



**396-3563Y1**

# QuickStart setup instructions for JDRC 2000 and SureFire harness for 2 Liquid/Dry Products

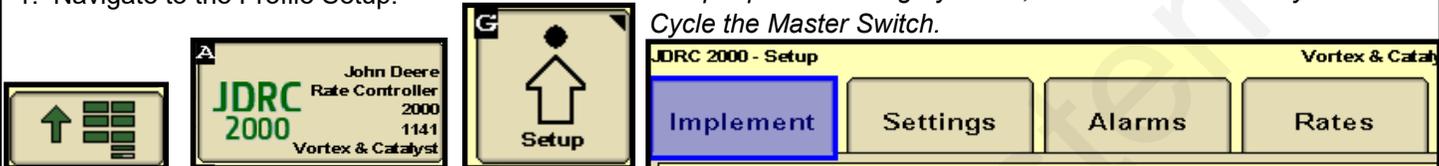
213-00-3453Y\_ 213-00-3538Y\_ 213-00-3467Y\_ 213-00-3585Y\_

Below are typical SureFire Liquid Fertilizer System setup screens. *Your setup may vary. Not all screens are shown.*

**NOTICE** See the John Deere JDRC 2000 Operator's Manual and the SureFire system manual for safety information and additional setup/operating information.

1. Navigate to the Profile Setup.

*Setup Tip: If a box is grayed out, the Master Switch may be on. Cycle the Master Switch.*

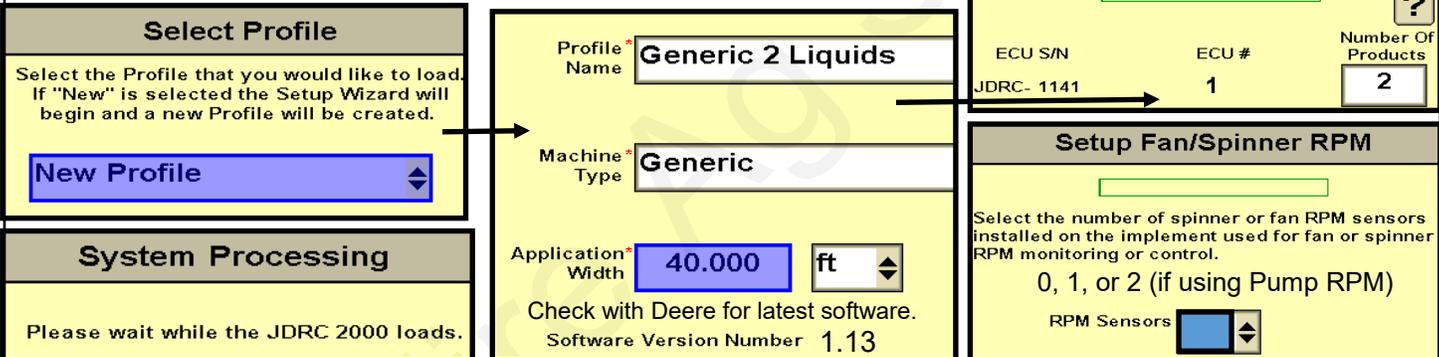


For initial setup, start a new profile. The JDRC 2000 allows you to store 8 profiles. Be prepared to wait a little.

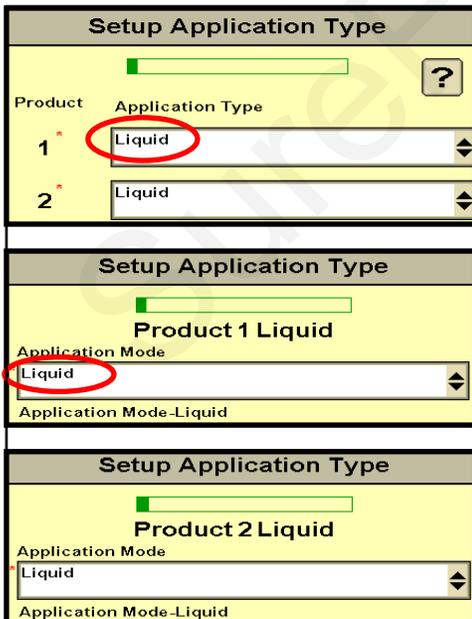
2. Enter a Profile Name. Machine Type—Generic. Software Version (check with JD dealer for latest software)

