POWER TEAM™
HYDRAULIC TECHNOLOGIES

Hydraulic Technologies
5885 11th Street Rockford,
IL 61109-3699 USA
powerteam.com

Tech Services: (800) 477-8326
Order Entry: (800) 541-1418

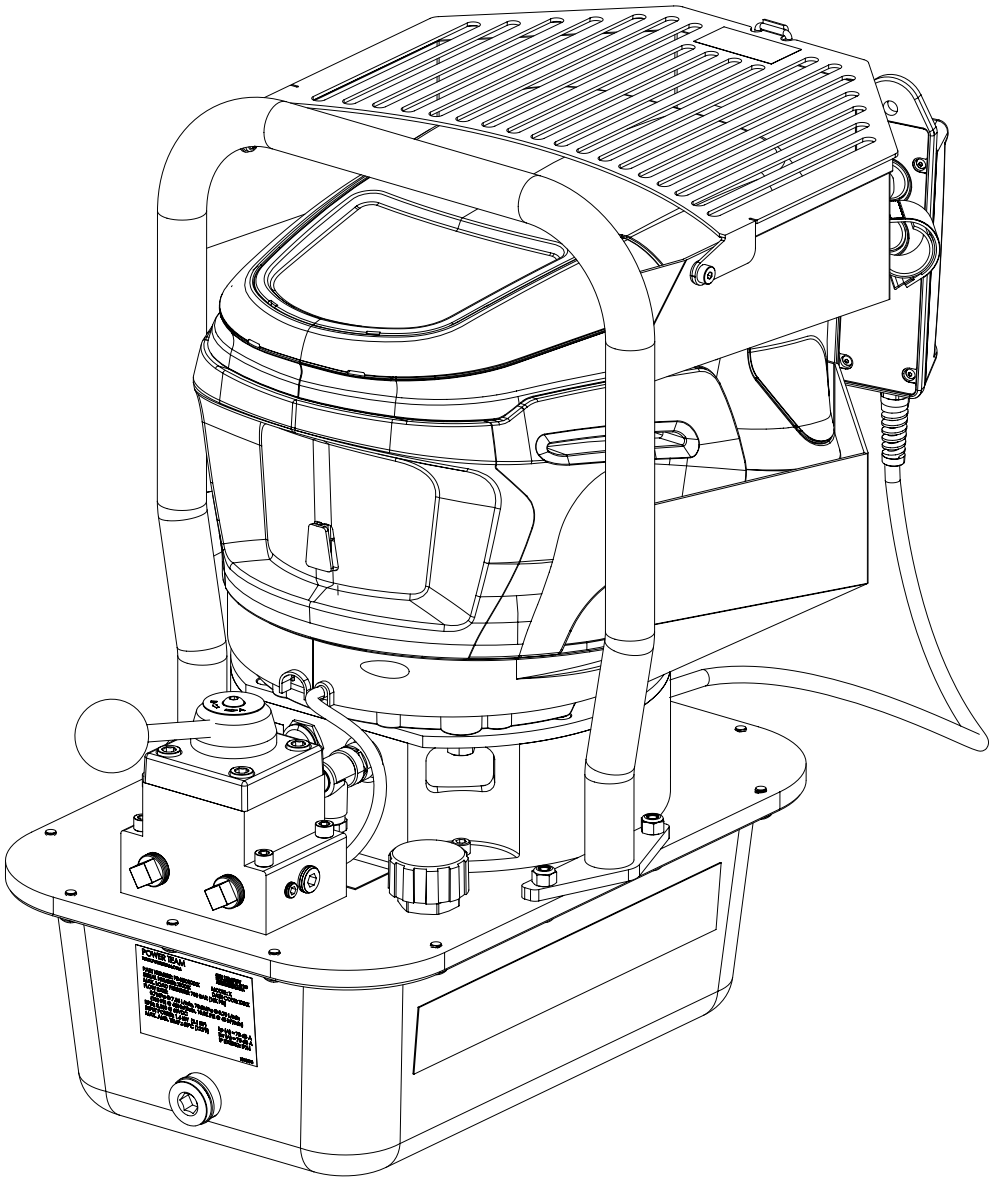
Operating Instructions For:

CE

PB43 Series

Battery-Powered

PB43 SERIES
HYDRAULIC PUMP



MODEL SHOWN FOR PB43MA1P-1

Form No. 1001372
Rev. 4 Aug. 26, 2024

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DESCRIPTION

The Power Team PB43 series battery-powered hydraulic pumps are designed to have a maximum of 700 bar (10,000 psi) at a flow rate of 705 cc/min (43 cu. in/min). Pump delivers hydraulic fluid under pressure through the use of an brushless DC electric motor and 60VDC Li-ION battery as a power source. A pump can be valved for use with either single or double-acting cylinders or tools.

The pump is driven by a battery motor, allowing the power pack to be used in remote areas where electrical or pneumatic power sources are not available. The cordless battery powered hydraulic pump kit may include the following based on pump options; the hydraulic pump, a hand pendant, a battery charger, and one Li-ION battery, as shown in figure 1.

Recommended operating temperature range is -20°C to +50°C (-4°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.

