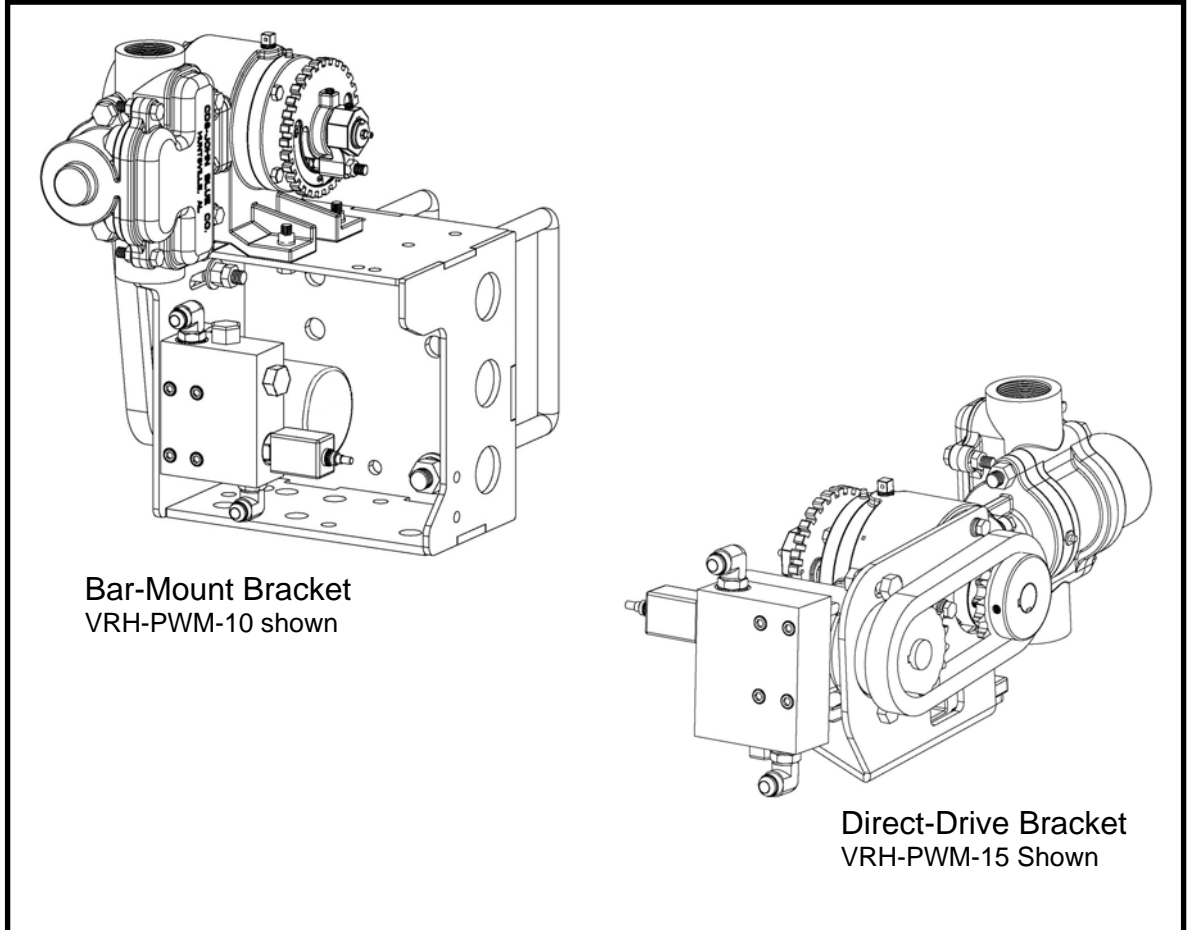




VRH-PWM-10/15/17 PWM VALVE HYDRAULIC DRIVE KIT

SYSTEM SETUP MANUAL



Bar-Mount Bracket
VRH-PWM-10 shown

Direct-Drive Bracket
VRH-PWM-15 Shown

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SAFETY PRECAUTIONS

- Equipment should be operated only by responsible people.
- A careful operator is the best insurance against an accident.
- Fill system with WATER first and check output.
- Check all valves, fittings, hose clamps, etc. for wear / leaks before admitting process fluid to the system.
- Replace hoses when worn, cracked, or if leaking.

