# SETUP GUIDE

# JOHN DEERE RATE CONTROLLER 2000

# SINGLE LIQUID with SECTION CONTROL

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|---|---|
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| REVISION DATE | 25/11/2024 |

# Overview

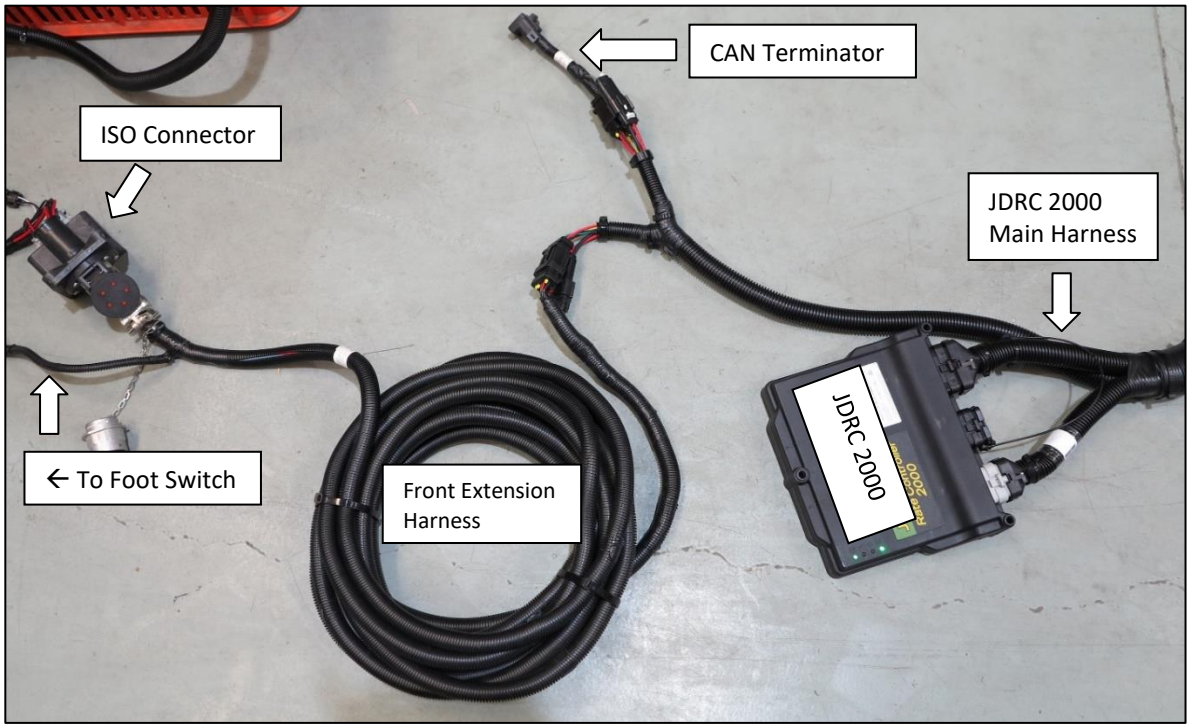
This document provides instructions for setting up a Liquid Systems (SA) Rate Control Module with a John Deere Greenstar Display using a John Deere Rate Controller 2000 (JDRC 2000). The scenario covers setup of a single liquid system with section control where it is the one and only product being controlled by the JDRC 2000.

This document should be read in conjunction with JDRC 2000 Operator's Manual.

# Configuration Prerequisites

Before the liquid system can be configured in the Greenstar Display (2630 or newer), the following steps need to be completed.

- Physical installation of Liquid Systems (SA) Rate Control module including tank plumbing.
- Installation and connection of JDRC 2000 to the Greenstar Display with Front Extension Harness and Foot Switch – see photo below.
- Installation of Height Switch on planting implement if required.



# Physical Connection to Liquid Systems module

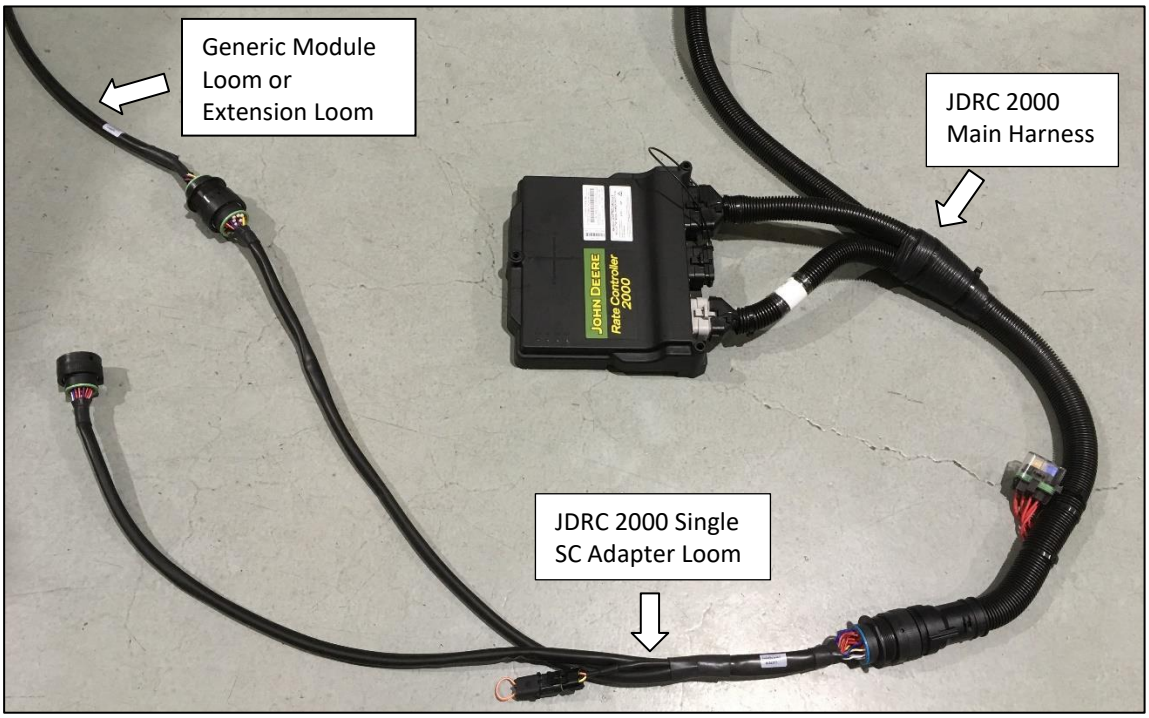
Connect Liquid Systems (SA) module to the JDRC 2000 with wiring looms supplied.
Liquid Systems (SA) looms available for single liquid set up with section control are:

| Part No. | Name | | Description |
|---|---|---|---|
| LL07019 | JDRC2000 Single SC Adapter Loom (47 pin) |  | Adapter that connects to 47 pin connector on JDRC 2000 Main Harness. |
| LL07072 | Generic Module Loom (5m) |  | Connects to individual device connectors on LQS pump module.<br><br>Connects to LL07019 Adapter Loom via 23 pin circular connector. |
| LL07079<br><br>or<br><br>LL07080<br><br>Or<br><br>LL07082 | Section Loom (12 Section, 6m)<br><br>Section Loom (6 Section, 6m)<br><br>Section Loom (8 Section, 6m) |  | Connects to individual section valve connectors on LQS section module.<br><br>Connects to LL07019 Adapter Loom via 20 pin circular connector. |
| LL07014 (optional)<br><br>or<br><br>LL07021 (optional) | Section Loom Extension (12 Section, 6m)<br><br>Section Loom Extension (12 Section, 12m) |  | Extensions of Section Loom for when additional length is required from LQS section module to JDRC 2000. |
| LL07015 (optional)<br><br>or<br><br>LL07020 (optional) | Generic Module Loom Extension (6m)<br><br>Generic Module Loom Extension (12m) |  | Extensions of Generic Module Loom for when additional length is required from LQS pump module to JDRC 2000. |

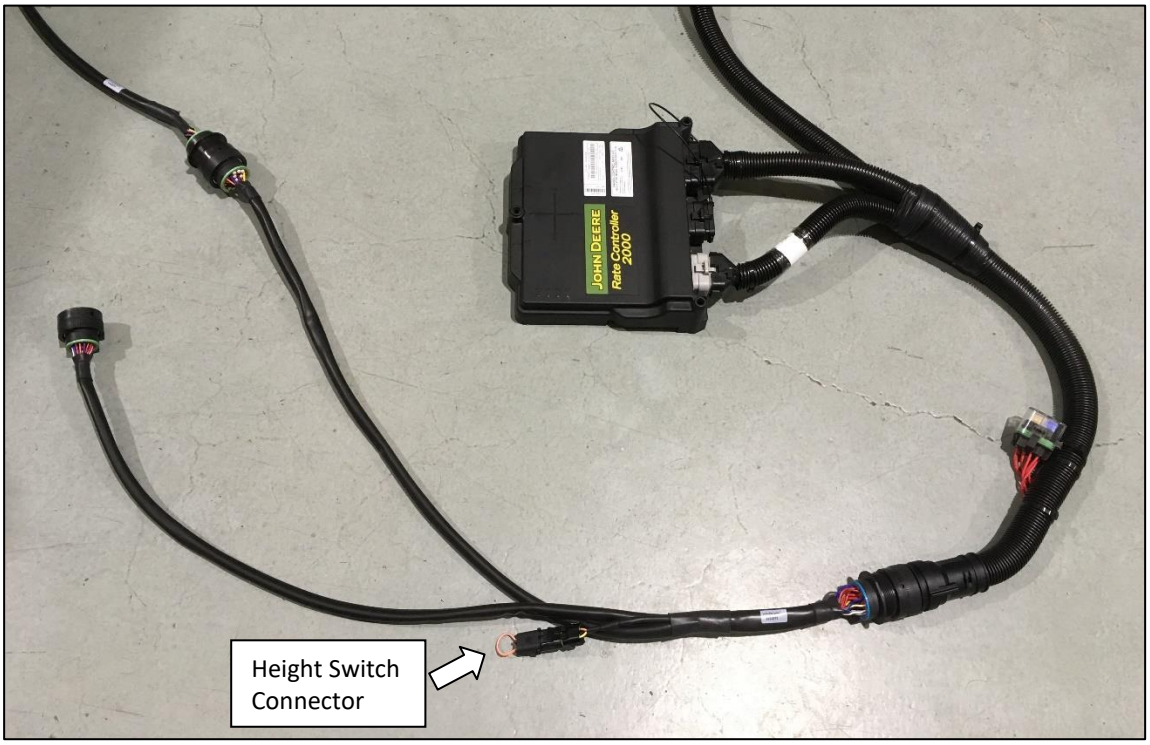
1. Connect Generic Module Loom (LL07072) to device connector on Liquid Systems (SA) module, ensuring connector is securely clipped in.

2. Connect and route Extension Loom (LL07015 or LL07020) to reach JDRC 2000 if required for the routing distance.

3. Connect JDRC 2000 Single SC Adapter Loom (LL07019) to the Generic Module Loom (or Extension Loom if installed) and to the JDRC 2000 Main Harness.




4. If installed connect Height Switch to height switch input on Adapter Loom (LL07019).

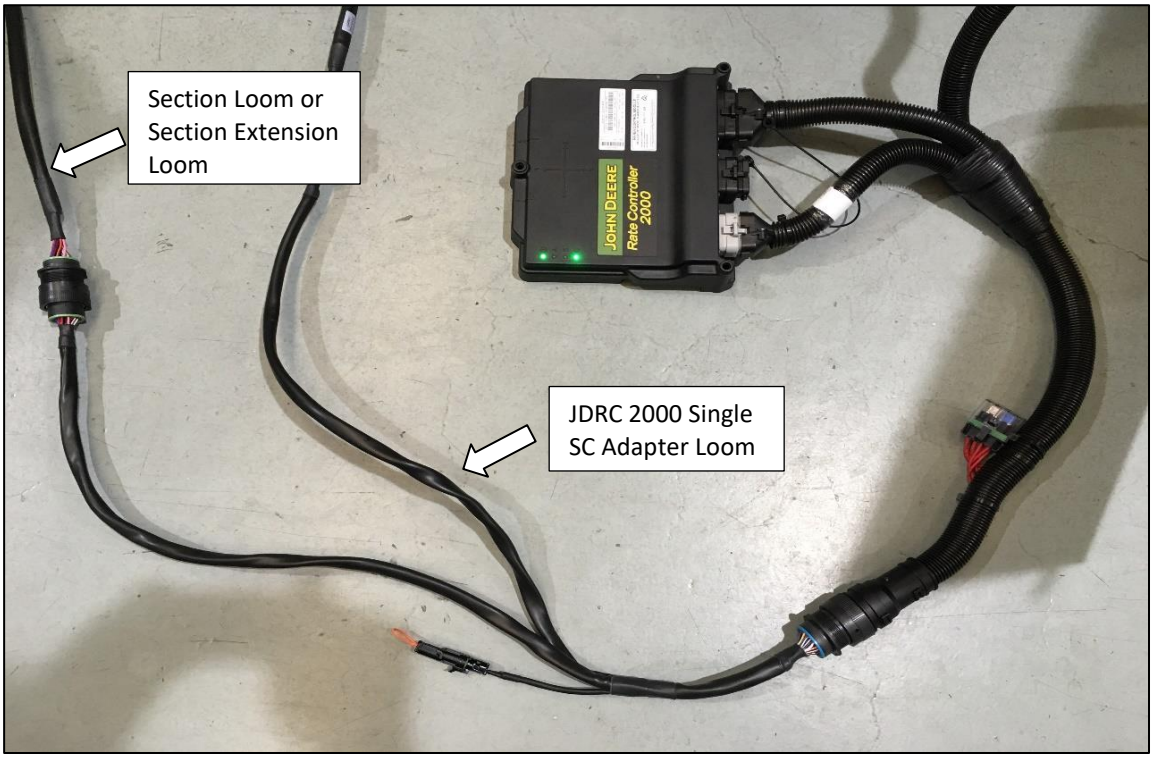



5. Connect Section Loom (LL07079 or LL07080 or LL07082) to individual connectors on the Liquid Systems (SA) section module. Ensure section valve number matches connector number. e.g. valve No. 1 plugs in to connector No.1. Insert dust plugs into un-used connectors on the Section Loom.

6. Route Section Loom towards JDRC 2000 module.

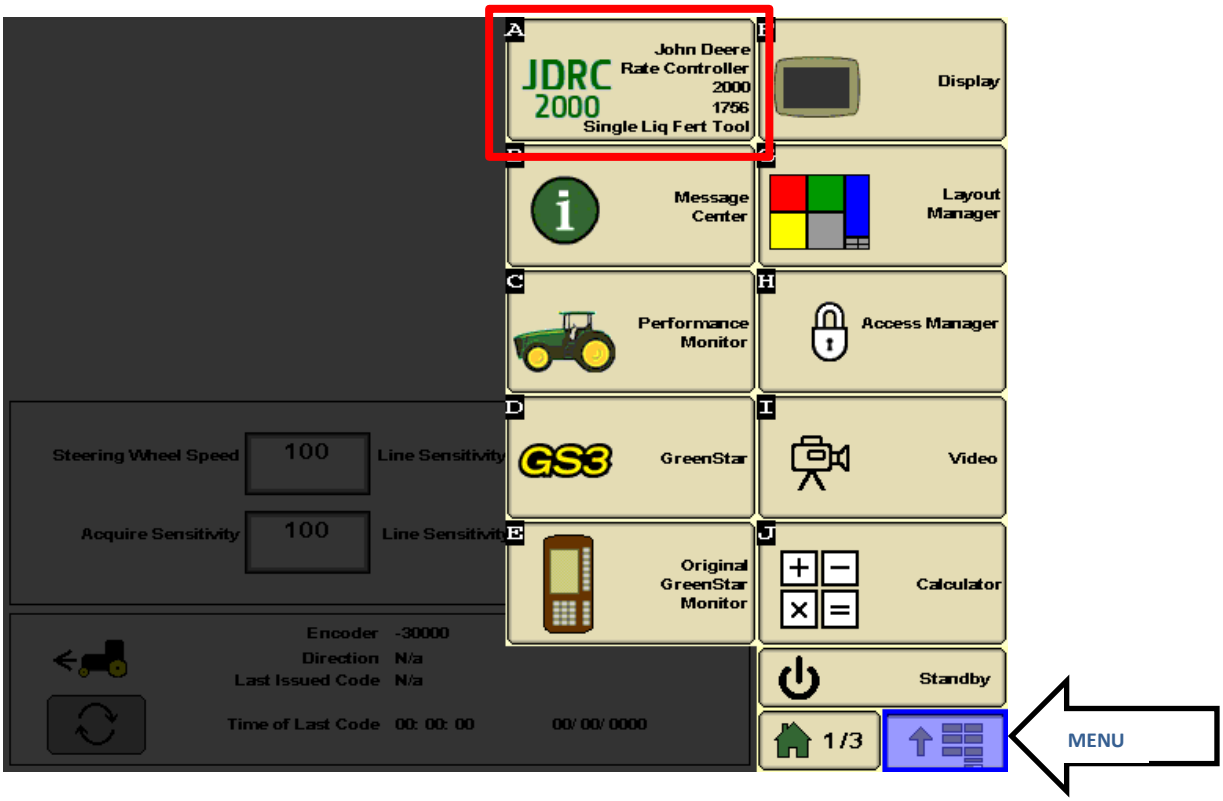
7. Connect and route Section Extension Loom (LL07014 or LL07021) to reach JDRC 2000 if required for the routing distance.

