SETUP GUIDE

GREENSTAR RATE CONTROLLER

FAST SHUTOFF - SINGLE LIQUID - SECTION CONTROL

DOCUMENT NO.	MAN0025
REVISION	F
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Overview

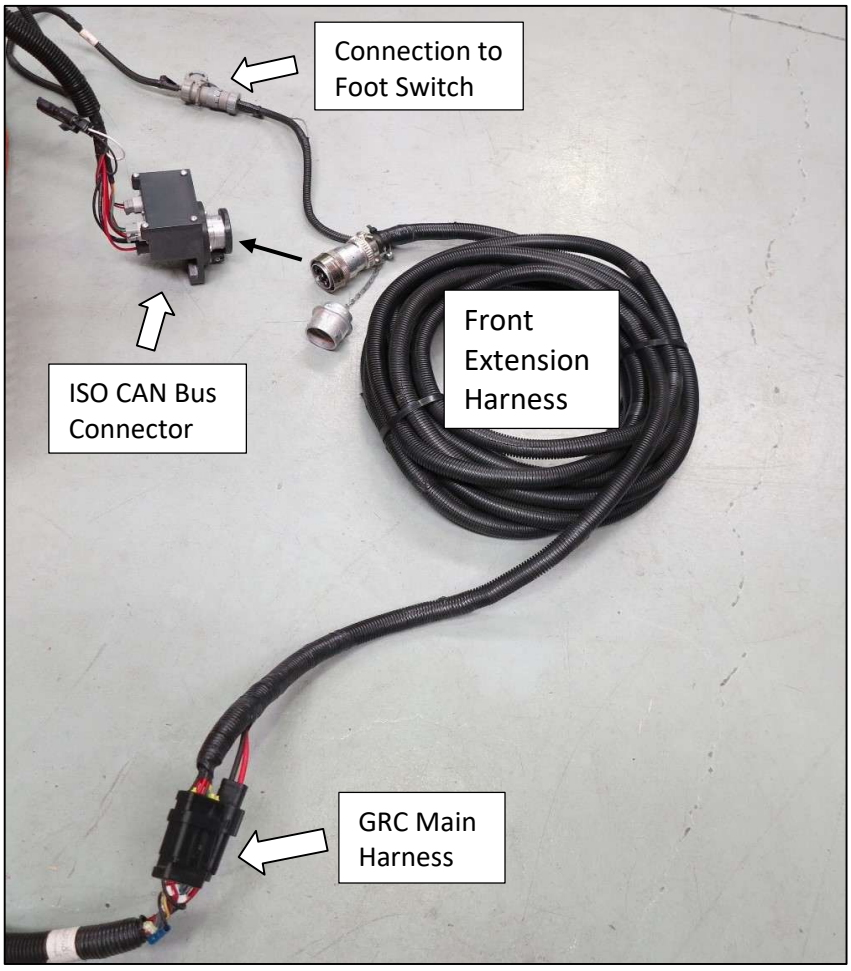
This document provides instructions for setting up a Fast Close Control Valve equipped Liquid Systems (SA) Rate Control Module with John Deere GreenStar Rate Controller (GRC) using John Deere GreenStar Display. The scenario covers setup of a single liquid system with section control.

This document should be read in conjunction with GreenStar Rate Controller Operator's Manual.

Configuration Prerequisites

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

- Physical installation of Liquid Systems (SA) Rate Control module including tank plumbing.
- Physical installation of a Stacker distribution system on the tool bar or planter.
- Installation and connection of GRC to the GreenStar Display with Front Extension Harness and Foot Switch – see photo below.
- Installation of Height Switch on planting equipment if required.
- Product tanks filled with enough water to conduct testing.



Physical Connection to Liquid Systems module

Connect Liquid Systems module to GRC with wiring looms supplied.

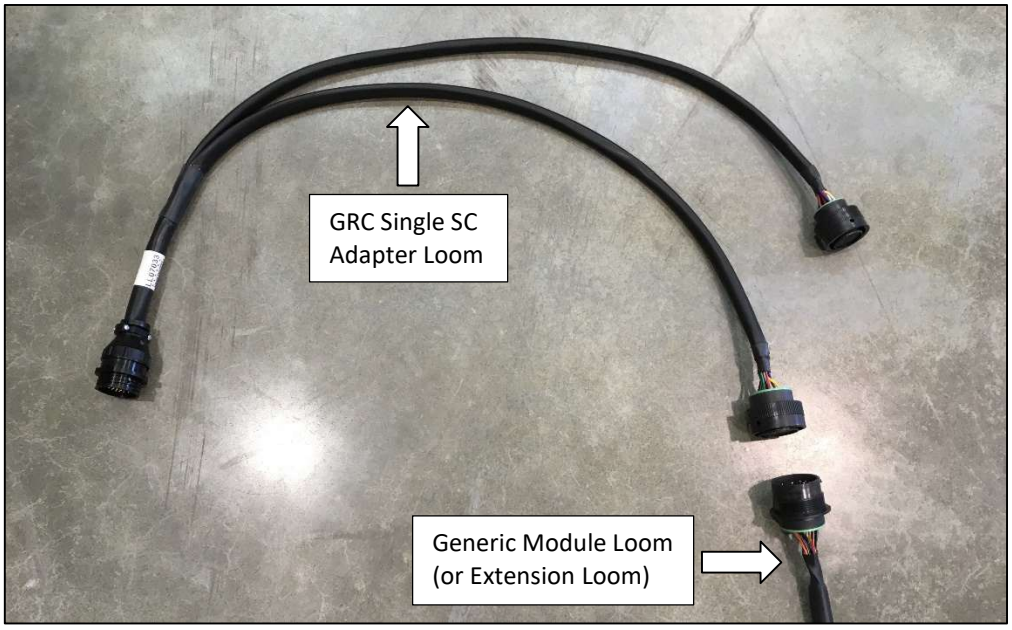
Liquid Systems (SA) looms available for single liquid set up with section control are:

Part No.	Name		Description
LL07033	GRC Single SC Adapter Loom (37 pin)		Connects to 37 pin circular connector on GRC Main Harness.
LL07072	Generic Module Loom (5m)		Connects to individual device connectors on LQS pump module. Connects to LL07033 Adapter Loom via 23 pin circular connector.
LL07079 or LL07080 or LL07082	Section Loom (12 Section, 6m) Section Loom (6 Section, 6m) Section Loom (8 Section, 6m)		Connects to individual section valve connectors on LQS section module. Connects to LL07033 Adapter Loom via 20 pin circular connector.
LL07014 (optional) or LL07021 (optional)	Section Loom Extension (12 Section, 6m) Section Loom Extension (12 Section, 12m)		Extensions of Section Loom for when additional length is required from LQS section module to GRC.
LL07015 (optional) or LL07020 (optional)	Generic Module Loom Extension (6m) Generic Module Loom Extension (12m)		Extensions of Generic Module Loom for when additional length is required from LQS pump module to GRC.

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

2. Connect and route Generic Module Extension Loom (LL07015 or LL07020) to reach GRC if additional length is required.

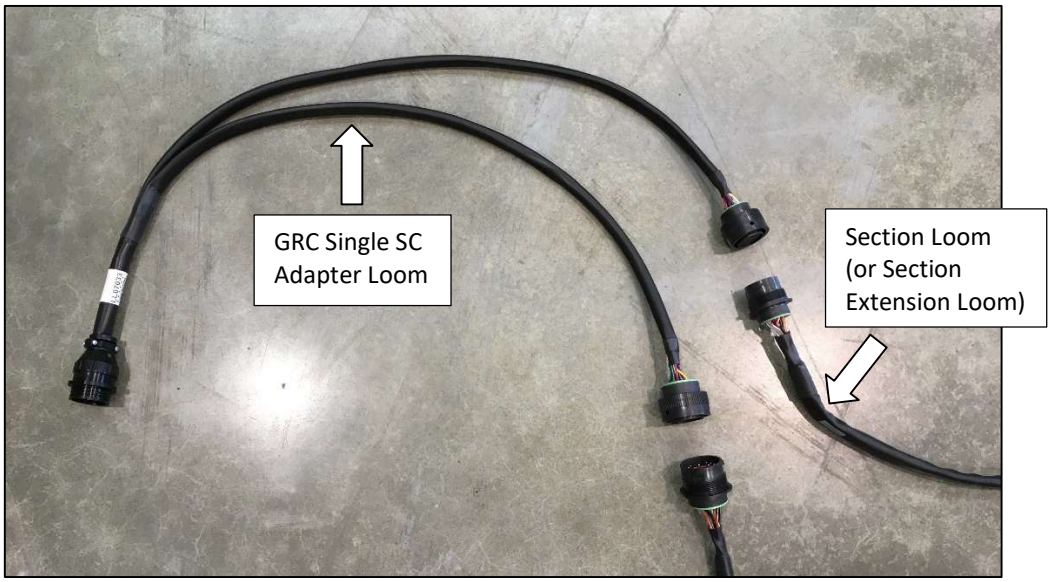
3. Connect Generic Module Loom (or Extension Loom if installed) to GRC Single SC Adapter Loom (LL07033).