WARNING: USE OF THIS PRODUCT FOR ANY PURPOSES OTHER THAN ITS ORIGINAL INTENT, ABUSE OF THE PRODUCT, AND/OR MODIFICATION TO THE ORIGINAL PRODUCT IS STRICTLY PROHIBITED BY CDS-JOHN BLUE COMPANY. CDS-JOHN BLUE COMPANY RESERVES THE RIGHT TO DENY WARRANTY OR LIABILITY CLAIMS IN ANY/ALL SITUATIONS INVOLVING MISUSE, ABUSE OR MODIFICATION.

THE ORIGINAL INTENT OF THIS PRODUCT DOES NOT INCLUDE USE WHERE THE MAXIMUM ALLOWED SPEED, PRESSURE, OR TEMPERATURE IS EXCEEDED, AND IT DOES NOT INCLUDE APPLICATIONS UTILIZING FLUIDS THAT ARE NOT COMPATIBLE WITH THE PRODUCT'S COMPONENT MATERIALS. DO NOT USE THIS PRODUCT WITH FLAMMABLE OR COMBUSTIBLE FLUIDS SUCH AS GASOLINE, KEROSENE, DIESEL, ETC..., AND DO NOT USE IN EXPLOSIVE ATMOSPHERES. FAILURE TO FOLLOW THIS NOTICE MAY RESULT IN SERIOUS INJURY AND/OR PROPERTY DAMAGE AND WILL VOID THE PRODUCT WARRANTY. IF IN DOUBT ABOUT YOUR APPLICATION, CONTACT YOUR STOCKING DEALER OR THE CDS-JOHN BLUE TECHNICAL STAFF AT 1-800-253-2583.

To The Owner

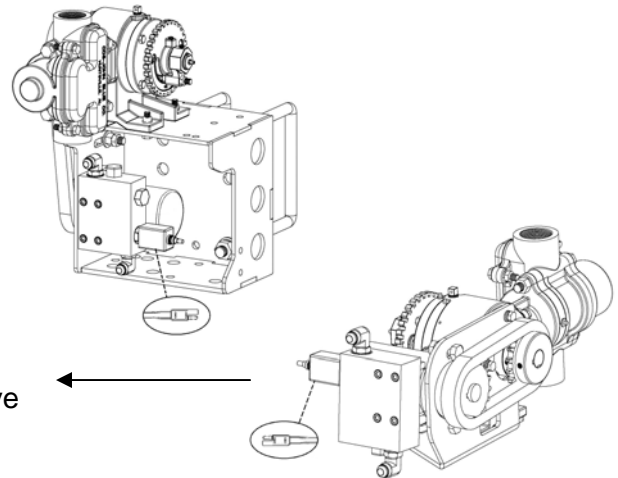
This manual has been prepared and illustrated to assist you in the maintenance of your CDS – JOHN BLUE PUMP. Enter your serial number and the date of the purchase in the space provided below for future reference in service information or for ordering parts. Because our engineering department is constantly improving products, we reserve the right to make design and specification changes without notice.

Model Number: _____ Serial Number: _____ Purchase Date: _____

Kit Description:

The PWM hydraulic drive kit provides the hardware and setup information to drive a CDS-John Blue piston pump with a PWM valve controlled hydraulic motor. The valve uses the common 2-pin molded trailer plug used by Raven Industries®. Two types of mounting assemblies are available:

- **VRH-PWM-10**
A bar-mount assembly to attach to the side or top surfaces of a bar.
- **VRH-MAN-15** (for 6055/8055 pumps)
- **VRH-PWM-17** (for 7055/9055 pumps)
A direct-drive assembly for installations that have a horizontal pad for the pump to bolt onto.



Some “off of the shelf” components (that the user may already have) will still need to be obtained to complete the installation of the fertilizer system, and they are listed on the next page. The components may be obtained from the supplier listed, or an equal to them may be found.