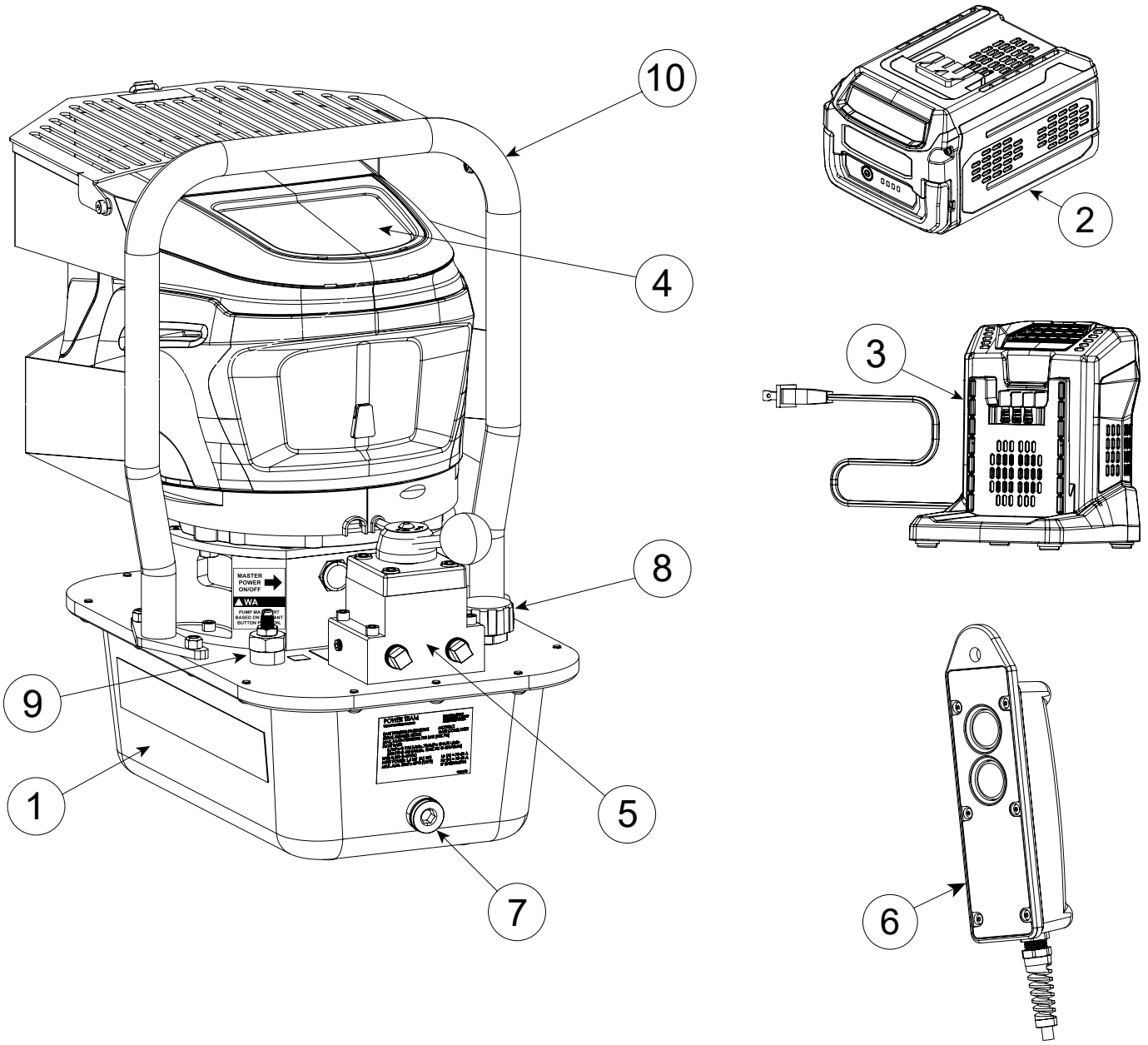


Fig. 1. Major Components of Pump

Description Continued

1. Hydraulic Reservoir
2. Battery Pack
3. Battery Charger
4. Power Head/Pump Motor Assembly
5. Directional Control Valve
6. Hand Pendant Controller
7. Hydraulic Reservoir Drain Plug
8. Oil Fill Plug
9. User-adjustable Relief Valve
10. Carrying Handle/Roll cage

Hydraulic Reservoir:

- 5.7L (1.5 Gal) nominal with 4.8L (295 in³) actual usable. Base weight for PB43 with a 5.7L reservoir (including oil) is 32.2 kg (71 lbs.). Weights do not include valve or accessories.
- 9.4L (2.5 Gal) nominal with 8.7L (532 in³) actual usable. Base weight for PB43 with a 9.4L reservoir (including oil) is 35.8 kg (79 lbs.). Weights do not include valve or accessories.

Battery:

- Please see the table below for the 60V Li-ION battery specifications.

Battery Cat, No.	Voltage (Max) Volts	Capacity Amps	Weight kg (lbs) Without cable	5.5A Rapid Charger (Appr. Hours)
2010994	60	8.0	2.7 (5.9)	1.5

Battery Charger:

- Please see the table below for the 60V battery charger specifications.

Charger Cat. No.	AC Input Volts	AC Input Amps	DC Output Volts	DC Output Amps	Weight kg (lbs)	Market
2010995	110-130	4.8	60	5.5	1.1 (2.4)	US
2011156	200-240	1.9	60	5.5	1.16 (2.56)	EU
3001464	200-240	1.9	60	5.5	1.16 (2.56)	UK
3001465	200-240	1.9	60	5.5	1.16 (2.56)	AU

Power Head/Pump Motor Assembly:

- 60V Power head comes with specification of brushless DC motor - 5.5HP/4.10KW, maximum 3000±100 rpm. It is equipped with cooling fan which enables for better heat dissipation.

Directional Control Valves:

- PB43 series cordless electric pump is equipped with a different directional control valves. It is controlled by a rotary lever located in front of the pump. Refer to page no. 16 "Directional Control Valve Options" for more information.

Hand Pendant Controller:

- Pump is equipped with two button hand pendant controller for easy operation. Please refer page no. 15 for more details.

NOTES:

- **Carefully inspect the pump upon arrival. The carrier, not the manufacturer, is responsible for any damage resulting from shipment.**
- **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 Power Team Authorized Hydraulic Service Center contact your nearest Power Team facility. A list of all Power Team facilities is located at the end of this document.

⚠ WARNING: To help prevent personal injury,

- **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. Power Team will supply information necessary to help make these decisions. Consult your nearest Power Team facility.**

General:

- **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.**

Battery Powered Pump:

⚠ WARNING: Pump may start when pressing ON/OFF push button switch to ON position (green light illuminates) based on pendant button position.

- **Any electrical work must be done and tested by a qualified electrician per local directives and standards.**
- **Remove battery from the pump and relieve pressure before doing any maintenance or repair.**
- **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.**
- **Always shut off the motor and relieve pressure before breaking any connections in the system.**
- **Do not connect pump to hydraulic system powered by another pump.**
- **Pump motor assembly (“Powerhead”) is not serviceable and should not be opened. Electric shock may result.**
- **Do not expose the pump to rain or wet conditions. Water entering the pump will increase the risk of shock.**
- **Never remove or modify the pump's safety devices.**

Battery and Battery Charger:

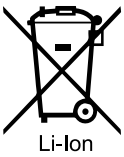
- **To reduce risk of injury, charge Power Team 60V lithium-ion battery with Power Team 60V lithium-ion battery chargers only. Other brands of battery packs may burst, causing personal injury and damage.**
- **Ensure rechargeable battery contacts cannot be shorted by metal objects, such as screws, instruments or nails. A short circuit between the battery contacts can cause burns or fire.**

- **Do not burn the charger or rechargeable batteries. Rechargeable batteries may explode and flare up.**
- **Allow battery to cool completely before charging.**

Safety Precautions Continued

- **As a result of improper use, liquid can leak from the battery. Avoid contact with this liquid. If battery liquid leaks and contact occurs, flush with water and seek medical help.**
- **Do not disassemble or attempt to repair the battery or battery charger.**

- **Store battery and battery charger in a cool, dry place. Keep these items in a secured area, away from children and pets. Unplug battery charger when cleaning or not in use.**
- **Do not allow children to use or play with the battery pack or battery charger; local regulations may restrict the age of the operator.**



- **Do not discard batteries into domestic waste disposal. Any damaged or disposed electric or electronic devices must be delivered to appropriate collection centers.**
- **If the battery is stored without being charged, natural drainage will cause the power to be reduced. The battery should be completely re-charged every three months if not in use.**

- **For indoor use only. Do not use the battery and charger outdoors or expose it to wet or damp conditions. Water entering the charger will increase the risk of electric shock.**
- **Only use the battery and charger that is supplied by manufacturer. Using a different battery or different charger may cause an explosion.**
- **If the supply cord to the battery charger is damaged, contact an Authorized Service Dealer to replace it.**
- **Do not use a battery pack or charger that is damaged or modified. Damaged or modified batteries may show unpredictable behavior resulting in fire explosion or risk of injury.**

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. 2. "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.**

Safety Precautions Continued

Cylinder or Tools:

- **Do not exceed the rated capacities of the cylinders or tools. Excess pressure can result in personal injury.**
- **Do not set poorly balanced or off-center loads on a cylinder or tools. The load can tip and cause 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.**

⚠ DANGER : A double-acting cylinder or ram must have both hoses and all couplers securely connected to both ports. If one of the two ports is restricted or becomes disconnected, pressure will build and the cylinder, hose or coupler can burst, possibly causing serious injury or death.

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.**

Transport:

- **Do not lift or drag the hydraulic pump by any pendant, 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.

⚠ WARNING: Pump may start when pressing ON/OFF push button switch to ON position (green light illuminates) based on pendant button position.

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.

Hydraulic lines and fittings can act as restrictors as the tool retracts. The restricting or slowing of the fluid flow causes back pressure that slows the tool's return. Return speed also varies because of the application, condition of the tool, inside diameter of hose or fitting, length of the hose, and the temperature and viscosity of the hydraulic fluid.

⚠ 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.

