Omni-System® ESP

OPERATION AND CONFIGURATION MANUAL

OESP 3020 OPEN & CLOSED SYSTEMS
HOIST, AUGER, SPINNER, AND LIQUID (PRE-WET)

MUNCIE®

SNOW & ICE CONTROL SOLUTIONS

TABLE OF CONTENTS

Features and Description 1

Controller/Hydraulics Specifications 2

Spreader System Components 3

Spreader Manifold Schematics 5

Wire Harnesses/Pin-Outs 6

Relief Valve Adjustment 8

Omni-System ESP P/N Breakdown 9

Complete Spreader Packages/Spreader Pre-wet Kits 10

Pre-wet Exhaust Valve Diagram 11

Controls and Displays/Operating Instructions 12

Operation Instructions – Controls 13

Operation Instructions 14

Configuration Menu 15

Troubleshooting 19

FEATURES AND DESCRIPTION

- Auto and Manual Operation
- 9 levels of Auger Control
- 9 levels of Spinner Control
- 9 levels of Pre-wet Control
- Hoist Control
- Blast Mode
- Pause Mode
- Optional Pre-wet (Electric)
- Groundspeed Controls
- Adjustable Backlighting

The Omni-System® Electronic Spreader (OESP) controller provides manual and automatic spreader operation. In the Auto Mode, the OESP maintains a constant pre-wet and spreader rate as the vehicle's speed varies. The controller will drive three (3) electrohydraulic proportional flow control valves: Conveyor (Auger), Spinner, Hoist, and optional pre-wet (electric). The OESP's valve control is fully adjustable with minimum and maximum trim settings.

The OESP's front panel incorporates three rate control knobs for the Auger, pre-wet, and Spinner operation. All settings are reported to the operator from digital displays located directly above the rate controls. For Blast and Pause, simply push each button.

The hoist control valve has ON/OFF functionality and will not be proportional. Momentary push buttons operate the hoist UP and DOWN.

CONTROLLER SPECIFICATIONS

OPERATING VOLTAGE

- 8–28 Volts DC
- Works with 12 V systems

OUTPUTS

- Two (2) voltage-controlled pulse width modulation (PWM) valve drivers for Auger and Spinner control; 2,200 mA max.
- One voltage-controlled output up to 12 Amps for electric or hydraulic functionality
- 100 Hz PWM
- Short and open circuit protection
- Four (4) voltage-controlled PWM valve drivers for Hoist control, PTO and aux control

INPUTS

- Groundspeed Input (0–2.5 kHz square or sine wave)

FRONT PANEL

- Three (3) dual seven-segment rate displays
- Three (3) rate controls (Auger, Liquid, and Spinner)
- Blast and Pause buttons
- Four (4) push buttons (Hoist UP/DOWN, PTO, AUX)

CALIBRATION

- All calibrations are set via the front panel; no tools required

HYDRAULIC SPECIFICATIONS

FLOW RATES/PRESSURES

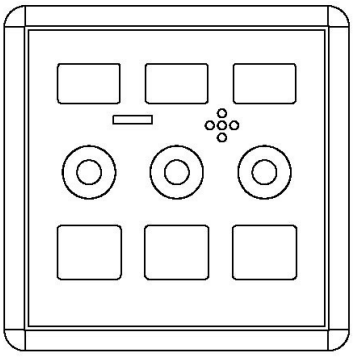
- System maximum flow: 40 GPM
  - Auger (proportional): 0–15 GPM
  - Spinner (proportional): 0–8 GPM
  - Hoist (proportional): 0–6 GPM

- Maximum Adjustable Pressure: 3,000 PSI

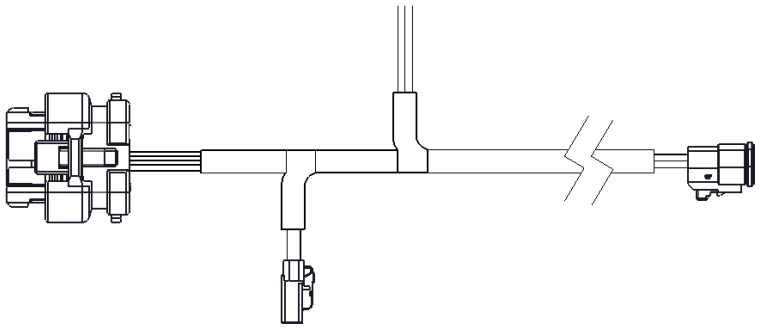
- Maximum System Pressure: 3,000 PSI (factory set at 2,500 PSI)

Optional Pre-wet Hydraulic System (see page 10 for specifications)

