

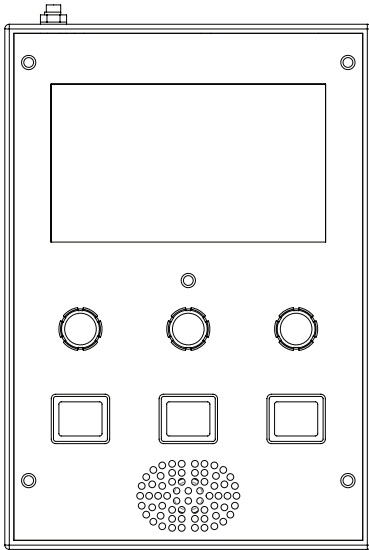


# ADVANTAGE PLUS Installation Instructions

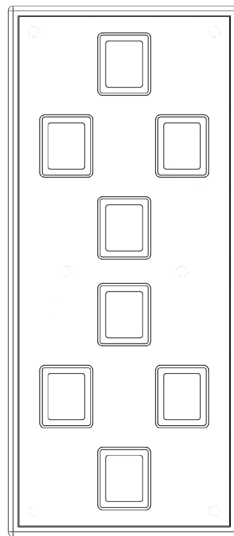
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# ELECTRICAL CONTROLS



Spreader Control  
P/N: APMP20167



Cylinder Control  
P/N: APCP20170



3 Function Joystick  
P/N: EJK2P3DCAN



Liquid Module  
P/N: APLM20173



Master Module  
P/N: APM20171



Slave Module  
P/N: APSM20172

# SENSORS



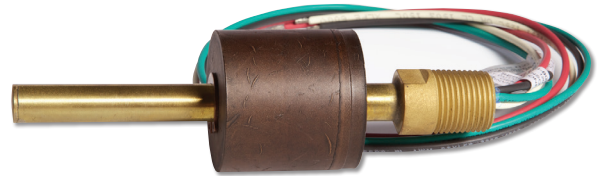
Air/Road Temperature Sensor  
P/N: 38T39461



