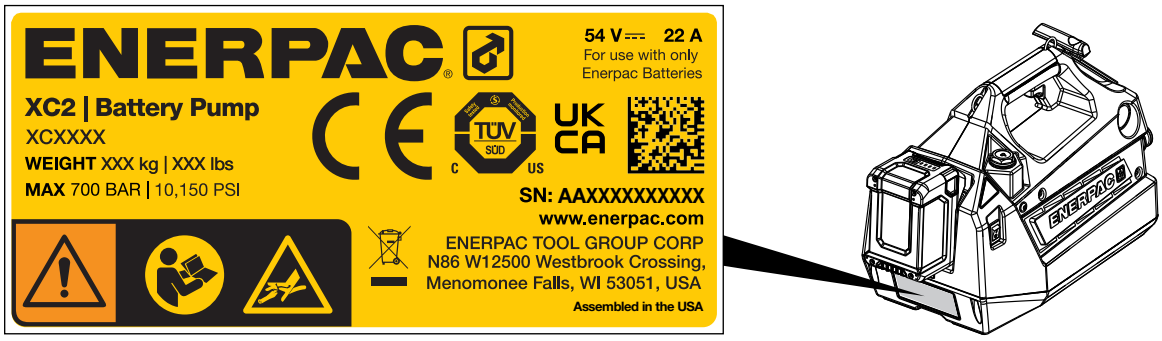
WARRANTY

Refer to the Enerpac Global Warranty document for terms and conditions of the product warranty. Such warranty information can be found at www.enerpac.com.

NAMEPLATE

Refer to the pump nameplate for the product model number, serial number and other applicable information.



Note: A typical XC2 Series nameplate is shown above. Nameplate data will vary depending on pump model and configuration.

AVAILABLE LANGUAGES

An electronic copy of this document is available online in multiple languages:

- EN English - For other languages, visit www.enerpac.com.
- CS Čeština - Další jazyky naleznete na adrese www.enerpac.com.
- DE Deutsch - Weitere Sprachen finden Sie unter www.enerpac.com.
- ES Español - Para otros idiomas visite www.enerpac.com.
- FI Suomi - Muita kieliä on osoitteessa www.enerpac.com.
- FR Français - Pour toutes les autres langues, rendez-vous sur www.enerpac.com.
- IT Italiano - Per altre lingue visitate il sito www.enerpac.com.
- JA 日本語 - その他の言語はwww.enerpac.comでご覧いただけます。
- KO 한국어 - 이 지침 시트의 다른 언어 버전은 www.enerpac.com.
- NL Nederlands - Ga voor de overige talen naar www.enerpac.com.
- NO Norsk - For alle andre språk henviser vi til www.enerpac.com.
- PL Polski - Inne wersje językowe można znaleźć na stronie www.enerpac.com.
- PT Português - Para outros idiomas consulte www.enerpac.com.
- RO Română - Per altre lingue visitate il sito www.enerpac.com.
- SV Svenska - För andra språk, besök www.enerpac.com.
- ZH 中文 - 如需其他语言，请前往 www.enerpac.com.

CONTENTS

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1.0 SAFETY

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

Save these instructions for future use.

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 a Enerpac hydraulic safety training course.

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

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

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

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

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

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

1.1 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.

1.1.1 General Hydraulic Safety Precautions

- Do not remove, modify or disable the pump's user adjustable pressure relief valve.
- Never set the pressure relief valve to a higher pressure than the maximum rated working pressure of the pump.
- Never remove, modify, disable or readjust the pump's internal safety relief valve.
- 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 uncoupled hydraulic couplers.
- Do not exceed the pump's maximum pressure rating of 10,150 psi [700 bar]. Overloading may cause equipment failure and possible personal injury.
- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. All hoses, fittings and couplers used with the pump must be rated at 10,150 psi [700 bar] minimum.
- Install pressure gauge(s) in the system to monitor operating pressure. It is your window to see what is happening in the system.
- 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. Enerpac parts are designed to fit properly and to withstand high loads. Non-Enerpac parts may break or cause the pump to malfunction. Personal injury and property damage may also occur.

⚠ 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.

NOTICE Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact an Enerpac authorized service center in your area.

1.1.2 Lifting 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 allow persons to be under a hydraulically supported load. Always support the load with stands, blocking or other suitable supports before allowing persons to enter the work area below the load.
- 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.
- Never use a cylinder or tool with uncoupled couplers. If the cylinder or tool becomes extremely overloaded, components can fail catastrophically.
- 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.
- Distribute the load evenly across the entire saddle surface. Always use a saddle to protect the plunger.
- 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.
- Do not exceed equipment ratings. Never attempt to lift a load weighing more than the capacity of the cylinder. Overloading may cause equipment failure and possible personal injury.
- 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.

1.2 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 use a battery operated pump in an explosive atmosphere, such as in the presence of flammable liquids, gases, or dust. Sparks and electrical arcing could ignite combustible vapors or airborne dust.
- Do not expose the pump to rain, water spray or wet conditions. Water entering the pump will increase the risk of electric shock and may damage the motor and other components. The pump can be used outdoors, but should be brought inside in the event of rain or other moisture.
- To avoid accidental pump startup, ensure that the pump power switch is in the OFF (**O**) position before moving or transporting the pump. Never carry the pump with your hand or fingers on the trigger switch.
- Ensure that the pump power switch is in the OFF (**O**) position before performing inspections, maintenance procedures, repairs or cleaning the pump. As an alternative, remove the battery from the pump.
- Battery power will remain connected to some electrical components inside the pump even when the pump power switch is in the OFF (**O**) position. For this reason, always remove the battery from the pump before opening the pump housing for any reason. All servicing must be performed only by qualified personnel with appropriate training and expertise, following standard shop safety precautions.
- Use insulated tools and wear electrician's gloves if it is necessary to troubleshoot the pump or observe operation with the pump housing removed (qualified personnel only).
- Do not use the pump if the trigger switch or pendant controls (if equipped) do not turn the motor on and off. Any power tool that cannot be controlled with the trigger switch or pendant controls is dangerous and must be repaired before being used.
- Use the Enerpac XC2 Series pump only with the specified Enerpac 54 volt Li-Ion battery. Use of any other battery 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.
- The battery cells may develop a small leak under extreme usage or temperature conditions. Avoid contact with battery liquid. Liquid ejected from the battery may cause irritation or burns. Refer to Section 1.3 for battery first aid instructions.
- If battery case is broken or damaged and/or if leakage occurs, do not reinstall the battery on the pump. Replace with a new battery.
- Recharge the battery only with the specified Enerpac battery charger. A charger that is suitable for one type of battery may create a risk of fire when used with another battery.
- Separate manuals are provided with the battery and battery charger and are also available online at www.enerpac.com. Read and understand all information contained in these manuals. Observe and comply with all communicated safety precautions when using the battery or charger.
- Remove the battery from the pump before storing the pump.
- The battery and battery charger have no serviceable parts. Do not attempt to disassemble or repair these items.

1.3 Battery First Aid Instructions

- If battery liquid comes in contact with skin, wash immediately with soap and water, then neutralize with lemon juice or vinegar.
- If battery liquid gets in your eyes, flush with clean water for a minimum of 10 minutes, then seek immediate medical attention.
- If battery liquid is swallowed, seek immediate medical attention.

1.4 Symbols

Various pictorial symbols are affixed to the pump or molded directly into the pump housing or components. Additional pictorial symbols are located on the battery and battery charger nameplates.

In some instances, these symbols may advise the user of potentially hazardous situations. Other symbols may be informational only. Understand the meaning of each symbol before using the pump.

Selected symbols are shown in the following chart:

Symbol	Definition
	Risk of electric shock. High voltage.
	Device shall not be exposed to high heat, fire/flame, or any heat source.
	Read instruction manual. Save instructions for future use.
	Do not expose device to rain, water or moisture.
	Do not dispose of device in trash.

1.5 Labels

Make sure all labels and decals are legible and securely affixed to the pump. If worn or missing, obtain replacements from Enerpac.

1.6 State of California Proposition 65 Warning (pump)

⚠ WARNING The pump uses hydraulic oil as the fluid medium. Hydraulic oils contain ethylbenzene, which may cause cancer and reproductive harm. Hydraulic oils need to be handled carefully, so that contact is avoided.

A warning decal is affixed to the pump, informing the operator of these risks. For additional information, go to www.P65Warnings.ca.gov.

1.7 State of California Proposition 65 Warning (battery)

⚠ WARNING The battery used with the pump can expose you to chemicals including cobalt lithium manganese nickel oxide and carbon black, which are known to the State of California to cause cancer and reproductive harm. For additional information go to www.P65Warnings.ca.gov.

2.0 COMPLIANCE

2.1 Compliance Statements

Cordless Hydraulic Pumps
Models XC2202M and XC2204M

Enerpac declares that the model XC2202M and XC2204M cordless hydraulic pumps have been tested and conform to applicable standards and are approved to carry the CE, TÜV and UKCA certification marks.

NOTICE For all pumps, a copy of the product's EU Declaration of Conformity is enclosed with each shipment. A copy of the UK Self-Declaration of Conformity is also enclosed.

2.2 Electromagnetic Compatibility (EMC)

The model XC2202M and XC2204M cordless hydraulic pumps have been tested and certified to conform to CE-EMC, FCC, and Japanese EMC emission and immunity standards.

NOTICE The pump may stop running and become unresponsive if electromagnetic interference (EMI) between 80 MHz and 400 MHz is present. The recommended action is to remove the source of the interference. If this is not possible, repositioning the pump may restore functionality.

2.3 Battery Safety Certifications

Refer to the separate battery manual for additional certifications pertaining to the Li-Ion battery used with the pump.

2.4 IP Rating

The model XC2202M and XC2204M cordless hydraulic pumps carry an IP20 ingress protection rating:

- The pump is resistant to objects that are over 12.5 mm [0.49 inch] in size.
- The pump has no protection against liquid entry, such as rain or water-spray.
- The pump can be used outdoors, but should be brought inside in the event of rain or other moisture.

3.0 PRODUCT DATA

3.1 Specifications

Pump Models	Control Valve	For Use With Cylinder or Tool Type:	Hydraulic Connection	Operating Temp Range*		Motor Rating		Motor Speed	Sound Pressure**
				˚F	˚C	hp	kW	RPM	dBA
XC2202M XC2204M	Lever Operated, Manual 3-way, 2-position	Single-acting	3/8" NPTF	+14 to +122	-10 to +50	0.94	0.70	14,000-18,000	83

*At 85% relative humidity. **Typical. Sound level will vary depending on pump speed and load.

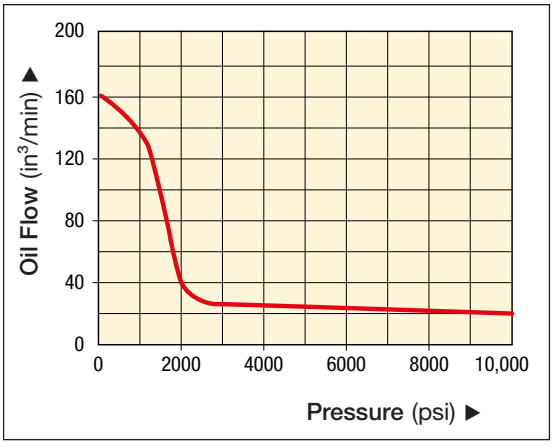
3.2 Pressure and Flow

Pump Models	Maximum Hydraulic Operating Pressure*		Flow Rate (also see Section 3.3)						Relief Valve Adjustment Range	
	psi	bar	At No Load		At 2000 psi [138 bar]		At 10,150 psi [700 bar]			
			in^3/min	l/min	in^3/min	l/min	in^3/min	l/min	psi	bar
XC2202M XC2204M	10,150	700	160	2.6	50	0.82	20	0.33	1,000 - 10,150	69 - 700

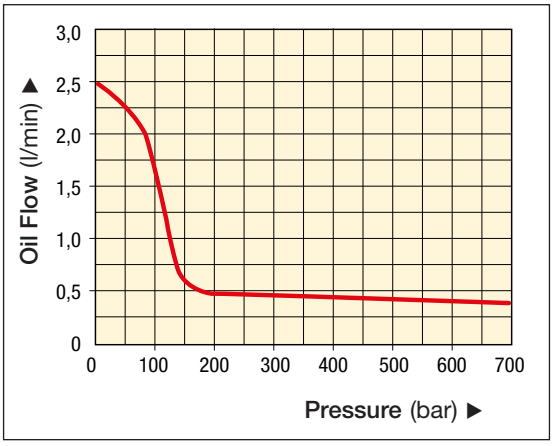
*Maximum system pressure is limited to approximately 10,400 -10,800 psi [717 - 744 bar] by an internal safety relief valve.

3.3 Performance Graphs

MODELS XC2202M & XC2204M (IMPERIAL)



MODELS XC2202M & XC2204M (METRIC)



Note: Graphs show typical pump pressure/flow curves.

3.4 Reservoir Capacities and Pump Weights

Pump Model Number	Pump Weight*		Reservoir Usable Oil Capacity		Hydraulic Oil
	lb	kg	in^3	l	
XC2202M	26.3	11.9	120	2.0	Enerpac HF
XC2204M	29.8	13.5	240	4.0	

*Approximate weight of pump with oil in reservoir, and with battery installed. Weight of battery is approximately 3.5 lb [1.6 kg].

3.5 Battery and Battery Charger

Pump Model Number	Item	Region/Country	Enerpac Model No.
XC2202M and XC2204M	Battery, 54V, Enerpac Lithium-Ion, 4.0 Ah, 216 Wh	(all)	EBH544
	Charger (includes AC power cord for selected region or country)	North America 115V	EC1F541B
		Europe 230V	EC1F542E
		Australia 230V	EC1F542A
	Charger AC power cord for Japan (order separately if needed)	Japan 100V	ECC541N
	Charger AC power cord for UK (order separately if needed)	United Kingdom 240V	ECC542U

Note: Battery and charger may be included with pump or may need to be purchased separately (varies depending on how pump was ordered). Charger power input is 100-240 VAC, 50-60 cycles, auto voltage sensing. Charger AC power cord (detachable) will vary depending on region/country and voltage. Refer to Figure 28 of this manual and also to the separate battery and charger manuals for additional information.

3.6 Selected Pump Accessories (optional equipment)

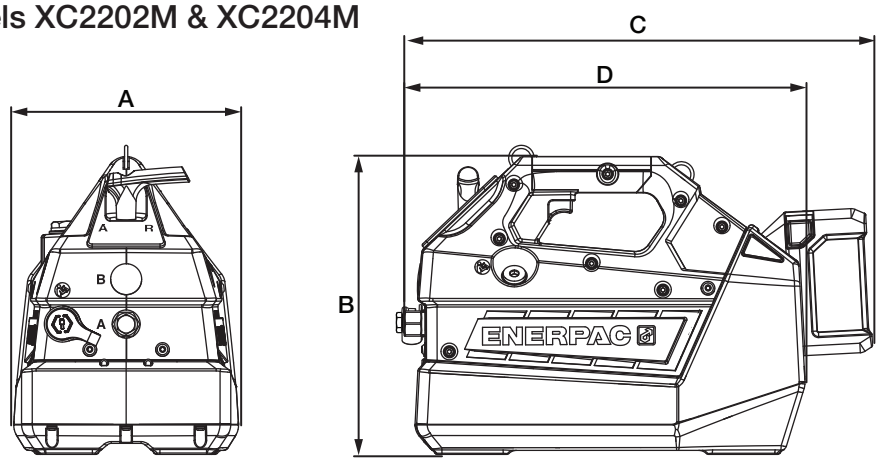
Pump Model Number	Item	Enerpac Model No.
XC2202M and XC2204M	Corded Remote Pendant, 10 ft [3 m]	CC131
	Corded Remote Pendant, 20 ft [6 m]	CC132
	Pendant Extension Cord, 10 ft [3 m]	CC010
	Shoulder Strap, XC2 Series Pumps	SSTRP55

Note: Refer to Enerpac website or catalog for a complete description of available pump accessories.