Hydraulic System Notes (also see supplied manual #12-M-54 for more installation details):

To reach full pump rpm, the hydraulic system must supply at least 9.5 gpm to the manifold inlet port, and be capable of developing at least 1600 psi. The maximum gpm and pressure should not exceed 10 gpm and 2750 psi.

Adjust your maximum flow output to 10 gpm, use an in-line bypass valve, or install a flow limiting device. A 1/8” orifice plate, #116377-01, is available that slips in the inlet port before the inlet fitting is installed. The orifice plate may be drilled if the resulting flow is too low. 10 gpm should not be exceeded to keep from spinning the pump above its maximum rpm.

As supplied, the system is compatible with a closed center load sensing hydraulic system, which compensates for flow and pressure. If you have a closed center pressure compensating system, you may have to put an orifice (1/8” diameter #116377-01 is available) in the inlet port of the manifold to make the variable stroke pump build pressure. Both of the systems above have a flow control valve to limit flow.

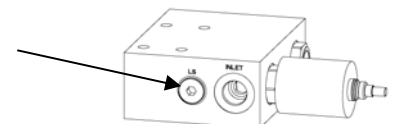
An open center hydraulic system will require the use of a flow bypass valve or limiter if the flow is too high, since this system uses a constant flow pump. Note that care must be taken to avoid overheating the oil when bypassing a large volume of it for long periods of time.

If you do not want the manifold to allow pass-thru flow, cavity plug #116378-01 may be used to replace the logic valve located near the Tank port of the manifold (see page 7 of manual 12-M-54).

See manual 12-M-54 for the required motor rotation direction.

For Power Beyond™ systems, some manifolds are equipped with a plugged “LS” port that you may unplug and connect to the sensing circuit. You must install a check valve (such as Vonberg #1104R or 1904R) in the port, and then run a hose to the sensing circuit. The port is #4 SAE o-ring.


For power beyond, must install check valve before hydraulic line (to only allow outflow from port)



Required Fertilizer System Components:

The following list details all of the fertilizer system components that are necessary to use with the CDS-John Blue Hydraulic Drive:

Harness included with CDS-John Blue kit:

| Item | Qty | Description | Mfg. & Part Number |
|------|-----|---|--------------------------|
| A | 1 | PWM valve adapter harness (w/Raven 2 pin plug)  | CDS-John Blue #116125-01 |

Required items that must be purchased separately:

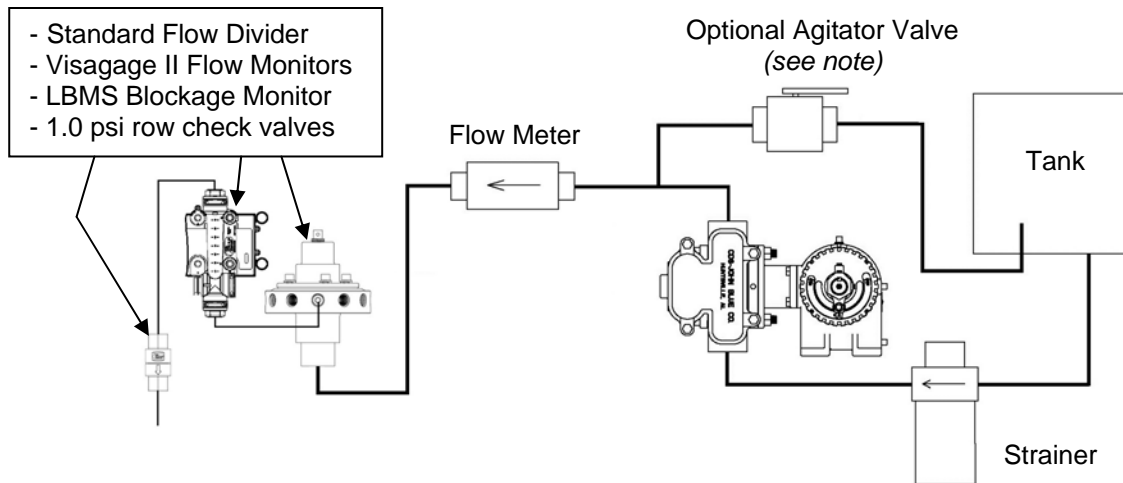
| Item | Qty | Description | Mfg. & Part Number <i>(or use equal)</i> |
|------|-----|---|---|
| B | 1 | Flow meter | Raven #RFM60P or #RFM100P Microtrak #FM270 |
| C | 1 | Strainer – 50 Mesh | Banjo #MLST150-50 |
| D | 1 | Standard flow divider (6, 12, and 20 port models available) | CDS-John Blue #FDxx10 |
| E | # | Visagage II monitors (qty depends on # of rows) | CDS-John Blue #SMFDx |
| F | # | 1.0 psi check valve (qty depends on # of rows) | CDS-John Blue #CV-1101-xxx |