Pressure Sensor  
P/N: NXPT5000



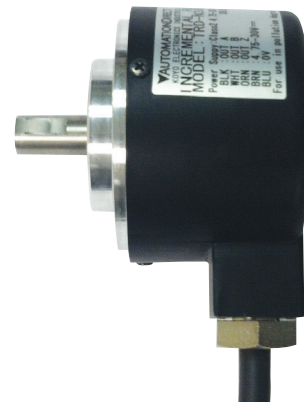
Filter Bypass Indicator  
P/N: PM515A



Hot, Cold, Low Oil Sensor  
P/N: 30T35899D

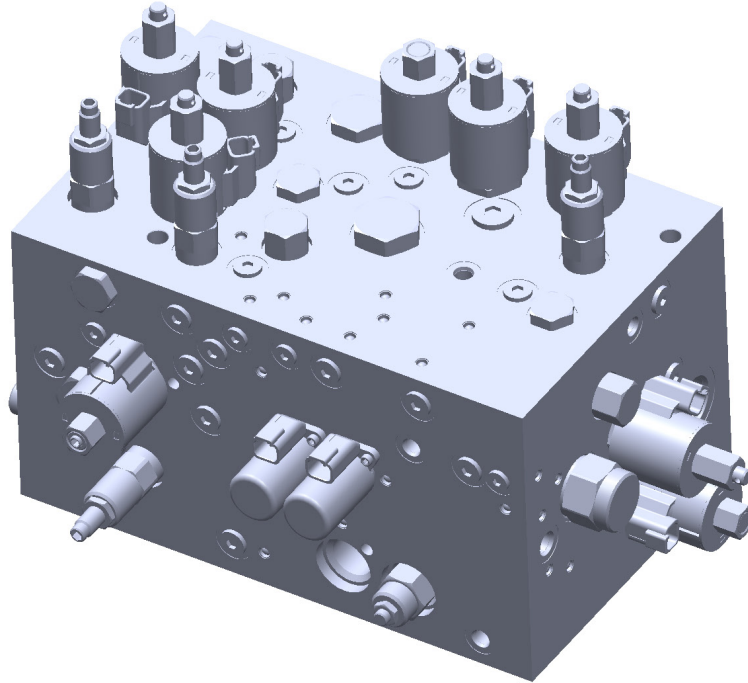


Hoist Raise Sensor  
P/N: MS100

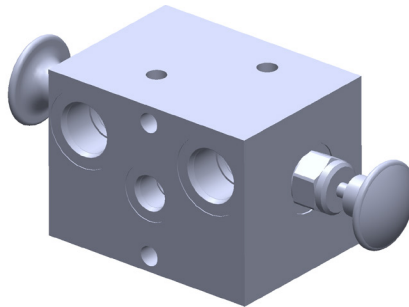


Feedback Sensor  
P/N: 38M36663

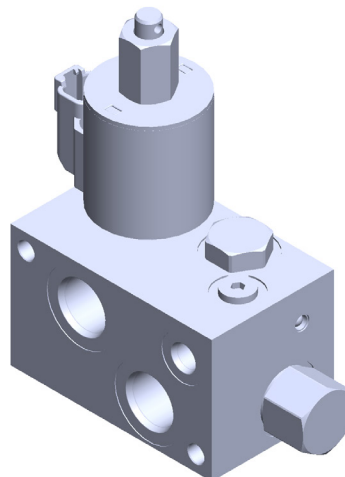
# HYDRAULIC COMPONENTS



Spreader / Cylinder Manifold  
P/N: HF81710-13

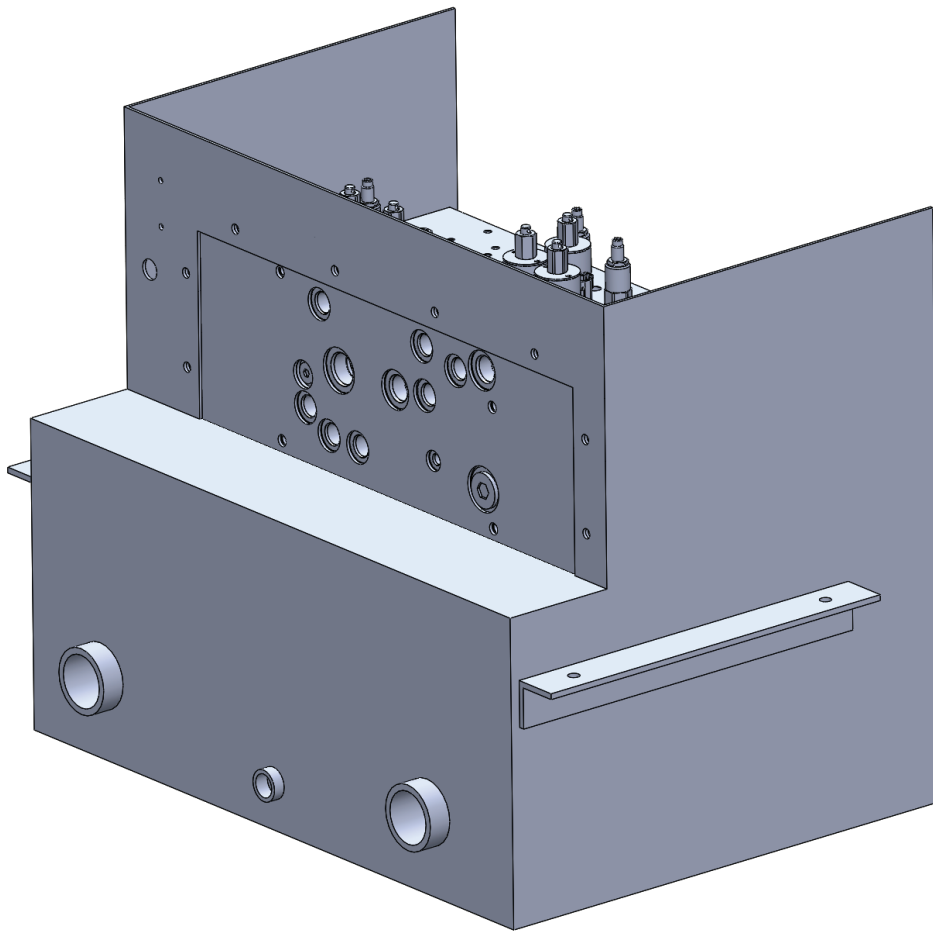


Plow Angle Release Manifold  
P/N: HF81718-13



(Optional) – Pre-Wet Manifold  
P/N: HF80988-12

# MOUNTING INSTRUCTIONS

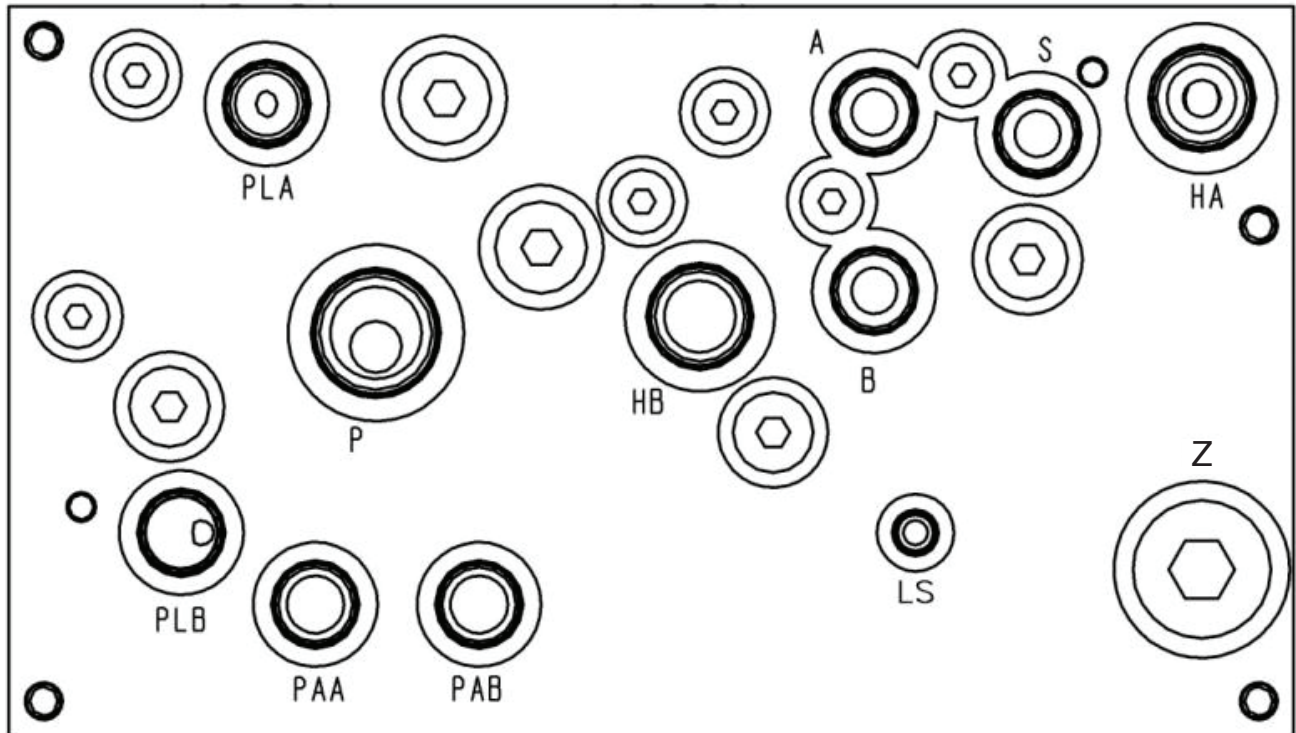


## Mounting Instructions:

1. When positioning the enclosure, be sure that there is adequate vertical clearance for lid removal when the dump body is lowered.
2. Use bolts to fasten enclosure to truck. Do not weld, this could potentially create undesired stress on the angle joints.

# HYDRAULIC INSTALLATION

## Port Designations



\*Clean all hose assemblies before Installation

DESIGNATION	FUNCTION	SIZE (SAE)
PLA	Plow Up	10
PLB	Plow Down	10
P	Pump	16
PAA	Plow Left	10
PAB	Plow Right	10
HB	Hoist Down	12
A	Auger	10
B	Auger Reverse / Spreader Return	10
LS	Load Sense	4
S	Spinner	10
HA	Hoist Up	12
Z	Route to Tank / Return Port*	16

\*Z – Typically this port is used as a return port. However, when the manifold is configured for a single acting telescopic hoist, this port may need to be routed directly to the reservoir. Please consult factory for further assistance.

