SurePoint™ Ag Systems

RFX™ Row Unit Suspension

RFX Hydraulic Downforce

Operator's Manual

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Abstract

The RFX Row Unit Suspension Operator's Manual provides comprehensive guidance for the setup, operation, and maintenance of SurePoint Ag Systems' RFX Row Unit Suspension. Designed to optimize planter performance across variable field conditions, the RFX system integrates individual row hydraulic control, accumulator-based pressure regulation, and system-wide uplift to maintain consistent seed depth and furrow integrity.

Table of Contents

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1. Introduction

1.1. End User License Agreement

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    Atwood, Kansas 67730
    USA
    Please include name of the product and the version number of the software in the request letter. This offer is valid to anyone in receipt of this information.

1.2. Warranty - SPA Standard

Warranty Policy

SurePoint Ag Systems, Inc. (hereinafter referred to as “SurePoint”) warrants the whole goods products it sells to be free from defects in material or workmanship for a period of one (1) year from the date of sale of the product(s) to the original user.

SurePoint warrants the parts it sells to be free from defects in material or workmanship for a period of ninety (90) days from the date of delivery of the product(s) to the original user. This shall include replacement parts installed by SurePoint.

Warranty of SurePoint whole goods and/or parts applies only to material and workmanship. Misuse, misapplication, neglect, alteration, accident, normal wear, or acts of God affecting SurePoint products are not eligible for warranty. Warranty shall apply only to the smallest reasonably serviced component (e.g. if a PWM solenoid fails on a hydraulic pump assembly, only the solenoid will be covered under warranty, not the entire pump assembly). In the event that multiple components are replaced, component warranty eligibility will be assessed once the parts are returned to SurePoint for determination of failure (parts determined to still be in working order will be returned to the dealer and warranty will not apply to those components).

1.2.1. Warranty Claims

A warranty claim and request to return defective product(s) must be presented to the SurePoint Support Department, describing the defect in material or workmanship of the product(s). This claim may be made via phone, e-mail, fax, or written request. Claims for warranty of whole goods or parts must also include proof of date of sale of the product(s) to the original user.

The SurePoint Support Department will proceed in making a preliminary decision as to the eligibility of the claim for warranty consideration. After the SurePoint Support Department deems it necessary to proceed with warranty consideration, a determination will be made as to whether or not the original product needs to be returned to SurePoint. In the event a return is deemed necessary, a Return Materials Authorization (RMA) will be generated by the SurePoint Support Department. The defective product(s) in question must be sent, freight prepaid, within fourteen (14) days of the discovery of the product failure and initial warranty claim. Replacement product(s) may be sent to the selling dealer, directly to the customer, or picked up at the SurePoint facility. At the discretion of the SurePoint Support Department, replacement product(s) may be sent prior to, or after, the SurePoint Returns Department receives the defective product(s).

NOTE

Any variation in the above procedure is at the sole discretion of the SurePoint Support Department.

SurePoint agrees to handle all warranty claims in a timely manner and will inform dealers of any revisions or modifications to the SurePoint Warranty Policy. Eligible warranty claims will be processed by SurePoint within sixty (60) days of receiving failed product(s).

If a warranty claim is found to be ineligible for warranty coverage, the SurePoint Support Department will be responsible to inform the dealer or end user in order to determine the course of action to be taken. SurePoint reserves the right to make changes in specification and design without notice and without incurring any obligations to owners of products previously sold.

1.3. Safety - General

Safety alert symbols found throughout this manual are used to call your attention to instructions involving your personal safety and the safety of others. Failure to follow these instructions can result in injury or death.

1.3.1. Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

1.3.2. Signal Words

Note the use of signal words, DANGER, WARNING, CAUTION, and NOTICE with safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER

DANGER indicates imminently hazardous situation that, if not avoided, can result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

WARNING

WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION

CAUTION indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

NOTICE is used to address safety practices not related to personal safety.

1.3.3. Personal Protective Equipment (PPE)

Wear clothing and personal protective equipment appropriate for the job. Wear steel-toed shoes when operating. Wear hearing protection when exposed to loud noises. Do not wear additional hearing impairment devices such as radio headphones, etc.

1.3.4. A Word to the Operator

It is your responsibility to read and understand the safety messages in this manual. You are the key to safety. Safety is your responsibility.

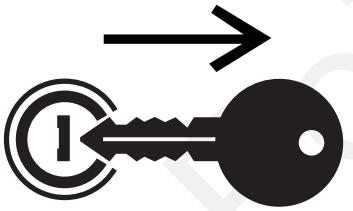
Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

1.3.5. Chemical Safety

Chemicals used in agricultural applications can be harmful to personal health and/or the environment if not used correctly. Always follow all label directions for effective, safe, and legal use of any chemicals.

1.3.6. Park Machine Safely

Before working on the machine:



- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap
- Display a "DO NOT OPERATE" tag in the operator station.

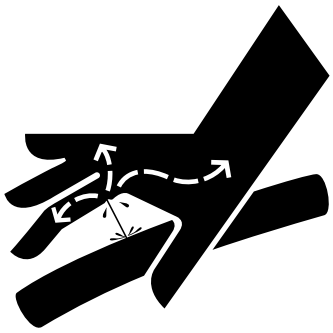
1.3.7. Follow Safety Instructions

Carefully read all safety messages in this instruction. Read the product operator's manual for operating instructions and safety messages. Do not let anyone operate without instruction.

1.3.8. Replace Safety Signs

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.

1.4. Safety - Hydraulic Fluid



DANGER
This system uses hydraulic equipment with hydraulic fluid under extremely high pressure.

Inspect hydraulic hoses periodically - at least once per year - for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with SurePoint approved replacement parts.

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately.

Safety - Accumulator

Escaping fluid or gas from pressurized hydraulic accumulator systems can cause serious injury.

Extreme heat can cause the accumulator to burst, and pressurized lines can be accidentally cut.

Do not weld or use a torch near a pressurized accumulator or pressurized line.

1.5. Safety Signs

Replace missing or damaged safety signs. Use this document for correct safety sign placement regarding this product.

There can be additional safety information contained on the implement or other parts and components sources from suppliers that is not reproduced in this document.

Cylinder & Accumulator Safety Signs

Left: Hydraulic Injection Warning label located on each RFX downforce cylinder.

WARNING
Do not pressurize system unless all row unit components are in place and depressurize system before performing service to avoid serious injury.

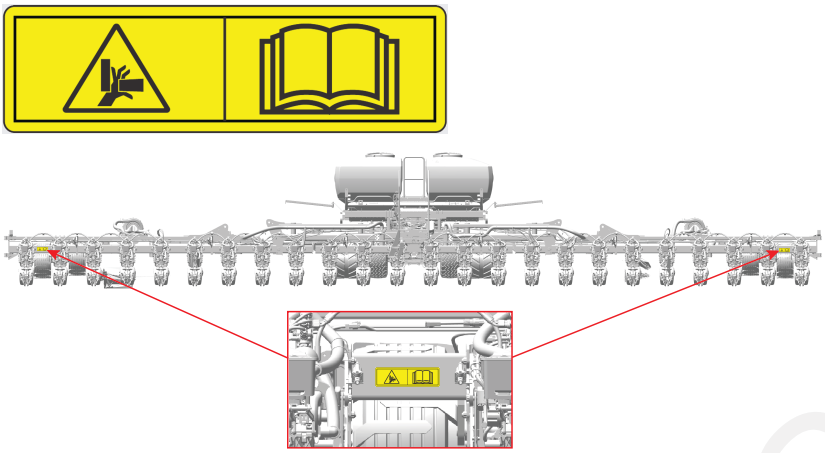
Serial Number Identification - Each RFX Cylinder has a unique Serial Number displayed directly below the hydraulic Warning label.

Right: Caution label located on each RFX downforce cylinder accumulator.

CAUTION
Relieve pressure from the hydraulic system before removing accumulator. Never attempt to relieve hydraulic system or accumulator pressure by loosening a fitting.

Safety Labels - Frame

Adhere decals to the rear of frame in locations show, smoothing out air pockets and ensuring view is not obstructed.



