

396-3460Y1 Setup Screenshots for JDRC 2000 with NH3 and SureFire Catalyst System for Low Rate Liquid

Screenshots from JDRC 2000 for setting up NH3 and NutriSphere NH3 liquid on a SureFire Catalyst system using harnesses 201-3426Y1 and 207-3427Y1.

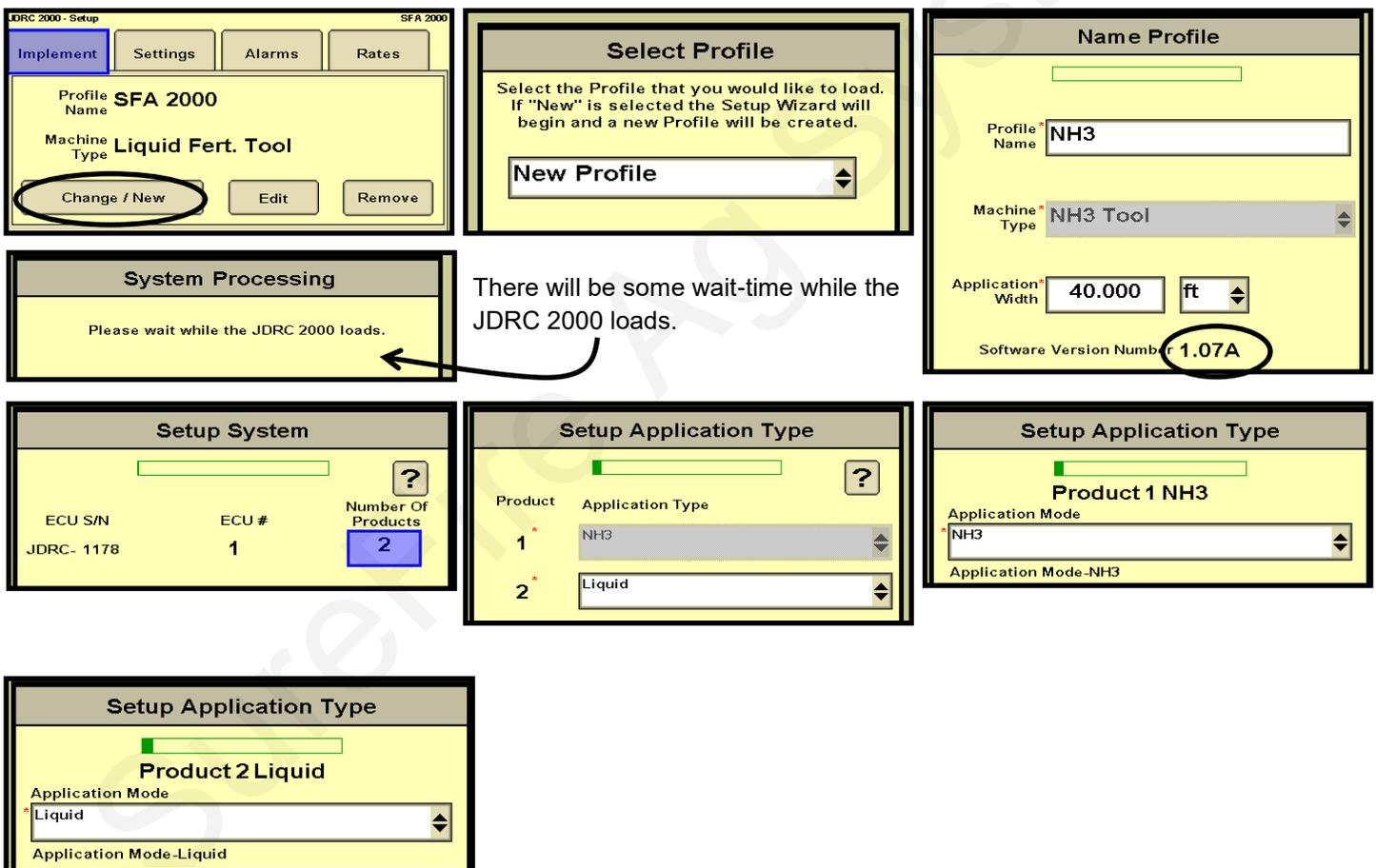
Not all screenshots and entries will be the same on your setup.

Be sure your John Deere dealer has upgraded the JDRC 2000 software to at least v.1.07A.

Valve calibration settings for the anhydrous system must be obtained from your system manufacturer.

The system will be set up as an NH3 profile with 2 products. Product 1 is NH3, Product 2 is liquid.

For full instructions on the setup and operation of the JDRC 2000 see the John Deere Rate Controller 2000 Operator's Manual.



Any personnel operating or servicing an anhydrous ammonia application system must be thoroughly trained in the safe handling of anhydrous ammonia and in emergency procedures in case of an accidental release of anhydrous ammonia.

This manual does not provide the training necessary for the safe operation of an anhydrous ammonia application system.

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Sample Section Groups and Section Driver Setup. Your setup may be different.

On an NH3 setup on the JDRC 2000, Section Group 1 and Section Drivers 1-6 are reserved for NH3.

The NutriSphere NH3 liquid will be Section Group 2, and will start with Section Driver 7.

Setup Section Groups

An NH3 product requires a dedicated section group and cannot share sections with other products. Section group(s) for other products must start at section 7 or higher.