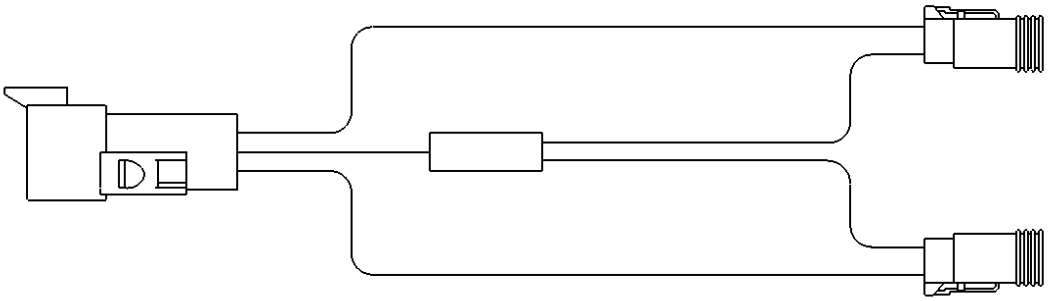
SPREADER SYSTEM COMPONENTS



Spreader Controller – OESP
OESP300A

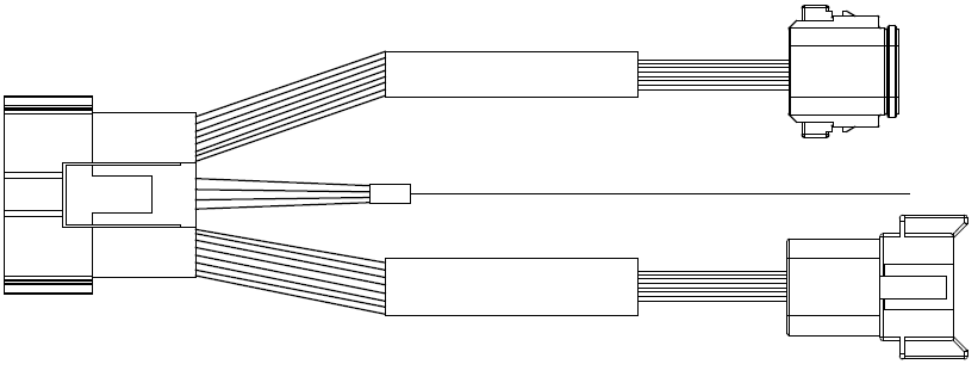


Controller Wire Harness – 34T67695



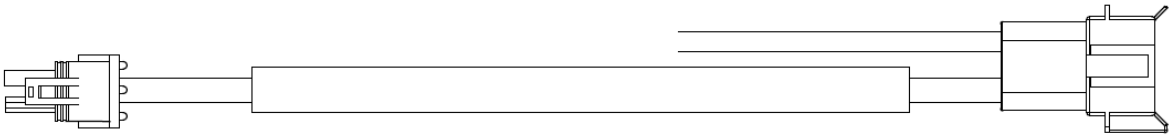
Valve Enclosure Wire Harness – 34T42522

VCMS2 Communication Harness – VCMS2WH1A

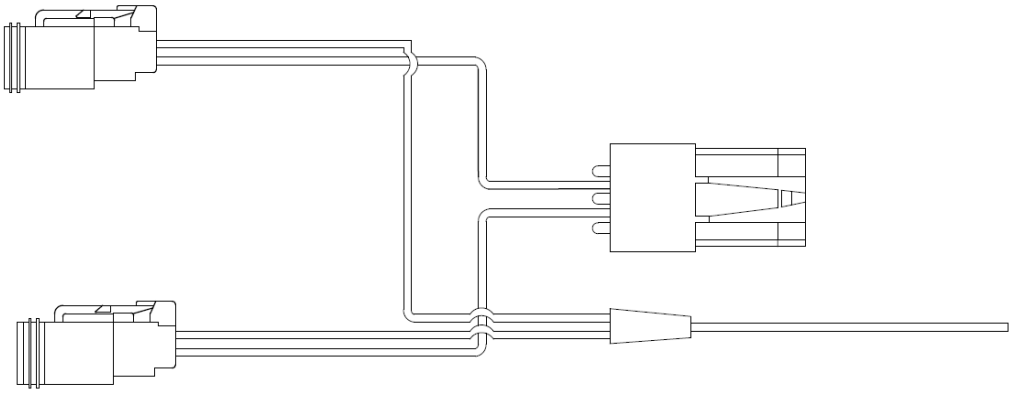


VCMS2 Input/Output Harness – VCMS2WH2

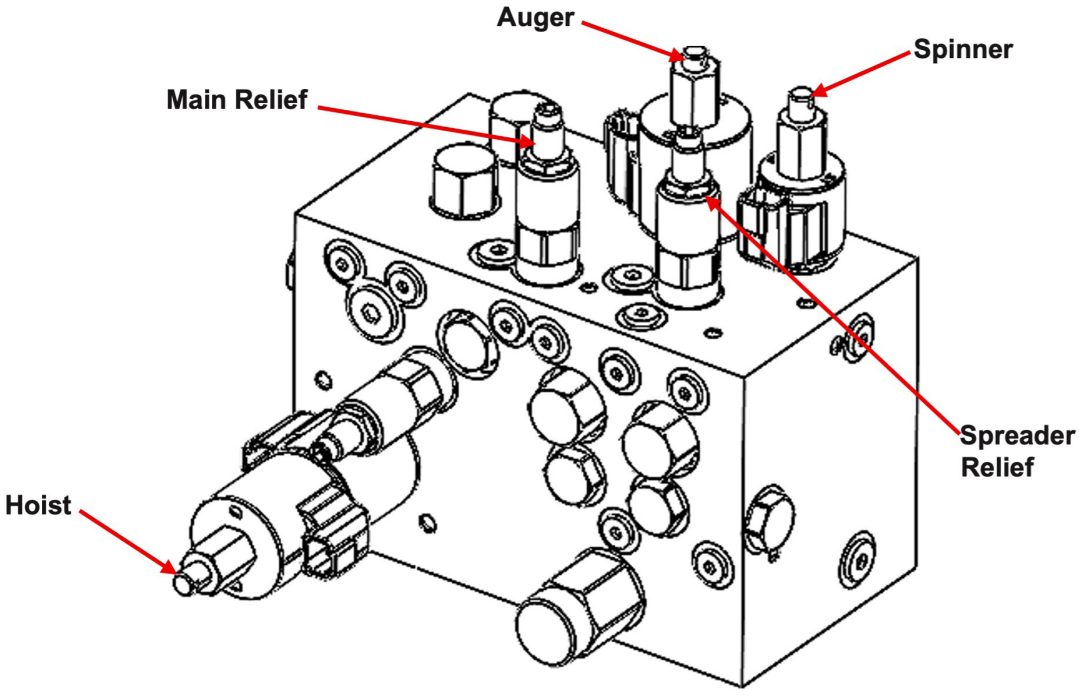