8. Connect JDRC 2000 Single SC Adapter (LL07019) to the Section Loom (or Section Extension Loom if installed) and to the JDRC 2000 Main Harness.

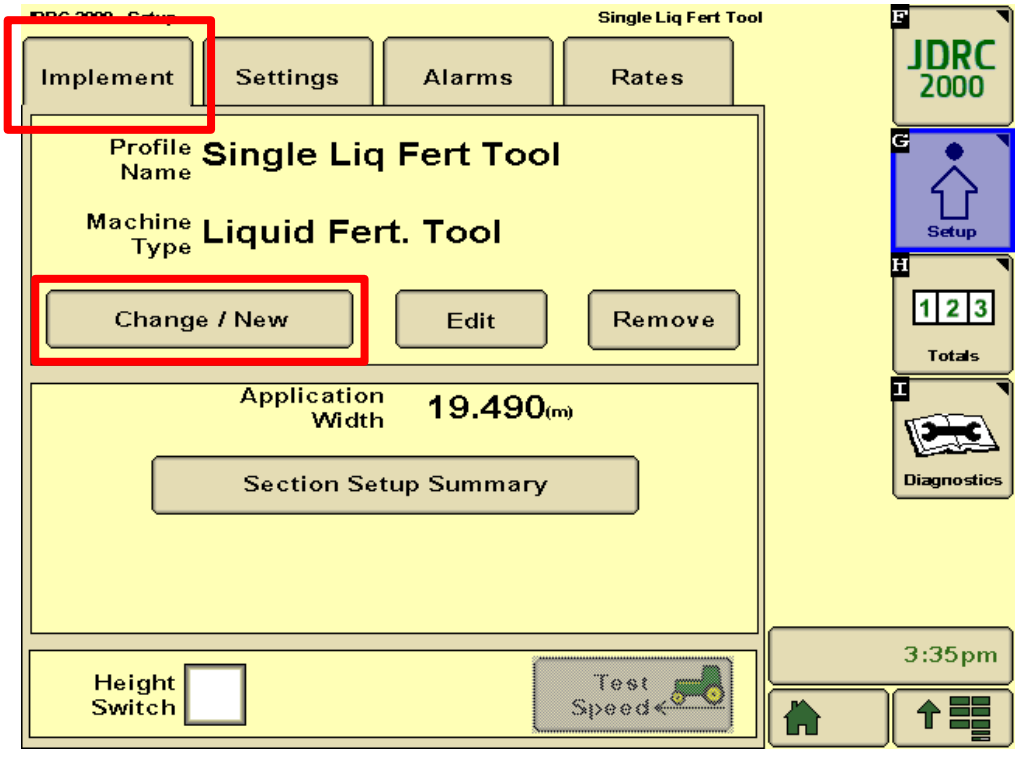


# Rate Controller 2000 Setup

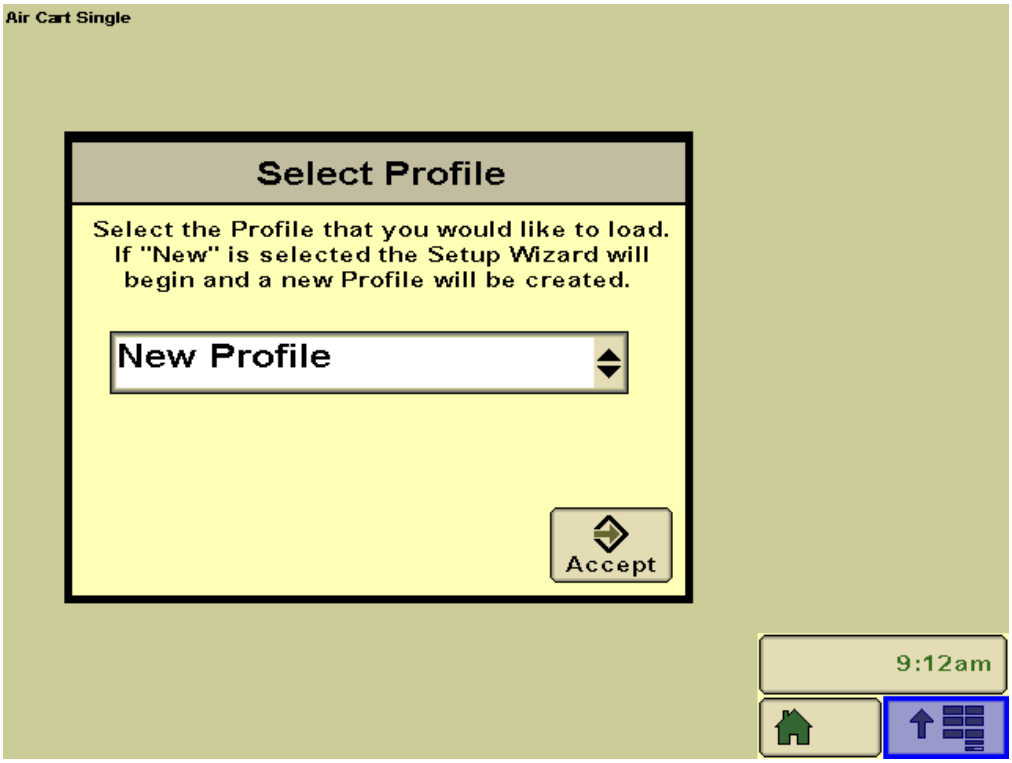
Press **Menu** button & select JDRC2000 button



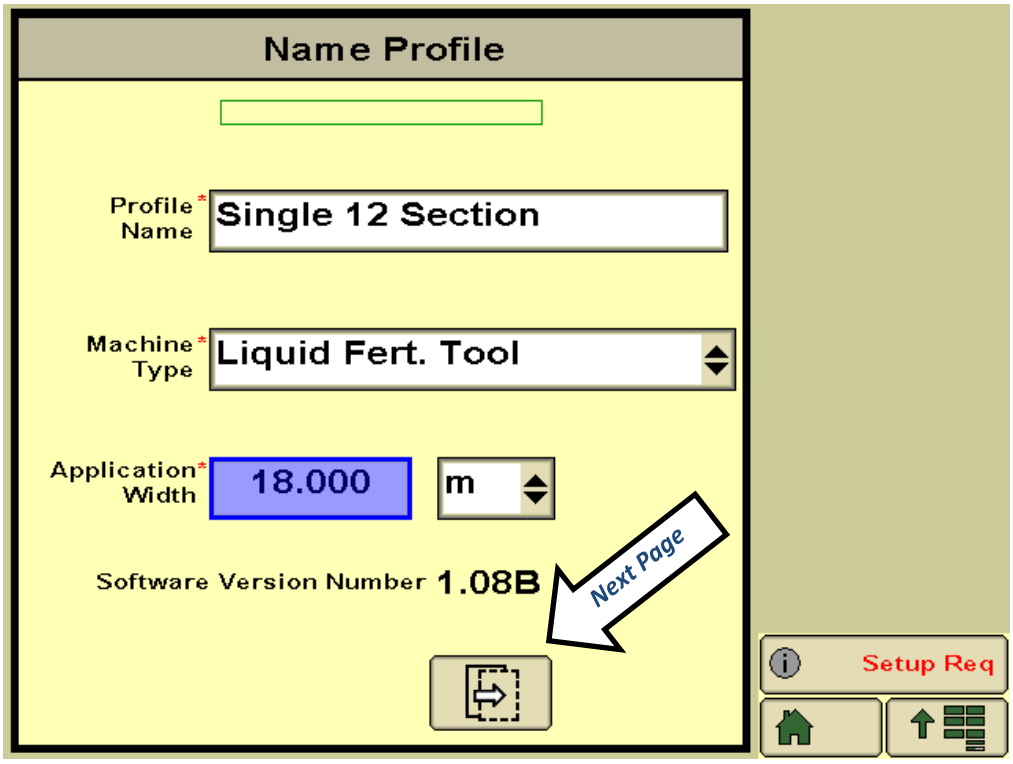

Enter Rate Controller **Setup** and press **Change/New** button on the Implement tab



Select **New Profile** from drop down menu and press **Accept** button.




Assign an appropriate **Profile Name**. Select **Liquid Fert Tool** from Machine Type drop down menu. Enter effective operating width of implement and press **Next Page** button (right arrow).

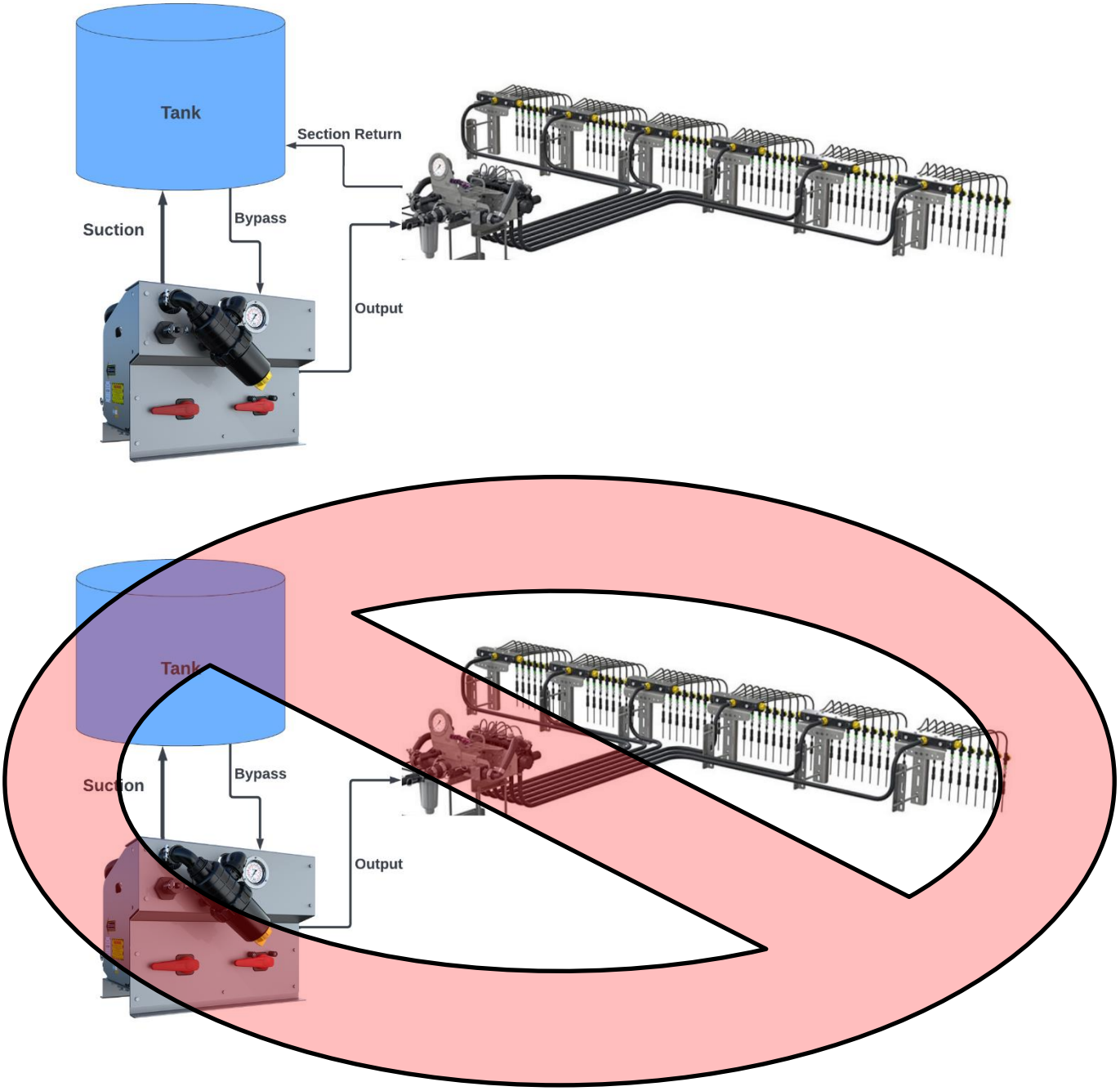


## Constant Flow

The LQS Stacker Section Control Module is designed to operate in both Constant Flow and Hard Shut-off mode. When a section valve is switched off in Constant Flow mode, excess flow is diverted back to tank thus maintaining a constant flow through remaining section valves.

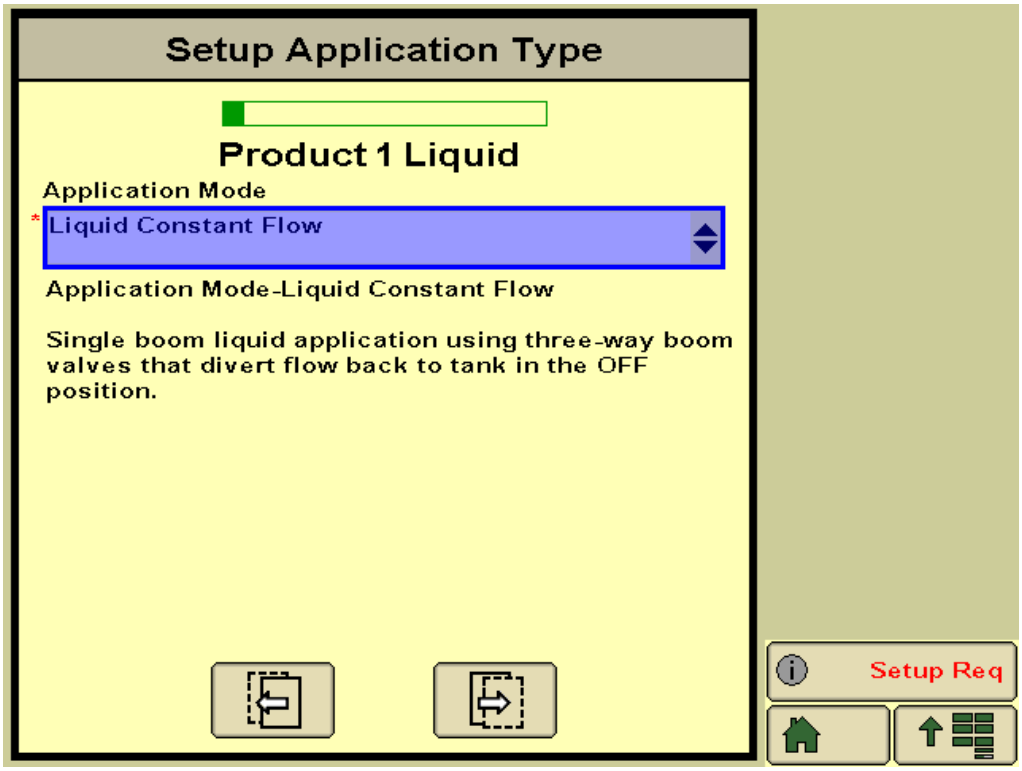
In Hard Shut off mode there is no return line to tank from the section valves. When a section valve is switched off, the control system needs to reduce output from the pump module so flow to remaining open sections remains the same. This is only recommended if a dosing system is installed, and the contaminated product cannot be returned to the tank **or if the RC200 profile is setup as a Generic or Air cart multi product system.**