60.00 ft			
Product 1			
15.00	15.00	15.00	15.00
1	2	3	4
Product 2			
30.00	30.00		
7	8		

Example

Setup Section Groups

Number of Section Groups

Setup Section Groups

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

Setup Section Groups

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

Setup Section Groups

Product	Section Groups
1 *	<input type="text" value="Section Group 1"/>
2 *	<input type="text" value="Section Group 2"/>

Setup Section Width

Enter the width of the sections (ft)

1 *	<input type="text" value="10.000"/>	7 *	<input type="text" value="20.000"/>
2 *	<input type="text" value="10.000"/>	8 *	<input type="text" value="20.000"/>
3 *	<input type="text" value="10.000"/>		
4 *	<input type="text" value="10.000"/>		

Setup Sections

40.000(m)

Product 1			
10	10	10	10
1	2	3	4
1	2	3	4
Product 2			
20	20		
7	8		
7	8		

Liquid Section Width
 Dry Section Width
 Wired Signal Driver
 Switch Number

Sample Pressure Sensor Setup.

A SureFire pressure sensor will be set up as a Custom Sensor. You can set up 1 or 2 pressure sensors using these harnesses.

Setup Pressure Sensors

Pressure Sensor 1: Custom

Pressure Sensor 2: Custom

Pressure Sensor 3: None

Pressure Sensor 4: None

Setup Pressure Alarms

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

Set up as desired. If you put a check mark in the Alarm box, the system will not operate below that Minimum Pressure or above that Maximum Pressure. This may keep you above or below your Target Rate.

Set up the NH3 Control Valve based on your NH3 system manufacturers recommendations. Your settings may be different than those shown.

Setup Control Valve

Product 1 NH3

Control Valve Type: Dual Valve/STD

Valve Response Rate (1-100): 50

Control Deadband (%): 2

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.

Configuration Help

Valve Delay: Enter the amount of time in seconds between when the first section is turned on and the rate controller begins to control the flow rate. This feature is useful when starting product application at lower speeds such as coming out of headland areas.

Valve Advance: Enter the amount of time in seconds the rate controller will drive the control valve open after all the sections are turned off. This setting may be used in conjunction with the valve delay for low rate applications to build up pressure when the master switch is toggled on.

Control Effort: Enter the minimum % power needed for the control valve to change position.

Setup Rate Sensor

Product 1 NH3

Flowmeter Calibration: 171

Flowmeter calibration units are (Pulses/10lbs of Actual N) for NH3 applications.

Flowmeter Calibration units are Pulses per 10 lbs of N. Your number may be different than above.

$$\text{pulses} / 10 \text{ lbs} = ((?) \text{ pulses} / 10 \text{ gallons}) / 4.22$$

Setup Tank

Product 1 NH3

Tank Capacity (lb N)

Current Level (%)

Low Tank Level (%) Alarm?

Set up as desired.

Setup Alarms

Product 1 NH3

Off Rate Alarm (% off target rate) Alarm?

Section Valve Status Feedback Alarm

Start with the Valve Response Rate at 50. If system is too slow to adjust to speed changes, increase by 5 at a time.

If the system overshoots and oscillates decrease by 5 at a time.

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.

Configuration Help

PWM Startup: For PWM closed type valves this is the duty cycle that the PWM valve will be commanded to when the product is activated.

Setup Rates

Product 1 NH3

Rate 1* Rate 2 Rate 3

Rate Bump (lbs N/ac) Rate Selection

Rate Smoothing %

Product 2 Liquid is the SureFire system for NutriSphere NH3

Setup Control Valve

Product 2 Liquid

Control Valve Type

Valve Response Rate (1-100) ~~80~~

Control Deadband (%)

Setup PWM

Product 2 Liquid

Coil Frequency (Hz)

High Limit (%)

Low Limit (%) ~~80~~

PWM Startup (%)

Start with Low Limit at 10. May need to lower this if system will not slow down low enough.

Configuration Help

Coil Frequency: This value sets the frequency of the pulses which are sent to the PWM valve. Refer to the valve manufacturer for appropriate settings.

High Limit: This value is the maximum PWM percent that the product controller will allow the system to go to when the product is turned on.

Low Limit: This value is the minimum PWM percent that the product controller will allow the system to go to when the product is turned on.

PWM Standby: When controlling a liquid product with a PWM valve selected the PWM standby value sets the duty cycle which the system will maintain when all sections are closed.

Most SureFire Catalyst systems with the 0.08 to 1.6 GPM flowmeter have a flow cal of 22710 pulses per gallon. The JDRC 2000 will not allow a 5-digit flow cal, so we use pulses per fl. oz. ($22710 / 128 = 177$ pulses per fl.oz.)

Check the Serial Number sticker on the side of the flowmeter to confirm pulses/gal. Verify the flowmeter calibration number for your flowmeter.

Setup Rate Sensor
Product 2 Liquid

Flowmeter Calibration: 177

Flowmeter Pulse/Units: fl oz

Setup Alarms
Product 2 Liquid

Off Rate Alarm (% off target rate): 20

Alarm?

Enter minimum flow rate required to maintain spray pattern.

Minimum Flow Rate: 0.0 (gal/min)

For a rate of 32 oz/acre ($32 / 128 = 0.25$ gal/acre), check the Decimal Shift box, and enter the rate as 0.25 gal/acre.

