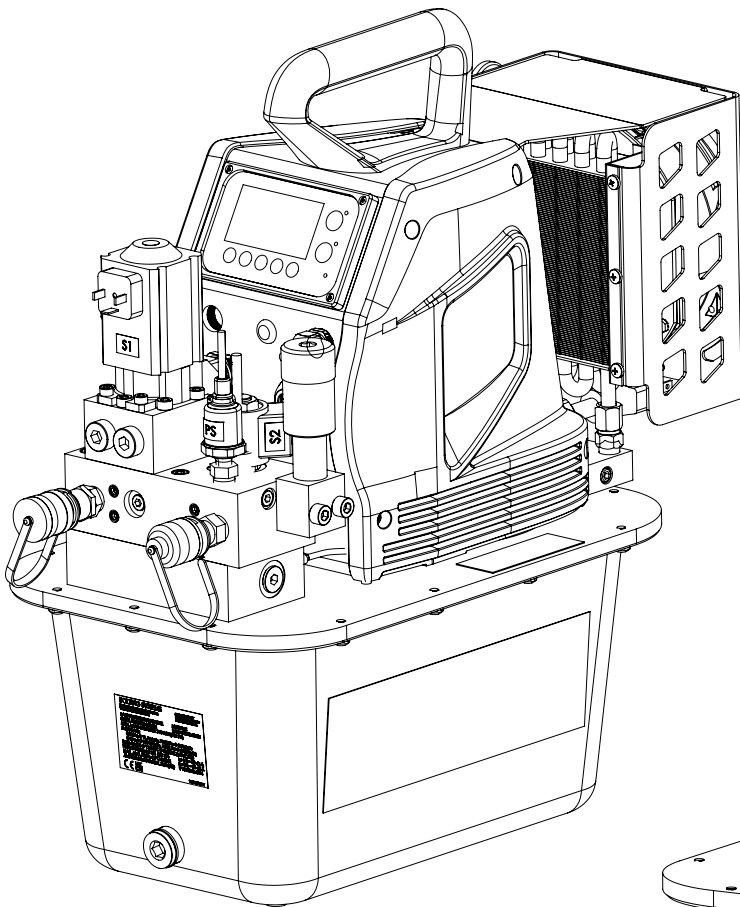
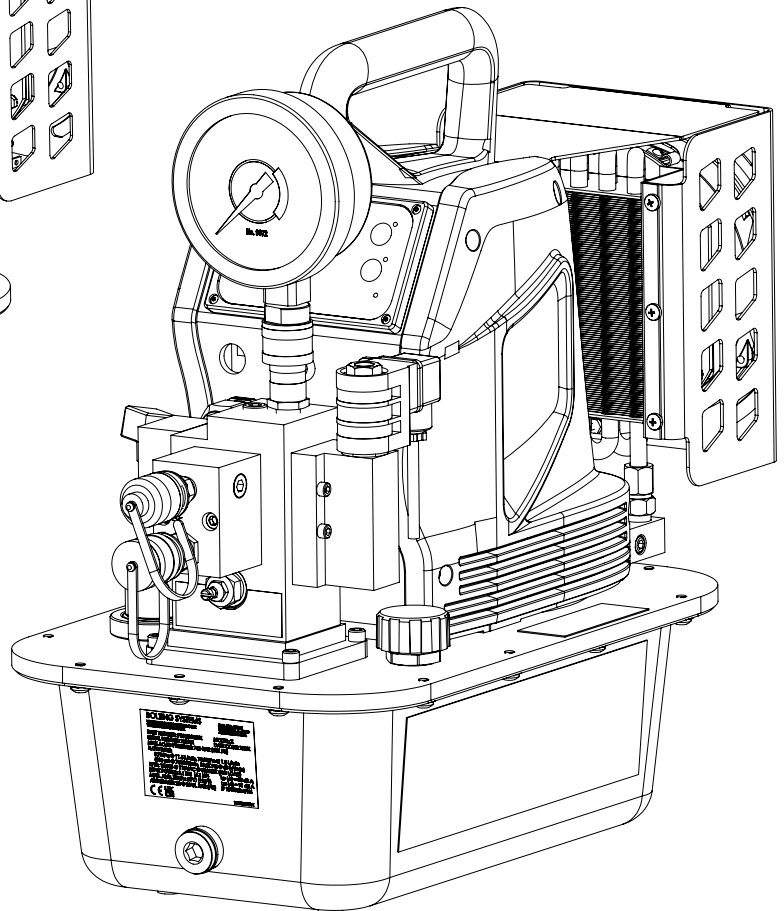


Electric-Powered
PE60 SERIES HYDRAULIC BOLTING PUMP
(AUTO and NON-AUTO Cycle)



Model shown for: PE603BB2P
(AUTO CYCLE PUMP)



Model shown for: PE601BA1P
(NON- AUTO CYCLE PUMP)

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DESCRIPTION

The Bolting Systems PE60 series hydraulic pumps are designed to deliver a maximum pressure of 700 bar (10,000 psi) with a flow rate of 983 cc/min (60 cu. in/min), making them ideal for bolting tool applications such as torquing, nut splitting, spreading, and alignment. Each pump is shipped fully assembled, less fluid, and is ready for operation.

Pumps are available in two configurations: LCD and NON-LCD models. The LCD models feature an Intelligent Autocycle option, allowing users to operate the pump in either manual or autocycle mode. In autocycle mode the advance and retract of the torque wrench is controlled by a logic control module activated by the autocycle button on the pendant control. LCD models provides a host of information and digital pressure visibility, along with full control at the shroud and pendant. In contrast, the NON-LCD models are equipped with analog pressure gauges for monitoring performance.

The pump includes a standard remote hand pendant and an oil cooler to enhance the bolting pump's performance. Users have the option to select various tool configurations for either single or four-tool bolting applications based on user needs. Users can purchase the roll cage accessory as an option, which provides protection against pump damage and facilitates easier handling.

Universal Motor

The motor is a 1.49kW (2.0 HP), 115V or 230V, 50/60Hz, 1PH., with a class F insulation class. Current draw can be up to 28 amps at 115V or 14 amps at 230V and the sound level is rated at 83-91 dB A.

Reservoir

- 4.7L (1.5 Gal) nominal with 4.8L (295 in³) actual usable.
- 9.4L (2.5 Gal) nominal with 8.7L (532 in³) actual usable.

Operating Temperature

Recommended operating temperature range is -25°C to +50°C (-13°F to 122°F). If temperatures are at extremes of the operating range, it is recommended to use hydraulic fluids that are rated for those temperatures. It is recommended that you use the cooling fan option for elevated ambient temperature or continuous duty.

Weight

Base weight for a PE60 with a 5.7L reservoir (including oil) is 25.1 kg (55.4 lbs.). Base weight for a PE60 with a 9.4L reservoir (including oil) is 29.2 kg (64.3 lbs.). Weights do not include valve, cooler or other accessories.

NOTES:

- **Carefully inspect the pump upon arrival. The carrier, not the manufacturer, is responsible for any damage resulting from shipment.**
- **The customer can choose from a variety of motors, controls, reservoirs, and other options. These instructions will include directions for options that your particular pump may not have.**
- **Do not change motors without consulting the pump manufacturer's Technical Services Department.**

SAFETY SYMBOLS AND DEFINITIONS

Safety symbols are used to identify any action or lack of action that can cause personal injury. Your reading and understanding of these safety symbols is very important.

 **DANGER** : Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING** : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION** : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION: Used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

IMPORTANT: Important is used when action or lack of action can cause equipment failure, either immediate or over a long period of time.

SAFETY PRECAUTIONS

These instructions are intended for end-user application needs. For a detailed parts list or to locate a Bolting Systems Authorized Hydraulic Service Center contact your nearest Bolting Systems facility. A list of all Bolting Systems facilities is located at the end of this document.

 **WARNING** : To help prevent personal injury,

General



- The following procedures must be performed by qualified, trained personnel who are familiar with this equipment. Operators must read and understand all safety precautions and operating instructions included with the device. If the operator cannot read these instructions, operating instructions and safety precautions must be read and discussed in the operator's native language.

- These components are designed for general use in normal environments. These components are not specifically designed for lifting and moving people, agri-food machinery, certain types of mobile machinery or special work environments such as: explosive, flammable, or corrosive. Only the user can decide the suitability of this machinery in these conditions or extreme environments. Bolting Systems will supply information necessary to help make these decisions. Consult your nearest Bolting Systems facility.



- Safety glasses must be worn at all times by the operator and anyone within sight of the unit. Additional personal protection equipment may include: face shield, goggles, gloves, apron, hard hat, safety shoes, and hearing protection.
- Operation, repair, or maintenance of hydraulic equipment should be performed by a qualified person who understands the proper function of hydraulic equipment per local directives and standards.
- Hydraulic equipment must be assembled correctly and then checked for proper function before use. Use hydraulic components of the same hydraulic pressure ratings. An appropriate hydraulic pressure gauge is recommended to monitor pressure.
- Never place your hands or other body parts near a hydraulic fluid leak. Never use your hands or other body parts to check for a possible leak. High pressure fluid can be injected under your skin causing serious injury and/or infection.