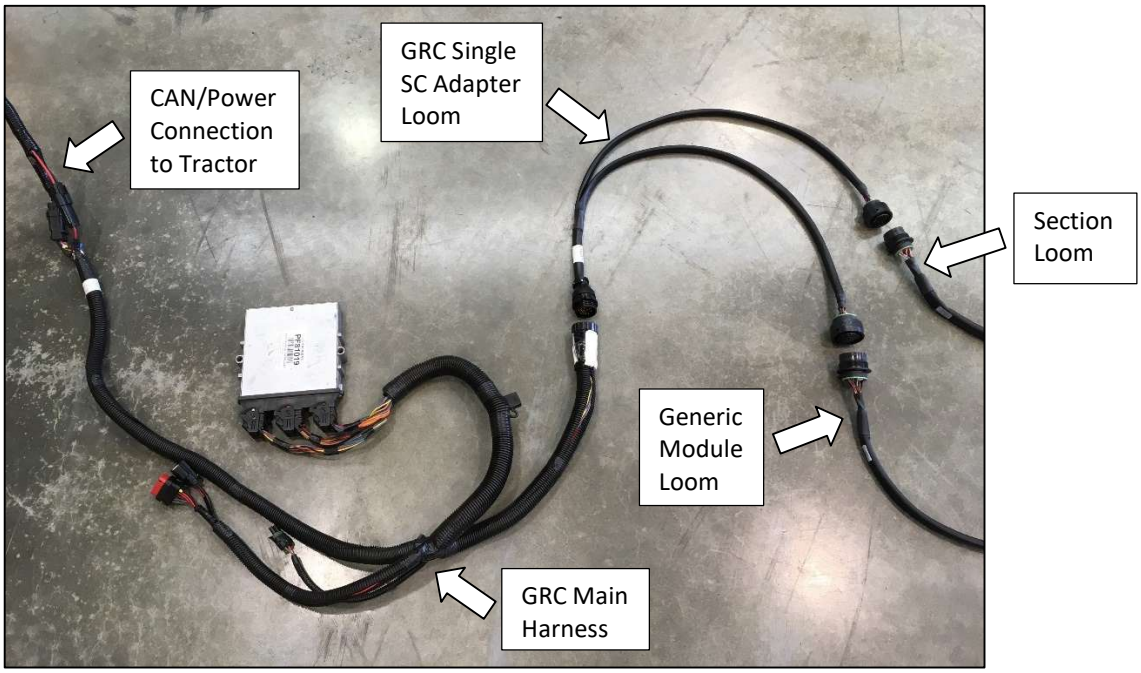
4. Connect Section Loom (LL07079 or LL07080 or LL07082) to individual connectors on the Liquid Systems (SA) section module. Ensure section valve number matches connector number. e.g., valve No. 1 plugs in to connector No.1. Insert dust plugs into un-used connectors on the Section Loom.

5. Route Section Loom towards GRC. Connect and route Section Extension Loom (LL07014 or LL07021) if additional length is required to reach GRC.

6. Connect Section Loom (or Section Extension Loom if installed) to GRC Single SC Adapter Loom (LL07033).

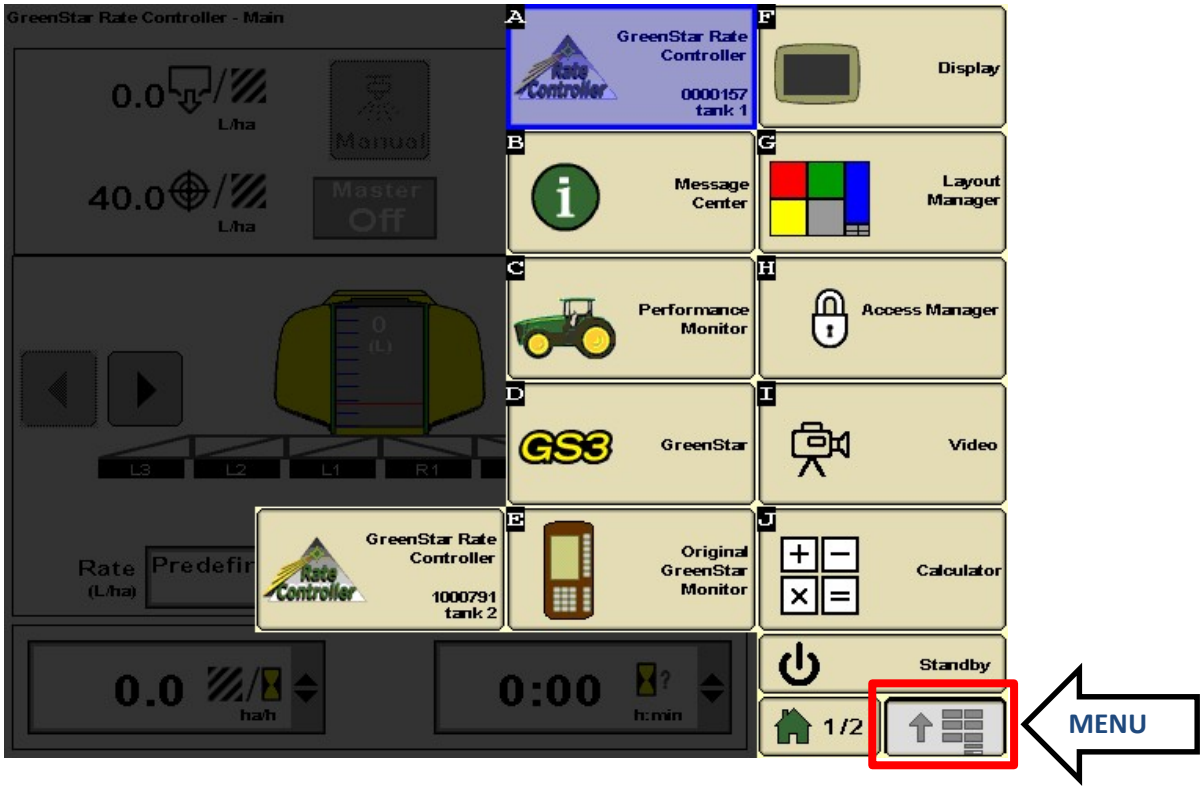


7. Connect GRC Single SC Adapter Loom to GRC Main Harness.

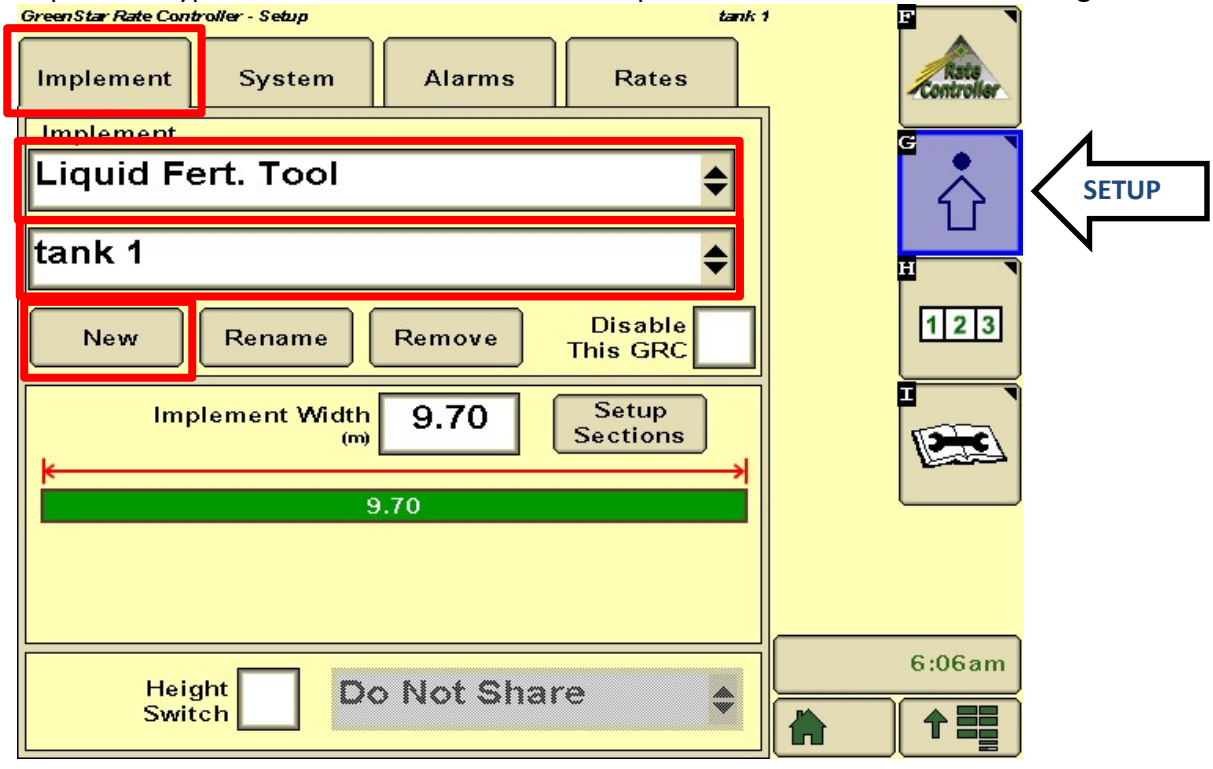


GreenStar Rate Controller Setup

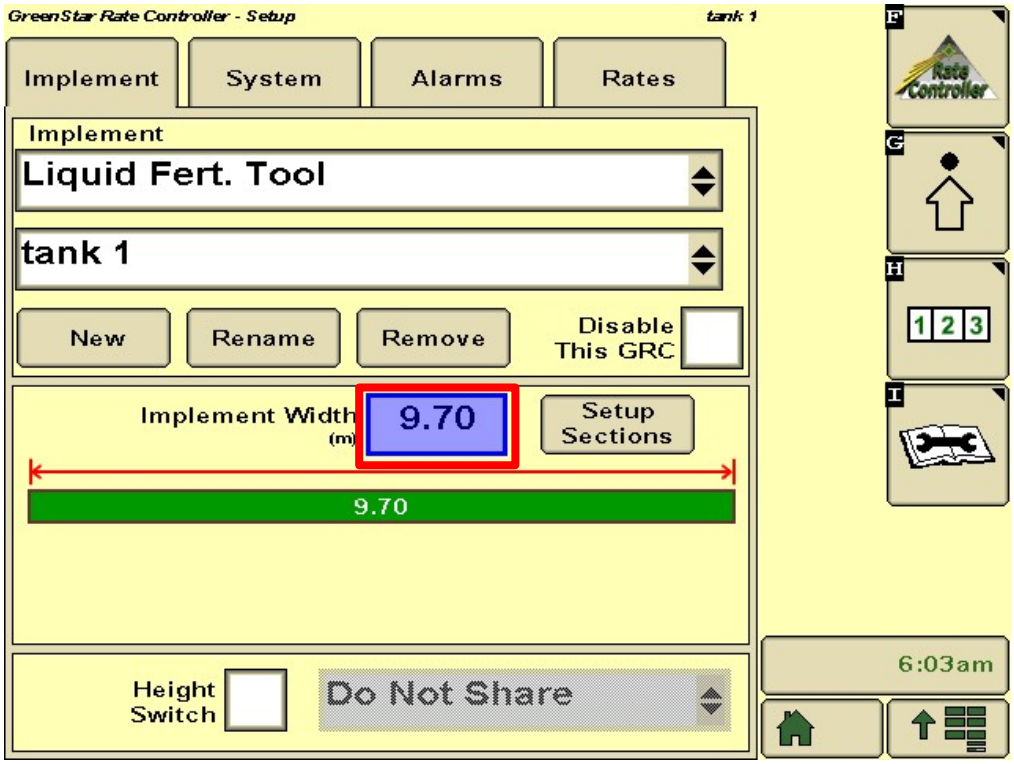
Press **Menu** button & select **GRC** button (If more than one GRC is installed, verify the serial number displayed on selected GRC button matches that on GRC to be setup).