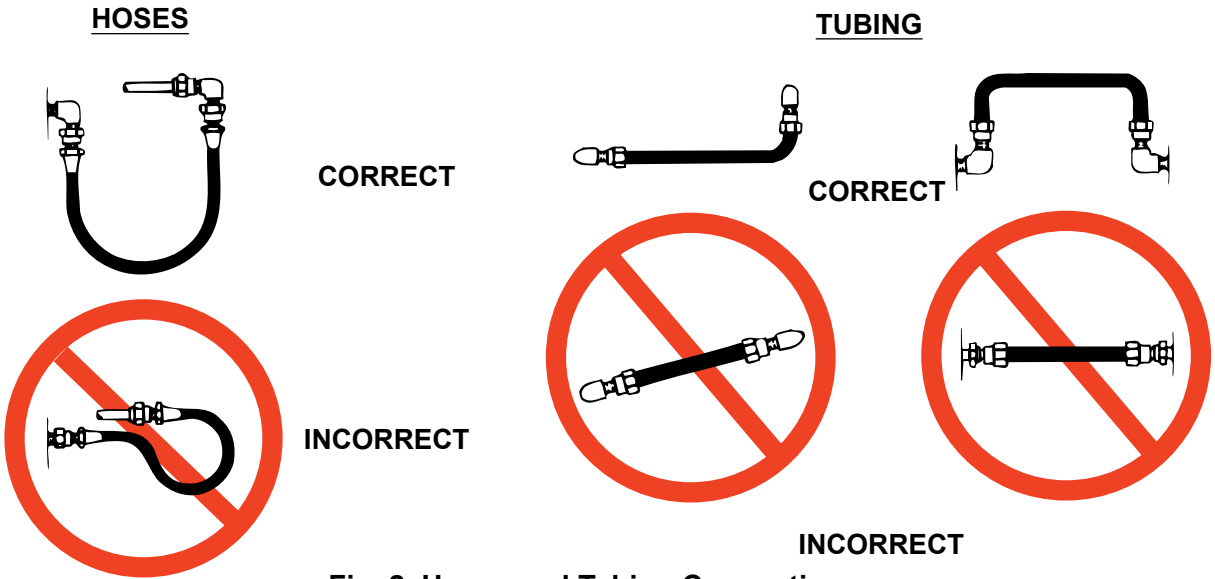


Fig. 2. Hoses and Tubing Connections

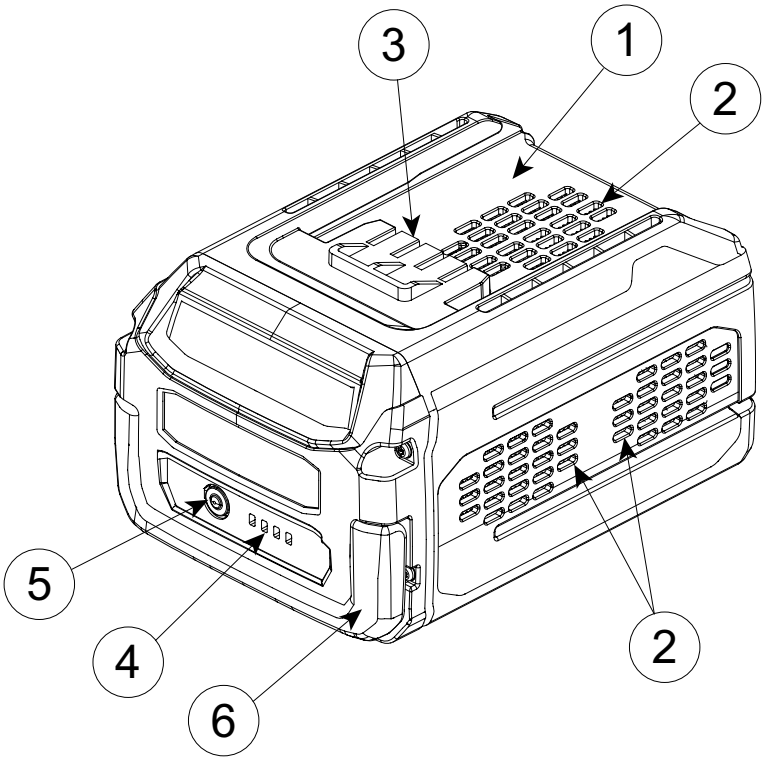
3. Charging the Battery Pack

IMPORTANT: The battery pack is not fully charged when you purchase it. Before using the tool for the first time, place the battery pack in the charger and charge it until the LED display indicates the battery pack is fully charged.

Battery Details:

At any time, press the battery power button on the battery pack to display the current charge (four LED indicators). Refer to Figure 3 to determine the level of charge.

The 4-LED indicator will illuminate one by one from right to left, after all 4-LED indicator were in solid green, then the LED indicator will illuminate as shown below and turn off after 10 seconds. A dead battery causes no LED to shine. The display may also be used during battery discharge.



1. Battery pack cavity
2. Cooling air vents
3. Battery contacts
4. Four LED indicators
5. Power button
6. Carrying Handle

Illustration	LED Indicator				Battery Status
	LED#4	LED#3	LED#2	LED#1	
Solid green	☐	☐	☐	■	3%-20%
Solid green	☐	☐	■	■	20%-60%
Solid green	☐	■	■	■	60%-80%
Solid green	■	■	■	■	80%-100%
Flash green	☐	☐	☐	☐	<3%
Flash green-1HZ	☐	☐	☐	☐	Error-abnormal temperature
Flash green-4HZ	☐	☐	☐	☐	Error-abnormal battery cell

Fig. 3. Battery Components and LED Indicators

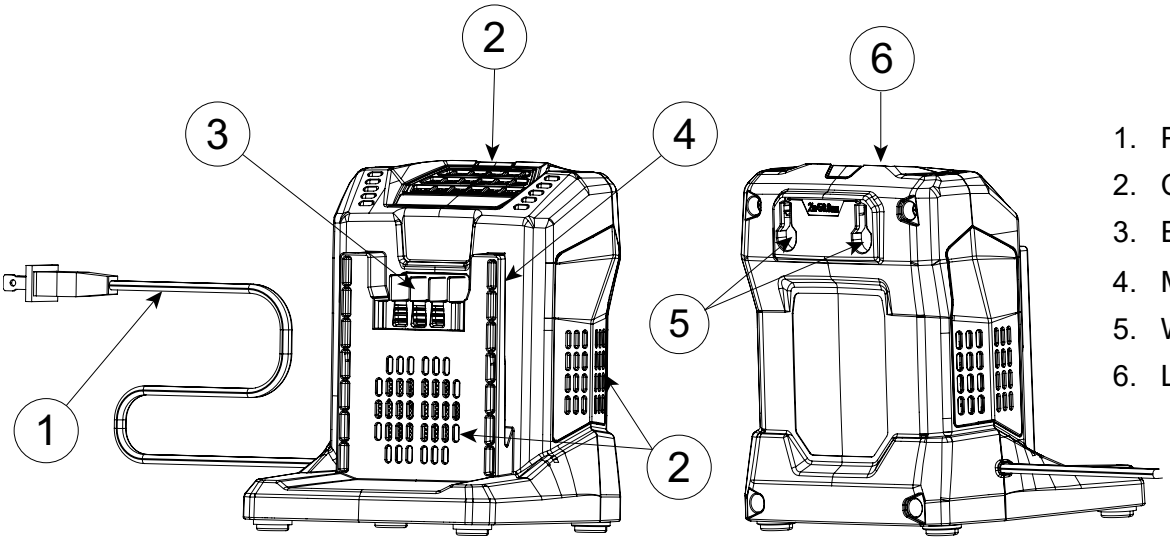
NOTE: For abnormal LED indicator and when all the LED indicators turn off please refer to section "Trouble Shooting Guide" for problem solving.

Battery Management System:

- The battery circuitry safeguards the battery pack on extreme temperatures, over-discharge, and over-charge. The battery pack circuitry will turn off the battery pack if it becomes overloaded or if the temperature rises too high during use to protect the battery and extend its life. This may occur in high-torque, binding, or stalling situations. The battery pack will shut down with LED indicator shining red for 10s when its operating temperature exceeds 158°F (70°C), and will begin normal operation when it returns to 152°F (67°C).
- This lithium-ion battery pack will perform optimally in temperatures ranging from 50°F(10°C) and 80°F(26°C). When the battery pack is extremely cold, it may "pulse" for the first minute of use in order to warm up. Connect the battery pack to a tool and use it in a light application. After about a minute, the battery pack will have warmed up and will function normally.
- Lithium-ion battery packs are shipped partially charged. Before using it the first time, fully charge the battery pack.
- This battery pack features an advanced self-maintenance function that will extend battery life. Depending on the battery charge, it will automatically perform a self-discharge operation after one month of storage. After this self-maintenance, the battery pack will enter sleep mode and retain 30% of its charge capacity. If stored for a month or longer, fully recharge the battery before the next use.