**Liquid Systems (SA) recommends CONSTANT FLOW mode for better rate control.**

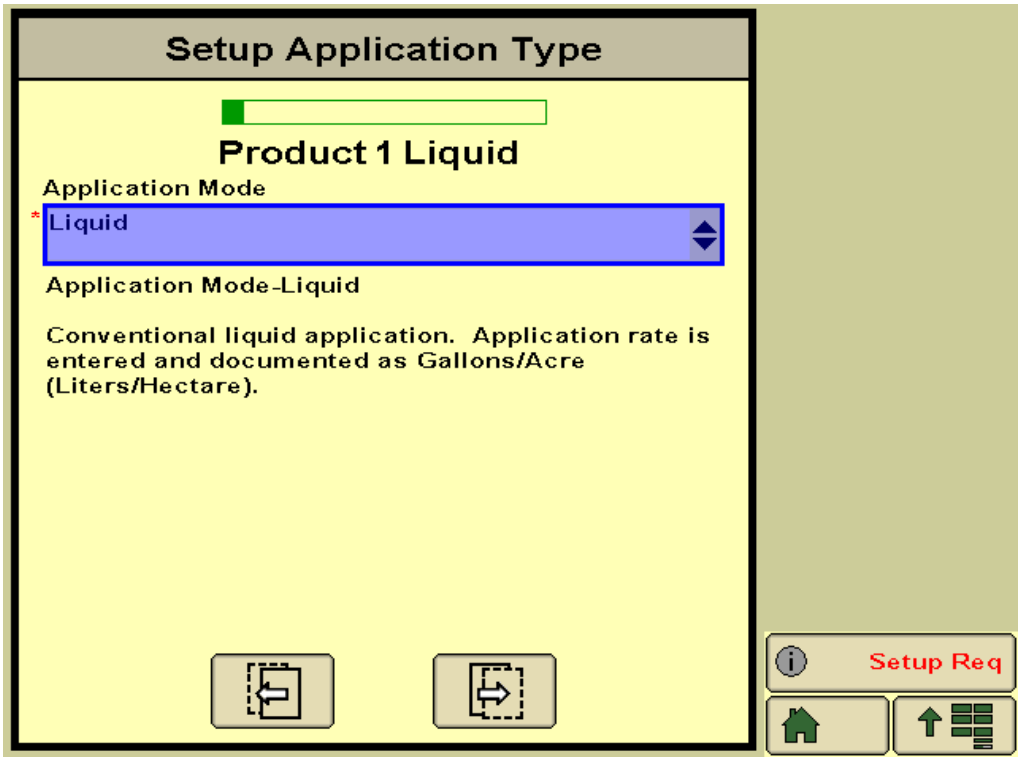


Select appropriate section control mode from Application Mode drop down menu.

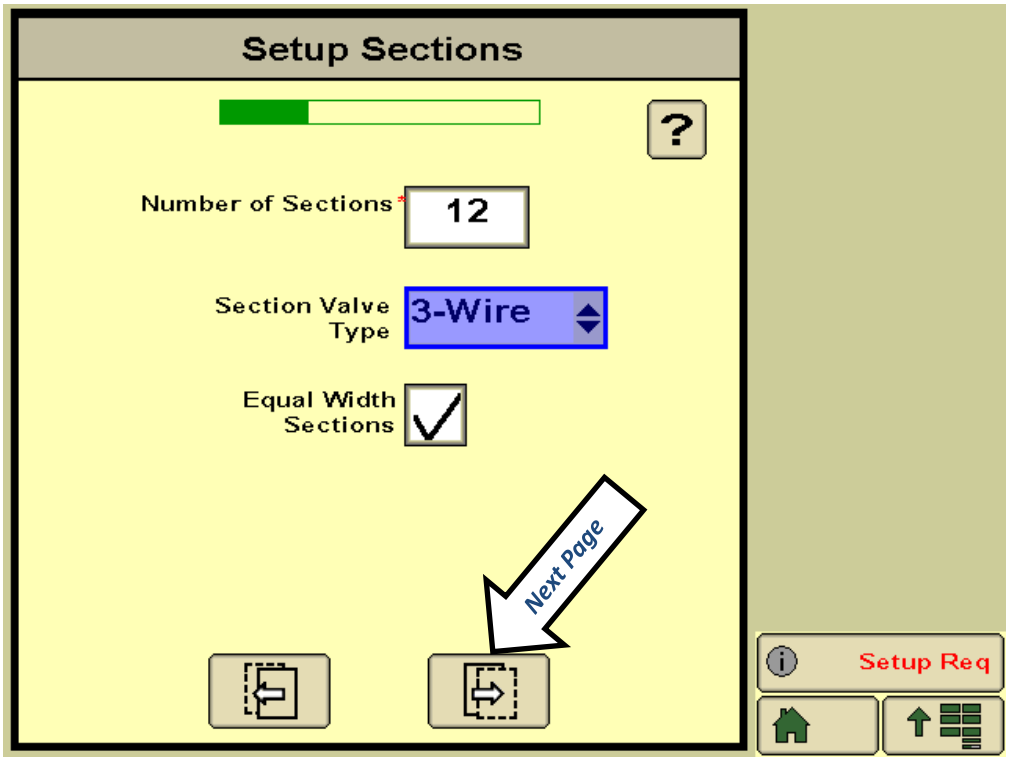
**Liquid Constant Flow** for Constant Flow Mode or



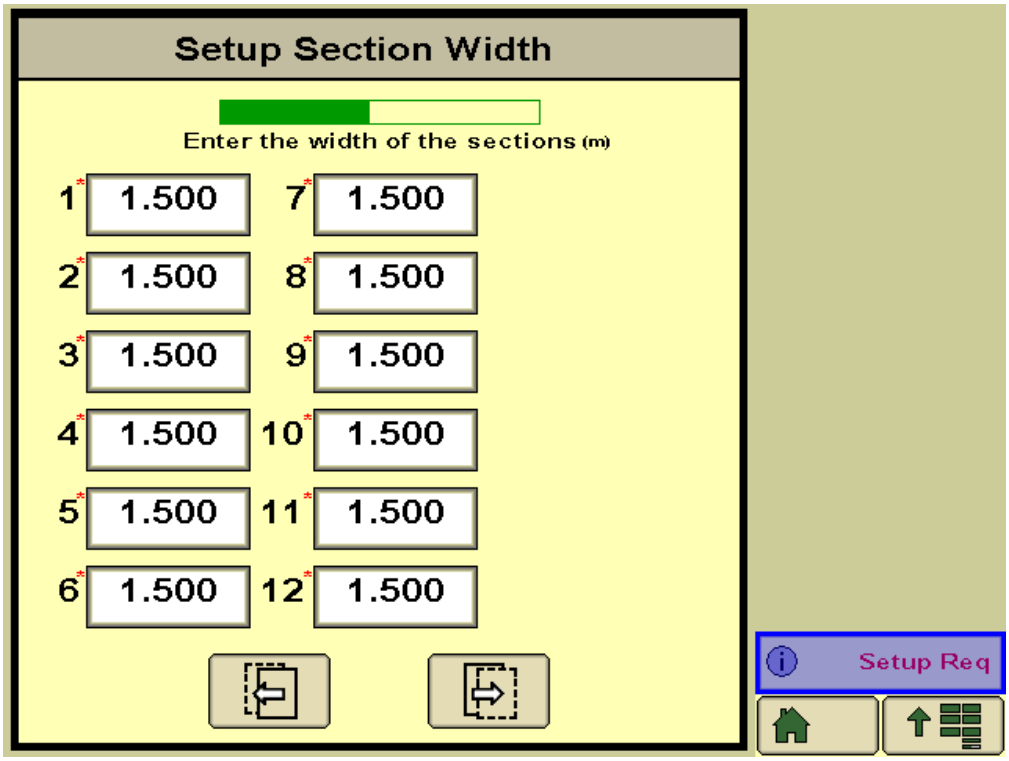

**Liquid** for Hard Shutoff mode. Press **Next Page** button (right arrow).



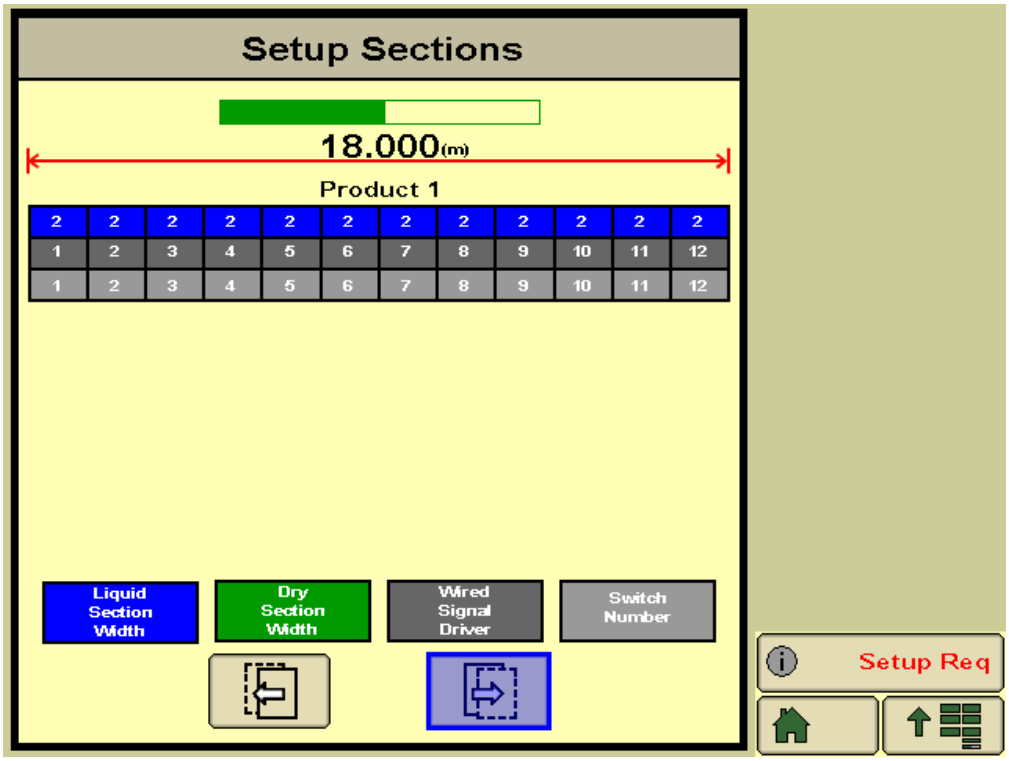
Enter Number of Sections. Select **3-Wire** for Section Valve Type. Tick Equal Width Sections. Press **Next Page** button (right arrow). If required, press **Previous Page** button (left arrow) to go back and re-enter data.



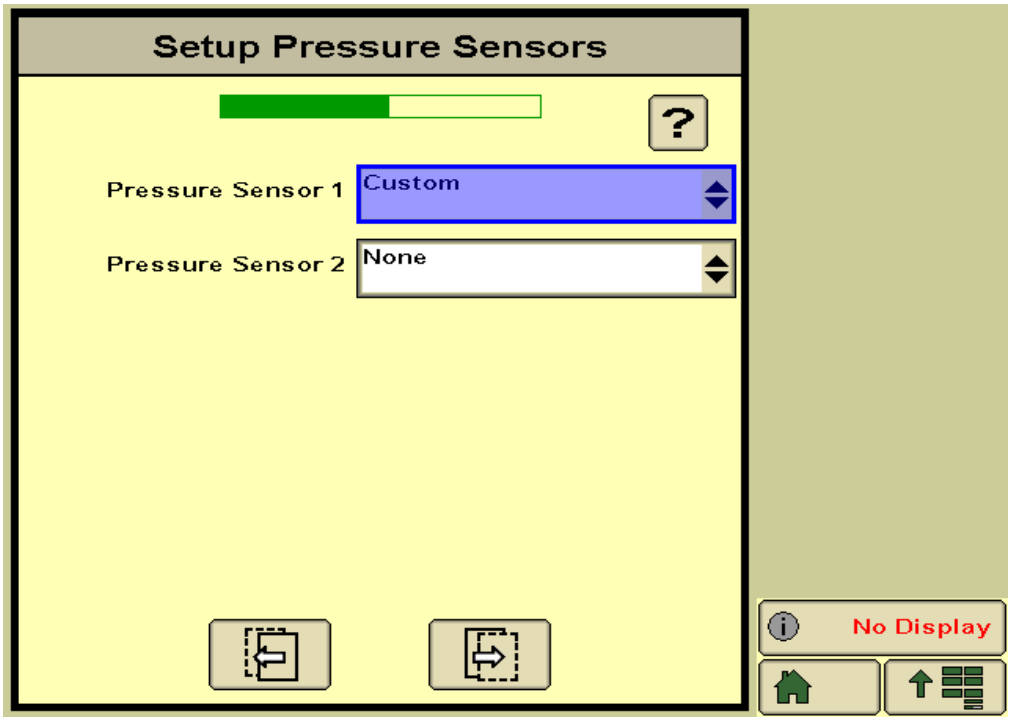

Enter the Width of Sections. (widths will be pre-filled if Equal Width Sections was ticked in previous screen)



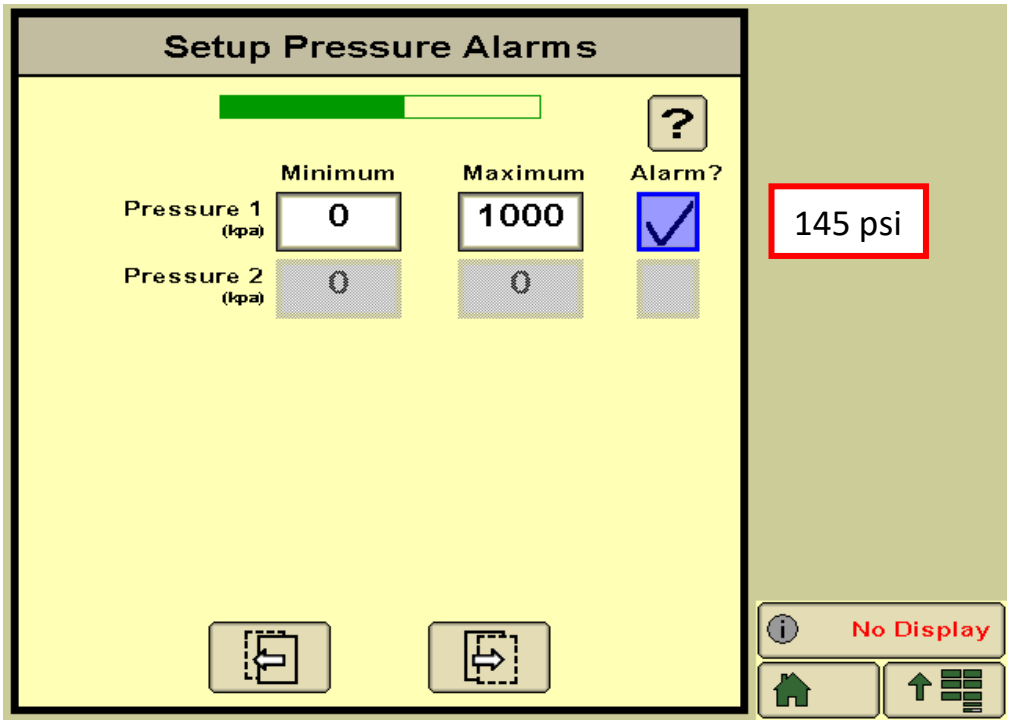
Review section set up data and press **Next Page** button (right arrow).