# HYDRAULIC INSTALLATION

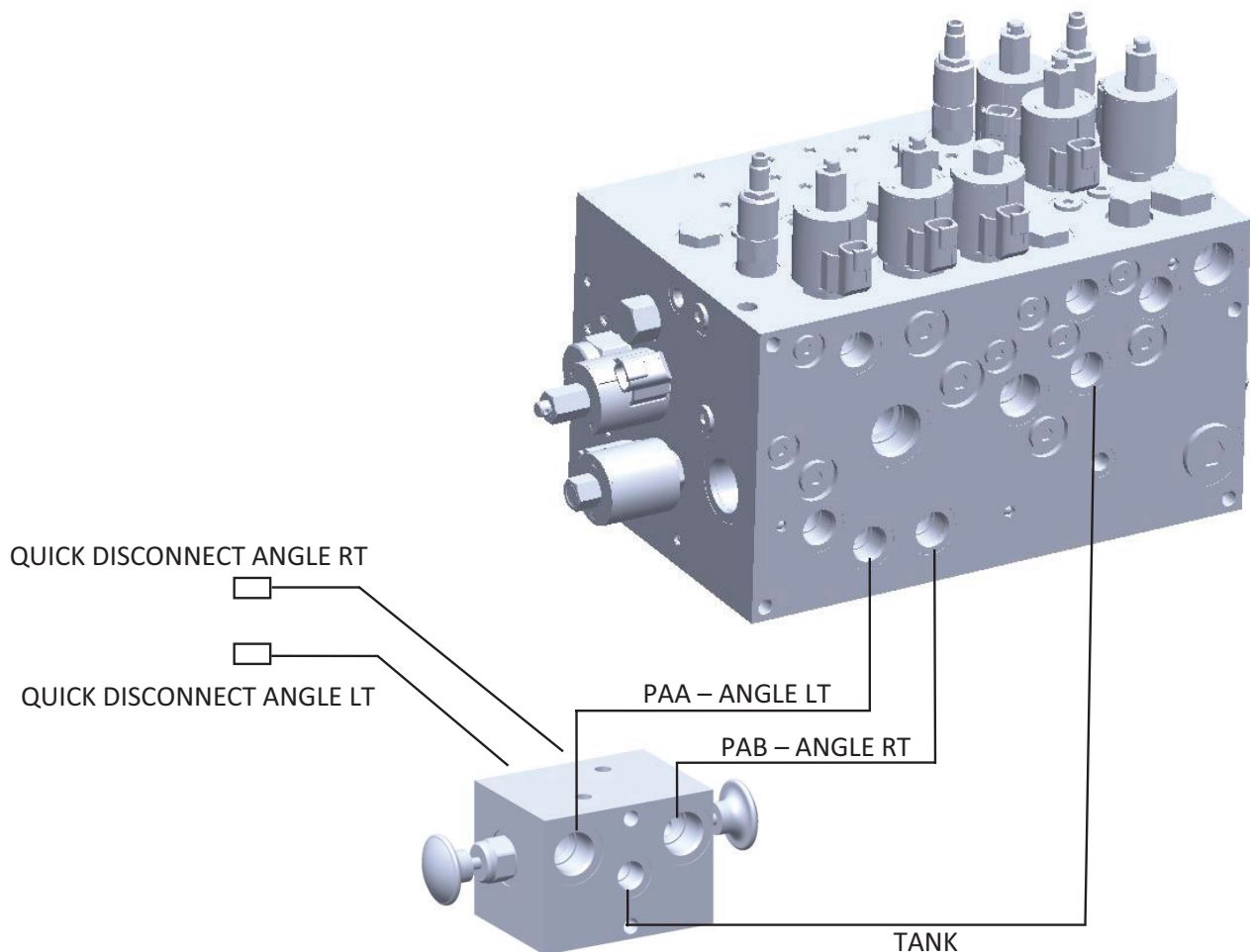
## Plow Angle Release Manifold

**Purpose:** This manifold is intended to relieve pressure within the plow angle lines. It allows easier connection between quick disconnect fittings.

**Operation Instruction:** Pull actuators to relieve pressure within the plow angle circuit

### Installation Instructions:

1. Locate the T Port – Route back to tank
2. Locate the PAA Port – Route to the PAA port on the Main Hydraulic Manifold
3. Locate the PAB Port – Route to the PAB port on the Main Hydraulic Manifold
4. Locate the PAA1 Port – Route to the plow left cylinder
5. Locate the PAB1 Port – Route to the plow right cylinder