Setup Rates
Product 2 Liquid

Preset Rate Values (gal/acre): Rate 1: 0.25, Rate 2: 0.00, Rate 3: 0.00

Rate Bump (gal/acre): 0.10

Rate Selection: Predefined

Rate Smoothing: 15 %

Decimal Shift:

Setup Tank
Product 2 Liquid

Tank Capacity (gal): 0

Current Level (gal): 0

Low Tank Level (gal): 0

Alarm?

Set up as desired.

Alternate Setup: (See pictures below) To show the rate in ounces per acre. This will show a rate of 32 oz/acre as 32. This will not be used very often. Use the setup shown above for most cases.

The controller thinks it is 32 gal/acre, but it is actually measuring ounces.

Set the flow cal at 177 and the units as pulses per gallon. Set the rate at 32.

Setup Rate Sensor
Product 2 Liquid

Flowmeter Calibration: 177

Flowmeter Pulse/Units: gal

Setup Rates
Product 2 Liquid

Preset Rate Values (gal/acre): Rate 1: 32.0, Rate 2: 0.0, Rate 3: 0.0

Rate Bump (gal/acre): 0.1

Rate Selection: Predefined

Rate Smoothing: 15 %

Decimal Shift:

Setup Alarms
Product 2 Liquid

Off Rate Alarm (% off target rate): 20

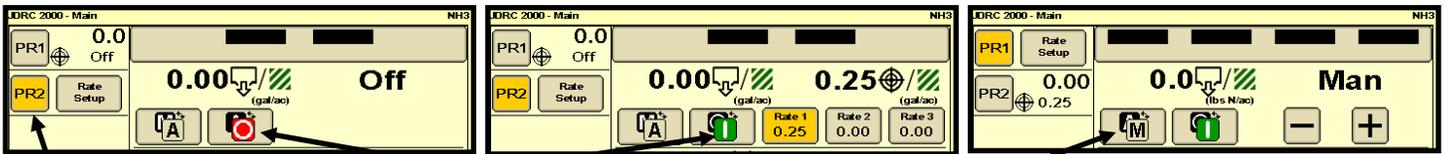
Alarm?

Enter minimum flow rate required to maintain spray pattern.

Minimum Flow Rate: 10.0 (gal/min)

This setup is rarely used. Use the setup shown at the top of the page.

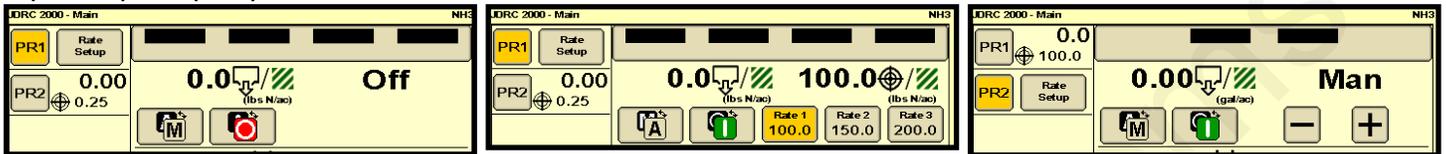
Main run screen: PR1 will be NH3. PR2 is the NutriSphere NH3 liquid.



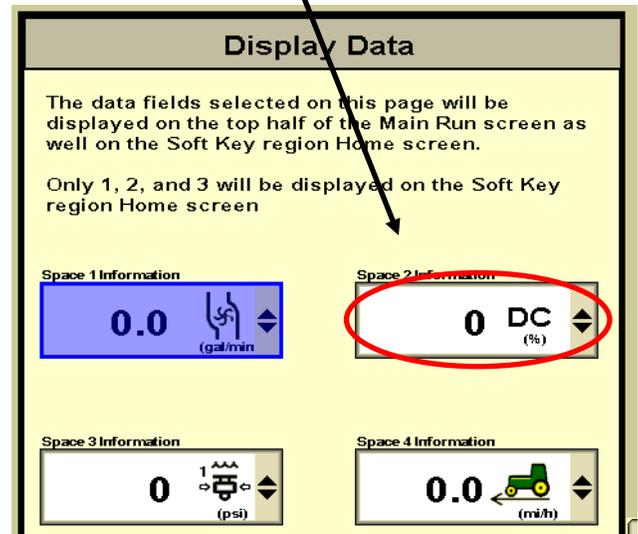
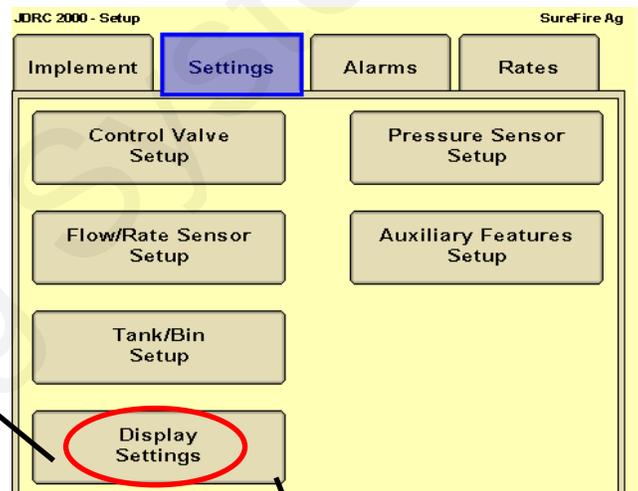
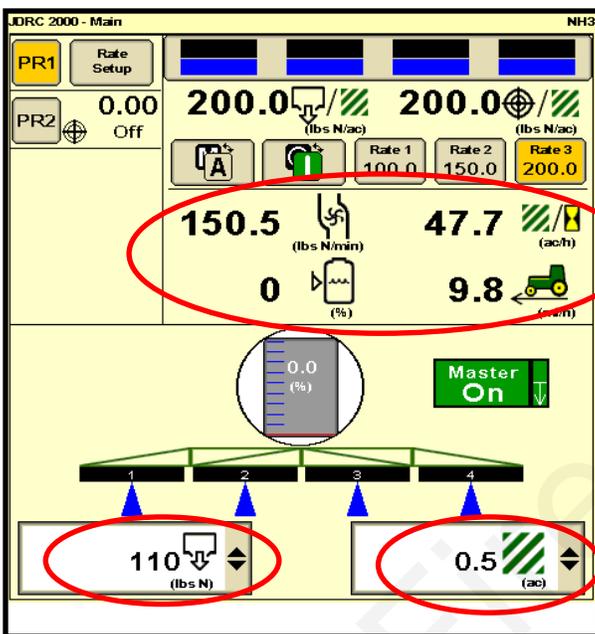
Select PR2 : Press here to turn PR2 ON or OFF. Press here for Auto or Manual Rate control.

