

DeltaForce®

**DeltaForce Operator's Guide
For Gen 3 20|20 Displays**



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System Setup and Operation

There are four requirements for the DeltaForce system to function:

1. There must be a speed source.
2. The Master Plant Switch on the Cab Control Module must be in the up position.
3. The planter must be lowered.
4. DeltaForce must be enabled.

Hydraulic Pressure Requirements

1. The hydraulic system must have a Supply Pressure greater than 2250 psi, a Return Pressure less than 100 psi, and a Lift Pressure between 200 psi and the supply pressure.

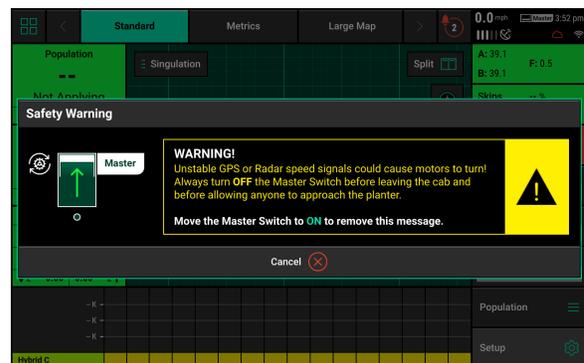
Safety Warning

Once any control product is configured on the 20|20 display, the system will require a Cab Control Module (CCM) and will prompt the user to toggle the Master Plant switch on the CCM before any control products can be used. This warning is triggered any time the system is booted up, and when the system has traveled for more than half a mile.

Note: This Safety Warning will only appear in 2020.1.x and newer software.



If a CCM is not installed, the cancel button can be used to bypass this warning. No control systems will operate until the Master Plant switch is toggled. This icon will be present in the status button in the top right if the Safety Warning was bypassed using the cancel button.

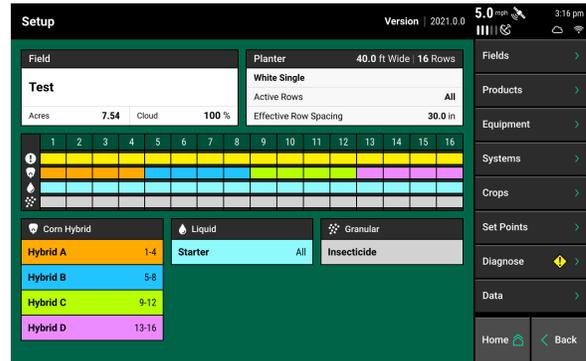


Configuring Monitor for DeltaForce

Step 1:

Set DeltaForce as the Down Force System.

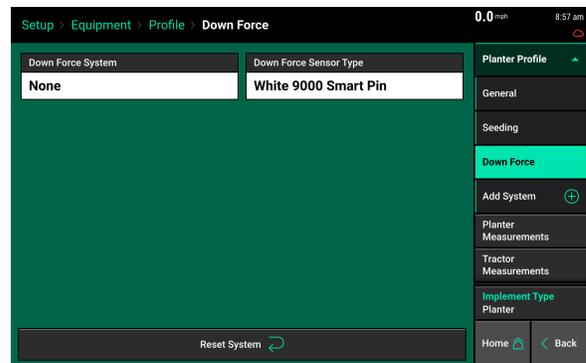
Navigate to the planter setup page by selecting, “Setup” – “Equipment”



Step 2:

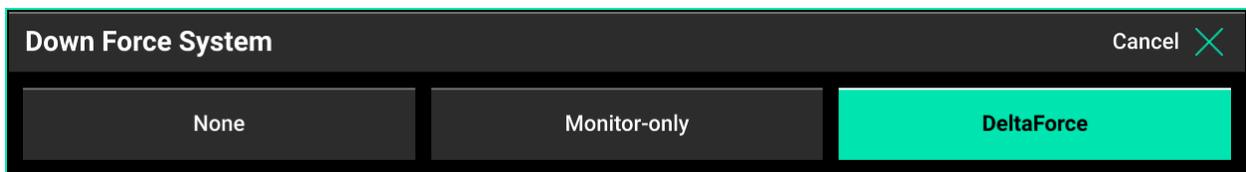
Select “Add System” and add Down Force to the Planter Profile. Navigate to the Down Force Section of the Planter Profile.

Note: In 2020.0.x and older software, this will be located under the main planter profile page.