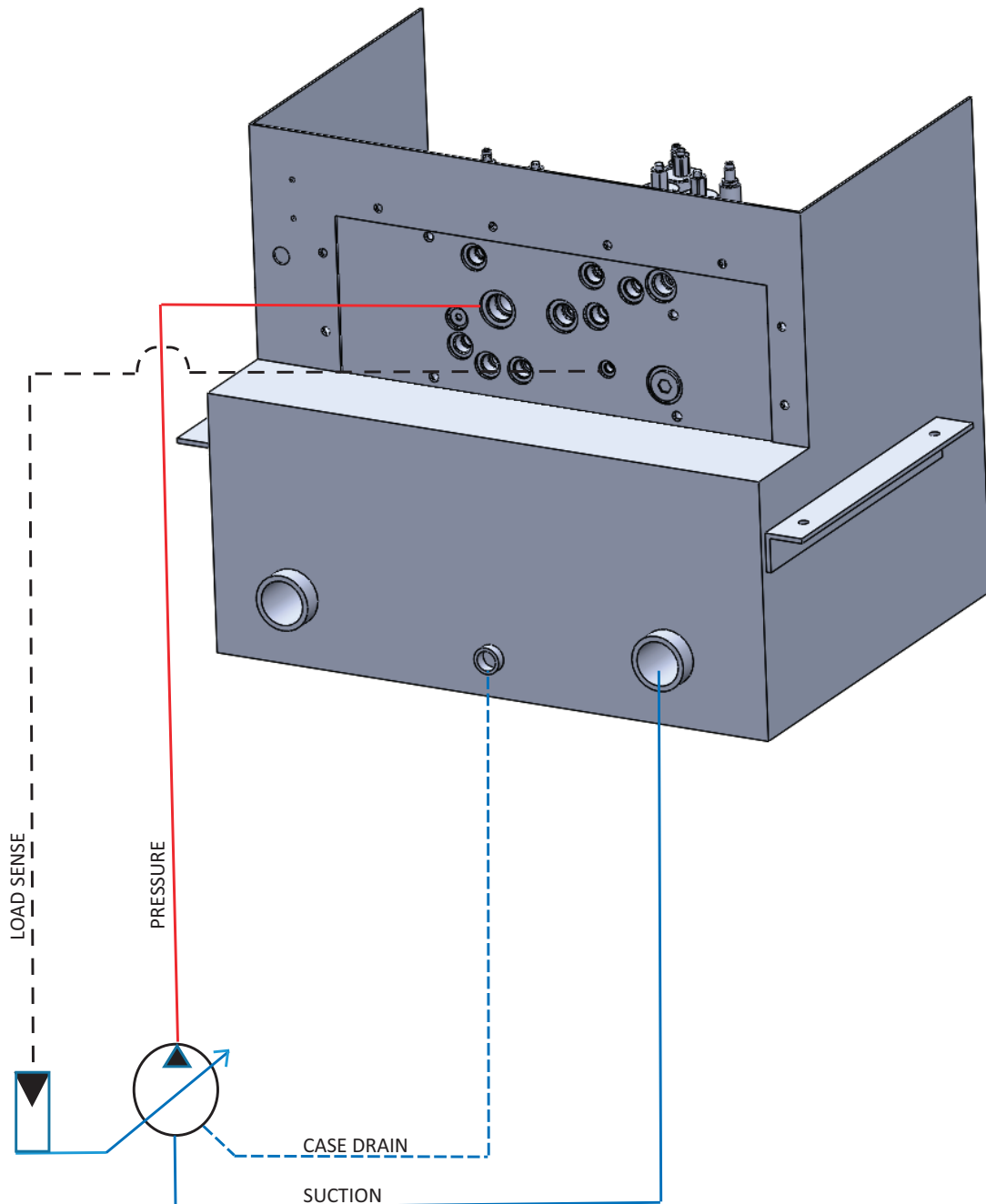




# HYDRAULIC INSTALLATION

## Piston Pump Installation

1. Connect the Pump Inlet to the Reservoir
2. Connect the Pump Outlet to the P port on the manifold
3. Connect the Pump Load Sense to the LS port on the manifold
4. Connect the Pump case drain to the open (1") port on the reservoir



# INSTALLATION AND SETUP

## Tank Enclosure Wiring Connections

**Gray Jacketed Cable** -Route jacketed cable from the enclosure to the cab. This is the power, ground, CAN connection of the controller.

**Red Wire** – Connect to 12VDC (Battery) with a 20A fused connection.

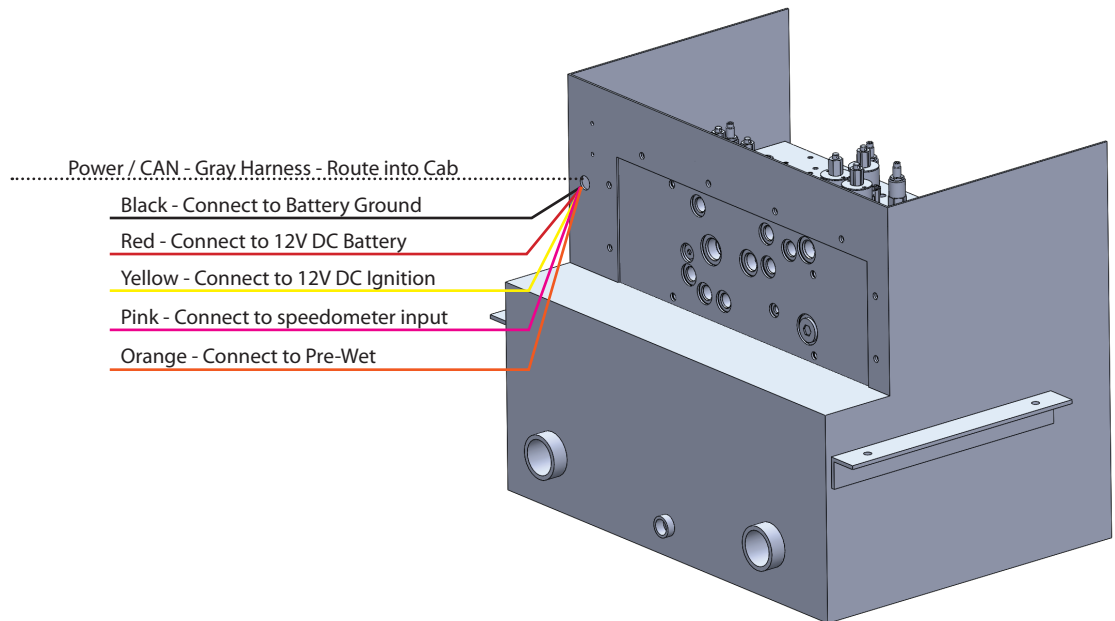
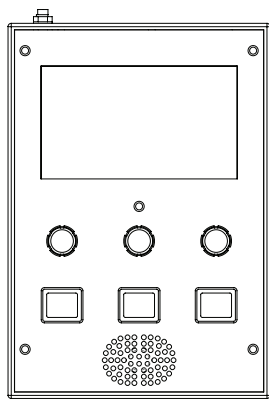
**Yellow Wire** – Ignition Power: Connect to a fused ignition power source.

**Black Wire** – Connect to Battery Ground

**Pink Wire:** - Connect to Speedometer Input

**Orange Wire (When applicable):** Connect to pre-wet valve or pump (Source Current)

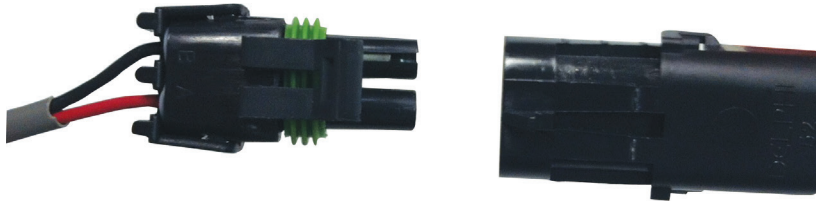
\*If the controller is connected correctly, it will stay powered for 10 seconds after the ignition is disengaged. This allows the controller to go through its proper shutdown sequence.



# INSTALLATION AND SETUP

## In-Cab Wiring Connections

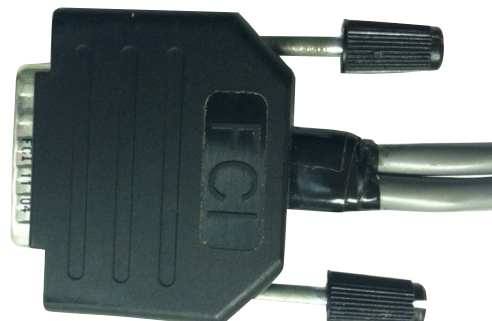
1. Connect the power and ground connectors.



2. Connect the CAN Hi / CAN Lo Connector to the appropriate harness.



3. Connect the cylinder harness into the back of the spreader panel. Route the other ends through the grommet and connect to the joystick and cylinder panel connector.