SPREADER SYSTEM COMPONENTS



VCMS2 MESP 3020 Harness – VCMS2WH8A

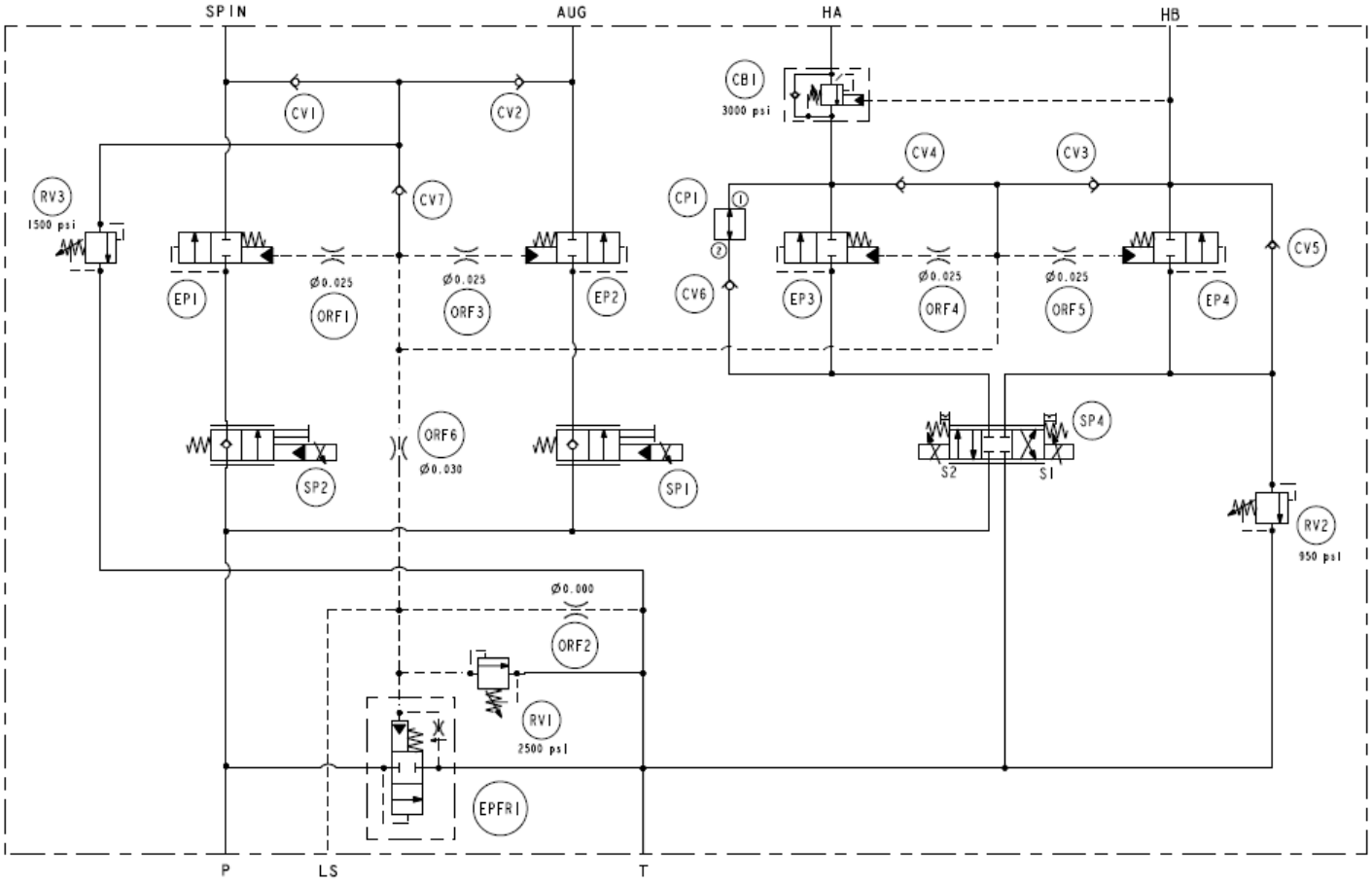


Electrical Harness – MESP303WH2A



Auger/Spinner/Pre-wet/Hoist Manifold – HF85622-13

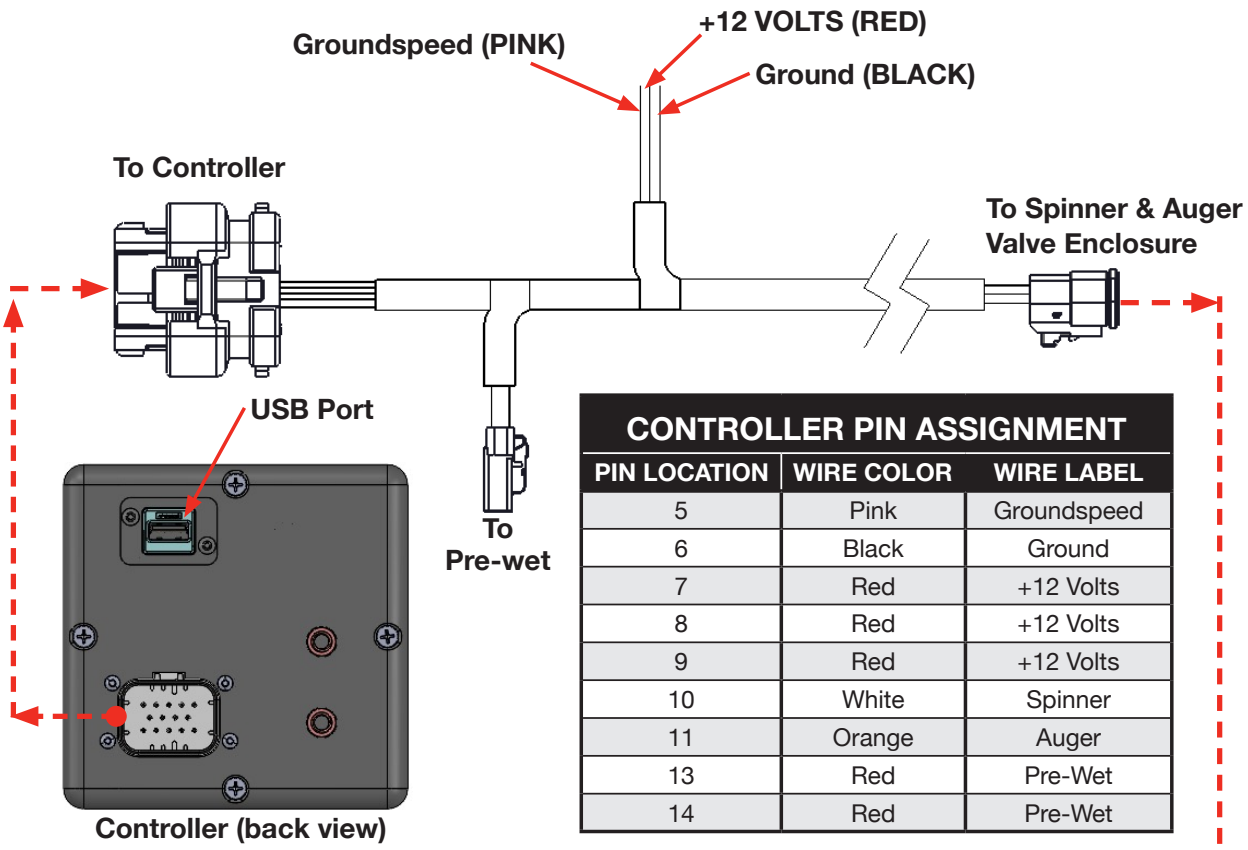
SPREADER MANIFOLD SCHEMATICS



Auger/Spinner/Pre-wet/Hoist Manifold – HF85622-13

WIRE HARNESS INSTALLATION/PIN-OUTS

Controller Wire Harness — 34T67696

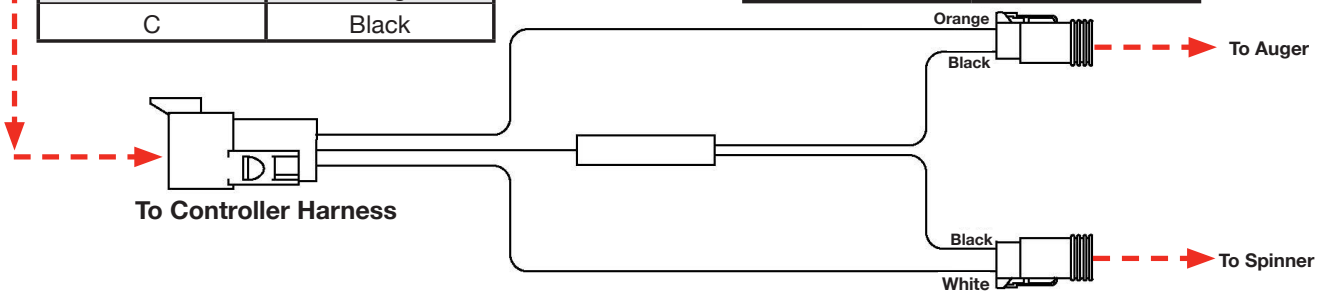


