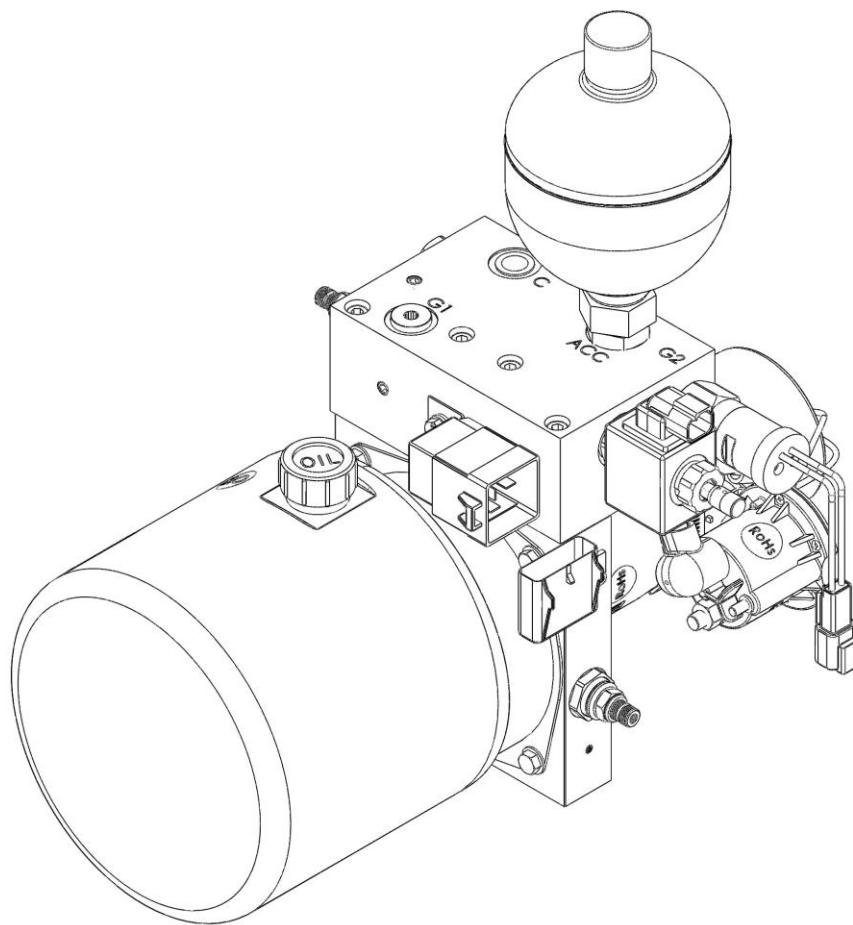


## HYDRAULIC POWER UNIT

### *Installation & Maintenance Manual*




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# CAUTIONS AND WARNINGS

Throughout this manual there are many **HAZARD WARNINGS** that must be read and adhered to in order to prevent possible loss of equipment and/or personal injury and or loss of life. The three warning words are “**Danger**”, “**Warning**” and “**Caution**”. They are used to indicate the severity of the hazard and are preceded by a safety alert symbol 

 **“Danger”** - Denotes the most serious injury hazard and is used when serious injury or death **WILL** result from misuse or failure to follow the specific instructions set forth in this manual.

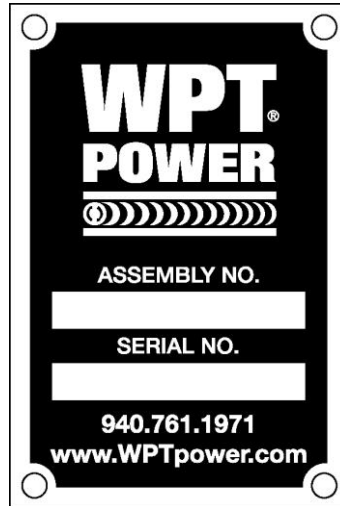
 **“Warning”** - Denotes when serious injury or death **MAY** result from misuse or failure to follow the specific instructions set forth in this manual.

 **“Caution”** - Denotes when injury or product or equipment damage may result from the misuse or failure to follow the specific instructions set forth in this manual.

