



396-3566Y1

QuickStart setup instructions for JDRC 2000 and SureFire harness for NH3 Profile plus one Liquid/Dry

213-00-3493Y1 213-00-3495Y1 213-00-3475Y1 213-00-3537Y1

Below are typical SureFire Liquid Fertilizer System setup screens. *Your setup may vary.*
See the John Deere JDRC 2000 Operator's 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 of the setup.

2. Enter a Profile Name. Machine Type—NH3 Tool. Software Version Number must be 1.08 or higher.

3. Number of Products = 2.

4. If you will be monitoring Pump RPM or Spinner RPM, select RPM Sensors-1.

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

Other Section Setups are possible.
PR 1 (NH3)— Sections 1-6 are reserved for NH3
PR2—Starts with Section Driver 7

Sample Setup:

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



QuickStart setup instructions for JDRC 2000 and SureFire:

Use with SureFire adapter harness: 213-00-3493Y1 or 3495Y1 or 3475Y1 or 3537Y1 for NH3 Profile plus one Liquid/Dry product

7. The SureFire pressure sensor will be set up as a **Custom** sensor.
 Pressure Sensor 1—NH3
 Pressure Sensor 3—Liquid

Setup Pressure Sensors

Pressure Sensor 1: Custom
 Pressure Sensor 2: None
 Pressure Sensor 3: Custom
 Pressure Sensor 4: None

Setup Sensor Assignment

Pressure Sensor 3

Product 1:
 Product 2:

Setup Pressure Alarms

	Minimum	Maximum	Alarm?
Pressure 1 (psi)	0	0	<input type="checkbox"/>
Pressure 2 (psi)	0	100	<input type="checkbox"/>
Pressure 3 (psi)	0	0	<input type="checkbox"/>

Setup RPM Sensor Assignment

RPM Sensor 1

Product 1:
 Product 2:

Sensors (such as pressure, pump RPM, spinner RPM) *do not* need to be assigned to a specific product if they are just being used to monitor a device and not to control it. There may be times when you want to assign the sensor to a product, and there will be times when you do not want to specifically assign the sensor.

For a typical setup, leave these 3 screens as shown on the left.

If you assign a Pressure Sensor to a Product, and enter a Minimum/Maximum and check the Alarm box, those become control limits. The system will not go above or below those pressures.

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)

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): 0

The SureFire hydraulic pump with an RPM Sensor is 15 pulses/rev as shown. If monitoring something else, enter the pulses/rev for that encoder or sensor.)

On the SureFire wiring harnesses indicated above, Pressure Signal 1 is on the NH3 Product 1 connector. Pressure Signal 3 and RPM Sensor 1 are on the Product 2 connector for Liquid.

9. Product 1 Control Valve Setup—Rate Sensor Setup—Rate Setup—Alarm Setup

Setup Control Valve

Product 1 NH3

Control Valve Type: Dual Valve/STD

Valve Response Rate (1-100): 50

Control Deadband (%): 3

Valve Delay (Seconds): 0.0

Control Effort (%): 35

Configuration Help

Control Valve Type: Select the type of control valve used to control the product application. Choose between a standard, fast, fast close, PWM, or PWM close valve for this setting. If a Control Valve Type needs to be changed after the profile is created you must edit the profile.

Response Rate: Enter a value between 1 and 100. This sets how aggressively the rate controller approaches the target rate. A value that is too high may lead to oscillation, values that are too low may take a long time to reach the target values.

Control Deadband: Enter the percent of target rate the control valve will control to. For example if 2% is entered the rate controller will attempt to adjust the flow rate until the actual rate is within 2% of the target rate.

Setup Rate Sensor

Product 1 NH3

Flowmeter Calibration: 171

For flowmeter with SureFire Torpedo system
 Flowmeter calibration units are (Pulses/10lbs of Actual N) for NH3 applications.

Start with the Default values for Valve Response Rate and Control Effort. Adjust as needed so system adjusts quickly to speed/rate changes, yet doesn't oscillate regularly going across the field.

If Control Deadband is set too low, it may create oscillation in the system.

Setup Rates

Product 1 NH3

	Rate 1 *	Rate 2	Rate 3
Preset Rate Values (lbs N/a)	80.0	100.0	120.0
Rate Bump (lbs N/a)	0.0		
Rate Selection	Predefined		
Rate Smoothing	<input checked="" type="checkbox"/>	10	%

Setup Alarms

Product 1 NH3

Off Rate Alarm (% off target rate): 20

Section Valve Status Feedback Alarm:



10. Product 2 Control Valve Setup—PWM Setup

Control Valve Setup (Also will do Advanced Tuning later.)