3.7 External Dimensions

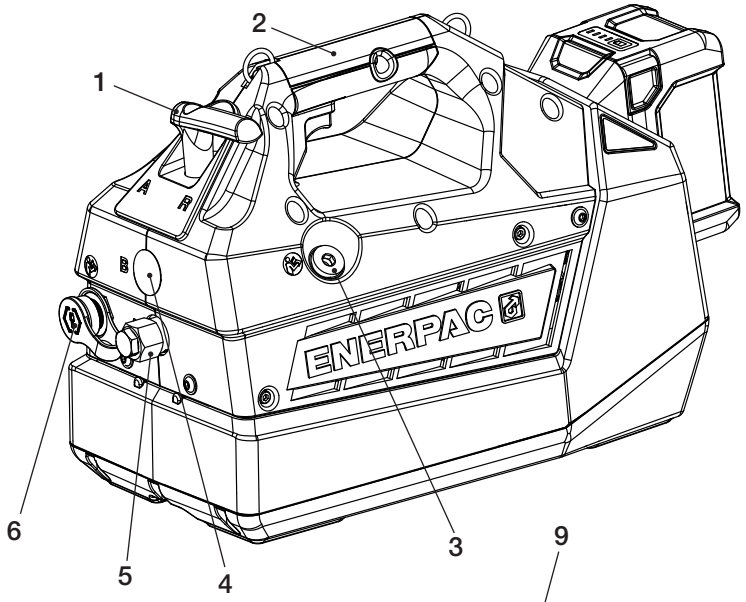
Item	Dimension	
	inch	mm
A	8.8	224
B	11.7	297
C	18.4	467
D	15.7	399

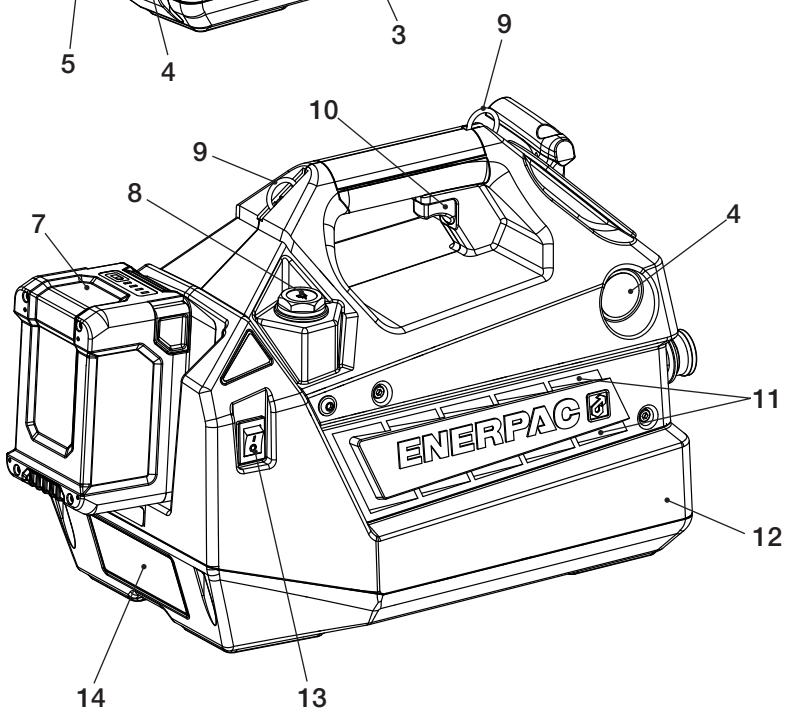
Models XC2202M & XC2204M

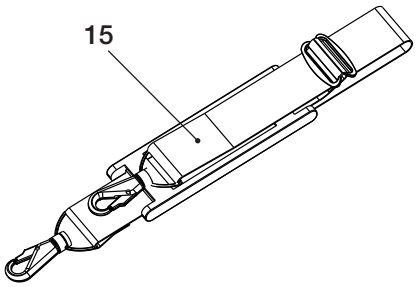


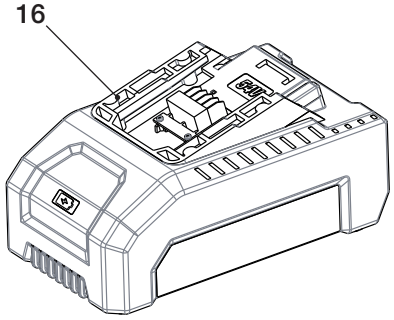
Note: Dimensions are the same for both pump models. Dimensions shown are for reference only and may vary slightly from pump to pump.

4.0 FEATURES AND COMPONENTS









Key:

1. Control Valve Lever
2. Carrying Handle
3. Access Plug, User-Adjustable Relief Valve
4. Plug (for unused hole)
5. Hydraulic Port “A” (advance/retract)
6. Pendant Connector
7. Lithium-Ion Battery*
8. Oil Fill Plug
9. Shoulder Strap Attachment Ring
10. Trigger Switch, Variable Speed
11. Ventilation Holes
12. Hyd. Reservoir (bladder type - inside pump housing)
13. Power Switch
14. Pump Nameplate
15. Shoulder Strap**
16. Battery Charger*
17. Remote Pendant**

* Item may be included with pump or may need to be purchased separately. Refer to Enerpac website or catalog for ordering information.

** Optional Accessory

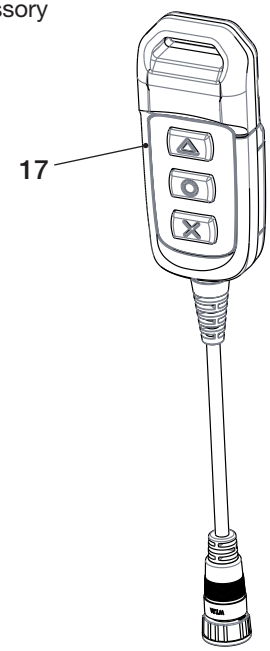


Figure 1: Features & Components, Models XC2202M and XC2204M

5.0 DESCRIPTION

The Enerpac XC2 Series cordless pumps combine the performance of a powered pump with the portability of a hand operated pump.

Designed for use with single-acting hydraulic cylinders and tools, pump models XC2202M and XC2204M feature a high-performance, brushless DC electric motor, two-stage hydraulic pump element and a manual 3-way, 2-position control valve.

An integral bladder type oil reservoir allows pump operation in any position and helps prevent contamination. Model XC2202M features a two liter [120 in^3] oil reservoir. Model XC2204M contains a four liter [240 in^3] oil reservoir, for use with larger and/or multiple cylinders or tools.

Power is supplied by a rechargeable 54 volt, 4 Ah Lithium-Ion battery. The Lithium-Ion battery is capable of providing extended run times, even under demanding conditions.

A variable speed trigger switch permits increased precision of tool or cylinder travel. For those users who require it, a remote control corded pendant is available as an optional accessory.

INSTALLATION & SETUP

5.1 Receiving Instructions

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

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

5.2 Hydraulic Connections

The pump contains a 3-way, 2-position lever-operated manual control valve. It is designed for use only with single-acting hydraulic cylinders and tools.

NOTICE Installation of a pressure gauge (user-supplied) in the hydraulic line is strongly recommended. All hoses couplers, fittings and other hydraulic components used with the pump must be rated to at least 10,150 psi [700 bar].

NOTICE As hoses, fittings and other components are assembled, apply 1-1⁄2 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 2. Use care to prevent pieces of tape from entering the hydraulic system.

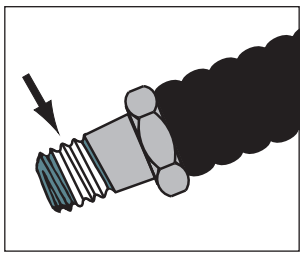


Figure 2: Sealing Tape

Make hydraulic connections as described in the following steps. Refer to Figure 4 for an example of a typical single-acting system setup.

1. To prevent the pump from starting while hydraulic connections are being made, be sure that the pump power switch is OFF (**O**). Or, remove the battery from the pump (if installed).
2. Move the control valve lever several times back and forth between the “A” and “R” positions to be sure that any residual hydraulic pressure is fully relieved.

NOTICE Refer to Figure 3 during steps 3 through 5. Only port “A” is present on pump models XC2202M and XC2204M. A plastic plug covers the unused port “B” opening.

3. Use a 15/16" wrench to hold the port “A” fitting in place. Then, using an 11/16" wrench, remove the shipping plug.

NOTICE Port “A” has 3/8" NPTF threads. When making threaded connections in steps 4 and 5, tighten hose fitting or coupler so it is finger tight. Then, tighten it an additional 2 full turns. During tightening, use a 15/16" wrench to hold the port fitting in place.

4. If used in your system, install a hydraulic coupler (user-supplied) in port “A” of the pump.
5. Connect one end of the hydraulic hose to port “A” of the pump or to the coupler installed in port “A”. Connect the other end of the hose to the pressure port of the single-acting cylinder or tool.

NOTICE Threaded connections for items such as fittings, gauges, etc. must be securely tightened and leak-free. If using hydraulic couplers, make sure that all couplers are fully engaged.

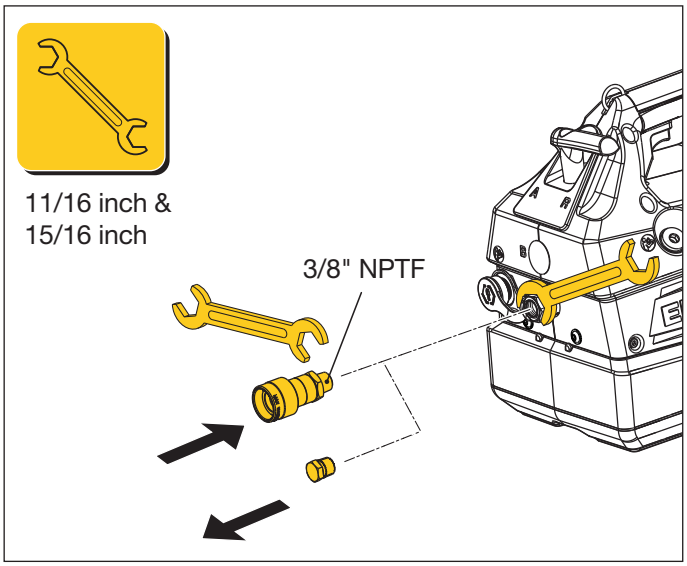
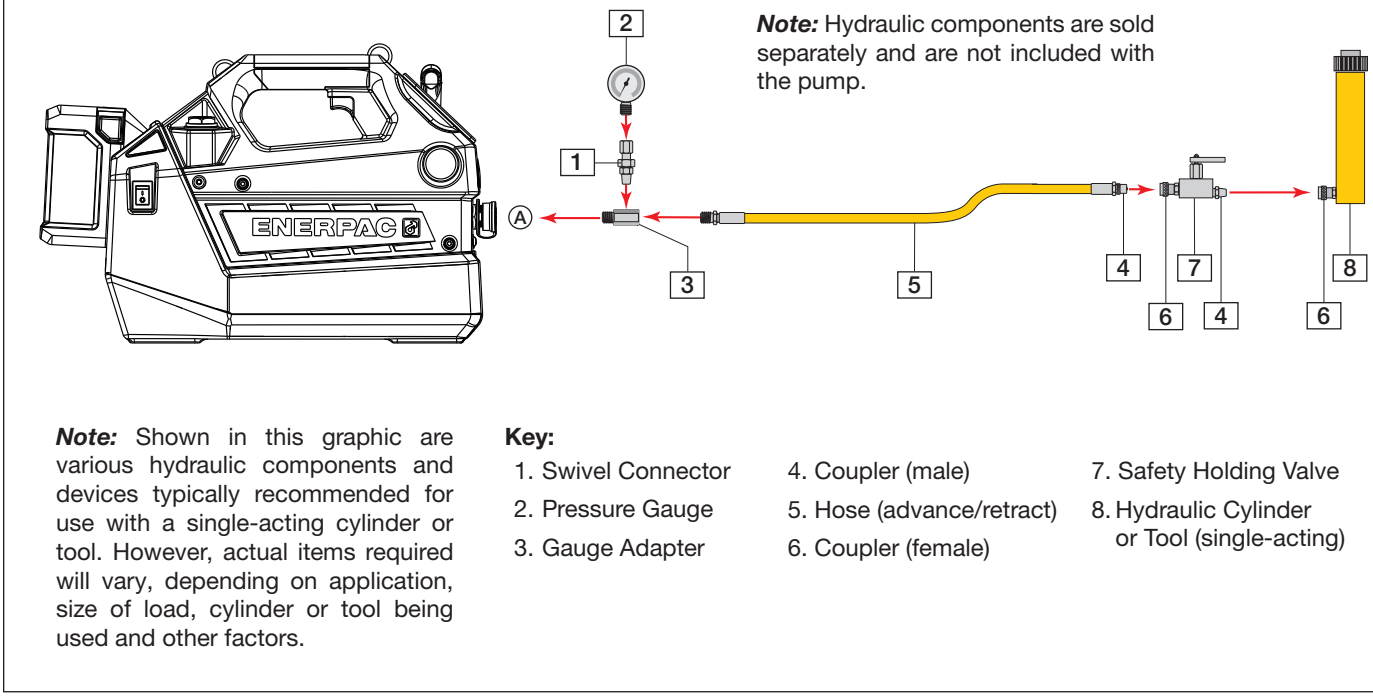


Figure 3: Hydraulic Connection to Pump



Note: Hydraulic components are sold separately and are not included with the pump.

Note: Shown in this graphic are various hydraulic components and devices typically recommended for use with a single-acting cylinder or tool. However, actual items required will vary, depending on application, size of load, cylinder or tool being used and other factors.

Key:

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

Figure 4: Single-Acting Hydraulic Circuit and Components (typical)

6.0 BATTERY

NOTICE Press battery charge indicator button to determine charge level before using or charging battery for the first time.

NOTICE New batteries should be fully charged before use. Battery and charger must be purchased separately if not included in the shipment with the pump. Refer to Section 3.5 of this manual for battery and charger model numbers.

NOTICE Refer to the separate battery and charger manuals for complete battery use and care information and charging instructions.

6.1 Charge Level Indicator

A small panel containing a charge indicator button and four charge indicator lights is located on the battery housing. Press the button to display the battery charge level. The lights will remain on for 3 seconds and then turn off automatically. See Figure 5.

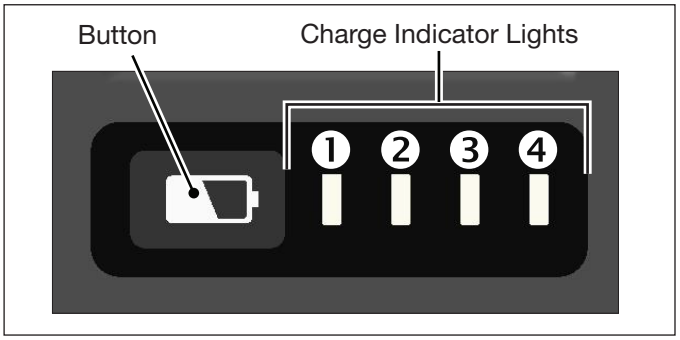


Figure 5: Battery Charge Level Indicator

Refer to the following table to determine the level of charge:

When battery charge indicator button is pressed:		Percent Charge: (approximate)
Lights 1-4 on		Above 75%
Lights 1-3 on		51 - 75%
Lights 1-2 on		26 - 50%
Light 1 on		10 - 25%
Light 1 flashing red	Remaining Charge < 5%	

One or more of the indicator lights should glow white when the charge indicator button is pressed. If the #1 indicator light flashes red when the button is pressed, the battery charge is very low. If none of the lights illuminate when the button is pressed, the battery is fully discharged.

NOTICE Run time between battery charges is mostly dependent on the pressure required for the application. The higher the required pressure setting, the shorter the runtime will be. To increase runtime, whenever possible use a cylinder or tool capable of operation below 8,000 psi [552 bar].

6.2 Low Voltage Shutoff

The pump will stop running (or will be prevented from starting) if battery voltage drops below a pre-determined low limit.

The pump may slow down or operate sluggishly before shutoff occurs, providing a signal that the battery is approaching full discharge.

NOTICE It is recommended that the battery be removed from the pump and placed in the charger before it becomes fully discharged. Full discharge cycles may cause permanent damage to the battery cells.

NOTICE If the battery becomes fully discharged while the pump is in use, it should be placed in the charger within 12 hours and kept in the charger until fully charged. This will help prevent battery damage and premature battery failure.

6.3 Overcurrent and Overtemperature Protection

The battery will shut-off automatically in the event that battery current draw becomes excessive or if the battery's internal temperature rises above acceptable limits.

Both faults are self-resetting. Normal battery operation will resume when the excessive current draw condition is eliminated or after the battery has cooled down.

In order to reset these faults, it may sometimes be necessary to cycle the pump power switch off and on, or to remove and reinstall the battery.

6.4 Cold Weather Operation

If the battery's internal temperature drops below approximately -13°F [-25°C], battery shutdown will occur and the pump will be prevented from starting.

If the pump will not start and the ambient temperature is very cold, remove the battery from the pump and take it to a room temperature location. Allow time for the battery to warm-up and be sure it is fully charged. Then, re-install the battery and try starting the pump again.

6.5 Battery Installation and Removal

- **To install battery on pump:** Slide the battery down onto the battery interface at the rear of the pump. Make sure it latches securely into place. See Figure 6.
- **To remove battery from pump:** Press and hold the release buttons located on each side of the battery. Then, slide the battery upward and remove it from the pump. See Figure 7.

NOTICE To ensure compatibility and proper operation, use only the specified Enerpac 54V Lithium-Ion battery with the pump. Refer to Section 3.5 for battery specifications and model number.

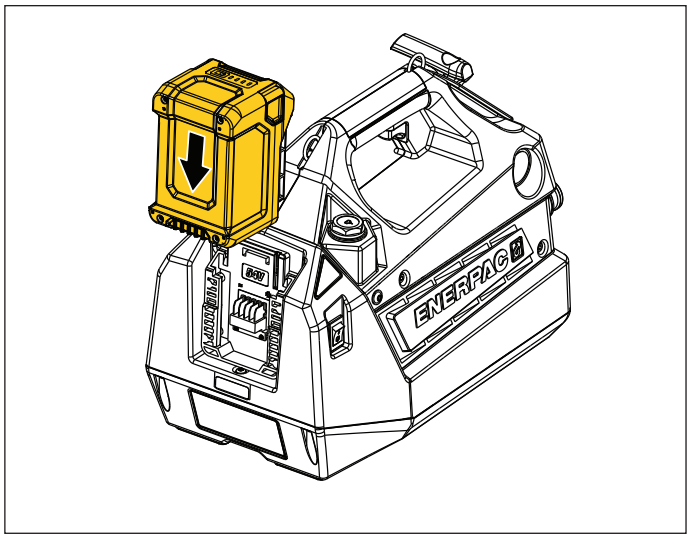


Figure 6: Battery - Install

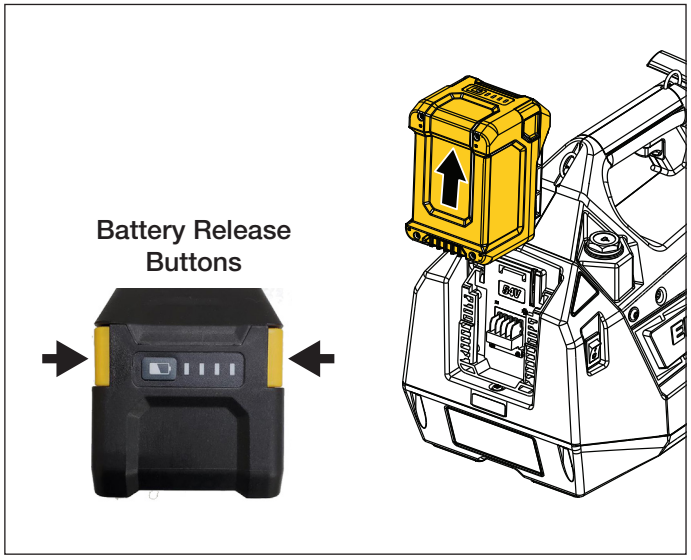


Figure 7: Battery - Remove

7.0 OPERATION

7.1 Power Switch

The pump is equipped with a two-position rocker style power switch. It is located on the right-hand side of the pump housing near the battery. Refer to Figure 8.