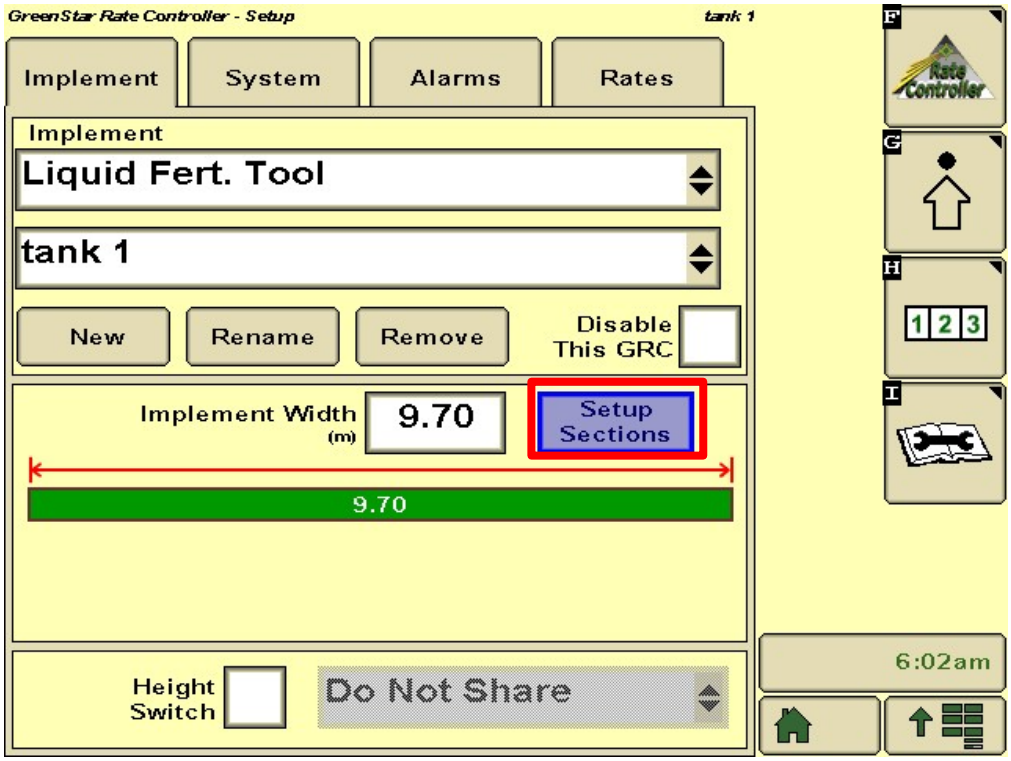
Select **Setup** button to enter GRC setup. Select **Implement** tab. Select **Liquid Fert. Tool** as implement type. Select **New** to create a new Implement name or select an existing name.



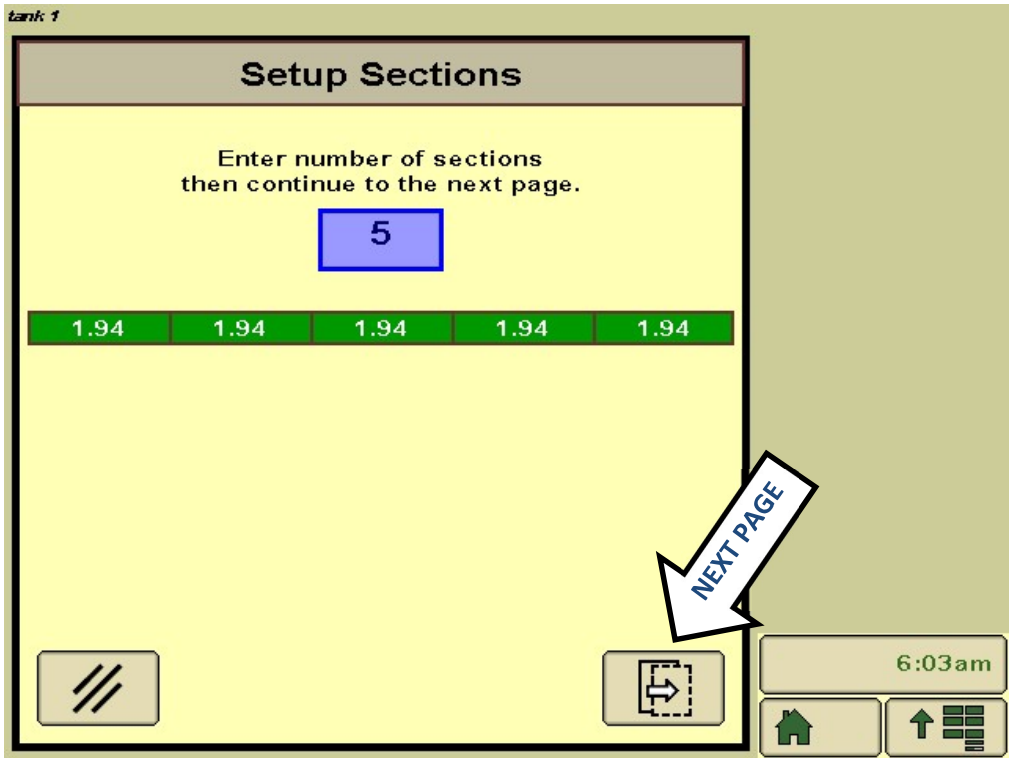
Select **Implement Width** field and enter effective planting width of the implement.



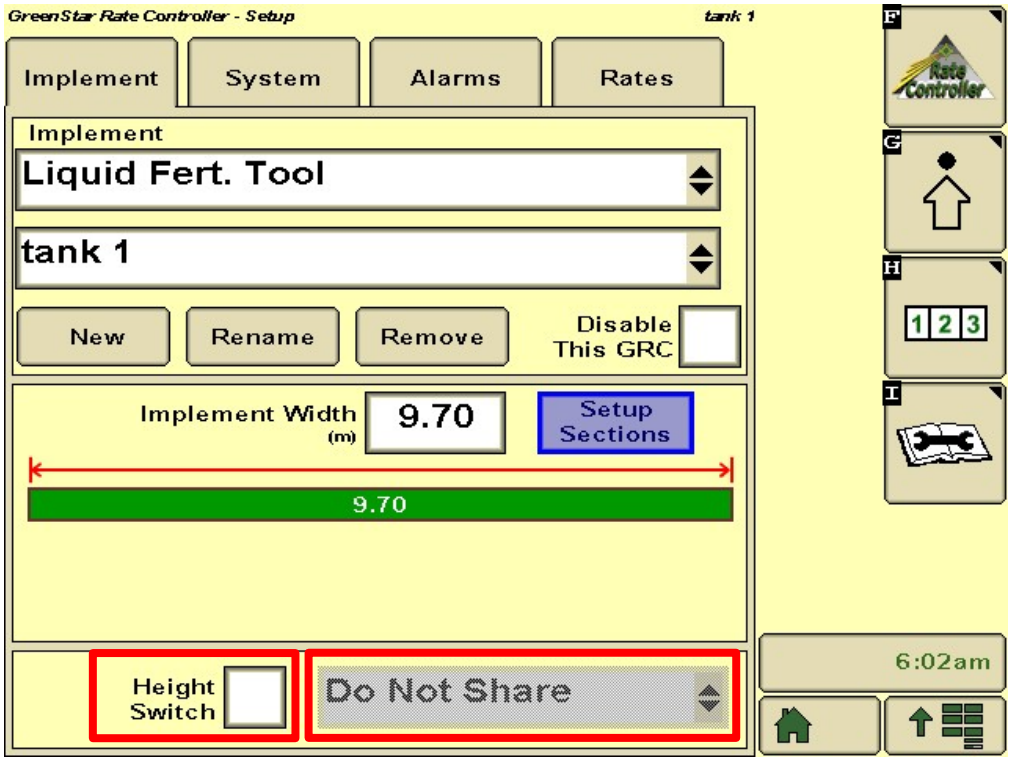
Select **Setup Sections** button.



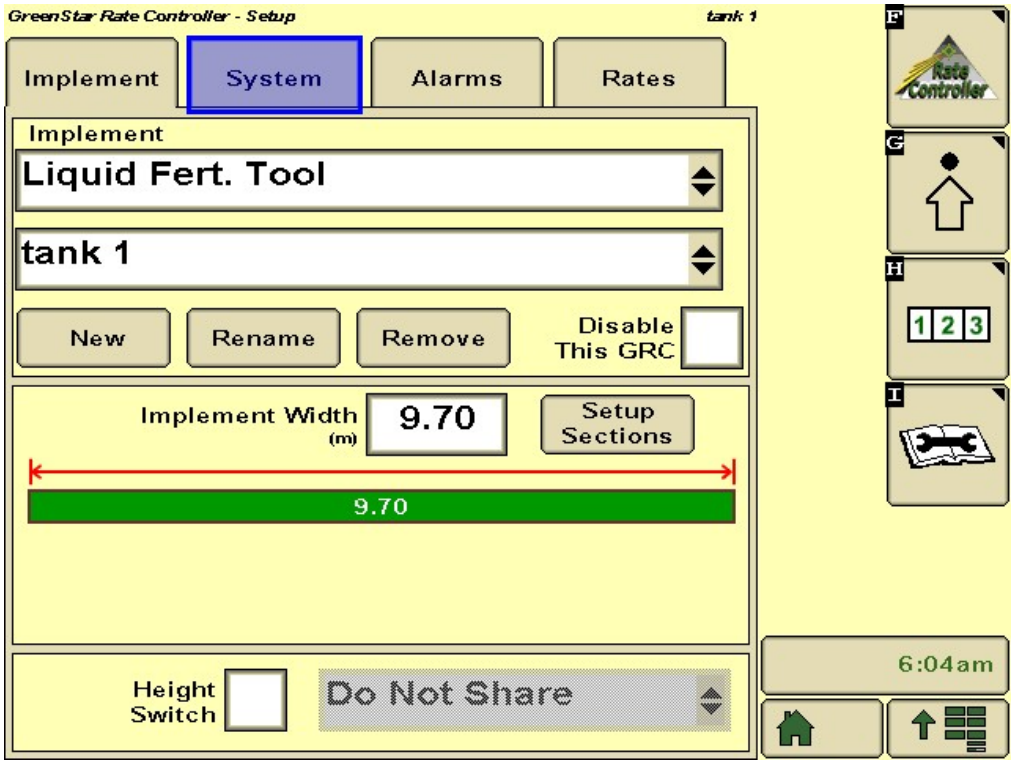
Enter number of sections and press **Next Page** button (right arrow).