When in Manual Rate Control press the (-) or (+) button to decrease or increase pump speed.

To test the system, enter a Test Speed and turn on PR2 and turn it on in Manual mode. Press (+) to speed up the pump



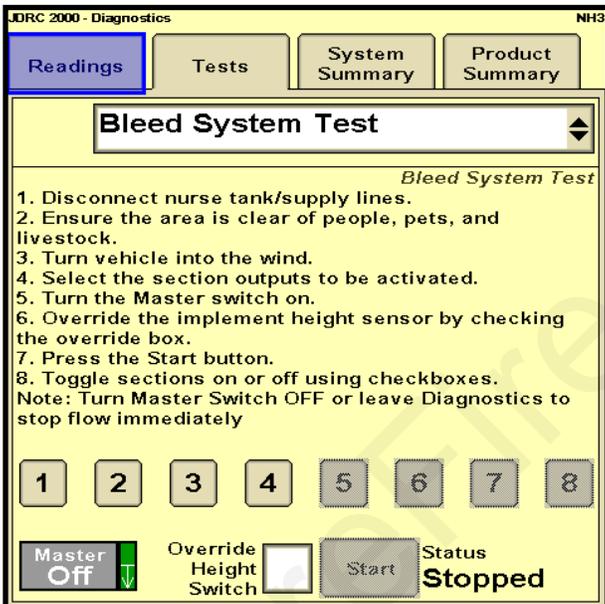
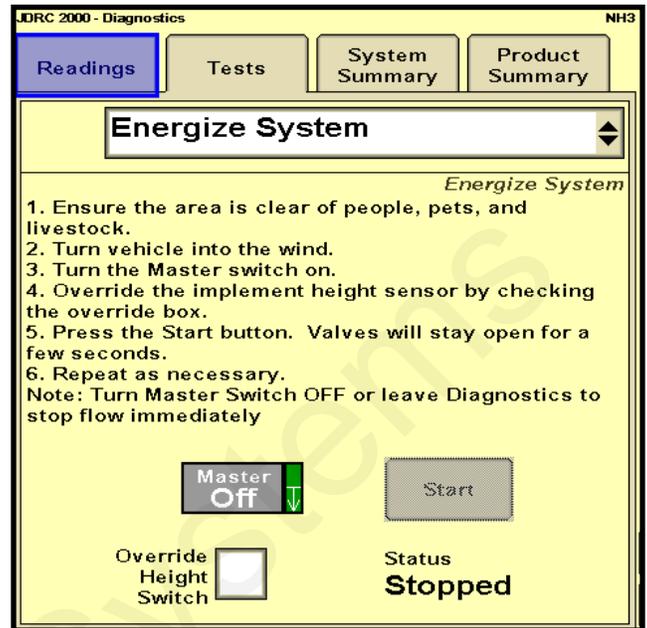
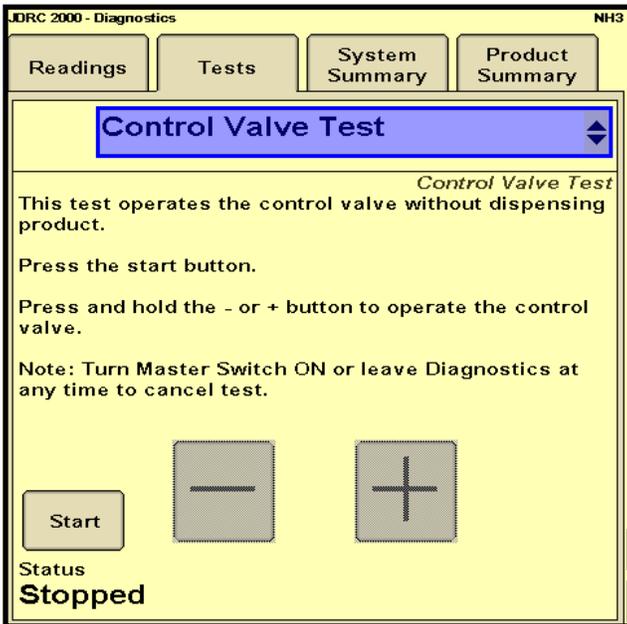
Below: Run screen showing NH3 application.