Charger Details:

⚠WARNING : Do not use the charger outdoors or expose it to wet or damp conditions. Water entering the charger will increase the risk of electric shock.



1. Power cord
2. Cooling air vents
3. Electrical contacts
4. Mounting slots
5. Wall mounting holes
6. LED indicators

Indicators	Indication
	Green Blinking - Battery is charging
	Green Steady - Battery is fully charged
	Red Blinking - Faulty battery/charger/charging connection
	Red Steady - Battery pack and/or battery charger is over or under the appropriate temperature range

Fig. 4. Charger Components and LED Indicators

Follow below steps to charge battery:

A. Ensure that there is no dust and debris in the electrical contacts and air vents of the battery and charger.

B. Connect the charger plug end to an appropriate power source. The LED indicator on the charger will briefly light up green, indicating that the charger is working properly.

C. Align the cavity on the battery pack with the mounting slots on the charger, then slide the battery pack onto the charger.

D. The charger will communicate with the battery pack to evaluate the condition of the battery pack.

E. When the battery pack is charging, the indicator LED on the charger will light up green. The fan in the charger continuously works to cool the battery pack.

F. Once the battery pack is completely charged, the charging indication LED will stop flashing green and remain green continuously. Wait for the cooling fan to stop, remove the battery pack from the charger, and disconnect it from the power supply.

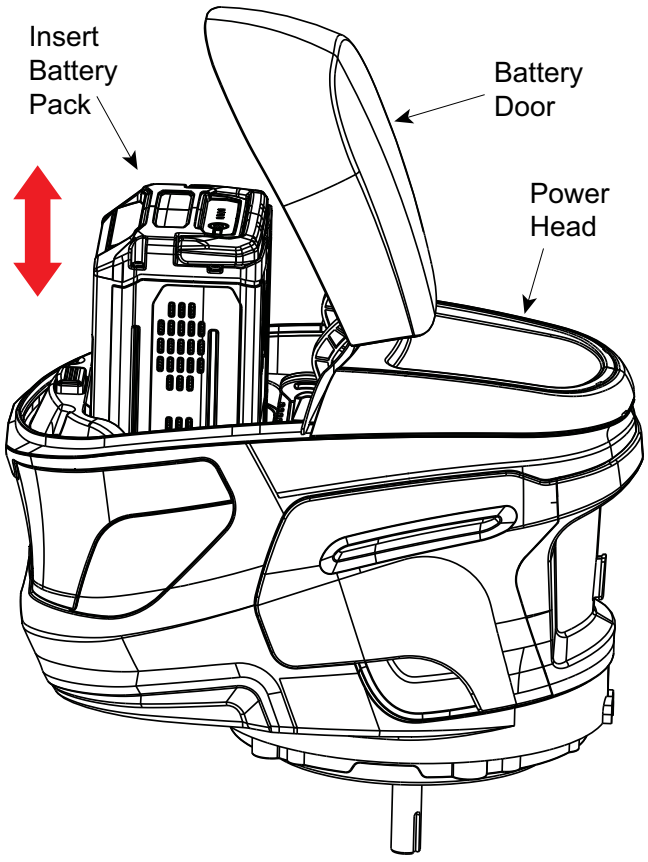
IMPORTANT: The battery can be left on the charger for short periods between uses. If the battery will not be used for longer periods, remove the battery from the charger.

4. Battery Pack and Safety Key Installation and Removal

A. Make sure that hand pendant switch and pump unit switch is in OFF position.

B. Open and hold the battery door on the power head or pump motor assembly.

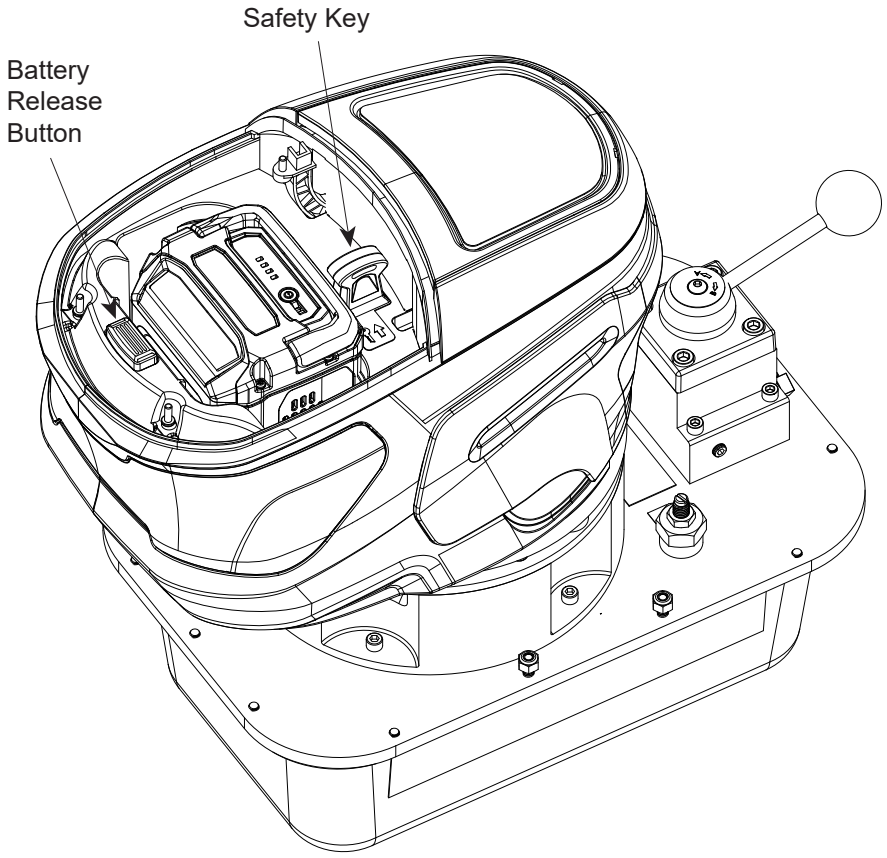
C. Align the ribs on the battery and the battery bracket. Push the battery pack into the battery compartment until you hear a "click" (Refer below image).



Set-Up Instructions Continued

D. Insert the safety key into the key slot as shown below.

NOTE: The pump can only be started when the safety key is inserted. Remove the safety key the power head after use.



E. Once the battery is fully seated and secured close the battery door on the power head.

F. When the work is finished, remove the battery from the pump and make sure the pump motor is turned off.

G. To remove the battery from the pump, open the battery door and depress the battery release button in the battery compartment (shown above).

H. Slide the battery out from the power head or pump motor assembly.

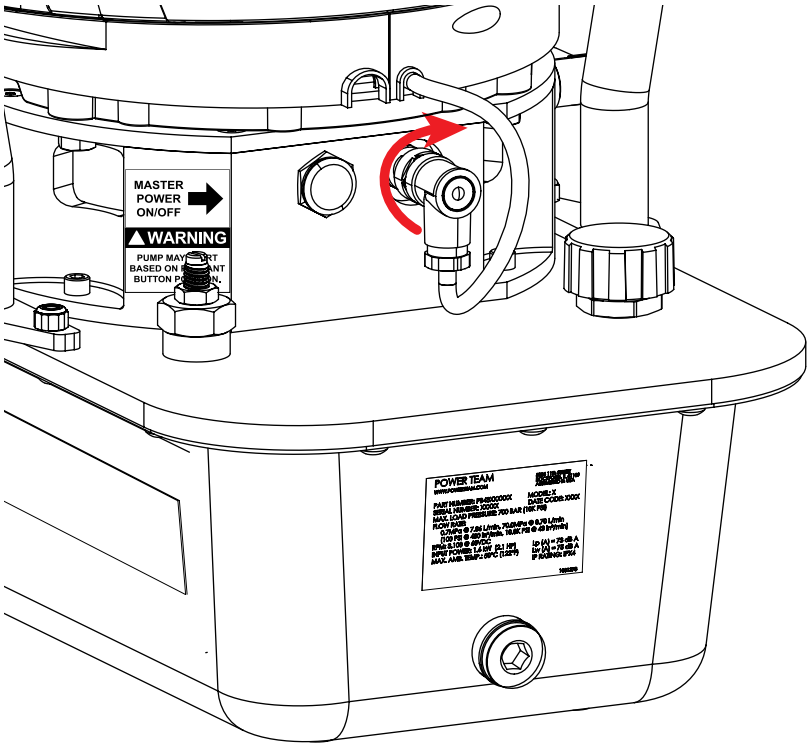
⚠WARNING: When the battery pack is not in use, keep it away from any metal objects that can make a connection from one terminal to another. Shortening the battery terminals together may cause burns or fire.