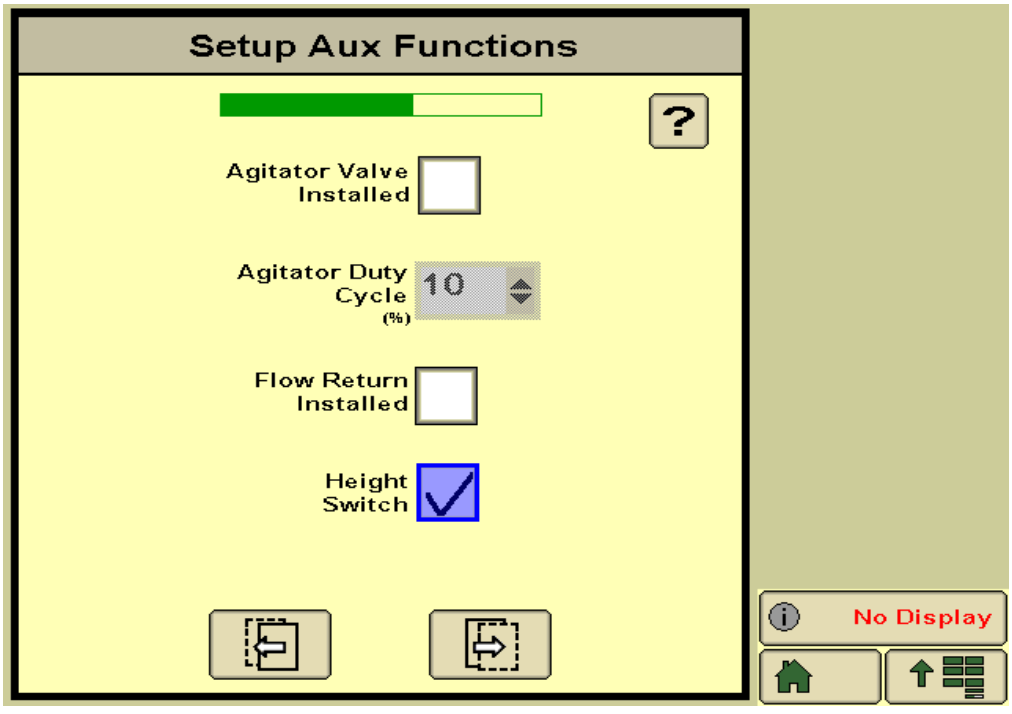

Select **Custom** from Pressure Sensor 1 drop down menu.
Ignore any warnings at this stage.



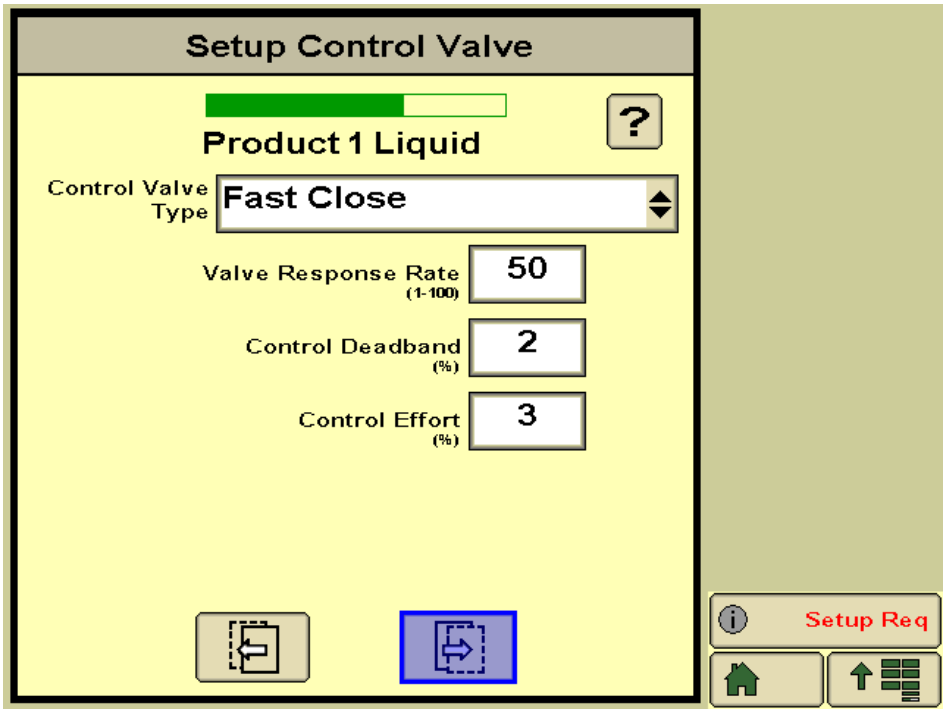
Set Maximum pressure alarm at **1000 kPa** (or 145 psi).




If installed, enable Height Switch and press **Next Page** button.

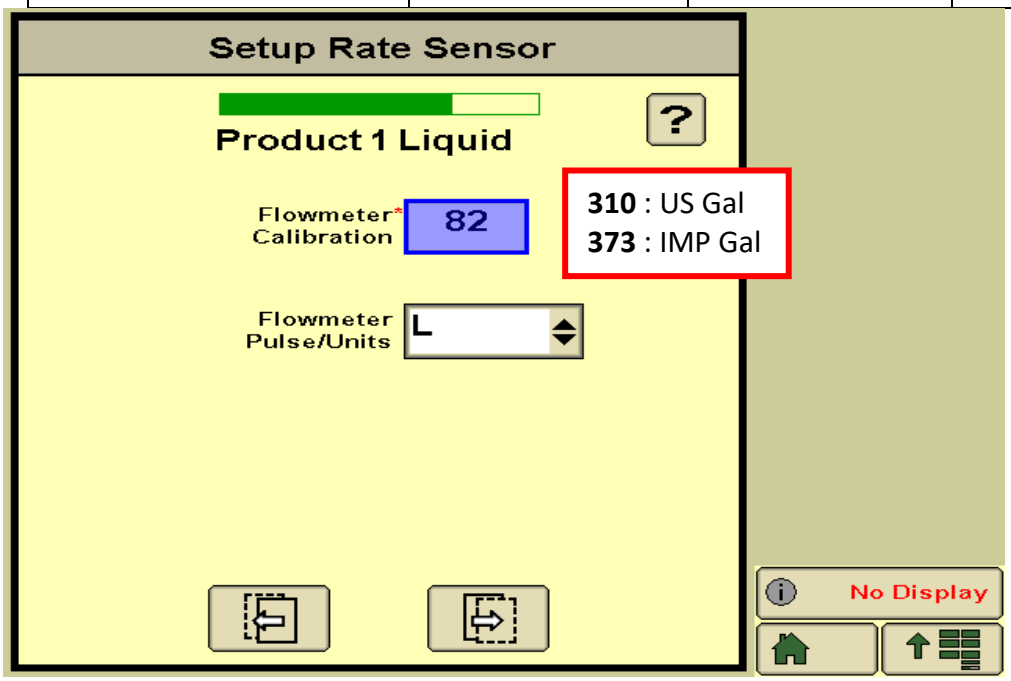


Enter following Control Valve settings as a starting point. If rate control is erratic or slow, these settings can be adjusted later. For **SPIKER** module, enter **Valve Response Rate** of **30**.

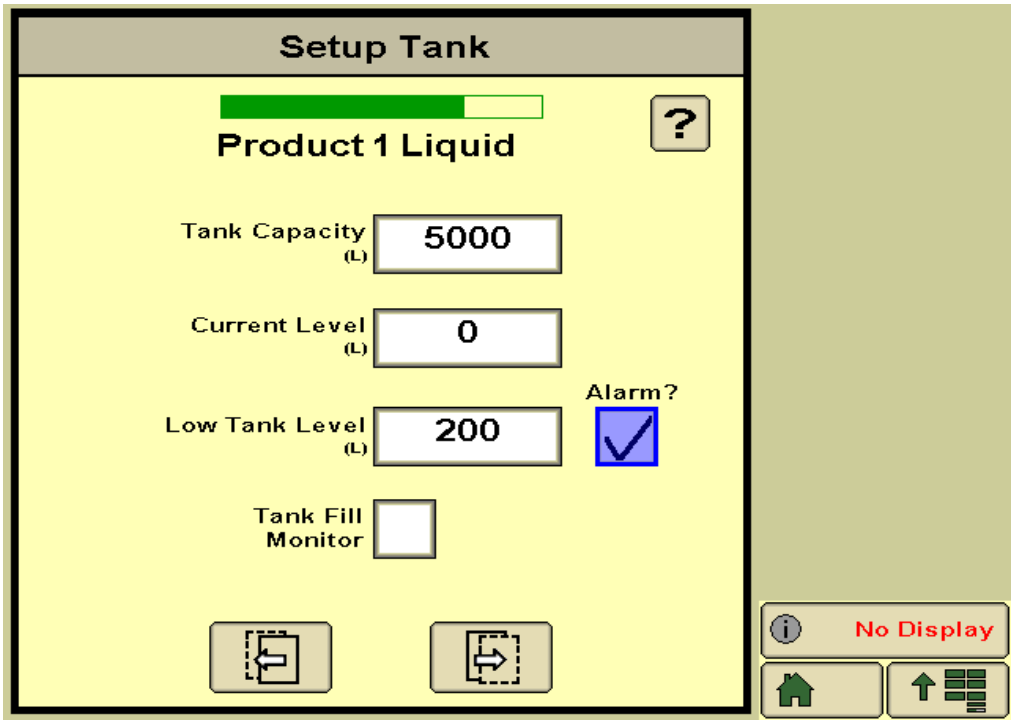



Enter Flowmeter Factory Calibration number as below.

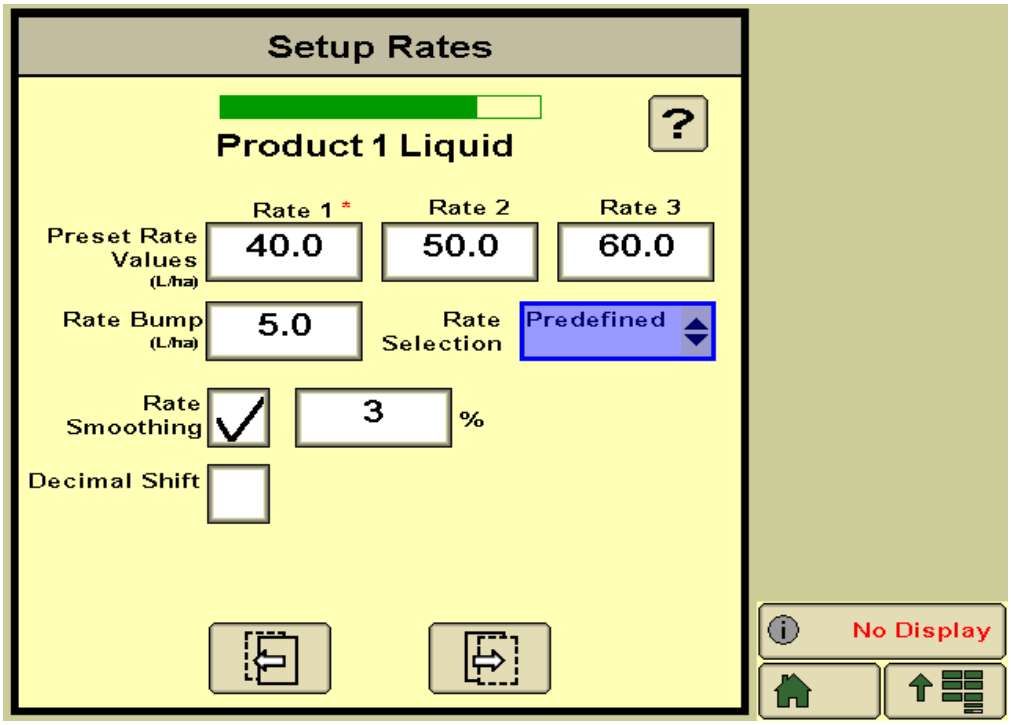
| Flowmeter | Pulses/Litre | Pulses/US Gal | Pulses/IMP Gal |
|---|---|---|---|
| Teejet 801 | 82 | 310 | 373 |
| ARAG Orion 2.5-50L/Min | 1200 | 4542 | 5455 |
| ARAG Orion 1-20L/Min | 3000 | 11355 | 13638 |
| ARAG Orion 0.5-10L/Min | 6000 | 22710 | 27277 |



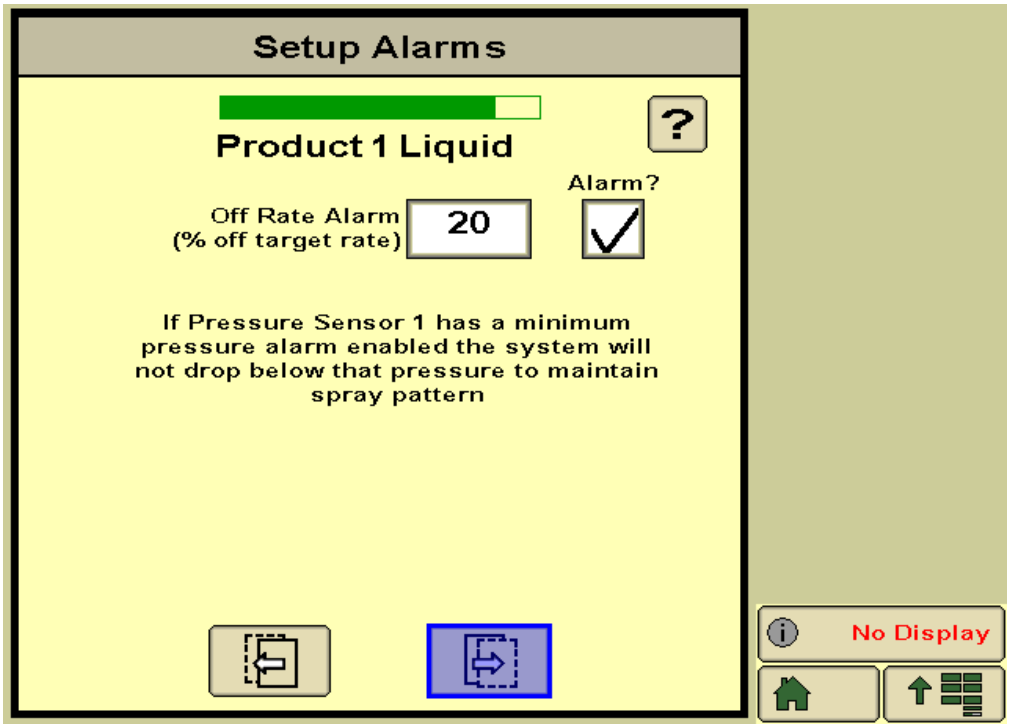

Enter Tank Capacity, Level and Alarms as required.



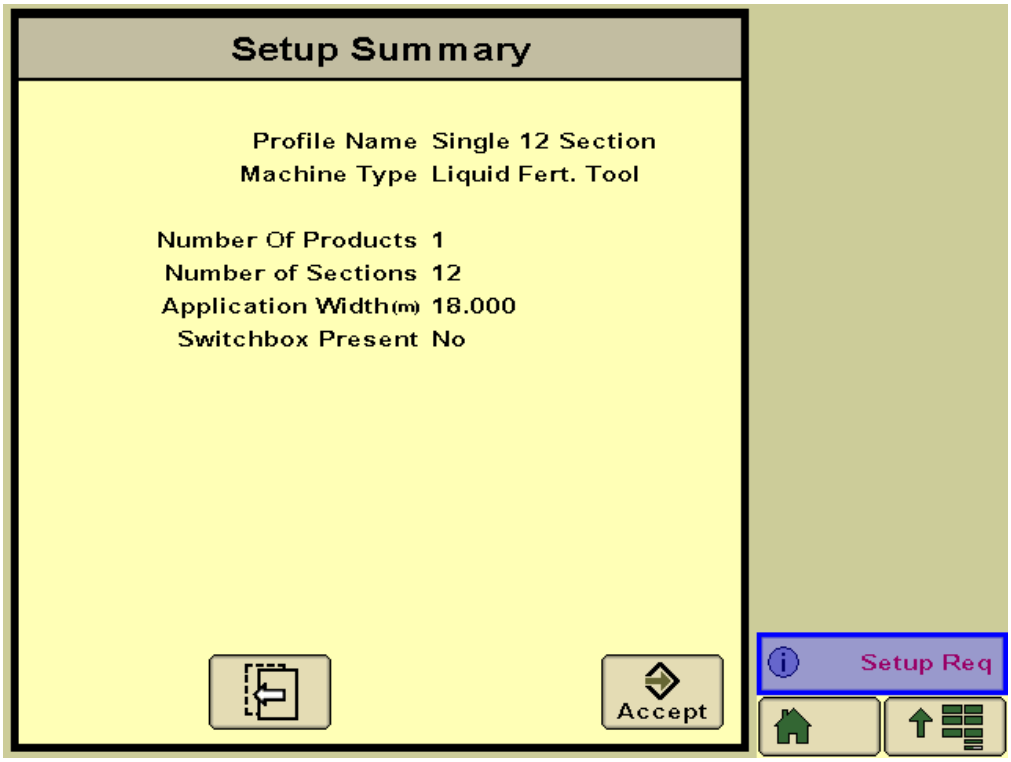

Enter Target Application Rates as required.