For a Liquid Product, set up one of the 4 upper display settings or one of the two bottom display boxes with "DC" to show the PWM Duty Cycle.

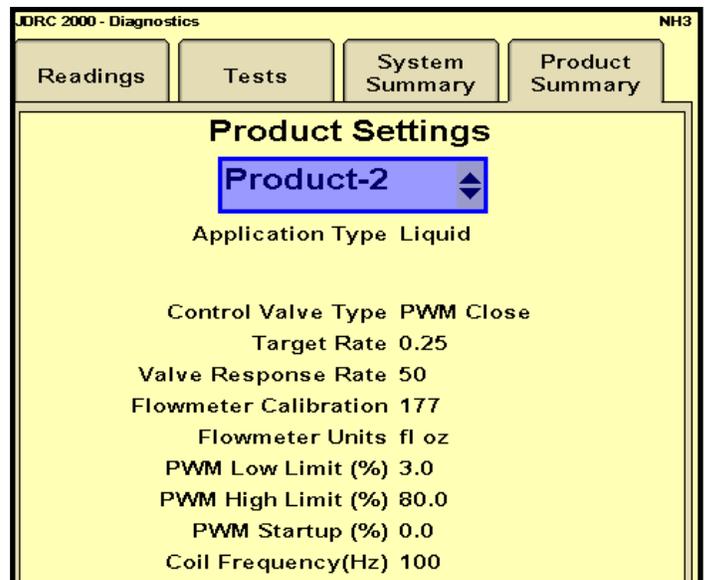
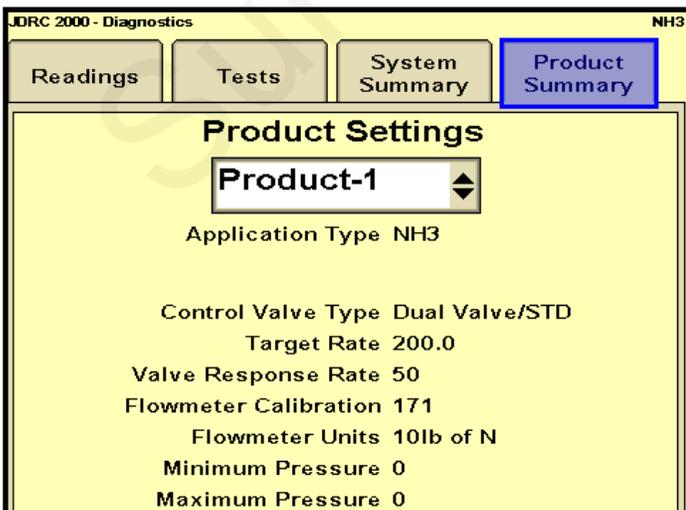
System Startup

Diagnostics > Tests These are the tests available for Product 1—NH3.
Be certain it is safe to release NH3 before running any of these.



See the John Deere Rate Controller 2000 Operator's Manual for complete information on the setup and operation of the system.

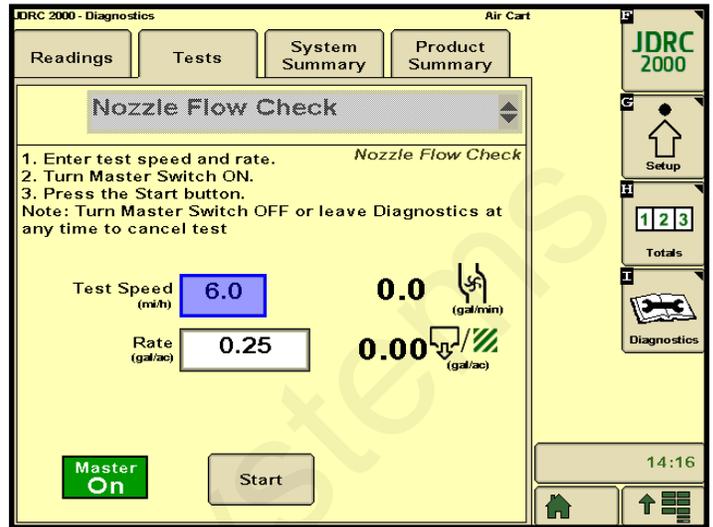
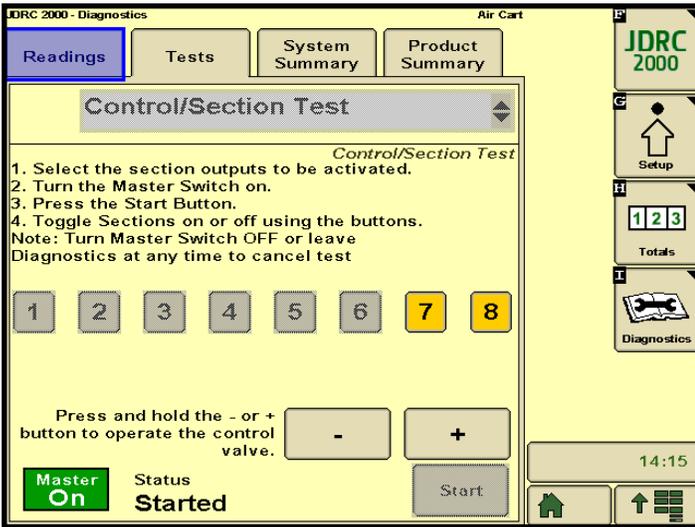
Product Summary screens will show your setup.