CONTROLLER PIN ASSIGNMENT		
PIN LOCATION	WIRE COLOR	WIRE LABEL
5	Pink	Groundspeed
6	Black	Ground
7	Red	+12 Volts
8	Red	+12 Volts
9	Red	+12 Volts
10	White	Spinner
11	Orange	Auger
13	Red	Pre-Wet
14	Red	Pre-Wet

Valve Enclosure Wire Harness — 34T42522

INPUT PIN ASSIGNMENT	
PIN	WIRE COLOR
A	White
B	Orange
C	Black

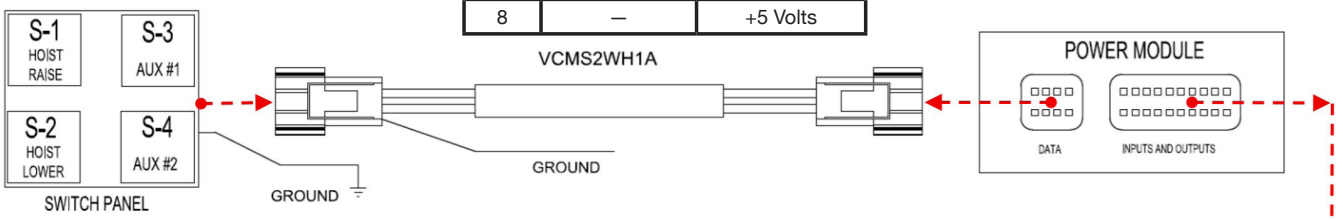
AUGER PIN ASSIGNMENT	
PIN	WIRE COLOR
1	Orange
2	Black