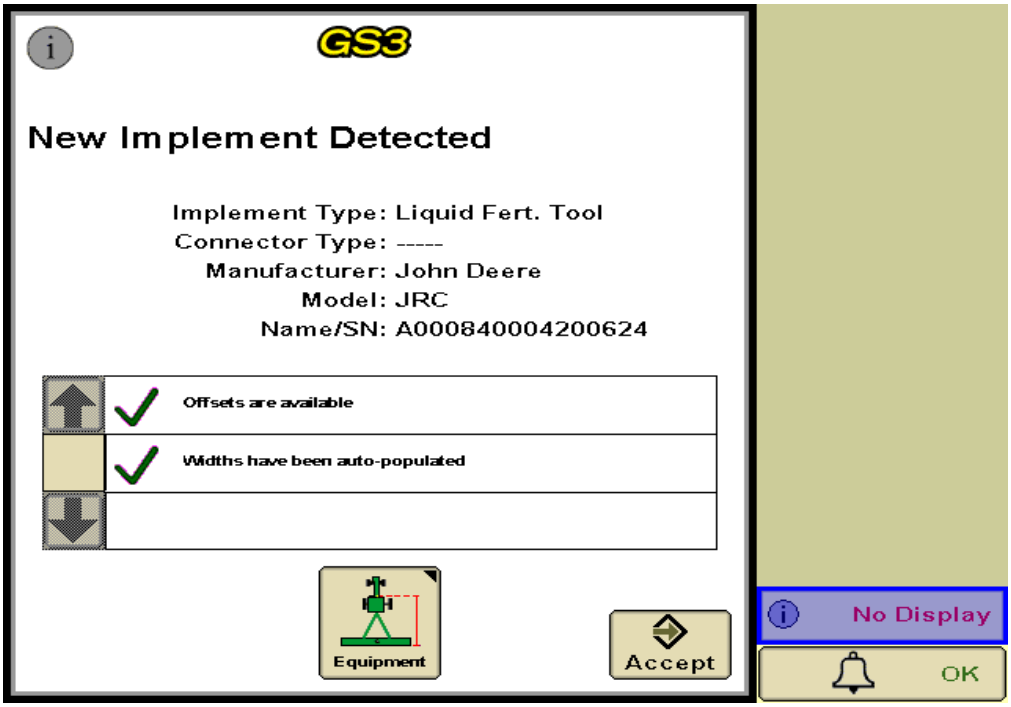

Enter Off Target Rate Alarm as required.



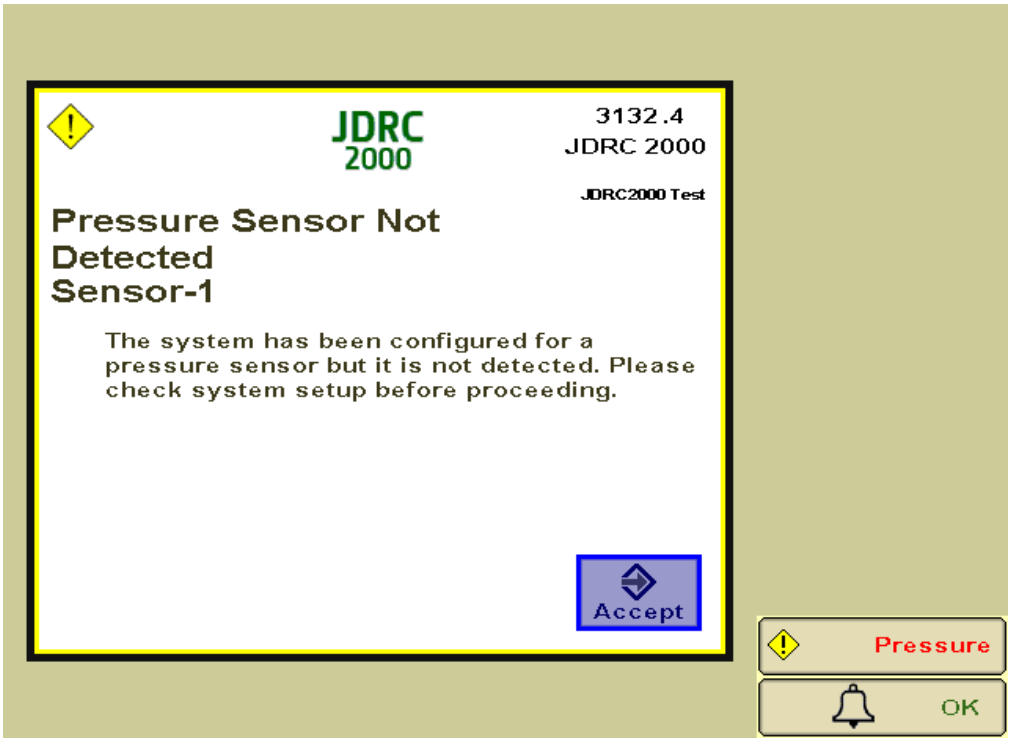

Review Setup summary. Press **Accept** or Previous Page button (left arrow) to edit.



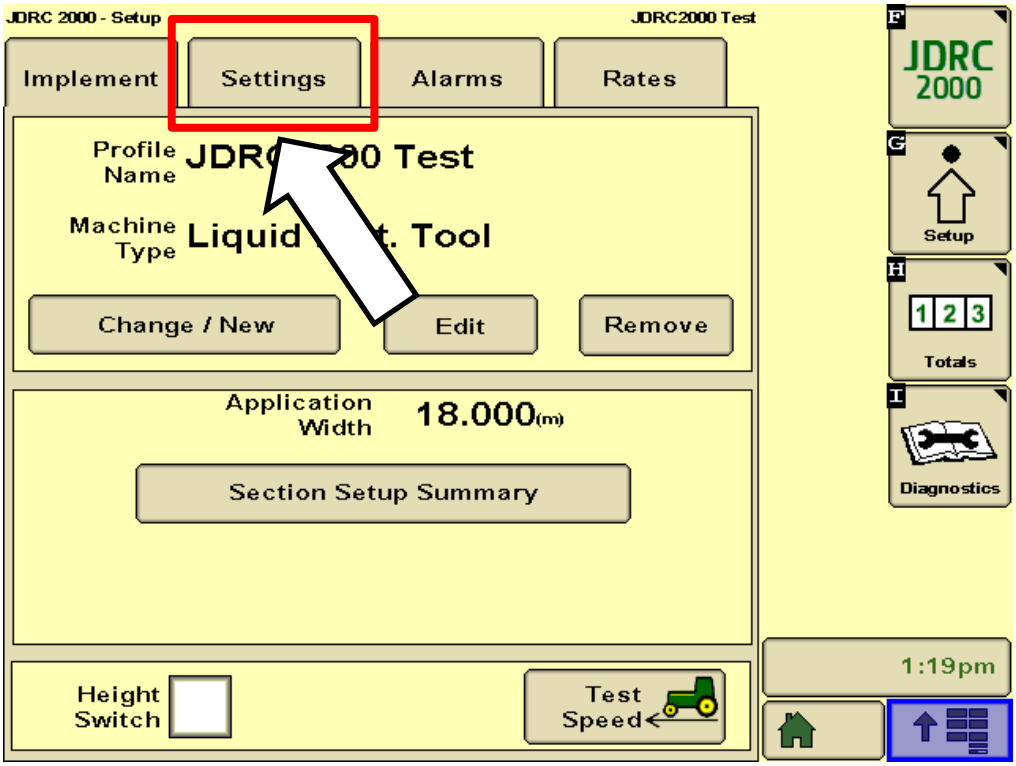

At this stage of set up, following screen will be displayed. Press **Accept**.



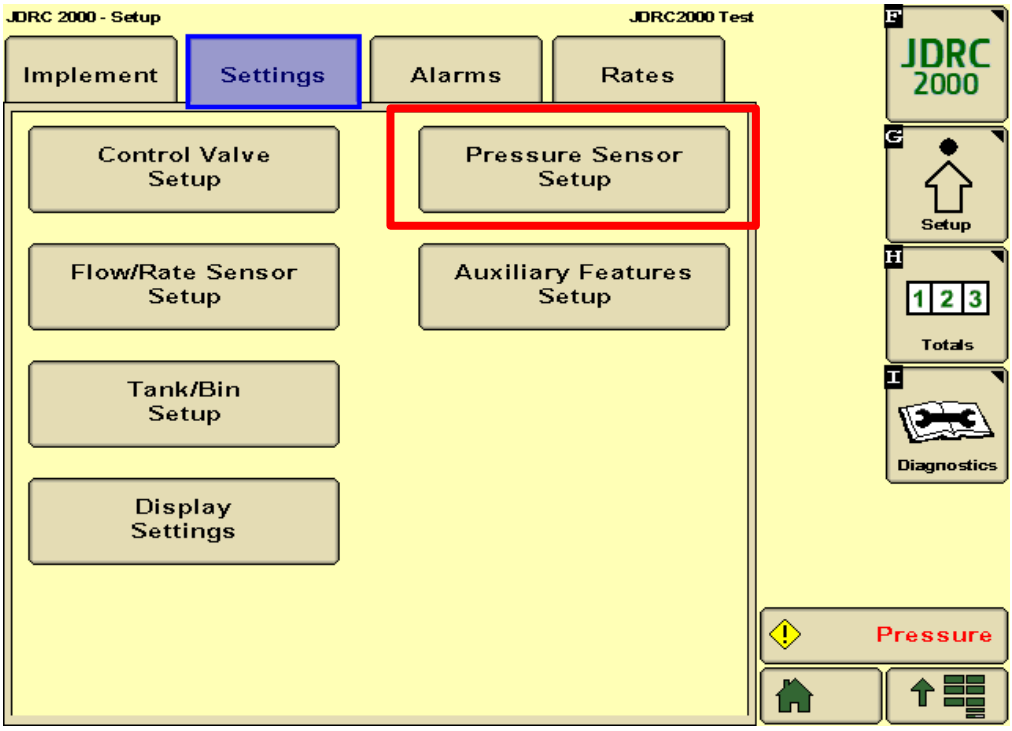

IGNORE THIS WARNING. Press **Accept** to proceed to pressure sensor set up.



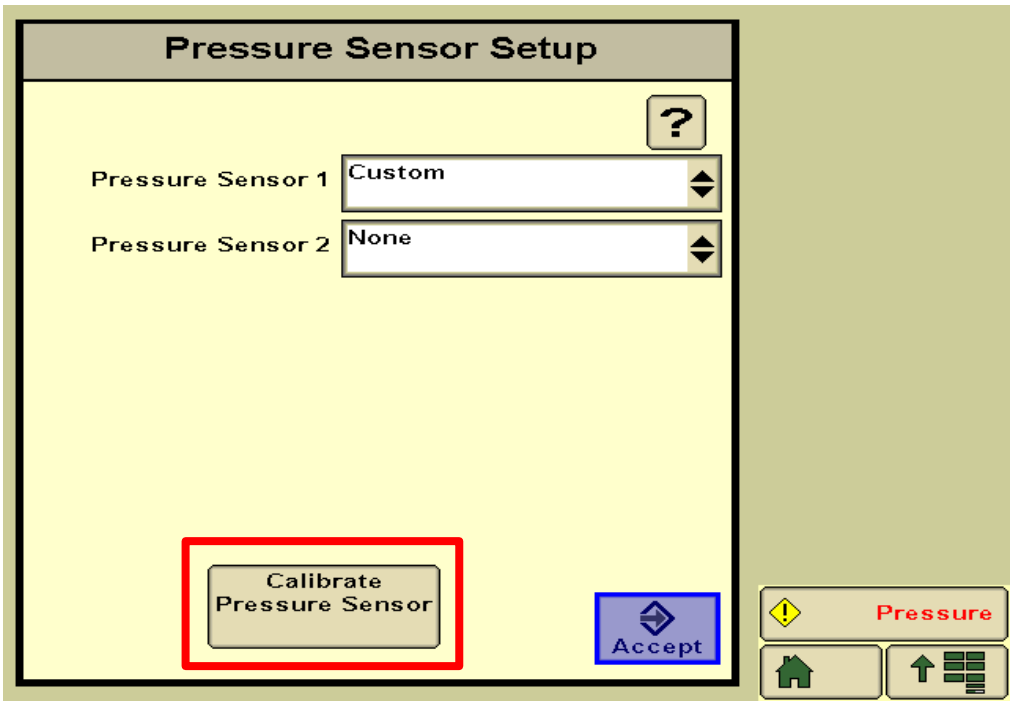

Select **Settings** tab from the Setup screen.



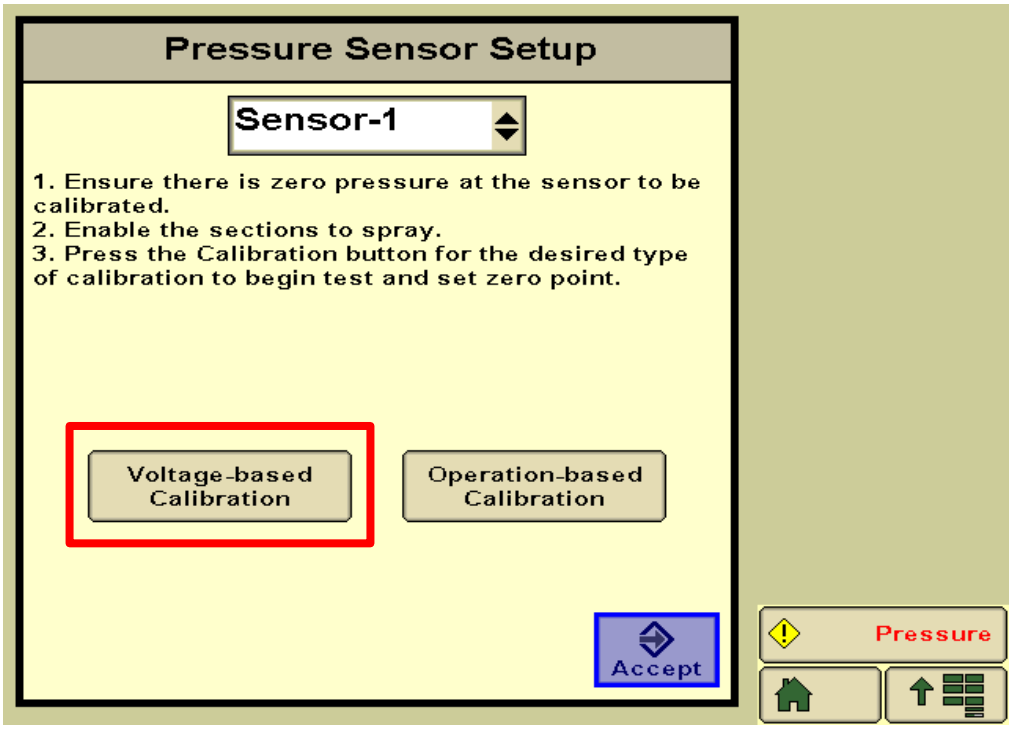

Select **Pressure Sensor Setup.**



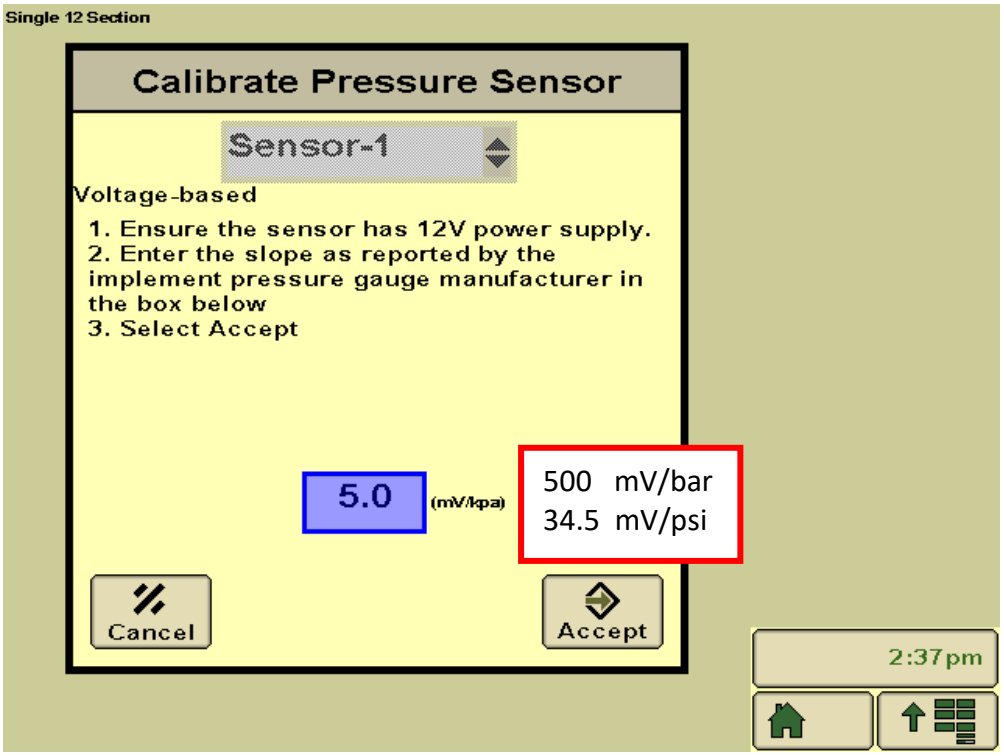

Select **Calibrate Pressure Sensor** and press **Accept**.