Safety Precautions Continued



- High pressure fluid is present throughout a hydraulic system. Always use caution when operating, repairing, or maintaining this equipment. Before beginning any work on any hydraulic system component, stop the equipment, disconnect from its power source, and relieve all pressure in all parts of the system. Do not tamper with the internal hydraulic relief valve settings.
- Avoid exposing hydraulic equipment (especially hoses) to extreme high or low temperatures. Damage to equipment or failure may result and cause loss of control or injury to the operator.
- Exercise caution to avoid the risk of fire.



- Do not drop any hydraulic system components. Damage to the equipment and/or injury may result.
- Avoid slipping or falling by cleaning up any oil spills.
- Avoid back injury by always lifting equipment carefully.
- It is strongly recommended to view the Bolting Systems Hydraulic Safety video tape before using hydraulic equipment.

Electrical Shock or Electrocution



- Any electrical work must be done and tested by a qualified electrician per local directives and standards.
- Disconnect the pump from the power supply and relieve pressure before removing the motor case cover or performing maintenance or repair.
- Never use an ungrounded power supply with this unit.
- If the power cord is damaged or wiring is exposed, replace or repair immediately.
- Changing the voltage on this unit is an involved, and if improperly performed, hazardous procedure. Consult the manufacturer for specific information before attempting any rewiring.
- All PE60 Series pump motors must be wired for clockwise (CW) rotation when viewed from the lead end (top) of the motor.
- Check the total amperage draw for the electrical circuit you will be using. (For example: Do not plug a pump or pumps that may draw 25 amps into a 20 amp fused electrical circuit.)
- Do not attempt to increase the current capacity by replacing a fuse with another fuse of higher value. Overheating and the possibility of a fire could result.
- Electric pumps should never be exposed to rain or water which could cause personal electrical hazard.
- Avoid conditions which can cause damage to the power cord such as abrasion, crushing, sharp cutting edges, or corrosive environment. Damage to the power cord can cause an electrical hazard.

Safety Precautions Continued

Hydraulic Hoses and Fluid Transmission Lines

- Avoid straight line tubing connections in short runs. Straight line runs do not provide for expansion and contraction due to pressure and/or temperature changes. See fig. 1. "Hose and Tubing Connections" under section "Hydraulic Connections" of this form.
- Eliminate stress in the tube lines. Long tubing runs should be supported by brackets or clips. Tubes through bulkheads must have bulkhead fittings. This makes easy removal possible and helps support the tubing.
- Before operating the pump, all hose connections must be tightened with the proper tools. Do not overtighten. Connections should only be tightened securely and leak-free. Overtightening can cause premature thread failure or high-pressure fittings to split at pressures lower than their rated capacities.
- Should a hydraulic hose ever rupture, burst, or need to be disconnected, immediately shut off the pump and release all pressure. Never attempt to grasp a leaking pressurized hose with your hands. The force of escaping hydraulic fluid could cause serious injury.
- Do not subject the hose to potential hazard such as fire, sharp surfaces, extreme heat or cold, or heavy impact. Do not allow the hose to kink, twist, curl, crush, cut, or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear, because any of these conditions can damage the hose and possibly result in personal injury. Never repair with tape.
- Do not use the hose to move attached equipment. Stress can damage the hose and possibly cause personal injury.
- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as creosote-impregnated objects and some paints. Hose deterioration due to corrosive materials can result in personal injury. Consult the manufacturer before painting a hose. Never paint a coupler.



Pump

- Do not exceed the hydraulic pressure rating noted on the pump nameplate or tamper with the internal high pressure relief valve. Creating pressure beyond rated capacities can result in personal injury.
- Before replenishing the fluid level, retract the system to prevent overfilling the pump reservoir. An overfill can cause personal injury due to excess reservoir pressure created when the tools are retracted.
- This pump is designed for torque applications and should never be used for lifting loads.
- Always shut off the motor and relieve pressure before breaking any connections in the system.
- The motor is the major part of the weight of the pump. Always take this into consideration when lifting or moving the pump.
- Do not connect pump to hydraulic system powered by another pump.

Safety Precautions Continued

Tools

DANGER

- Do not exceed rated capacities of the tools. Excess pressure may result in personal injury.
- Read and understand all safety and warning decals and instructions for devices attached.
- Inspect each tool and coupler before each shift or usage to prevent unsafe conditions from developing.
- Do not use tools if they are damaged, altered or in poor condition.
- Do not use tools with bent or damaged couplers or damaged port threads.
- Avoid pinch points or crush points that can be created by the tool.
- Never use extreme heat to disassemble hydraulic tools. Metal fatigue and/or seal damage will result and can lead to unsafe operating conditions.



IMPORTANT:

- Keep the tool clean at all times.
- Use an approved, high-grade pipe thread sealant to seal all hydraulic connections. PTFE tape can be used if only one layer of tape is used, and it is applied carefully (two threads back) to prevent the tape from being pinched by the coupler and broken off inside the pipe end. Any loose pieces of tape could travel through the system and obstruct the flow of fluid or cause jamming of precision-fit parts.
- Always use protective covers on disconnected quick couplers.

Hydraulic Fluids

- Properly dispose of all fluids, components and assemblies at the end of their useful life according to the applicable local waste-treatment and environmental regulations.
- Hydraulic fluid should be compatible with all hydraulic components.

Fuse

 **WARNING** : If motor stops due to an overload or power outage:

- Depress OFF button and shift control valve to neutral position. Unplug or disconnect power supply and allow motor to cool. Replace in-line fuse before reconnecting unit to power supply.

Transport



- Do not lift hydraulic pump by any electrical cord, hose or coupler. To safely transport, always use the carrying handle, roll cage or suitable lifting aid, along with assistance and proper lifting techniques.

Note: The guide cannot cover every hazard or situation so always do the job with **SAFETY FIRST**.

SET-UP INSTRUCTIONS

1. Filling the Pump Reservoir

NOTE: Most pumps are shipped without hydraulic fluid in the reservoir. Hydraulic fluid may have been shipped in a separate container, but if hydraulic fluid is needed, use only Power Team approved hydraulic fluid rated at 47 cSt @ 38°C (215 SUS @ 100°F). If low temperature requirements are needed, use hydraulic fluid 5.1 cSt @ 100°C (451 cSt @ -40°C).

- A. Clean the area around the filler cap to remove debris. Debris in the hydraulic fluid can damage the polished surfaces and precision-fit components of this pump.
- B. Remove the filler cap and insert a clean funnel with a filter.
- C. Fill the reservoir with hydraulic fluid to 1" (25,4 mm) from the bottom of the cover plate or to fill line.
- D. Install the filler cap. Verify the breather-hole is open, if applicable.
- E. Clean up any oil spillage to avoid causing a safety and/or environmental hazard.

2. Hydraulic Connections

- Clean the areas around the fluid ports of the pump and tools.
- Inspect all threads and fittings for signs of wear or damage, replace as needed.
- Clean all hose ends, couplers or union ends.
- Remove the thread protectors from the hydraulic fluid outlets.
- Connect the hose assembly to the hydraulic fluid outlet and couple the hose to the tool.

CAUTION : To prevent personal injury from leaking hydraulic fluid, seal all hydraulic connections with a high-quality, non-hardening, pipe thread sealant.



IMPORTANT: Sealant tape or non-hardening sealer tape can be used to seal hydraulic connections if only one layer of tape is used. Apply tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the system. Loose pieces of sealant could travel through the system and obstruct the flow of fluid or cause jamming of precision-fit parts.

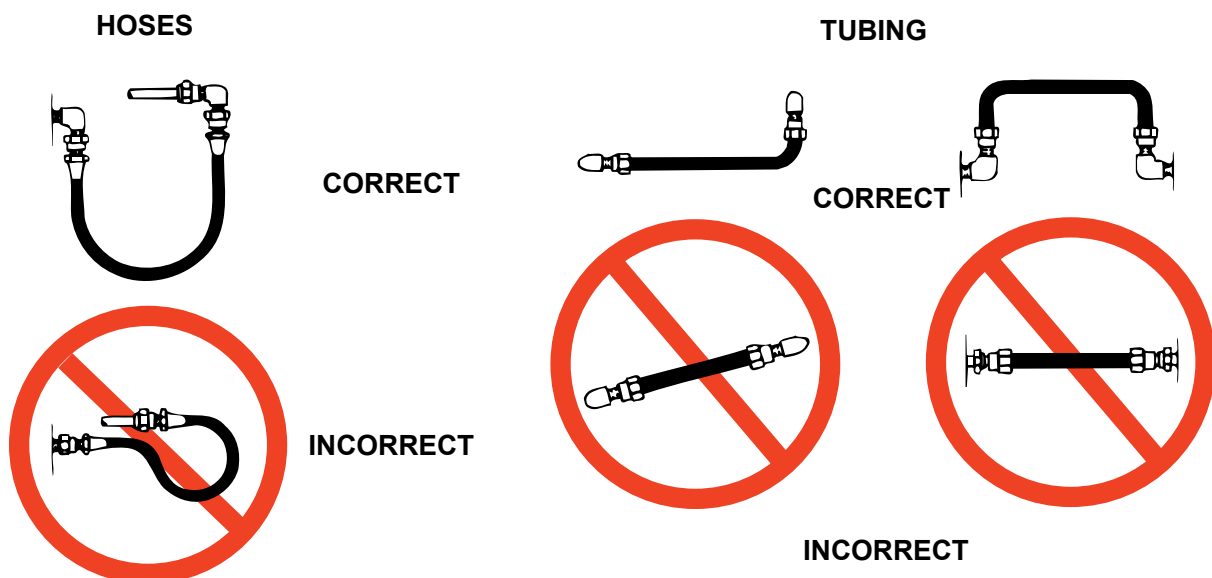


Fig. 1. Hoses and Tubing Connections

Set-Up Instructions Continued

3. Electric Motor Operation

⚠ WARNING : Electrical work must be performed and tested by a qualified electrician per local directives and standards.

