



**396-3564Y1**

# QuickStart setup instructions for JDRC 2000 and SureFire harness for 3 Liquid/Dry Products

213-00-3517Y\_ or 213-00-4889Y\_. This harness is NOT for NH3.  
This is NOT for Gen3 LiquiShift setup.

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

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**

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

2. Enter a **Profile Name**. Machine Type—Generic. Software Version Number should be 1.13 or higher.
3. **Number of Products = 3.** (Must be set for 3, even if only using 1 or 2—pinouts change for 3-product profile)
4. If you will be monitoring Pump RPM or Spinner RPM, select **RPM Sensors-2.**

**Select Profile**

Select the Profile that you would like to load. If "New" is selected the Setup Wizard will begin and a new Profile will be created.

**New Profile**

**Profile Name**: Generic 3 Liquids

**Machine Type**: Generic

**Application Width**: 40.000 ft

**Software Version Number**: 1.13

**Setup System**

ECU S/N: JDRC- 1141    ECU #: 1    Number Of Products: 3

**Setup Fan/Spinner RPM**

Select the number of spinner or fan RPM sensors installed on the implement used for fan or spinner RPM monitoring or control.

0, 1, or 2 (if using Pump RPM)

RPM Sensors: 2

5. Select **Application Type** and **Application**    6. Set up **Section Groups**. **Section Group 2** will start with **Section Driver 7**.

**Setup Application Type**

Product 1: Liquid

Product 2: Liquid

**Setup Section Groups**

Other Section Setups are possible. There are 14 section drivers on this harness.

PR1—Sections 1-6 (many other arrangements are possible)

PR2—Sections 7-12

PR3—Sections 13-14

**Spartan injection pump should share sections with main product.**

Are section drivers shared between all products in a product harness? **No**

**Setup Section Groups**

Section Groups	Starting Section Driver	Number of Sections	Equal Section Widths
1	1	4	<input checked="" type="checkbox"/>
2	7	4	<input checked="" type="checkbox"/>
3	13	1	<input checked="" type="checkbox"/>

**Setup Section Width**

Enter the width of the sections (ft)

1	10.000	7	10.000	13	40.000
2	10.000	8	10.000		
3	10.000	9	10.000		
4	10.000	10	10.000		



# QuickStart setup instructions for JDRC 2000 and SureFire:

Use with SureFire adapter harness: 213-00-3517Y\_ or 213-00-4889Y\_ for 3 Liquid/Dry products

7. The SureFire pressure sensor will be set up as a **Custom** sensor. Calibration will be done later. This harness allows 3 sensors.

**Setup Pressure Sensors**

Pressure Sensor 1: Custom

Pressure Sensor 2: Custom

Pressure Sensor 3: Custom

Pressure Sensor 4: None

**Setup Sensor Assignment**

Pressure Sensor 1

Product 1:

Product 2:

If your system has pressure sensors: For a typical setup, assign Pressure Sensor 1 to Product 1, and assign Pressure Sensor 2 to Product 2. A Pressure Alarm becomes a control limit (used mainly for spray tip nozzles).

On a SureFire PumpRight hydraulic setup, set the Maximum Pressure at 85 PSI and check the Alarm box so the pump does not overspeed if the pressure gets too high and opens the Pressure Relief Valve (PRV).

**Setup Pressure Alarms**

Pressure 1 (psi): Minimum 0, Maximum 85, Alarm?

Pressure 2 (psi): Minimum 0, Maximum 0, Alarm?

You can put the display for a particular sensor on the product RUN screen so you can see all the information about that system on one screen. (See Display Settings)

**System Setup Notes**

Product 3 cannot be a LiquiShift system. A Dry system may be run as any of the products.

If Section Drivers are shared between two products, you will need a 3-pin Y adapter harness to split each shared section driver signal.

See the harness drawings to see where each function connects.