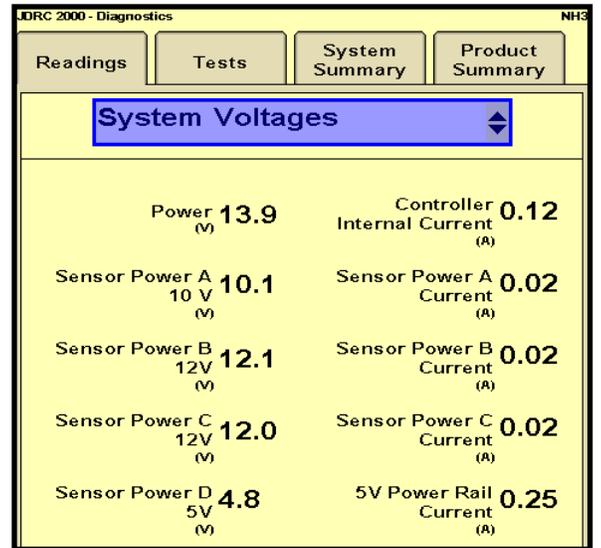
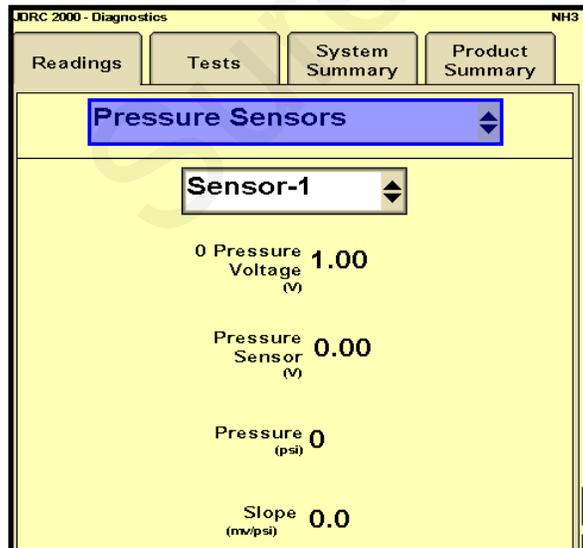
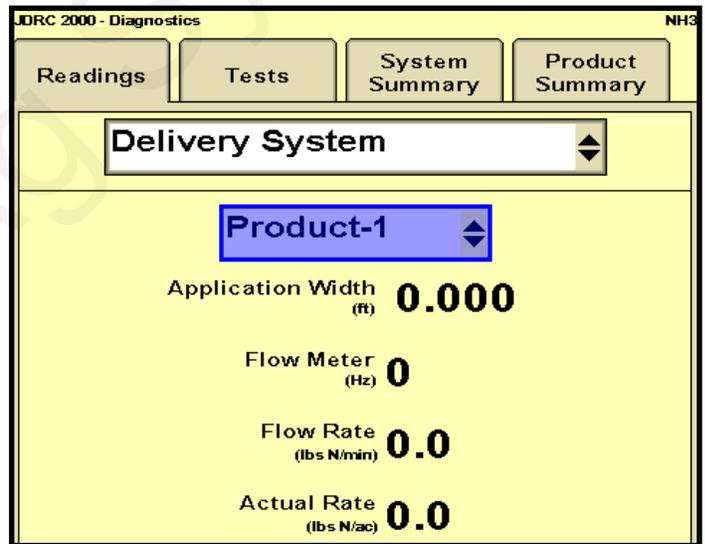
Screenshots from Diagnostics > Tests (For the Liquid Product—Product 2)

System Startup

Control/Section Test and Nozzle Flow Check are good tests to run on initial system startup. If testing with water, the pressure will be much less than it will be with the NutriSphere NH3 product.



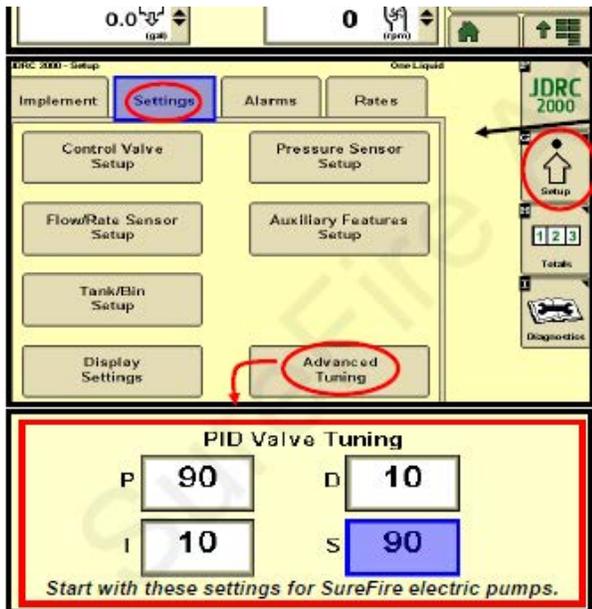
Screenshots from Diagnostics > Readings (These can provide helpful troubleshooting information)



For full instructions on the setup and operation of the JDRC 2000 see the John Deere Rate Controller 2000 Operator's Manual.