Step 3:

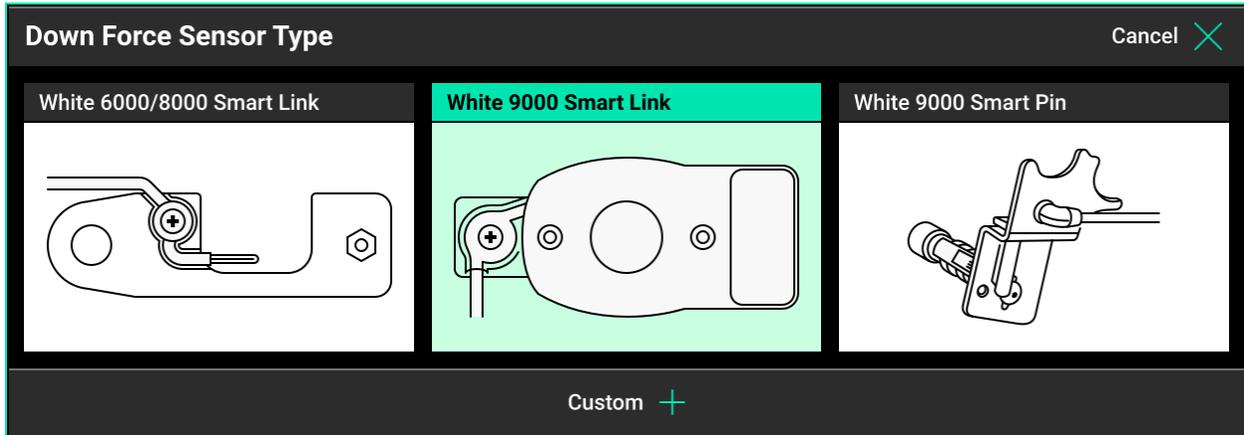
Press “Down Force System” and then select “DeltaForce”.



If the monitor is not connected to a planter or if it is not communicating with DeltaForce, DeltaForce will be yellow after selecting it, indicating the monitor is not able to communicate with the system.

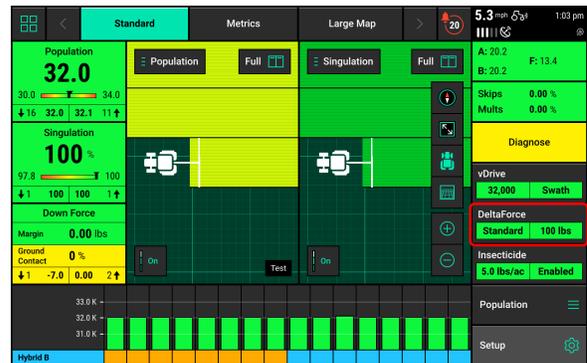
Step 4:

Once DeltaForce has been set as the Down Force System. Select the correct Down Force Sensor Type.



Step 5:

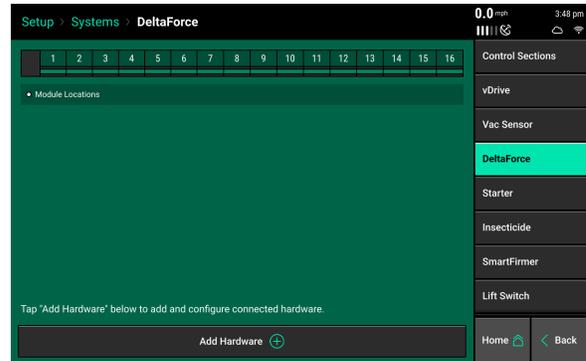
On the home screen the DeltaForce control button will appear on the right hand side of the screen in the Standard and Metrics tabs. It will display the Down Force Setting and the DeltaForce target value. Use this button to access the DeltaForce control page. For more information, see the DeltaForce Control section below.