## 8. Optional Aux Functions—RPM Sensors

**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): 0

**Setup RPM Sensor Assignment**

RPM Sensor 1

Product 1:

Product 2:

**213-00-3517Y\_ and 4889 Pinouts**

Product 1	Pressure 1	RPM1
Product 2	Pressure 2	RPM 2
Product 3	Pressure 3	RPM 1

SureFire hydraulic pump with RPM sensor is 15 pulses/rev. Set RPM High Limit at 500 and check box to limit pump speed.

## 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**.

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

PumpRight (hydraulic) 25-30  
Tower (electric) 10  
Catalyst and Spartan 5

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

PumpRight (hydraulic) 35-40  
Tower (electric) 15-25  
Catalyst and Spartan 5-10

**Setup Control Valve**

Product 1 Liquid

Control Valve Type: PWM Close

Valve Response Rate (1-100): 2

Control Deadband (%): 2

**Setup PWM**

Product 1 Liquid

Coil Frequency (Hz): 100

High Limit (%): 100.0

Low Limit (%): See

PWM Startup (%): Above

## 10. Rate Sensor (Flowmeter) Setup

**Setup Rate Sensor**

Product 1 Liquid

Flowmeter Calibration: See Below

Flowmeter Pulse/Units: gal

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



# QuickStart setup instructions for JDRC 2000 and SureFire: 3 liquid/dry products

## 10. Rate Sensor (Flowmeter) Setup

**Flow/Rate Sensor Setup**

Product-1

Flowmeter Calibration

Flowmeter Pulse/Units: gal

Flowmeter Low Limit (gal/min): 0—or

### Adjusting the Flow Cal number:

Verify the acres worked and gallons applied and adjust the Flow Cal if needed. If you need more product, increase the Flow Cal. If you need less, decrease the Flow Cal.

Flowmeter Low Limit may be set at 0 or 0.13—set at 0.1 0.3—0.2 0.6—0.4 1.3—1.0 2.6—2.0

The flowmeter will read lower than what it is rated. Set the Low Limit when operating near the low end of the flowmeter.

## 11. Tank and Fill Flowmeter Setup

**Setup Tank**

Product 1 Liquid

OPTIONAL: Use as desired

Tank Capacity (gal): 0

Current Level (gal): 0

Low Tank Level (gal): 0 Alarm?

Tank Fill Monitor

**Setup Tank Fill**

SFA 3" Fill Flowmeter: 130

SFA 2" Fill Flowmeter: 300

Tank Fill Flowmeter Calibration

Tank Fill Flowmeter Pulse/Units: 10 gal

Check **Tank Fill Monitor** box if using a fill flowmeter (not often used). Then enter **Tank Fill Flowmeter Calibration (Units are 10 gal)**.

## 12. Rates and Rate Smoothing. Set as desired.

**Decimal Shift**- normally set at 1. Set at 2 for rates less than 1 gpa (such as 0.25 gpa). Can set at 0 for high rates.

JDRC 2000 - Setup SureFire Liquid

Implement Settings Alarms Rates

Product-1

Preset Rate Values (gal/ae): Rate 1: 3.0 Rate 2: 5.0 Rate 3: 8.0

Rate Bump (gal/ae): 0.0 Rate Selection: Predefined

Rate Smoothing:  10 %

Decimal Shift: 1

## 13. Off Rate Alarm Setup

Set **Off Rate Alarm** as desired. The **Minimum Flow Rate** box will not be present if a pressure sensor has been assigned to this product. Typically, Minimum Flow Rate will be left at 0 or set as shown above.

**Setup Alarms**

Product 1 Liquid

Off Rate Alarm (% off target rate): 20 Alarm?

Minimum Flow Rate: 0.0 (gal/min)

Enter minimum flow rate required to maintain spray pattern.

14. All **Pressure Sensors** must be calibrated. See the boxes below for the procedure. Enter **50.0 mv/PSI** for SureFire 0 -100 PSI, 0 to 5 volt sensor. (Be sure there is no pressure against the sensor when calibrating. Unplug the sensor during the calibration process. More on Pressure Sensor Diagnostics below.)