Optional items for sectional control (to be purchased separately):

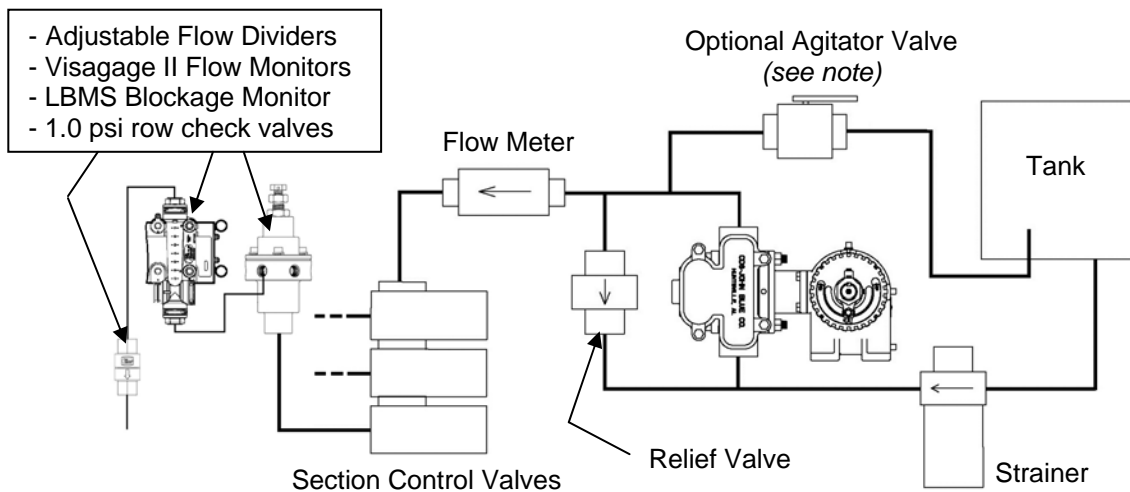
| Item | Qty | Description | Mfg. & Part Number <i>(or use equal)</i> |
|------|-----|--|--|
| G | 1 | Relief valve – 100 psi setting | Banjo #MVRP100-100 |
| H | # | 3-way control valve (qty depends on # of sections) | Banjo #MEV200SLCF |
| I | # | Adjustable flow divider (qty depends on # of sections) | CDS-John Blue #FDxx10-ADJ |
| J | # | Visagage II monitors (qty depends on # of rows) | CDS-John Blue #SMFDx |
| K | # | 1.0 psi check valve (qty depends on # of rows) | CDS-John Blue #CV-1101-xxx |

Fertilizer System Plumbing:

The following diagram shows a typical variable rate setup using a hydraulically driven CDS – John Blue piston pump, using a single flow divider.



The following diagram shows a multi-section system, using multiple adjustable flow dividers:



Notes:

- When using a tank agitator circuit, the amount bled off to the tank will reduce the max flow capability of the pump by the same amount.
- Section control will require the purchase of optional wiring harnesses and the correct number of 3-way valves, adjustable flow dividers, etc... to complete the system.
- The adjustable flow dividers will need to be calibrated at installation by using flow meters or a visual flow monitor system to compare each section's output flow. This is to be completed at system setup – reference the instructions supplied with the flow divider.
- It is recommended that the lines going to each row out of the flow divider be equal in length, and all coiled-up line be laid flat.