# INTRODUCTION & NOMENCLATURE

## 1. Introduction

When ordering replacement parts, use the part numbers from the Bill of Material and drawing supplied with the Assembly. The most current documents may be obtained by contacting WPT or an authorized distributor. When ordering parts, provide the assembly number and serial number for the unit found on the brass tag affixed to the Assembly. See example below.



Recommended spare parts should be held by the customer. This will greatly reduce the possibility of 'costly downtime'. Contact WPT for a list of recommended spare parts.

Read this manual in its entirety. Contact WPT with any questions regarding function or necessary supporting equipment

## 2. Nomenclature

HPU	Hydraulic Power Unit
VDC or V	Voltage Direct Current
PS	Pressure Switch
ACC	Accumulator
HPRV	High Pressure Relief Valve
LPRV	Low Pressure Relief Valve
SV	Solenoid Valve
SPST	Single-Pole Single-Throw Relay
CR	Control Relay, Relay, or SPST Relay

# PRODUCT DESCRIPTION

## 3. Product Description

The WPT HPU is designed to engage and maintain engagement of hydraulic PTO's. It is a system complete with everything needed to operate WPT hydraulic PTO's.

The WPT HPU was designed to be self-contained, limiting the need for customer supplied components.

The HPU is started by turning the key switch to the momentary start position, then releasing the key switch to maintain its position in the ON position. The system will not operate unless advancing to the START position, which latches the provided relay. After releasing the switch from START to ON, the relay latch is maintained, keeping the HPU in operating mode. During the operating mode, the Pressure Switch (PS) will turn the pump motor ON and OFF as required to maintain system pressure. In the event pressure rises too far in excess of the rated pressure, the LPRV will crack allowing some oil pressure to return to tank during which time the PS will function as normal. In the event the motor temperature is too high, the motor's over-temperature switch will open, which will de-latch the relay. In this event, the motor will not turn back on until the key switch is turned to the momentary start position, then released to the maintained ON position.

WPT's HPU uses a Key so that it can be removed from the HPU's key switch when the equipment is undergoing maintenance or repair. During maintenance or repair, it is recommended to remove the HPU Key, then follow the guidelines of your company's Lock-Out Tag-Out procedures.

A wiring diagram and circuit (ladder) diagram is available. Contact WPT.

# SPECIFICATIONS

## 4. Specifications

Ambient Temperature	0 F [-18 C] to 110 F [43 C]
Voltage	Depending on the specific model, either 12 VDC or 24 VDC. 12 VDC versions should not be used on 24 VDC systems and vice versa. NOTE: The system voltage will be listed with a large sticker on the tank.
Pressure	100-275 lbf/in <sup>2</sup> [7-19 bar] 300-500 lbf/in <sup>2</sup> [21-35 bar]
Power (rated)	800 W
Current (rated)	12 VDC system - System ON, Motor ON: 70 Amps + Inrush - System On, Motor OFF: < 3 Amps  24 VDC system - System ON, Motor ON: 35 Amps + Inrush - System On, Motor OFF: < 2 Amps
Oil Type	Mobilfluid 424 Chevron Rando HZD (32 or 46) Shell Tellus S2 M (32 or 46) Shell Tellus S2 V (32 or 46) John Deere Hygard Caterpillar HYDO
Tank	0.80 gal [3.0 L]
Oil Level	Screw-in dipstick affixed to the vented cap
Protection	IP65

Port	Description	SAE O-ring Port
G1	Pump Pressure Test Port (not a customer connection)	#6, 9/16"-18
G2	Pressure Switch Port	#6, 9/16"-18
ACC	Accumulator Connection Port	#8, 3/4"-16
PS	Customer Hydraulic Output Connection Port (option 1)	#6, 9/16"-18
C	Customer Hydraulic Output Connection Port (option 2)	#6, 9/16"-18

# INSTALLATION

## 5. Installation

### 5.1.

Product Serial Number	
Product Part Number and Revision	
Purchase Date	
Installation Date	
Oil Brand / Type	

### **Warning**

Before beginning any work on the HPU it is recommended to disconnect the electric power supply from the HPU to prevent possibility of actuation, pressurized oil, or electrical hazard.