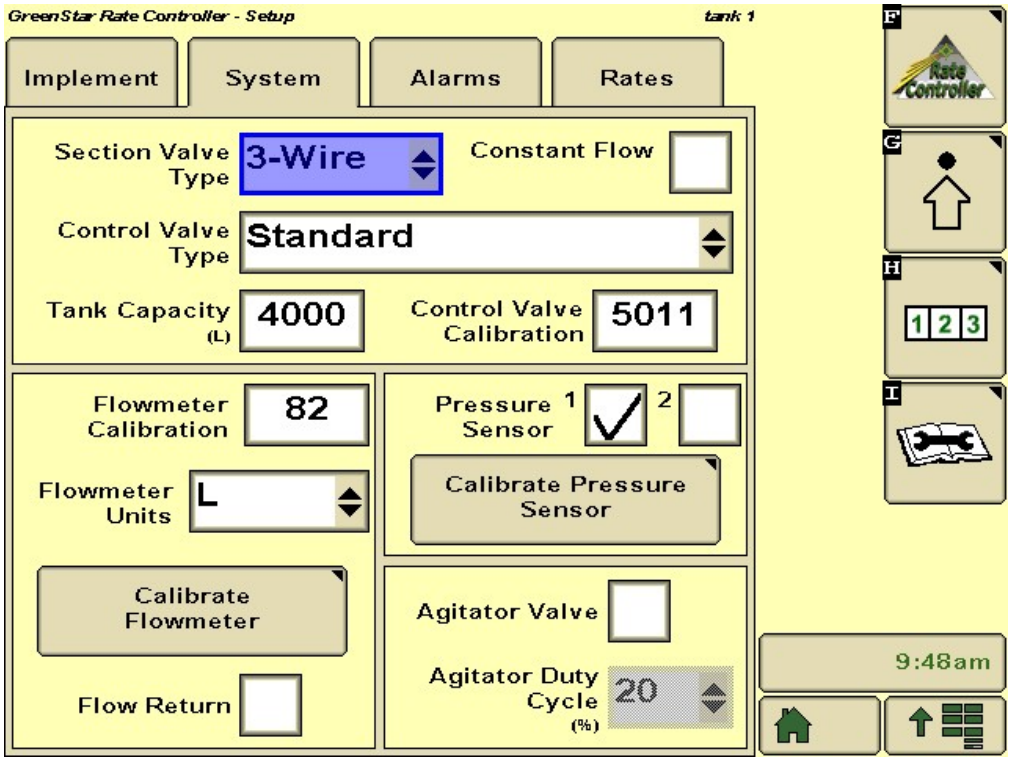
If installed, enable Height **Switch** (by placing a tick in the box) and select appropriate **Messaging** option from drop down menu.



Select **System** tab to enter system setup.



Select **3-Wire** for Section Valve Type from drop down menu.

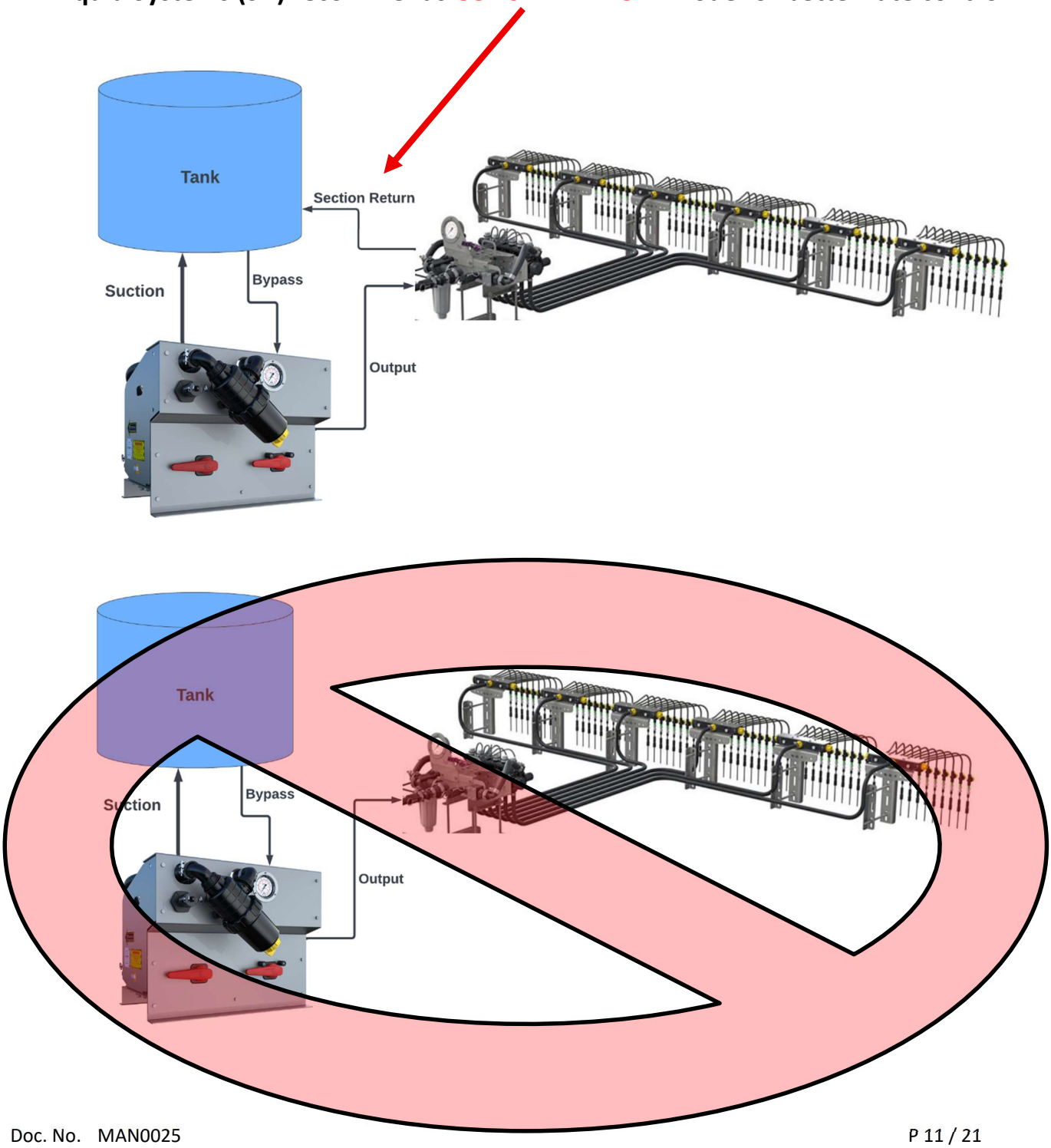


Constant Flow

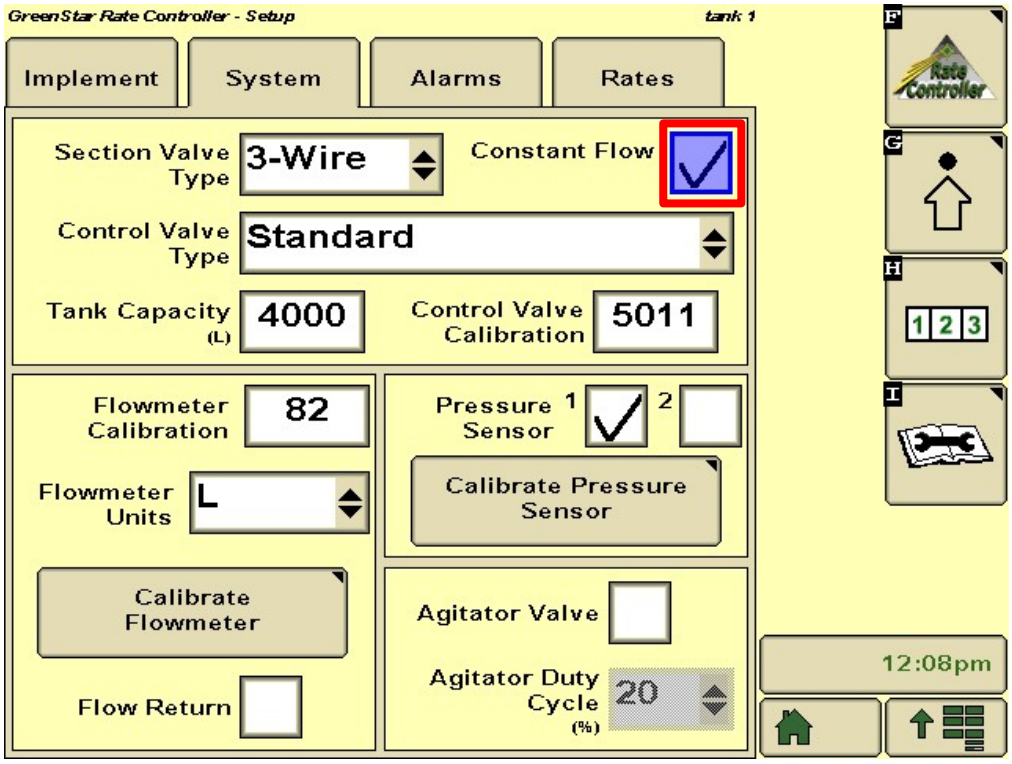
The LQS Stacker Section Control Module is designed to operate in both Constant Flow and Hard Shut-off mode. When a section valve is switched off in Constant Flow mode, excess flow is diverted back to tank thus maintaining a constant flow through remaining section valves.

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. Hard Shut off mode is only recommended if a dosing system is installed and the contaminated product cannot be returned to the tank.