3. Number of Products = 2.

4. RPM Sensors—0, 1, or 2 (PumpRight hydraulic pumps can have RPM sensor)



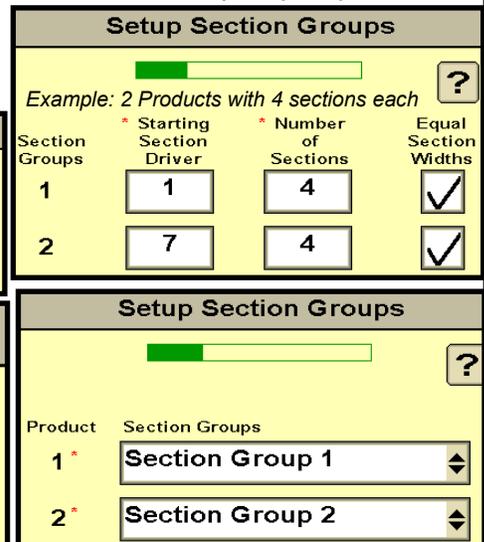
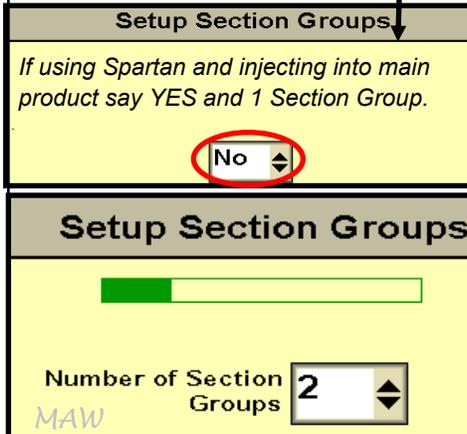
5. Select Application Type and Application Mode.



6. Set up Section Groups. Section Group 2 may start with Section Driver 7.

*Other Section Setups are possible. The standard SureFire harness has Sections 1-6 with Product 1, and Sections 7-12 with Product 2.*

*Your setup may vary.*



# QuickStart setup instructions for JDRC 2000 and SureFire: Two Products

Use with SureFire adapter harness: 213-00-3453Y\_ or 3467Y\_ or 3538Y\_ or 3585Y\_

7. The SureFire pressure sensor will be set up as a **Custom** sensor. Calibration will be done later.

### Setup Pressure Sensors

Pressure Sensor 1: Custom

Pressure Sensor 2: Custom

Pressure Sensor 3: None

### Setup Sensor Assignment

Pressure Sensor 1

Product 1

### Setup Pressure Alarms

*Hydraulic setting shown. Leave all at 0 for electric pump.*

	Minimum	Maximum	Alarm
Pressure 1 (psi)	0	85	<input checked="" type="checkbox"/>
Pressure 2 (psi)	0	85	<input checked="" type="checkbox"/>

Checking the Alarm box will keep the system from going above 85 PSI. The system would work fine up to 95 PSI, but if it is running this high, check for restrictions on the outlet side of the system and check to see if a larger diameter (or shorter) metering tube pair is needed.

8. Optional Aux Functions—RPM Sensors (RPM Sensors will be on hydraulic pumps)

### Setup Aux Functions

RPM 1 Calibration Pulses/Rev: 15

RPM 1 Low Limit (rpm): 0

RPM 1 High Limit (rpm): 500

RPM 2 Calibration Pulses/Rev: 15

RPM 2 Low Limit (rpm): 0

RPM 2 High Limit (rpm): 500

### Setup RPM Sensor Assignment

RPM Sensor 1

Product 1

This QuickStart Card is a supplement to the full system manual (396-3583Y1 or 396-3616Y1). This card and that manual and other troubleshooting guides are available at [www.surefireag.com/support](http://www.surefireag.com/support).

⚠ WARNING

The operator is responsible for the safe operation of this equipment. Systems with hydraulic equipment require additional safety precautions to prevent serious injury and/or death.

### 9. Control Valve Setup

**Valve Response Rate:** (Adjust as needed)

PumpRight (hydraulic) PR17-80  
PR30-70 PR40-60 D250-50  
Tower (electric) 100  
Catalyst and Spartan 5-15

If pump is slow responding to rate or speed changes, increase **Valve Response Rate** 10 at a time. If product oscillates around rate going across the field, reduce **Valve Response Rate**.