CAUTION

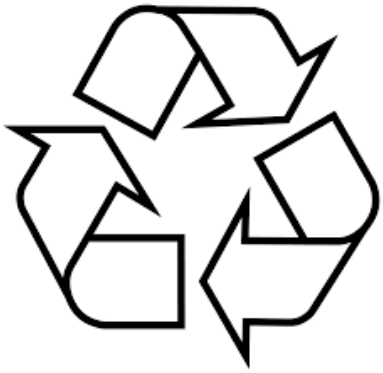
Avoid injury from machine movement or exposure to fluid under pressure.

Individual row downforce actuator has a hydraulic accumulator.

Refer to Operator's Manual and relieve all system hydraulic pressure before attempting service to actuator or its mounting.

1.6. Decommissioning

Proper Recycling and Disposal of Fluids and Components



Safety and environmental stewardship measures must be taken into account when decommissioning a machine and/or component. These measures include the following:

- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields, or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by disconnecting battery or electrical power, and releasing pressure in hydraulic components, accumulators, and other similar systems.
- Minimize exposure to components which may have residue from agricultural chemicals, such as fertilizers and pesticides. Handle and dispose of these components appropriately.
- Do not pour waste fluids onto the ground, down a drain, or into any water source.
- Observe all national, state, and local laws, regulations, or ordinances governing the handling or disposal of waste fluids, and other substances or parts. Burning of flammable fluids or components in other than specially designed incinerators may be prohibited by law and could result in exposure to harmful fumes or ashes.
- Evaluate recycling options for metal, plastic, rubber, and electronic components which may be recyclable, in part or completely.
- Contact your local environmental or recycling center, or your SurePoint Ag dealer for information on the proper way to recycle or dispose of waste.

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2. System Overview

Table 1. What's in the Box - Kits are implement specific.

Qty	Kit	Description
1 per system	ISO Cab Control Kit	ECU & harnessing
1 per system	Mounting Kit	QRUC Brackets & hardware
1 per row	RFX Cylinder Assy	Cylinder assembly with valves & sensor
1 per row	Load Pin Kit	Load pin sensor
1 per system	RFX Harness Kit	Various extension harnesses
1 per system	Hyd Hose Kit, Sup/Ret	Supply & Return hoses & fittings, tractor to RFX block.
1 per system	Hyd Fitting Service Kit	Hydraulic fittings. Misc and spare.
1 per system	Hyd Hose Kit, Row to Row	Row to row hydraulic hoses. Cylinder to Cylinder
1 per system	Hyd Block Kit	Control block, mount, & fittings
1 per system	Draft Arm Mounting Kit	Brackets and hardware for mounting supply & return hoses
1 per row*	Lower parallel mounting	Lower parallel arms/inserts & hardware
1 per row*	Upper cylinder mount	Upper cylinder mount bracket & hardware
1 per row*	Upper parallel arm kit	Upper parallel arms & hardware
1 per system*	ISO adapter	ISO adapter 12+2 to 9 or 9 to 12+2
1 per system*	ISO Auxiliary power kit	Anderson power harness, relay & extension
1 per 4 rows	4 Row Section (QRUC)	QRUC Module & harnessing
* Optional kits depending on implement setup		
See Installation Guide and/or sales order for exact kit part numbers.		

2.1. System Requirements

SurePoint's RFX Row Unit Suspension System is compatible with most ISOBUS VT displays. Model Year 2026 systems are compatible with John Deere XP or ME5 row units, and Kinze planters 3000 row units.

2.1.1. Hydraulic Requirements

RFX Row Unit Suspension requires a continuous flow of hydraulic from the tractor and consumes 0.35 gallon per minute, per row. Typically, a complete system requires 6-9 gallons per minute of flow at 2500 PSI.

Table 2. Hyd Hose Sizing

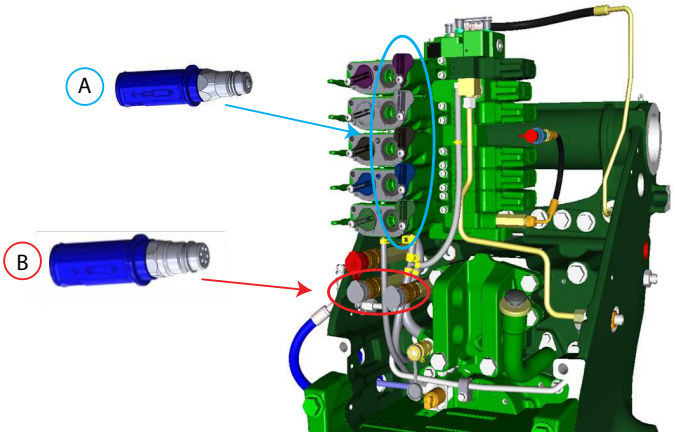
Hose Type	Hose size, Dash No. (I.D.)
0-36 Rows Supply & Return, Tractor to RFX Block	-8, (1/2")
37-48 Rows Supply & Return, Tractor to RFX Block	-10, (5/8")
RFX Block to Cylinder/Rows (all)	-6, (3/8")

2.1.2. Connecting to Tractor Hydraulics

Below are the preferred methods of connecting the hydraulic supply and return from the tractor for the RFX system.

Preferred Method #1

Connect Supply to SCV and Return to Motor Return

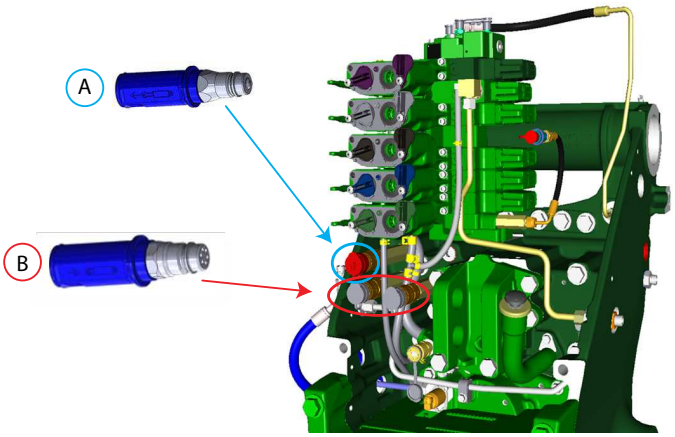


A. Connect Supply connector to SCV Port.
B. Connect Return connector to Motor Return Port.

NOTE
SCV must be detent to Continuous ON

Preferred Method #2

Connect Supply to Power Beyond and Return to Motor Return

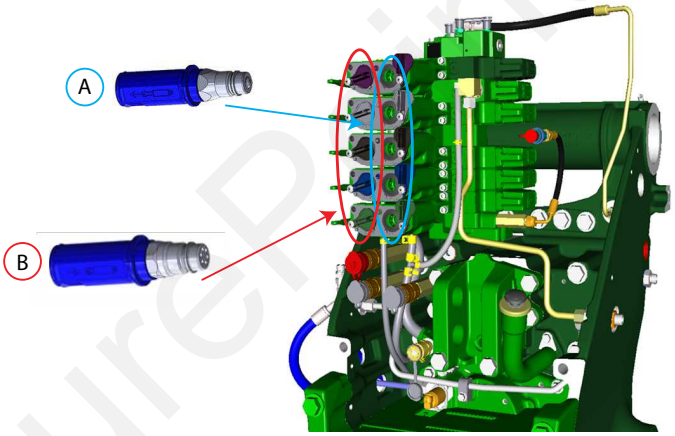


A. Connect Supply connector to Power Beyond Port.
B. Connect Return (salt & pepper) connector to Motor Return Port.

NOTE
SCV must be stroked to engage Power Beyond.

Preferred Method #3

Connect Supply and Return to SCV Port



1. Connect Supply to SCV Port.
2. Connect Return to a SCV Port.

NOTE
SCV must be detent to Continuous ON

NOTE
When utilizing Method #3, it is important to place the SCV in the **Float** position when the RFX system is not in use. This is the only way to relieve stored pressure from the accumulator prior to storing or servicing the RFX system.

2.1.3. Electrical System

RFX requires 12 Volts DC power supplied through the ISOBUS connection. When using more than 16 rows, an additional auxiliary power supply is required from the tractor. See below for more details when needing auxiliary power.