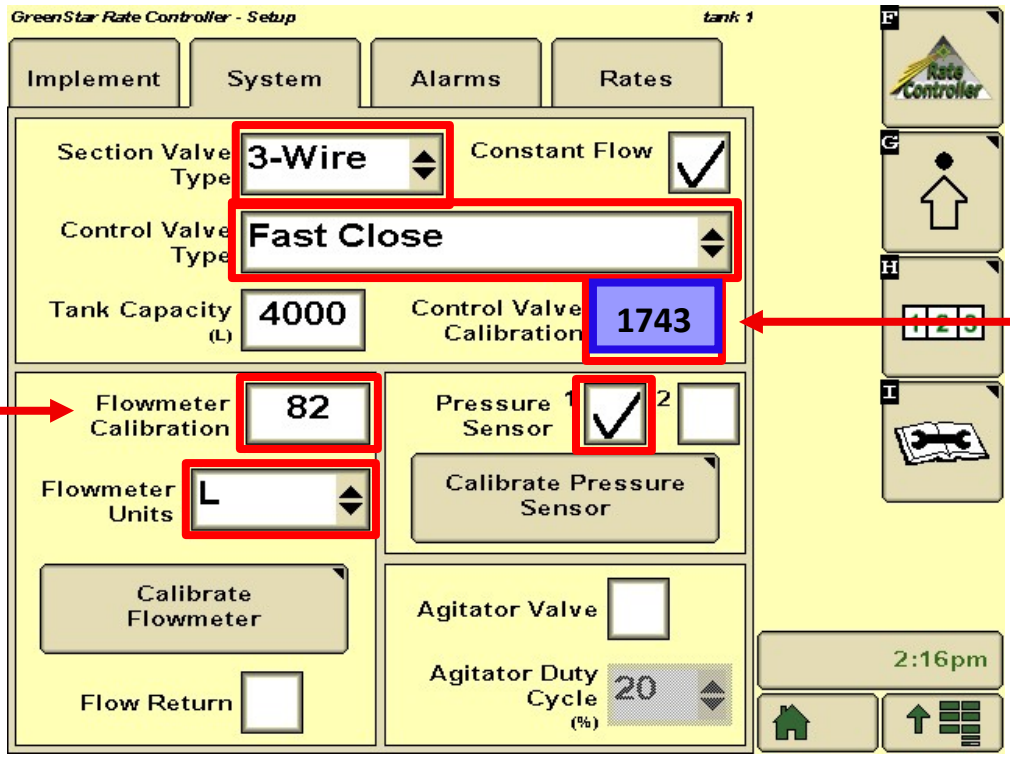
Liquid Systems (SA) recommends CONSTANT FLOW mode for better rate control.



For **Constant Flow** plumbing configuration place a tick in the box



Enter values as follows: **SEE NEXT PAGE FOR VALVE CALIBRATIONS**



NOTE: This Control Valve Calibration setting is for a Standard KZ L03085

NOTE: This Flow Meter Calibration setting is for a Standard TeeJet 801 Flowmeter in Litres. For modules with **ARAG Electromagnetic** Flowmeter, check label for calibration setting. **SEE Calibration setting on next page**.

FLOW METER Identification & Settings----------

All Liquid Systems (SA) Pump and Rate Control Modules are available with multiple flow meter configurations to suit specific applications and flow rates. Each flow meter has a 'Calibration Factor' which needs to be input to the rate controller by the operator. If the incorrect calibration factor is used, the system will not operate correctly, and the applied rate will be incorrect. The below images and tables show the different flow meter and calibration factors.

TeeJet 801 Flow Meter (STD)

ARAG Flow Meters

IDENTIFICATION LABEL
ARAG Flow Meters all appear visually the same, although can be identified by the label on the side. This label shows the range and calibration factor in pulses per litre.

Flow Meter Variations & Calibration Setting	**TeeJet 801 Flow Meter** (Standard)	**ARAG Electromagnetic Flow Meter**		
Flowmeter Range	7.5-250L/Min	2.5-50L/Min	1.0-20L/Min	0.5-10L/Min
Pulses Per Litre	82	1200	3000	6000
Pulses Per US Gallon	310	4542	11355	22710
Pulses Per Imperial Gallon	373	5455	13638	27277

SHUTOFF VALVE Identification & Settings----------

LQS Modules are built with 3 different Fast-Shutoff Valves, the images below show the difference between the two KZ Valves and Teejet Valve.

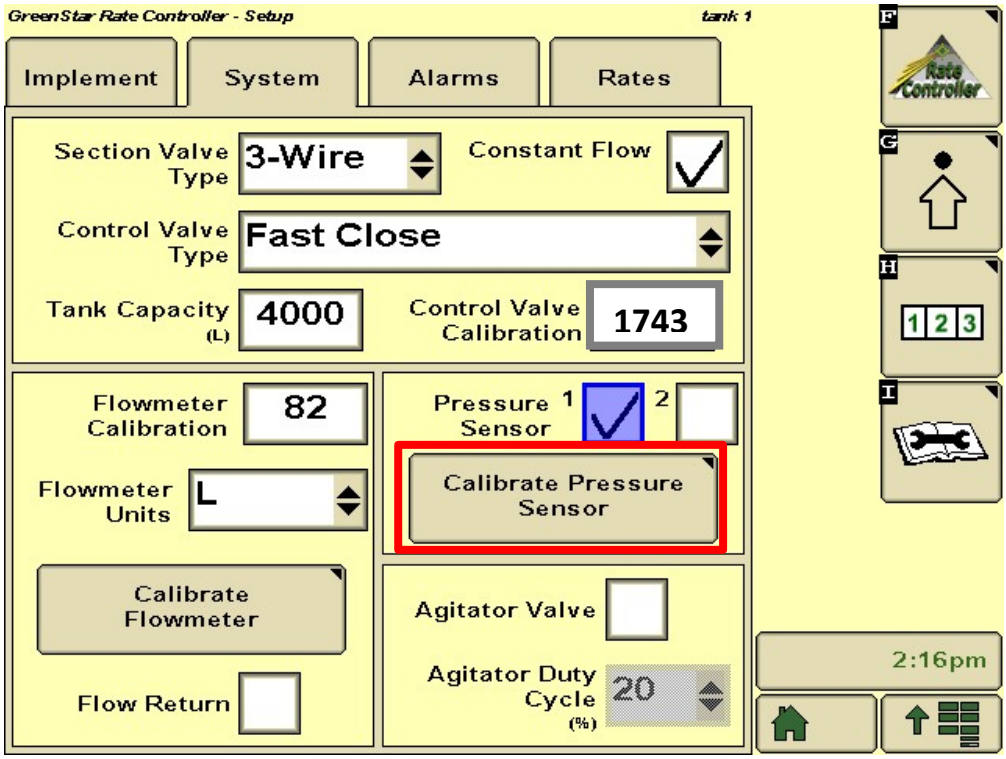
KZ Valve- L03067

KZ Valve- L03085

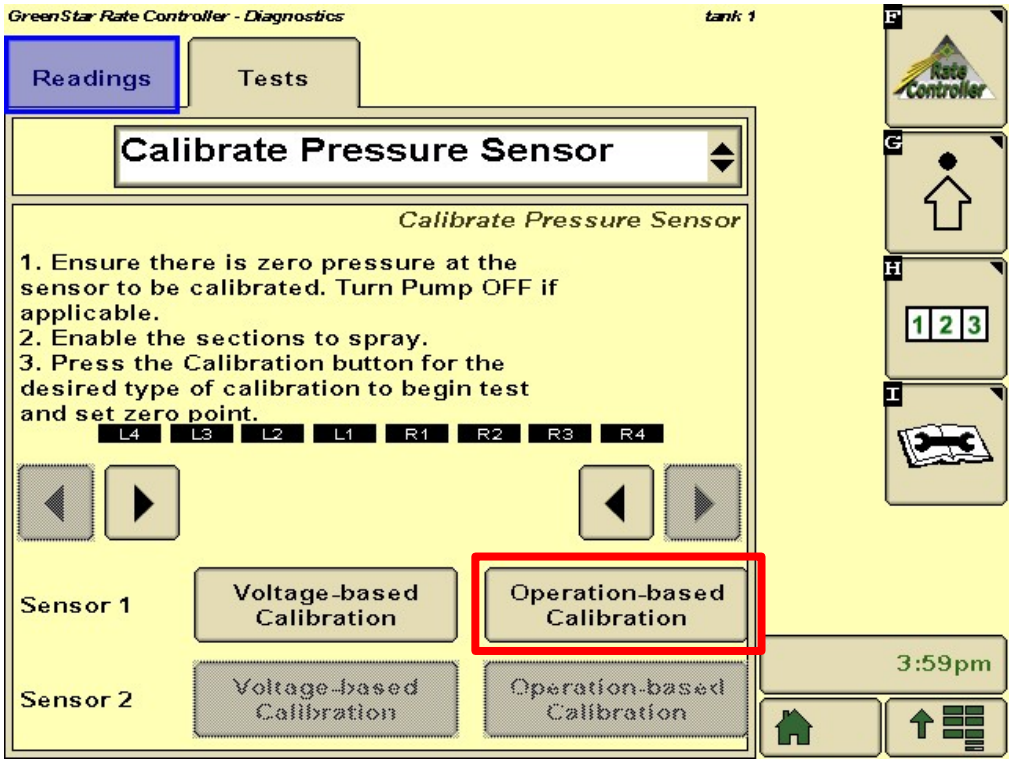
TeeJet Valve

Shut Off VALVE TYPE	**Modules Pre 2025 Setting**	**Modules 2025 Setting (BPOD)** Note: BPOD – Back Pressure Orifice Diffuser
L03067	1031	1243
L03085	1343	1743
TeeJet	3031	1643

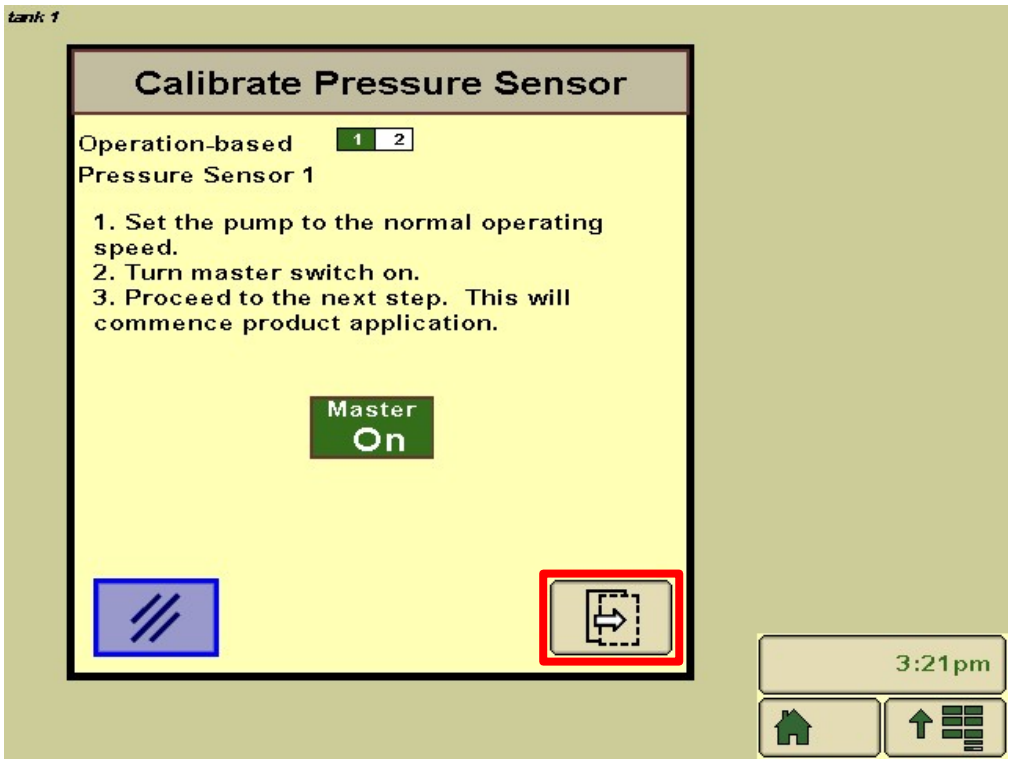
Select **Calibrate Pressure Sensor** button.