#### Setup Control Valve

Product 1 Liquid

Control Valve Type: PWM Close

See Valve Response Rate (1-100) Above

Control Deadband (%): 2

**Low Limit** (Adjust in field as needed)

PumpRight (hydraulic) 25  
Tower (electric) 10  
Catalyst and Spartan 5-10

**PWM Startup** (Adjust in field as needed)

PumpRight (hydraulic) 40  
Tower (electric) 10-25  
Catalyst and Spartan 5-10

#### Setup PWM

Product 1 Liquid

Coil Frequency (Hz): 100

High Limit may be set lower to limit speed of pump

High Limit (%): 100.0

Low Limit (%): See

PWM Startup (%): Above

### Tip for Best Startup Performance

For best startup performance, set the **PWM Startup** at or slightly above the normal operating PWM Duty Cycle (DC%). When the pump starts, it will go immediately to that Duty Cycle and then will have just a minor adjustment to lock on to the Target Rate.

Normal Operation	PWM Startup
37.1 DC (%)	PWM Startup (%) 40.0

If pump starts up too fast, lower the PWM Startup.



# QuickStart setup instructions for JDRC 2000 and SureFire: Two products

### 10. Rate Sensor (Flowmeter) Setup

**Setup Rate Sensor**

Product 1 Liquid

Flowmeter Calibration

Flowmeter Pulse/Units: gal

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**Flowmeter Calibration and Units**

Flowmeter Size (GPM)	Pulses/Gal	Spartan model #	Puls/fl oz
0.08-1.6	22710		
0.13-2.6	3000		
0.3-5.0	3000	115	1700
0.6-13	2000	125	890
1.3-26	2000	135	450
2.6-53	2000	145	220

Flow Cal number is on serial number label on side of flowmeter.

### 11. Tank and Fill Flowmeter Setup (Optional)

**Setup Tank**

Product 1 Liquid

OPTIONAL: Use as desired

Tank Capacity (gal): 0

Current Level (gal): 0

Low Tank Level (gal): 0

Alarm?

Check **Tank Fill Monitor** box if using a fill flowmeter.

Tank Fill Monitor  Seldom used.

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**Setup Tank Fill**

SFA 3" Fill Flowmeter: 130

SFA 2" Fill Flowmeter: 300

Tank Fill Flowmeter Calibration

The Tank Fill Flowmeter is not used very often.

Tank Fill Flowmeter Pulse/Units: 10 gal

### 12. Rates (Predefined or Map-Based), Rate Smoothing, Decimal Shift

**Setup Rates**

Product 1 Liquid

Preset Rate Values (gal/ac): Rate 1: 4.0, Rate 2: 0.0, Rate 3: 0.0

Rate Bump (gal/ac): 0.0

Rate Selection: Predefined

Rate Smoothing:  10 %

Decimal Shift: 1

Select **Map-Based** for a prescription.

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**Setup Alarms**

Product 1 Liquid

Off Rate Alarm (% off target rate): 20

Alarm:

JDRC 2000 - Setup

Generic 2 Liquids

Implement Settings Alarms Rates

9 Control Valve Setup

13 Pressure Sensor Setup

14 Flow/Rate Sensor Setup

8 Auxiliary Features Setup

11 Tank/Bin Setup

15 Display Settings

Setup

Totals

Diagnostics

### 13. Pressure Sensors must be calibrated. Enter 50.0 mv/PSI for SureFire 0-100 PSI, 0 to 5 volt sensor. (Unplug the sensor during the calibration process.)

**Pressure Sensor Setup**

Sensor-1

- Ensure there is zero pressure at the sensor to be calibrated.
- Enable the sections to spray.
- Press the Calibration button for the desired type of calibration to begin test and set zero point.

**Calibrate Pressure Sensor**

Sensor-1

Voltage-based

- Ensure the sensor has 12V power supply.
- Enter the slope as reported by the implement pressure gauge manufacturer in the box below
- Select Accept

Calibrate Sensor 1 & Sensor 2.

Voltage-based Calibration: 50.0 (mv/psi)

### 14. Set Flowmeter Low Limit

**Flow/Rate Sensor Setup**

Product-1

Flowmeter Calibration: 2000

Flowmeter Pulse/Units: gal

Flowmeter Low Limit (gal/min): [ ]

Set Flowmeter Low Limit for Product 1 and Product 2.