DeltaForce Setup

Navigate to “Setup” - “Systems” - “DeltaForce”

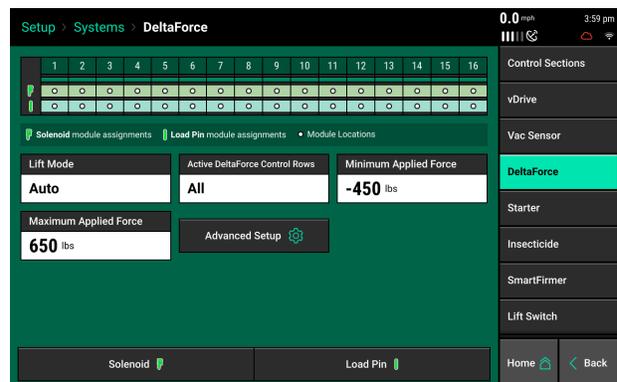
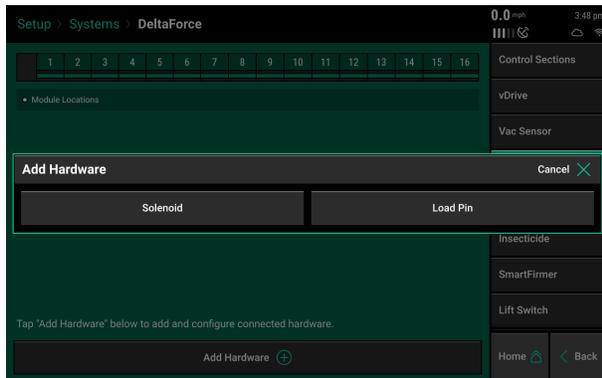
The default DeltaForce settings will function properly for most situations. Adjust settings only if necessary.



Add Hardware

Press ‘Add Hardware’ and select row installation locations for the DeltaForce Solenoids and Load Pins.

Note: This is only required in 2020.1.x and newer software.



Lift Mode

- Automatic mode is the default setting and the system adjusts the amount of lift force according to the needs of each row’s down force. It is rare that this setting would ever need to be changed.
- Manual Mode allows the user to set a consistent manual lift force while still running DeltaForce in an automatic control mode. Adjust the lift force in the DeltaForce Control page. Do not use manual mode unless advised by Precision Planting Product Support.

Note: DeltaForce cylinders must overcome the lift force to hold the row unit on the ground. Excessive manual lift targets can compromise the system’s ability to maintain ground contact.

Active DeltaForce Control Rows - Determine the active rows for DeltaForce. This is typically only changed when DeltaForce is not installed on all rows (Disable rows that do not have DeltaForce installed). It will also be applicable on planters with inter row units. For example on a Kinze planter with pusher and puller row units the pusher units are designated as “Right” in the monitor and the puller row units are “Left”. On John Deere 1790 with an odd number of total rows (ex. 12/23 or 16/31) the corn rows would be labeled as the “Odd” rows and the bean rows

“Even”. On the same planter with an even number of total rows (ex. 12/24 or 16/32) the corn rows are labeled “Even” and the bean rows “Odd”.

Note: Rows that have been disabled in the planter profile will also have DeltaForce disabled and should not also be disabled in the DeltaForce Systems page.

Example: If the odd rows have been disabled in the planter profile and the Active DeltaForce Control Rows is set to Odd, then the even rows (every other row) of the active rows will have DeltaForce disabled.

Units - Select which unit (lbs or PSI) to display DeltaForce values. Pounds (lbs) are the default unit.

Minimum Applied Force - The minimum amount of force that can be applied to each row unit. The default setting is -450 lbs. This value can be set from -450 to 0.

Maximum Applied Force - The maximum amount of force that can be applied to each row unit. The default setting is 650 lbs. The value can range from 0 to 650.

Advanced Setup - This contains a setting which will allow the user to disable the Low Pressure DeltaForce popup.

Note: If this popup is disabled, DeltaForce will not alert the user to low pressure conditions. Low hydraulic pressure conditions will limit DeltaForce performance.

Load Cells

Navigate to “Setup” – “Diagnose” – “Load Cells”

This page displays Load Cell information as well as control for zeroing and disabling load cells.

Load Cell values can be zeroed by pressing the “Zero All” button at the bottom of the page.

Ensure the planter is raised when zeroing load cells.



Reading (lbs) - displays the current weight that is being measured on each individual row.

Sensor Source - Identifies the type of module the Load Cell is plugged into.

Status - displays the status of each load cell. Selecting a row in the status column will allow the operator to disable (ignore) the load cell on that row. To make a load cell active that has been ignored select that row in the status column.

Reference Value - This is a value that is used to give a Load Cell a true zero. A healthy reference value is between 28 and 36. Reference values will vary across the planter but all should be within this range.

Note: If a load cell is ignored, that row will control DeltaForce to the 80th percentile of all other properly operating rows.

Note: If the system suspects an issue with a load sensor, it will automatically ignore that load sensor.