# INSTALLATION AND SETUP

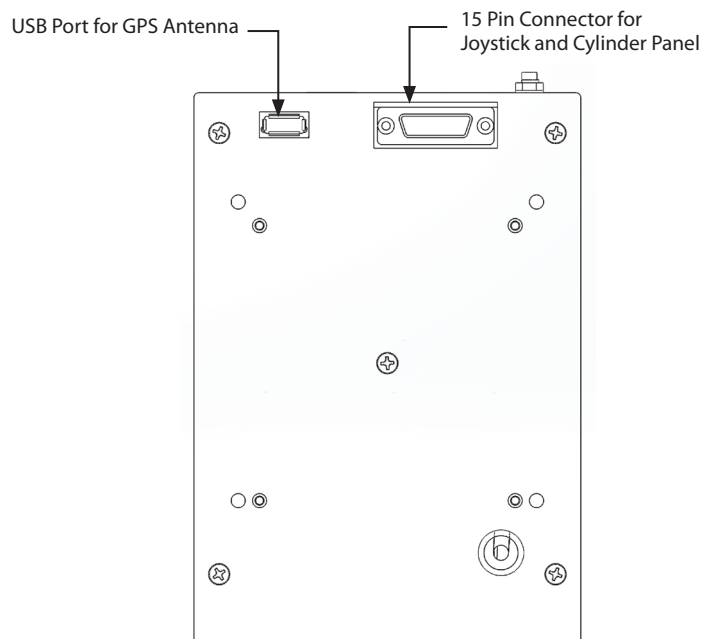
## GPS Sensor Installation

1. **Locate** – Locate the GPS antennae (P/N: NXGPS).



2. **Mount** – Mount the sensor inside of the cab using either the integrated magnet or provided suction cup. We recommend placing the antennae so that it has clear signal reception.

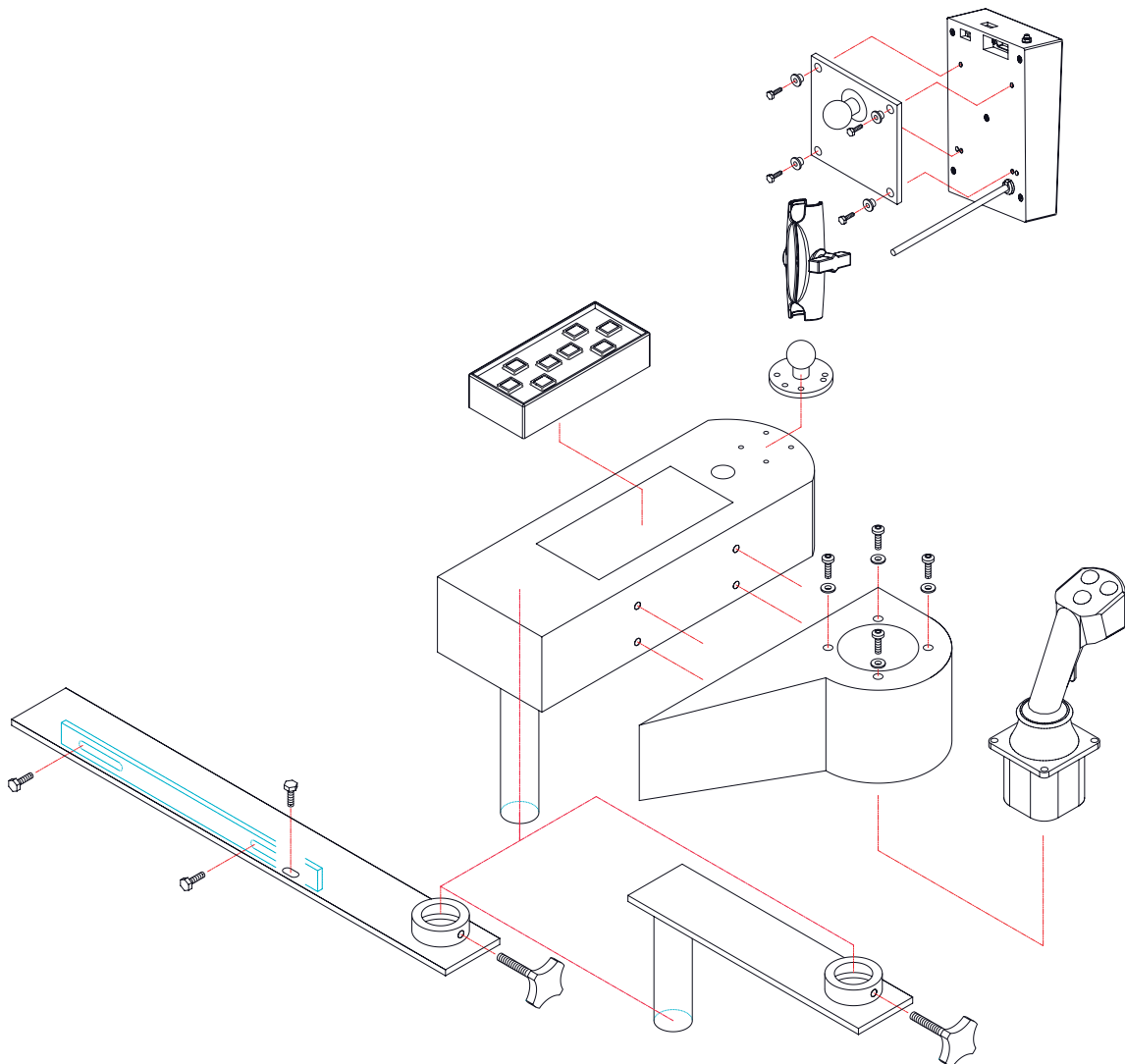
3. **Connect** – Plug the GPS USB connector into the USB port located on the back of the controller. \*Do not plug the GPS antennae into the top USB port.



# MOUNTING INSTALLATION INSTRUCTIONS

## Console Installation

1. Lean the driver's seat, seat cushion forward
2. Lay the seat bracket across the seat sub-frame with the collet up and pointed toward the center of the truck. The slots in the lower flange of the seat bracket will line up with the bolt holes in the seat sub-frame located toward the front of the seat. Tighten the 3 hex head cap screws provided.
3. Slide and fasten the console into the collet of the seat bracket. Install the optional extension arm for more lateral clearance.
4. Attach the Console Mounting base to the Spreader Controller
5. Using the dog bone, connect the mounting base to the Console



# FILTRATION RECOMMENDATIONS

1. Clean all hose assemblies before installation.
2. The system should be flushed with a remote filter cart, where possible.
3. High-pressure filtration, non-bypass, high-collapse elements with condition indicators are recommended to minimize valve inlet-side contamination.
4. Upon Initial Startup, it is recommended to engage the pump and allow the system to cycle oil for 20 minutes before actuating any functions. Contamination has the highest probably of occurring at system installation and fluid replenishment.
5. Next, it is recommended to cycle each of the cylinder functions 10-15 times to ensure that all contamination is dislodged.
6. Failure to provide and maintain required “Minimum Filtration” levels may result in premature malfunction or failure.