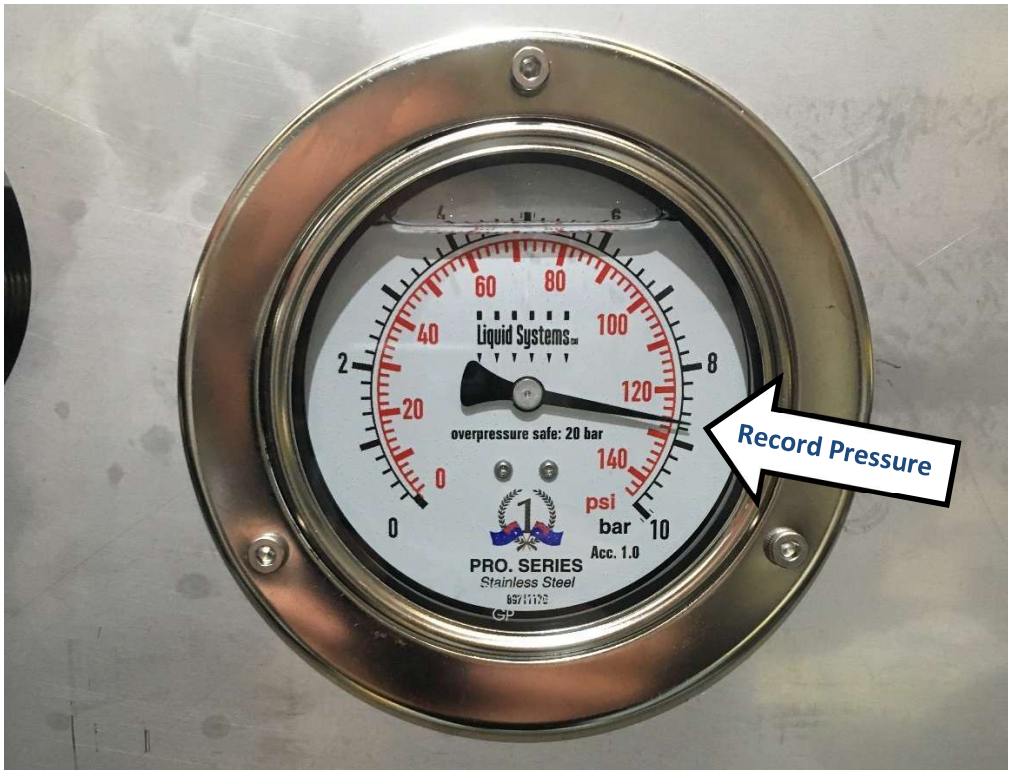
Ensure pump is NOT running before selecting **Operation-based Calibration** button.



Turn the pump on via tractor hydraulics.
Turn the master switch on and press **Next Page** button.



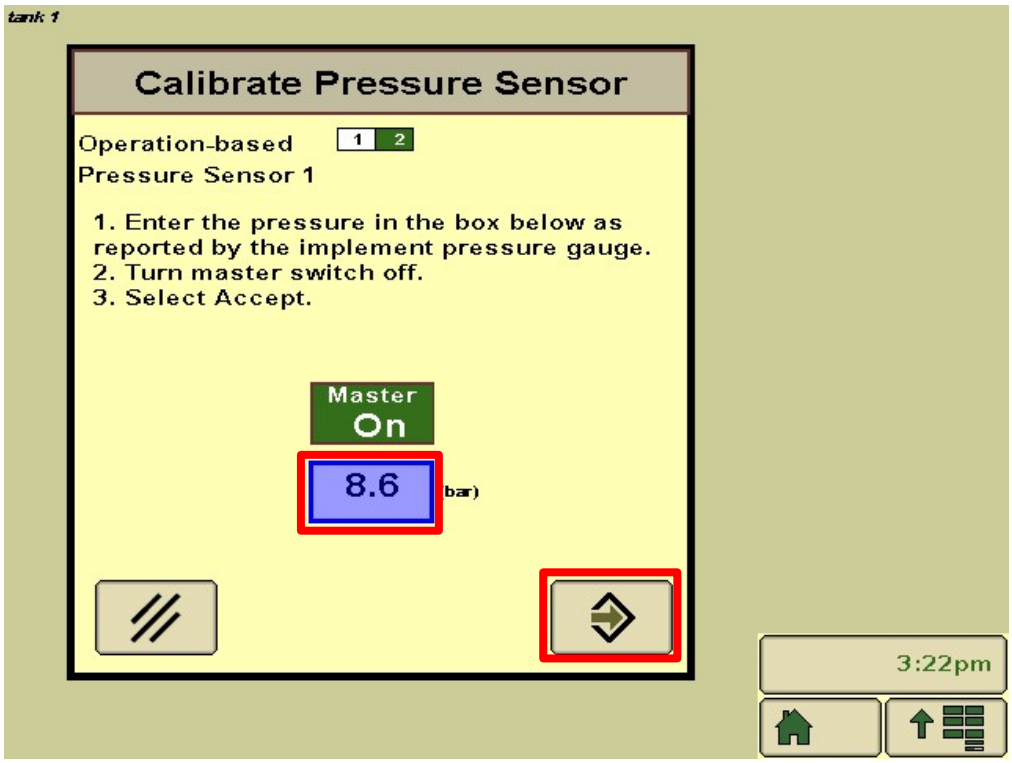
Observe the pressure on the module pressure gauge.



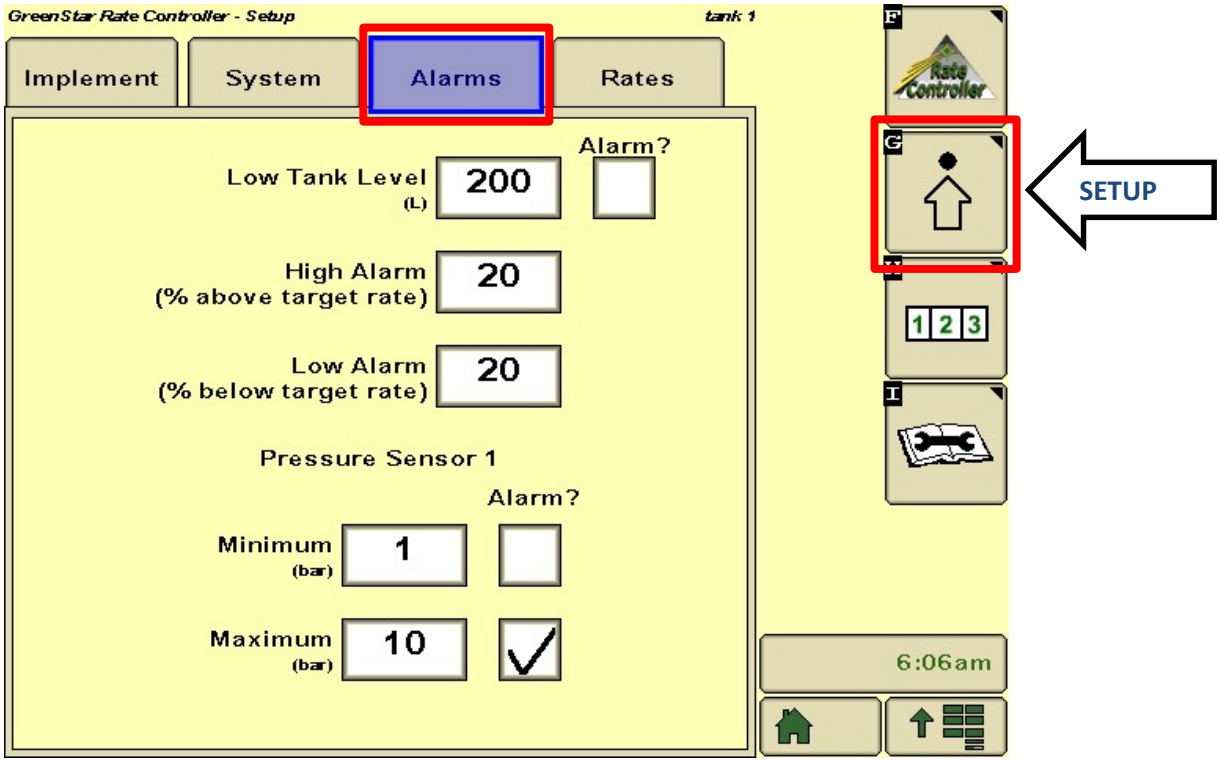
Enter observed pressure into the on-screen field.