Calibration Factor - The calibration factor will auto-populate based on the planter make and model selected and the Downforce Sensor type.

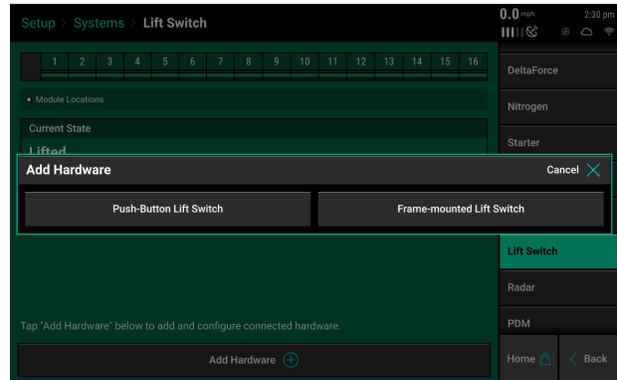
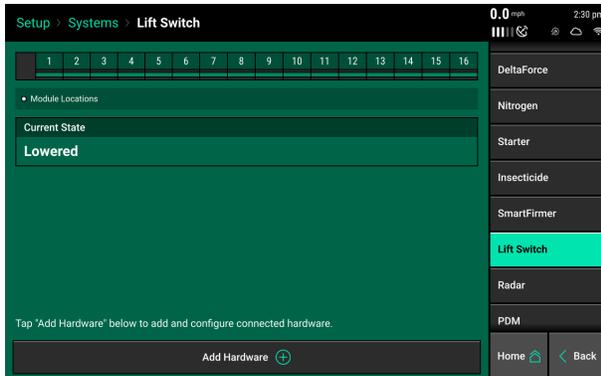
Calibration Factors for each type of load cell:		
Load Cell	Row Units	Calibration Factor
1/2” Load Pin	John Deere 7000 and Kinze 2000 row units	85
5/8” Load Pin	John Deere XP row units and newer	85
Kinze Link	Kinze 3000 & 4900 row units	65
White Smart Link	White 6000 & 8000 row units	65
White Smart Pin	White 9000/Precision Ready Row units	143
Case 1200 Sensor	Case IH 1200 row units	65
Case 2100 Sensor	Case IH 2100 row units	196
Monosem 5/8” Load Pin	Monosem NG+ 3 and 4	88

Lift Switch

One of the requirements for all control products to function is for a lift switch to be installed, and reading lowered.

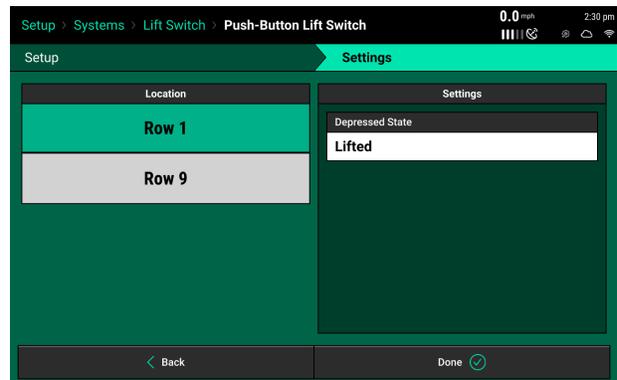
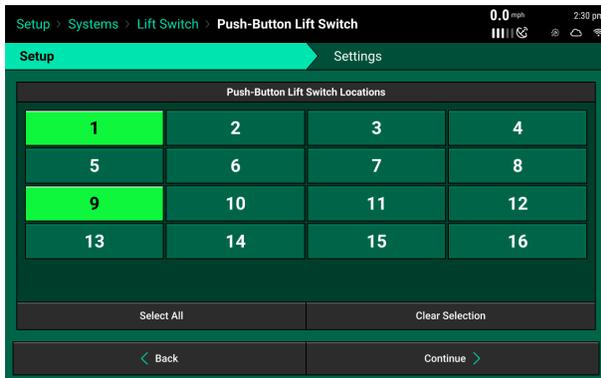
Configure the connected lift switches by selecting 'Add Hardware'. Select the type of lift switch (es) plugged in. A summary of lift switch locations will be displayed at the top of the screen.

Note: Configuration of lift switch row locations is only required on 2020.1.x and newer software.