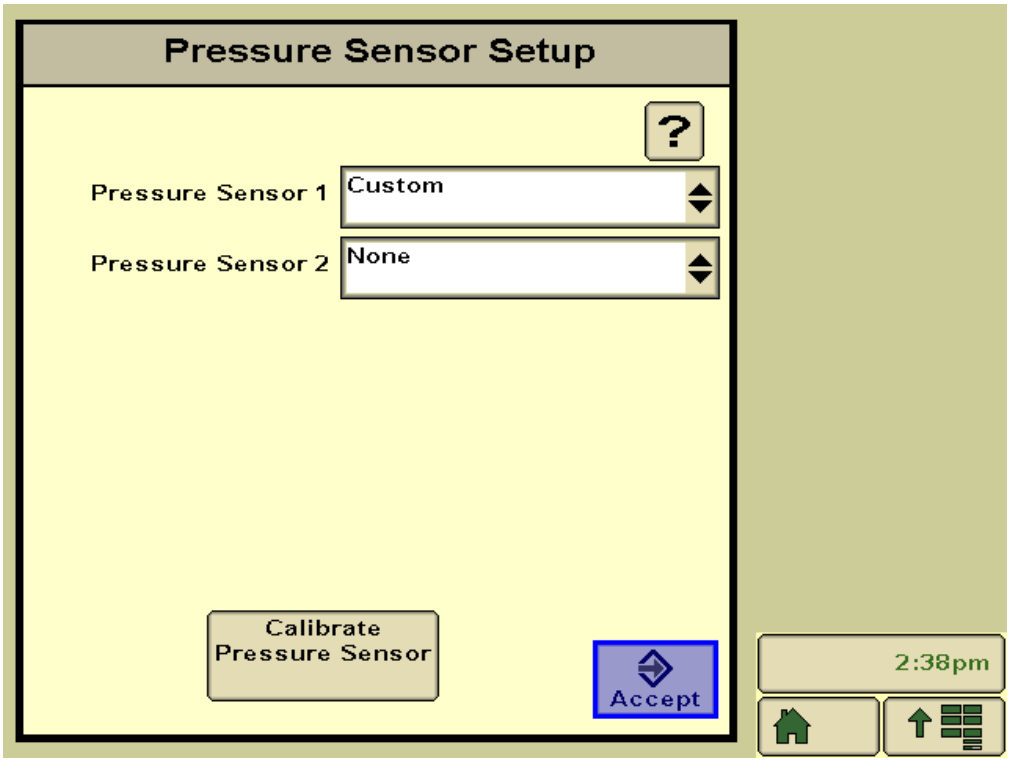

Ensure Master switch is **OFF** (& pump is **NOT** running). Select **Voltage-based Calibration**.




Enter Pressure Sensor Calibration factor 5mV/kPa : 500mV/bar : 34.5mV/psi
Press **Accept**.



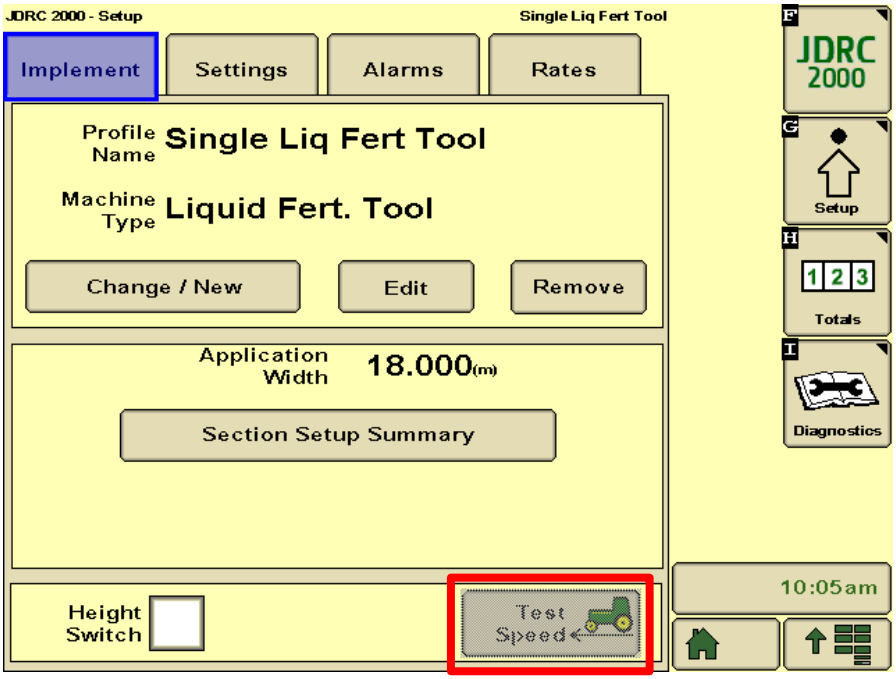

Press **Accept** to save settings and return to the Setup screen.



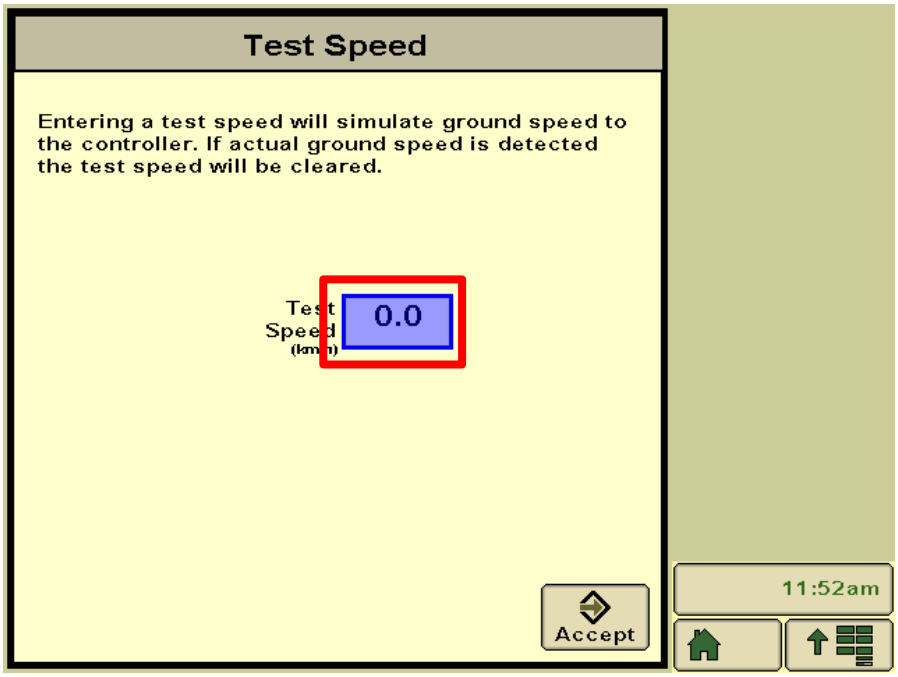
# Section Valve Tuning

For correct application of liquid in **Constant Flow** mode, section valves must be tuned while the module is running using the following procedure.

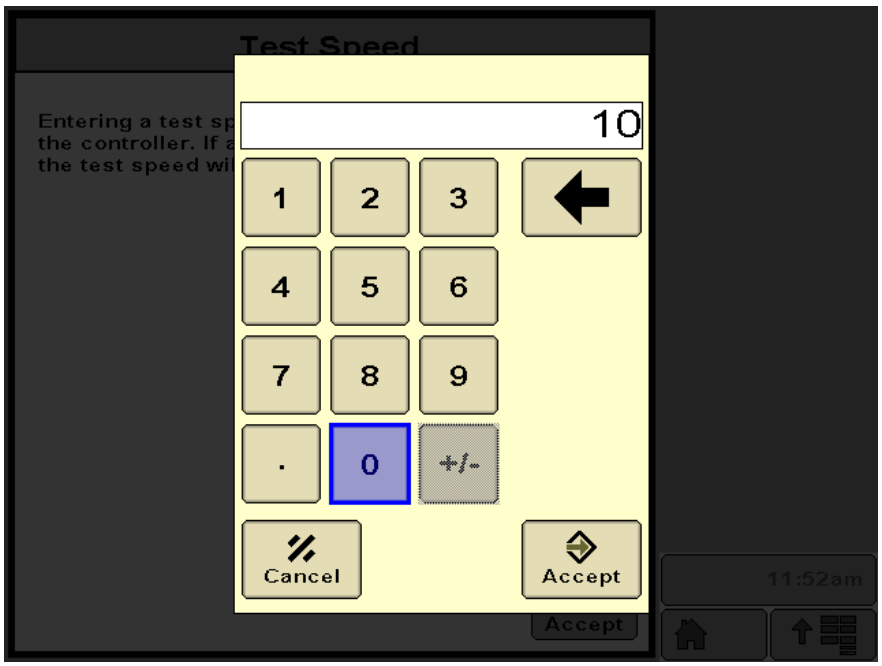
1. Start the pump and press **Test Speed** button on Implement tab of the Setup screen.



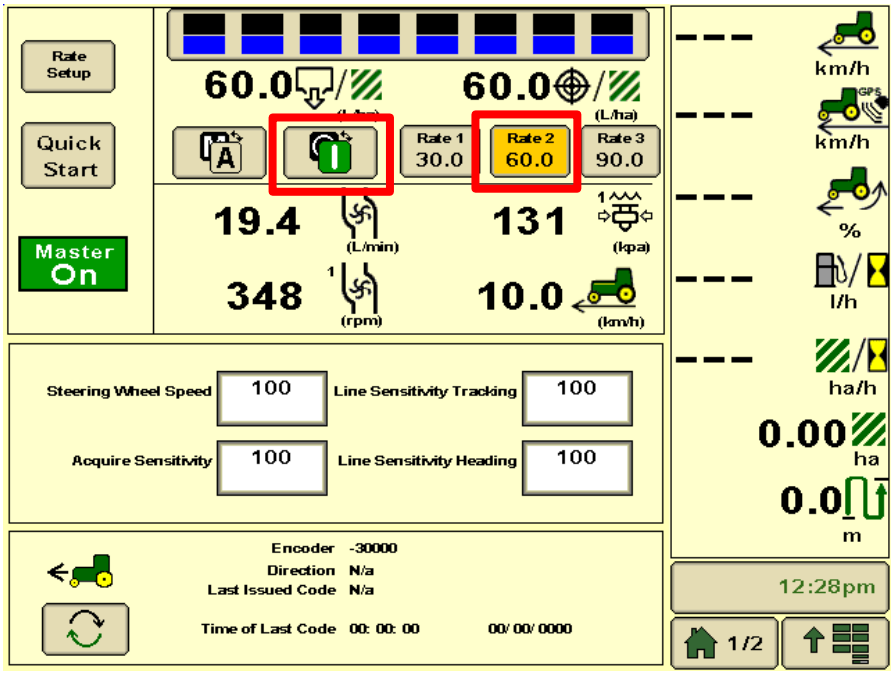

2. Press **Test Speed**.



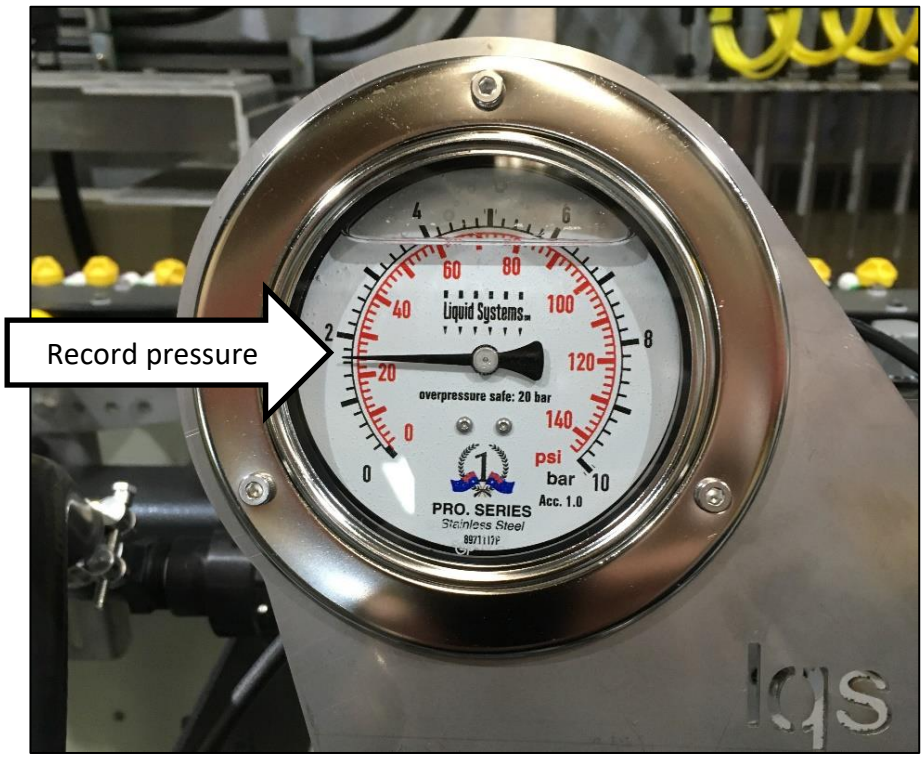
3. Enter a typical operating speed using the virtual keyboard and press Accept.



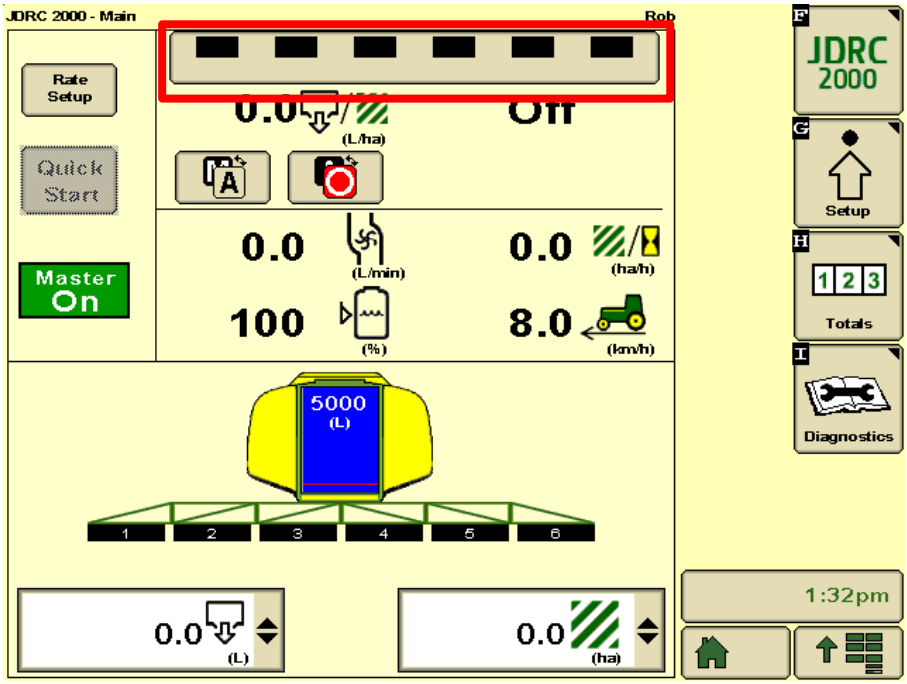

4. Press  icon to go to the JDRC 2000 Run screen. Select a typical application rate and turn the system on using the virtual toggle switch. Ensure all sections are open.