Turn the master switch off

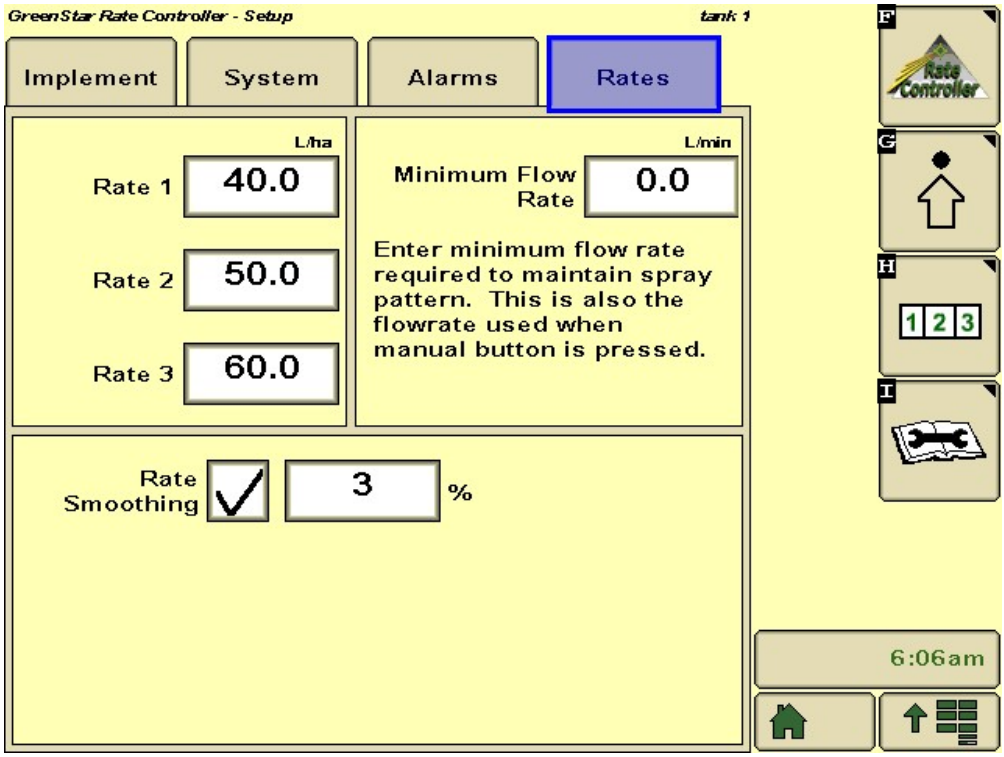
Press **Accept** button to complete calibration process



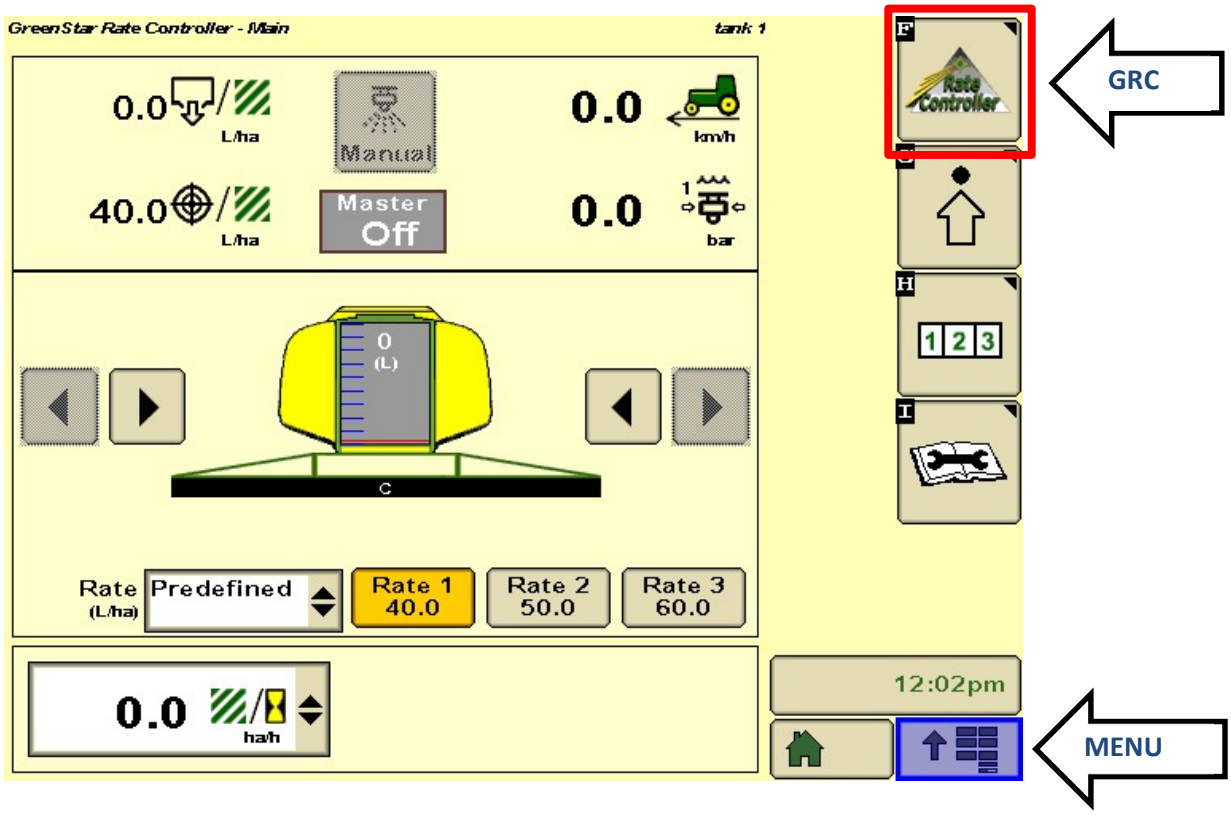
Select **Alarms** tab on the Setup screen and enter alarm limits for **Low Tank Level, Off Target Flow Rate** and **Minimum & Maximum Pressure** as required. Tick Alarm boxes for an audible alarm.



Select **Rates** tab and enter 3 x pre-defined target flow rates as required.
Tick **Rate Smoothing** box to enter % setting. (3% is system default setting).

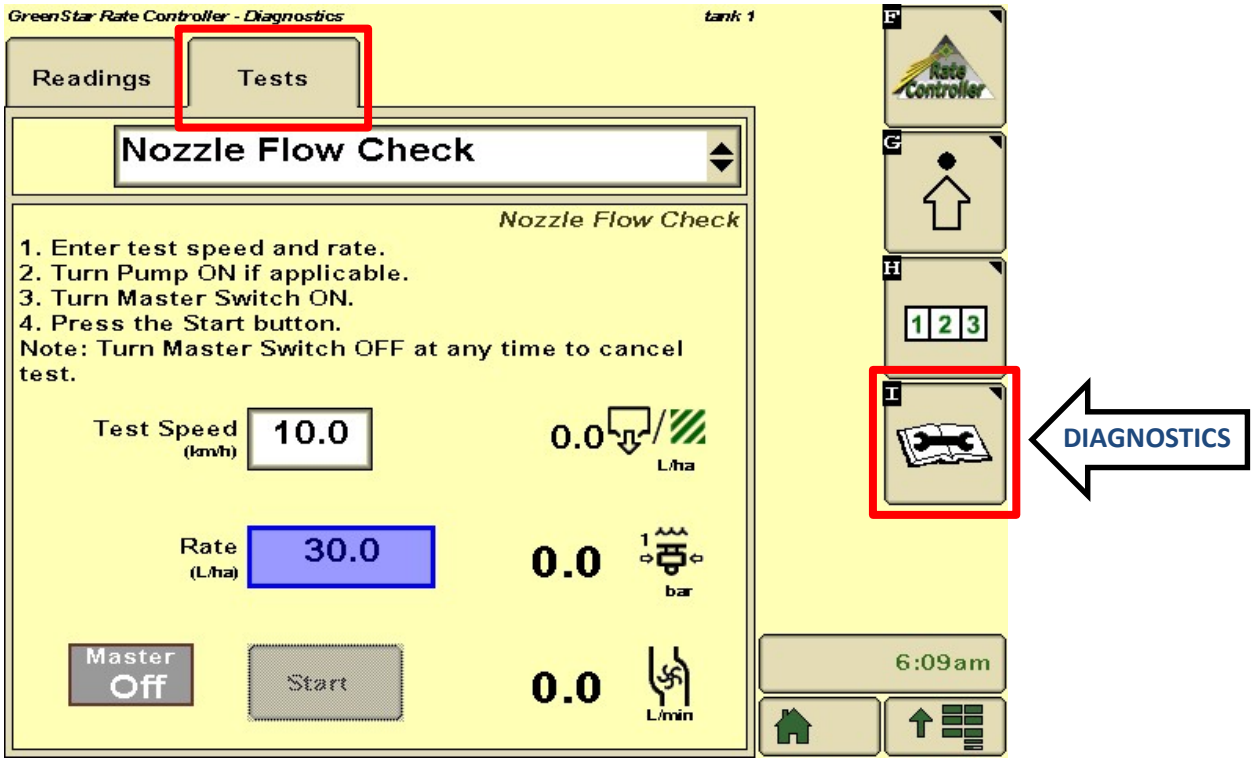


Press **Menu** button & select **GRC** button to return to the Main screen.

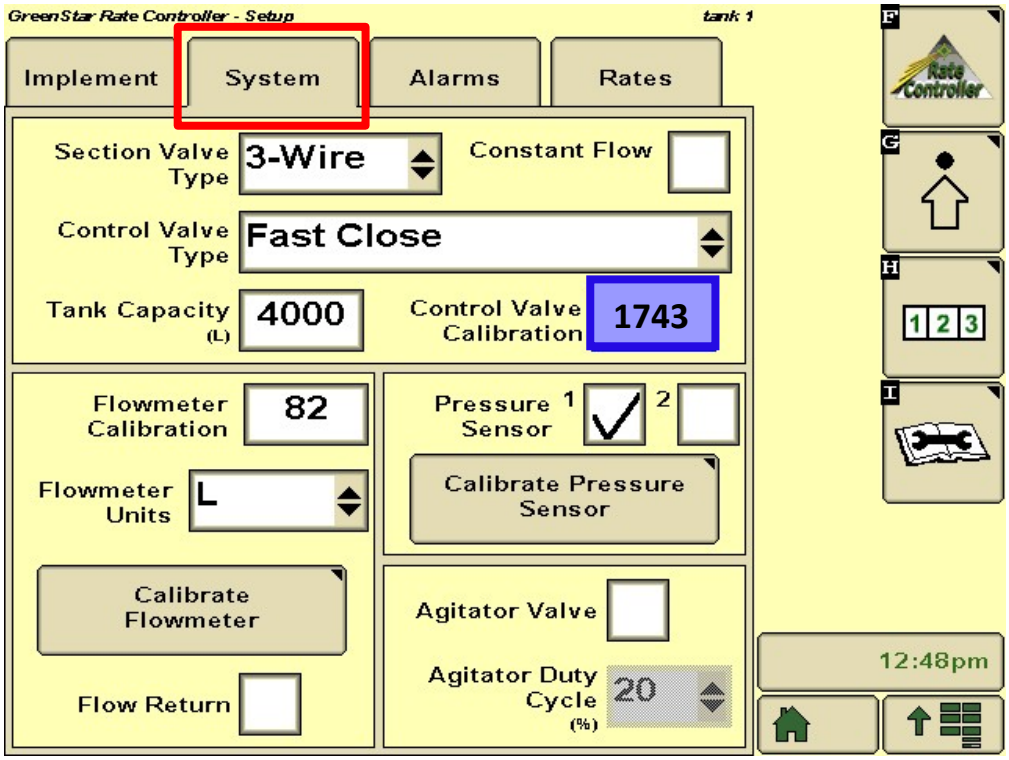


System Set Up Verification Tests

Enter **Diagnostics** screen and select **Tests** tab. Start the pump and perform **Nozzle Flow Check** using typical speed and application rate to test control. Vary speed and application rate to ensure the control system is performing correctly across the entire setup range. Turn the master switch (foot switch) off to terminate the test.