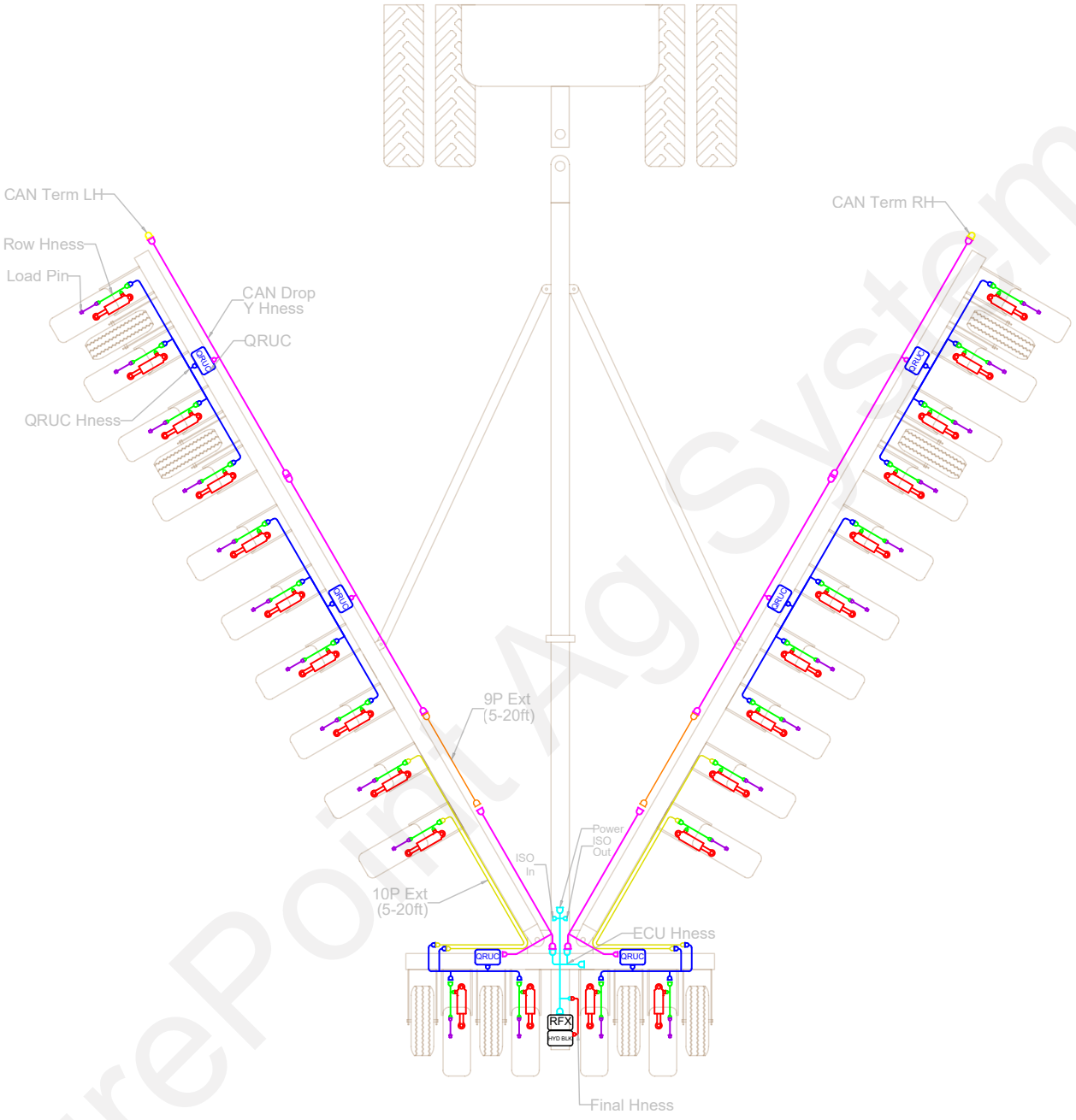
Table 3. RFX Electrical Supply Requirements

System Size	Power Req'd	Add'l Info
0-16 Rows	1 Amp per Row, <16A @ 12VDC	Through ISOBUS Connection/Harness
17-36 Rows	1 Amp per Row, >17A @ 12VDC	Requires auxiliary power harness, relay and extension

When auxiliary power is required, a power harness, relay, and extension are available. The power source will need to be connected to a key-switched power with appropriate load capability depending on size of implement. RFX uses constant power even when not in use, so connecting directly to battery is NOT an option. The power source chosen needs to disconnect when the implement is not in use.

NOTICE
If power is not shut off, the RFX system will continue to draw from power source and drain the battery.

Electrical Architecture



2.2. Installation Overview

Below are 10 generic steps to install a complete RFX system. For more detailed installation instructions, visit SurePoint Ag Support Site, and locate the Installation Guide for your planter frame.

Prior to installation, remove all previous downforce systems (springs, airbags, cylinders) and associated wiring and plumbing. If replacing existing hydraulic downforce, skip step 4. The RFX cylinder is a direct drop-in replacement for other hydraulic downforce cylinders without modifying mounting bracketry.

1. Install supply & return hydraulic hoses and harnesses from hitch to rear of planter. Use external draft arm mounting brackets if supplied.
2. Mount hydraulic block and ECU. Hydraulic block will mount at center rear of the planter, typically on the rear hitch tube. ECU mounts above hydraulic block on supplied bracket.
3. Mount QRUC brackets and modules. Each QRUC controls 4 rows of RFX starting at the left of the planter and is mounted directly to the toolbar. Specific QRUC mounting bracket and location varies based on planter frame and other obstacles on the toolbar.
4. Install cylinder mounts and parallel arms, if applicable. If planter previously had springs or airbags, upper and lower cylinder mounts will need to be installed. In addition, SurePoint offers upper parallel arms and hardware to install at this time.

   CAUTION
   Row units/shanks are heavy. Use an appropriate device to lift and support them when replacing parallel arms.

5. Install RFX cylinders. Use supplied pins, washers, and keepers to fully install RFX cylinder at each row.
6. Replace walking depth stop. Remove and discard existing walking depth stop. Replace with supplied walking depth stop and load pin at each row. Route the harness toward the front of the shank while avoiding pinch points that might cause damage. It might be applicable to replace T-handle on load pin with existing T-handle.
7. Route and connect all harnessing. Connect ECU Control harness to RFX ECU, ISOBUS, height switch, auxilary power (if required), and pressure.
   Connect RFX Final harness to ECU Control harness and to Pressure sensor(s) and PWM control valve(s) located on the hydraulic block.
   Connect adapter harness to CAN right or left on ECU Control harness and route through foldpoint and connect to QRUC(s). Extension harnesses may be needed depending on planter frame and/or location of QRUC.
   Connect QRUC harness to QRUC module and route to each row unit.
   Connect RFX Row harness to QRUC harness and then to RFX cylinder valves and sensors.
8. Route and connect most hydraulic hoses. Route all hydraulic hoses labeled Tee Connection, Foldpoint, Foldpoint Tee, Center to RFX Block, and Uplift to RFX Block. Assemble all fittings for hydraulic block and connect hoses, including the supply and return hoses from Step 1.
9. Connect all row to row hydraulic hoses to RFX Cylinders. Pressure and return row to row hoses are QuickLoc push-to-connect fittings. These fittings require pushing until they lock into place. Once installed the only method of removal is by unthreading the fitting directly in the cylinder. Install plugs or caps on RFX cylinder ports that don't require a fitting or hose.
10. Connect electrical harnesses and hydraulic hoses to tractor and test system. See RFX Operator's Manual for details.

3. ISOBUS

3.1. RFX VT Icon Definitions

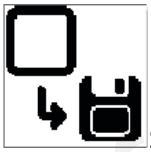
RFX (Home) icon - Returns to the main run/home screen


Wrench/Screwdriver Setup icon - Navigates to the Setup screen to modify most product settings.


Sunburst icon - Navigates to the Software screen to view software version and serial numbers, plus most VT settings.


Next Page icon - Toggles to the next page.