\*Hydraulic fluid and components should be cleaned and certified to the appropriate ISO 4406 level prior to installation.

<p><b>Recommended Minimum Filtration</b> <b>ISO 4406:1999</b> <b>SAE J1165</b> <b>4µm / 6µm / 14µm</b></p>
<p>18 / 16 / 13</p>

# HYDRAULIC FUNCTIONALITY

## Circuit Information:

**Load Sense** – The Advantage Plus hydraulic circuit utilizes load sensing technology. Therefore, the system operates efficiently by only building pressure required to move the load of the cylinder or motor.

**Flow Sharing** – In traditional hydraulic circuits, the flow always takes the path of least resistance. This means that when multiple pieces of equipment are operating, flow will be directed to the lower PSI application. However, the Advantage Plus utilizes post compensators in its circuit that allows flow to be shared equally across all functions. This means that during low flow scenarios (truck idling or smaller pump), all of the functions will equally share the pump flow preventing any one function from coming to a complete stop.

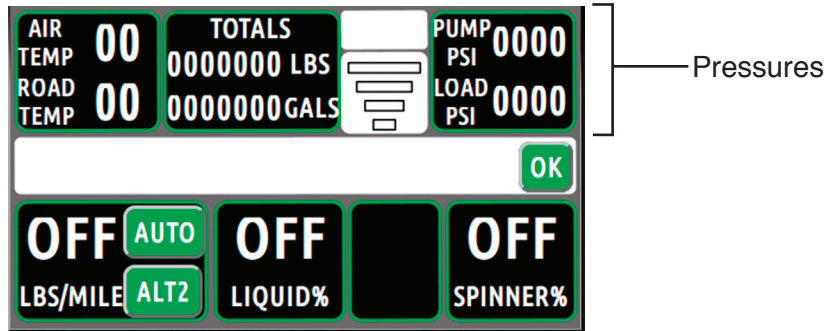
**Pump Types** – The Advantage Plus is compatible with gear pumps or piston pumps. However, careful consideration should be made when specifying the appropriate pump type to maximize system performance.

\*Keep in mind that gear pumps can only generate a fixed amount of oil and are a function of the engine RPM. Therefore, all functions will have the least amount of flow / slowest speeds at engine idle.

\*\*All speed adjustments are made from the control panel. Increasing the pressure will NOT increase the speed of the function.

FUNCTION / VALVE	Max Flow Rate
Max Inlet Flow (EV16-S34)	50 GPM
Auger (SP10-20)	15 GPM @ 200 PSI boost
Spinner (SP10-20)	15 GPM @ 200 PSI boost
Plow Raise (SP10-20)	15 GPM @ 200 PSI boost
Plow Lower (SP12-20)	23 GPM @ 200 PSI boost
Plow angle (PE16)	23 GPM @ 200 PSI boost
Hoist Raise (SP16)	32 GPM @ 200 PSI boost
Hoist Lower* (SP16)	32 GPM @ 200 PSI boost

# PRESSURES EXPLAINED



**Pump PSI** – The pump pressure indicates the inlet pressure from the pump. This pressure will always be approximately 200 - 300 PSI higher than the load sense pressure. This pressure will never exceed the main relief setting.

**Load PSI** – The Load Sense PSI indicates the pressure of the hydraulic load. With no functions operating, the LS pressure should be 0 PSI. There will only be a LS pressure if a function is operating.

**Boost / Differential Pressure** – The boost or differential (pressure) is the difference between the Pump and the Load Sense Pressures. Typical load sense hydraulic systems require a boost between 200 and 300 PSI. The boost pressure is required to overcome the pressure drop across the valves. Using a gear pump, the boost pressure is set using the boost pressure cartridge. Using a Piston Pump, the boost pressure is adjusted at the pump.

FUNCTION / VALVE	MAX RATE	ADJUSTED
Main Relief	3000 PSI	Electrically Adjustable – Through Calibration menu
Boost Relief (Gear Pump Only)	200 PSI	Mechanically Adjusted – Using the Stem of the Cartridge Valve
Spreader Relief	1800 PSI	Mechanically Adjusted – Using the Stem of the Cartridge Valve
Plow Up Relief	2000 PSI	Electrically Adjustable – Through Calibration menu
Plow Down Relief	0 -1000 PSI	Mechanically Adjusted – Using the Stem of the Cartridge Valve
Hoist Up Relief	2000 PSI	Mechanically Adjusted – Using the Stem of the Cartridge Valve
Hoist Down Relief	0 -1000 PSI	Electrically Adjustable – Through Calibration menu



# INSTALLATION AND SETUP

## System Checklist

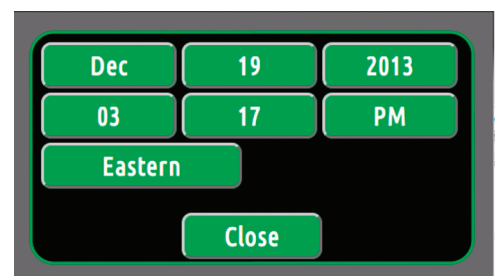
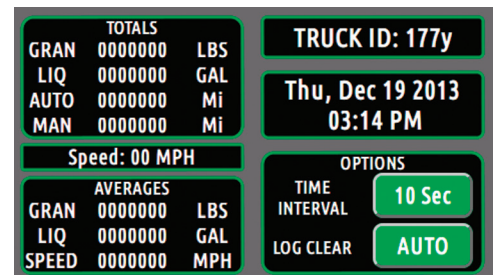
### Circuit Information:

- 1. **Hoses and Fittings Secured** – Check that all hoses and fittings are secure, away from moving parts, and heat sources.
- 2. **Leaks** – Check all seals, hoses and fittings for leaks.
- 3. **Quick Couplers** – Check that all quick couplers are fully seated.
- 4. **Manual Overrides** – Check that all manual overrides are disengaged.
- 5. **Foaming Oil** – Check tank for foaming oil.