Valve Response Rate: (Adjust as needed)

PumpRight (hydraulic)	80
Tower (electric)	100
Catalyst and Spartan	80

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**.

Control Deadband: Start at 2

Low Limit (Adjust in field as needed)

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

PWM Startup (Adjust in field as needed)

PumpRight (hydraulic)	40
Tower (electric)	40
Catalyst and Spartan	10

Setup PWM

Product 2 Liquid

Coil Frequency (Hz)

High Limit (%)

Low Limit (%)

PWM Startup (%)

Setup Control Valve

Product 2 Liquid

Control Valve Type

Valve Response Rate (1-100)

Control Deadband (%)

11. Rate Sensor (Flowmeter) Setup

Setup Rate Sensor

Product 2 Liquid

Flowmeter Calibration

Flowmeter Pulse/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	110	1760
0.6-13	2000	120	880
1.3-26	2000	130	440
2.6-53	2000	140	220

* for 22710 flow cal use 177 pls/fl oz

12. Tank and Fill Flowmeter Setup (Optional)

Caution: When choosing pulses/gal, be sure to choose the gal units, and not the l gal units.

Flowmeter Pulse/Units

gal

L

10 L

gal

10 gal

l Gal *DO NOT USE THIS. It is Imperial Gallons.*

Setup Tank

Product 2 Liquid

OPTIONAL: Use as desired

Tank Capacity (gal)

Current Level (gal)

Low Tank Level (gal)

Alarm?

Tank Fill Monitor

Setup Tank Fill

SFA 3" Fill Flowmeter

SFA 2" Fill Flowmeter

Tank Fill Flowmeter Calibration

Tank Fill Flowmeter Pulse/Units

Check **Tank Fill Monitor** box if using a fill flowmeter. Then enter **Tank Fill Flowmeter Calibration (Units are 10 gal)**.

13. Rates and Rate Smoothing Setup

Set **Rates** and **Rate Smoothing** as desired.

Check the **Decimal Shift** box to enter rates with one more decimal point (such as 0.25 gpa).

Setup Rates

Product 2 Liquid

Preset Rate Values (gal/ac)	Rate 1 * <input type="text" value="20.0"/>	Rate 2 <input type="text" value="25.0"/>	Rate 3 <input type="text" value="30.0"/>
Rate Bump (gal/ac)	<input type="text" value="0.0"/>		
Rate Smoothing	<input checked="" type="checkbox"/>	<input type="text" value="10"/>	%
Decimal Shift	<input type="checkbox"/>		

14. 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.

Setup Alarms

Product 2 Liquid

Off Rate Alarm (% off target rate)

Alarm?

Minimum Flow Rate

(gal/min)

This QuickStart sheet does not cover every possible setup. Your setup may be different. See the John Deere Rate Controller 2000 Operator's Manual for important safety information and complete setup and operating instructions.

SureFire harnesses for the JDRC 2000 are designed for specific operating setups. Pinouts on the JDRC 2000 change depending on the Profile Setup and the number of products. See the wiring harness diagram for your harness.

More information is available at www.surefireag.com/support.



QuickStart setup instructions for JDRC 2000 and SureFire: 2 liquid/dry products

15. All **Pressure Sensors** must be calibrated. See the boxes below for the procedure. Enter **50.0 mv/PSI** for SureFire 0-100 PSI 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.)

The image shows two screenshots from the JDRC 2000 control panel. The left screenshot shows the 'Settings' menu with 'Pressure Sensor Setup' circled in red. The right screenshot shows the 'Calibrate Pressure Sensor' screen for 'Sensor-3' with 'Voltage-based Calibration' and the value '50.0 (mv/psi)' circled in red. A 'Setup' button is also circled in red in the left screenshot.

Pressure Sensor Setup

Sensor-1
 1. Ensure there is zero pressure at the sensor to be calibrated.
 2. Enable the sections to spray.
 3. Press the Calibration button for the desired type of calibration to begin test and set zero point.

Sensor 1-NH3-12.5 mv/PSI
 Sensor 3-Liquid-50 mv/PSI

Calibrate Pressure Sensor

Sensor-3
 Voltage-based
 1. Ensure the sensor has 12V power supply.
 2. Enter the slope as reported by the implement pressure gauge manufacturer in the box below
 3. 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 on Liquid System

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.