5. Pump Unit Connections (Hand Pendant and Power Head Cable)

A. Notice the location of the alignment pins in the male connector located on the pump unit.

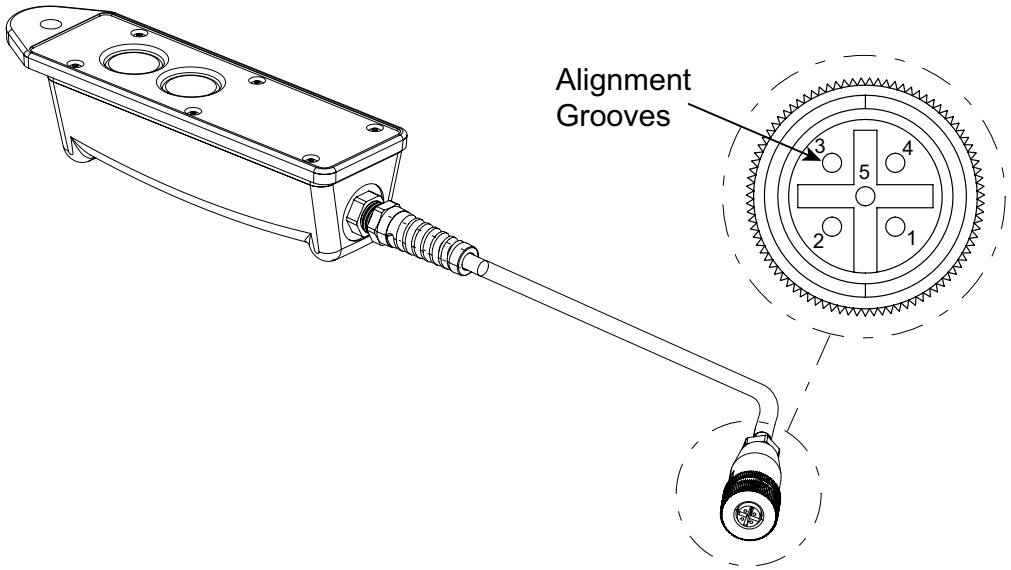
B. Align the grooves located in the female connector on the power head cable end with the male connector on the pump unit and insert the power head cable.

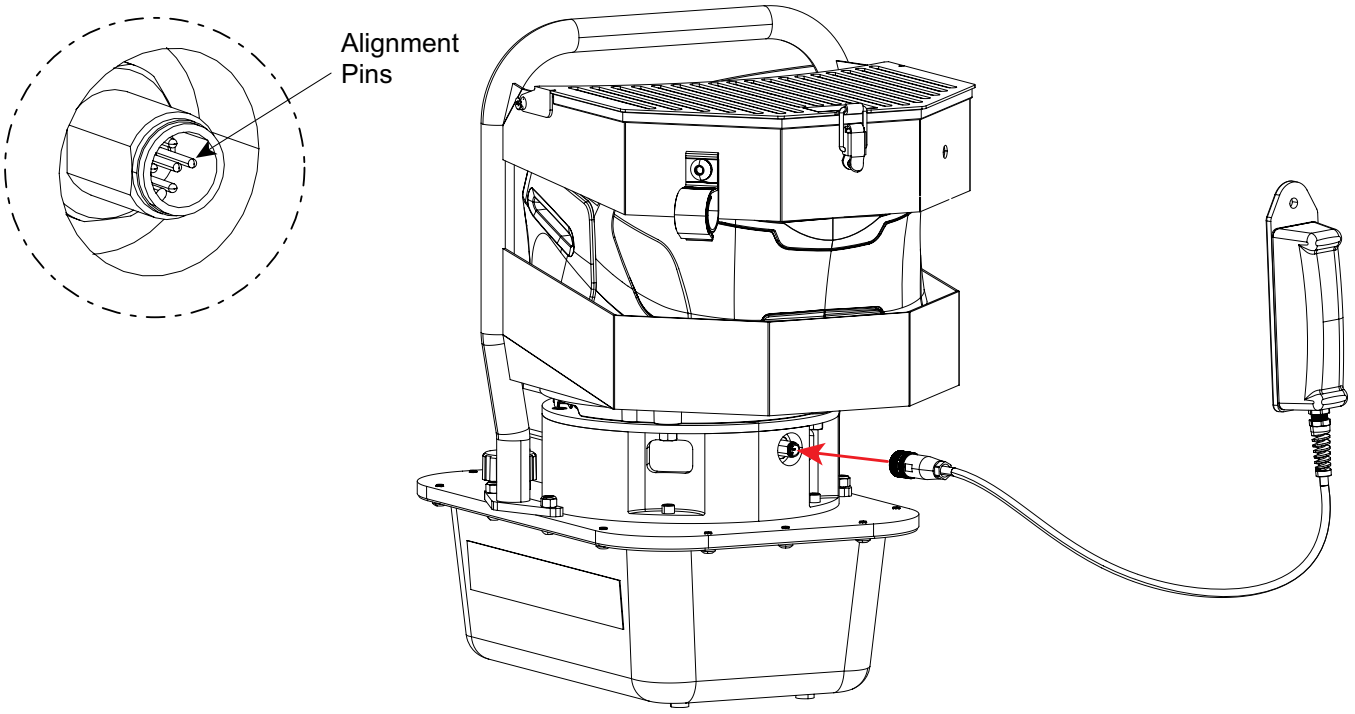
C. Secure the connection by threading (rotating clockwise) the cable fitting into the pump unit fitting, as shown below.



D. Notice the location of the alignment pins in the male connector located on the pump unit.

E. Align the grooves located in the female connector on the pendant cable end with the male connector on the pump unit, and insert the pendant cable as shown below.





E. Secure the connection by inserting the pendant cable into the pump unit fitting.

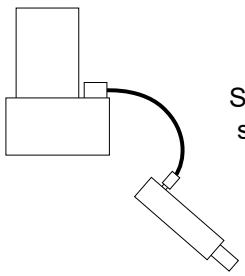
F. To check the pendant connection depress ON/OFF to ON position or press and hold the JOG button.

6. Bleeding Air from the System

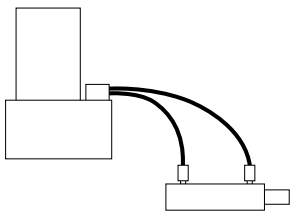
After all connections are made, the hydraulic system must be bled of any trapped air. Refer to the diagrams below.

With no load on the system and the pump vented and positioned higher than the cylinder or hydraulic device, cycle the system several times. Check the reservoir for possible low fluid level and fill to proper level with approved, compatible hydraulic fluid as necessary (see section “Filling the Pump Reservoir” under section "Set-Up Instructions"). If there is a problem, contact Power Team.

IMPORTANT: Some spring return cylinders, or rams have a cavity in the rod which forms an air pocket. This type of cylinder or ram should be bled when positioned upside down or lying on its side with the port facing upward.



System with a single-acting cylinder



System with a double-acting cylinder

1. Priming the Pump

When operating the pump for the first time:

A. Valve and hose connections must be tight, and the reservoir must be filled to the proper oil level.

B. Set valve to the neutral or return position and jog the pump several times to build pressure. If the pump doesn't build pressure, it may not be primed. Disconnect a hose from the system and route it back to the pump reservoir. Run the pump until a steady flow of oil is observed free of suspended air bubbles. Reconnect the hose to the system.