### Wiring:

- 6. **Controller Power** – Check that the controller stays on for 10 seconds after the ignition is turned off.
- 7. **Speedometer Input** – Check that pink groundspeed wire is connected to the trucks speedometer output.
- 8. **Hoist Inclination Limit** – For SA telescopic hoists, a travel limit switch is recommended to keep body below maximum inclination. (Consult Factory for Instructions).
- 9. **Sensor Functionality** – Check that all sensors are properly connected and functional.
- 10. **Wiring Connections** – Check that all wiring connections and harnesses are secure and away from moving parts and heat sources.
- 11. **TCM Programmed for Mobile Application** – If pump is PTO driven, check that the TCM (If applicable) has been programmed for mobile application.

- 12. **Set Truck ID:**
  - a. Click on the truck ID and input the appropriate #.
- 13. **Set Time and Date:**
  - a. Click on the date and time box.
  - b. input the Month, Day, Year, Time, and Time Zone.

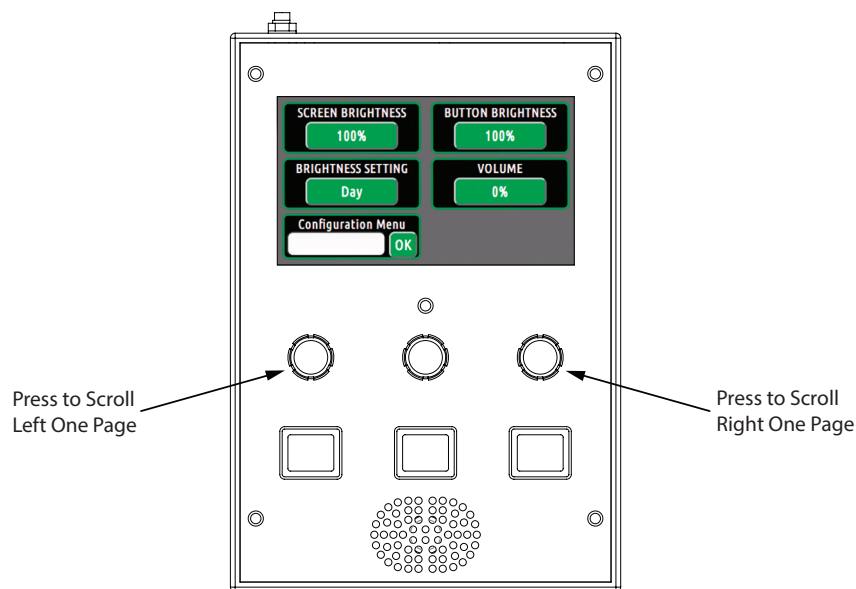


# INSTALLATION AND SETUP

## System Calibrations

The Advantage Plus is pre-configured at the factory to be operational with most hydraulic setups. However, due to variations in plumbing, cylinder volumes, cylinder types, and motor displacement, we recommend tuning these settings for optimal performance.

Muncie recommends checking all functions and adjusting speeds as needed. In addition, it is recommended to record all of the settings for future reference. For best results, tune while plow, hoist, and spreader and installed and operational.



### Entering the Calibration Menu:

1. With the controller on, press one of the Auger and Spinner Rate knobs to scroll to the screen shown above:
2. Select the White Box to enter the passcode.
3. A keyboard will appear to enter the passcode. Use the “caps” button to toggle between letters, numbers, and symbols. (The default passcode is “1”)
4. Once the passcode has been entered, press the OK button on the keyboard
5. Next, press the OK button next to the white box to enter the calibration menu

### Navigating the Configuration Menu:

- Once in the configuration menu, scroll through the menu pages by pressing the Auger and Spinner Rate Knobs
- Use the touchscreen to adjust the values
- A stylus is useful for adjusting settings on the touchscreen

# INSTALLATION AND SETUP

## System Calibrations

### 14. Speedometer Calibration

- Locate the following page.
- The “Ground Speed Cal” can be set using two different methods.

– The first method is to click on the Pulse Per Mile Window and directly enter the pulses generated per mile from the TCM or a magnetic pickup.

Spreader Calibration Pg. 8	
Prod Name	MAIN
Cal (OL)	20
Cal (CL)	20
Spreader Cal	Calibrate
Ground Speed	1
Ground Speed Cal	Calibrate 00 MPH

– The second method is to drive the truck 20 MPH and push the calibrate button. This will automatically populate the Pulse Per Mile Window.

15. **SA / DA Plow Setting** – For a single acting plow, make sure that the controller is set for SA plow. This will allow the plow to “float” when the down button is pressed twice within a 2 second increment.

Plow Settings Pg.12	
Down Cylinder	Single Acting
Down Float	Disabled
Down Relief	300 PSI
Down Speed	Min: 0% / Max: 50%
Left Speed	Min: 0% / Max: 50%
Right Speed	Min: 0% / Max: 50%

# INSTALLATION AND SETUP

## System Calibrations

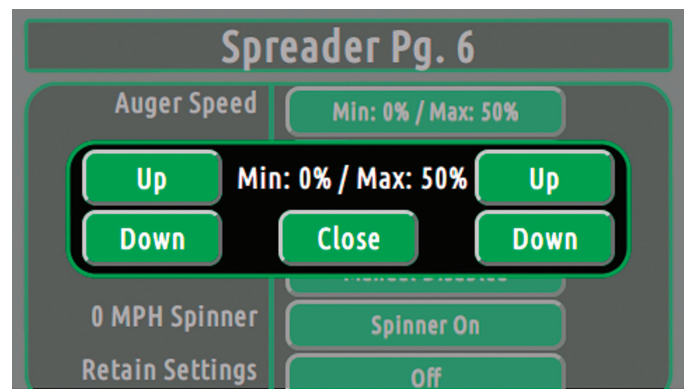
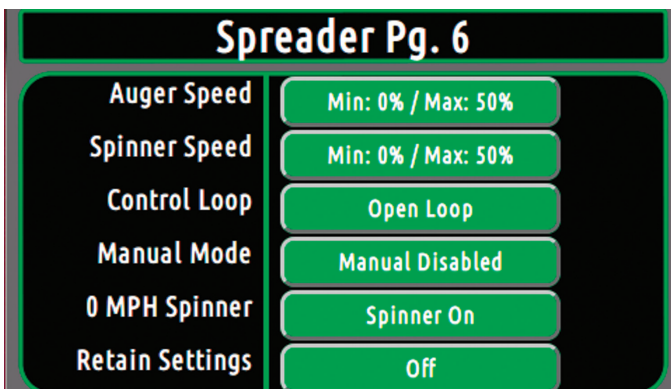
**16. Auger Check** – Does the auger activate in MANUAL mode? MIN setting\_\_\_\_\_, MAX setting\_\_\_\_\_.

**17. Spinner Check** – Does the spinner activate? MIN setting\_\_\_\_\_, MAX setting\_\_\_\_\_.

- The Auger and Spinner min and max current percentages can be set by pressing the button and using the up and down buttons to change the percentage.
- The “Control Loop” can be changed from open to close loop by pressing the button.