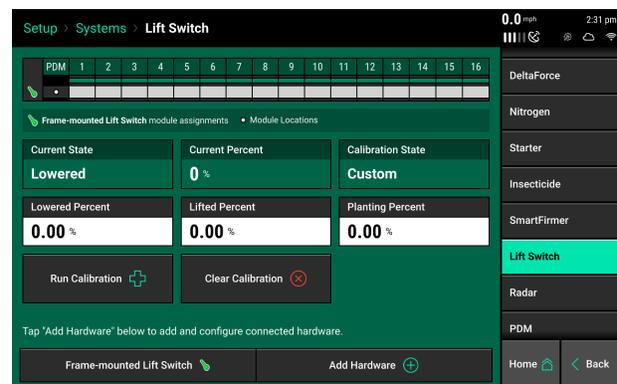
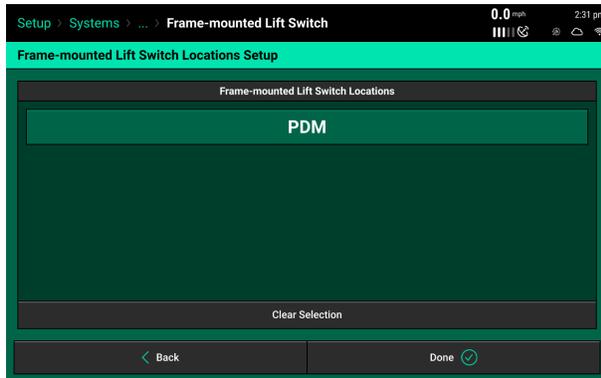
Push Button Lift Switches

Select what rows have push button lift switches installed, then press 'Continue'. In the settings page, select if the push button is depressed (pushed in) when lifted or lowered. A calibration will not need to be performed for push button lift switches.



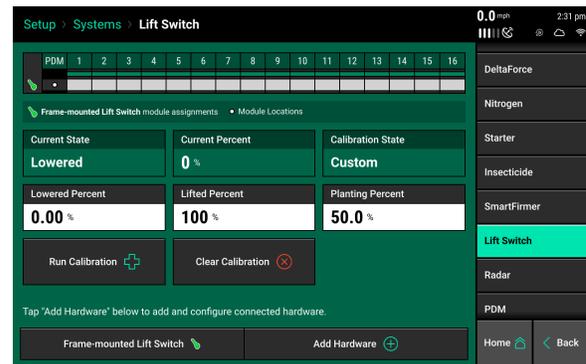
Frame Mounted Lift Switches

For a frame mounted switch, configure the plug in location as the PDM. Once the PDM is selected as the location, the system will then need to be calibrated for lifted and lowered position.



Calibrate Lift Switch

To complete the Lift Switch calibration, press the “Run Calibration” button at the bottom of the screen. Follow the on-screen instructions for the different positions the planter must be in. The results will then be displayed on the main Lift Switch Page. For issues with the lift switch not calibrating or functioning correctly, see the Troubleshooting Guides for Lift Switches in the Dealer Service Manual. After a calibration has been completed, verify the system is reading the lift switch correctly by watching the “Current State” information on the Lift Switch page. Ensure the “Current State” is correct when lowering and lifting the planter.



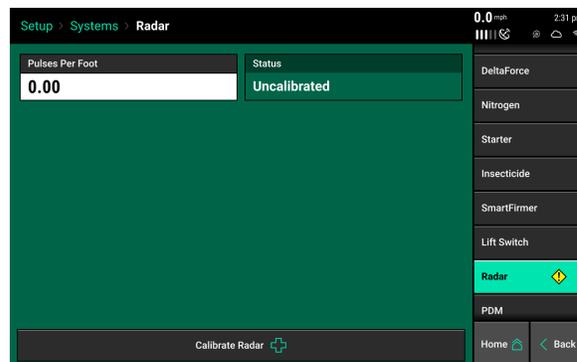
Manual entry of values can be done by selecting the “Lowered Percent”, “Lifted Percent”, or “Planting Percent” buttons and entering a value.

To clear out the current calibration press the “Clear Calibration” button located at the bottom of the screen.

Radar

Receiving a speed reading from a tractor mounted radar is recommended when running a control product. The Radar Status page allows the operator to calibrate the radar.

Select the “Calibrate Radar” button at the bottom of the screen and then follow the onscreen instructions.