PWM Valve Control Configurations:

***** Note that these are recommended initial settings – you are responsible for modifying them to match your exact configuration to provide reliable performance. *****

1.) Raven®

PWM compatible Raven® controls include the: SCS440, SCS4400/4600, Envizio Pro™, and Viper Pro™ with the liquid control harness. The following instructions detail the recommended settings for our valve:

A. Select “**PWM Close**” as the valve type under system setup. “PWM Close” causes the pump to stop when the master switch is shut off, which stops product flow.

B. Recommended Initial PWM valve settings:

| | | |
|---------------|---|------|
| Valve Cal | = | 0043 |
| PWM Frequency | = | 122 |

C. You may set the Max PWM and Min PWM values if desired.
(Refer to the Raven® manual for a description of these parameters.)

2.) Ag Leader®

The Integra™ display with the DirectCommand™ liquid control module can initially be configured for our PWM flow control valve as shown below. Note that you will need to use Raven® “valve/flow meter” cable (#4000451-x) to plug directly into our valve harness.

A. In the DirectCommand™ setup screens, navigate to “**Controller Settings**” and set the Rate Off Flow Control Valve setting to “**Close**”.

B. Choose “**Control Valve Settings**” and set the valve type to “**PWM 12V**”.

C. Set the other valve parameters as follows:

| | | |
|------------------|---|-------|
| Valve frequency | = | 122Hz |
| PWM gain | = | 800 |
| Zero Flow Offset | = | 35 |
| PWM standby | = | 40 |

(Refer to the Ag Leader® manual for a description of these parameters.)

3.) Trimble®

The displays that are compatible with the Field-IQ™ Rate and Section Control module can initially be configured as follows:

A. In the Field-IQ™ Rate and Section Control Module “**Calibration**” screen, select “**Valve Calibration**”

B. For the “Valve” tab, set the parameters as follows:

| | | |
|-----------------------------------|---|-------|
| Valve type | = | PWM |
| Valve Behavior on Sections Closed | = | Close |

C. For the “Control” tab, set the parameters as follows:

| | | |
|------------------|---|-----------------------|
| Allowable Error | = | between 1.0 and 3.0 % |
| Gain | = | 10.0 max. |
| Minimum Response | = | 20.0 % |

(Refer to the Trimble® manual for a description of these parameters.)

4.) John Deere Greenstar 2/3®

If using the VRH PWM drive with an aftermarket 37-pin harness, the Greenstar™ display may be configured as follows:

A. Select the Implement tab under the SETUP button

- Select the implement type, and add a name and size to help identify the setup later when navigating the menus
- Enter your implement section and swath width information
- The height switch drop down box is normally set to “Do not share” (see *special notes*)

B. Select the System tab

PWM flow control valve setup instructions:

- Enter the information as follows:

| | | |
|---------------------|---|--|
| Section Valve type | = | 3-wire (for Banjo, Raven, & Teejet valves) |
| Control Valve type | = | PWM CLOSE |
| Tank Capacity | = | Enter your value, default is 1000 gal. |
| Flow Return box | = | NOT checked |
| Constant Flow box | = | NOT checked |
| Flowmeter Calib. | = | Enter value for your specific flowmeter |
| Flowmeter Units | = | gal or 10 gal (check your flowmeter) |
| Agitator Valve box | = | NOT checked (unless equipped) |
| Pressure Sensor box | = | NOT checked (unless equipped) |

- Press the “PWM Setup” button and enter the following:

| | | |
|---------------------------|---|---------|
| Control Valve Calibration | = | 6533 |
| Coil Frequency | = | 300 |
| High Limit | = | 255 |
| Low Limit | = | 57 |
| Pump Enable Checkbox | = | CHECKED |
| Enable Pump | = | CHECKED |

5.) Other controls not listed (Dickey-john®, TopCon®, etc.):

Most control system companies will list recommended initial settings in their manuals for PWM flow control valves. Please follow their recommendations or contact their technical support to see what parameters other customers have used to control a Hydraforce® PWM valve. Note that you will also need to choose the Raven® valve/flow meter cable options when specifying your system.