JDRC 2000 - Setup Generic 2 Liquids

Implement Settings Alarms Rates

Control Valve Setup

Pressure Sensor Setup

Flow/Rate Sensor Setup

Auxiliary Features Setup

Tank/Bin Setup

Display Settings

JDRC 2000 Setup

Totals

Diagnostics

**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.

Voltage-based Calibration

**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

50.0 (mv/psi)

For complete information on how the sensor is operating, go to **Diagnostics > Readings > Pressure Sensors**. 0 Pressure Voltage should be 0.00 V.

### Valuable 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. For example, if the normal DC% is as shown on the right, set the PWM Startup at 40% and the pump will start just a little faster than normal operating speed for a quick return to rate. If the pump starts up too fast, lower the PWM Startup %.

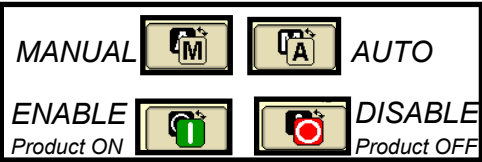
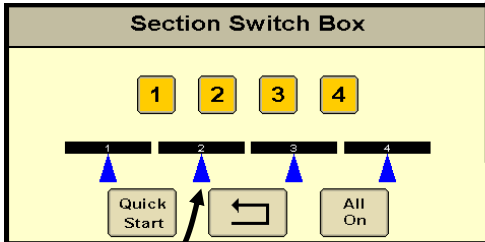
37.8 DC (%)

PWM Startup (%) 40.0



# 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



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)

0 (gal) Master Off

PUMP RPM (For hydraulic)

5:10pm

**AUTO MODE Product ENABLED**

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

Rate 1 20.0 Rate 2 25.0 Rate 3 30.0

**AUTO MODE Product DISABLED**

0.0 (gal/ac) Off

**MANUAL MODE Product DISABLED**

0.0 (gal/ac) Off

**MANUAL MODE Product ENABLED**

0.0 (gal/ac) Man

JDRC 2000 - Setup

One Liquid

Implement **Settings** Alarms Rates

Control Valve Setup Pressure Sensor Setup **14**

Flow/Rate Sensor Setup **9-10** Auxiliary Features Setup

Tank/Bin Setup

Advanced Tuning-use

**15** Display Settings **16** Advanced Tuning

**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.
- Go to *Diagnostics > System Summary* for a quick look at the System Settings.
  - Go to *Diagnostics > Product Summary* for a quick look at the settings for each product setup.
  - 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:

1. Fill the system with water. For first time startup, open air bleed valve.
2. Enter a Test Speed at Setup > Implement
3. Navigate to MANUAL MODE as shown above for the product you are testing.
4. Height switch must be DOWN (or uncheck Height Switch box).
5. Turn on Master Switch. Press + to increase flow.
6. Monitor Flow (gal/min), PSI, DC, Pump RPM.
7. Go to Section Switch box (above). Turn Sections OFF and ON.
8. Turn Master Switch OFF.

## NOTICE

Running these tests will dispense liquid. Be sure it is safe to dispense the liquid in your tank in this location.

### 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 + 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 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.

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

1. Enter a Test Speed at Setup > Implement
2. Navigate to AUTO MODE as shown above. 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 (above). Turn Sections OFF and ON.
7. Turn Master Switch OFF. (NOTE: Pressure will be much less with water than with heavier, thicker fertilizer.)

Check out the other tests available at **Diagnostics > Tests**.

Other resources available at [www.surefireag.com/support](http://www.surefireag.com/support)

396-3583Y1 SureFire PumpRight System for JDRC 2000

396-3616Y1 SureFire Tower System for JDRC 2000

396-3613Y1 Troubleshooting Service Guide for PWM Liquid Systems and JDRC 2000

## 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. See [www.surefireag.com/support](http://www.surefireag.com/support) for the SureFire manual.