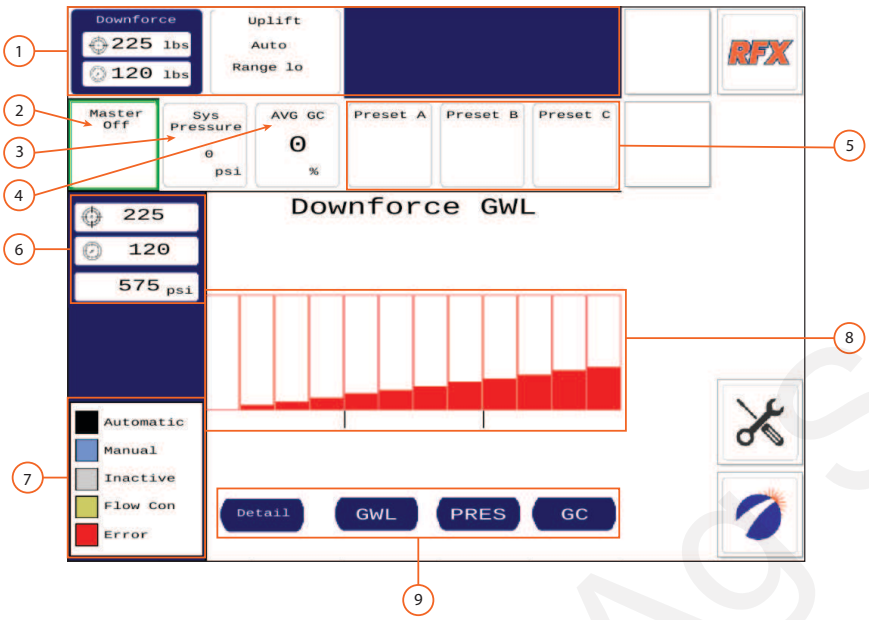

Last Page icon - Toggles to the previous page.


Save to this VT - When more than one display is available, this saves RFX as the current display.

3.2. User Screens

3.2.1. RFX Home Page

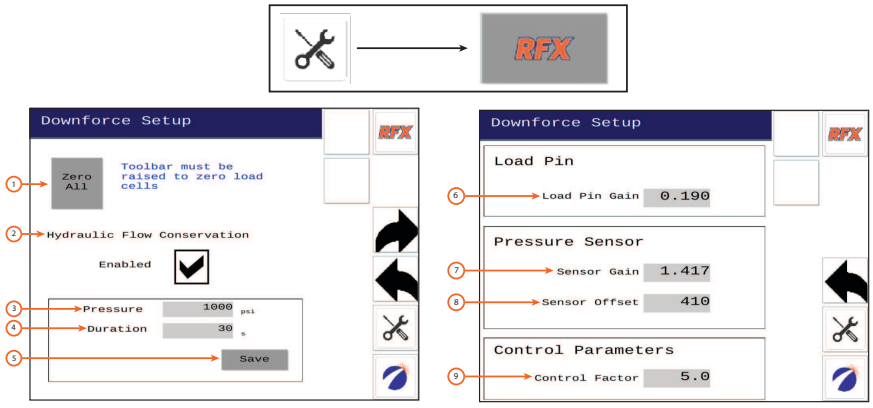
Figure 1.



1. Top row are buttons that when pressed will populate the home screen. Downforce, Uplift, and Row Cleaner are the options.
2. Master On/Off - Will show as GREEN when system is engaged, or GREY when system is disengaged. It can be controlled by the soft button, master switch, or height switch. To modify these options, go to System Start/Stop Options page.
3. Sys Pressure - Shows the System Pressure in Pounds per square inch (PSI), measured at the RFX Control Block.
4. AVG GC - Shows the Average Ground Contact in percentage of the system. Best practice is for this to be close to 100, but with minor fluctuation. If never below 100%, there is too much downforce, if always below 100%, there is too little downforce.
5. Presets - Press desired preset to use as a quick change to modify any system settings. To modify a preset setting, go to the Presets page.
6. System readout - Three settings always present, top is target load in lbs, middle is actual load in lbs, bottom is cylinder pressure in PSI.
7. Color legend - Shows the five different colors possible on the home screen graph. **Black** = Automatic or Normal, **Blue** = Manual, **Grey** = Inactive or OFF, **Gold** = Flow conservation mode, **Red** = Error or Alarm present.
8. Graph Display - Shows the current display graph depending on which is selected from the display buttons. Row One starts at the left-hand side.
9. Display buttons - Press either of the right three buttons to view each function; **GWL** = Ground Wheel Load, **PRES** = Downforce Pressure, **GC** = Ground Contact. The **Detail** button navigates to color-coded page of each row where you can navigate to more specific row settings.

3.2.2. Downforce Setup

Figure 2.



1. Zero All - Press this button to zero all load cells of the downforce system.

> **IMPORTANT**
> Toolbar must be in the raised position with no ground contact before pressing this button.

2. Hydraulic Flow Conservation Enabled - Check this box to enable this setting. Hydraulic Flow Conservation is a feature that allows the system to maintain active pressure for a period of time to prevent lag in start-up or building pressure in the system when placing toolbar in the ground. Often this is best utilized during turns at endrows, or other times when your toolbar will be up for a short time.
3. Pressure - Pressure setting, PSI, when Hydraulic Flow Conservation is active.
4. Duration - Period of time, seconds, when Hydraulic Flow Conservation is active.

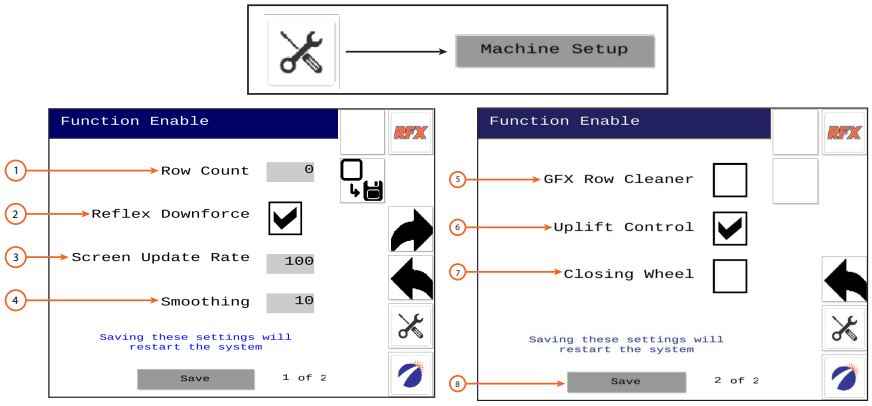
> **NOTE**
> Once master switch is toggled ON, the system resumes normal settings. If set duration lapses, or master is toggled OFF, the system will deactivate and lose system pressure.

5. Save - Press to save downforce setup changes.
6. Load Pin Gain - Default = 0.190
7. Pressure Sensor Gain - Default = 1.417
8. Pressure Sensor Offset - Default = 410
9. Control Factor - Default = 5.0

> **IMPORTANT**
> Do not modify any of the four above settings without consulting or being instructed by your SurePoint Dealer or Representative.

3.2.3. Machine Setup (Function Enable)

Figure 3.



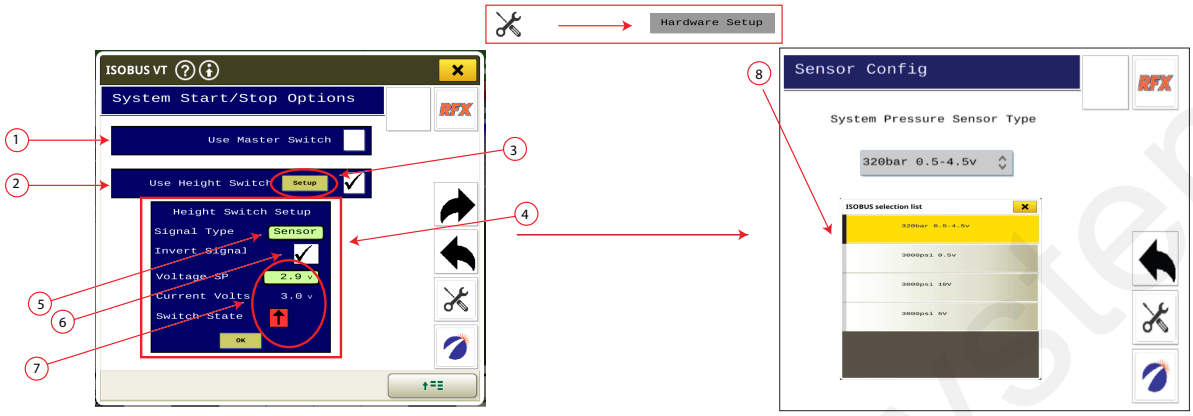
This page is also accessible from the popup prompt at startup when selecting 'Configure Setup Now'.