The electric motor is wired for nominal 115 or nominal 230 volts, 50/60 Hz. Nominal 230 volts electric motors are shipped without a plug attached. Please obtain and install the applicable plug for your area.

- Verify the valve is in the neutral or hold position (If applicable).
- Connect the power cord to an appropriate power source.

⚠ CAUTION

- The correct voltage is required for the pump to operate. Verify the voltage rating on the pump motor name plate matches the outlet or power source you are using. Low voltage may cause: an overheated motor; a motor that fails to start under load; motor surging when trying to start; or a stalled motor before maximum pressure is reached.
- Check the voltage at the motor with the pump running at full pressure.
- Never run the motor on long, light gauge (small cross-section) extension cords. Refer to the minimum recommended gauge (cross-section) chart below.

AMPS at Maximum Hyd. Pressure	Electrical Cord Size AWG (mm ²) 3.2 Volt Drop			
	Length of Electrical Cord			
	0-25 ft. (0-8 m)	25-50 ft. (8-15 m)	50-100 ft. (15-30 m)	100-150 ft. (30-46 m)
6	18 (.82)	16 (1.33)	14 (2.09)	12 (3.32)
10	18 (.82)	14 (2.09)	12 (3.32)	10 (5.37)
14	16 (1.33)	12 (3.32)	10 (5.37)	8 (8.37)
18	14 (2.09)	12 (3.32)	8 (8.37)	8 (8.37)
22	14 (2.09)	10 (5.37)	8 (8.37)	6 (13.30)
26	12 (3.32)	10 (5.37)	8 (8.37)	6 (13.30)
30	12 (3.32)	10 (5.37)	6 (13.30)	4 (21.29)

Table 1. Minimum Recommended Gauge

- Start the pump and shift as required.
- Turn off the pump when not in use.

4. Bleeding Air from the System

Air can accumulate in the hydraulic system if the reservoir oil level is too low. This air causes the wrench to respond in an unstable or slow manner. To remove the air:

- The hydraulic wrench(s) must be positioned on their side(s) with the couplers located upward.
- Remove any load from the wrench(s), and cycle the hydraulic system through several cycles (extending and retracting wrenches).

NOTE: The wrench must be at a lower level than the pump to allow air to be released through the pump reservoir.

5. Oil Cooler Kit Installation

All PE60 bolting hydraulic pumps come with a company-fitted cooler unit. Please refer to cooler installation manual number 1001337 for replacement or new installation.

DIRECTIONAL CONTROL VALVE OPTIONS

Valve Code	Description	Valve Function	Hydraulic Diagram
NON AUTO-CYCLE VALVES			
BA (110V) BE (220V) Single Tool (11 lbs.) Or BC (110V) BG (220V) Four Tool (14 lbs.)	4-Way, 2-Pos. ----- Solenoid -Operated 110VAC, 50/60Hz. Or 220VAC, 50/60Hz.	Solenoid Energized (Advance): Pressure "P" to "A" port, "B" port to tank "T". Solenoid De-energized (Retract): Pressure "P" to "B" port, "A" port to tank "T".	
AUTO-CYCLE VALVES			
BB (110V) BF (220V) Single Tool (15.6 lbs.) Or BD (110V) BH (220V) Four Tool (15.6 lbs.)	4-Way, 2-Pos. ----- Solenoid -Operated 110VAC, 50/60Hz. Or 220VAC, 50/60Hz.	Solenoid 1 and 2 Energized (Advance): Pressure "P" to "A" port, "B" port to tank "T". Solenoid 1 De-energized, Solenoid 2 Energized (Retract): Pressure "P" to "B" port, "A" port to tank "T".	

OPERATION

1. Before Operation

Before starting the operation, check the following points:

- Verify that all hydraulic hose connections are securely attached and there are no fluid leakages.
- Ensure that the electrical connections are correctly established.
- Inspect the hydraulic oil level and add oil if needed. Refer to the section titled "Filling the Pump Reservoir."
- Confirm that the hand pendant is connected and that no buttons are being pressed

2. NON-LCD Pump Operation

The following instructions are used to operate non-LCD pumps. These pumps do not have an auto-cycle feature and can be operated manually.

A. Connect the pump power cord to an appropriate power source.

⚠ WARNING : To help prevent personal injury, check the voltage rating on the motor nameplate to be sure the outlet has the appropriate voltage.

B. Press the ON/OFF button; Power will be supplied to the pump unit and hand pendant. See figure below.

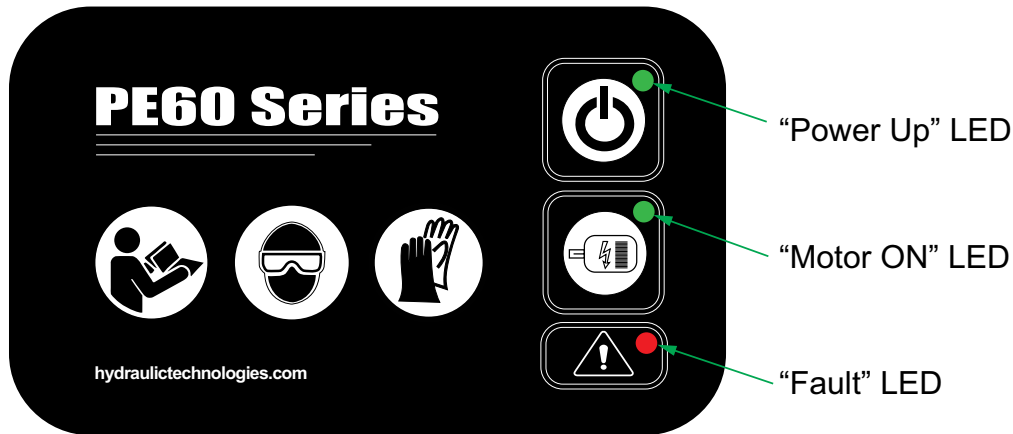


Fig. 2. Basic Membrane

Buttons/Symbol	Functions
	ON/OFF - Used to turn the pump ON and OFF. Which supplies power to the pump and hand pendant.
	MOTOR - Used to turn the motor ON and OFF.
	FAULT LIGHT - Illuminates when a fault error is detected.

During "POWER UP" the system performs a system check to verify if any button(s) are depressed or activated on the display or pendant. A red fault light comes on if this occurs. To clear the fault, disconnect the power source before service, and verify all buttons are not depressed or damaged. Once completed, power up system so unit may perform another system check.

Operation Continued

C. Follow below hand pendant instructions for operating the pump

Four Button Motor Control Pendant (ON, OFF, ADVANCE and RESET), See Figure 4.