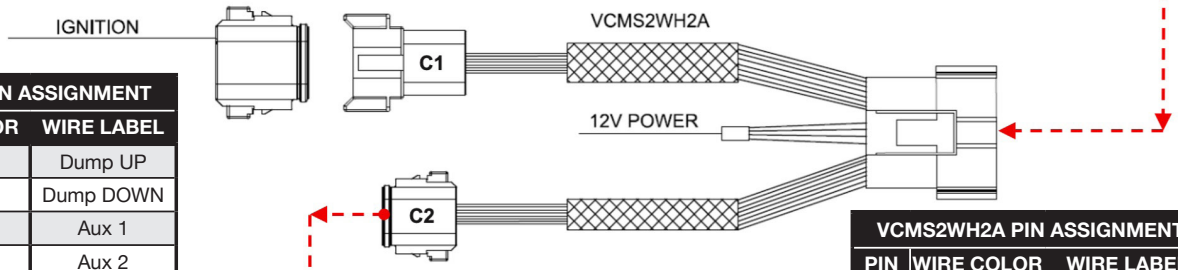


SPINNER PIN ASSIGNMENT	
PIN	WIRE COLOR
1	White
2	Black

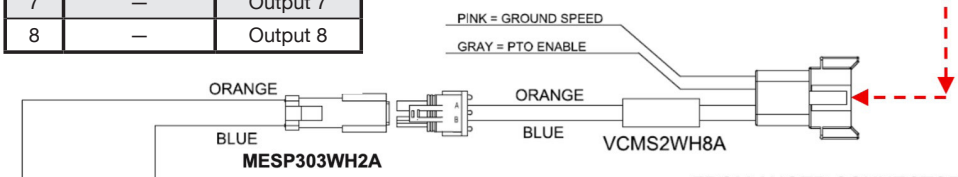
WIRE HARNESS INSTALLATION/PIN-OUTS

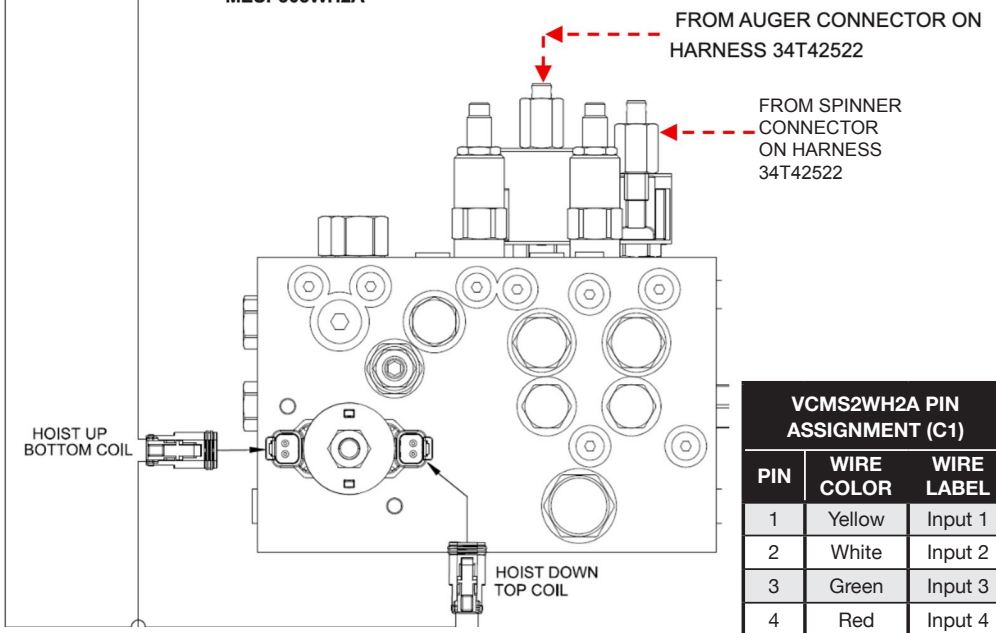
VCMS2WH1A PIN ASSIGNMENT		
PIN	WIRE COLOR	WIRE LABEL
1	Black	Ground
2	White	Data
3	Green	Clock
4	Red	+5 Volts
5	Black	Ground
6	—	Data
7	—	Clock
8	—	+5 Volts





VCMS2WH1A PIN ASSIGNMENT		
PIN	WIRE COLOR	WIRE LABEL
1	Blue	Dump UP
2	Orange	Dump DOWN
3	Gray	Aux 1
4	Pink	Aux 2
5	—	Output 5
6	—	Output 6
7	—	Output 7
8	—	Output 8





VCMS2WH2A PIN ASSIGNMENT (C1)		
PIN	WIRE COLOR	WIRE LABEL
1	Yellow	Input 1
2	White	Input 2
3	Green	Input 3
4	Red	Input 4
5	Brown	Input 5
6	Black	Input 6
7	Gray	Input 7
8	Blue	Input 8

VCMS2WH2A PIN ASSIGNMENT		
PIN	WIRE COLOR	WIRE LABEL
1	Yellow	Input 1
2	White	Input 2
3	Green	Input 3
4	Red	Input 4
5	Red	+12 Volts
6	Red	+12 Volts
7	Brown	Input 5
8	Black	Input 6
9	Gray	Input 7
10	Blue	Input 8
11	Orange	Output 1
12	White	Output 2
13	Gray	Output 3
14	Blue	Output 4
15	Red	+12 Volts
16	Red	+12 Volts
17	Purple	Output 5
18	Yellow	Output 6
19	Green	Output 7
20	Black	Output 8

VCMS2WH2A PIN ASSIGNMENT		
PIN	WIRE COLOR	WIRE LABEL
1	Orange	Output 1
2	White	Output 2
3	Gray	Output 3
4	Blue	Output 4
5	Purple	Output 5
6	Yellow	Output 6
7	Green	Output 7
8	Black	Output 8

RELIEF VALVE ADJUSTMENT

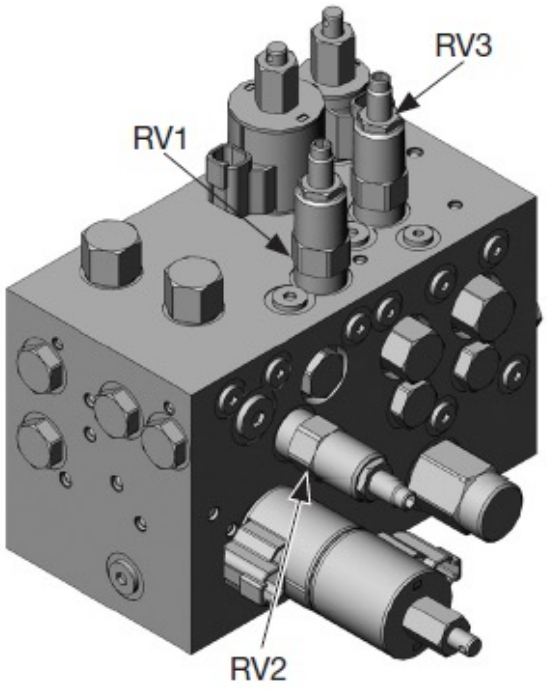
Main System Relief (Factory Setting 2,5000 PSI) — RV1

1. The tools required for adjusting the main relief setting includes: ¾" wrench and a ¼" Allen drive.
2. Tee a pressure gauge into the pump port (gauge greater than 3,000 PSI.
3. Loosen the lock nut while holding the Allen screw stationary.
4. Start the truck and deadhead flow at either the Auger or Spinner. (Pressure will increase to the main relief setting.)
5. While observing the pressure gauge, turn the Allen screw CCW to decrease pressure, and CW to increase pressure.
   DO NOT EXCEED 3,000 PSI

   ALWAYS VERIFY MAX. MOTOR PRESSURE RATINGS BEFORE ADJUSTING
6. Once the desired pressure has been established, hold the Allen screw stationary and tighten the lock nut.