1. Row Count - Number of rows on planter
2. Reflex Downforce - Check to enable RFX Downforce.
3. Screen Update Rate - Default = 100
4. Smoothing - Default = 5
5. GFX Row Cleaner - Check to enable GFX Row Cleaner.
6. Uplift Control - Check to enable Uplift control.
7. Closing Wheel - Not used at this time.
8. Save - Makes actual changes to the VT. This will reboot the system.

IMPORTANT
Must press Save to enable any changes!

3.2.4. Hardware Setup

Figure 4.



From the home screen, press wrench/screwdriver, then 'hardware setup' to navigate to this page.

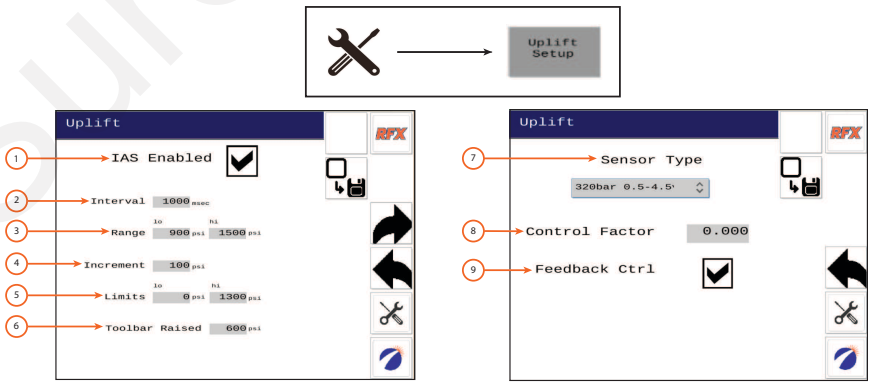
1. Master Switch - Check the box to enable a master switch, such as a foot pedal switch.
2. Height Switch - Check the box to enable a height switch.

> **NOTE**
> RFX Must have height switch present to operate.

3. Height Switch Setup - Press to configure height switch settings shown in #4.
4. Height Switch Configuration
5. Height Switch Signal Type - Toggle between switch or sensor.
6. Invert Signal - Check to invert signal of height switch.
7. Sensor readings - Voltage setting to trigger height switch sensor, Voltage reading of current state of height switch sensor and current implement state, raised or lowered.
8. Pressure Sensor Configuration - Press drop down menu to change the pressure sensor type. 320 bar 0.5 - 4.5V is default.

3.2.5. Uplift

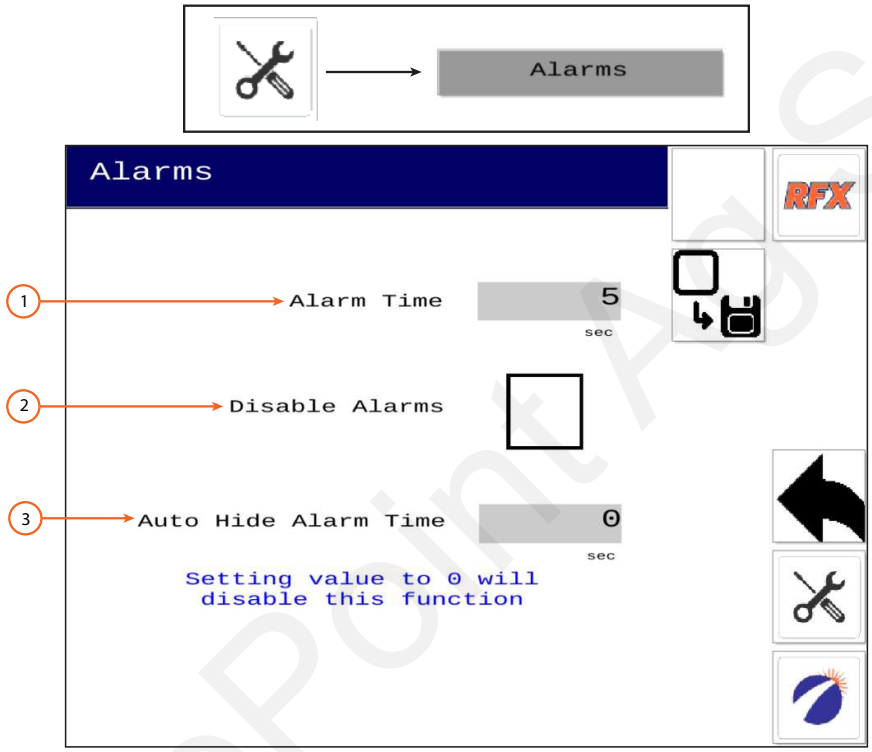
Figure 5.



1. IAS Enabled - Check or Un-Check this box to toggle IAS on or off. IAS is the Automatic control loop of the Uplift function of RFX and calculates how much uplift is needed to optimize the functionality of the entire system.
2. Interval - The frequency which uplift is calculated, default is 1000 msec.
3. Range - The cylinder pressure threshold. Default is 900-1500 PSI.
4. Increment - The amount the pressure will increase or decrease each time its commanded to change. Default is 100 PSI.
5. Limits - The high and low pressure settings for the system. Default for CCS planters = 0-1300 PSI; Default for 3BU Hoppers = 500-1200 PSI.
6. Toolbar Raised - The cylinder pressure when toolbar is raised.

3.2.6. Alarms

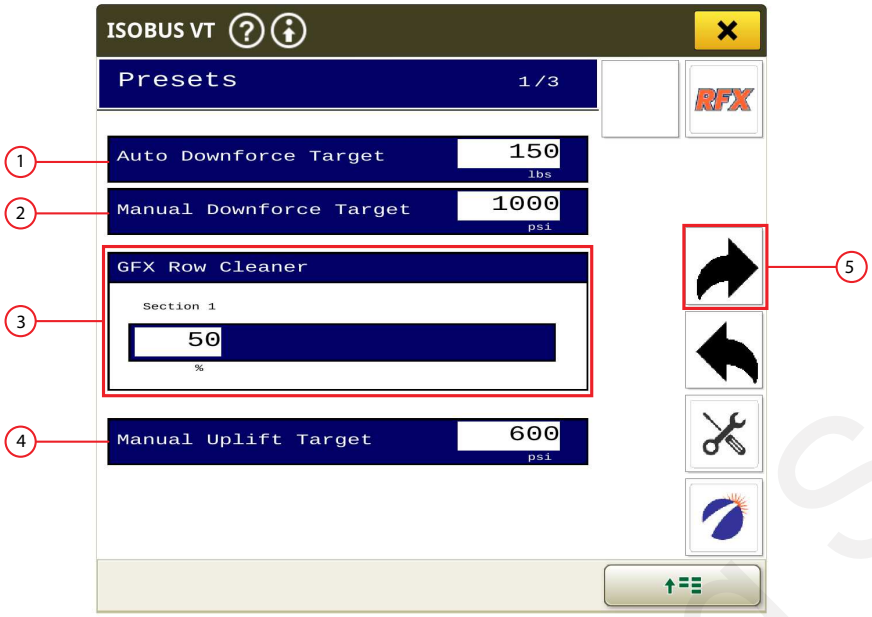
Figure 6.



1. Alarm Time - Duration when a fault is present before the alarm activates. Default = 5 seconds
2. Disable Alarm - Check to disable all Alarms
3. Auto Hide Alarm Time - Duration of time in which an active alarm will auto hide. Default = 0 seconds which disables this function.

3.2.7. Presets

Figure 7.