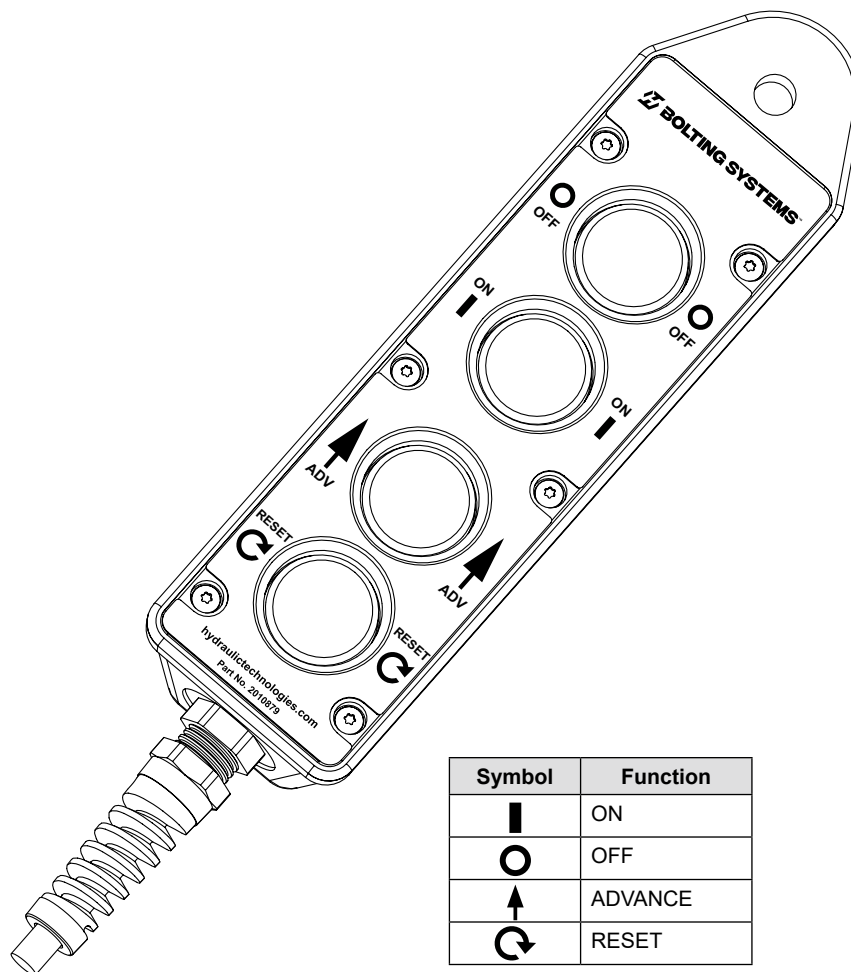
- i. Depress ON button on the hand pendant to start the motor. Once released motor stays on.
- ii. Depress and release OFF button to stop the motor.

NOTE: Function is maintained once button is depressed, both buttons (ON and OFF) cannot run simultaneously.

- iii. In a motor "ON" condition, depress ADVANCE to activate solenoid and advance the tool. Release when tool has reached the end of its stroke, which de-energizes solenoid.

NOTE: If ON button is depressed and ADVANCE button is not depressed after 2 seconds, timer starts, and motor will shut down after additional 18 seconds. If ADVANCE button is depressed before 18 seconds, it activates solenoid advance. Once ADVANCE button is released, timer will restart from "0" state.

- iv. In the event the unit does time out, depress and release the RESET button. This will enable the pendant to function again.
- v. If there is trapped pressure after the unit has been shut off, depressing the ADVANCE button twice within 500 milliseconds will energize the coil for 20 milliseconds, releasing trapped pressure.



**Fig. 4. Four Button (ON, OFF, ADVANCE and RESET)
(Valve Codes: BA, BC, BE, BG)**

Operation Continued

D. Adjusting the Pressure Regulating Valve

The pressure regulating valve can be adjusted to bypass fluid at a given setting while the pump continues to run.

NOTE: For easy adjustment of the pressure regulating valve, always adjust the pressure by increasing to the desired pressure setting.

- i. Loosen the locknut on the pressure regulating valve, and back the adjusting screw or knob out a few turns by turning it in a counterclockwise (CCW) direction. This will decrease the pressure setting to a lower than desired pressure.
- ii. Make that the pump is fully connected, both electrically and hydraulically. With the pump turned on, press and hold the ADVANCE button on the hand pendant to start the pump motor and build pressure.
- iii. Slowly turn the adjusting screw or knob in a clockwise (CW) direction. This gradually increases the pressure setting. When the desired pressure is reached (see pressure gauge reading), cycle the pump again to verify the correct pressure setting. Once set, lock the adjusting screw in position by tightening the lock nut. Shut off the pump.

IMPORTANT: The pressure range is from 1,000 to 10,000 PSI (70 to 700 BAR) depending on the pump model.

NOTE: With the ADVANCE button depressed, the timer will start. If the pressure is not set within 20 seconds the motor will shut down. The ON button must be depressed again to finish relief valve adjustment.

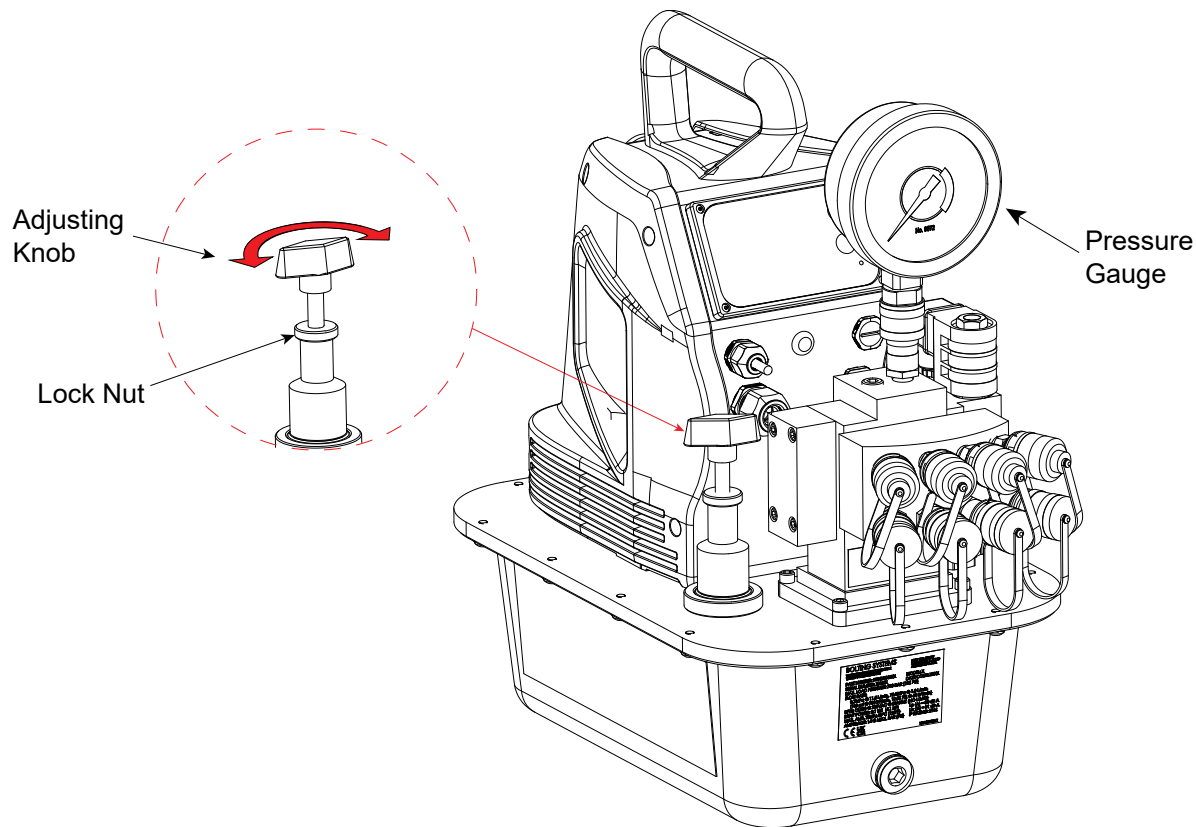


Fig. 5. Pressure Regulator Valve (Non Auto-Cycle Pump)

3. LCD Pump Operation

The following instructions are used to operate LCD pumps. These pumps are equipped with an Auto-cycle feature that enables users to operate pumps in both Manual and Automatic modes.

- A. Connect the pump power cord to an appropriate power source.
- B. Press the ON/OFF button; Power will be supplied to the pump unit and hand pendant.
- C. During "POWER UP" the system performs a system check to verify if any button(s) are depressed or activated on the display or pendant. If this is the case, a red fault light will illuminate. To resolve the fault, disconnect the power source before servicing, and ensure that all buttons are neither pressed nor damaged. After this verification, power the system back on to allow it to perform another system check.

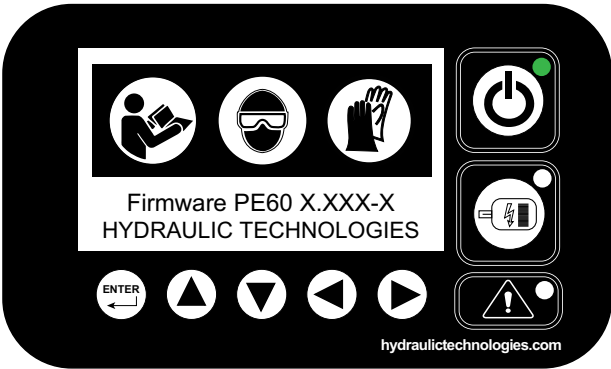
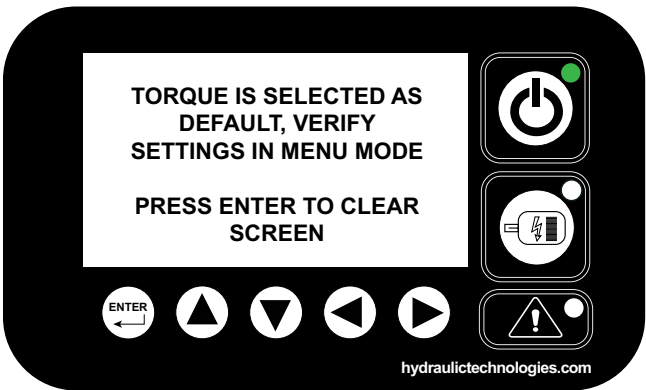


Fig. 6. LCD Panel

Buttons/Symbol	Functions
	ON/OFF - Used to turn the pump ON and OFF. Which supplies power to the pump and hand pendant.
	MOTOR - Used to turn the motor ON and OFF.
	FAULT LIGHT - Illuminates when a fault error is detected.