Depressing the top half of the power switch (**I**) connects battery power to the pump motor control circuit. Depressing the bottom half of the power switch (**O**) disconnects battery power to the motor control circuit.

The power switch must be in the ON (**I**) position to allow the pump motor to start, whether it is being controlled by the pump's built-in trigger or the optional remote pendant. The trigger switch and pendant buttons are non-functional when the power switch is in the OFF (**O**) position.

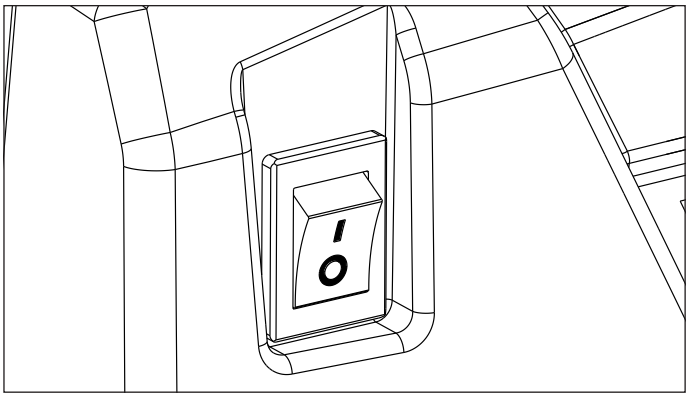


Figure 8: Power Switch

The power switch can remain in the ON (**I**) position when the pump is temporarily idle, but in regular use.

However, always turn the power switch OFF (**O**) in any of the following conditions:

- If an emergency occurs and the pump must be stopped immediately.
- Before moving or transporting the pump.
- During sustained periods of non-use (overnight, etc.) while the battery remains installed on the pump.
- When performing routine inspection and maintenance procedures while the battery is installed.

NOTICE The pump motor control circuits will consume a small amount of battery power when the pump is idle and the power switch is in the ON (**I**) position. To prolong the battery charge, it is recommended that the power switch be turned off overnight and during other long periods of inactivity.

7.2 Before Start-up

1. Connect the hydraulic hose. Check all hydraulic fittings and connections to be sure they are tight and leak free. Refer to instructions in Section 5.2.
2. Check the hydraulic oil level. Add oil if necessary. Refer to sections 8.1, 8.2 and 8.3 for procedures.
3. If ordered with the pump: Connect the remote pendant (optional accessory) to the connector on the front of the pump housing. Attach the shoulder strap (optional accessory) to the ring at each end of the pump carrying handle.
4. Install a fully charged battery on the pump. Refer to Section 6.5 for additional information.

NOTICE Press battery charge indicator button to determine charge level before using or charging battery for the first time.

NOTICE New batteries should be fully charged before use. Refer to Section 6.1. Also refer to the separate manuals for the battery and battery charger for additional information.

5. Before operating the pump under load, perform the air removal procedure to purge any trapped air from the system. Refer to Section 7.9.
6. Pump relief valve is factory set to approximately 10,150 psi [700 bar]. If a lower setting is desired, readjust the relief valve pressure as described in Section 8.5.

7.3 Operating 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 the load drops on persons below.

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

- Keep persons away from area under load during lifting, lowering and whenever the control valve lever is moved or system pressure is relieved.
- To prevent the load from dropping, always immediately support it with jack stands or other mechanical blocking devices of adequate rated capacity after lifting is completed. The pump control valve does NOT contain a safety locking valve.
- Be certain that blocking is fully in place before moving the control valve lever from the “A” to the “R” position. An unsupported load will drop when the control valve is shifted.
- Although the pump hydraulics may temporarily hold the load, be aware that the load can drift downward or drop suddenly at any time if it is not mechanically supported.

7.4 Operating the Pump Motor

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

1. Be sure that the pump power switch is in the ON (**I**) position.
2. To start the pump motor, firmly grasp the carrying handle and pull the trigger switch upward. To run the pump faster, pull the trigger switch further upward. To run the pump slower, reduce force on the trigger switch.

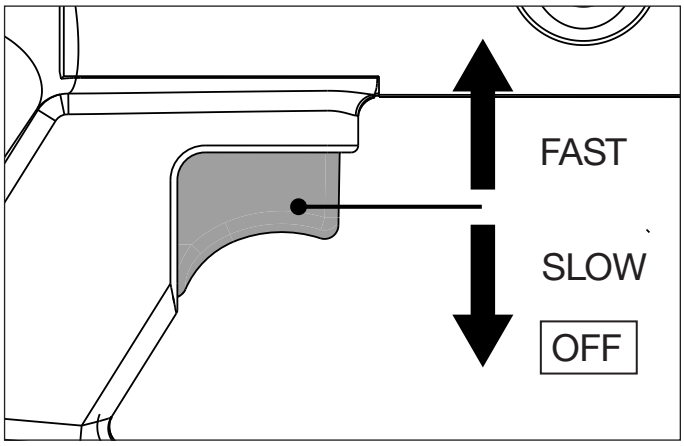


Figure 9: Trigger Switch Operation

3. To stop the pump motor at any time, fully release the trigger switch.

7.5 Control Valve Operation

The pump's manual control valve is operated by a rotary lever located at the front of the pump. See Figure 10 and Figure 11 for valve positions.

- To advance the cylinder: Move the control valve lever to the "A" position. Then, pull the trigger switch upward to start the motor. The cylinder will continue to advance until the trigger switch is released or the cylinder reaches its maximum travel.
- To retract the cylinder: Move the control valve lever to the "R" position. The cylinder will continue to retract until the valve lever is moved to the "A" position or until the cylinder is fully retracted.
- The pump is not designed to hydraulically hold or support the load while persons are working in the area. After lifting is completed, the load must be mechanically supported (refer to warning statements and related information in Section 7.3).

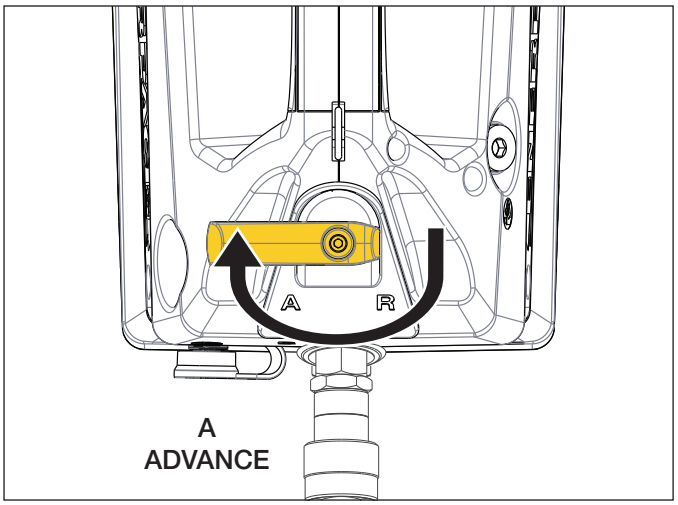


Figure 10: Control Valve Lever - Advance Position

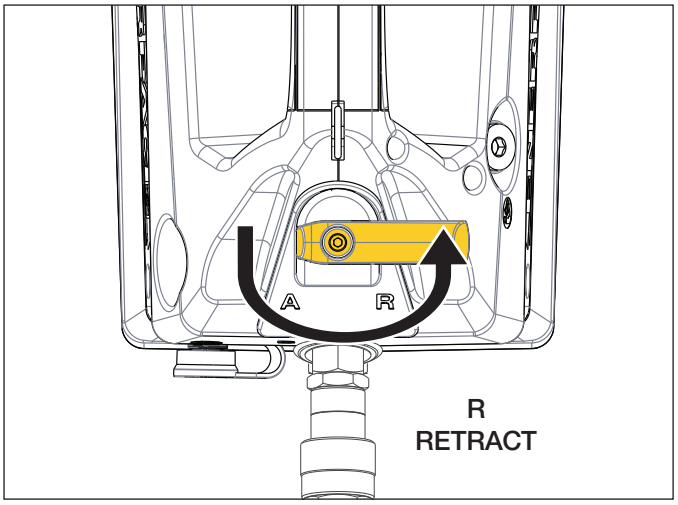


Figure 11: Control Valve Lever - Retract Position

7.6 Remote Pendant Operation

A corded remote pendant is available as an optional accessory.

The pendant cable connection is located on the front of the pump, beside hydraulic port "A".

Pendant operation is as follows. See Figure 12:

- Press and hold the JOG button to start the motor.
- Release the JOG button to stop the motor.
- The and buttons are NOT used on this pump version.
- The motor will automatically run at maximum speed when the JOG button is pressed. If variable speed capability is needed, use the trigger switch on the pump.

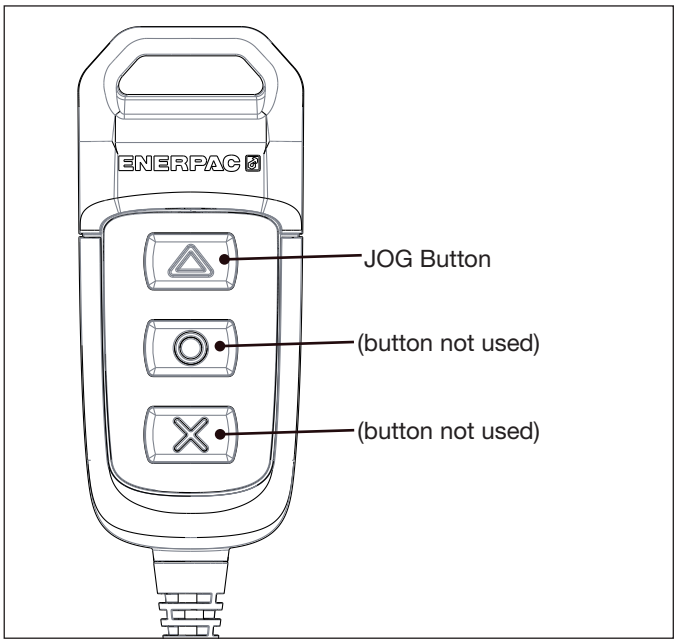


Figure 12: Remote Pendant (optional accessory)

7.7 Fault Conditions

If a fault condition is initiated while the pump motor is running, the motor will stop immediately. In addition, when a fault condition is active, the motor will not restart when using either the trigger switch or the optional remote pendant.

Any of the following occurrences will initiate a fault condition:

- Pressing any two pendant buttons at the same time.
- Pressing any pendant button at the same time while the pump trigger switch is being operated.
- If battery voltage falls below a pre-determined limit.
- Excessive pump internal temperatures.
- Damaged pump components and/or abnormal conditions sensed by the pump electronic control system.

7.8 If Motor Fails To Start (Fault Reset)

If the battery is charged, and the pump motor fails to start when the trigger switch is operated or the pendant JOG button is pressed:

1. Turn off the pump power switch (**O**).
2. Wait for 3 to 5 seconds. Then, turn on the pump power switch (**I**) to reset the fault.
3. If a fault has been successfully reset and the battery is adequately charged, normal pump operation should resume.

NOTICE If motor still fails to start, take pump to an Enerpac authorized service center for inspection and diagnosis.

7.9 Air Removal

When hydraulic connections are made to a new pump, air will be trapped inside the hoses and other components. This trapped air can cause erratic operation of cylinders or tools.

To ensure smooth, safe operation, remove the pump oil fill plug and run the cylinder or tool through several complete advance-retract cycles. Do this under no load and with the pump positioned higher than the cylinder or tool.

When the cylinder or tool advances and retracts smoothly without hesitation, it is an indication that air has been successfully vented from the system. Fully retract the cylinder and re-install the oil fill plug after procedure is completed.

7.10 Disconnecting Hydraulic Hose

Relieve hydraulic pressure and disconnect the hydraulic hose from the pump as described in the following steps:

1. Fully retract the cylinder or tool. Be sure that the load is completely removed.
2. Turn off the pump power switch (**O**).
3. Move the control valve lever back and forth between the “A” and “R” positions several times to relieve any residual hydraulic pressure in the system.
4. If a pressure gauge has been installed, verify that the gauge indicates zero (0) psi/bar. Verify that hose is not stiff and that there are no other indications of possible trapped hydraulic pressure.
5. Disconnect hose from the pump “A” port.
6. To prevent dirt entry and contamination, install a dust cap or plug (as required) in the pump “A” port connection.

7.11 Transporting the Pump

Before moving or transporting the pump, be sure that the pump power switch is OFF (**O**) or that the battery is removed. This will help prevent accidental pump startup.

Always move or transport the pump using only the built-in carrying handle or the shoulder strap (optional accessory).

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

8.0 MAINTENANCE

8.1 Check Oil Level

1. Be sure hydraulic cylinder or tool is fully retracted and that the load is completely removed.
2. Move the control valve lever back and forth between the “A” and “R” positions several times to relieve any residual hydraulic pressure in the system.
3. Turn off the pump power switch (**O**).
4. Be sure the pump is on a level surface.
5. Remove the oil fill plug from the fill opening. Use a 27 mm wrench. See Figure 13.

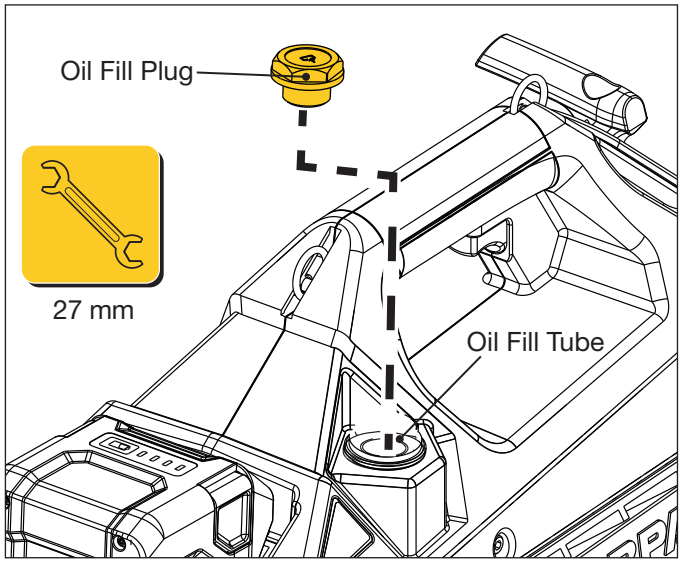


Figure 13: Oil Fill Location

6. Check the oil level. Reservoir is FULL when oil level is near the top of the oil fill tube.
7. If oil level is low, add oil as described in Section 8.3. Refer to Section 8.2 for oil requirements.

NOTICE An O-ring fits inside a groove on the underside of the oil fill plug. Check for this O-ring and reinstall it if it has dropped out of the groove. If the O-ring is missing or damaged, replace the oil fill plug. A new O-ring will be included with the replacement oil fill plug.

8. Reinstall the oil fill plug after checking oil level. Tighten the plug until it is hand-tight. Do not overtighten.

8.2 Hydraulic Oil Requirements

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

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

8.3 Adding Oil

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

NOTICE

- Always turn off the pump power switch (**O**) before removing the oil fill plug and adding oil. This will prevent accidental pump start-up.
- Use only Enerpac HF hydraulic oil. Refer to Section 8.2. Use only new oil poured from a clean container.
- To avoid spillage and to allow proper venting, always use a funnel of the proper size when adding oil. Spillage and under filling will occur if a funnel is not used.

Add oil as described in the following steps:

1. Be sure hydraulic cylinder or tool is fully retracted and that the load is completely removed.
2. Move the control valve lever back and forth between the “A” and “R” positions several times to relieve any residual hydraulic pressure in the system.
3. Place the pump on a level work surface. Be sure the pump power switch is in the OFF (**O**) position.
4. Remove the oil fill plug from the fill opening. Use a 27 mm wrench. See Figure 13.
5. Place a funnel (maximum 3/4" [19 mm] stem outer diameter & at least 1-3/16" [30 mm] long) through the fill opening and into the oil fill tube. See Figure 14.

NOTICE Pour oil slowly to avoid spillage. If oil begins to overflow from the fill opening, stop pouring immediately.

6. SLOWLY add Enerpac HF oil while watching the oil level in the funnel stem. To avoid spillage, stop pouring immediately when oil reaches the top of the fill opening or begins flowing around the outside of the funnel stem.
7. Remove funnel from fill opening. Wipe off and/or remove any spilled oil.

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

NOTICE An O-ring fits inside a groove on the underside of the oil fill plug. Check for this O-ring and reinstall it if it has dropped out of the groove. If the O-ring is missing or damaged, replace the oil fill plug. A new O-ring will be included with the replacement oil fill plug.