### **Warning**

The WPT Power HPU is supplied with a pressurized accumulator, which is a stored energy device. Proper preventative safety measures should be taken when working on and around the HPU.

### **Warning**

The HPU contains a stored energy in the form of a gas filled accumulator. Care should be taken when working on or around the HPU to prevent personal injury or damage.

### **Warning**

The HPU provides a source of hydraulic pressure with capability of flow. Care should be taken, when working with pressurized hydraulic fluid to prevent injury and equipment damage.

# INSTALLATION

## 5.2. Installation Procedure

5.2.1. Disconnect the machine battery or other power supply to remove all electrical power before proceeding with the installation of the pump.

5.2.2. Mount the Pump assembly using at least 4 of the 8 provided mounting holes indicated in Figure 1 and Figure 2.

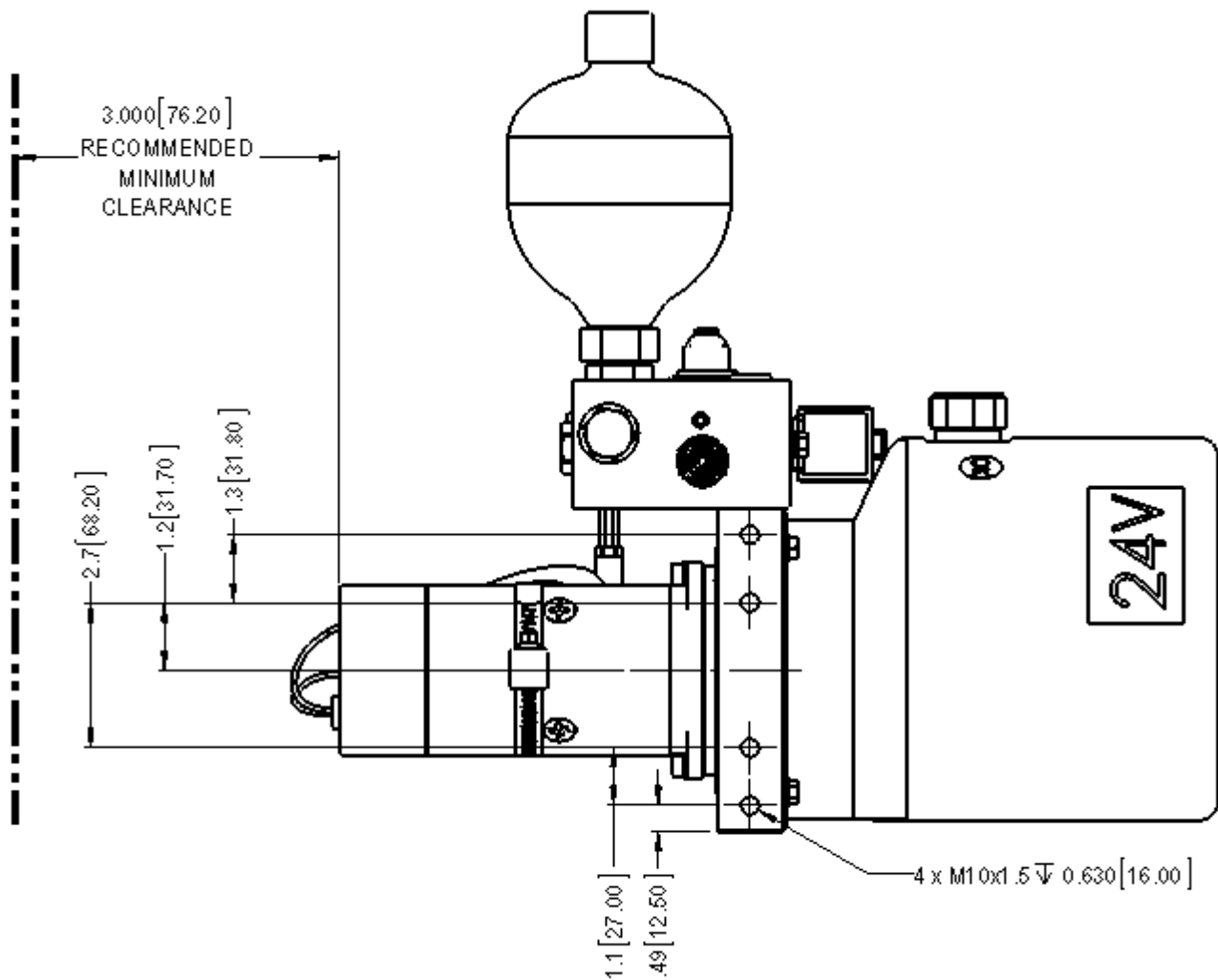


Figure 1



# INSTALLATION

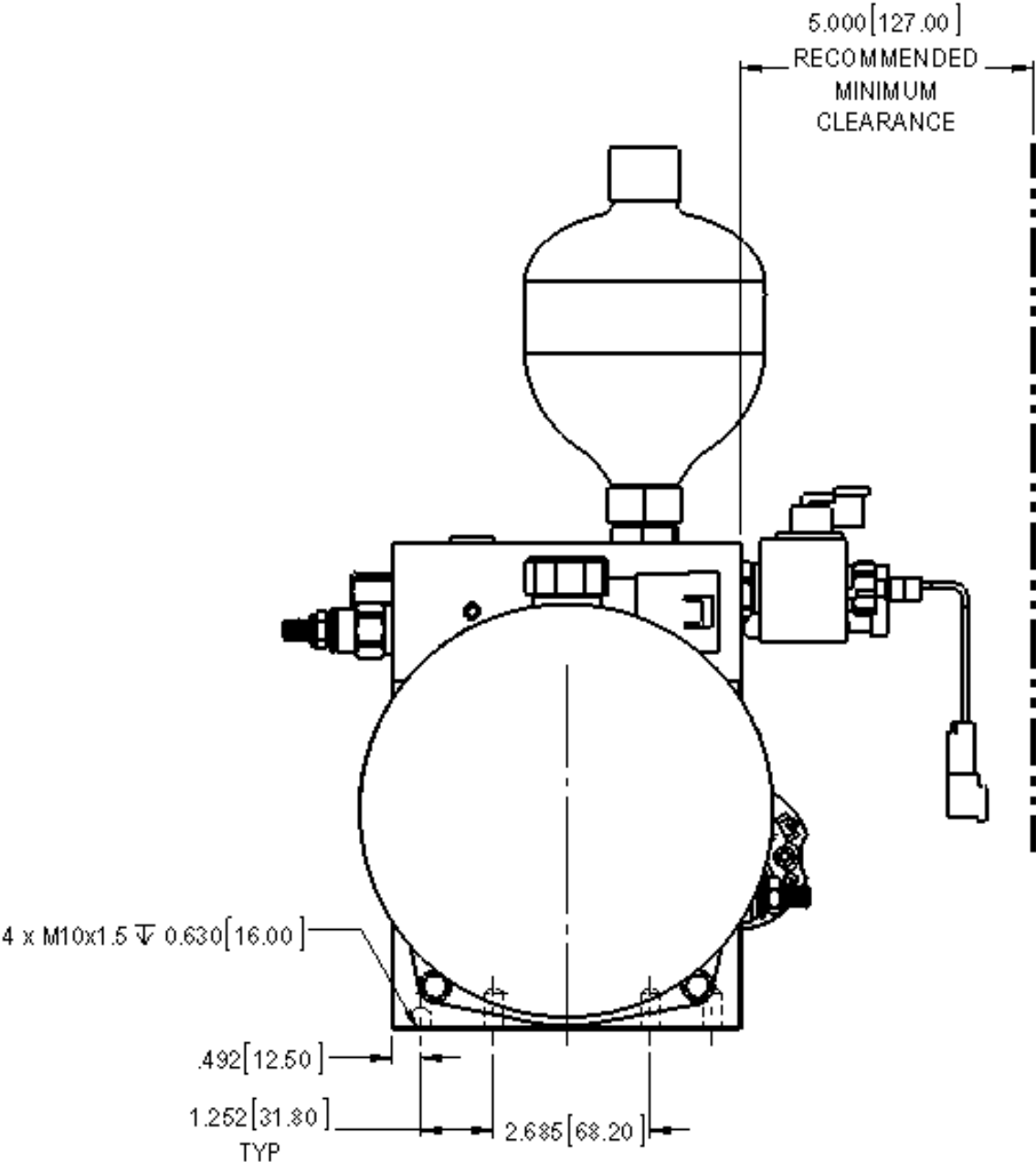


Figure 2

# INSTALLATION

5.2.3. Fill with oil. See the Specifications section of this manual for oil type.

5.2.4. The key to operate the system is affixed to the back of the key switch. Remove the key for future use, applying lockout procedures as required by your company. Keep the keys in a locked-out condition until otherwise mentioned in the instructions.