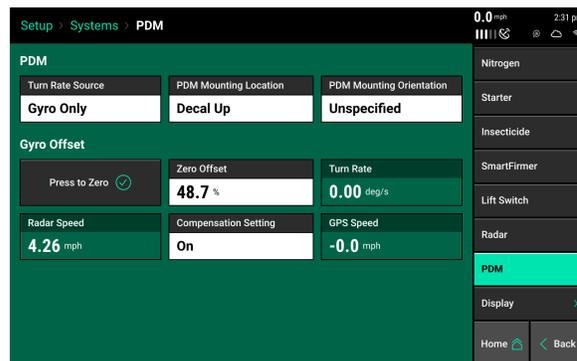


The calibration process will require a good GPS signal as well as having the operator drive straight for at least 300 feet at a constant speed of 4 mph or greater.

If the Pulses Per Foot is already known, enter this value manually by selecting the “Pulses Per Foot” box.

PDM

The Power Distribution Module [PDM] must be configured in order for control products that connect through the SRM infrastructure to operator properly.



Turn Rate Source - Select the input source for calculating turn compensation when planting through curves. Select between “Gyro then GPS”, “Gyro Only”, and “GPS Only”. “Gyro Only” is the recommended setup.

Note: For the system to be able to recognize forward acceleration quickly and start seeding correctly, the position of the Gyro inside of the PDM must be known. Ensure that the PDM Mounting Location and PDM Mounting Orientation are set correctly. Otherwise performance will be degraded.

PDM Mounting Location - Determine if the PDM is mounted with the decal on the PDM facing up or if the decal on the PDM is facing down.

PDM Mounting Orientation - Determine the orientation of the fuses. The orientation is based on the operator sitting in the cab. Fuses can be orientated either: Forward, Right, Backwards, or Left.

“Press to Zero” - use this button to zero the gyro. The gyro should always be zeroed when setting up a new system. There will be a Zero Offset percentage recorded after the gyro has been zeroed. Make sure the planter is straight behind the tractor when zeroing the gyro. If the turn compensation seems to be off or if getting warnings about the gyro, re-zero the gyro.

Zero Offset - Displays the zero offset set when the Gyro was zeroed.

Turn Rate - Displays the radius of a turn in degrees per second, of the turn that is being read from the gyro while turning. This is the degree that will be used for turn compensation.

Compensation Setting - Press on this button to adjust the turn compensation.

On - This is the RECOMMENDED and default setting for all SRM systems. In this setting, both control and monitoring will be based on the speed of each individual row. For example; all rows will keep a consistent seed spacing around curves.

Control Only - Each row will control to its own calculated speed and will keep consistent seed spacing. However, the reporting will only show a population based on the center of the planter. There will be a higher population on the outside rows and lower population on the inside rows of the curve.

Monitor Only - Control for all rows will be based on the center of the planter. However, reporting will show a population based on the distance each individual row traveled. Resulting in a higher population for the inside rows and lower populations for the outside rows.

Off - both control and monitoring will be based on the speed of the tractor. Seed Spacing will be closer on the inside of the curve and further apart on the outside of the curve.

Radar Speed - displays the speed being read from the Radar. Press on this button to be directed to the Radar Status page.

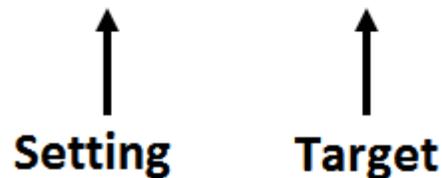
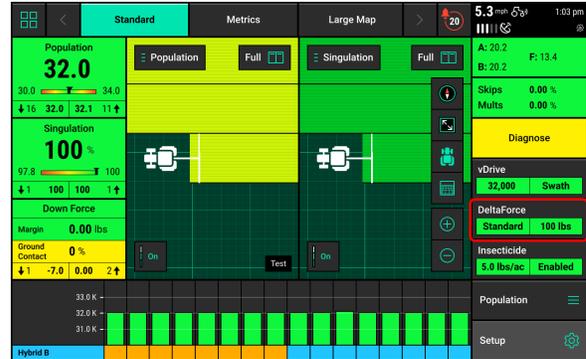
GPS Speed - displays the speed being read from GPS. Press on this button to be directed to the GPS Communication page.