CDS-John Blue also welcomes your feedback on the settings you use for the applications shown above, and for applications that we do not yet have listed. We will add them to the manual to help other users. Please call 1-800-253-2583 with your feedback.

TROUBLE SHOOTING

| ISSUE | POSSIBLE CAUSES |
|---|---|
| Pump/motor runs uncontrollably | Hydraulic flow is backward and is entering the manifold “Outlet” port instead of the “Inlet” port. Check that rotation of the pump and/or motor is CLOCKWISE from the motor shaft (or sprocket) end - reverse hydraulic flow if needed. |
| | Hydraulic flow is too high – adjust tractor’s maximum flow to be 10 GPM. |
| Pump/motor will not start | Ensure “Pump Enable” checkboxes are set correctly in the “PWM Setup” screen. Also check High and Low Limit settings. |
| | An orifice is needed in INLET port of manifold if using a closed-center pressure compensating hydraulic system. Orifice size should be approx. 0.125” |
| | Test to see if coil is getting power. Coil will be magnetic when powered on (may hold steel object close to it to test). |
| | Hydraulic flow is too low – adjust tractor’s hydraulic flow to be at least 5 gpm, but preferably close to 10 gpm. |
| Pump/motor will not stop when implement is lifted | Test resistance of implement switch contacts to make sure no current can pass when they are supposed to be “open”. |

System Components:

Other CDS-John blue components that are recommended for use with this kit are:

- **Exacto-Flow** flow dividers, available 6, 12, and 20 port models and available with adjustable spring tension for section balancing (FD-0610, FD-1210, & FD-2010)
- **Visagage Orifice Selectors**, available in sets of four or as single units (SMPT-OSA1 or SMPT-OSA4).
- **Visagage II** flow monitors, available in sets of four or as single columns (SMSSx OR SMFDx)
- **Serviceable Check Valves**, available with or without fittings (CV-1101, 1.0 psi)

NOTES

LIMITED WARRANTY

THIS WARRANTY IS IN LIEU OF ALL OTHER WRITTEN OR EXPRESS WARRANTIES AND REPRESENTATIONS. ANY IMPLIED WARRANTIES INCLUDING MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THIS WRITTEN WARRANTY. CDS-JOHN BLUE COMPANY SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES.

Use of this product for any purpose other than its original intent, abuse of the product, and/or any modification to the original product is strictly prohibited by the manufacturer, CDS-John Blue Company. Any modification to the product should be approved by CDS-John Blue Company prior to use. CDS-John Blue Company will deny Warranty claims and liability in any situation involving misuse, abuse or modification.

Each new machine or component manufactured by CDS-John Blue Company through original buyer is warranted by CDS-John Blue Company to buyer and to any party or parties to whom buyer may resell, lease or lend the equipment to be free from defects in material and workmanship under normal use and service. This obligation of CDS-John Blue Company under this warranty is limited to the repair or replacement of defective parts or correction of improper workmanship of any parts of such equipment which shall within one year from the date of CDS-John Blue's original delivery thereof, be returned to CDS-John Blue's factory, transportation charges prepaid and which CDS-John Blue Company shall determine to its satisfaction upon examination thereof to have been thus defective. When it is impractical to return the defective parts of such equipment to CDS-John Blue's factory, then CDS-John Blue shall have no liability for the labor cost involved in repairing or replacing any such parts and shall be liable solely for supplying the material necessary to replace or repair the defective parts, provided that prior thereto CDS-John Blue Company shall have determined to its satisfaction that any such parts are thus defective.

This warranty shall not apply to any equipment which shall have been repaired or altered outside CDS-John Blue's factory in any way so as to affect its durability, nor which has been subjected to misuse, abuse, negligence or accident, or operated in any manner other than in accordance with operating instructions provided by CDS-John Blue Company. This warranty does not extend to repairs made necessary by the use of inferior or unsuitable parts or accessories, or parts or accessories not recommended by CDS-John Blue Company.

CDS-John Blue Company makes no warranties in respect to parts, accessories or components not manufactured by CDS-John Blue Company, same ordinarily being warranted separately by their respective manufacturers.

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