Downside Hoist Relief (Factory Setting: 950 PSI) – RV2

1. The tools required to adjust the downside hoist relief setting include: a ¾" wrench and a ¼" Allen drive.
2. Tee a pressure gauge into the hoist lower (HB) port; gauge greater than 1,000 PSI.
3. Loosen the lock nut while holding the Allen screw stationary.
4. Start the truck and deadhead the hoist down. Pressure will increase to the downside relief setting.
5. While observing the pressure again, turn the Allen screw CCW to decrease pressure and CW to increase pressure.
6. Once the desired pressure has been established, hold the Allen screw stationary and tighten the lock nut.



OMNI-SYSTEM® ELECTRONIC SPREADER PACKAGE

MODEL NUMBER CONSTRUCTION

OESP 30 16 GL ASM S 1

Series

OESP — Omni-System ESP

Controller

30 — OESP300A

Valve Configuration

20 — Spreader w/Integrated Hoist

Functionality

G — Auger/Spinner Manifold (No Pre-wet Pump)

GL — Auger/Spinner Manifold + Electric Pre-wet Pump Kt.

E — G Manifold + PV76 Pre-wet Exhaust Valve *

Manifold Enclosure Configuration

BLANK — No Enclosure Supplied

ASM — Steel Enclosure Included

Enclosure Material Selection

BLANK — Powder Coated Steel

S — Stainless Steel Enclosure Included

Revision #

BLANK

1, 2, 3, 4, 5 — Number of Revisions

* Recommended for smaller duty vehicles. Contact Muncie Power for this option.

COMPLETE SPREADER PACKAGES

WITH ENCLOSURE

OESP3020GASM1
Includes the following:
- OESP300A – Controller
- 34T67695 – Controller Wire Harness
- 34T42522 – Valve Enclosure Harness
- HF85622-13 – Open Center Manifold
- 55T43281 – Enclosure (powder coat)
- 55T43306 – Lid

OESP3020GASM1
Includes the following:
- OESP300A – Controller
- 34T67695 – Controller Wire Harness
- 34T42522 – Valve Enclosure Harness
- HF85622-13 – Open Center Manifold
- 55T43281SS – Enclosure (Stainless Steel)
- 55T43306SS – Lid

PRE-WET KITS

Developed to match the granular groundspeed, it spreads consistently to maintain the desired gallons per ton of salt distribution. Our pre-wet kits are mounted and pre-wired into NEMA enclosures. Electric pre-wet pumps are available for 5 GPM and hydraulic motor/pump configurations up to 10 GPM.

OMPWT1ASM05M
Electric Liquid (Pre-wet)

Includes the following:
- 5 GPM Electric Pump
- NEMA Enclosure
- Check Valve

OMPWT1ASM10H
Hydraulic Liquid (Pre-wet)

Includes the following:
- 10 GPM Hydraulic Pump
- NEMA Enclosure
- Check Valve
- Maximum motor input – 4.5 GPM
- Maximum pump output – 10.4 GPM

PRE-WET EXHAUST VALVE DIAGRAM

PARTS NEEDED: QTY. (1) NXPV7630AM12TN12ER

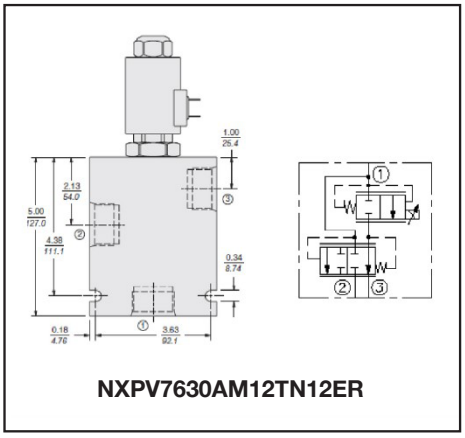
This is a solenoid operated proportional flow control valve used to direct flow to the pre-wet motor from the Auger return. It electronically regulates the Auger return flow between the pre-wet motor and tank.

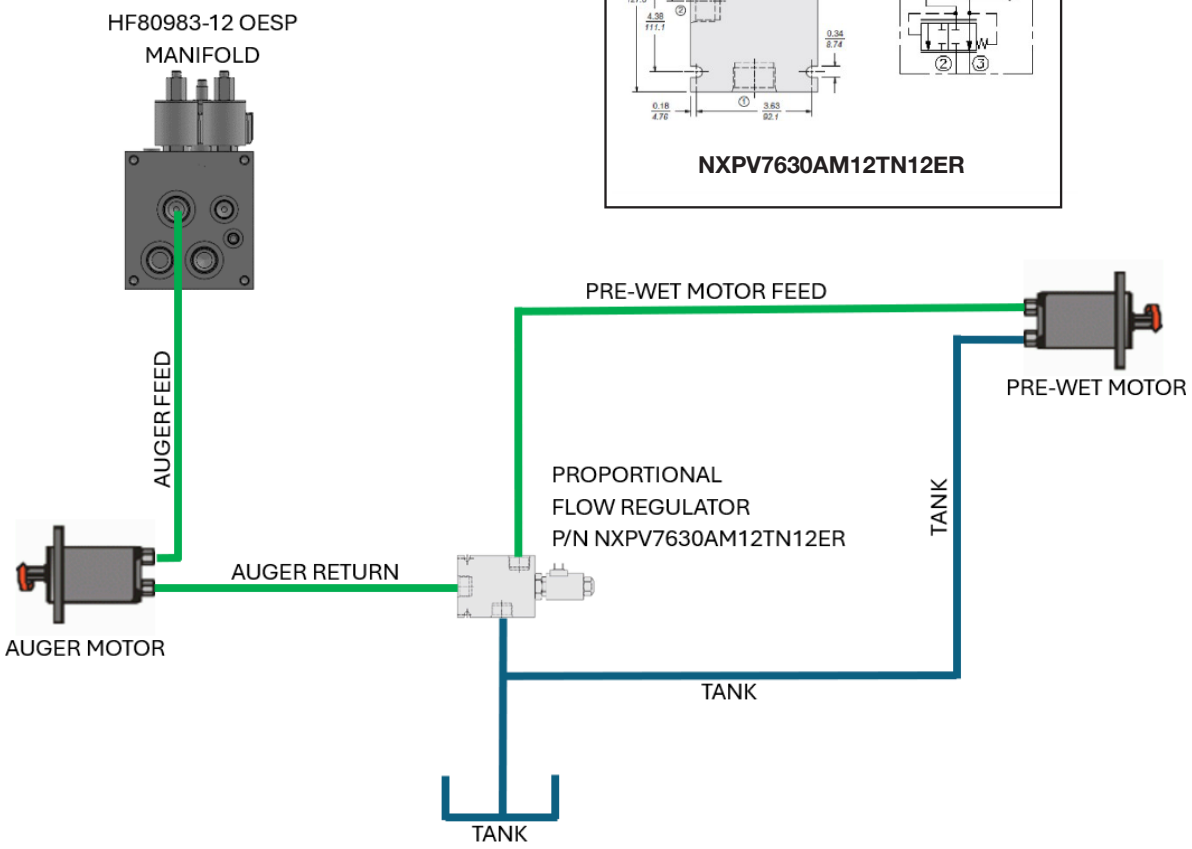
Max. Flow: 25 GPM
Max. Pressure: 3,000 PSI
Port Size: SAE 12