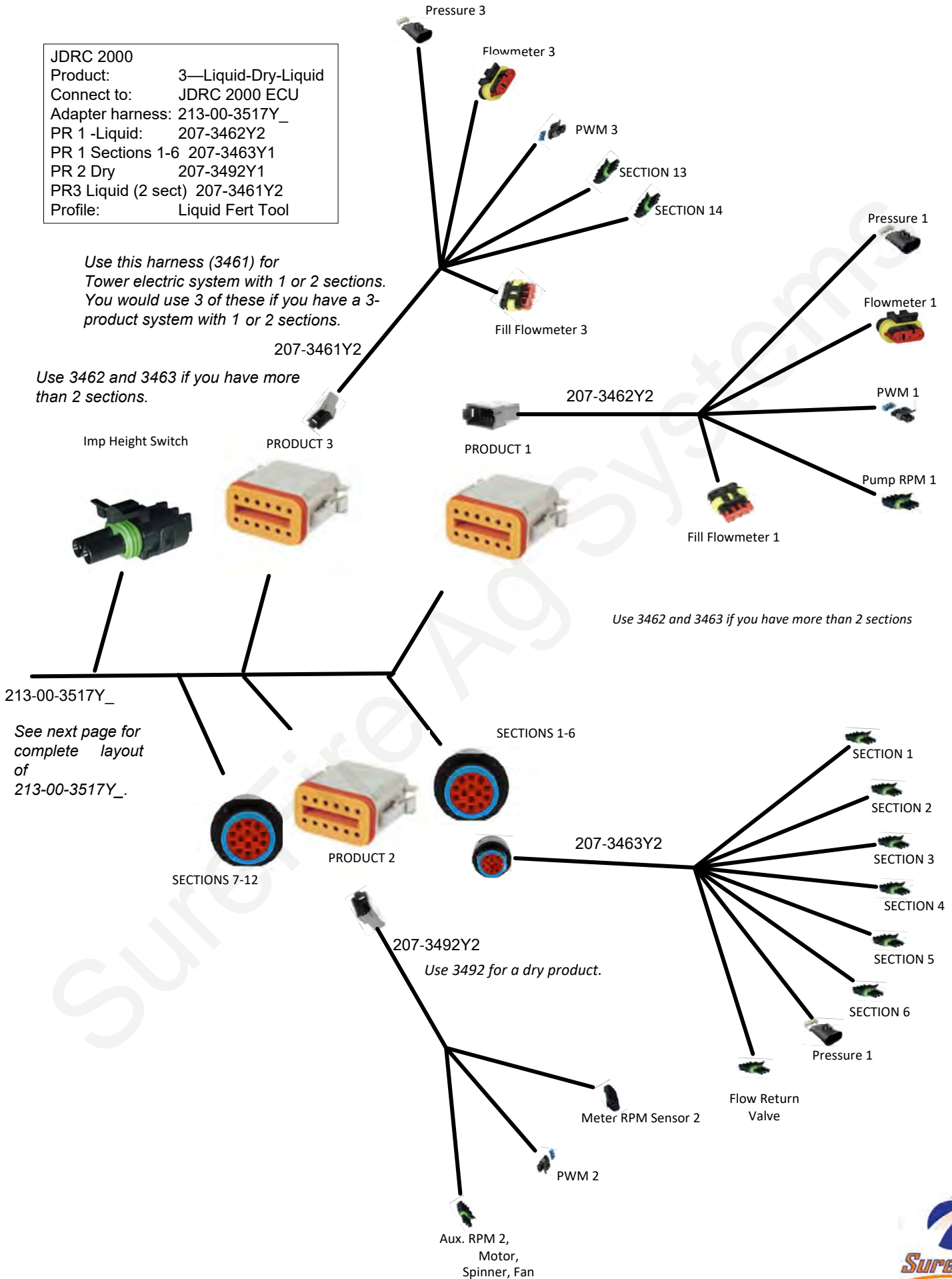


# SureFire Ag Systems and JDRC 2000 Harnessing

JDRC 2000  
 Product: 3—Liquid-Dry-Liquid  
 Connect to: JDRC 2000 ECU  
 Adapter harness: 213-00-3517Y\_  
 PR 1 -Liquid: 207-3462Y2  
 PR 1 Sections 1-6 207-3463Y1  