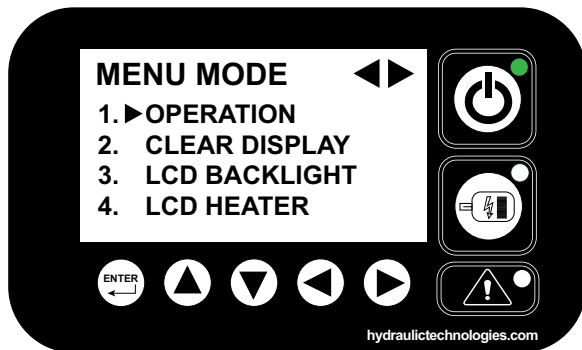
- D. For detailed information on the operations and settings for the LCD pumps, please refer to the LCD user instruction manual 1001338.
- E. After the pump is set up and powered on without any errors, the LCD will display the default output screen in either PRESSURE or TORQUE mode. Below is the screen 1 for torque mode, where torque is selected for operation. Press the ENTER button to clear the screen.



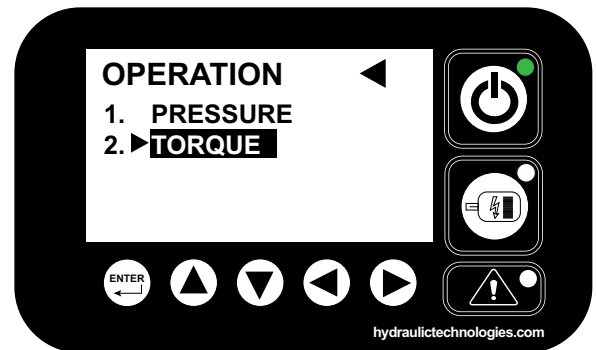
Screen 1

Operation Continued

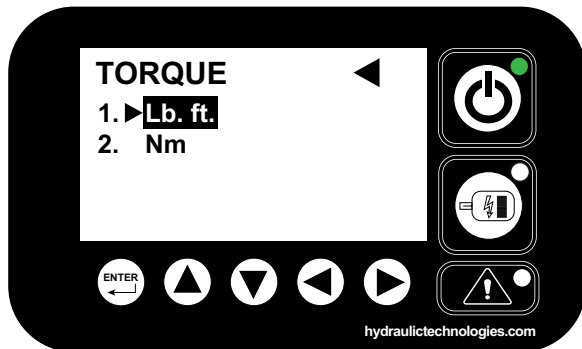
- F. Set the required torque value on LCD for tool (torque wrench)
- Access the MENU MODE and use the “▲” and “▼” buttons to navigate to “OPERATION” mode, then press the “ENTER” button (see screen 2).
 - On the next screen 3, select “TORQUE” and press the “ENTER” button.
 - Choose the preferred units for the torque operation Lb. ft. or Nm (see screen 4).
 - Refer the Pressure/Torque Conversion Chart included with each torque wrench and input the maximum torque output value (see screen 5) for the specific torque wrench (for example, 3975 lb. ft. at 10,000 PSI for the bolting torque wrench TWLC 4).



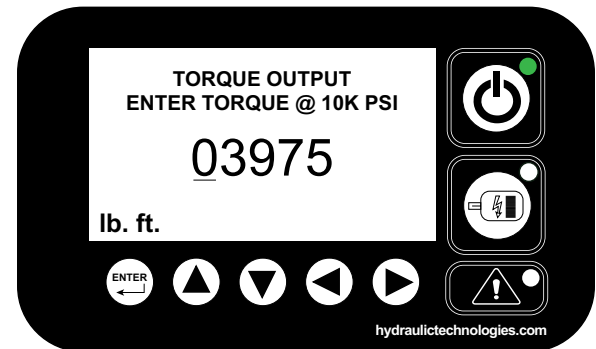
Screen 2



Screen 3

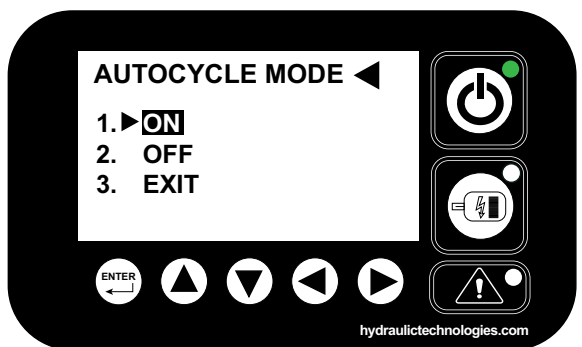


Screen 4

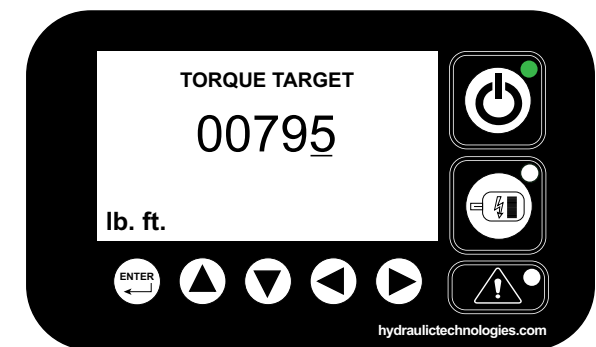


Screen 5

- Following screen 6, enable the auto cycle mode as needed, and save the setting by pressing the “ENTER” button. Note that this option is available only for auto cycle feature bolting pumps.
- On the next screen 7 add the "TORQUE TARGET" value, then press ENTER button to save the data. (for example, 795 lb. ft. at 2000 PSI for the bolting torque wrench TWLC 4).



Screen 6



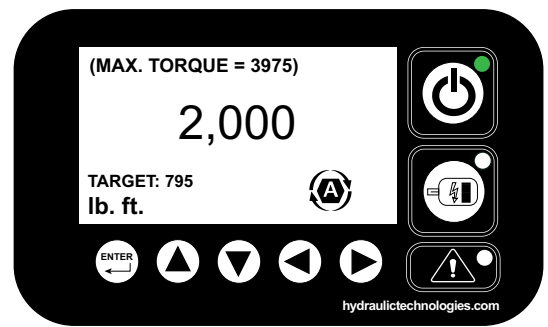
Screen 7

NOTE: When auto cycle mode is turned "ON," pressing AUTO button 4 on the hand pendant will display an Auto-cycle icon on the screen. If auto cycle mode is turned "OFF," pressing AUTO button 4 will show the message, "Auto-cycle is off."

Operation Continued

- vii. Next screen 8 will show the input torque value (for example, TARGET: 795 lb. ft. at set pressure of 2000 PSI). and maximum torque value of the wrench.
- viii. This completes the LCD setup for the Auto-cycle operation.

NOTE: Use the Pressure/Torque Conversion Chart supplied with each torque wrench tool to obtain the required pump pressure.



Screen 8

- G. Set the pressure value using the pressure regulator on the pump
- i. Once the LCD setup for the torque value is complete, verify that the pump is securely connected to the torque wrench tool and a proper power supply is available.
 - ii. Before applying the hydraulic torque wrench to the application, the pump output pressure must be preset to relieve at the pressure obtained from the Pressure/Torque Conversion Chart. This can be done in manual mode with the hydraulic torque wrench connected to the pump and resting on the floor or bench.
 - iii. Activate the pump by pressing the ON button, then press and hold the ADVANCE button on the hand pendant to run the pump motor.
 - iv. Applying advance pressure to the hydraulic torque wrench will extend the piston until it reaches the end of its stroke whereby the pump pressure will build. Holding the wrench at the end of its stroke will allow the pump pressure to be adjusted.
 - v. Set the pressure value on the LCD (refer to screen 8) until the desired pressure is reached (for example, 2000 PSI) by turning the regulator knob: rotate clockwise to raise the pressure and counterclockwise to lower it (see figure 7 below).
 - vi. Retract the hydraulic torque wrench piston and advance again making sure that the pump relieves at the desired pressure setting.
 - vii. After setting the Torque and Pressure values, the tool is now ready for Auto-cycle operation.