The image shows two small screenshots. The first shows '37.8 DC (%)' and the second shows 'PWM Startup (%)' set to '40.0'.

16. Advanced Setup Information (Advanced Tuning)

The screenshot shows the 'Settings' menu with 'Advanced Tuning' circled in red. A red arrow points from the 'Advanced Tuning' button to the 'PID Valve Tuning' screen below.

PID Valve Tuning ?

P **90** D **10**
 I **10** S **90**

Start with these settings for SureFire electric pumps.

MUST do the following for Electric Pump Systems

16. Advanced Tuning

On SureFire **electric pump systems**, 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 system response set P =100 and S=100, and Valve Response Rate =100.

If system oscillates going across field and won't lock on to rate, start by lowering Valve Response Rate 10 at a time.

You should not need to use Advanced Tuning on a standard SureFire hydraulic pump system.

Anyone setting up, operating, or servicing an NH3 system must have an approved NH3 safety course before beginning work. Follow all safety precautions every time. Be sure entire system is bled before opening any connections for service.

Advanced Setup and Operating Information, Run Page, Initial Startup

17. For the Liquid System, set these 4 items in **Setup > Settings > Display Settings**
 Gal/min
 Pressure (PSI)
 DC(%) (PWM)
 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) 0 (psi)

0.0 DC (%) 0.0 (mi/hr)

PUMP RPM

Section Switch Box

1 2 3 4

Quick Start All On

AUTO MODE

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

Rate 1 20.0 Rate 2 25.0 Rate 3 30.0

System ENABLE / DISABLE

0.0 (gal/ac) Off

0.0 (gal/ac) Off

0.0 (gal/ac) Man

MANUAL MODE

18. NH3 Initial Operation: FOLLOW ALL SAFETY PRECAUTIONS BEFORE TURNING ON ANHYDROUS AMMONIA

1. Before opening nurse tank valve, check the operation of the control valve: **Diagnostics > Tests > Product 1 > Control Valve Test**. Be sure the control valve is moving in the correct direction.
2. Before opening nurse tank valve, run **Energize System Test** to check the operation of the valves.
3. When safe to do so, slowly open the nurse tank valve. Running Energize System test will allow anhydrous ammonia to escape. Be sure it is safe and wind is in the right direction before running this test. Read all safety precautions before starting this test.
4. **Bleed System Test** will open the valves to empty the system. Close the nurse tank valve before running this.
5. Monitor amount applied with first tank or two and check the amount shown on the display against the weigh ticket for the tank. Adjust flowmeter calibration as needed.

19. Liquid Initial Operation in MANUAL mode: For NH3 setup use optional manual pump operation shown on right.

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.
4. Height switch must be DOWN.
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.

OPTIONAL MANUAL PUMP OPERATION:

Start with **Diagnostics > Tests > Calibrate PWM LIMITS**. This is a place where you can manually run the pump to test the Liquid System:

- Override Height Switch
- Manual Switch > ON
- Press Start > Press and hold (+) to speed up pump.