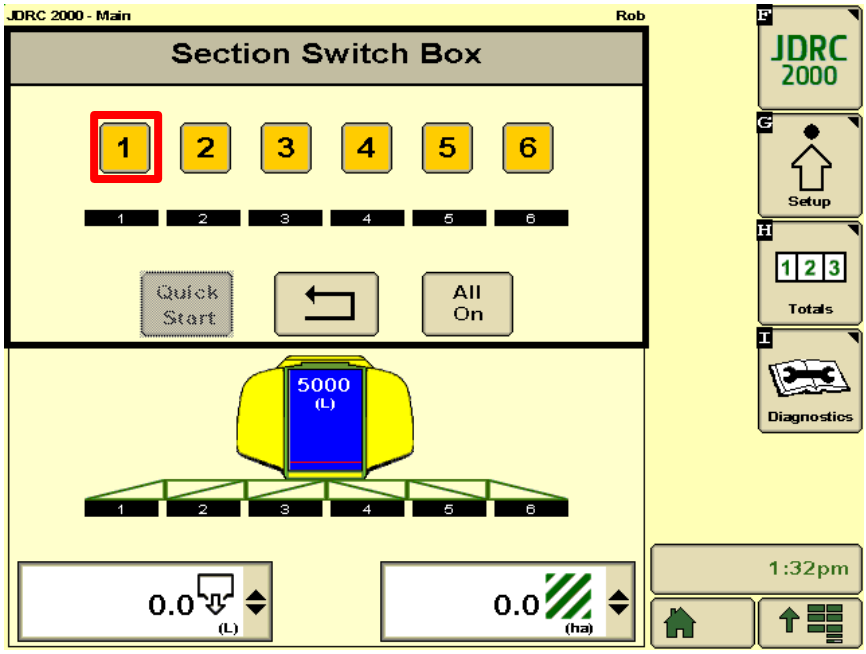
5. Record indicated pressure on the section control module gauge. Taking a photo on a smartphone is an easy way to do this.




6. Select the Section virtual switch bar to display all section switches

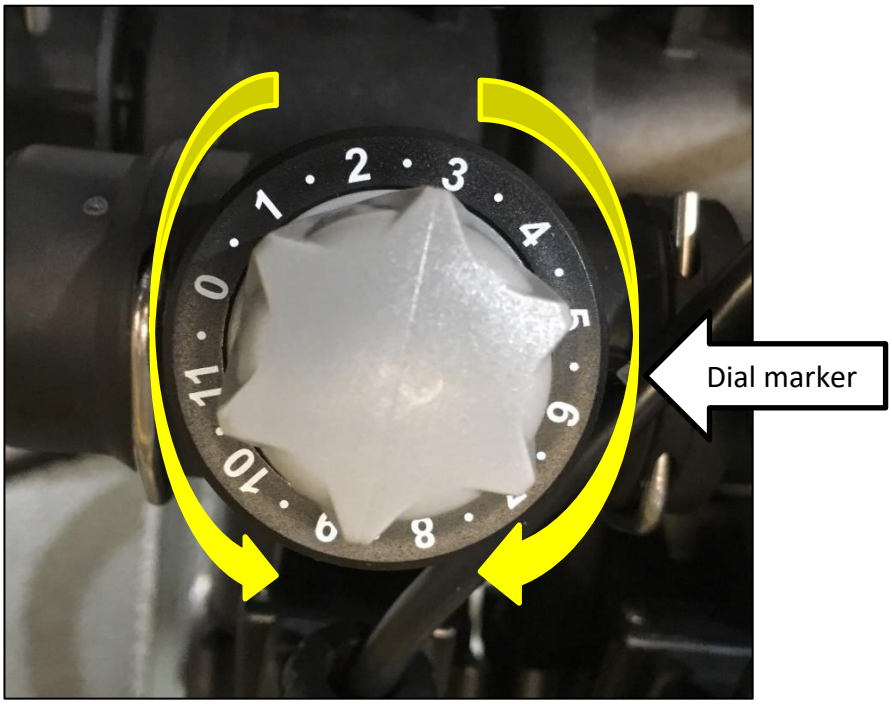



7. Shut off Section 1 and observe any pressure change.




- If pressure has increased, rotate the dial on the valve anti-clockwise until pressure drops to the level recorded in step 5.

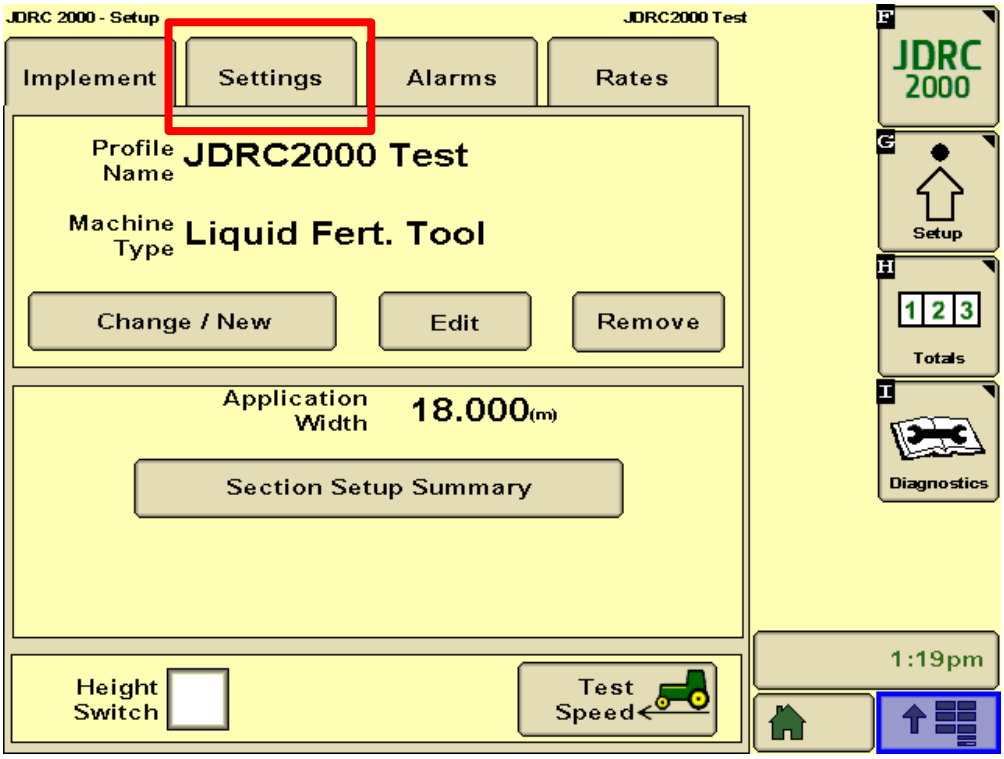
- If pressure has decreased, rotate the dial clockwise until pressure increases to the level recorded in step 5.



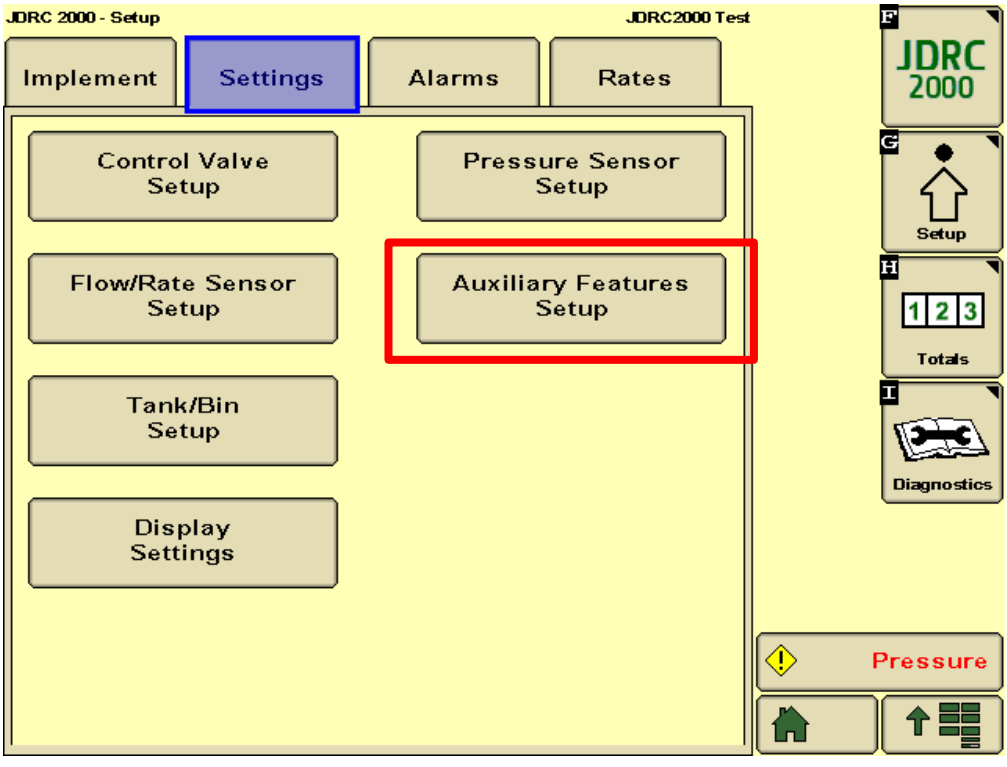

8. Repeat step 7 for remaining valves one at a time. Sections with the same number of outlets will normally end up with the same setting on the dial.

# RPM Sensor Integration

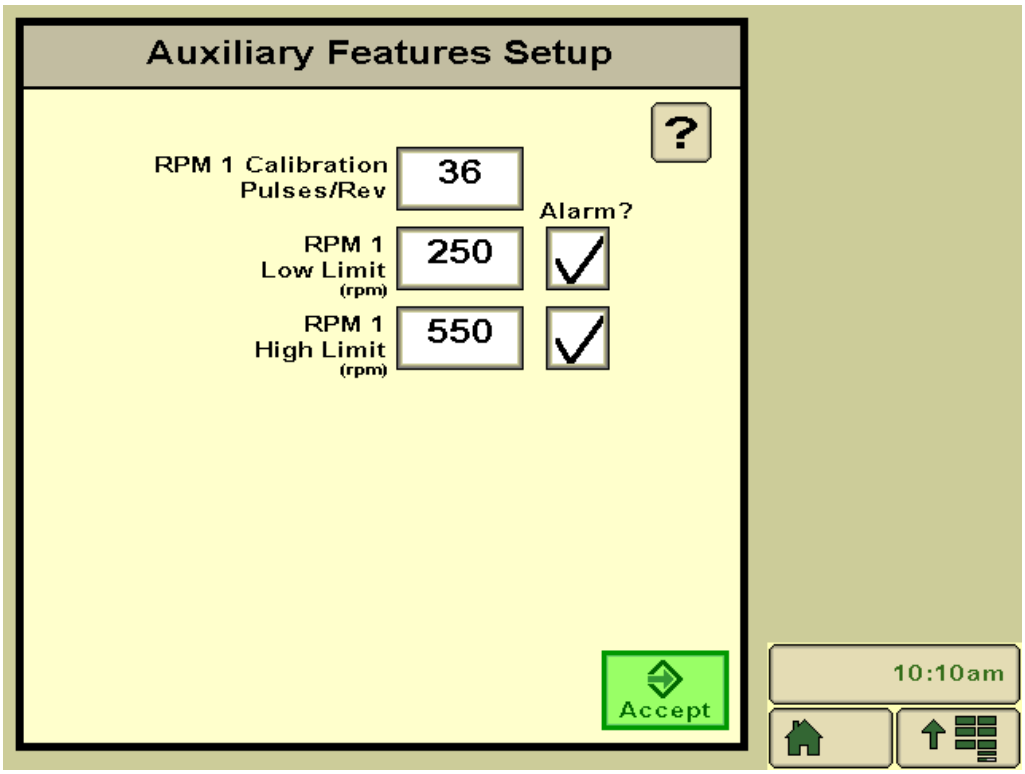
1. Select **Settings** tab from the Setup screen.



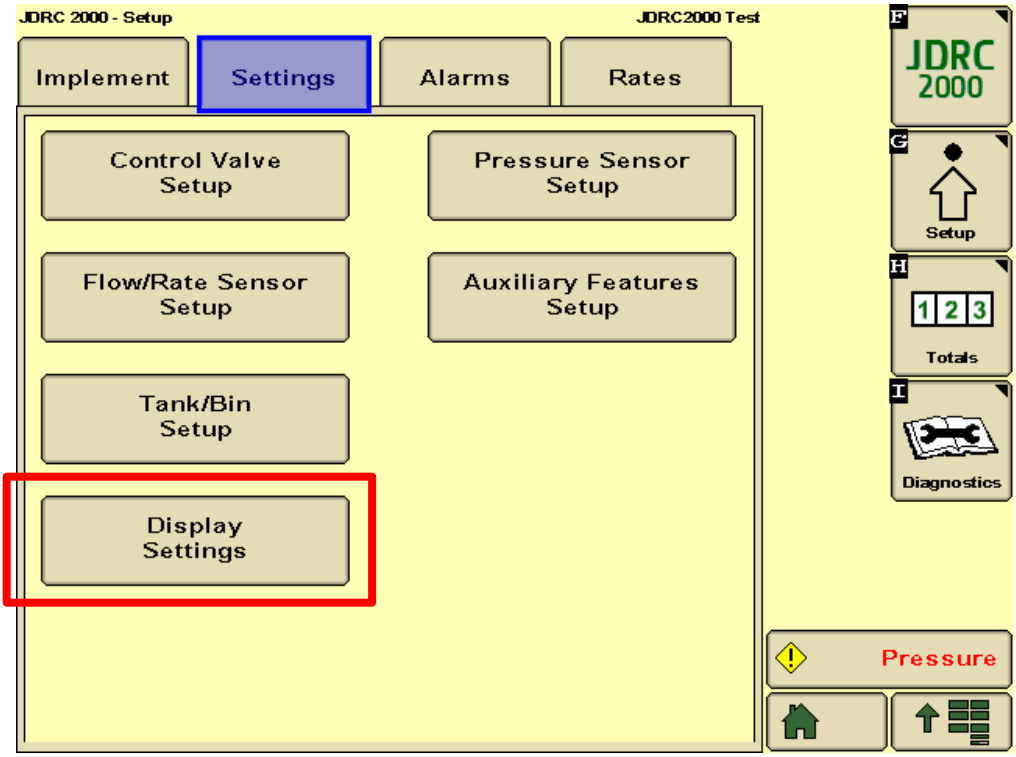

2. Select **Auxiliary Features Setup**.



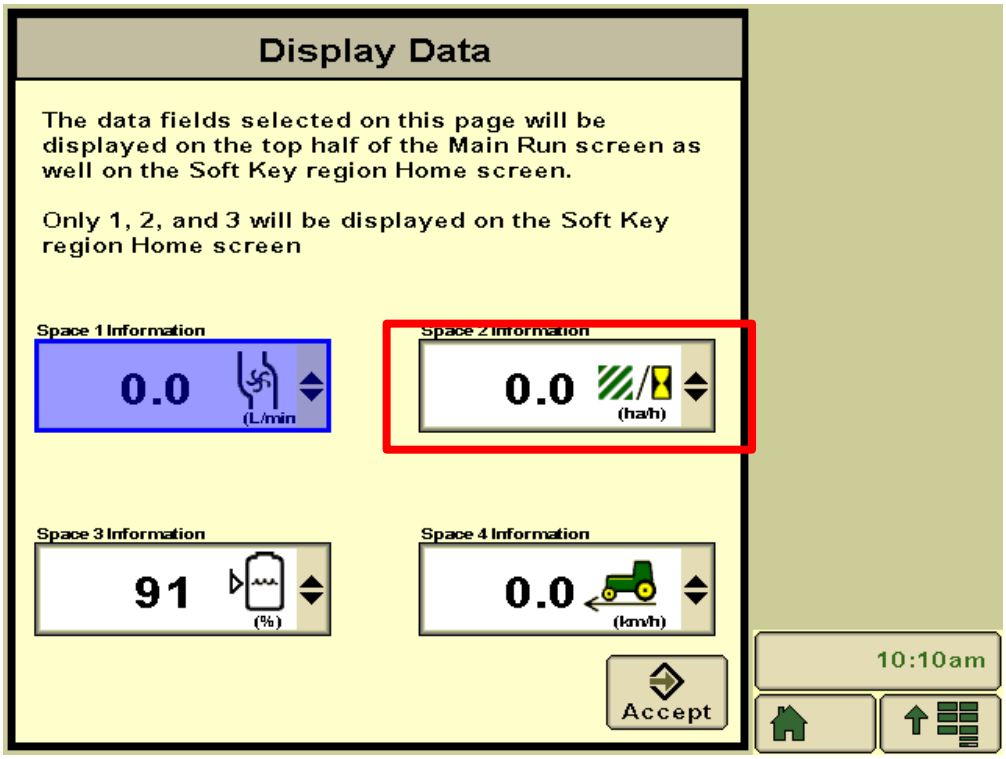
3. Enter **36** for RPM Calibration Pulses/Rev and **250** & **550** for Low & High RPM Alarm limits respectively. Press **Accept** to save settings and to return to Set up screen.