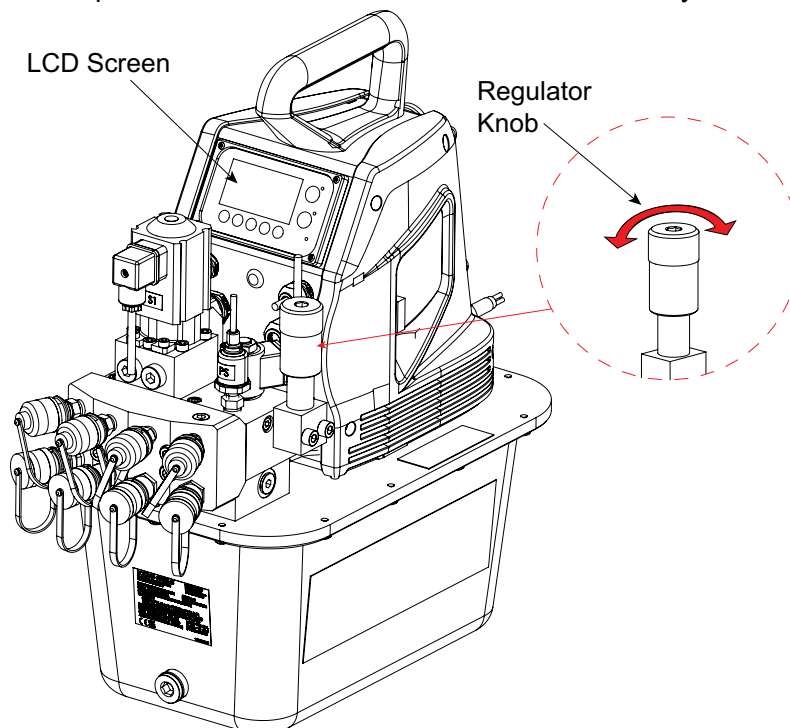
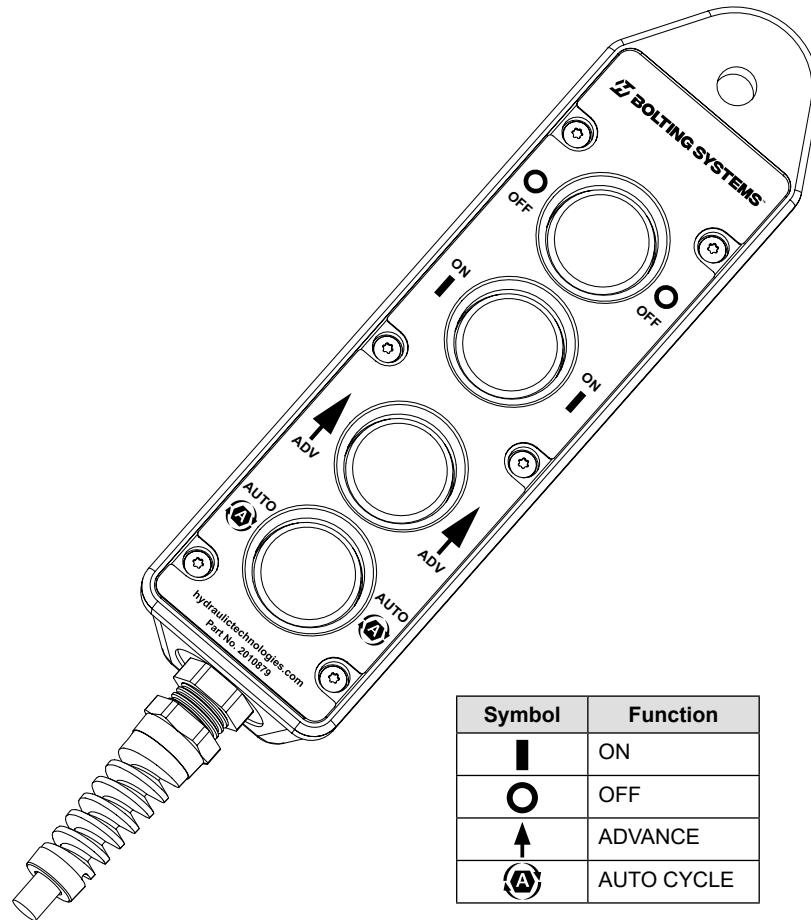


Fig. 7. Pressure Regulator Valve (Auto-Cycle Pump)

Operation Continued

H. Refer hand pendant instructions below for the manual and Auto mode operation.



**Fig. 8. Four Button (ON, OFF, ADVANCE and AUTO CYCLE)
(Valve Codes: BB, BD, BF, BH)**

Manual Operation:

- Depress ON button on the hand pendant to start the motor. Once released motor stays on.
- Depress and release OFF button again to stop the motor.

NOTE: Function is maintained once button is depressed, both buttons (ON and OFF) cannot run simultaneously.

- In a motor "ON" condition. Depress ADVANCE button to activate solenoid advance. Release when tool has reached the end of its stroke, which deactivates solenoid advance.

NOTE: If ON button is depressed and ADVANCE button is not depressed after 2 seconds, timer starts, and motor will shut down after additional 18 seconds. If ADVANCE button is depressed before 18 seconds, it activates solenoid advance. Once ADVANCE button is released, timer will restart from "0" state. Or, if the ADVANCE button is not cycled within 6 seconds the motor will shut off.

- In the event the unit does time out, depress the ON button on the hand pendant to start the motor.
- If there is trapped pressure after the unit has been shut off, depressing the ADVANCE button twice within 500 milliseconds will energize the coil for 20 milliseconds, releasing trapped pressure.

Operation Continued

Auto Cycle Operation:

NOTE: Depending on the hydraulic fluid used, the auto cycle portion may not function when cold. If this happens, the pump must be first warmed up using the manual mode. This condition can be minimized by using the appropriate fluid in cold weather.

- i. Depress ON button on the hand pendant to start the motor. Once released motor stays on.
- ii. In a motor "ON" condition, press and hold the AUTO button on the hand pendant.
 - The valve shifts to the advance mode and hydraulic fluid is delivered to the advance port in the manifold. When the tool meets the end of the advance stroke the valve will shift to the retract mode. Hydraulic fluid will be delivered to the retract port in the manifold. When the tool meets the end of the retract stroke the valve will shift back to the advance mode. This cycling between advance and retract will continue as long as the auto button is depressed.
 - When the pressure has reached the preset value, the system will continue by initiating two more "dwell" cycles to verify proper torque has been met. Once torque has been fully verified, and tool has fully retracted, the pump will shift into "standby mode" (motor running but coils are deactivated). Once in "stand by" mode, the timer starts, and motor will shut down after 2 seconds or when AUTO button is released.
 - When torque value has been verified, and tool fully retracts, a message on the LCD screen will state "TORQUE TARGET MET".
- iii. Release the AUTO button on the pendant and repeat above steps for next operation.
- iv. If there is trapped pressure after the unit has been shut off, depressing the advance button twice with 500 milliseconds will energize the coil for 20 milliseconds, releasing trapped pressure.

GENERAL MAINTENANCE

⚠ WARNING : To prevent personal injury,



- Disconnect the unit from the power supply before performing maintenance or repair procedures.
- Repairs and maintenance are to be performed in a dust-free area by a qualified technician.

1. System Evaluation

The components of your hydraulic system — pump, hoses, and couplings — all must be:

- Rated for the same maximum operating pressure.
- Correctly connected.
- Compatible with the hydraulic fluid used.

A system that does not meet these requirements can fail, possibly resulting in serious injury. If you are in doubt about the components of your hydraulic system, contact Bolting Systems Technical Support.

2. Inspection

Keep a dated and signed inspection record of the equipment. Before each use, the operator or other designated personnel should visually inspect for the following conditions:

- Excessive wear, bending, damage, or insufficient thread engagement.
- Leaking hydraulic fluid.
- Loose fasteners, pipe plugs or fittings.
- Bent or damaged couplers or port threads.

3. Periodic cleaning

⚠ WARNING : Contamination of the hydraulic fluid could cause the valve to malfunction.

Establish a routine to keep the hydraulic system as free from debris as possible.

- Seal unused couplers with protective covers.
- Keep hose connections free of debris.
- Keep the breather-hole in the filler cap clean and unobstructed.
- Use only Power Team hydraulic fluid. Replace hydraulic fluid as recommended, or sooner if the fluid becomes contaminated. Never exceed 300 hours of use between fluid changes.

4. Hydraulic Fluid Level

- A. Check the fluid level in the reservoir after each 10 hours of use. The fluid level should be 1" (25,4 mm) from the bottom of the cover plate or to fill line when all tools are retracted.
- B. Drain, flush, and refill the reservoir with an approved Power Team hydraulic fluid after 300 hours of use. The frequency of fluid changes depends upon general working conditions, severity of use, the overall cleanliness and care given to the pump. Fluid should be changed more frequently when the system is used in outdoors or in a dirty environment.

General Maintenance Continued

5. Draining and Flushing the Reservoir

- A. Disconnect the power supply.
- A. Clean the pump exterior before the pump interior is removed from the reservoir.
- B. Remove all screws fastening the motor and pump assembly to the reservoir.
- C. Remove the motor assembly and place aside.

CAUTION: Do not damage the pump filter or pressure regulating valves when lifting the pump and motor off the reservoir.