5.2.5. Mount the switch by cutting a mounting hole to meet these dimensions, shown in Figure 3. Extension wires are available. Contact WPT for standard options.

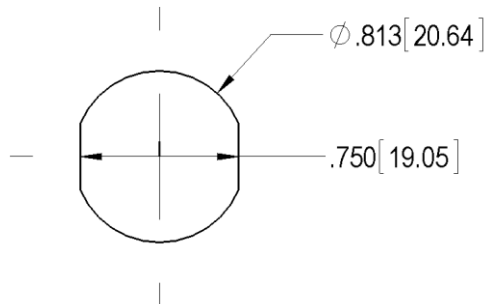


Figure 2 (not to scale)

5.2.6. Verify the voltage supply with a voltmeter, making sure it matches the HPU system voltage rating.

5.2.7. Connect the key switch wiring harness to the main wiring harness affixed to the pump, if not done already. This is done by plugging in the triangular shaped 3-Pin Deutsch style connector.

# INSTALLATION

5.2.8. Customer installed and provided status light (optional):

5.2.8.1. CONDITION: System powered ON, not over temperature.

5.2.8.1.1. Find the included piggyback connector shipped with your HPU, see Figure 4.



Figure 4

- 5.2.8.1.2. Remove the female flat blade connector from the rear of the ignition switch terminal marked "I" for "Ignition".
- 5.2.8.1.3. Install the Piggyback connector to the switch Ignition terminal.
- 5.2.8.1.4. Connect the removed wire to the piggyback connector.
- 5.2.8.1.5. For the (+) Positive light connection connect to the remaining exposed terminal of the piggyback connector.
- 5.2.8.1.6. Use an LED-type light.
- 5.2.8.1.7. Connect the (-) ground to a Chassis ground, which is grounded with the battery.