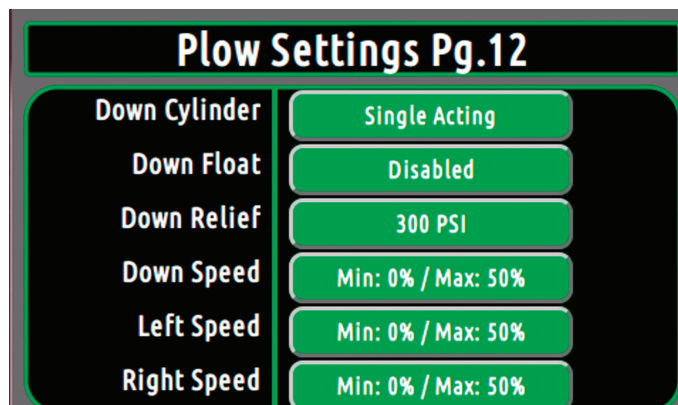
*Note: Close loop control requires a feedback sensor / encoder.*

*Caution: Adjusting this setting will active the auger and spinner. Make sure that the auger and spinner are safe to operate before adjusting this setting.*



**18. Plow Lift Check** – Does the plow raise and lower? MIN setting\_\_\_\_\_, MAX setting\_\_\_\_\_.

**19. Plow Angle Check** – Does the plow angle? MIN setting\_\_\_\_\_, MAX setting\_\_\_\_\_.



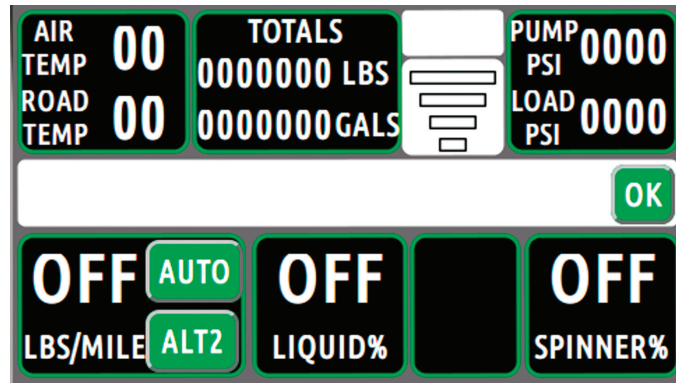
# INSTALLATION AND SETUP

## System Checklist

- 20. Hoist Check** – Does the hoist raise and lower? MIN setting\_\_\_\_\_,  
MAX setting\_\_\_\_\_.
- 21. Other Check** – Check additional functions if they apply. (wing plow, underbody scraper, hyd. Prewet).
- 22. Hydraulic Pressure Check** – Hydraulic pressure checks:
  1. \_\_\_\_\_PSI. With pump engaged and nothing activated. (should read 0± PSI on both gauges)
  2. \_\_\_\_\_PSI. With the auger / conveyor activated. (should read anywhere from 200 - 600 PSI on pump gauge and 400 - 800 PSI on LS gauge. If the pressure reads above 1000 PSI, there may be a problem. Check boost pressure; check the load-sense drain and check the quick couplers.
  3. \_\_\_\_\_PSI. While deadheading hoist up (should read 2000-2200 PSI, may be adjusted to 3000)
  4. \_\_\_\_\_PSI. While deadheading hoist down. (should read 0-1000 PSI depending on controller settings and cylinder type.)
  5. \_\_\_\_\_PSI. While deadheading plow up. (should read 2000-2200 PSI)
  6. \_\_\_\_\_PSI. While deadheading plow down. (Should read 0-1000 PSI depending on controller settings and cylinder type)
  7. \_\_\_\_\_PSI. With the plow fully angled to one side. (should read main relief pressure setting or crossover relief setting on the plow)

# CONTROLLER ERRORS

System Errors and messages will appear in the message bar. These messages will include open circuits, short circuits, controller errors, sensor warnings, and more. Resolve the issue and depress the “ok” button to clear the message. Consult factor for assistance.



## Operation Messages:

**Hot Oil** – This indicates the hydraulic oil has exceeded 186 degrees Fahrenheit. Allow system to cool and take corrective action to eliminate source of over-heating.

**Cold Oil** – This indicates the hydraulic oil is below 34 degrees Fahrenheit. Cold oil can be very viscous and cause performance issues. Muncie recommends actuating a motor function and allowing the system to warm before performing any rigorous functions.

**Low Oil** – This indicates the oil level is low. Replenish oil level as needed.

**Filter Bypass** – This indicates that the filter bypass switch has been tripped. Change the filter element.

**Body Up** – This indicates that the body up switch has engaged.

**Open Circuit Detected** – This indicates that a wire or connector has disconnected creating an open circuit condition. Inspect wiring and correct.

**Short Circuit Detected** – This indicates that an output wire is shorted to ground. Please inspect wiring and correct.

**Switched to GPS fallback groundspeed** – This message indicates that the groundspeed signal from the truck was lost. Therefore, the GPS signal will be used to calculate the speed of the truck.

# CONTROLLER ERRORS

## Hardware Related Messages:

**No Master Module Found** – Master Module not detected upon startup. Check wiring and correct.

**Master Lost** – Master Module disconnected after startup. Check wiring and correct.

**Slave Lost** – Slave Module disconnected after startup. Check wiring and correct.

**Motor Mod Lost** – Motor Module disconnected after startup. Check wiring and correct.

**Liquid Feedback Sensor Failure** – flow turbine not detected. Check wiring and correct. If not utilizing flow turbine, switch to open loop setting in calibration menu.

**Lost auger feedback** – feedback sensor not detected. Check wiring and correct. If not utilizing feedback sensor, switch to open loop setting in calibration menu.

## Panel Faults:

**Found Configuration Display Corruption** – Configuration file corrupted. Please contact Muncie and check wiring on controller so that it is connected to ignition triggered shutdown.

**Processor was reset forcibly** – This error indicates an unexpected system crash. If problem persists, please contact Muncie.

**Panel Comm Fault** – This message indicates a processor communication error. Try resetting the controller. If problem persists, contact Muncie.  
not utilizing flow turbine, switch to open loop setting in calibration menu.



Member of the Interpump Group  
IN14-05 (Rev. 07-14)

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201 East Jackson Street • Muncie, Indiana 47305  
800-367-7867 • Fax 765-284-6991 • [info@munciepower.com](mailto:info@munciepower.com) • [www.munciepower.com](http://www.munciepower.com)  
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