 PR 2 Dry 207-3492Y1  
 PR3 Liquid (2 sect) 207-3461Y2  
 Profile: Liquid Fert Tool

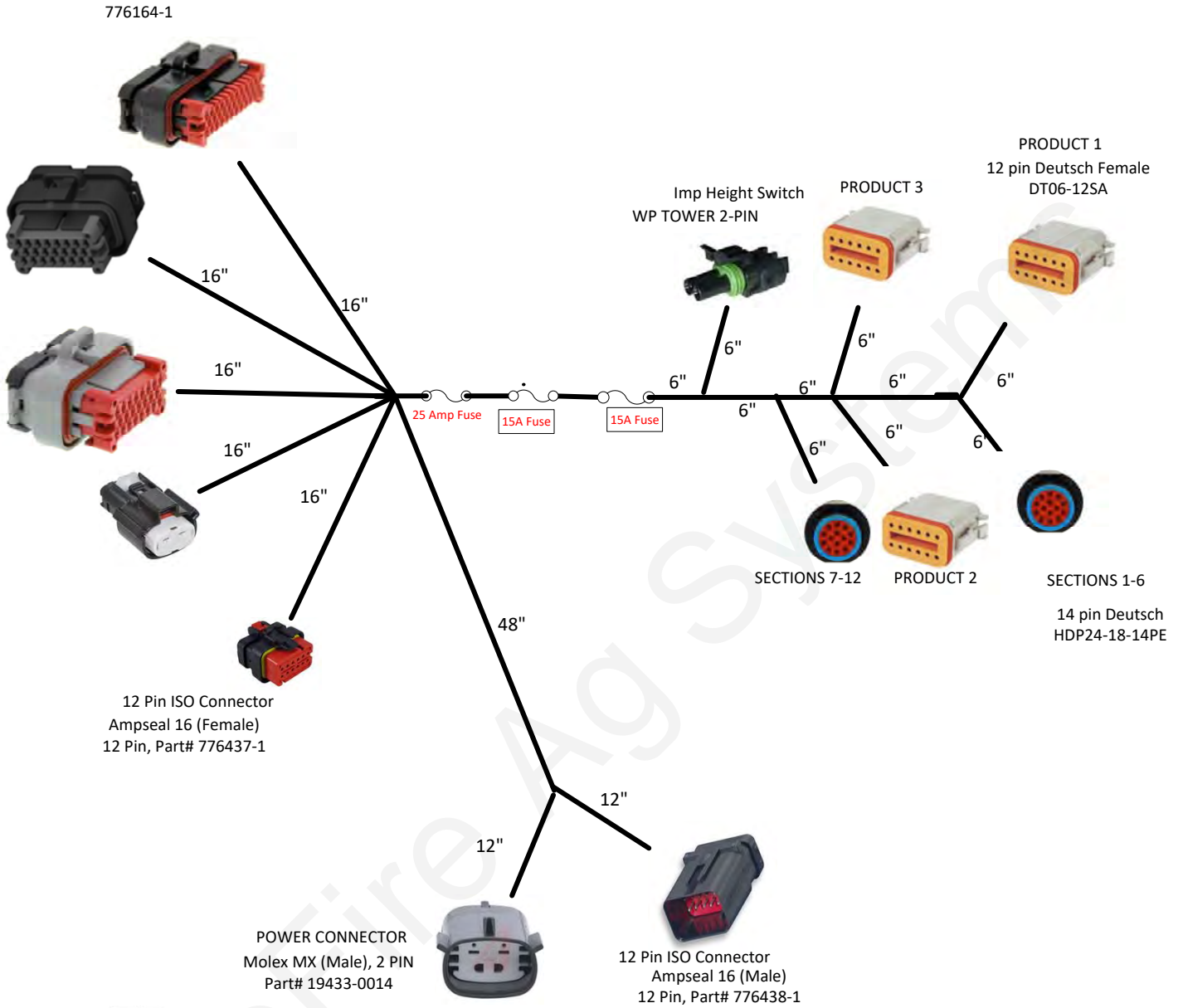
Use this harness (3461) for Tower electric system with 1 or 2 sections. You would use 3 of these if you have a 3-product system with 1 or 2 sections.