# INSTALLATION

5.2.8.2. CONDITION: Motor ON, signifying the Motor is running.

5.2.8.2.1. This light will not be maintained and will only be powered when the pump motor is ON.

5.2.8.2.2. Use an LED-type light.

5.2.8.2.3. Connect the (+) positive wire for the light as indicated in Figure 5.

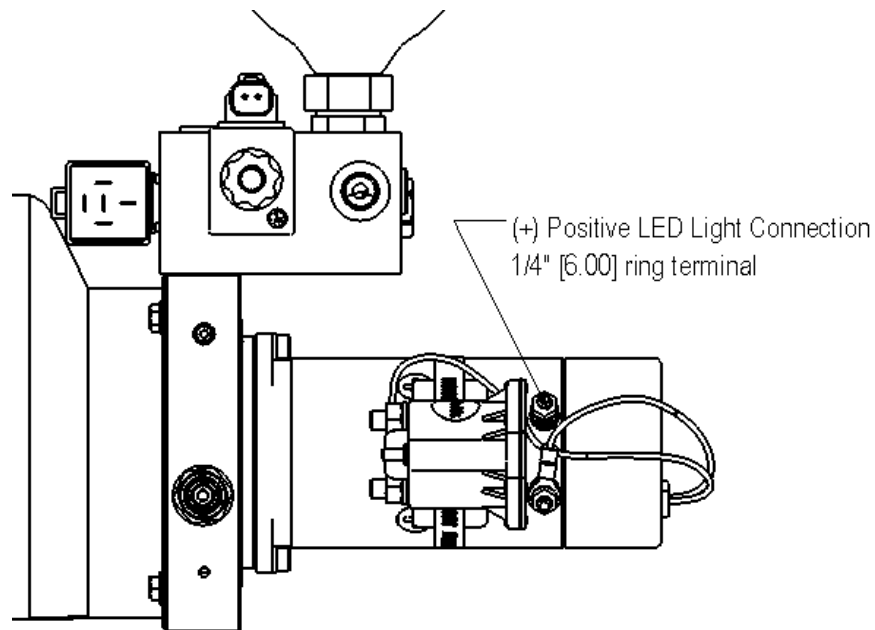


Figure 5

5.2.8.2.4. Connect the (-) ground to a Chassis ground, which is grounded with the battery.

# INSTALLATION

5.2.9. Connect the primary (+) positive and (-) ground terminals to power the HPU. Use battery cable capable of meeting minimum, twice the amperage requirement shown in the product specifications. Consult an electrician for the appropriate wire gauge. See Figure 6

## Warning

It is recommended to use a 70 amp rated circuit breaker for 12 VDC systems or 35 amp rated circuit breaker on 24 VDC systems. The circuit breaker should be connected the (+) positive battery connection and the HPU.

## Danger

The HPU system is connected directly to the battery as described in these instructions. Given this, it is possible for the HPU switch to be left in the ON position when the machine is turned off. Meaning the HPU will keep the PTO engaged when the machine is shut down. Preventative measures can be taken. Consult with WPT or an electrician as needed.

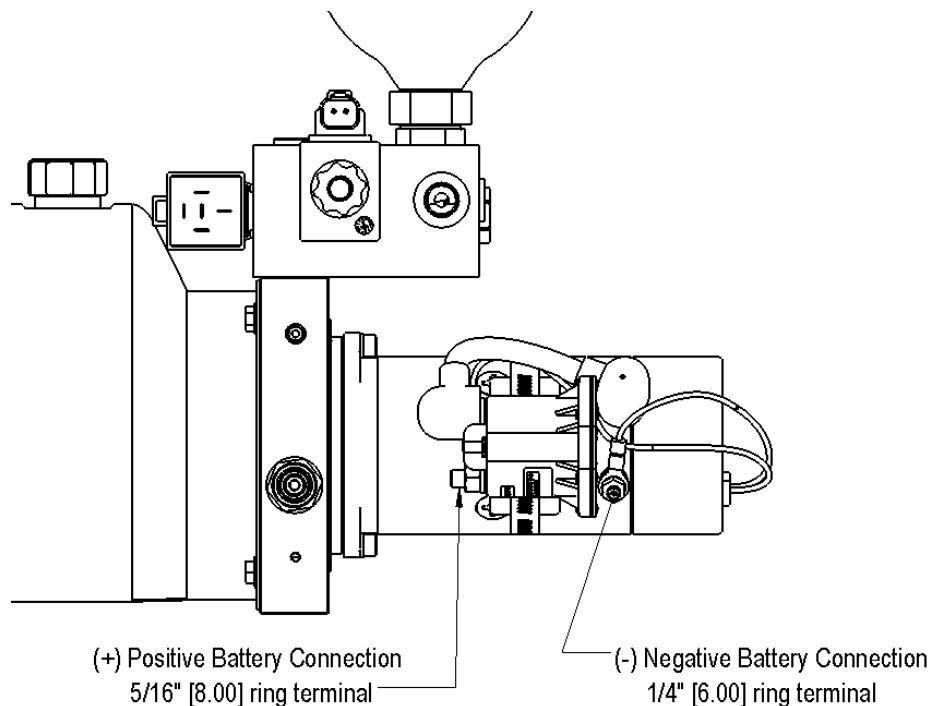


Figure 6

5.2.10. All pressure settings were set at the time of manufacture at WPT per the Purchase Order requirements. Documentation supplied with the HPU notate the rated pressure and should be kept for your records.