Additional Setup Information.

It may be necessary to use the Advanced Tuning feature to get the electric pump to respond more quickly to speed or rate changes.



The screenshot shows the JDRC 2000 operator interface. At the top, there are two numerical displays: '0.0' and '0'. Below these are icons for a home button, a refresh button, and a menu button. The main menu has tabs for 'Implement', 'Settings', 'Alarms', and 'Rates'. The 'Settings' tab is selected and highlighted with a red circle. Below the tabs are several menu items: 'Control Valve Setup', 'Pressure Sensor Setup', 'FlowRate Sensor Setup', 'Auxiliary Features Setup', 'Tank/Bin Setup', 'Display Settings', and 'Advanced Tuning'. The 'Advanced Tuning' option is highlighted with a red circle. To the right of the menu is a vertical toolbar with a 'Setup' button (a house icon) circled in red, and buttons for 'Totals' and 'Diagnostics'. Below the main menu is a detailed view of the 'PID Valve Tuning' screen. It has a title 'PID Valve Tuning' and four input fields: 'P' with the value '90', 'D' with the value '10', 'I' with the value '10', and 'S' with the value '90'. The 'S' field is highlighted with a blue background. Below the fields is the text: 'Start with these settings for SureFire electric pumps.'

16. Advanced Tuning

On SureFire electric pump systems (Tower 110, Tower 200, Catalyst, and Spartan), 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.

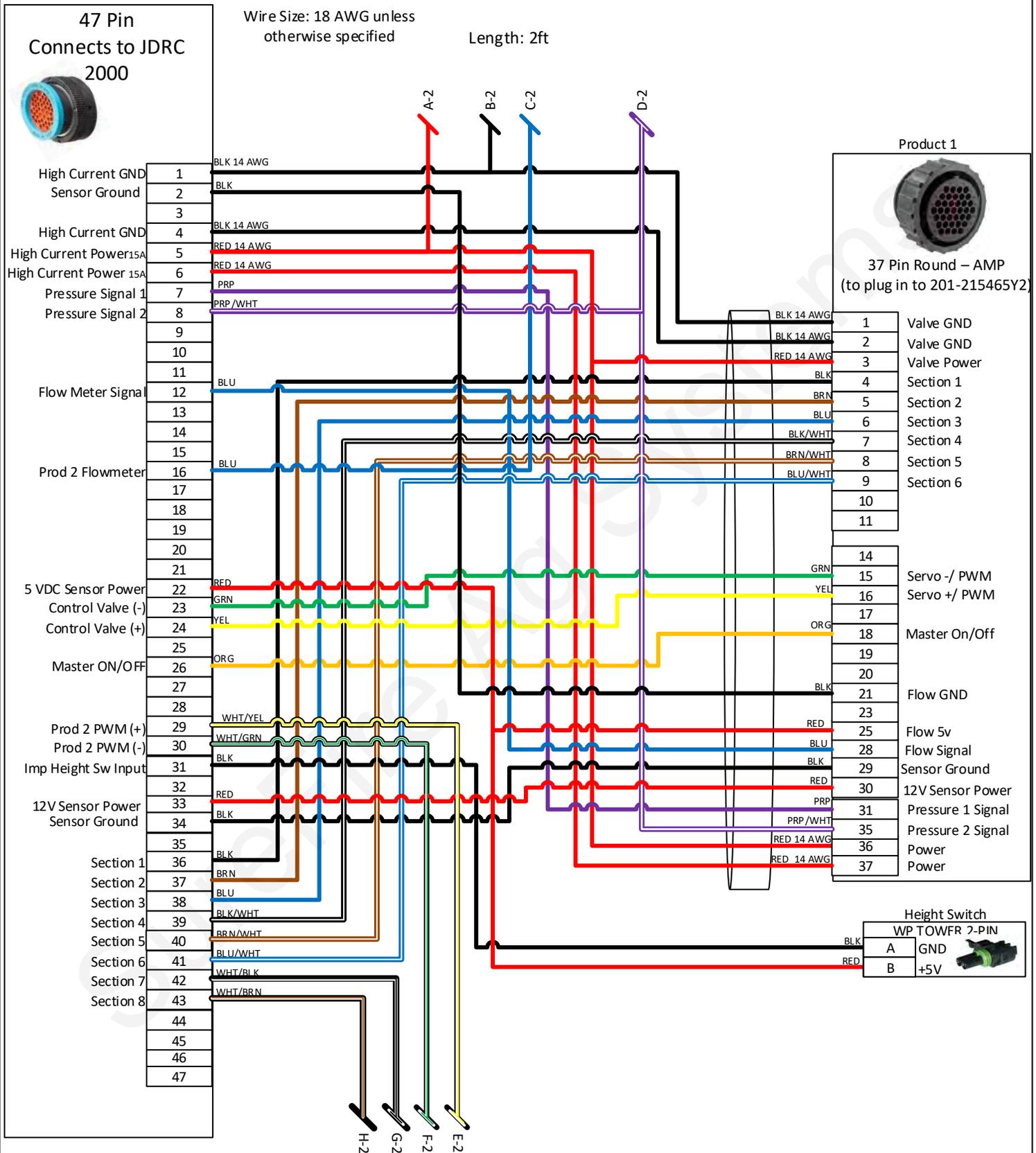
Fine-tuning of the system may require some adjustment of these numbers along with the Valve Response Rate on the Control Valve Setup.