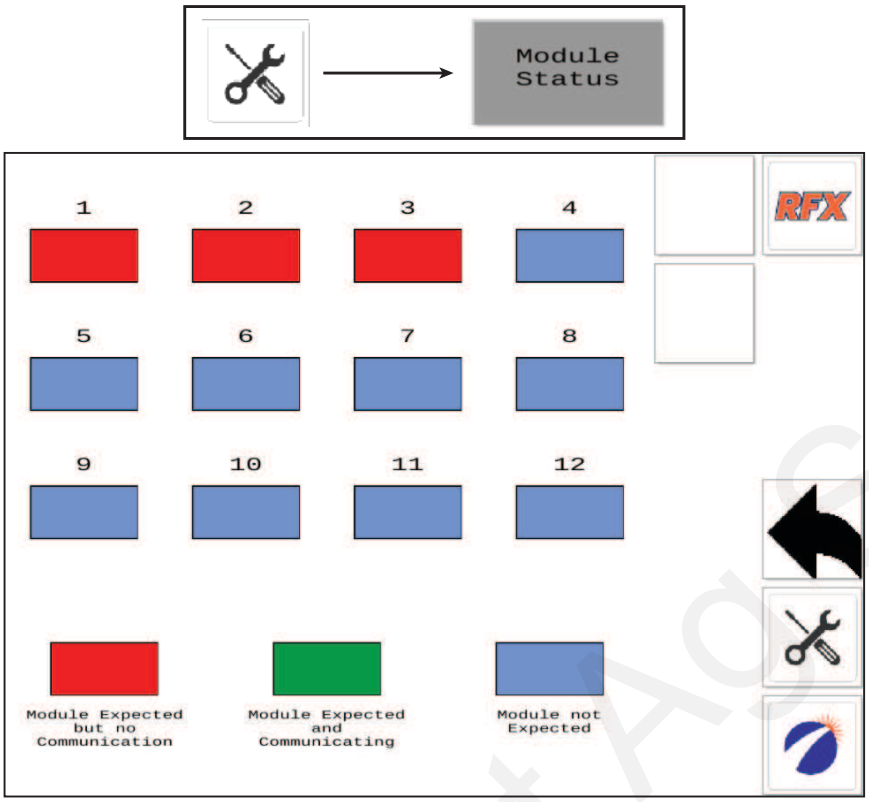
1. Auto Downforce Target - Amount of downforce, lbs, the system is controlling to when in Auto mode.
2. Manual Downforce Target - Amount of downforce, cylinder pressure, the system is controlling to when in Manual mode.
3. GFX Row Cleaner - Percent pressure for each section (if applicable)

> **NOTE**
> GFX Row Cleaners must be present and activated to use this function.

4. Manual Uplift Target - Uplift pressure when in Manual mode.
5. Save button - Must press save for each preset before leaving the page.
6. Toggle to next page to input settings for presets 2 and 3.

3.2.8. Module Status

Figure 8.

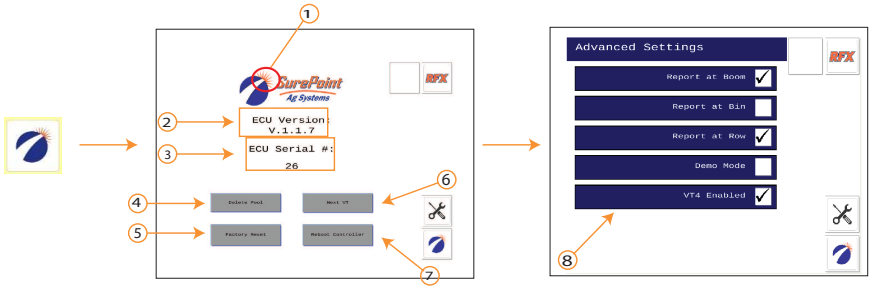


The Module Status page is to check on each module and its communication status. Each module controls four rows. Module 1 controlling rows 1-4, Module 2 controlling rows 5-8, and so on.

- RED - Module expected but no communication
- GREEN - Module expected and communicating
- BLUE - Module not expected

3.2.9. Auxiliary Settings

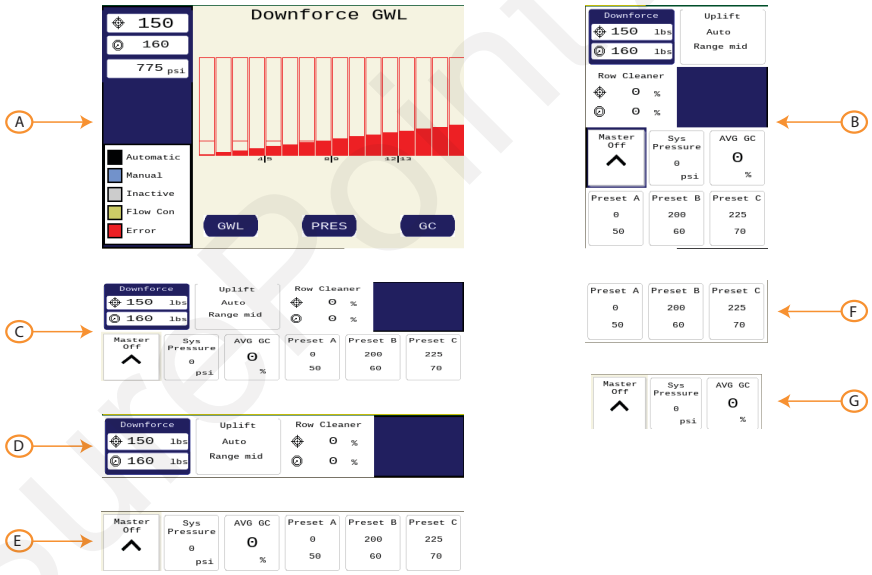
Figure 9.



From the home screen press the SurePoint icon to naigate to the Auxiliary Settings

1. Press the starburst area of logo to access Advanced Settings (#8)
2. ECU Version - shows the current ECU software version
3. ECU Serial # - Shows the Serial number of ECU
4. Delete Pool - Deletes the current object pool on the VT and forces the monitor to regenerate the display when rebooted.
5. Factory Reset - Restores RFX controller to factory default settings
6. Next VT - Sends RFX to another VT when more than one display is used.
7. Reboot Controller - Restart RFX on the VT
8. Advanced Settings - Enable VT4 to utilize split screen widgets on the VT Display. Contact SurePoint or your dealer prior to changing any other settings.

Figure 10. RFX Split Screen Widgets



Current split screen widget options for RFX. Use these to configure your display as desired.

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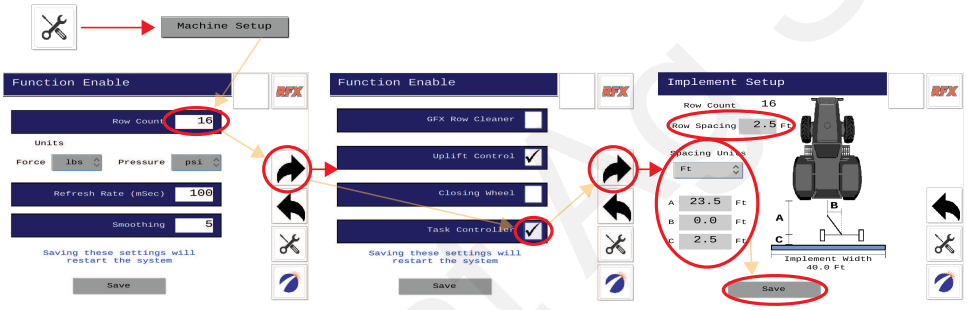
4. Setup & Operation

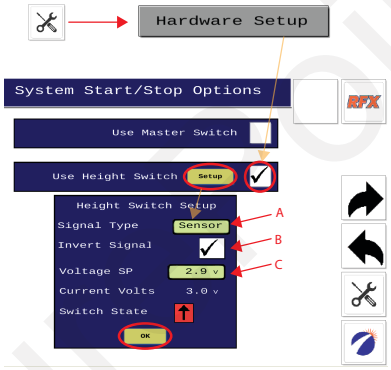
4.1. Start-Up Procedure

1. Connect RFX system to the tractor. Hook up hydraulic supply and return hoses to appropriate ports. See Connecting to Tractor Hydraulics [16] for preferred hydraulic source. Connect electrical harnesses including ISOBUS connector, Anderson Power harness (if equipped) and master switch (if used).
2. Turn on tractor and load RFX on the VT

3. Go to **Machine Setup** and input number of rows, Enable Task Control if desired, and input Implement Setup dimensions. Press 'Save' when complete. The RFX controller will reboot on the VT. This will take several seconds.