Flowmeter	Low Limit
0.6 to 13	0.4
1.3 to 26	0.8
2.6 to 53	1.6

15. See the next page for DISPLAY SETTINGS and JDRC 2000 Run Page. You need to set up DISPLAY SETTINGS for both PR1 and PR2. Use PSI(1) and RPM (1) for PR1. Use PSI (2) and RPM (2) for PR2.

16. See the next page for ADVANCED TUNING.

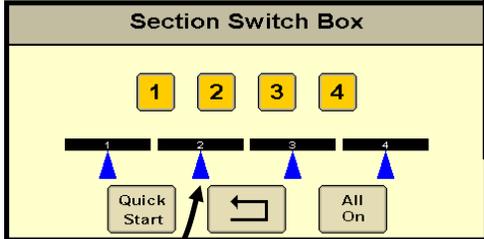
17. See the next page for INITIAL OPERATION IN MANUAL MODE.

18. See the next page for INITIAL OPERATION IN AUTO MODE.

**Adjusting the Flow Cal number:** Verify the acres worked and gallons applied in the field and adjust the flowmeter calibration if needed for better accuracy. If you need more product, increase the Flow Cal number. If you need less product, decrease the Flow Cal number.

# Display Settings, Section Switch Box, Run Page (Manual/Auto, Enable/Disable)

15. Set these 4 items in **Setup > Settings > Display Settings**
- Gal/min
  - Pressure (PSI) **15**
  - DC(%) (PWM Duty Cycle)
  - Mi/hr



MANUAL AUTO

ENABLE Product ON Product OFF

JDRC 2000 - Main

Generic 2 Liquids

Press on this bar to open Section Switch Box

0.0 (gal/ac) 20.0 (gal/ac)

Rate 1 20.0 Rate 2 25.0 Rate 3 30.0

0.0 (gal/min) **15** (psi)

0.0 DC (%) 0.0 (mi/hr)

Quick Start Master Off

PUMP RPM (For hydraulic pump) 5:10pm

AUTO MODE Product ENABLED

AUTO MODE Product DISABLED

MANUAL MODE Product DISABLED

MANUAL MODE Product ENABLED

JDRC 2000 - Setup

One Liquid

Settings **15**

Control Valve Setup Pressure Sensor Setup **13**

Flow/Rate Sensor Setup **14** Auxiliary Features Setup

Tank/Bin Setup

Advanced Tuning-use only on electric pump.

Advanced Tuning **16**

**16. Advanced Tuning**

On SureFire electric pump systems (Tower 110, Tower 200), it will be necessary to use the **Advanced Tuning** feature in addition to the regular Control Valve Calibration. To activate **Advanced Tuning**, press and hold the **Settings** tab for about 8 seconds.

On electric pump systems, set the PID Valve Tuning parameters as shown (below left). Press the “?” for an explanation of what each of these values does.

Fine-tuning of the system may require some adjustment of these numbers along with the Valve Response Rate on the Control Valve Setup.

For quickest response on Tower 110 systems set P = 100 and S = 100.

**Do not use Advanced Tuning on SureFire hydraulic pump systems.**

PID Valve Tuning

P **90** D **10**

I **10** S **90**

**16**

Start with these settings for SureFire electric pumps.

- TIPS: When first starting the system or when troubleshooting a problem, you can turn OFF either Product 1 or Product 2 and just run the system you want. You can also operate in the field with only one system turned on.
- (2) Go to *Diagnostics > System Summary* for a quick look at the System Settings.
  - (3) Go to *Diagnostics > Product Summary* for a quick look at the settings for each product setup.
  - (4) Go to *Diagnostics > Readings* for important information and feedback: *Hardware/Software, Delivery System, Section Status, System Voltage, Pressure Sensors, RPM Sensors and more.*

## Tests for Initial Operation

### 17. Initial Operation in MANUAL mode: (Run PR1 and PR2 separately)

#### NOTICE

1. Fill the system with water. For first time startup, open air bleed valve, close recirculation.
2. Enter a Test Speed at Setup > Implement
3. Navigate to MANUAL MODE on the JDRC 2000 Run Page.
4. Height switch must be DOWN (or uncheck Height Switch box).
5. Turn on Master Switch. Press and hold (+) to increase flow. Do not worry if it says "SOLUTION PUMP DRY". The SureFire pump will not be damaged by running dry.
6. Monitor Flow (gal/min), PSI, DC, Pump RPM. Note: Pressure will be much lower when testing with water.
7. Go to Section Switch box (see previous page). Turn Sections OFF and ON.
8. Turn Master Switch OFF.