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

Do not use Advanced Tuning on SureFire hydraulic pump systems.

201-3426Y1

JDRC 2000 47-pin to 2 products (Prod 1 37-pin with Sect 1-6, Prod 2 8-pin Deutsch, Sect 7-8)



201-3426Y1

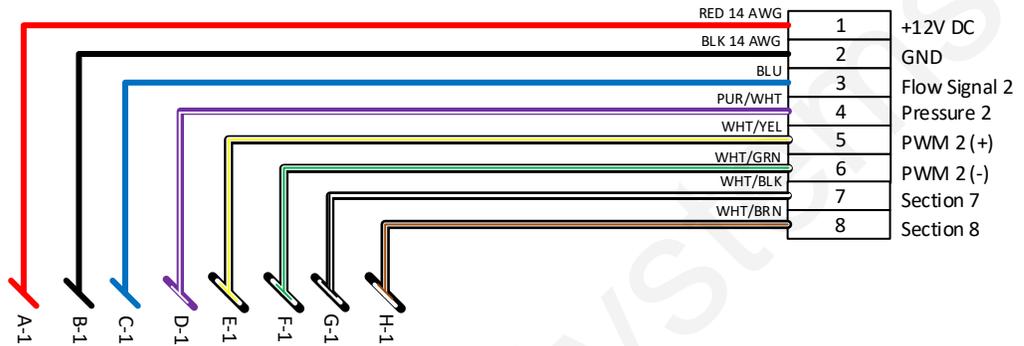
JDRC 2000 47-pin to 2 products (Prod 1 37-pin with Sect 1-6, Prod 2 8-pin Deutsch, Sect 7-8)

Connects to 207-3427Y1



Pump

DEUTSCH 8-pin DT04-08P



REVISIONS

A-01 Original Drawing



Part No:	201-3426Y1	Drawn By:	Mark Wolters		
Description:	JDRC 2000 47-pin to 2 products (Prod 1 37-pin with Sect 1-6, Prod 2 8-pin Deutsch, Sect 7-8)	Last Edit Date:	10/14/2016 2:30:56 PM	Revision	Rev A-01
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207-3427Y1

8-pin final pump harness for Catalyst

10 ft.

Wire 18AWG
unless otherwise
specified

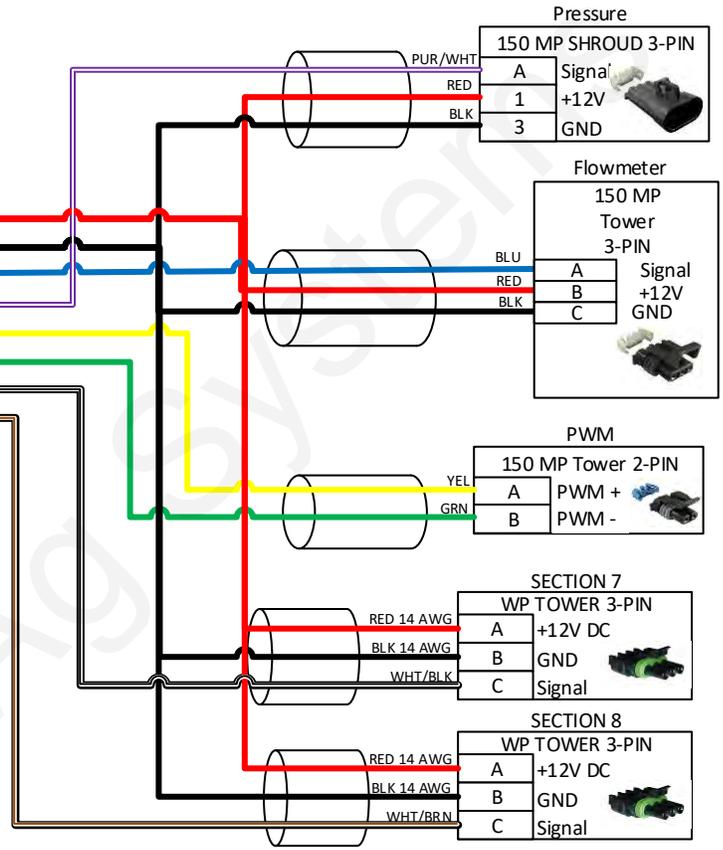


Connects to 201-3426Y1

Pump

DEUTSCH 8-pin DT06-08S

+12V DC	1	RED 14 AWG
GND	2	BLK 14 AWG
Flow Signal 2	3	BLU
Pressure 2	4	PUR/WHT
PWM 2 (+)	5	YEL
PWM 2 (-)	6	GRN
Section 7	7	WHT/BLK
Section 8	8	WHT/BRN



SureFire Ag Systems



Part No:	207-3427Y1	Drawn By:	Mark Wolters		
Description:	8-pin final pump harness for Catalyst	Last Edit Date:	10/14/2016 2:25:23 PM	Revision	A-01
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