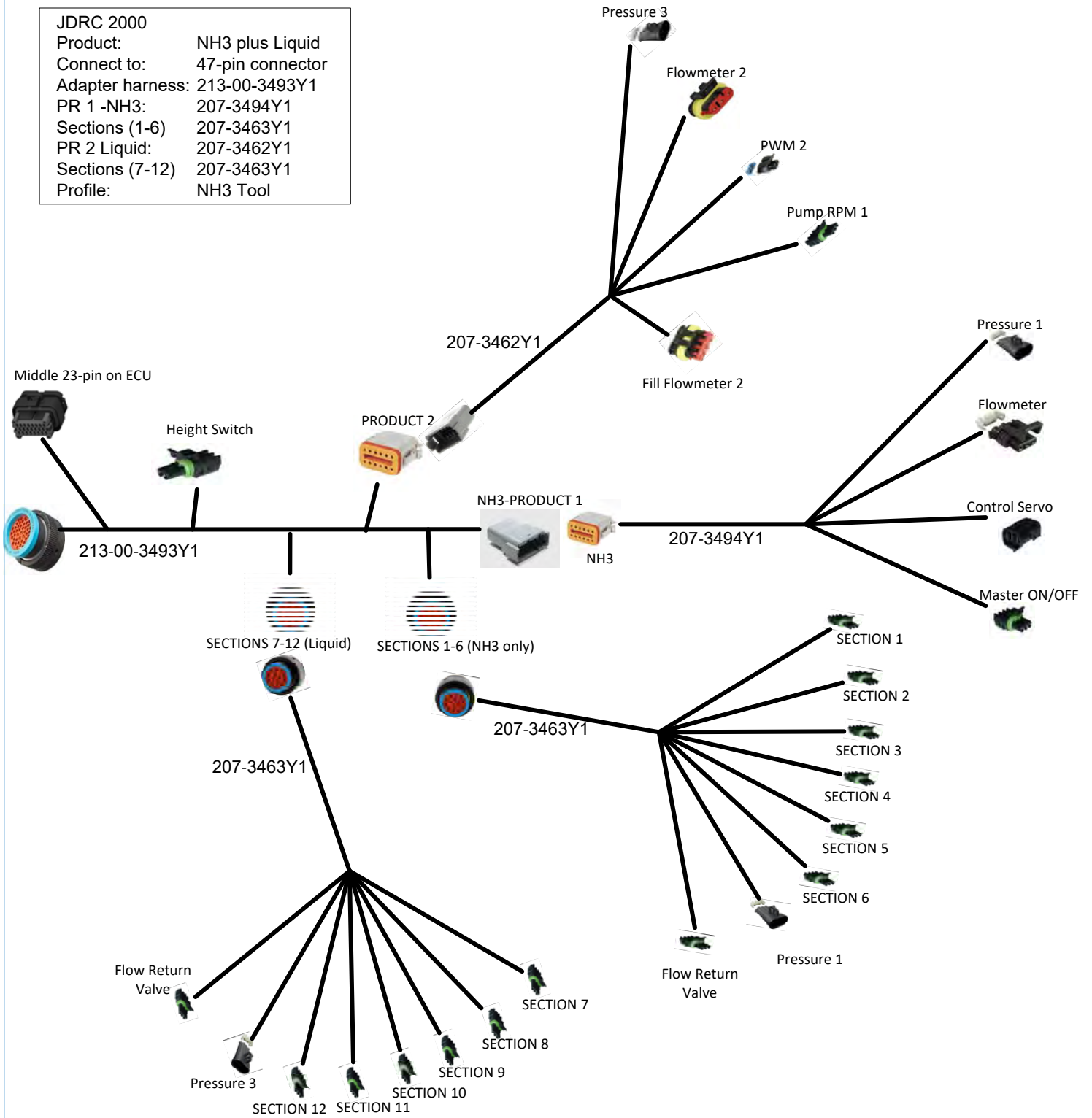
Also, you can run **Control/Section Test** to test the operation of the Liquid System.

20. Liquid Initial Operation in AUTO mode (for Generic or Liquid Fert Tool profile): (For NH3 setup use Nozzle Flow Check for Product 2).

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.
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.)