DeltaForce Control

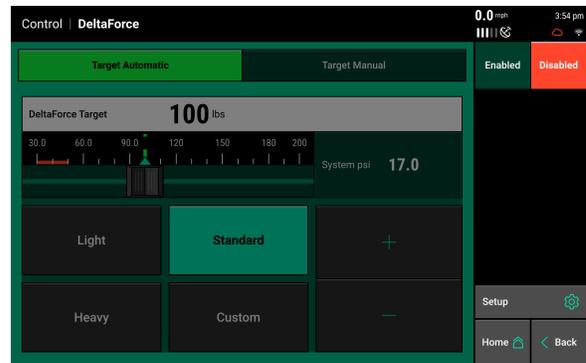
The DeltaForce system control button controls the system and displays the status. If this button is not located on the home screen, see the 20|20 Operator’s Guide for information on configuring the home screen.

If the DeltaForce system is disabled, the DeltaForce control button will be red and display Disabled.

If the DeltaForce system is enabled, the control button will display the DownForce Setting and the DeltaForce target value.



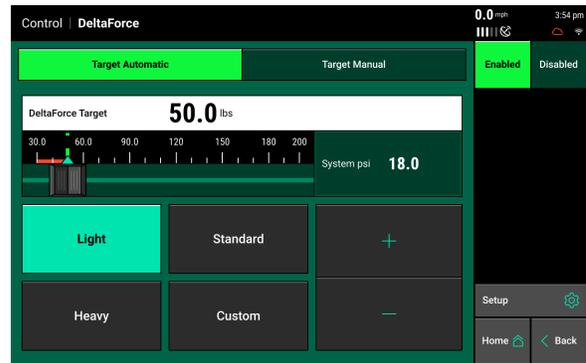
Press the DeltaForce Control button to access the control pages. Use the control page to adjust the automatic target or manually control the DeltaForce system. Use the buttons in the top right hand corner to Enable or Disable the DeltaForce System.



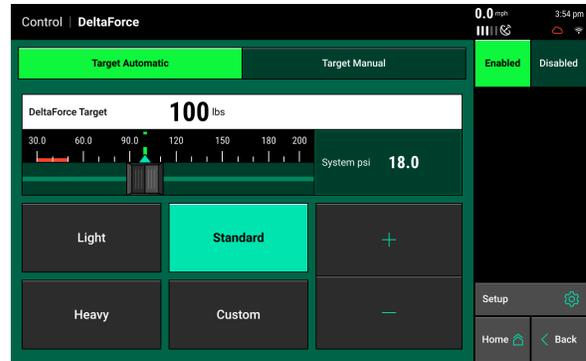
Automatic Target Control – Set a target value of weight that the operator wants to maintain between the ground and the gauge wheels on each row. The system will adjust the applied force and/or lift as needed on each row independent of each other to maintain the target value that was set. All DeltaForce adjustments will be based on the load cell readings measuring the weight on each gauge wheel. Select between: Light, Standard, Heavy, or Custom.

Note: For recommendations on how to set DeltaForce and what Automatic setting to use, refer to the section of this manual on how to set DeltaForce.

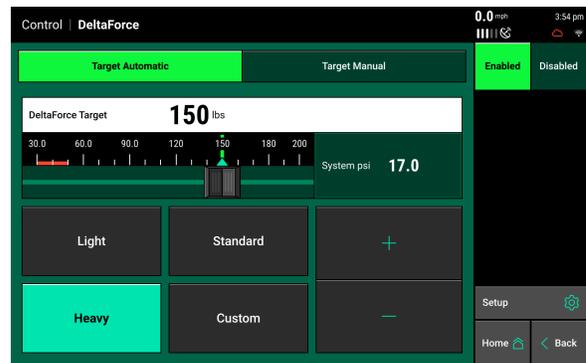
Light – The light target is 50 pounds. Meaning the system will target 50 lbs of force between the gauge wheel and the ground.