8. Reinstall the oil fill plug. Tighten the plug until it is hand-tight. Do not overtighten.

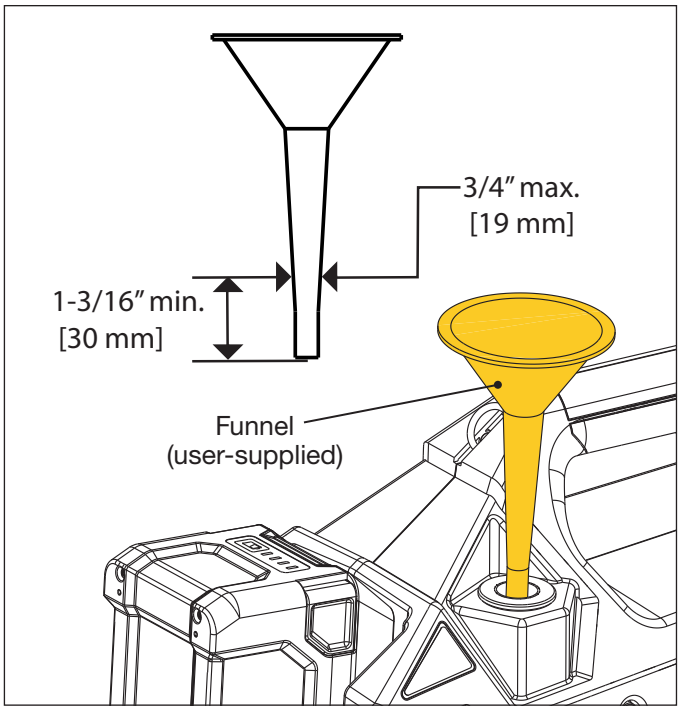


Figure 14: Adding Oil Using Funnel

8.4 Oil Change

Check oil for contamination by comparing the color of the oil in the reservoir fill tube to new unused Enerpac HF oil. Unused Enerpac HF oil is a crisp blue color.

As a general rule, completely drain and refill the pump’s bladder type reservoir every 250 hours of operation, or more frequently if used in dirty environments. Refer to the following procedure:

1. Be sure hydraulic cylinder or tool is fully retracted and that the load is completely removed.
2. Relieve any residual hydraulic pressure and disconnect the hydraulic hose from the pump “A” port. Refer to instructions in Section 7.10 of this manual.
3. Place the pump on a level work surface. Be sure the pump power switch is in the OFF (**O**) position.
4. 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 Model XC2202M has a two liter [120 in^3] reservoir capacity. Model XC2204M has a four liter [240 in^3] reservoir capacity. Be sure that pan or container is large enough to hold all the used oil.

5. Be sure the control valve lever is in the “A” advance position.
6. If removed, reinstall the oil fill plug in the pump oil fill port. This plug must remain installed in steps 7-9.
7. Turn on the pump power switch (**I**).

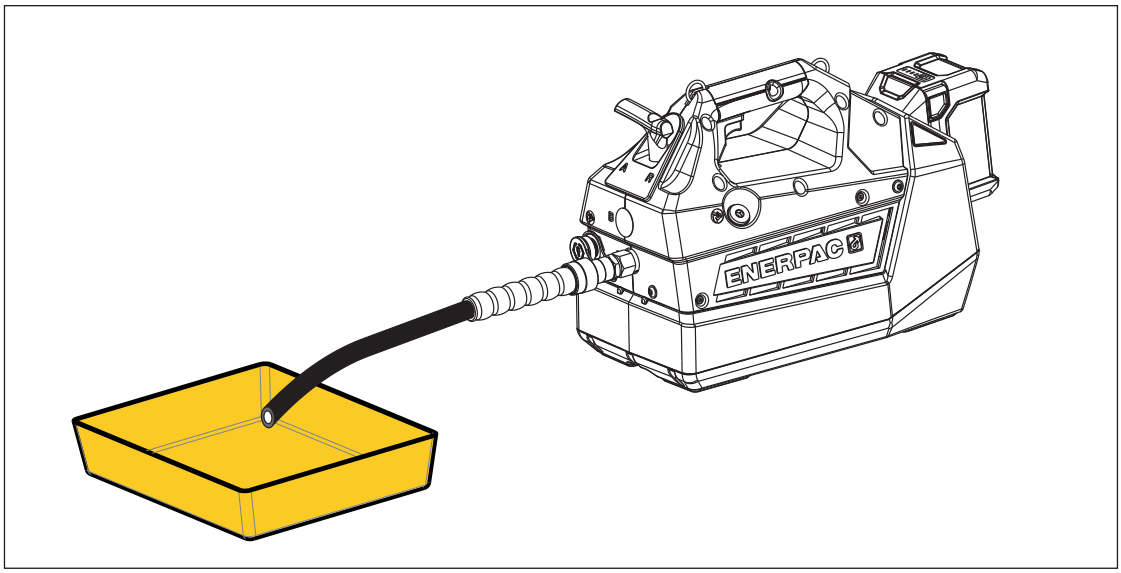


Figure 15: Draining the Hydraulic Reservoir

8. Pull the trigger switch upward to start the pump motor and begin draining the reservoir. Continue running the motor until oil stops flowing from the open-ended hose. Then, release the trigger switch. See Figure 15.

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

9. Turn off the pump power switch (**O**).
10. Remove the oil fill plug and fill the reservoir with new Enerpac oil. Refer to Section 8.2 for hydraulic oil requirements and Section 8.3 for detailed oil fill instructions.

NOTICE The actual amount of oil required to fill a completely empty reservoir may be slightly more than the pump's rated usable oil capacity (Refer to Section 3.4 of this manual).

11. Disconnect the open-ended hose from the pump “A” port. Reconnect the hydraulic hose from the cylinder or tool.
12. Run the pump and cycle the cylinder or tool several times to bleed any trapped air from the system. Refer to Section 7.9 for additional information.
13. Recheck oil level after cycling the cylinder or tool. With the cylinder or tool fully retracted, verify that oil level has not dropped. Add additional oil if level is low.

8.5 Relief Valve Pressure Adjustment

The pump contains a user-adjustable hydraulic pressure relief valve that is factory set before shipment to approximately 10,150 psi [700 bar]. Check the setting and readjust it if necessary as described in the following steps. See Figure 16.

1. Be sure that the hydraulic cylinder or tool is fully retracted and that the load is completely removed.
2. Turn off the pump power switch (**O**).
3. Relieve any residual hydraulic pressure and disconnect the hydraulic hose from the pump “A” port. Refer to instructions in Section 7.10 of this manual.
4. Connect a 0-15,000 psi [0-1000 bar] pressure gauge to the pump “A” port.
5. Move the control valve lever to the “A” advance position.
6. Turn on the pump power switch (**I**).
7. Pull the trigger switch upward to start the pump motor. While the motor is running, check the gauge reading to verify the relief valve pressure setting:
   - If the pressure setting shown on the gauge is correct for your application and does not exceed the maximum rated pressure of the cylinder or tool to be used, skip step 8 and go to step 9.
   - If the pressure setting shown on the gauge is not correct for your application and/or exceeds the maximum rated pressure of the cylinder or tool to be used, readjust the setting as described in step 8.

⚠ WARNING Be certain that the pressure setting does not exceed the maximum rated pressure of the cylinder (or tool) to be used, or of any other components in the system (hoses, fittings, etc.). Failure to observe this precaution may result in failure of cylinder or tool and related components. Death or serious personal injury could occur.

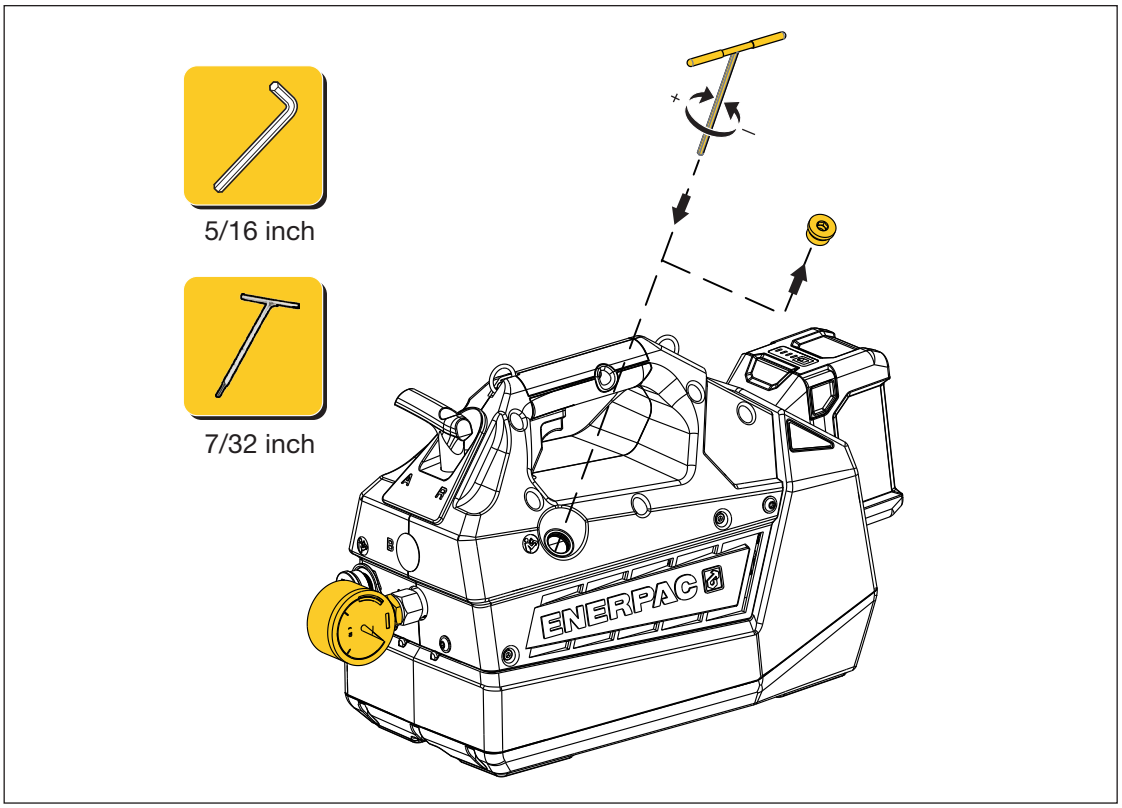


Figure 16: Relief Valve Pressure Adjustment

NOTICE Maximum system pressure is limited to approximately 10,400-10,800 psi [717 - 744 bar] by an internal safety relief valve.

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

   a. Using a 5/16" Allen wrench, remove the access plug from the side of the pump.

   b. Place a long 7/32" Allen wrench through the opening until it engages with the socket head of the pressure adjustment screw.

   c. Move the control valve lever several times back and forth between the “A” and “R” positions to relieve hydraulic pressure in the pump. Verify that the pressure gauge indicates zero (0) psi/bar.

   d. Only if pressure setting is to be decreased: Using the Allen wrench, turn the pressure adjustment screw about two turns counter-clockwise.

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

   e. Pull the trigger switch upward to start the pump motor.

   f. With the motor running, slowly turn the Allen wrench clockwise to increase the pressure setting to the desired setting. Observe the pressure gauge to determine when this setting has been reached.

   g. After adjusting the pressure setting, release the trigger switch to stop the motor.

   h. Move the control valve lever several times back and forth between the “A” and “R” positions to relieve hydraulic pressure in the pump. Verify that the pressure gauge indicates zero (0) psi/bar.

   i. Pull the trigger switch upward again to restart the pump motor. Re-check the pressure gauge reading.

NOTICE If pressure is too high or too low, stop the pump and repeat steps 8c through 8i. Note that it will first be necessary to relieve any residual pump pressure as described in step 8c before performing step 8d.

9. After verifying that the desired pressure setting has been achieved, remove the Allen wrench and reinstall the access plug.
10. Move the control valve lever several times back and forth between the “A” and “R” positions to relieve hydraulic pressure in the pump. Verify that the pressure gauge indicates zero (0) psi/bar.
11. Turn off the pump power switch (**O**).
12. Disconnect pressure gauge from the pump “A” port.
13. Reconnect hydraulic hose to the pump “A” port.

9.0 CLEANING

- Before beginning any cleaning procedures, always turn off the pump power switch (**O**) or remove the battery. Be sure that hydraulic pressure is completely relieved (0 psi/bar).
- Motor cooling vents are located on both sides of the pump housing, around each ENERPAC logo. To help ensure unrestricted airflow, remove any dust or dirt from these vents. Use a suitable soft brush.

⚠ WARNING To avoid a shock hazard, do not insert any objects inside the vents. Do not spray water or cleaners inside the vents.

- Wipe the pump exterior with a dry, soft cloth. Avoid using strong detergents or cleaners.
- Refer to the battery manual for battery cleaning instructions.

10.0 STORAGE

Store the pump as described in the following procedure:

1. Be sure that hydraulic pressure is completely relieved (0 psi/bar).
2. Turn off the pump power switch (**O**).
3. Remove the battery from the pump.
4. Store the pump and battery in a clean, dry and secured location, away from unauthorized users. Avoid storing in extreme heat or cold.

NOTICE After removing battery from storage, press charge indicator button to determine battery charge level. Do this before using or charging battery.

NOTICE Refer to the separate manuals for the battery and battery charger for additional storage information pertaining to those items.

11.0 SAFE DISPOSAL PROCEDURE

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

1. Drain all hydraulic oil from the pump hydraulic reservoir as described in Section 8.4 of this manual. Dispose of used oil in accordance with all applicable laws and regulations.
2. Remove battery from pump. Dispose of battery in accordance with instructions contained in the Enerpac battery manual.
3. Take the pump to an approved industrial recycling facility for disposal.

12.0 FIRMWARE UPDATES

When issued, product firmware updates will be made available via the Enerpac Connect App. Specific firmware updating instructions for your product model will be provided in the app.

ENERPAC CONNECT®

The Enerpac Connect App is available for download on the Apple App Store and on Google Play.

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13.0 TROUBLESHOOTING

Only qualified technicians should service the pump or system components. For repair service, contact your Enerpac authorized service center.

The troubleshooting guide (see next page) is intended to be used only as an aid in determining if a problem exists. A system failure may or may not be the result of a pump malfunction. To determine the cause of the problem, the complete system must be included in any diagnostic procedure.

⚠ 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 repair procedures.

Troubleshooting Guide		
Problem	**Possible Cause**	**Action**
1. Pump will not start.	a. Battery not installed.	Install battery.
	b. Pump power switch is in the OFF (**O**) position.	Turn on the pump power switch (**I**).
	c. Battery discharged.	Press the battery charge indicator button to determine battery charge level. Place battery in charger if charge level is low. Replace battery if it is damaged and cannot be charged.
	d. Electrical contacts dirty or corroded.	Clean the pump electrical contacts. **⚠ WARNING** To avoid sparks or possible electric shock, DO NOT clean contacts on battery.
	e. Battery overtemperature or undertemperature condition.	Battery will shut-down and prevent pump from starting if its internal temperature becomes too high or too low. If this condition is suspected, remove the battery from the pump and take it to a room temperature location. Allow time for the battery to return to normal operating temperatures before reinstalling it on the pump.
	f. Fault Condition • Button Fault • Trigger Fault • Other Fault Condition	Cycle power switch off and on to reset fault condition. Or, remove and reinstall battery.
	g. Pendant controls or cable damaged. (pumps equipped with optional remote pendant only)	Try operating the pump using the trigger switch or a different compatible pendant. If pump starts and operates normally, repair or replace the pendant.
	h. Motor and/or electronic control board damaged.	Contact Enerpac authorized service center.
	i. Pump jammed due to obstruction. Possible internal damage to pump.	Contact Enerpac authorized service center.

(continued on next page)

Troubleshooting Guide (continued)		
Problem	**Possible Cause**	**Action**
2. 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 motor with the control valve in the “R” 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. Control valve internal leakage, wear and/or damage.	Contact Enerpac authorized service center.
	e. Pump element internal leakage, wear and/or damage.	Contact Enerpac authorized service center.
3. Cylinder will not advance or retract.	a. Control valve lever in wrong position.	Move lever to the “A” position to advance. Move lever to the “R” position to retract.
	b. Hydraulic coupler(s) not fully engaged.	Check hydraulic couplers for full engagement. A partially engaged hydraulic coupler may reduce or block hydraulic flow.
	c. Low oil level.	Add oil until reservoir is completely full.
	d. Pump needs priming.	To prime the pump, be sure that the pump reservoir is filled with oil. Then, run the pump motor with the control valve in the “R” position while gently rocking the pump from side-to-side.
	e. Oil intake screen clogged with debris.	Contact Enerpac authorized service center.