Recommended for smaller duty vehicles with limited pump flow available that require hydraulic liquid.

PLUMBING INSTRUCTIONS

1. Connect Port 1 to the Auger Return
2. Connect Port 2 to Tank
3. Connect Port 3 to Pre-wet Motor





CONTROLS AND DISPLAYS

OPERATION INSTRUCTIONS – CONTROLS

ON/OFF: Press the ON/OFF button to power the controller.

AUGER RATE CONTROL: Rotate the Auger control knob clockwise to increase and counter-clockwise to decrease the rate.

LIQUID RATE CONTROL: Press and release the Liquid knob to turn on. Rotate the Liquid control knob clockwise to increase and counter-clockwise to decrease the rate.

SPINNER RATE CONTROL: Rotate the Spinner control knob clockwise to increase and counter-clockwise to decrease the rate.

BLAST: Press the Blast button to increase Auger output to the maximum trim setting. Once released, the Blast will continue for the number of seconds configured in controller settings. See Configuration Menu, pages 20–21. Repress the Blast during the timed interval to cancel the blast operation. Hold the Blast button for infinite operation. The numerical value nine (9) will show on the Auger display while the system is in blast mode.

PAUSE: Push and release the button to pause the operation of the Auger, Spinner, and Liquid. Push and release again to resume operation at the original settings.

PUSH BUTTONS: Press buttons to raise and lower hoist, activate/deactivate PTO and aux functions.

SWITCHING AUTO & MANUAL MODES: Press the Auger control knob down to switch between Auto & Manual Modes. The Auto light will illuminate yellow on the controller when Auto Mode is active. Auto will flash under Auger display when the controller is not receiving an MPH signal.

BRIGHTNESS: To adjust the brightness of the display and buttons:

1. With the controller powered off, depress and hold the Liquid knob for 6 seconds until a numerical value appears in the Spinner window.
2. While continuing to depress the Liquid knob, rotate the Spinner knob to adjust the intensity of the backlighting.

OPERATION INSTRUCTIONS

AUTO MODE OPERATION

In Auto Mode, the truck's speed in miles per hour (MPH) is used to automatically increase/decrease the Auger output to maintain a constant rate. If the Auto Mode feature is going to be used, the vehicle speed will need to be synchronized with the controller. See steps below on how to verify the controller is receiving the speedometer signal and the process to sync.

1. Verify the controller is receiving a speedometer input:

    - Turn the controller ON
    - Place the controller in Auto Mode by pressing the Auger knob. The Auto light will light up yellow on the controller when Auto Mode is active.
    - In Auto Mode, the Auger and Liquid display will flash whenever the MPH is 0, or there is no speedometer connection. This also indicates the Auger is not turning and there is no Liquid output. If the Auger and Liquid display go steady when the vehicle begins moving, the controller is receiving a valid signal. (See Speedometer Synchronizing on page 18.)

Note: If the Liquid (Pre-wet) function is not part of your truck setup, then only the Auger display will act as described above. Liquid will show an error if turned on when not connected.

- In Auto Mode, the Auger rate adjustment has ten (10) settings: 0 through 9, with 0 being OFF. As the Auger rate is increased, the Auger will discharge more material per lane mile.
- The Auger will automatically halt at 0 MPH in Auto Mode. The Auger display will continuously flash at 0 MPH or if there is no speedometer connection.
- Auto Mode does not proportionally affect the Spinner rate like the Auger. This is set by the operator and remains constant at all MPH speeds.
- The Liquid function will automatically halt at 0 MPH in Auto Mode. The Liquid display will continuously flash at 0 MPH if there is no speedometer connection.

MANUAL MODE OPERATION

In Manual Mode, the Auger rate adjustment has ten (10) settings: 0 through 9, with 0 being OFF.

- Each increment changes the Auger speed by approximately 10%, independent of truck speed. Unlike Auto Mode, the system will not automatically turn off the Spreader output when the truck comes to a stop. The operator must use the Pause button or turn the Auger rate to 0 to manually stop the spreader.

CONFIGURATION MENU

ACCESSING CONFIGURATION MENU:

This menu is passcode protected to limit access to non-authorized personnel. It is recommended to change the passcode from the default value to limit access and prevent unintentional system adjustments.

Follow the steps below to enter the Configuration Menu:

1. **Accessing Configuration Menu:** With the Spreader off, simultaneously depress the Auger and Spinner knobs and release.

2. **Passcode Entry:** The Liquid knob will adjust the left two (2) digits, and the Spinner control will adjust the right two (2) digits. Enter the passcode and depress the Spinner knob.

   (Default Passcode = 0001)

3. **Navigating Configuration Menu:**

   - Rotate the Auger knob to scroll through the various adjustment items.
   - To enter and exit the submenus, depress the Auger knob.
   - To change settings, rotate the Liquid and Spinner knobs

CONFIGURATION MENU

SYSTEM MENU:

Firmware Bundle: Non-adjustable and reference only.