C. Run the tool several times to eliminate air from the system. For more complete instructions, refer to the section titled "Bleeding Air from the System."

D. The pump is now ready to be put into regular operation.

IMPORTANT: After eliminating trapped air from the system, retract the tool and refill the pump reservoir to 1" (25.4 mm) from the bottom of the cover plate or to fill line.

⚠ DANGER: When lifting or lowering a load, the load must be under operator control at all times and others must be clear of the load. Use blocking and cribbing to guard against a falling load. Do not drop the load. The use of a load lowering, or metering valve is recommended in addition to the pump directional control valve.

2. Pump Motor Operation

A. Before start-up check all hydraulic fittings and connections to be sure they are tight and leak free.

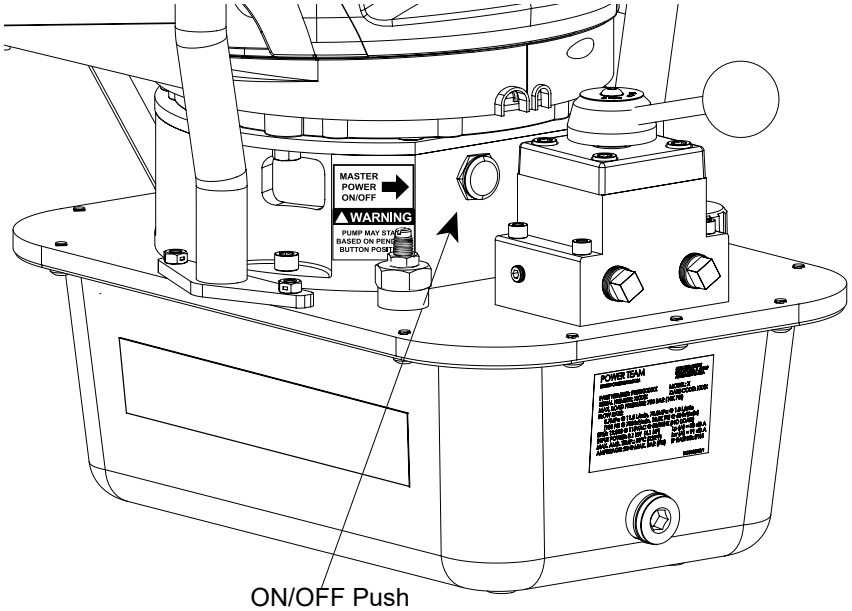
B. Check the hydraulic oil level. Add oil if necessary. Refer to section "Filling the Pump Reservoir."

C. Install a fully charged battery on the pump. Refer to Section "Battery Installation and Removal"

D. Place control valve lever in the neutral or return position. Refer to section "Directional Control Valve" option for specific functions for each directional valve.

E. Start the pump by pressing ON/OFF push button to the ON position (green light illuminates); Power will be supplied to the pump unit and hand pendant. See figure below.

⚠ WARNING: Pump may start when pressing ON/OFF push button switch to ON position (green light illuminates) based on pendant button position.



ON/OFF Push
Button Switch

F. See Figure 5. Two button hand pendant controller.

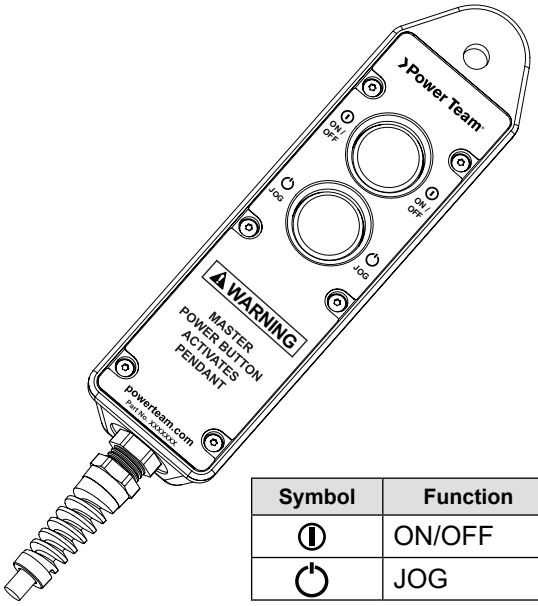
i. Depress ON/OFF button on the hand pendant to start the pump motor and to advance or retract the tool.

ii. When released motor stays on.

iii. Depress ON/OFF button again to stop the motor.

iv. Press and hold momentary JOG button on the hand pendant to start the motor.

v. When released, motor stops.



Symbol	Function
⏻	ON/OFF
⏻	JOG

Fig. 5. Two Button Hand Pendant Controller

3. Adjusting the Pressure Regulating Controls

The pressure regulating valve can be adjusted to bypass fluid at a given setting while the pump continues to run (See Figure 6).

User Adjustable Relief Valve:

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

A. 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 setting to a lower than desired pressure.

B. The pump must be completely connected electrically and hydraulically. Start the pump and build pressure.

C. Slowly turn the adjusting screw or knob in a clockwise (CW) direction. This gradually increases the pressure setting. When the desired pressure is reached, cycle the pump again to verify correct pressure setting. Once set, lock the adjusting screw in position by tightening the locknut. 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.

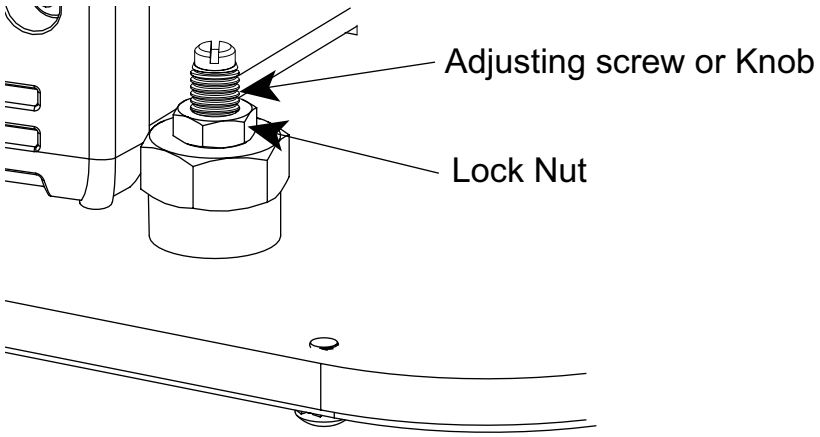
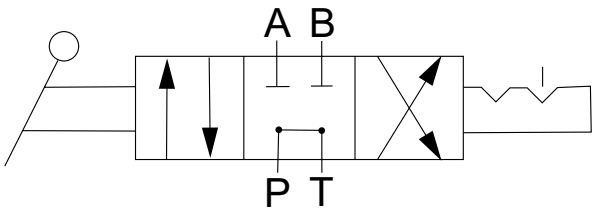
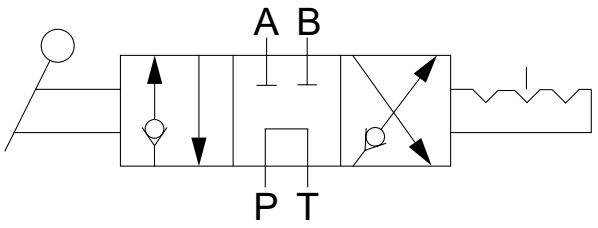
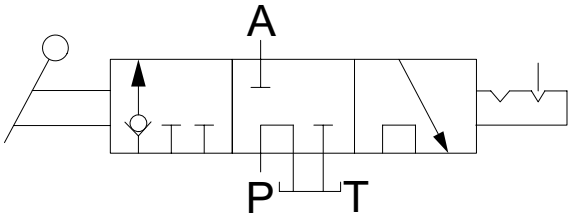
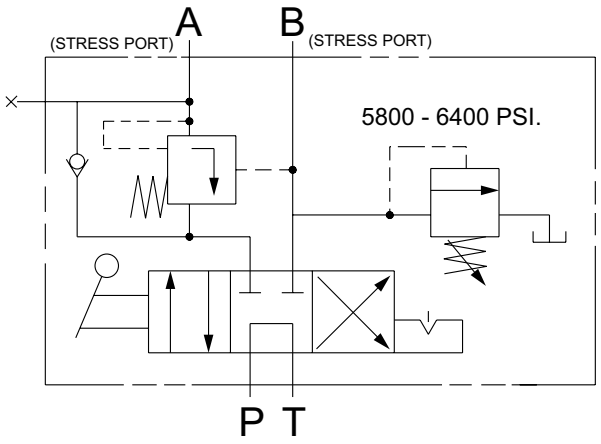
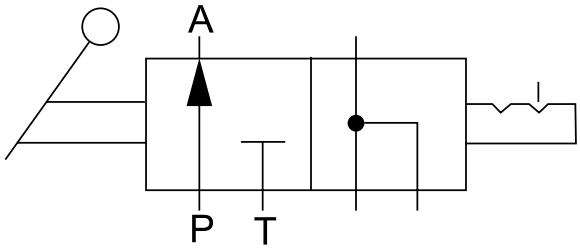