Running these tests will dispense liquid. Be sure it is safe to dispense the liquid at this time.

#### OPTIONAL MANUAL PUMP OPERATION:

Go to **Diagnostics > Tests > Calibrate PWM LIMITS**. This is a place where you can manually run the pump without the system shutting down if it doesn't read flow immediately. When you press START, the section valves will open. Press and hold (+) to increase the PWM Duty Cycle. For electric pumps the DC will have to be 10%-15% to get flow. Hydraulic pumps will need to be around 30% to get flow. When priming the pump, it will help to open the air bleed valve, close the recirculation knob and run the pump faster to get it primed and to get the air out.

**TROUBLESHOOTING TIP: Pump Won't Run**—Start the Calibrate PWM Limits Test. Run the PWM Duty Cycle (DC) to 100%. With a voltmeter check voltage at the 2-pin PWM connector. Should have 12-13 volts. If there is voltage here, but pump won't run, check the pump as described next:

**Electric Pump**—Unplug the two big connectors at the black EPD module. Plug these together. This will take power from the battery directly to the pump(s). The pump(s) should run full speed.

**Hydraulic Pump**—On the hydraulic valve block, pop up the Manual Override button (red knob on top of solenoid). If unit has been in the field, you may need to loosen the dirt to move the knob. In cab, turn hydraulic flow to very low so you won't overspeed the pump. Engage hydraulics. Pump should begin turning. Slowly increase hydraulic flow to speed up the pump. In an emergency, the pump can be run in the field like this, controlled by the hydraulic flow set in the cab.

You can also run the pump manually in *Diagnostics > Tests > Control/Section Test*. You can open and close the section valves individually here.

### 18. Initial Operation in AUTO mode: (Could also do Diagnostics > Tests > Nozzle Flow Check).

1. Enter a Test Speed at Setup > Implement
2. Navigate to AUTO MODE on the JDRC 2000 Run Page. Select a Rate.
3. Height switch must be DOWN (or uncheck Height Switch box).
4. Turn on Master Switch.
5. Monitor Actual Rate (gal/ac), Flow (gal/min), PSI, DC, Pump RPM.
6. Go to Section Switch box (see previous page). Turn Sections OFF and ON.
7. Turn Master Switch OFF. (NOTE: Pressure will be much less with water than with heavier, thicker fertilizer. You may have to double or triple the rate with water to get all the check valves to open.)