Profile: Non-adjustable and reference only.

Passcode Change: Using the Liquid and Spinner knobs, adjust the default passcode.

EQUIPMENT MENU:

E Flow: Flow Sharing – N/A on standard OESP only setups.

Speedometer Synchronizing:
The display should show as 0 MPH. Begin accelerating until you reach 20 MPH **on truck speedometer.** Once at 20 MPH **on truck speedometer,** press the Spinner knob. The controller should now be calibrated.

CONFIGURATION MENU

Plow Down Float: Not applicable to standard OESP-only setups.

SPREADER:

Retain: Use the Spinner knob to toggle the retain settings feature. This functionality allows the controller to retain the Auger, Liquid, and Spinner rates through power cycles. **0 = OFF / 1 = ON**

CAUTION: This will cause the spreader controller to retain the settings after the controller has been powered off. Be aware that anytime the spreader controller is repowered, the motors will initiate at the last settings.

0 = OFF / 1 = ON

0 MPH SPINNER: The 0 MPH Spinner feature allows the Spinner operation to halt when the truck comes to a stop. If the setting is configured for Spinner ON, the Spinner will remain spinning regardless of truck speed. **0 = OFF / 1 = ON**

0 = OFF / 1 = ON

BLAST LVL: The Blast level sets the Auger speed when the Blast button is pressed. This is adjustable from 0–100%. Use the Spinner knob to change.

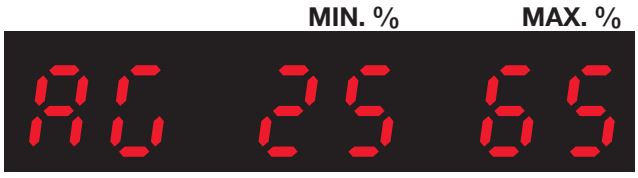
%

CONFIGURATION MENU

BLAST Time: The Blast duration can be adjusted from 0–199 seconds. Use the Liquid and Spinner knob to change it. Setting it above 199 will change to LT (latching). This means when you hit Blast, it will stay on until turned off.

Take-off Timer: The take-off timer is only applicable to Auto Mode, and it is intended to help expedite material output as a vehicle accelerates from a stop. This setting is adjustable from 0–20 seconds. Turning this setting above 0 will cause the Auger to blast material. Use the Spinner knob to adjust this setting.

Auger Min./Max.: The minimum setting should be adjusted so that the Auger is barely turning. The maximum setting is the preferred maximum Auger speed.



Spinner Min./Max.: The minimum setting should be adjusted so that the Spinner is barely turning. The maximum is the preferred maximum Spinner speed.

Pre-wet Min./Max.: The minimum setting should be adjusted so that the pre-wet is barely flowing from the spray nozzles. The maximum is the preferred maximum Liquid speed.

EXIT:

Save & Exit: Navigate to this menu item and depress the Auger knob to save and exit the calibration menu.

TROUBLESHOOTING

(Controller)

Symptom	Possible Cause
OESP300A controller will not power ON	• Check wiring designation and check inline fuse if installed.
Auger is nonfunctional	• Check if the Auto display light is illuminated yellow on controller. The Auger will not function in Auto Mode until vehicle begins moving.
Auto Mode is non-functional	• If Auger or Liquid display continuously flash in Auto Mode while truck is moving, the controller is not recognizing a speedometer signal. Verify that speedometer input is connected to a valid speedometer signal. • Speedometer input not properly synchronized with controller. Try recalibrating speedometer input (see page 18).
Auto Mode does not perform at low MPH	• Speedometer input not properly synchronized with controller. Try recalibrating speedometer input (see page 18). • Set Auger minimum trim setting.
Auger, Hoist, or Spinner is inoperative in Auto and Manual Mode	• Check wire harness connections and verify that pins are crimped and seated correctly in the connectors. Controller will show “ER” (for error) if connection is broken. • Check electrical connections to solenoids valves and grounds. Controller will show “ER” (for error) if connection is broken. • Adjust trim settings.
No Auger, Hoist, or Spinner operation at low rates	• Increase minimum trim settings so that either the Spinner, Auger, or Hoist just begins to move. This will eliminate the deadband within the valve.
Spinner only operates when vehicle is moving	• Check the Spinner pause at 0 MPH setting (see page 19).

TROUBLESHOOTING

CAUTION: ONLY REMOVE COMPONENTS WHEN PUMP IS OFF AND SYSTEM IS NOT UNDER PRESSURE

Symptom	Possible Cause
Either the Auger, Spinner, or Hoist operate wide open	• Check manual overrides of SP1, SP2, or SP4 • Remove SP1, SP2, or SP4 from manifold and inspect cavity and cartridge for contamination. * * **DO NOT OVER TORQUE COIL NUT 5–7 ft.lbs. (6.8 to 9.5 Nm). This will stretch the stem.**
Either the Auger, Spinner, or Hoist are inoperative	• Inspect wiring and check continuity of Deutsch connector into solenoid receptacle. • Verify that the flow is not bypassing motor. (loss of efficiency)
Neither Auger, Spinner, or Hoist do not operate	• Remove EP1 from manifold and inspect cavity and cartridge for contamination. • Check RV1 for contamination. • Verify that pump is producing flow when pressurized.
Manifold operates continuously at main relief pressure (1,800 PSI)	• Inspect plumbing; if applicable, check quick disconnects. • Remove EP1 from manifold and inspect cavity and cartridge for contamination. • For closed center setups, also check the LS drain (ORF2). Remove and inspect orifice for debris.
Oscillating noise/compensator instability coming from manifold bypassing through EP1	• Downsize inlet hose diameter to increase flow velocity. Verify smaller hose size will handle input pressure before replacing. • Add check valve (10–15 PSI) at outlet (T) to create back pressure and stabilize. (Contact Muncie Power for assistance.)
Hoist will not operate	• Downsize inlet hose diameter to increase flow velocity. Verify smaller hose size will handle input pressure before replacing. • Inspect wiring • Increase the main relief pressure setting (see page 10).
Hoist will not lower	• Adjust conterbalance.

Muncie® Power Products

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