Fig. 6. Pressure Regulator Valve

DIRECTIONAL CONTROL VALVE OPTIONS

Valve No. (Code)	Description	Valve Function	Hydraulic Diagram
9500 (MA) (4.2 lbs.)	4-Way, 3-Pos. Tandem Center --- Lever-Operated, Detent-Positioned --- Used with SA or DA Tools	**Center Position:** "A" and "B" ports blocked, pressure "P" to tank "T". **Advance Position**: Pressure "P" to "A" port, "B" port to tank "T". **Return Position**: Pressure "P" to "B" port, "A" port to tank "T". **Note: All ports open to tank during transition between valve positions.**	
9506 (MD) (5.1 lbs.)	4-Way, 3-Pos. Tandem Center, with Posi-check Featured --- Lever-Operated, Detent-Positioned --- Used with SA or DA Tools	**Center (Hold) Position**: "A" and "B" Ports blocked, pressure "P" to tank "T". **Advance Position**: Pressure "P" to "A" port (Reverse flow checked), "B" port to tank "T". **Return Position**: Pressure "P" to "B" port (Reverse flow checked), "A" port to tank "T". **NOTE: "A" and "B" Ports are blocked with the pressure port open to tank during transition between valve positions. (Non-Interflow.)**	
9520 (MH) (5.1 lbs.)	3-Way, 3-Pos. Tandem Center, with Posi-check Featured --- Lever-Operated, Detent-Positioned --- Used with SA Tools	**Center Position**: “A” Port blocked, pressure port "P" to tank "T". **Advance Position**: Pressure "P" to “A” port, tank port blocked. **Return Position**: Pressure "P" to tank "T" (independent return), “A” port to tank "T" (independent return). **Note: “A” port blocked with the pressure port open to tank during transition between valve positions. (Non-Inter flow.)**	
*** "SA" represents Single-Acting tools and "DA" represents Double-Acting tools.**			

Directional Control Valve Options Continued

Valve No. (Code)	Description	Valve Function	Hydraulic Diagram
9628 (ML) (5.4 lbs.)	Post-Tensioning --- Lever-Operated, Detent-Positioned --- Single strand, double-acting stressing jacks	**Center Position**: "A" and "B" ports blocked, pressure "P" to tank "T". **"A" Position**: Pressure "P" to "A" port, "B" port to tank "T". **"B" Position**: Pressure "P" to "B" port (controlled to 6400 P.S.I. max.) "A" port to hold until pressure ratio is obtained and then releases to tank. "A" Port will remain open as long as "B" port maintains pressure ratio. **Note: "A" Port is blocked with "B" and "P" ports open to tank during transition between valve positions. Pressure ratio is the pressure differential in the "A" and "B" ports.**	
9582-A (MI) (2.5 lbs.)	3-Way, 2-Pos. --- Lever-Operated --- Used with SA Tools	**Advance Position** - Valve is closed and oil is delivered to the system through port "A" from port "P". **Return Position** - Valve is open, pressure is released and oil returns to tank port "T".	
*** "SA" represents Single-Acting tools and "DA" represents Double-Acting tools.**			

GENERAL MAINTENANCE

⚠ WARNING: To prevent personal injury,

- **Remove battery pack and safety key from the pump 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, battery unit and couplings — all must be:

- Rated for the same maximum operating pressure
- Correctly connected
- Compatible with the hydraulic fluid used
- Battery and Battery charger both should be compatible

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 Power Team 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 or battery leakage
- 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 the FILL LINE when all cylinders or 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.

5. Draining and Flushing the Reservoir

A. Disconnect the battery pack from the pump unit.

B. Clean the pump exterior before the pump interior is removed from the reservoir.

C. Remove all screws fastening the pump motor assembly to the reservoir.

D. Remove the pump motor assembly and place aside.

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

E. Clean the inside of the reservoir, and fill with Power Team hydraulic fluid. Rinse the filter clean.

F. Place the pump motor assembly back onto the reservoir, and secure with two fasteners assembled on opposite corners of the cover plate.

G. 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.

H. Run the pump for several minutes.

I. Disconnect the pump motor assembly, and drain and clean the inside of the reservoir.

J. Fill the reservoir with Power Team hydraulic fluid.

K. Place the pump 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 battery pack from the pump unit.

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.

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.**
- **Use a nonflammable contact cleaners to clean the electrical contacts on the battery and tool.**

NOTE: For a detailed parts list or to locate a Power Team Authorized Hydraulic Service Center contact your nearest Power Team facility.

PROBLEM	CAUSE	SOLUTION
Pump motor does not run	1. Pump not turned ON	1. Press the ON/OFF button to turn ON.
	2. Battery failure	2. Charge or replace battery
	3. Power head or battery contacts dirty or corroded.	3. Clean contacts when dry with non-conducting material.
	4. Battery not inserted properly.	4. Remove and reinsert battery.
	5. Broken lead wire or defective internal wiring.	5. Contact a Power Team Authorized Hydraulic Service Center.
	6. Pump and battery contacts damaged.	6. Reform contacts
	7. Safety key is not inserted.	7. Insert the safety key.
Pump will not shut off	1. Defective motor controls.	1. Disconnect from power supply and contact a Power Team Authorized Hyd. Service Center.
Pump builds pressure but cannot maintain pressure.	1. External leaks	1. Seal leaking pipe fittings with pipe sealant. Replace leak king pipes or hoses.
	2. Internal or external leakage on hydraulic cylinder.	2. Remove the cylinder from pump. If the pump builds and maintains full pressure, the cylinder is defective. Contact a Power Team Authorized Hydraulic Service Center.
	3. Leaking control valve or check valve.	3. Contact a Power Team Authorized Hydraulic Service Center.
Pump delivers excess oil pressure.	1. Faulty pressure gauge.	1. Calibrate gauge
	2. Relief valve not properly set.	2. Contact a Power Team Authorized Hydraulic Service Center.