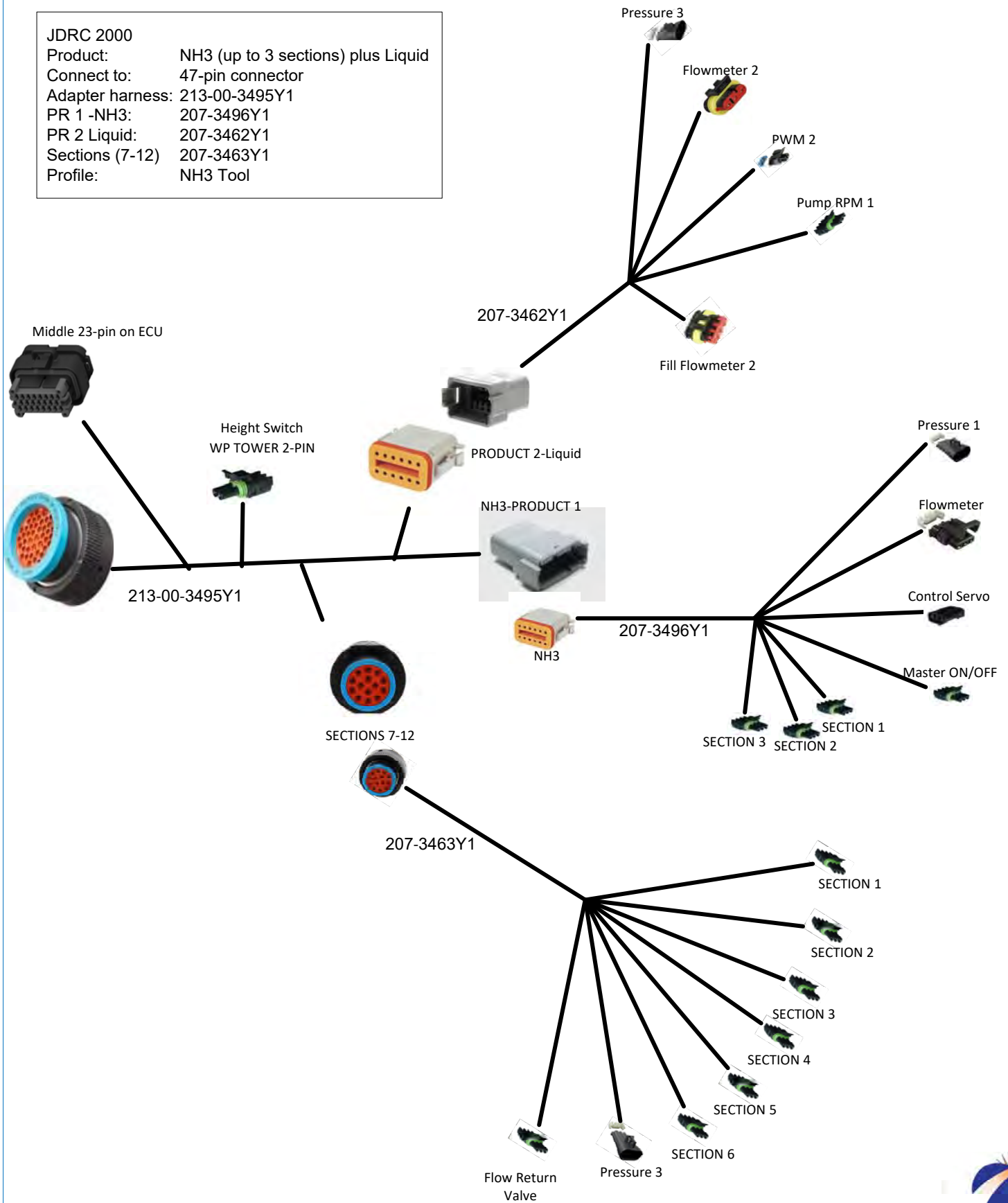
SureFire Ag Systems and JDRC 2000 Harnessing

JDRC 2000	
Product:	NH3 plus Liquid
Connect to:	47-pin connector
Adapter harness:	213-00-3493Y1
PR 1 -NH3:	207-3494Y1
Sections (1-6)	207-3463Y1
PR 2 Liquid:	207-3462Y1
Sections (7-12)	207-3463Y1
Profile:	NH3 Tool



SureFire Ag Systems and JDRC 2000 Harnessing

JDRC 2000
 Product: NH3 (up to 3 sections) plus Liquid
 Connect to: 47-pin connector
 Adapter harness: 213-00-3495Y1
 PR 1 -NH3: 207-3496Y1
 PR 2 Liquid: 207-3462Y1
 Sections (7-12) 207-3463Y1
 Profile: NH3 Tool



JDRC 2000
 Product: NH3 plus Liquid
 Connect to: 47-pin connector
 Adapter harness: 213-00-3475Y1
 PR 1 -NH3: Existing 37- or 16-pin
 PR 2 Liquid: 207-3461Y1
 with Sections 7 & 8
 Profile: NH3 Tool



213-00-3475Y1



Height Switch

Product 1 NH3



Product 1: NH3:
 Connect to existing 37-pin
 adapter harness or use
 37- to 16-pin adapter (201-
 21400Y2) and connect to
 16-pin harness



Product 2 Liquid
with 2 sections

207-3461Y1

Pressure 3



Flowmeter 2



PWM 2



Fill Flowmeter



SECTION 7



SECTION 8



213-00-3537Y1

Height Switch
150 WP Tower 2-PIN



213-00-3537Y1
 47-pin to
 Product 1 NH3 37-pin
 and
 Product 2 Liquid 37-pin

Product 1-NH3



Use 201-21400Y2
 37-pin to 16-pin adapter
 when connecting to
 16-pin system harness

Product 2
Liquid