- D. Clean the inside of the reservoir, and fill with Power Team hydraulic fluid. Rinse the filter clean.
- E. Place the pump and motor assembly back onto the reservoir, and secure with two fasteners assembled on opposite corners of the cover plate.
- F. Place the hydraulic flow control valve in the neutral position. If the pump is equipped with a valve that has only an advance or retract position, place the valve in the advance position, and connect a hose to the advance port on the valve. Place the other end of the hose into the fluid filler plug hole.
- G. Run the pump for several minutes.
- H. Disconnect the motor and pump assembly, and drain and clean the inside of the reservoir.
- I. Fill the reservoir with Power Team hydraulic fluid.
- J. Place the pump and motor assembly back onto the reservoir, and secure with fasteners. Tighten screws securely and evenly.

6. Adding Hydraulic Fluid to the Reservoir

- A. Disconnect the power supply.
- B. Make sure that all hydraulic actuators that may still be connected to the pump are in their fully retracted position.
- C. Clean the entire area around the filler cap.
- D. Remove the filler cap, and install a clean funnel with a filter.

NOTE: Use only Power Team hydraulic fluid 47 cSt @ 38°C (215 SUS @ 100°F). If low temperature requirements are needed, use hydraulic fluid 5.1 cSt @ 100°C (451 cSt @ -40°C).

- E. Fill the reservoir with hydraulic fluid to 1" (25,4 mm) from the bottom of the cover plate or to fill line.
- F. Install the filler cap. Verify the breather-hole is open, if applicable.

7. Hose Connections

CAUTION : To prevent personal injury from leaking hydraulic fluid, seal all hydraulic connections with a high-quality, non-hardening, pipe thread sealant.



IMPORTANT : Pipe thread sealant tape can be used to seal hydraulic connections if only one layer of tape is used. Apply tape carefully, two threads back, to prevent it from being pinched by the coupler and broken off inside the system. Loose pieces of tape could travel through the system and obstruct the flow of fluid or cause interference of precision-fit parts.

8. Storage

Store the unit in a dry, well-protected area where it will not be exposed to corrosive vapors, debris, or other harmful elements. If a unit has been stored for an extended period of time, it must be thoroughly inspected before it is used.

General Maintenance Continued

9. Checking Brushes on Universal Motors

To help prevent premature failure of the armature, check the brushes periodically:

- A. Disconnect the power supply.
- B. Remove shrouds, brush holder caps, and brush assemblies.
- C. The brush assemblies must be replaced if they are 6.5 mm (1/4") long or less. See Figure 9.
- D. Install brush assemblies, brush holder caps.
- E. Clean/replace open cell foam behind shroud vents before re-installing shrouds.

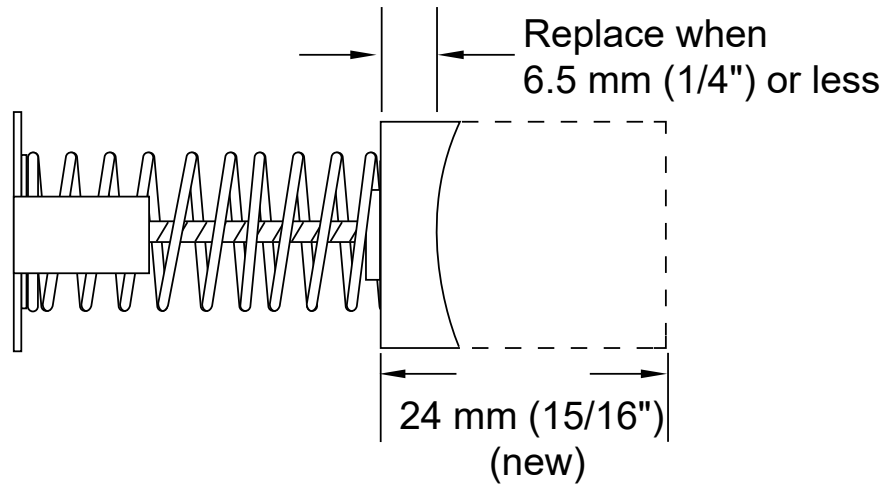


Figure 9.
Brush Inspection

TROUBLESHOOTING GUIDE

⚠ WARNING

- To help prevent personal injury, any repair work or troubleshooting must be done by qualified personnel familiar with this equipment.
- Use the proper gauges and equipment when troubleshooting.
- It is best to check for system leaks by using a hand pump and applying pressure to the suspect area. Watch for leaking fluid and follow it back to its source. **Never** use your hand or other body parts to check for a possible leak.

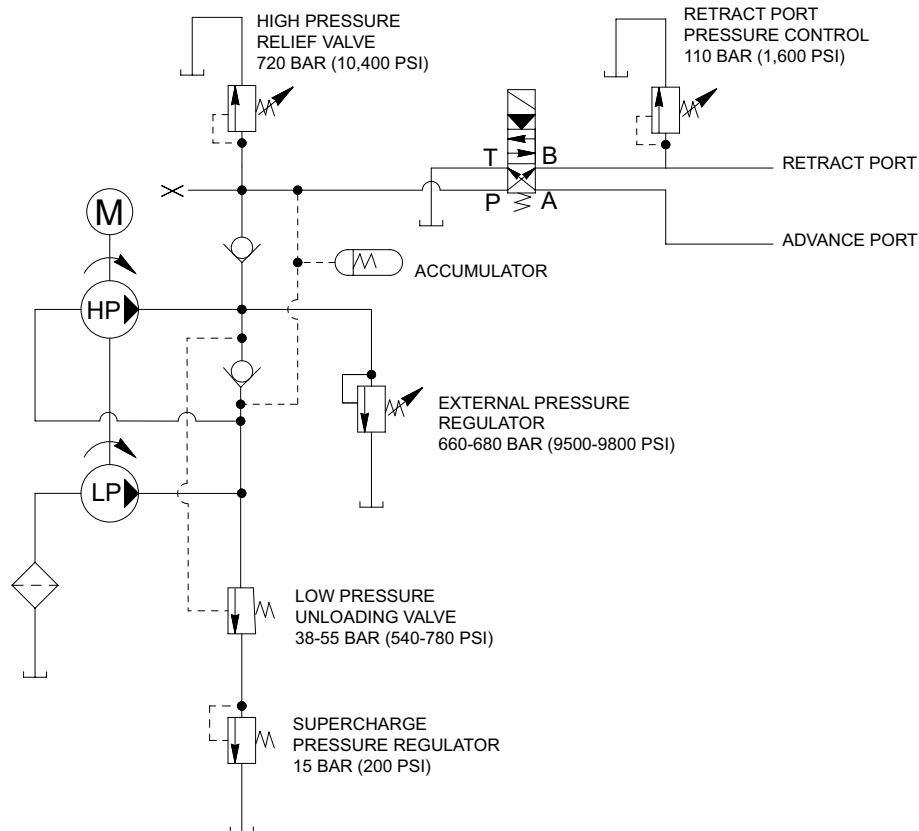
NOTE: For a detailed parts list or to locate a Bolting Systems Authorized Hydraulic Service Center, contact your nearest Bolting Systems facility.

PROBLEM	CAUSE	SOLUTION
⚠ WARNING To help prevent personal injury, disconnect power supply before removing cover. Any electrical work should be performed by a qualified electrician.	1. Pump not turned ON.	1. Press the ON/OFF button to turn ON.
	2. Unit is not plugged in.	2. Plug in unit.
	3. No voltage supply.	3. Check line voltage. Check reset button on power panel.
	4. Worn brushes.	4. Replace brushes.
	5. Broken lead wire or defective power cord plug.	5. Contact a Bolting Systems Authorized Hydraulic Service Center.
	6. Fuse broken.	6. Verify the fuse connection. If it is broken or damaged, replace it.
	7. LCD fault condition.	7. Check the LCD screen error and verify the action against the error (Refer LCD fault mode guide in 1001338).
Electric motor will not shut off.	1. Defective motor controls.	1. Disconnect unit from power supply; contact a Bolting Systems Authorized Hydraulic Service Center.
Electric motor stalls, surges, overheats or will not start under a load.	1. Low voltage.	1. Refer to electric motor information in "Set-Up Instructions" section.
	2. Electrical cord size too small.	2. Refer to electrical cord chart in "Set-Up Instructions" section.
Electric fuse keeps blowing	1. Wired incorrectly.	1. Disconnect unit from power supply; have qualified electrician review motor and circuit wiring.
Pump delivers excess fluid pressure.	1. Faulty pressure gauge.	1. Replace gauge.
	2. Relief valve set incorrectly.	2. Contact a Bolting Systems Authorized Hydraulic Service Center.
Pump does not build to full pressure.	1. Faulty pressure gauge.	1. Calibrate or Replace gauge.
	2. Check for external leakage.	2. Seal faulty pipe fittings with pipe sealant.
	3. Check external pressure regulator. Check relief valve setting.	3. Refer to Adjusting the Pressure Regulating Valve.
	4. Inadequate power supply.	4. Refer to "Electric Motor Operation" information under "Set-Up Instructions" section.
	5. Leaking control valve or defective pump	5. Contact a Bolting Systems Authorized Hydraulic Service Center.