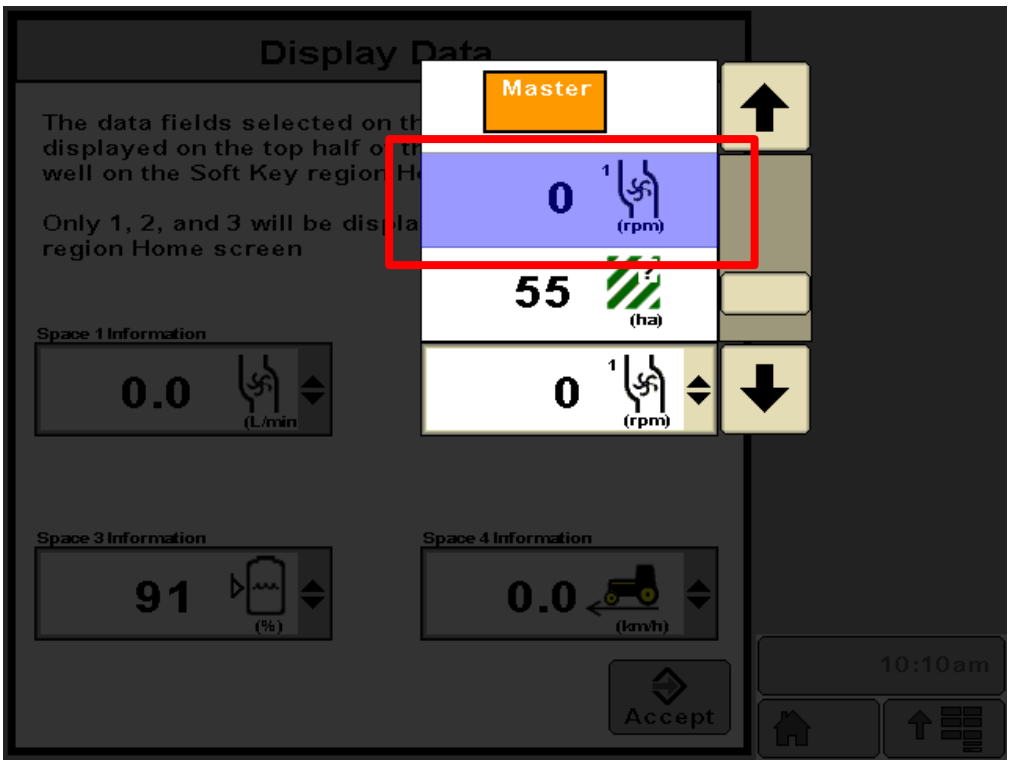

6. To configure the screen to display Pump speed, select **Display Settings**.



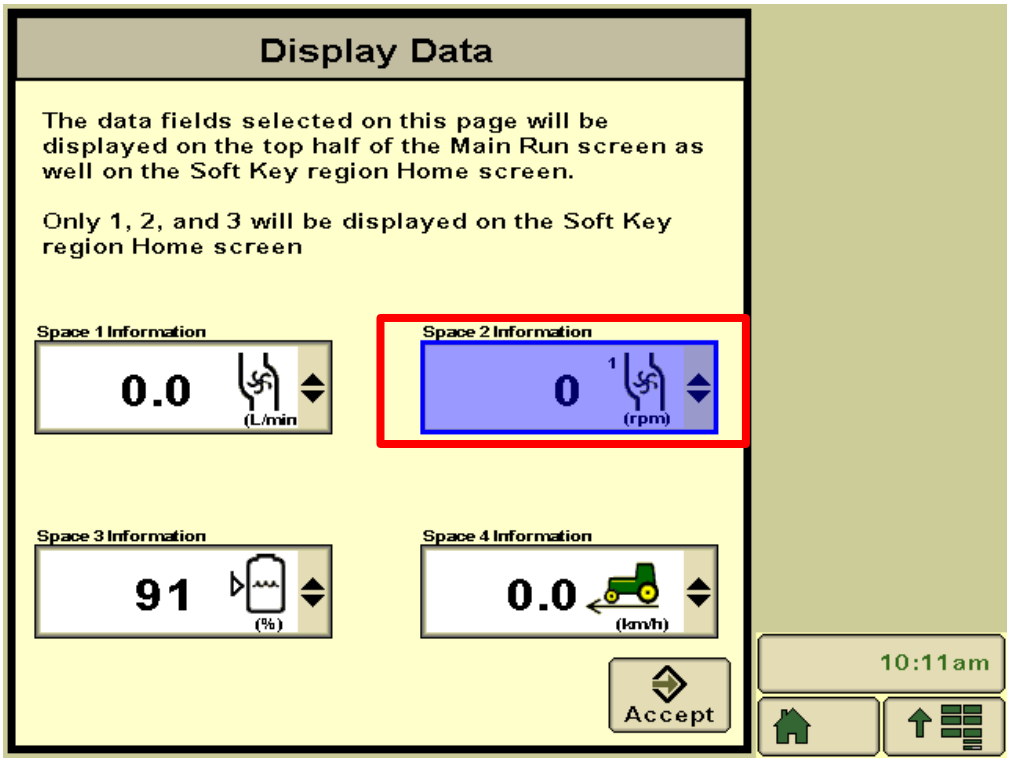
7. Select a **Data Field** to display pump speed.



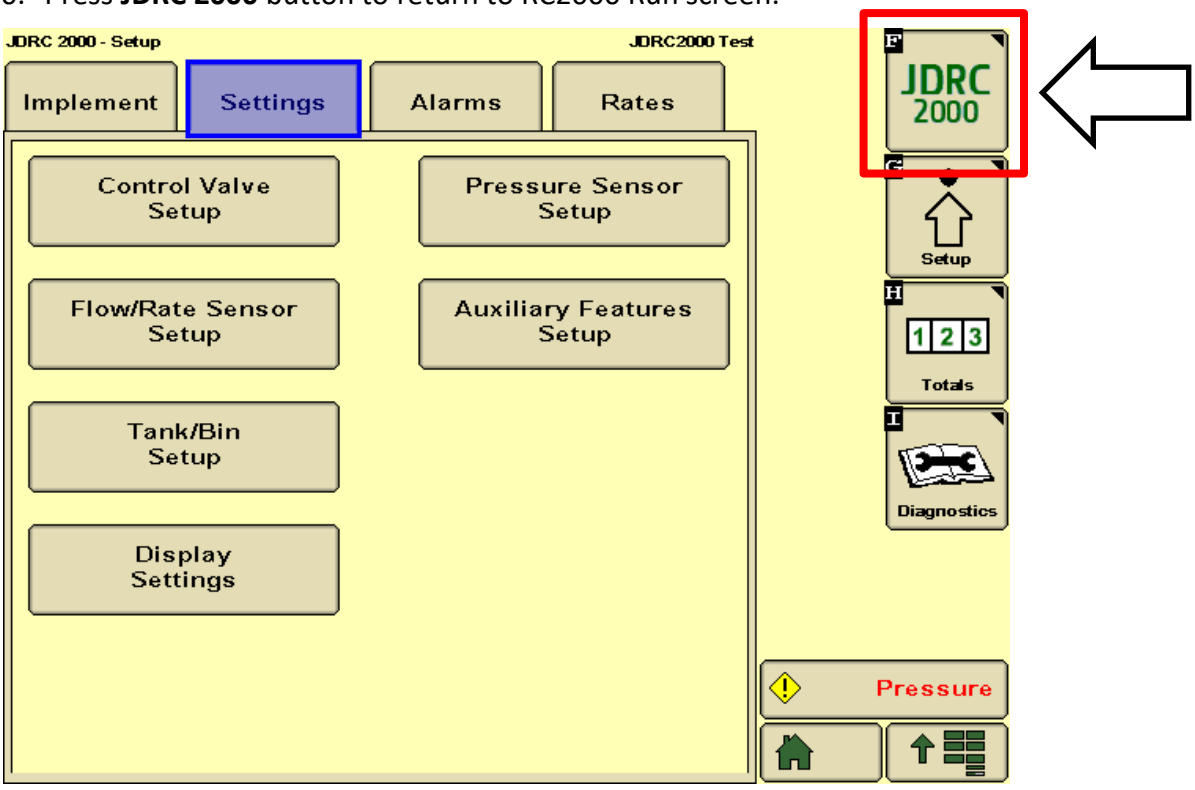

8. Scroll down the menu and select **Pump Speed** (RPM) option.



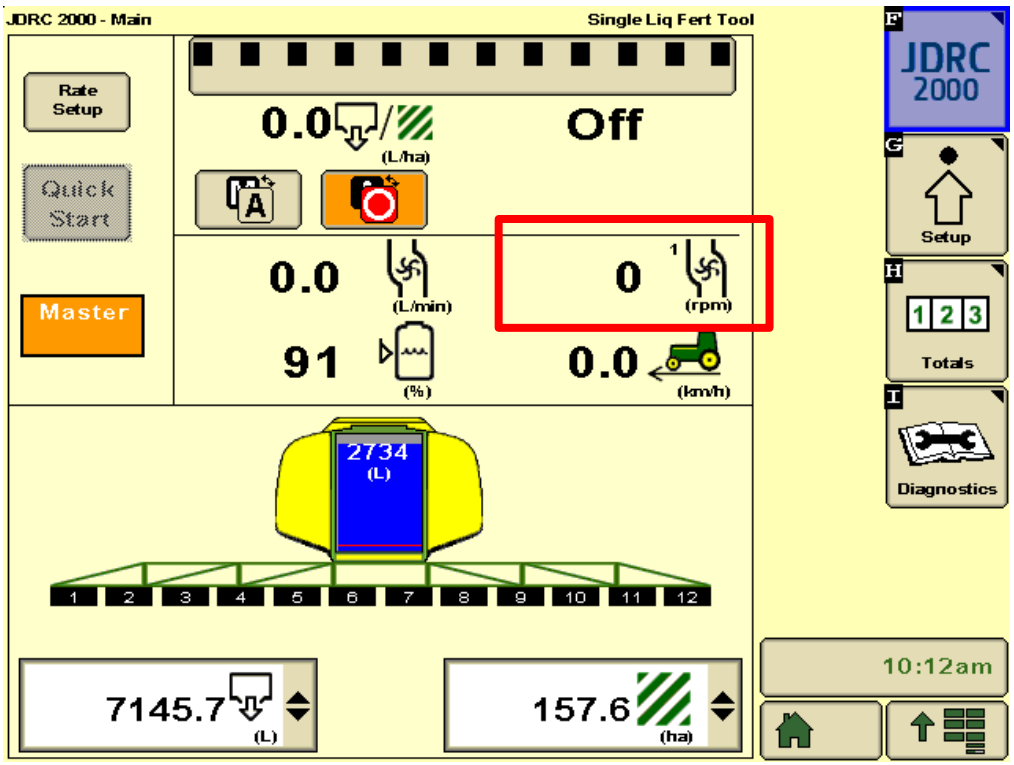
9. **Pump Speed** should now be displayed in the data field. Press **Accept** to save settings and return to Set up screen.




10. Press **JDRC 2000** button to return to RC2000 Run screen.



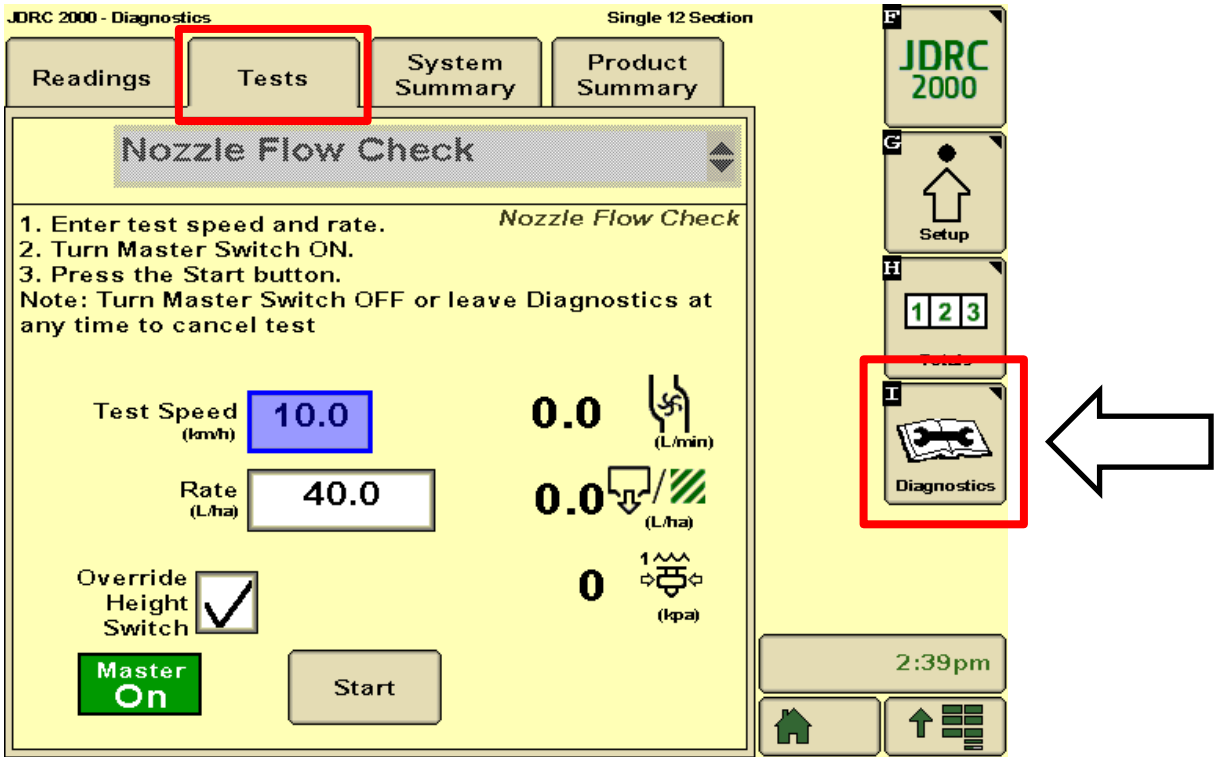
11. **Pump Speed** should now be displayed on the RC2000 Run screen.



# System Set Up Verification Tests

Enter **Diagnostics** screen and select **Tests** tab.

Start the pump and perform **Nozzle Flow Check** to test control. Use typical speed and application rate to start the test then vary the speed and application rates to ensure the control system is performing correctly across the required range. Turn the master switch (foot switch) off to terminate the test.




If rate control is erratic, go to **Control Valve Setup** screen and reduce **Valve Response Rate**