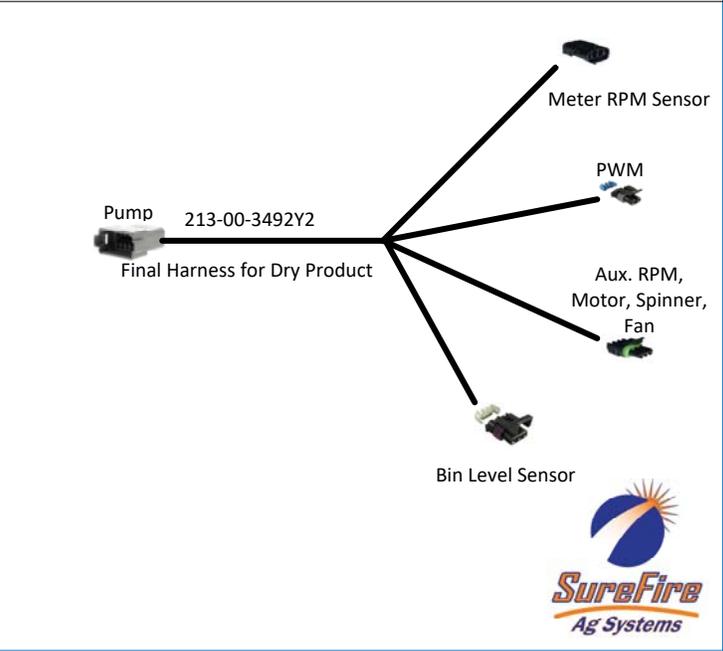
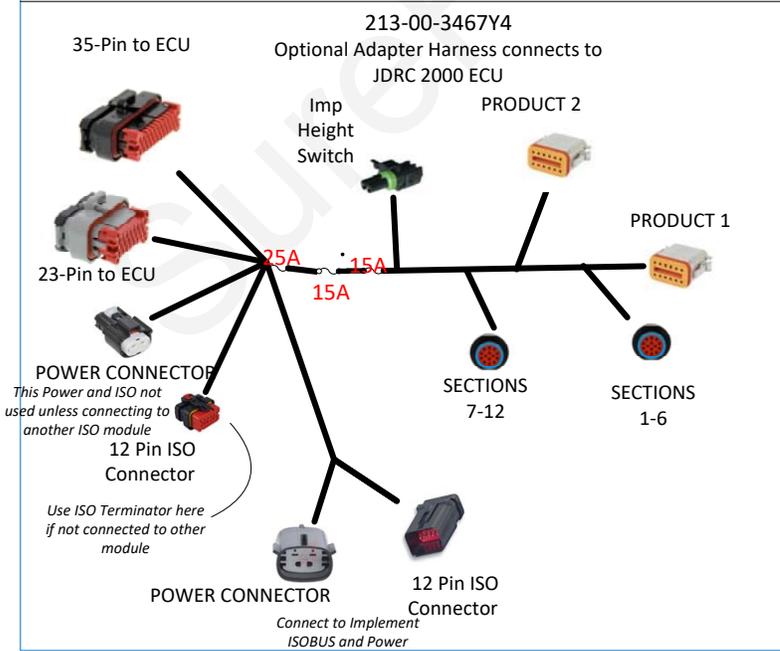
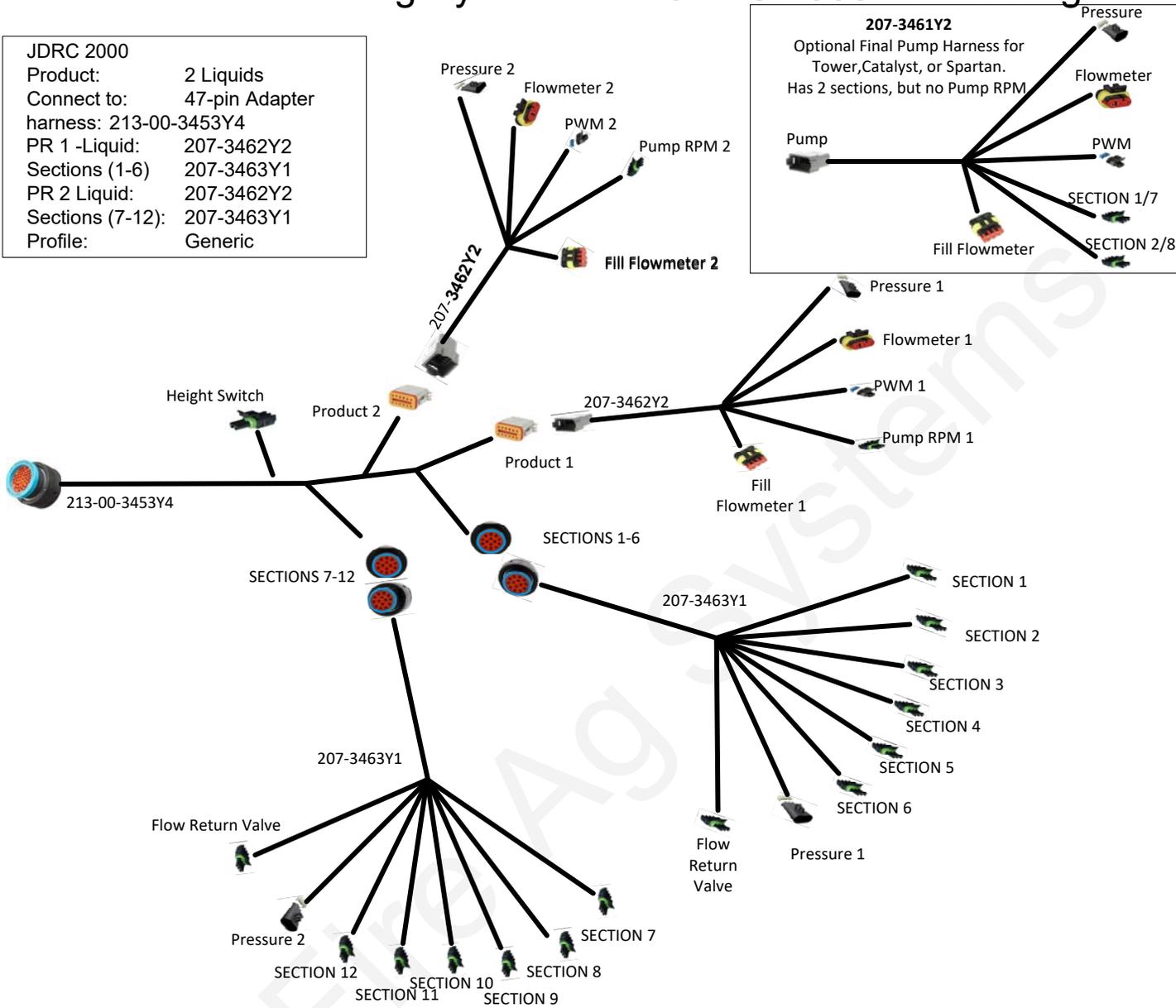
**TIPS: RECIRCULATION KNOB and PRESSURE**—There is a gray knob plumbed into both electric and hydraulic systems for recirculation. Typically, this knob is closed all the way. If it necessary to open recirculation, start with a quarter turn of the knob. If the knob is open too far, the pump may not be able to hit the rate desired. Opening the recirculation knob will NOT lower the pressure. The pressure simply shows how hard the pump has to push to get the desired amount of product through all the plumbing. On an electric pump system, as the pressure increases, the maximum output of the pump decreases. If the pressure is too high, you may not be able to hit the desired rate. If the pressure is too high, you may need larger diameter or shorter metering tubes. An electric pump is OK up to 60 PSI if it can hit the rate. It is better to try to keep an electric system in 15 to 30 PSI range.