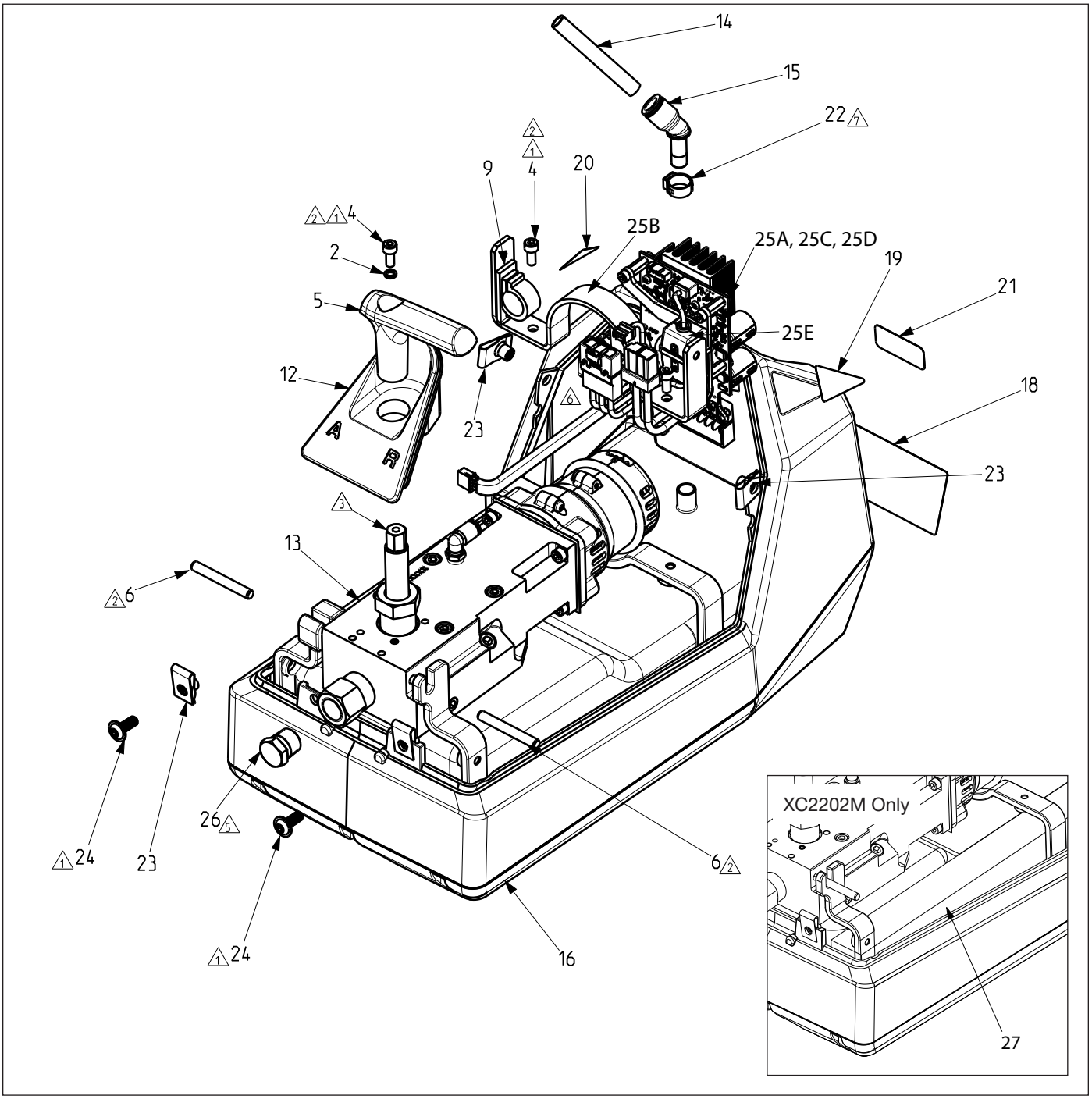
(continued on next page)

Troubleshooting Guide (continued)		
Problem	**Possible Cause**	**Action**
4. Cylinder advances and retracts erratically.	a. Air in the system.	Advance and retract the cylinder until operation is smooth. Refer to procedure in Section 7.9.
	b. External hydraulic leak.	Tighten connections. Replace damaged components.
	c. Control valve internal leakage, wear and/or damage.	Contact Enerpac authorized service center.
	d. Pump element internal leakage, wear and/or damage.	Contact Enerpac authorized service center.
5. Pump slows down and stops.	Battery discharged.	Charge battery. Replace battery if it is damaged and cannot be charged.
6. Pump stops during prolonged or heavy operation.	Excessive current draw or overtemperature condition.	Immediately release the trigger switch or pendant JOG button  . Allow time for pump to cool before restarting.
7. Pump stops during normal operation (even when battery is sufficiently charged).	a. Electromagnetic interference (EMI).	Electromagnetic interference (EMI) from other devices may cause pump to stop running and become unresponsive. When an EMI related shutdown occurs, the pump electronics will automatically reset and must finish cycling before the pump can be restarted. If pump stops after being restarted, check for and remove source of electromagnetic interference. If this is not possible, try repositioning or relocating the pump. Refer to Section 2.2 of this manual for additional information.
	b. Mechanical or electrical component failure.	Contact Enerpac authorized service center.
8. Pump does not build pressure.	User-adjustable relief valve set too low.	Adjust relief valve pressure. Refer to procedure in Section 8.5.
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 REPAIR PARTS SECTION

CONTENTS PAGE

Figure 17: Main Assembly



Notes:

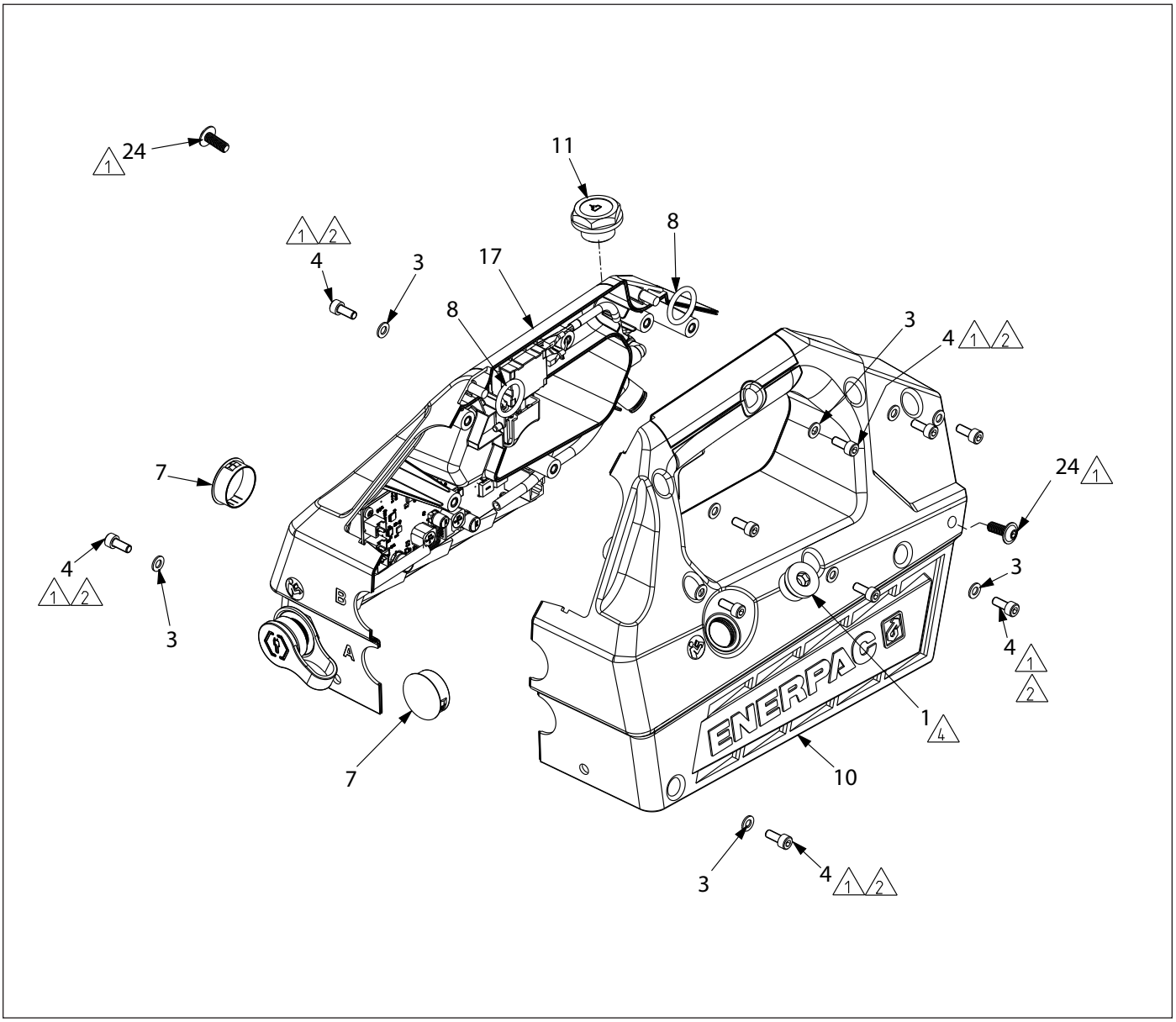
1 Torque to 18-26 in-lbs [2-3 Nm].
2 Secure with Loctite 243 thread locking compound.
Refer to manufacturer's technical data sheet for application instructions.
3 Before installing handle, rotate valve shaft counter-clockwise until it stops.
5 Torque to 120-144 in-lbs [13.6-16.3 Nm].
6 Secure motor and battery wires with cable ties.
7 Crimp tight.

Parts List for Figure 17

Item	Description		Qty	Part Number	
				Model XC2202M	Model XC2204M
2	◎	Washer, Lock #10	1	B1086066	B1086066
4	◆ ◎	Screw, SHCS Hex, M5	3	CBZ517028-1A	CBZ517028-1A
5	◎	Handle, Valve Lever	1	DD3398070	DD3398070
6	❖	Pin, 6 mm x 45 mm Lg	2	DD3417059	DD3417059
9	□	Cable Tie, Screw Mount	1	DD7326217	DD7326217
12	◆ ◎	Grommet	1	DD7952808	DD7952808
13		Power Unit & Reservoir Assembly	1	(See Figure 21)	(See Figure 21)
14	†	Tube, 0.38 OD x 2.56 Lg	1	DD8428268	DD8428268
15	▲▼†	Fitting, Elbow 45 Tube to Barb	1	DD8498097	DD8498097
16		Pump Base Assembly	1	(See Figure 20)	(See Figure 20)
18		Decal, Prod Specification Nameplate	1	DD7957026SR	DD8788026SR
19	O	Decal, 54V Left	1	DD8924026	DD8924026
20	O	Decal, 54V Right	1	DD8925026	DD8925026
21	O	Decal, California Prop 65	1	DD9065026	DD9065026
22	▲▼†	Clamp, Pinch	1	DD9124299	DD9124299
23	O	Nut, Clip On M6	4	DD9397021	DD9397021
24	◆	Screw, Flange Button Head M6	2	DD9398048	DD9398048
25A		Motor Driver, 24-63 VDC	1	DD8815380SR	DD8815380SR
25B	□	Bracket, Motor Clamp	1	DD8248111	DD8248111
25C	□	Standoff, 6 mm Hex	3	DD9404054	DD9404054
25D	□	SHCS, Hex, M4	6	CBE413028-1A	CBE413028-1A
25E		Ferrite Core	1	DM1535380SR	DM1535380SR
26		Plug	1	R515245-2	R515245-2
27		Insert, Foam	2	DD9045225	- - -

▲	Items included in 2L Bladder Kit, XC2B2LK.
▼	Items included in 4L Bladder Kit, XC2B4LK.
O	Items included in Lower Shroud Kit, XC2LSK.
◆	Items included in Upper Shroud Kit, XC2USK.
❖	Items included in Eccentric Housing Service Kit, XC2ECK.
□	Items included in Motor Driver Mounting Kit, XC2MDMK.
†	Items included in Oil Fill Tube Kit, XC2TK.
◎	Items included in Valve Handle Kit, XC2VHK.

Figure 18: Shroud Halves



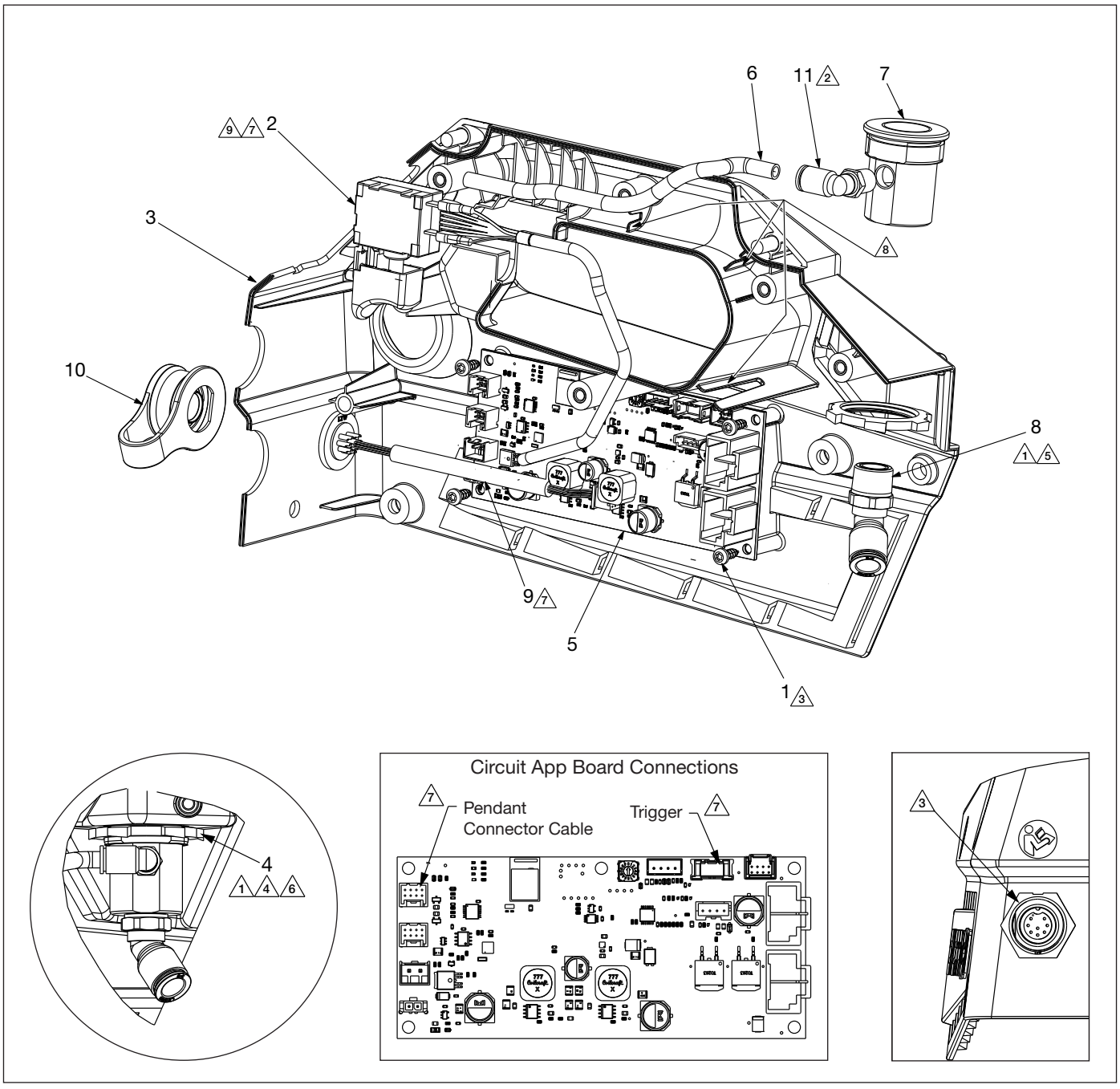
Notes:

1. Torque to 18-26 in-lbs [2-3 Nm].
2. Secure with Loctite 243 thread locking compound.
   Refer to manufacturer's technical data sheet for application instructions.
4. Torque to 25-30 in-lbs [2.8-3.4 Nm].

Parts List for Figure 18

Item		Description	Qty	Part Number	
				Model XC2202M	Model XC2204M
1	◆	Plug, Soc Hd St Thread 0.750-16	1	B1006006	B1006006
3	◆	Washer, Flat	10	CAE1050108-1A	CAE1050108-1A
4	◆	Screw, SHCS Hex, M5	10	CBZ517028-1A	CBZ517028-1A
7	◆	Plug, Dome, 28 mm	2	DD4112009	DD4112009
8		Ring, Round	2	DD4769667	DD4769667
10	◆	Shroud, Left-Hand	1	DD7920424	DD7920424
11	☆	Plug, Oil Fill	1	DD7927006	DD7927006
17		Right-Hand Shroud Components	1	(See Figure 19)	(See Figure 19)
24	◆	Screw, Flange Button Head M6	2	DD9398048	DD9398048
◆ Items included in Upper Shroud Kit, XC2USK.					
☆ Items included in Oil Fill Service Kit, XC2VFK.					