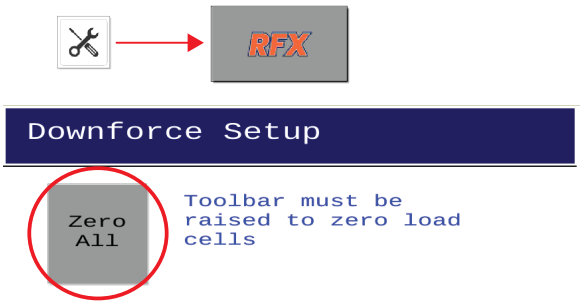
4. Setup and calibrate **Height Switch**.



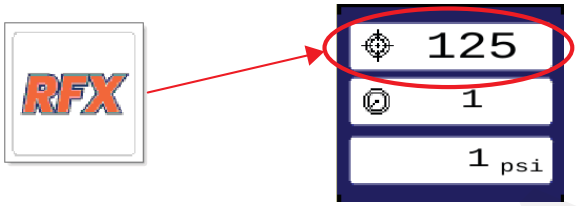
   a. Navigate to **Hardware Setup** page and select **switch** type for push button or **sensor** type if using potentiometer by pressing the setup button.
   b. Invert signal if switch state arrow does not match the position of the planter frame.
   c. If sensor - calibrate setpoint to desired position. Lower planter frame until guage wheels contact the ground. Enter the current voltage in the setpoint box.
   d. Raise and lower planter multiple times and monitor the switch state arrow. Adjust voltage setpoint as desired.
5. Activate hydraulic system and ensure **system pressure** is greater than **2650 psi**.

> **NOTE**
> Increase tractor RPM and/or SCV flow to achieve adequate pressure.

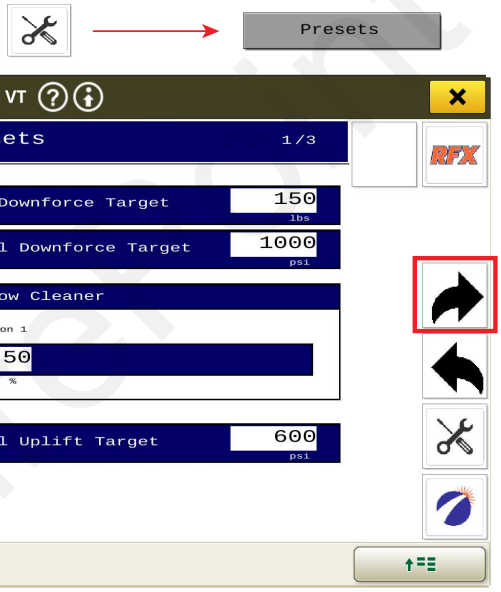
6. Bleed hydraulic system. See Hydraulic Circuit Bleeding [36] for detailed instructions
7. Zero all load pins



8. Input target downforce



9. Configure **Presets** buttons as desired. Enter the auto downforce target and hit next arrow to setup all 3 presets. Presets show at the top right of the Home Screen. 

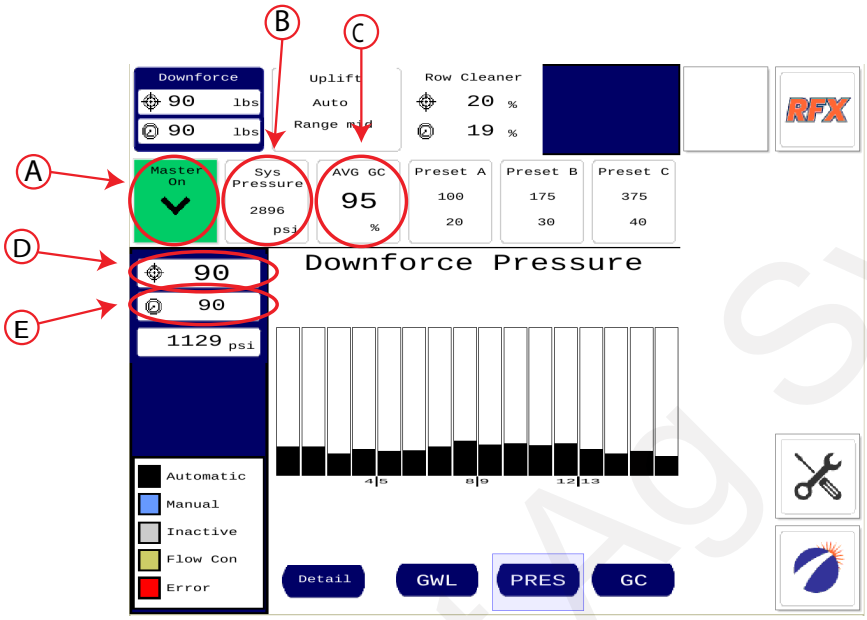


10. Input Uplift settings

4.2. In-Field Testing

Once initial setup has been established, it is recommended to test the RFX system in the field prior to planting. Be prepared to operate the planter in the ground for a short run. It would be preferred to operate the planter over 2-5 acres to confirm proper function as listed below.

1. Ensure the system is connected to the tractor and start-up procedure has been completed.
2. Lower the planter frame to activate the RFX system.
3. Verify the following readings from the RFX run screen as shown below:

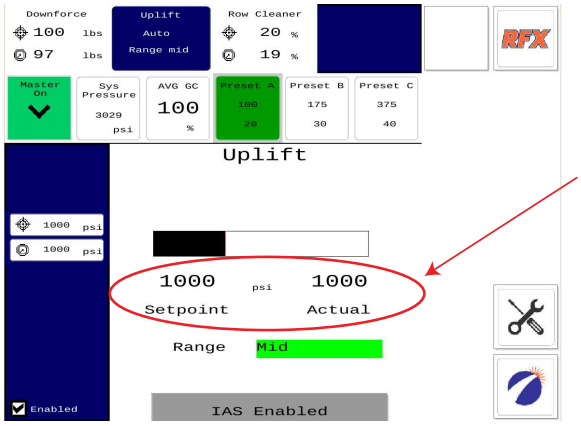


A. Ensure Master Switch is ON and implement arrow is DOWN
B. Verify System Pressure is greater than 2500 PSI
C. Watch that Average Ground Contact maintains 94-99%

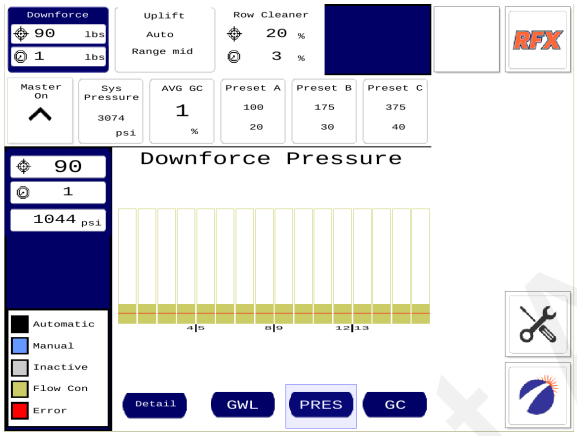
> **TIP**
> This will help adjust target downforce. Visually inspect the trench to determine desired setting.

D. Set Target Guage Wheel Load
E. Verify Actual Guage Wheel Load is obtained

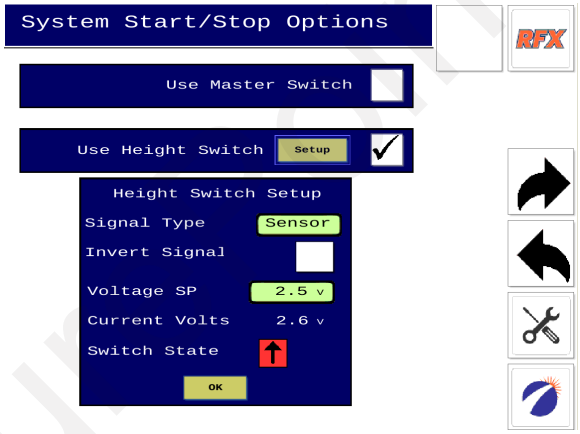
4. Verify the uplift target is achieved.



5. Lift the implement and verify flow conservation mode is active.



6. Ensure height switch is functioning properly and and calibrated.



4.3. Hydraulic Circuit Bleeding

NOTE
It is recommended to utilize the following procedure to flush the RFX hydraulic circuit each time the planter is hydraulically connected to the tractor, or after any service procedure is performed.