#### WARNING

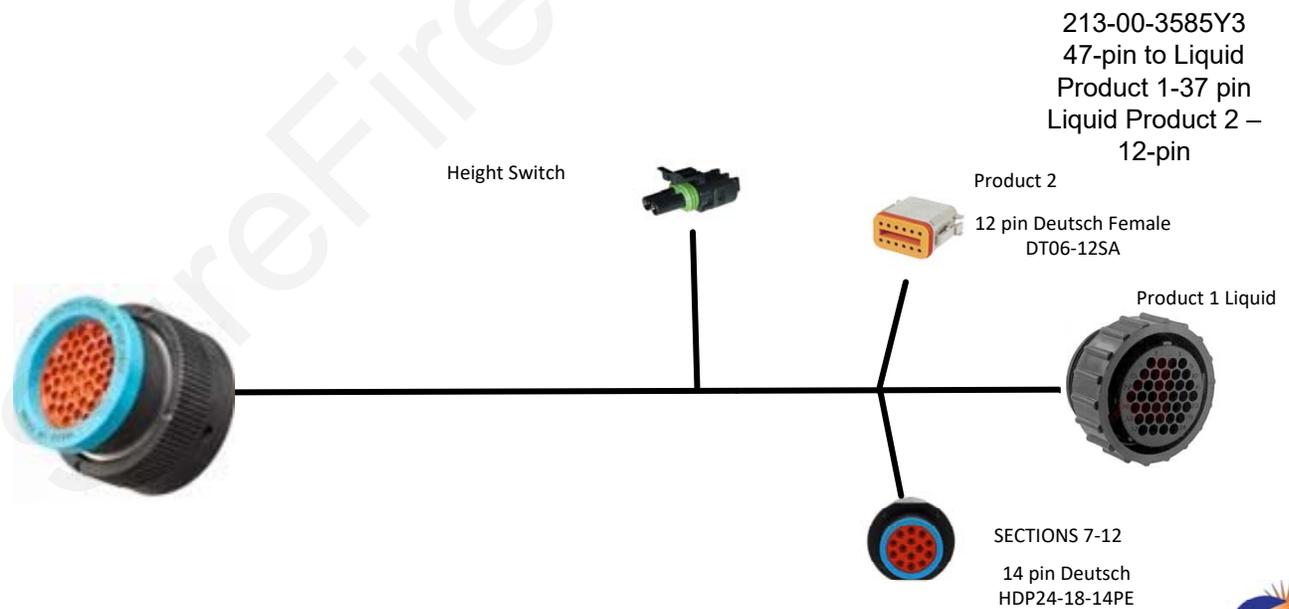
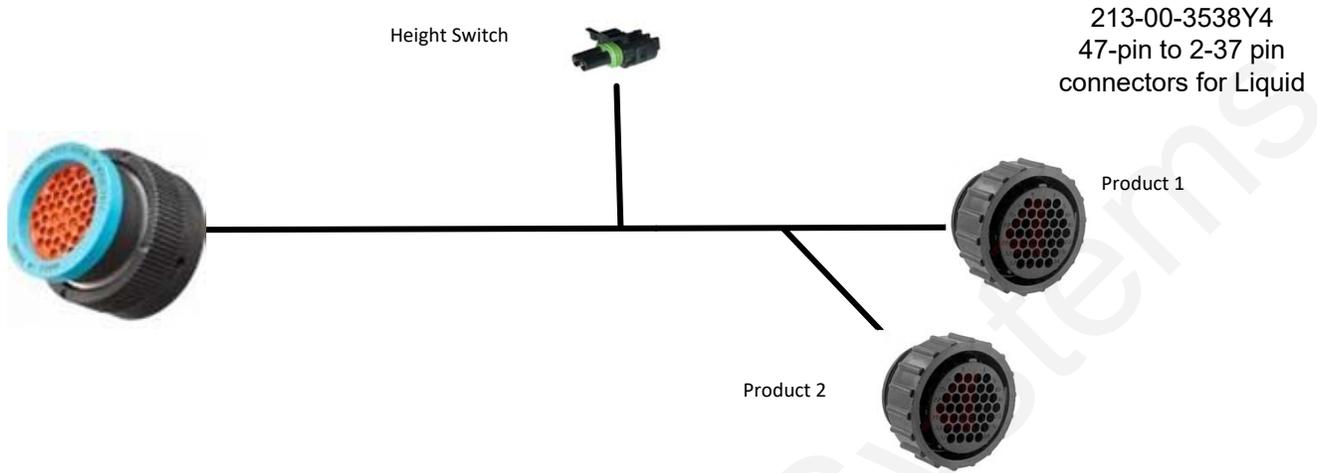
The operator is responsible for knowing and understanding the safe operation of this equipment. Systems with hydraulic equipment require additional safety precautions to prevent serious injury and/or death. See the full SureFire Manual and the *John Deere Rate Controller 2000 Operator's Manual* for important safety information and setup and operating instructions. SureFire manuals and troubleshooting guides are available at [www.surefireag.com/support](http://www.surefireag.com/support).