Figure 19: Right-Hand Shroud Components



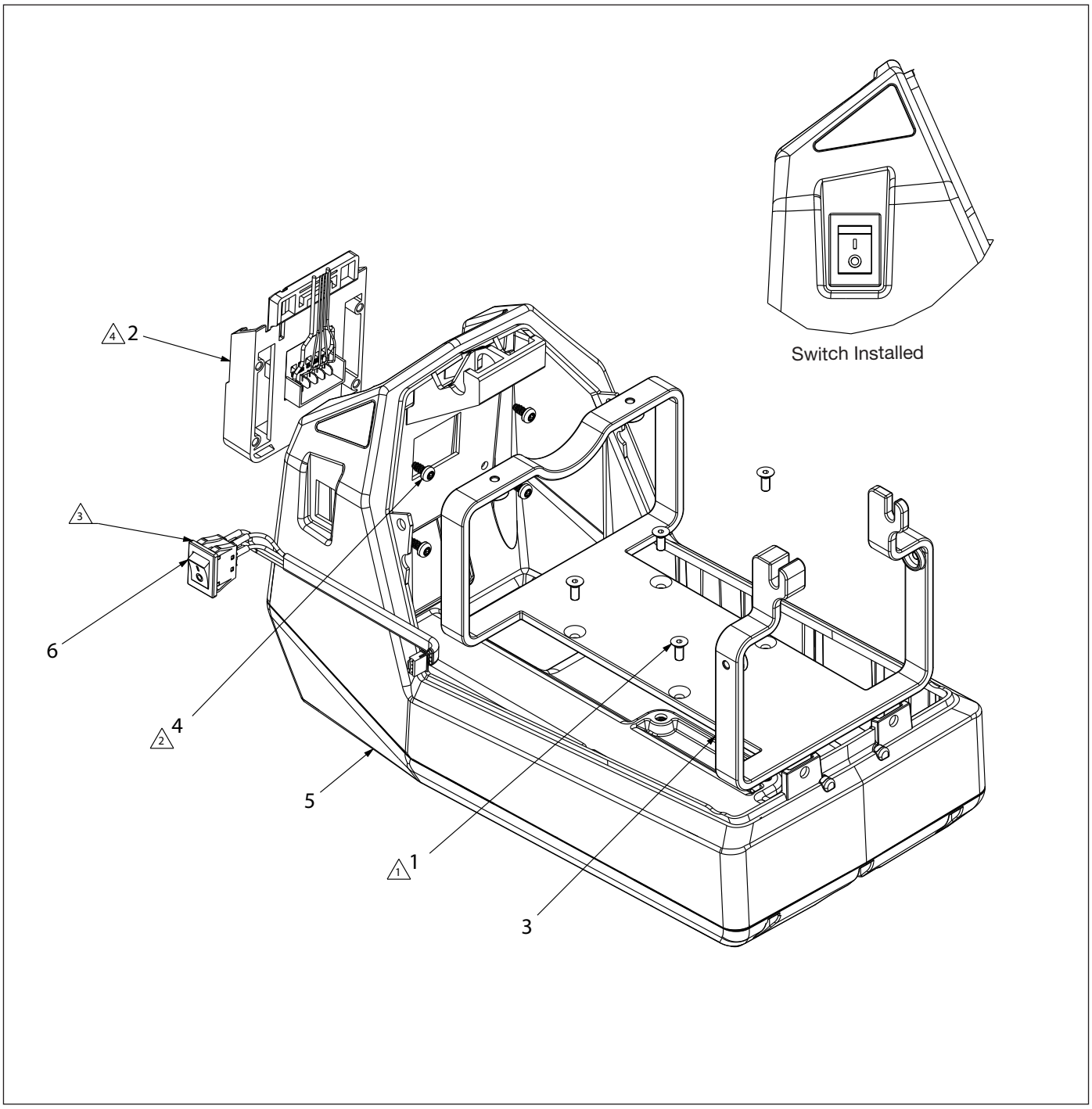
Notes:

1. Torque to 120-144 in-lb [13.6 - 16.3 Nm].
2. Torque to 60-80 in-lb [6.8 - 9.0 Nm].
3. Torque to 8-10 in-lb [0.9 - 1.1 Nm].
4. Secure with Loctite 271 thread locking compound.
   Refer to manufacturer's technical data sheet for application instructions.
5. Apply PTFE tape.
6. Orient with tabs bent down away from shell.
7. Connect to trigger and pendant connectors on circuit app board.
8. Secure trigger cable into slots on the shroud.
9. Trigger lock selector switch needs to be moved from the center locked position.

Parts List for Figure 19

Item	Description		Qty	Part Number
1	✸	Screw, M4 x 10 Thrd FRM	5	DD3883028
2	✯	Trigger, Variable Speed	1	DD7874372
3	◆	Shroud, Right-Hand	1	DD7921424
4	☆	Retainer, XC2 Oil Fill	1	DD7926160
5	✸	Circuit App Board	1	DD7929827
6	✝	Tube, Oil Vent	1	DD7962268
7	☆	Threaded Insert, Oil Fill	1	DD7966225
8	✝☆	Fitting, Elbow 45, Tube	1	DD8426097
9		Cord, Pendant Connector	1	DD8667960SR
10		Dust Cap, C1 Pendant Connector	1	DD8729020SR
11	✝☆	Fitting-M 90	1	F100097-52
◆ Items included in Upper Shroud Kit, XC2USK.				
✝ Items included in Oil Fill Tube Kit, XC2TK.				
✯ Items included in Trigger Kit, XC2TRK.				
☆ Items included in Oil Fill Service Kit, XC2VFK.				
✸ Items included in PCB Service Kit, XC2ACK.				

Figure 20: Pump Base Assembly



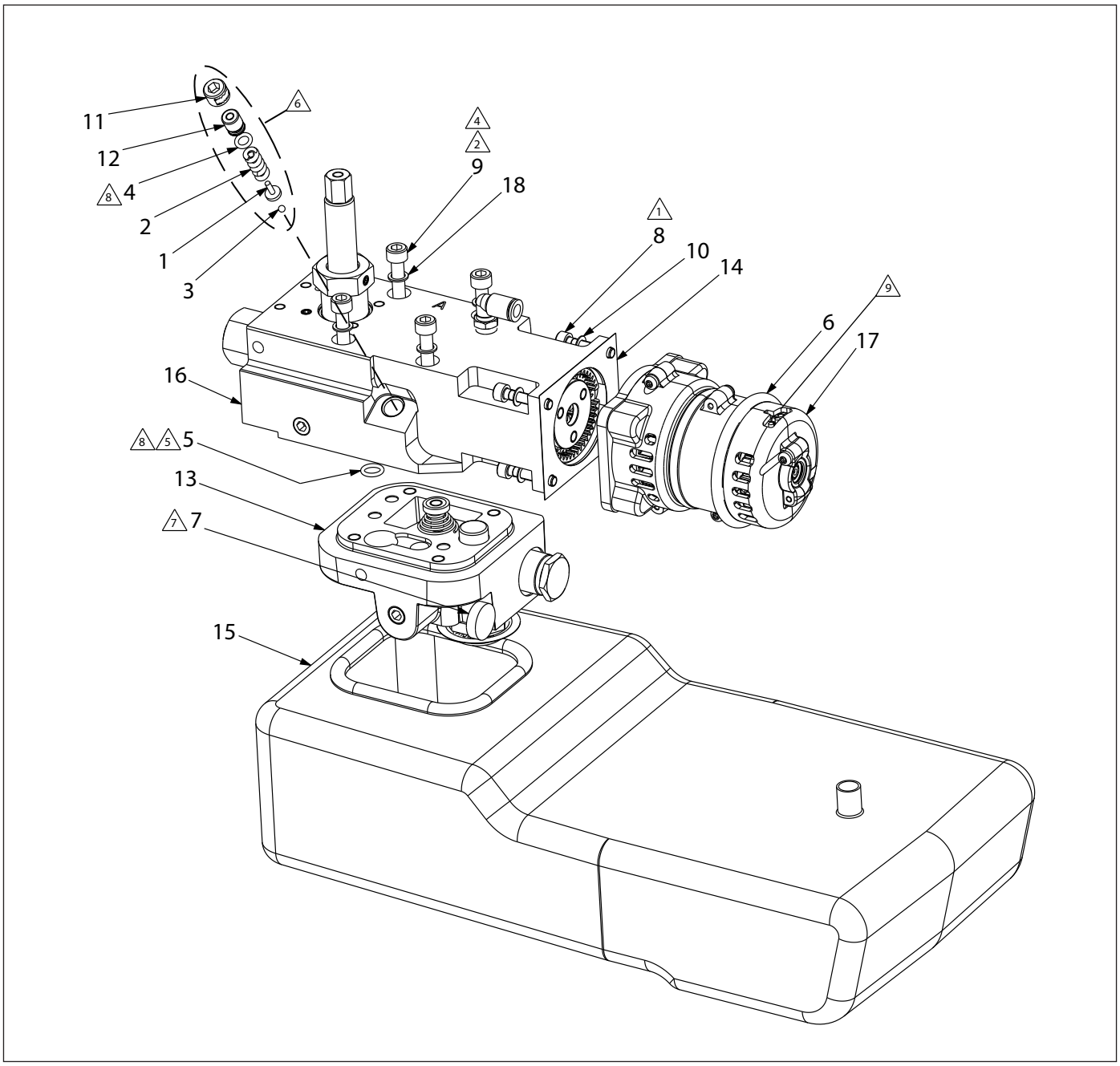
Notes:

1. Torque to 18-26 in-lb [2.0 - 3.0 Nm].
2. Torque to 10-12 in-lb [1.13 - 1.36 Nm].
3. Pull wires for switch through hole in housing.
4. Pull wires through hole in housing.

Parts List for Figure 20

Item	Description		Qty	Part Number
1	O	Screw, Flat Hd M5	4	CBA517028-1B
2	■	Plate, Battery Interface w/Cable	1	DD7953101
3		Bracket, Motor, XC2	1	DD8251111
4	■ O	Screw, M5 x 10, Thread Forming,Torx	4	DD8781028
5	O	Base, XC2 Pump	1	DD8836005
6		Switch, Rocker DPST 30 VDC 10A	1	DD8866372SR
■ Items included in 54V Battery Guide Kit, XC2BGK.				
O Items included in Lower Shroud Kit, XC2LSK.				

Figure 21: Power Unit & Reservoir Assembly



Notes:

1. Torque to 45-60 in-lbs [5.1 - 6.8 Nm].
2. Torque to 12-15 ft-lbs [16.3 - 20.3 Nm].
4. Secure with Loctite 2760 thread locking compound.
   Refer to manufacturer's technical data sheet for application instructions.
5. Install on eccentric housing (item 16).
6. Install these parts after pump element (item 13) is installed.
7. Attach magnet (item 7) to pump element (item 13) prior to assembling bladder (item 15).
8. Lubricate seals before assembly.
9. Orient motor so that wires exit in position shown.

Parts List for Figure 21

Item	Description		Qty	Part Number	
				Model XC2202M	Model XC2204M
1	◘	Ball Cap	1	A8038570	A8038570
2	◘	Spring, Compression	1	A8126110	A8126110
3	◘	Ball, 0.125, Stl	1	B1003016	B1003016
4	★■	O-Ring, Round, 0.219, 0.344, 0.063	1	B1004503	B1004503
5	★▲▼❖	O-Ring, Round, 0.313, 0.438, 0.063	1	B1011803	B1011803
6	֍	O-Ring, Round, 2.0, 2.375, 0.188	1	B1032503	B1032503
7		Magnet	1	C187018	C187018
8	❖֍	Screw, SHCS, M5 x 25	4	CCA523028-1A	CCA523028-1A
9	❖▲▼	Screw, SHCS, M6 x 55	4	CCA635028-1A	CCA635028-1A
10	❖֍	Washer, Lock M5	4	CCE1050108-6A	CCE1050108-6A
11	◘	Set Screw, Cup Point Nylock	1	DC10131048	DC10131048
12	◘	Plug	1	DC7234009	DC7234009
13		Pump Element	1	(See Figure 26)	(See Figure 26)
14	֍	Gasket	1	DD6917037	DD6917037
15	▲	Bladder, 2L	1	DD8266025	- - -
	▼	Bladder, 4L	1	- - -	DD8184025
16		Rel Valve & Eccentric Hsg Assy	1	(See Figure 22)	(See Figure 22)
17	֍	Motor, Sub Assembly	1	DD8826900	DD8826900
18	★▲▼❖	Gasket	4	S3037	S3037

▲ Items included in XC2 2L Bladder Kit, XC2B2LK.

▼ Items included in XC2 4L Bladder Kit, XC2B4LK.

★ Items included in XC Pump Seal Kit, XC1SK.

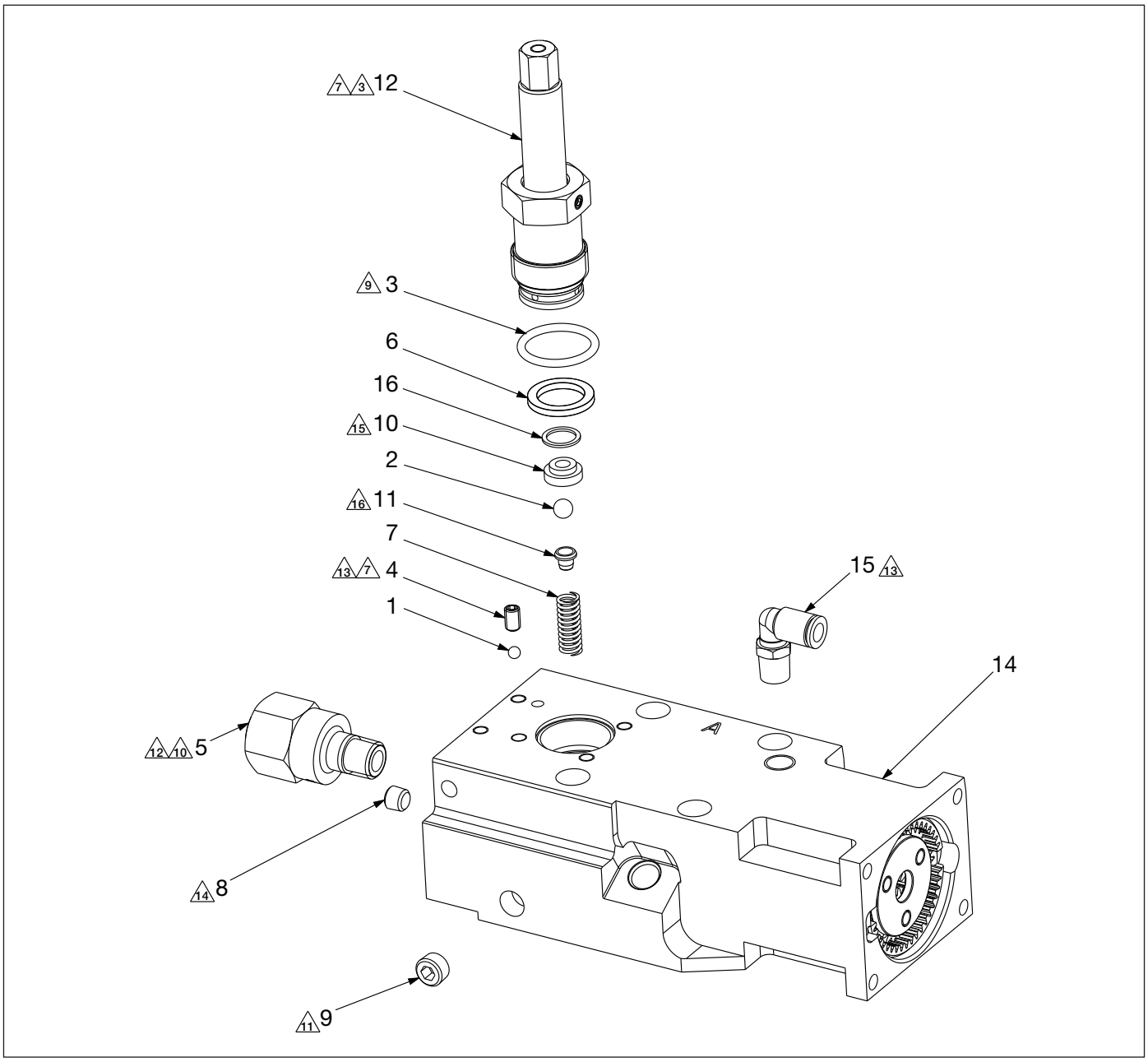
◘ Items included in Service Kit, XA1UARVK.

■ Items included in 54V Battery Guide Kit, XC2BGK.

❖ Items included in Eccentric Housing Service Kit, XC2ECK.

֍ Items included in 54V Brushless Motor Service Kit, XC2EMK.

Figure 22: Release Valve & Eccentric Housing Assembly



Notes:

3 Torque valve body to 90-95 ft-lbs [122.0 -128.8 Nm].
7 Secure with Loctite 243 thread locking compound.
Refer to manufacturer's technical data sheet for application instructions.
9 Lubricate seals before assembly.
10 Apply PTFE tape.
11 Torque to 16-19 ft-lbs [22 - 26 Nm].
12 Torque to 32-39 ft-lbs [43 - 53 Nm].
13 Torque to 60-80 in-lbs [6.8 - 9.0 Nm].
14 Torque to 120-144 in-lbs [13.6 - 16.3 Nm].
15 Coin seat prior to assembly with 1000 psi [68.9 bar] using a 5 ton cylinder for 10 seconds.
16 Use grease to aid assembly.