If rate control is erratic, go to **System Setup** screen and adjust **Control Valve Calibration** values to optimise performance. Increase first 2 digits for faster response, decrease for smoother control. Refer to GreenStar Rate Controller Operator's Manual for more information.

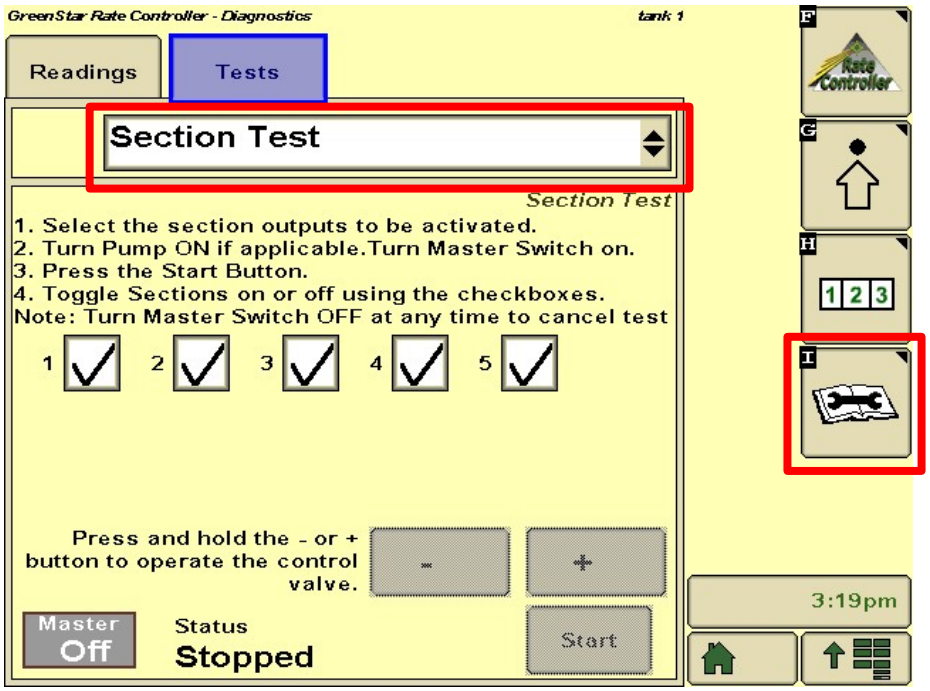


Section Valve Tuning

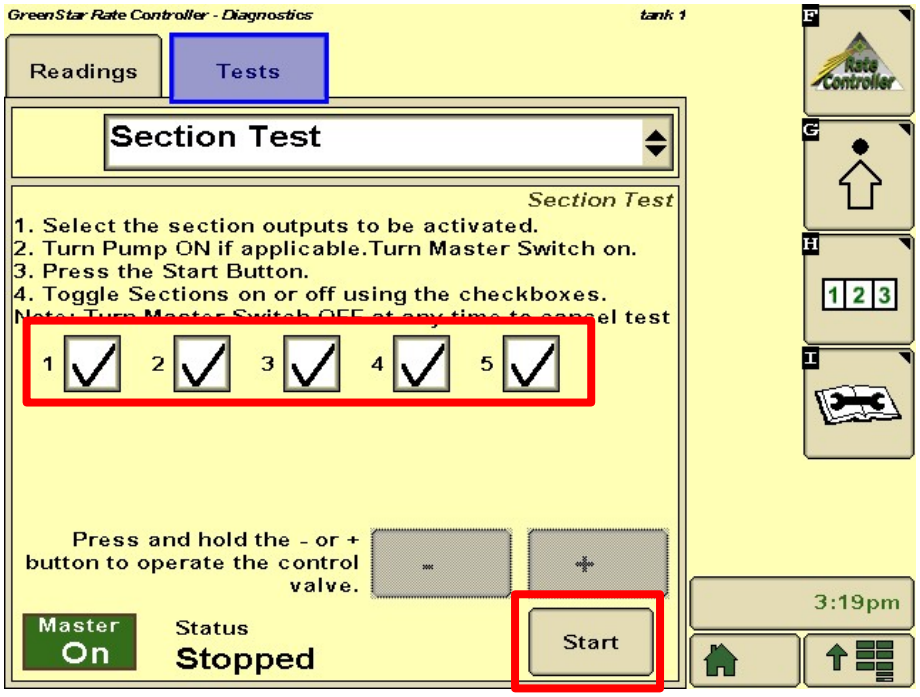
NOTE: Important step.

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. Press **Diagnostics** button. Press **Tests** tab and select **Section Test** from drop down menu



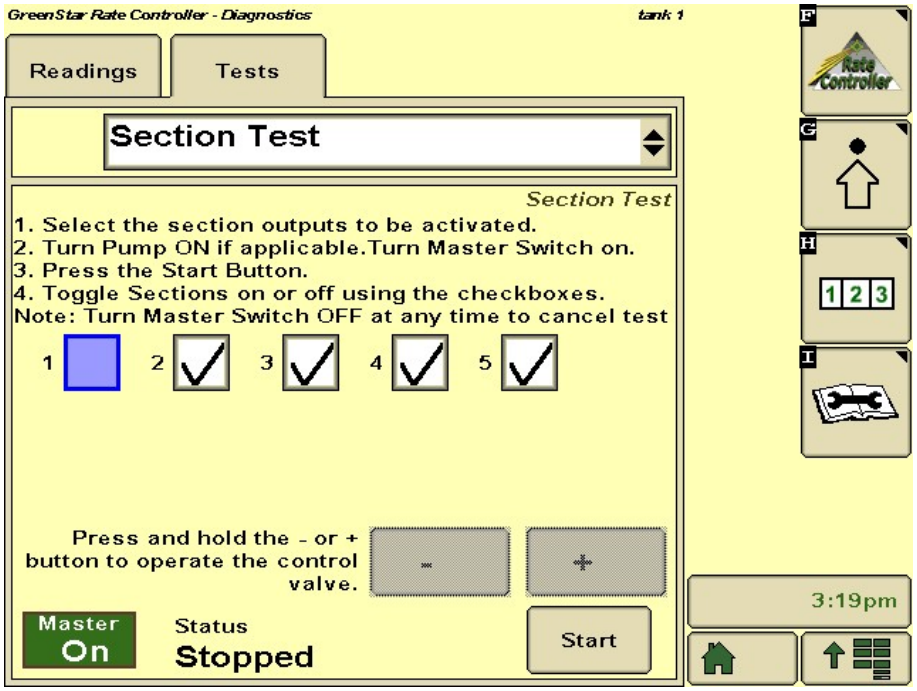
2. Turn the Master switch on and press **Start** button to start the test. Ensure all sections are open.



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

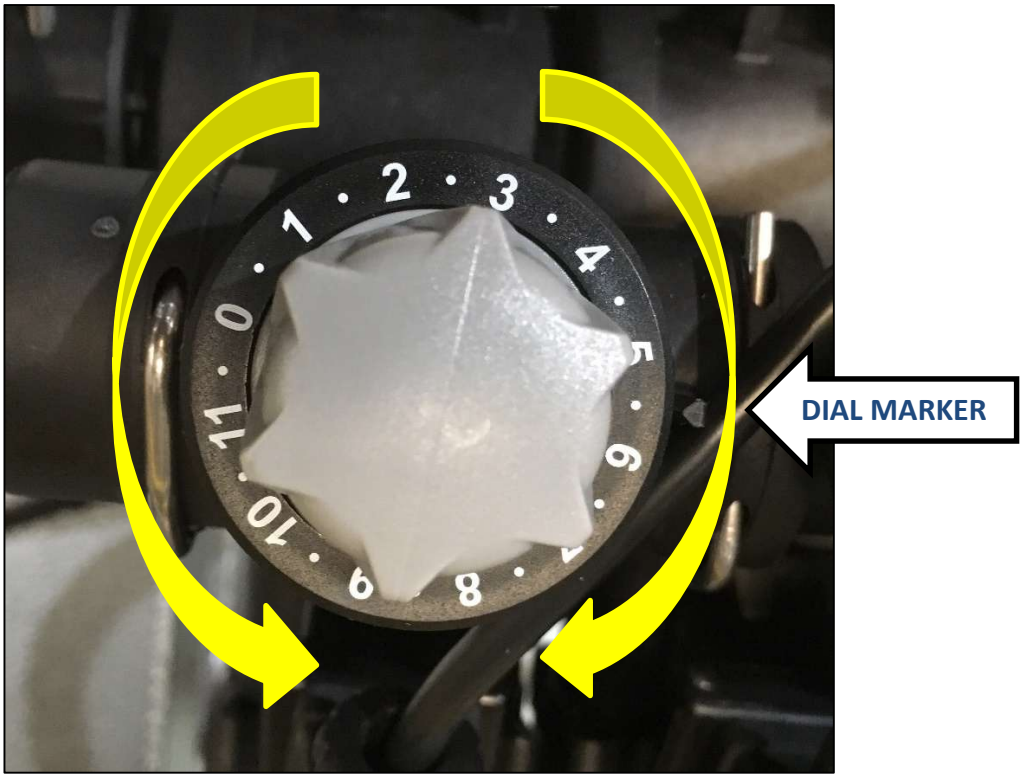
Ideally the pressure should be similar to pressure at typical operating rate and speed. Adjust pressure with the onscreen **–** and **+** buttons on screen if the pressure is too high or low.

4. Shut off section valve #1 by un-ticking the box and observe pressure.



- If pressure has increased, rotate the dial on the valve anti-clockwise until it drops to the level recorded in step 3.

- If pressure has decreased, rotate the dial clockwise until it increases to the level recorded in step 3.



5. **Repeat step 4 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.**