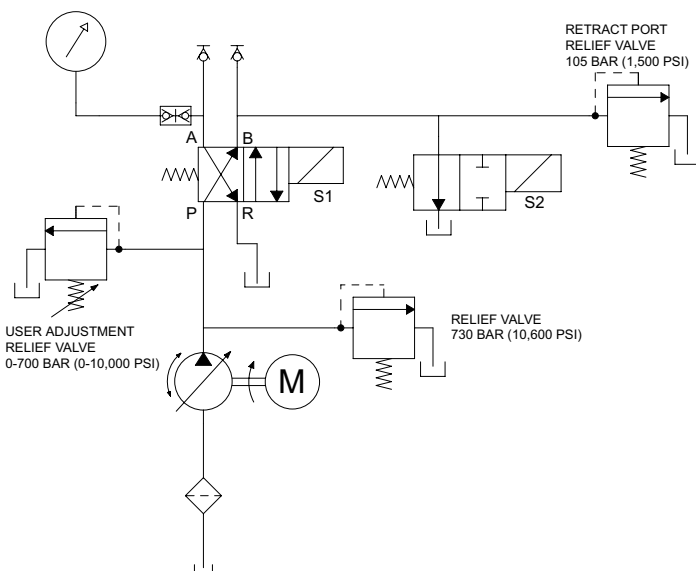
Troubleshooting Guide Continued

PROBLEM	CAUSE	SOLUTION
Pump is not delivering fluid or delivers only enough fluid to advance connected components partially or erratically or operation to slow.	1. Fluid level too low.	1. Fill reservoir according to directions "Filling the Pump Reservoir" under "Set-up Instructions" section.
	2. Loose-fitting coupler to component.	2. Verify quick-disconnect couplings are completely coupled. Couplers may need to be replaced because ball check does not stay open due to wear.
	3. Air in system.	3. Refer to the section titled "Bleeding Air from the System" under "Set-up Instructions" section.
	4. Air leak in suction line.	4. Check and tighten suction line.
	5. Debris in pump or filter plugged.	5. Clean pump filter. If problem persists, disconnect from power supply. Contact a Bolting Systems Authorized Hydraulic Service Center.
	6. Cold fluid or fluid too heavy. (Hydraulic fluid is of a higher viscosity than necessary.)	6. Drain, flush, and refill reservoir using a lighter weight fluid. Refer to "General Maintenance" section.
	7. Vacuum in reservoir.	7. Clean plugged vent in filler cap.
Pump builds pressure but cannot maintain pressure.	1. Fluid leakage.	1. Look for external leaks. If no fluid leakage is visible, the problem is internal. Seal leaking pipe fittings with pipe sealant.
	2. Leaking pressure switch seal.	2. Replace pressure switch.
Torque wrench does not auto-cycle or erratically.	1. Auto-cycle mode turned OFF.	1. Check if the auto-cycle mode is activated (refer to the LCD user instruction manual).
	2. Ensure the pressure setting for the required torque output is at or below the specified pressure.	2. Refer pressure/Torque Conversion Chart provided with each torque wrench to check the pressure value.
	3. Check the pump configuration.	3. The auto-cycle feature is only available on LCD pumps.
Pump runs hot	1. Cooler malfunctioning or high ambient temperature.	1. Verify whether the cooler is circulating fluid correctly or not. If it is damaged replace with new cooler kit.
	2. Advance or retract flow restricted.	2. Inspect for any blockages in the ports and ensure couplers are fully engaged.

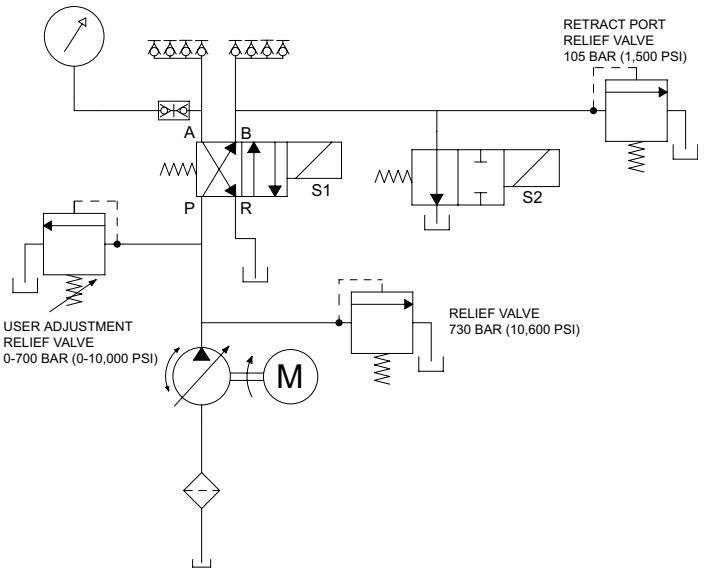
HYDRAULIC SCHEMATIC



Valve Codes: BA, BC, BE, BG (NON AUTOCYCLE)



Valve Codes: BB and BF (AUTOCYCLE)



Valve Codes: BD and BH (AUTOCYCLE)

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+44 1670 850580

EC DECLARATION OF CONFORMITY

We declare under our sole responsibility that our Electric Pump models, defined under the following series or specific part number as:

PE60xx – E110 and PE60xx – E220 series

to which this declaration relates are in conformity with the following:

2006/42 EC - Per the provisions of the Machinery Safety Directive	
EN_ISO 12100	Safety of machinery, basic concepts, general principles for design, risk assessment and risk reduction
EN 4413	Hydraulic Fluid Power – general rules and safety requirements for systems and their components
2014/30 EU - Per the provisions of the EMC Directive	
EN_61000-4-2	Electromagnetic Discharge Immunity test
EN_61000-4-3	Radiated, Radio Frequency, Electromagnetic Field Immunity test
EN_61000-4-4	Electrical Fast Transient / Burst Immunity test
EN_61000-4-5	Surge immunity test
EN_61000-4-6	Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields
EN_61000-4-11	Voltage Dip and Interrupt test
EN 55011	Industrial, Scientific and Medical (ISM) Radio Frequency Equipment-Electromagnetic Disturbance Characteristics-Limits and Methods of Measurement
2014/35 EU - Per the provisions of the Low Voltage Directive	
EN_60204-1	Safety of Machinery –Electrical equipment of machines-Part 1 General requirements
2000/14 EC - Per the provisions of the Noise Emission in the Environment by Equipment for Use Outdoors Directive	
EN_3200L0014	Noise emission in the environment for use outdoors
ISO 3744	Sound Power Level Measurements measured sound power level on an equipment representative for this type: 89 dB(A) guaranteed sound power level for this equipment: 91 dB(A) or less
2011/65/EU - Per the provisions of the RoHS Directive	
	Restriction of the use of certain hazardous substances in electrical and electronic equipment (Applicable only to those components of this product, that are dependent on electric currents or electromagnetic fields in order to function properly.)

Hydraulic Technologies USA LLC

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IL 61109-3699
United States of America

Hydraulic Technologies

Netherlands B.V.

Albert Thijsstraat 12
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Eygelsloven
The Netherlands

We hereby declare that the equipment specified hereon, conforms to the above quoted European Community Directive(s) and Standard(s) as per the currently valid revision.

Hydraulic Technologies is certified and registered to ISO 9001: 2015.

The Netherlands,



Neil Hughes, Operations Lead EMEA



UKCA DECLARATION OF CONFORMITY

We declare under our sole responsibility that our Electric Pump models, defined under the following series or specific part number as:

PE60xx – E110 and P630xx – E220 series

to which this declaration relates are in conformity with the following:

The Supply of Machinery (Safety) Regulations 2008 No. 1597 and amendments	
EN_ISO 12100	Safety of machinery, basic concepts, general principles for design, risk assessment & risk reduction
EN 4413	Hydraulic Fluid Power – general rules and safety requirements for systems & their components
The Electromagnetic Compatibility Regulations 2016 No. 1091	
EN_61000-4-2	Electromagnetic Discharge Immunity test
EN_61000-4-3	Radiated, Radio Frequency, Electromagnetic Field Immunity test
EN_61000-4-4	Electrical Fast Transient / Burst Immunity test
EN_61000-4-5	Surge immunity test
EN_61000-4-6	Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields
EN_61000-4-11	Voltage Dip and Interrupt test
EN 55011	Industrial, Scientific and Medical (ISM) Radio Frequency Equipment-Electromagnetic Disturbance Characteristics-Limits and Methods of Measurement
The Electrical Equipment (Safety) Regulations 2016 No. 1101	
EN_60204-1	Safety of Machinery –Electrical equipment of machines – Part 1 General requirements
The Noise Emissions in the Environment by Equipment for use Outdoors Regulation 2001 No. 1701	
EN_3200L0014	Noise emission in the environment for use outdoors
ISO 3744	Sound Power Level Measurements measured sound power level on an equipment representative for this type: 89 dB(A) guaranteed sound power level for this equipment: 91 dB(A) or less
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032	
	Restriction of the use of certain hazardous substances in electrical and electronic equipment

Hydraulic Technologies USA LLC

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We hereby declare that the equipment specified hereon, conforms to the above quoted UK Legislation and international Standard(s) as per the currently valid revision.

Hydraulic Technologies is certified and registered to ISO 9001: 2015.

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