Parts List for Figure 22

Item		Description	Qty	Part Number
1	❖	Ball, 0.156, Steel	1	B1004016
2	✾★	Ball, 0.250, Steel	1	B1007016
3	✾★	O-Ring, Round, 0.875, 1.063, 0.094	1	B1118903
4	❖	Set Screw, Flat, HS, M5	1	CCA513028-5A
5		Adapter	1	CF927038
6	✾★	Gasket	1	CL344167
7	✾	Compression Spring	1	DC10140110
8	❖	Flush Plug, PTF- SAE 0.062	1	DC6792245
9	❖	Flush Plug, PTF- SAE 0.125	1	DC6793245
10	✾	Seat	1	DC7305290
11	✾	Ball Guide	1	DC7309013
12	✾	Manual Release Valve Assy, 3/2	1	(See Figure 23)
14	❖	Eccentric Housing Assy	1	(See Figure 24)
15	✝	Fitting- M 90	1	F100097-52
16	✾★	Gasket, Valve Plug	1	P20037

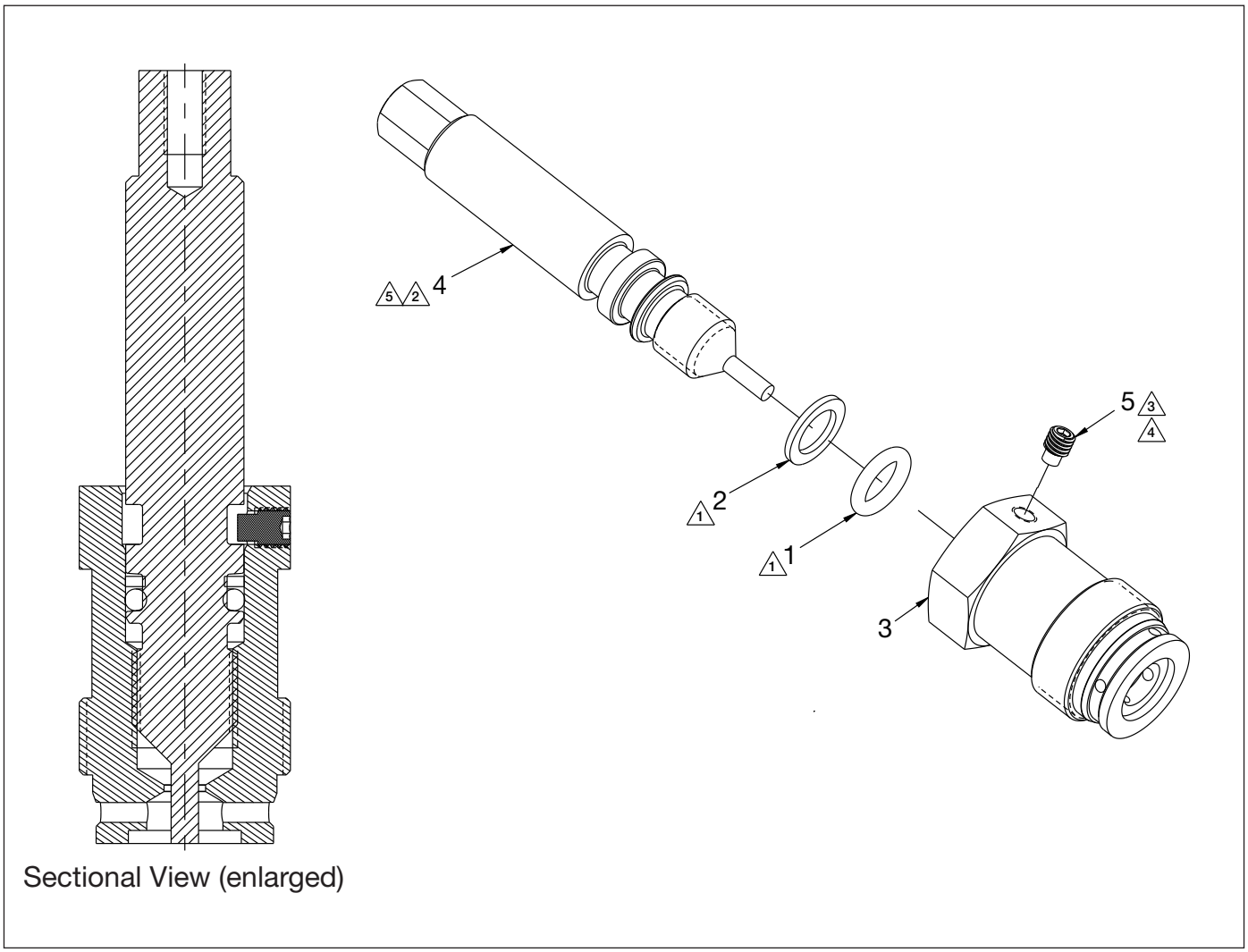
★ Items included in XC Pump Seal Kit, XC1SK.

❖ Items included in Eccentric Housing Service Kit, XC2ECK.

✾ Items included in Release Valve Service Kit, XC1MVSK.

✝ Items included in Oil Fill Service Kit, XC2TK.

Figure 23: Release Valve Subassembly



Sectional View (enlarged)

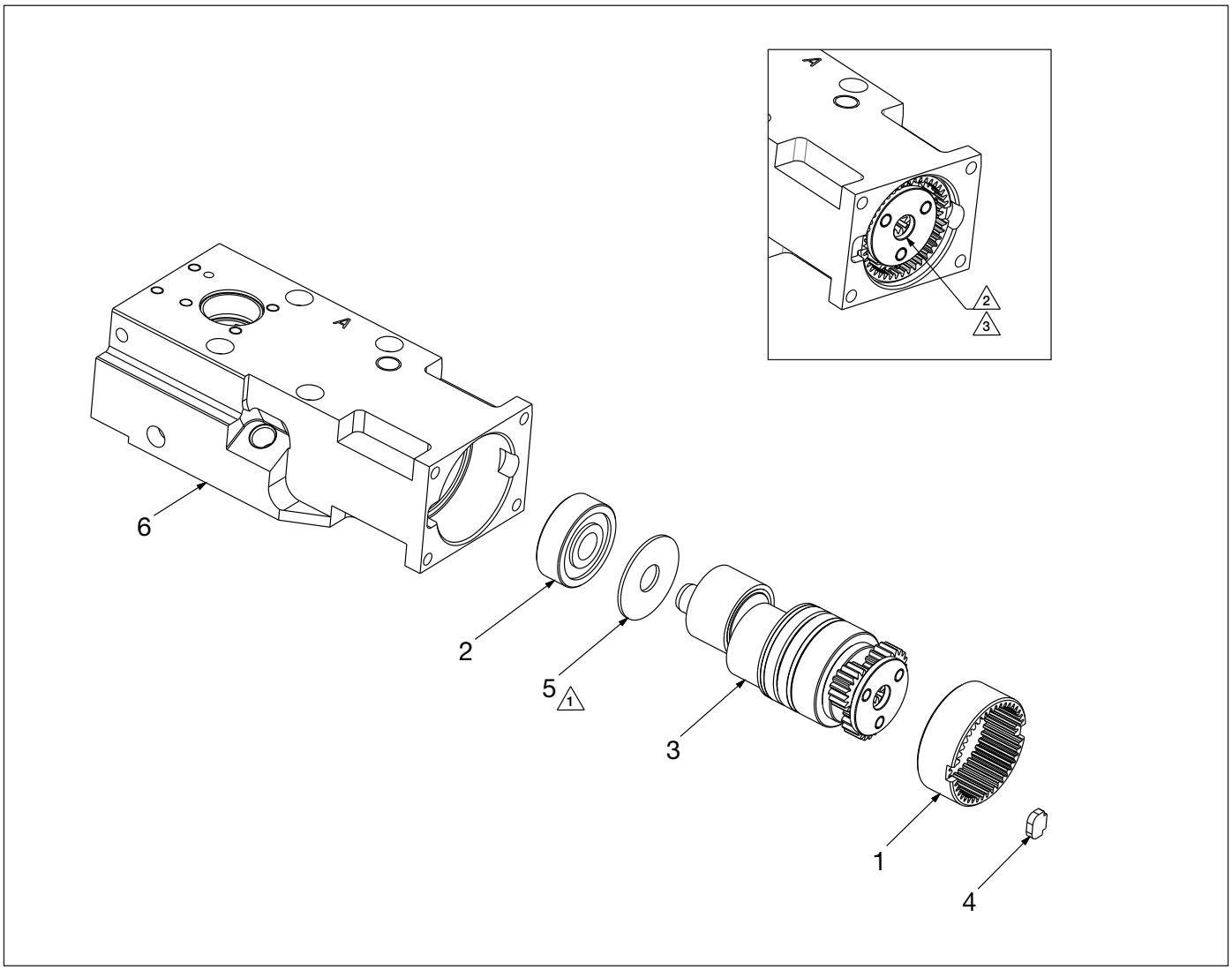
Notes:

1. Apply grease to O-ring and back-up ring after assembly to spindle, before assembly to body.
2. Turn CCW to assemble. Turn in until groove is seen in body through hole.
3. Apply Loctite #243 to threads.
   Refer to manufacturer's technical data sheet for application instructions.
4. Torque to 21-26 in-lb [2.4 - 3.0 Nm].
5. Spin test after assembly. Must turn freely.

Parts List for Figure 23

Item	Description		Qty	Part Number
1	★✾	O-Ring, Viton	1	B1110203
2	★✾	Back-Up Ring, Split	1	B1110564
3	✾	Body, Release Valve	1	DD2988013
4	✾	Spindle, Release Valve	1	DD2992010
5	✾	Set Screw	1	DD3400027
✾ Items included in Release Valve Service Kit, XC1MVSK.				
★ Items included in XC Pump Seal Kit, XC1SK.				

Figure 24: Eccentric Shaft & Housing Subassembly



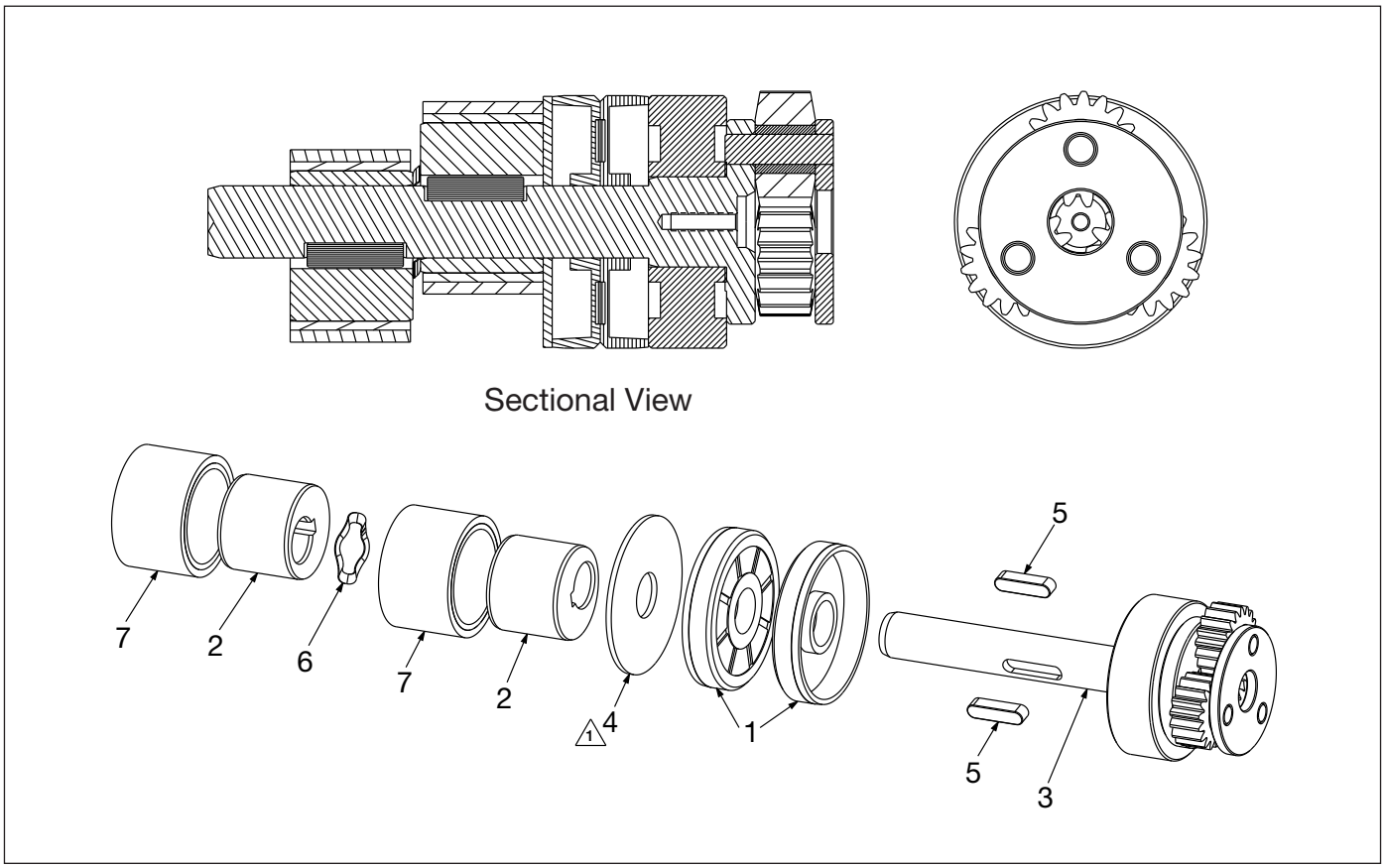
Notes:

1. Position grey coated side of bushing (item 5) toward eccentric (item 3).
2. Spin test after assembly (1 full eccentric rotation).
3. Use a pick to align the gears with the ring gear.

Parts List for Figure 24

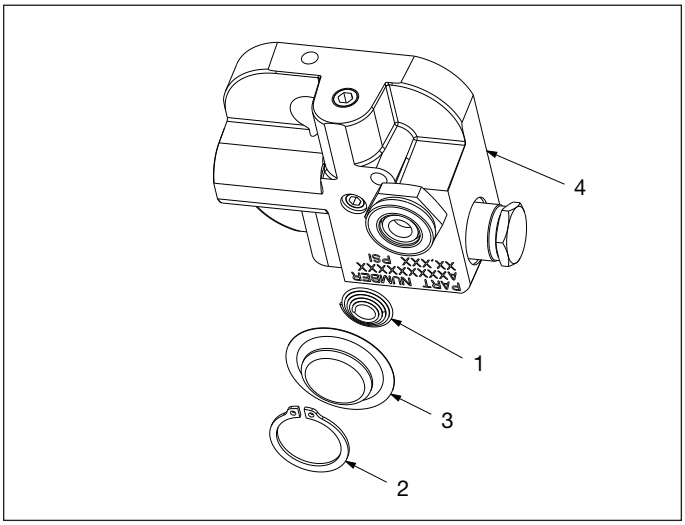
Item	Description		Qty	Part Number
1	❖	Ring Gear	1	DC7089228
2	❖	Bearing	1	DC7096155
3	❖	Assembly, Eccentric Shaft	1	(See Figure 25)
4	❖ ֍	Key, Ring Gear	1	DC7452251
5	❖	Bushing	1	DC7464108
6	❖	Eccentric Housing	1	DD8425001
❖ Items included in Eccentric Housing Service Kit, XC2ECK.				
֍ Items included in 54V Brushless Motor Service Kit, XC2EMK.				

Figure 25: Eccentric Shaft Assembly



Notes:
⚠1 Position grey coated side of thrust washer (item 4) toward lip seal (item 1).

Figure 26: Pump Element



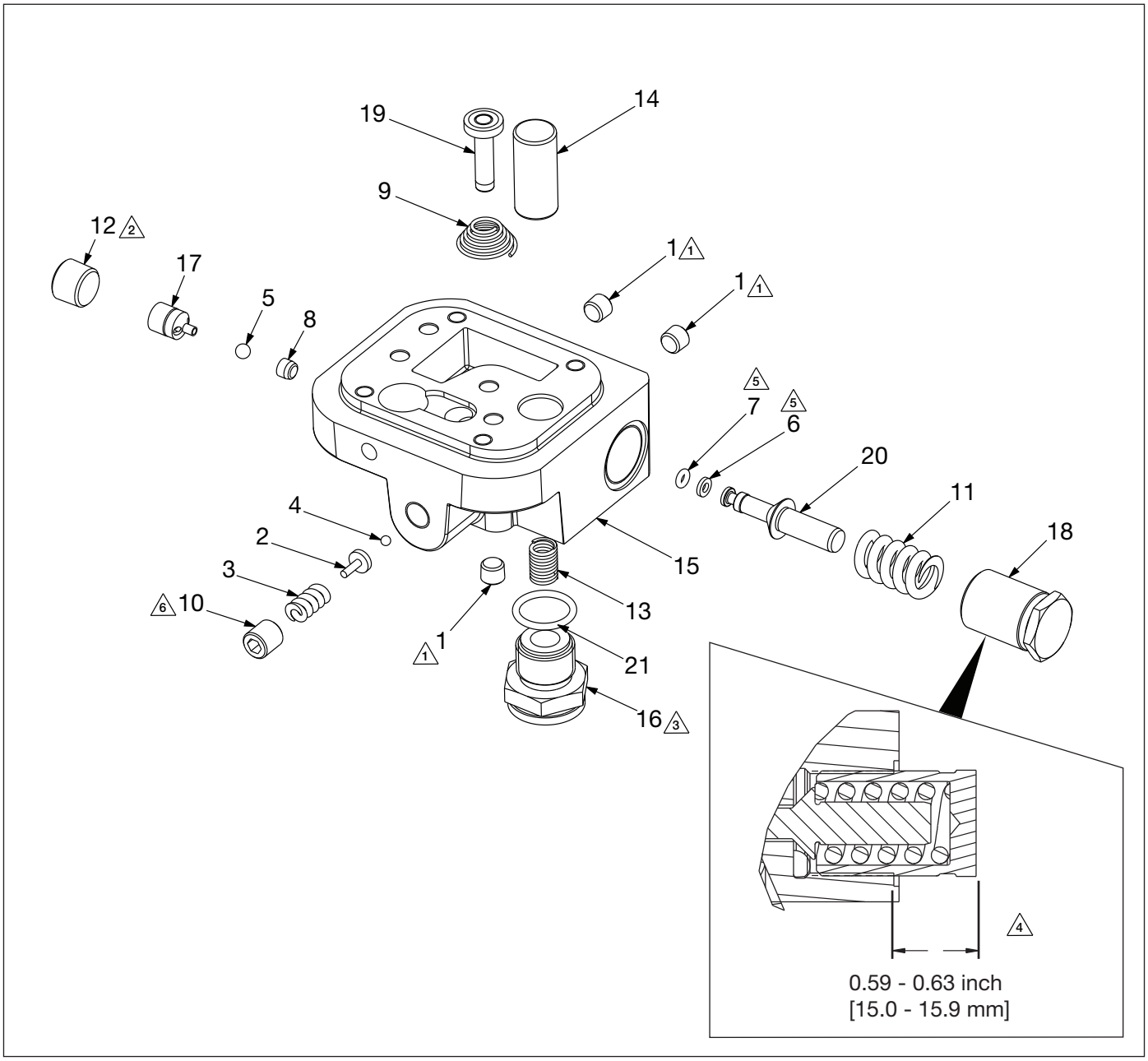
Parts List for Figure 25

Item	Description		Qty	Part Number
1	❖	Lip Seal	2	DC7090476
2	❖	Eccentric, 4mm	2	DC7117537
3	❖	Subassembly, Eccentric Shaft	1	DC7870950
4	❖	Washer, Thrust	1	DC7186108
5	❖	Key	2	DC7191251
6	❖	Spring, Wave	1	DC7750410
7	❖	Subassembly, Cam	2	DC7755950
❖ Items included in Eccentric Housing Service Kit, XC2ECK.				