1. Turn off the tractor
2. Connect the RFX hoses to the tractor, following recommended connections in this manual.
3. Remove dust covers from RFX cylinder fittings and attach the loop hose.
4. Keep bystanders clear and start the tractor.
5. Engage SCV to continuous detent postion in order for the tractor to reach high pump pressure.
6. Engage RFX master switch to the ON position.
7. Lower the planter to activate RFX.
8. Increase engine rpm to high idle and allow hydraulics to flush for a minimum of two minutes. Raise and lower the planter 2-3 times during this two minutes.
9. Raise planter and disengage the SCV and place in the float postition. Reduce engine to low idle.
10. Monitor system pressure and cylinder pressure and ensure it decreases below 50 psi.
11. Shut off the tractor and disconnect the loop hose.
12. Reinstall dust covers and store the loop hose.
13. Repeat steps for each section.

5. Maintenance & Storage

When storing the RFX system when not in use it is important to relieve all hydraulic pressure from the system, including allowing the accumulators to de-energize. This can lead to personal injury or accelerated hose wear and damage if not done properly.

To relieve hydraulic pressure, place the SCV in the Float position for a minimum of 5 minutes prior to turning off the tractor. Monitor the System Pressure and Cylinder Pressure to ensure these are both below 50 psi prior to storing or servicing the system.

CAUTION
Failure to relieve hydraulic pressure can cause injury when attempting to service the RFX system while under pressure.

Inspect the RFX System

Visually inspect all components of the RFX system daily, and more in-depth seasonally.

Check hydraulic hoses for wear, abraisions, or leaks.

Check cylinders, hydraulic manifold, and fittings for leaks.

Inspect harness, hydraulic hoses, and connections for damage or obstructions when folding and unfolding the planter frame.

5.1. Parts

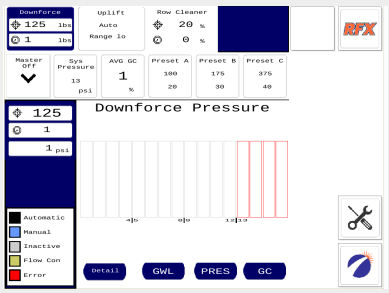
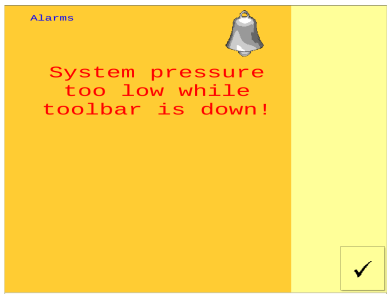
Below are common components that may need serviced or replaced. Visit SurePoint Ag Webstore or contact your local dealer to purchase.

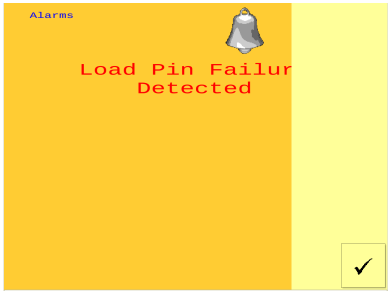
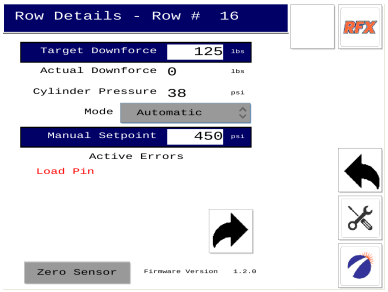
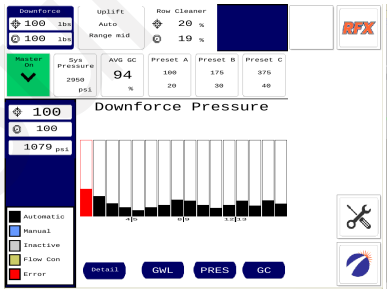
Table 4. RFX Components

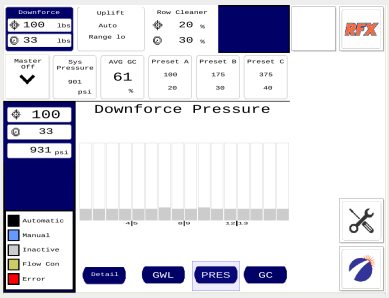
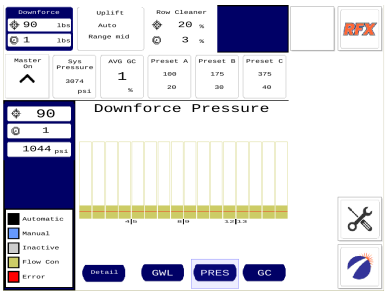
Image	Part No.	Description
	416-6733Y1	Coil, RFX Cylinder
	416-6732Y1	Valve, RFX Cylinder Poppet
	759-6469Y1	Sensor, Pressure Transducer
	416-6862Y1	Coil, RFX Manifold
	416-6861Y1	Valve, RFX Manifold
	416-6204Y1	Accumulator, RFX
	208-12-6492Y2	Row Harness, RFX
	417-6445Y1	Load Pin Sensor Assembly, JD Style

6. Troubleshooting

Table 5. RFX Troubleshooting

Symptom	Problem	Solution
No system pressure		
4 Rows Red/QRUC LOS alarm 	CAN connection issue	Check wiring/connections for signal loss. Verify battery voltage is >12V
Low System Pressure Alarm 	System Pressure Low	Turn on SVC Turn up SVC-more flow Check System Pressure Sensor and Wiring. Ensure min Pressure > 2650psi Confirm supply and return hoses are connected properly.
Loss of Ground Contact Alarm 	Load Pin Harness Damaged QRUC or Row Final harness damaged	Zero Load Pin Replace Load Pin Replace Damaged Harness

Symptom	Problem	Solution
Load Pin Failure Alarm 	QRUC or Row Final harness damaged. Load Pin Malfunction 	Attempt to Zero Load Pin Repair/Replace damaged harness Replace load pin.
	No Ground Contact	Increase downforce setting. Check planter depth- load pin not engaging with guage wheels. Planting too shallow, on top of soil/ rocks
Loss of Ground Contact Alarm 	Cylinder Pressure too low. Load pin malfunction	Verify cylinder pressure is adequate. Check Load Pin connection and harness. Replace Load Pin
GWL low/zero (single row)	Downforce Target not enough	Slow down Increase Downforce Target setting
Planter up, showing GWL	Need to calibrate load pin Debris/Mud buildup around load pin	Zero load pin(s) Clear debris from row unit.
Cyl Pres High (single row)	Row harness connection incorrect Valve coil malfunction	Check pres/return valve connections Check valve coil
Bar graph RED. Row detail, observe alarm type 	Load Pin malfunction out of range.	Check Load Pin connection and harness. Zero Load Pin Replace Load Pin Place row in manual mode to gain control.
	Cyl pressure sensor malfunction out of range.	Check harness, replace sensor. Warning for relieve pressure.
	CAN loss of comm.	Check wiring/connectors for signal loss.

Symptom	Problem	Solution
Bar graph GREY 	Rows or Rows not active	Master is not on or height switch is not down
Bar graph GOLD 	Flow conservation mode.	This condition is correct if downforce was active and the implement was just raised.
Row or rows won't achieve target GWL	Dowforce setting too light Ground too hard. Guage wheels not engaging load pin Inspect row unit for damage Driving too fast Vee opener dull or worn out	Increase Target GWL Check planter depth - increase Repair or adjust row unit as needed. Slow down Replace Vee openers
QRUC communication loss alarm 	Communication needs re-established. Terminator damaged or not present. QRUC is not connected Battery voltage too low No auxiliary power source	Cycle power Install or replace terminators Repair/replace wiring Charge or change battery source. Install auxiliary power source.
No Hyd System Pressure	No return to tank	Reconnect hoses in correct order on SVC. Ensure return is to tank. Verify pressure at guage Verify wiring intact to pressure sensor.
No Hyd System Pressure. Master is ON implement down	No fluid present at manifold	Supply Hydraulic pressure to system or check for leaks, SCV status

Symptom	Problem	Solution
Cylinder pressure present after turning system off	SVC off - can't return fluid	Place SCV in float. Perform key on, engine off SCV activation to releive pressure.