# SureFire Ag Systems and JDRC 2000 Harnessing

JDRC 2000	
Product:	2 Liquids
Connect to:	47-pin Adapter harness: 213-00-3453Y4
PR 1 -Liquid:	207-3462Y2
Sections (1-6)	207-3463Y1
PR 2 Liquid:	207-3462Y2
Sections (7-12):	207-3463Y1
Profile:	Generic



# SureFire Ag Systems and JDRC 2000 Harnessing



## Startup Checklist Before Going to The Field

- Read your operator's manual (396-3583Y1 or 3616Y1) to learn the basics of operating your new system.
- Read and use the QuickStart Setup card to set up the controller/display for your system.
- Fill Tank with water first. DO NOT start with fertilizer. This step will allow you to test the system for leaks and will allow you to learn how to operate the system before you go to the field
- Tighten tank straps after filling with water. They are tightened at SureFire before the system ships, but will need re-tightened after liquid is added to the tank
- Run the system in Manual mode or Calibrate PWM Limits Test to get the system primed for the first time. This is a good time to test the system for leaks and ensure all mechanical components are operating correctly. (Note: when testing with water, the pressure will be much lower than with fertilizer, and some rows may not flow because the check valves don't open. Increase the flow to open all the check valves.)
- Run the system in an automatic test mode where you enter a speed and rate and make sure the system locks on rate at the desired speed entered. If the pump does not lock on rate you may need to make some adjustments to the valve calibration settings to get the pump to lock on rate. See operator's manual on adjusting valve calibration settings.
- If you can't get the pump to lock on rate after adjusting controller settings contact your SureFire dealer or SureFire technical support to assist you with setting changes.
- Do a catch test to verify that the flowmeter is measuring accurately. Verify the flowmeter calibration in the field. Adjust flowmeter calibration as needed.
- If the unit may encounter freezing temperatures, winterize the system with RV antifreeze.
- When you are comfortable with operating your new SureFire system you can offload the water and load fertilizer in your tank. Double check the tank straps one more time to make sure they are tight before going to the field.
- Enjoy your new SureFire fertilizer system.