Parts List for Figure 26

Item	Description		Qty	Part Number
1	✦	Spring, Conical	1	BSS5509D
2	✦	Retaining Ring, External, 25 mm Stl	1	CCA1025044-1A
3	✦	Screen	1	DC7152018
4	✦	Pump Element Components	1	(See Figure 27)
✦ Items included in XVARI Pump Element Kit, XA1PEK.				

Figure 27: Pump Element Components



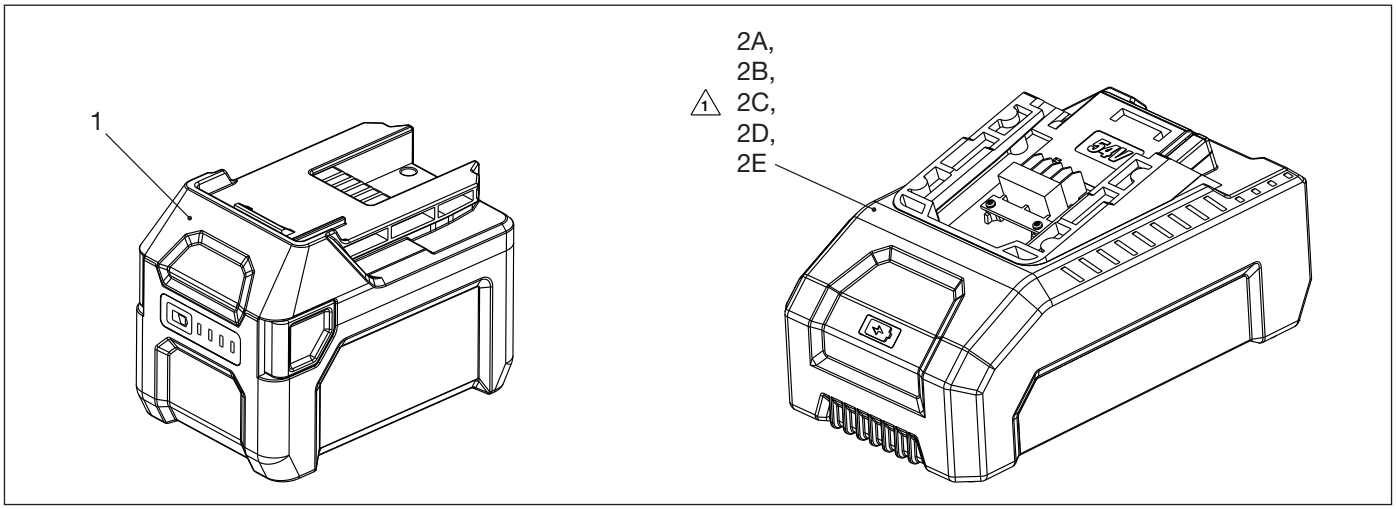
Notes:

1 Torque to 9.6-11.8 ft-lb [13 - 16 Nm].
2 Torque to 44.3-52.3 ft-lb [60 - 71 Nm].
3 Torque to 18.5-22.1 ft-lb [25 - 30 Nm].
4 Adjust length of bypass end cap (item 18) to between 0.59-0.63 inch [15.0 - 15.9 mm] from spot face.
5 Lubricate seals before assembly.
6 Relief valve to be set at 10,400-10,800 psi [717 - 714 bar].

Parts List for Figure 27

Item	Description		Qty	Part Number
1	✦	Plug, Flush, Hex 27.0 Stl Teflon	3	A1006245
2	✦	Ball Cap	1	A8038570
3	✦	Spring, Compression	1	A8126110
4	✦	Ball, 0.125 Stl	1	B1003016
5	✦	Ball 0.188 Stl	1	B1005016
6	★✦	Back Up Ring, Split	1	B1006564
7	★✦	O-Ring, Round, 0.125, 0.250, 0.063	1	B1006803
8	✦	Seat, Piston, Lower	1	BSS5358D
9	✦	Spring, Conical	1	BSS5509D
10	✦	Set Screw, Hollow Socket	1	DC1185048
11	✦	Spring, Bypass	1	DC394110
12	✦	PTF - SAE Flush Plug, 0.250	1	DC6794245
13	✦	Spring, Large Piston SAP	1	DC7026110
14	✦	Piston, 14 mm Dia, Lg	1	DC7027051
15	✦	Pump Body	1	DC7201190
16	✦	Plug Assembly, Inlet Check Valve	1	DC7453950
17	✦	Subassembly, Outlet Check Valve	1	DC7904900
18	✦	End Cap, Bypass	1	DC9208020
19	✦	Piston Assembly, MPE	1	DC9244920
20	✦	Piston, Bypass	1	DC9292051
21	★✦	O-Ring (included with item 16)	1	B1908503
✦ Items included in XVARI Pump Element Kit, XA1PEK.				
★ Items included in XC Pump Seal Kit, XC1SK.				

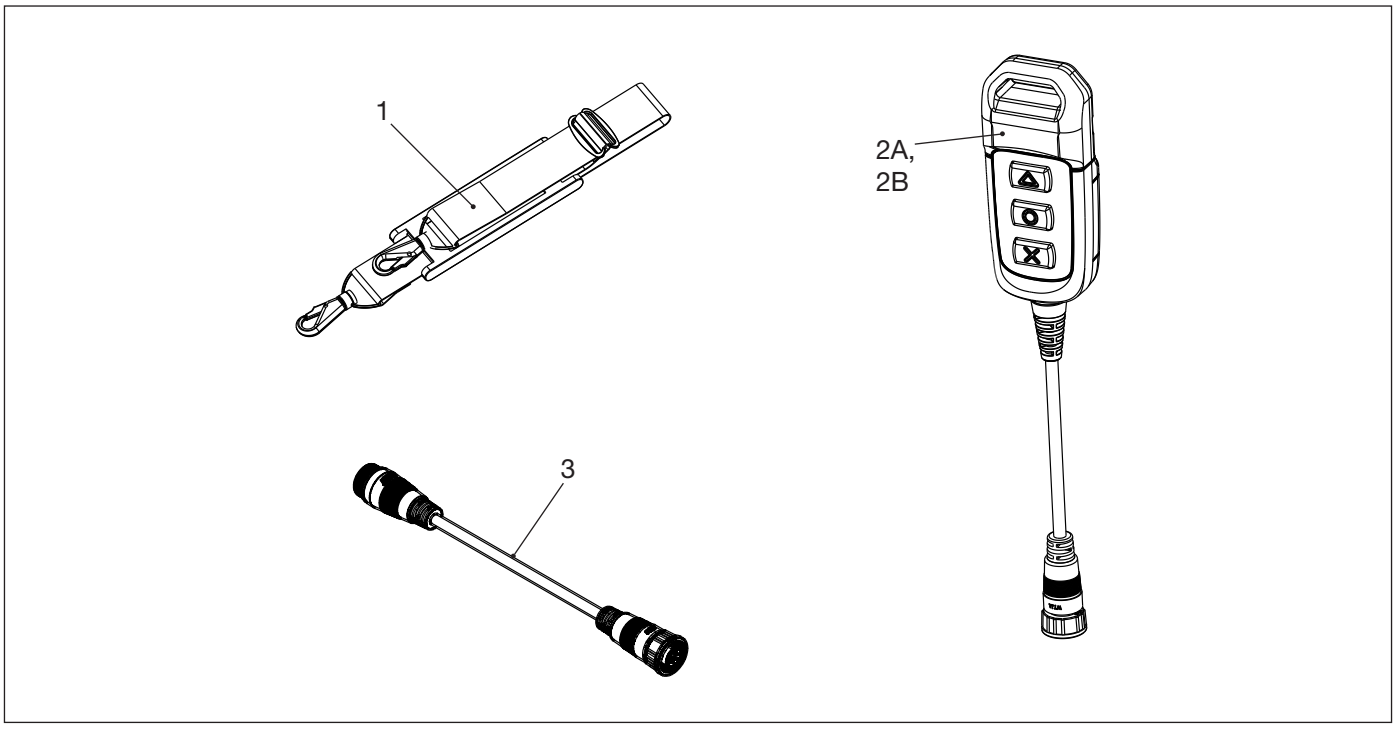
Figure 28: Battery and Battery Charger



Notes: ⚠1

- Charger must be purchased separately if not included in the shipment with the battery or tool. Unit is auto-voltage sensing, 100-240 VAC, 50/60 Hz.
- North America, Europe and Australia: Charger and power cord includes one Enerpac EC1F54 battery charger and the AC power cord for use in the selected region. Charger not sold without power cord.
- Japan and United Kingdom: Order charger and power cord EC1F542A, EC1F541B or EC1F542E plus the power cord applicable for your region/country. Replace the power cord included with the charger with the power cord that was ordered separately (ECC541N or ECC542U).

Figure 29: Selected Accessories



Parts List for Figure 28

Item	Description		Qty	Part Number
1		Battery, 54V, Lithium-Ion, 4.0 Ah, 216 Wh	1	EBH544
2A		Battery Charger & Power Cord, Australia - 230V	1	EC1F542A
2B		Battery Charger & Power Cord, North America - 115V	1	EC1F541B
2C		Battery Charger & Power Cord, European Union - 230V	1	EC1F542E
2D		Power Cord, Japan - 100V	1	ECC541N
2E		Power Cord, United Kingdom - 240V	1	ECC542U

Parts List for Figure 29

Item	Description		Qty	Part Number
1		Shoulder Strap, XC2 Series Pumps	1	SSTRP55
2A		Corded Remote Pendant, 10 ft [3 m]	1	CC131
2B		Corded Remote Pendant, 20 ft [6 m]	1	CC132
3		Pendant Extension Cord, 10 ft [3 m]	1	CC010

Figure 30: Hydraulic Schematic

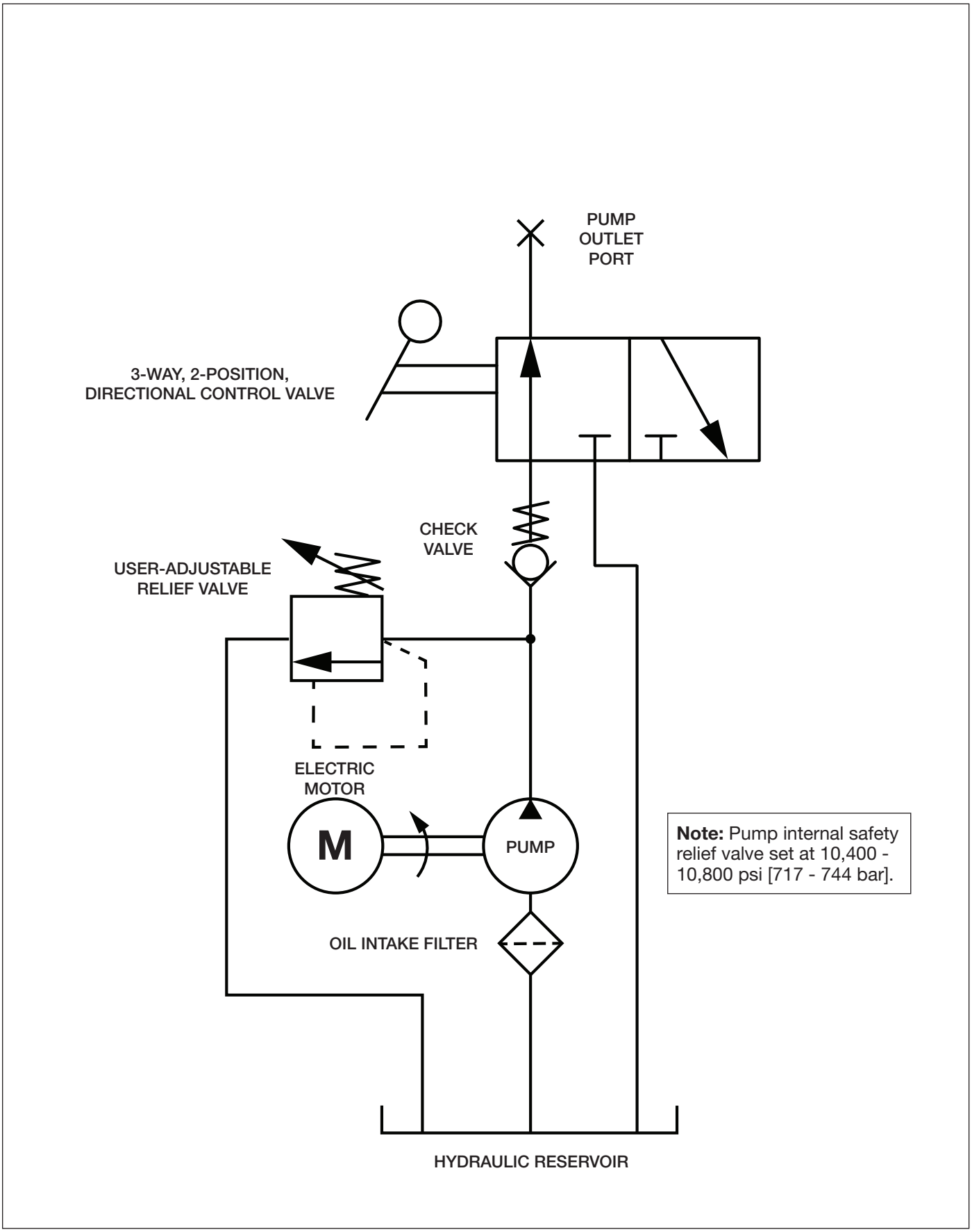
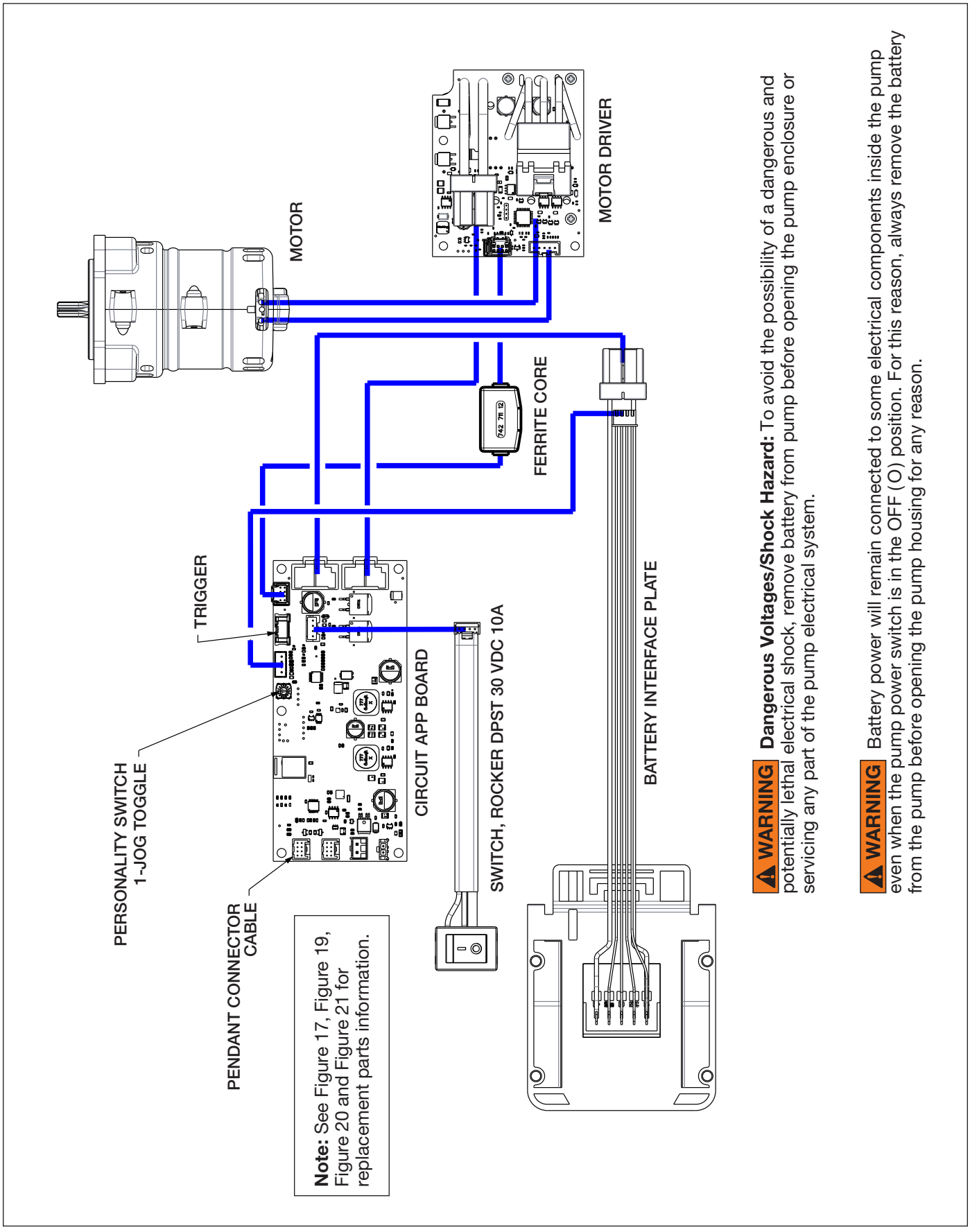


Figure 31: Electrical Schematic



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