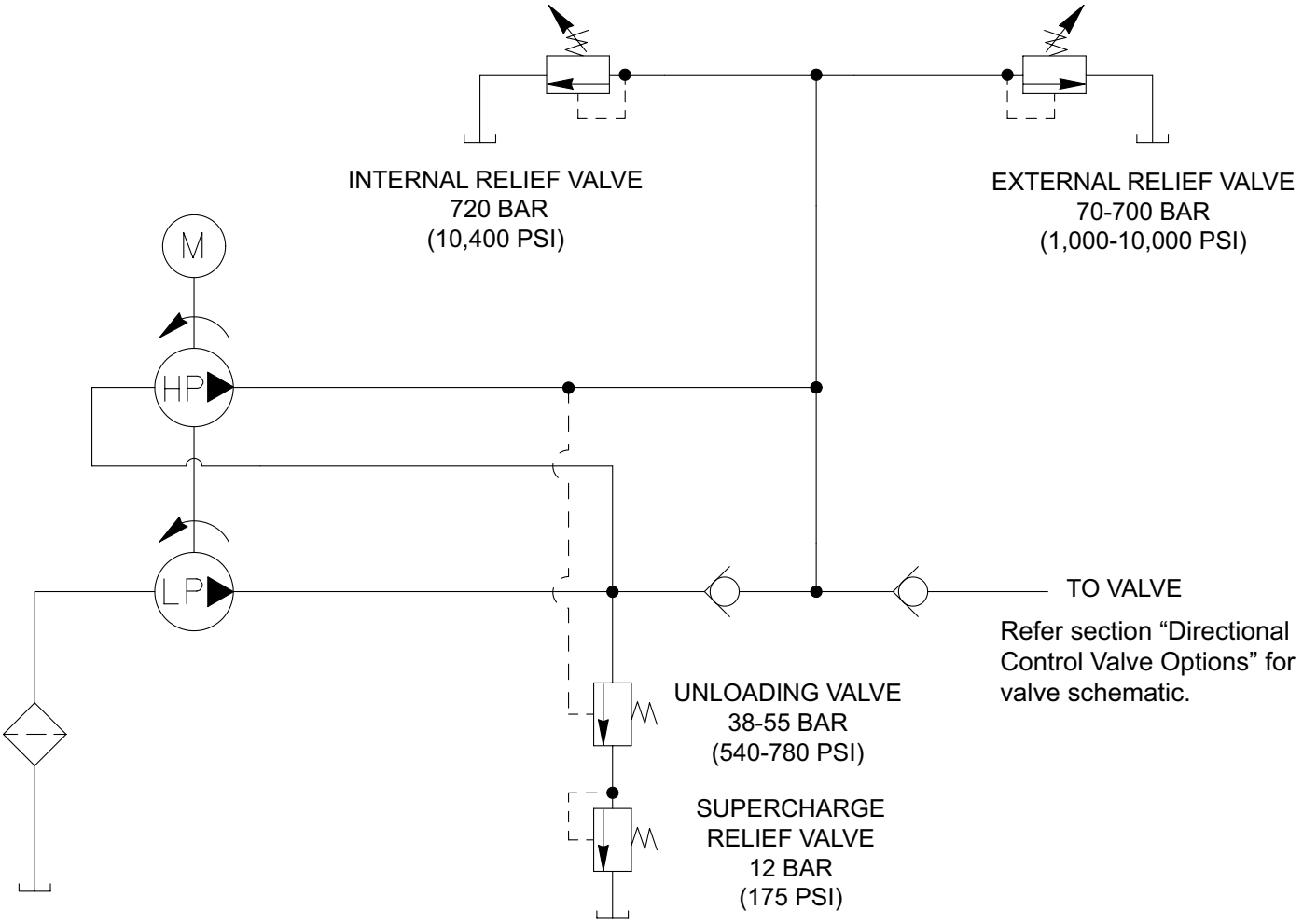
Troubleshooting Guide Continued

PROBLEM	CAUSE	SOLUTION
Pump is not delivering fluid or delivers only enough fluid to advance cylinder(s) partially or erratically.	1. Fluid level too low.	1. Fill reservoir according to directions “Filling the Pump Reservoir” under “Set-up Instructions” section.
	2. Quick disconnect couplings are not completely coupled.	2. Check quick-disconnect couplings to cylinders to ensure that they are completely coupled. Occasionally couplers have to be replaced because the 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. Cold fluid or fluid too heavy. (Hydraulic fluid is of a higher viscosity than necessary.)	4. Drain, flush, and refill reservoir using a lighter weight fluid. Refer to General Maintenance section.
	5. Reservoir capacity is too small for the size of cylinder(s) used.	5. Use smaller cylinder(s) or larger reservoir.
	6. Vacuum in reservoir	6. Check for plugged vent in filler plug.
	7. Debris in pump or filter plugged.	7. Pump filter should be cleaned and, if necessary, pump should be dismantled and all parts inspected and cleaned.
	8. Fluid bypasses through the double-acting cylinder.	8. Remove cylinder; cap hoses. Check pump and valve for leaks.
Pump will not build full pressure.	1. Faulty pressure gauge	1. Calibrate or Replace gauge.
	2. Check for external leakage.	2. Seal faulty fittings with sealant. Replace leaking pipes or hoses.
	3. Improperly adjusted external pressure regulator setting.	3. Refer to “User Adjustable Relief Valve” information under section “Adjusting the pressure Regulating Controls”.
	4. Internal or external leakage on hydraulic cylinder.	4. Remove the cylinder form the pump. If the pump builds full pressure, the cylinder is defective. Contact a Power Team Authorized Hyd. Service Center.
	5. Leaking control valve or defective pump.	5. Contact a Power Team Authorized Hydraulic Service Center.
Remote hand pendant not working properly	1. Defective electrical supply.	1. Check electrical connections.
	2. Defective circuit board.	2. Contact a Power Team Authorized Hydraulic Service Center.
	3. Remote control connection wire is disconnected.	3. Check electrical connections.

Troubleshooting Guide Continued

PROBLEM	CAUSE	SOLUTION
Cylinder(s) will not retract or extend.	1. Quick disconnect couplings are not completely coupled. **⚠ DANGER** **A Double acting cylinder or ram must have both hoses and all couplers securely connected to both ports. If one of the two ports is restricted or becomes disconnected, pressure will build and the cylinder, hose or coupler can burst, possibly causing serious injury or death.**	1. Check quick disconnect coupling to cylinders to ensure that they are completely coupled. Occasionally couplers have to be replaced because the ball check does not stay open due to wear.
	2. Broken return spring in spring return cylinder or seals blown in double-acting cylinder.	2. Contact a Power Team Authorized Hydraulic Service Center.
The battery pack power reduced after more than one month of non-use.	1. The battery pack has automatically performed self-maintenance to extend its life.	1. Fully recharge the battery pack before use.
The 4-LED indicator shines green-1HZ when the battery pack is working.	1. Abnormal battery pack temperature	1. Check whether the temperature line is poor contact. Let the temperature drop to (rise to) the normal working temperature range (- 20°C ~ 40°C). Replace the main board.
The 4-LED indicator shines green-5HZ when the battery pack is working	1. Abnormal battery pack Li-ion cell.	1. Ensure that each section of the battery cell is connected properly. Make sure the voltage difference of each battery cell is within 1V. Ensure that the voltage of the lowest section of the battery cell is raised for 10 minutes of charging. Replace the main board or the battery cell.
Charger does not work. LED flashes red or the LED go out.	1. Battery pack or charger is defective or bad connection between the battery pack and charger.	1. Try to remove and reinsert the battery pack in the charger. Try charging a different battery pack. Unplug the charger and wait until the red LED goes out, then reconnect the plug to the power supply.
Charger does not work and LED shines red.	1. Battery pack is too hot or too cold.	1. Allow the battery pack to reach normal temperature. Charging will begin when battery pack returns to 37°F(3°C) -35°F(57°C).

HYDRAULIC SCHEMATIC



POWER TEAM FACILITIES AND CONTACT

Rockford, Illinois USA
Customer Service/Order Entry
Tel: +1 800 541 1418
Fax: +1 800 288 7031

European Headquarters
Tel: +31 45 567 8877

Asia Pacific Headquar ters
Tel: +65 6265 3343

Technical Services
Tel: + 1 800 477 8326

Shanghai, China
Tel: +86 21 2208 5888

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:

PB43 - 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+A2	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
2006/66/EC - Per the provisions of the Battery Directive	
IEC 61960	Secondary Lithium Cells and Batteries for Portable Applications
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: 75 dB(A) guaranteed sound power level for this equipment: 78 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

Hydraulic Technologies
5885 11th Street
Rockford,
IL 61109-3699
United States of America

Hydraulic Technologies Netherlands B.V.
Albert Thijsstraat 12
NL-6471 WX
Eygelshoven
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

CE