5.2.11. Install the WPT PTO as per the guidelines in the PTO's installation and maintenance manual.

5.2.12. Connect the Supply hose to the PTO.

5.2.13. Reconnect the machine battery cables, connecting the (-) negative connection last.

# STARTUP & OPERATION

## 6. Startup

- 6.1. Crack the supply hose connection of the hose nearest the PTO to allow air to bleed from the system.
- 6.2. Insert the Key into the HPU's mounted key switch.
- 6.3. Before turning the key, understand the positions of the key switch.
  - 6.3.1. ACC (Accessory), NOT USED, in the fully left (CCW) position.
  - 6.3.2. OFF
  - 6.3.3. ON
  - 6.3.4. START (momentary)
- 6.4. Turn the key switch to the OFF position.
- 6.5. Advance the key to the START position, then release to ON. The HPU should be powered on and building pressure.
- 6.6. Once the air is purged and oil begins to leak from the loosened hose fitting. Turn the HPU key to the OFF position.
- 6.7. Tighten the fitting.
- 6.8. Check the oil level, refill as necessary.
- 6.9. Advance the key to the START position, then release to ON.
- 6.10. The HPU motor should build pressure then turn itself OFF while the key switch is maintained in the ON position.
- 6.11. To turn the HPU OFF, simply turn the key switch to the OFF position.

## 7. Operation

- 7.1. Before operation of the HPU, verify all Maintenance is complete. See the Maintenance section of this manual.
- 7.2. During the first startup each day, it is recommended to look at each hydraulic connection, verifying no leaks are present.
- 7.3. To startup, turn the ignition switch from the OFF position, fully CW until the momentary START position, the allow the switch to return to the ON position, between OFF and START.
- 7.4. Leave the system in the ON position during operation.
- 7.5. To power the system off, simply turn the HPU key switch to the OFF position.

# MAINTENANCE

## 8. Maintenance

### 8.1. Schedule:

	Daily	Weekly	Monthly	Biannually	Yearly	2 Years
Check Oil						
Clean Terminal Corrosion						
Drain & Replace Oil						
Check Accumulator Precharge						
Check LPRV Setting						
Check HPRV Setting						
Check PS Setting						
Replace SV Coil						

### 8.2. Check oil:

8.2.1. The tank is equipped with a vented cap with an affixed dipstick.

8.2.2. Unscrew the cap, check the oil level per the markings, fill as necessary.

### 8.3. Drain & Replace Oil

8.3.1. Disconnect the PTO hose connection and put the hose into a suitable container to capture the oil.

8.3.2. Power the HPU on allowing it to pump the oil out. Once the flow of the oil becomes erratic, turn the HPU OFF.

8.3.3. Fill the HPU tank with oil as stated in the Installation section of this manual.

8.3.4. Follow the Startup section of this manual to prime the pump.

8.3.5. Operate as normal

### 8.4. Clean Terminal Corrosion

8.4.1. Disconnect the battery and or all other power supplies from the HPU.

8.4.2. Using a wire brush, disconnect and clean each terminal as necessary.

8.4.3. Reconnect terminals.

8.4.4. Reconnect machine battery.

8.4.5. Operate as normal.

# TROUBLESHOOTING GUIDE

## 9. Troubleshooting Guide

Symptom	Possible Cause	Solution
System will Not Operate	Disconnected Power Source	Check for damaged wiring, or loose connections.
	HPU Fuse Blown	Replace Fuse
	System breaker blown	Reset Breaker
	Terminal Corrosion	Clean Corrosion
	Pump overheated	See "Motor Over-temp" symptom
	Relay Failure	Replace Relay
Pump will not stop running	Low Oil Level	Fill oil as indicated on dispstick
	Oil Leaks	Tighten or replace fittings as necessary to prevent leaks.
	Pressure Switch Setting too high	Contact WPT
	LPRV or HPRV setting too low	Contact WPT
Pump Motor cycles ON / OFF frequently	Oil Leaks	Tighten or replace fittings as necessary to prevent leaks.
	Accumulator Precharge Incorrect	Contact WPT
	Valve block internal leakage	Contact WPT
	Pressure switch not functioning properly	Contact WPT
HPU fuse blows repeatedly	Loose Connector	Tighten or secure connectors
	Direct Short	Check for damaged wiring, or loose connections.
	System voltage too Low	Correct Power Supply
	HPU Motor Starter Faulty	Replace motor starter
System Breaker blows repeatedly	Loose Connector	Tighten or secure connectors
	Direct Short	Check for damaged wiring, or loose connections.
	System voltage too Low	Correct Power Supply
Motor Over-Temp (shuts off)	System voltage too low or too high	Correct Power Supply
	Pump motor runtime exceeds duty cycle	See symptom "Pump will not stop running"
	Faulty Over-Temperature Switch	Replace over-temperature switch