Use 3462 and 3463 if you have more than 2 sections.



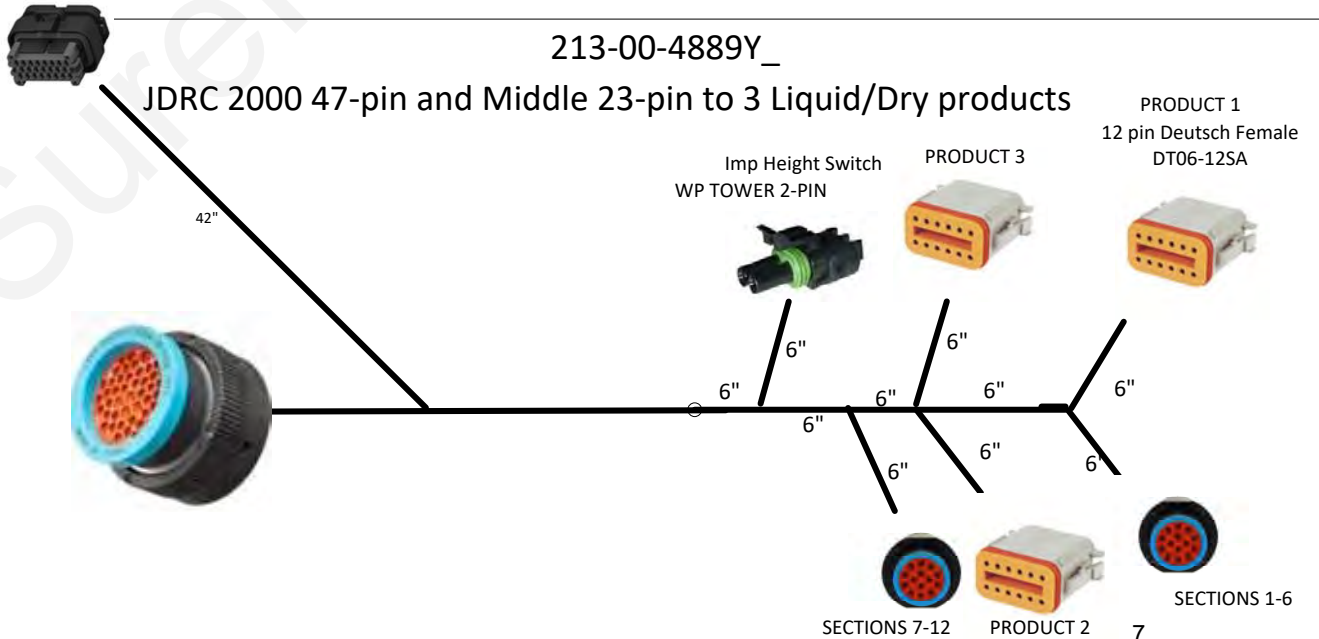
213-00-3517Y\_

JDRC 2000 ECU to 3 Liquid/Dry products



213-00-4889Y\_

JDRC 2000 47-pin and Middle 23-pin to 3 Liquid/Dry products



## 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.