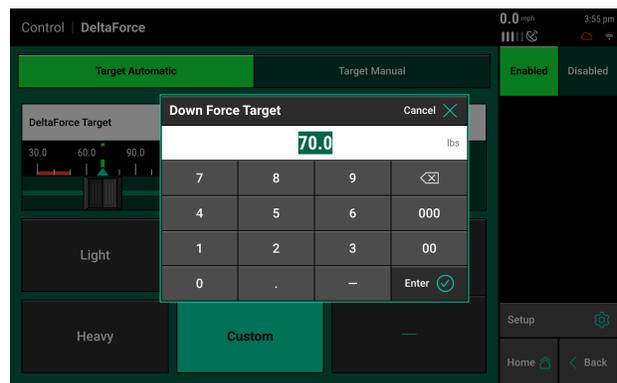
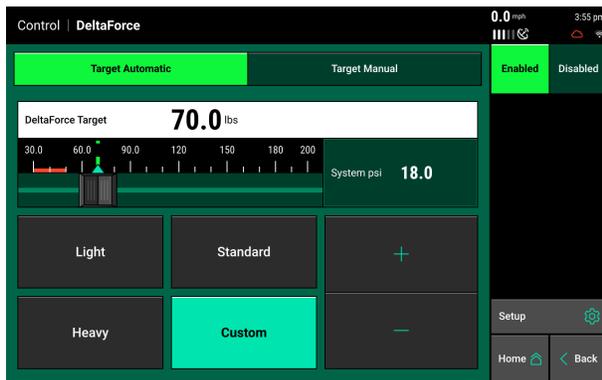
Standard – The standard target is 100 pounds. This is the default setting.



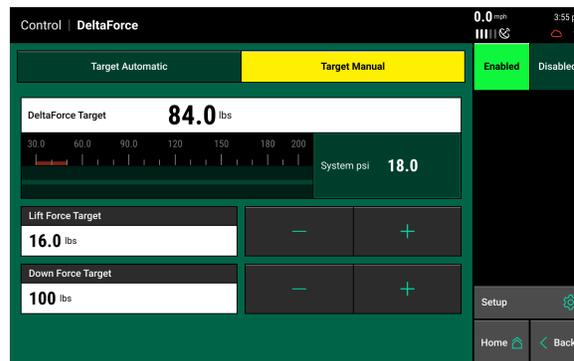
Heavy – The heavy target is 150 pounds.



Custom – This control mode allows the operator to set any target value (up to 195 lbs.) while still maintaining automatic control. Use the plus and minus arrows to adjust the target value or select the target and enter in a value.



The DeltaForce system may also be operated in **Manual Mode**. This control mode allows the operator to designate a desired force for the system to maintain. Both a Lift Force and a Down Force value can be entered. When using Manual Mode, weigh pin readings are not taken into account and all cylinders will apply a single force to all rows until manually changed by the operator.



Use the Plus and Minus arrows to adjust the Lift and Down Force targets. Net applied force will be displayed at the top of the screen.

System PSI displays the current PSI reading from the pressure sensor located on the DeltaForce Lift Manifold.

If the DeltaForce system is not functioning and all requirements for running it have been met, use the Troubleshooting Trees in the Dealer Service Manual for assistance.

How to Set DeltaForce

When DeltaForce is enabled for the first time it is in Standard Mode at 100lbs. If DeltaForce is installed on a John Deere, Kinze, or White planter, Standard Mode is a reasonable starting point when planting at 5 miles per hour. When planting faster, a higher target may be needed. If DeltaForce is installed on a CaseIH planter, Heavy Mode (150 lbs.) is the recommended starter setting. This is because the Reduced Inner Diameter (RID) gauge wheel style allows for increased flowability of soil between the opening disks and gauge wheels. An increased DeltaForce target will ensure that soil along the RID is properly firmed, and will not allow dry soil from a crumbling sidewall to fall into the furrow. This principle also applies to RID gauge wheels on a different equipment manufacturer's planter.

From an agronomic perspective, if this is the first time running DeltaForce; err on the side of heavy — too much downforce. While both compaction (excessive downforce) and shallow planted seeds are yield robbing events, the consequences of shallow planting seeds are greater than losing a row(s) around an ear from soil compaction. Once the first pass is complete, look to the first two tools listed below (20/20 metrics and High Definition Mapping) to help maintain near 100% ground contact. Once this is either achieved or closely achieved, start to evaluate the furrow and dig seed. Below is an in depth look at each tool.

Ground Contact Percentage (20|20) - On the home page of the 20|20 there is a box that displays a percentage of ground contact. This is the percentage of time that the gauge wheels are pushing against the depth stop. This number is updated every second based on a three second rolling average per row and then averaged across the planter. The goal is to maintain 100% ground

contact. If the ground contact is not near 100%, the DeltaForce target should be increased until near 100% is achieved. Depending on the conditions of the field, 100% ground contact may not be unobtainable. On the other hand, just because 100% ground contact is achieved does not mean this is the proper setting. A lighter setting may be needed if excessive force is being used and the furrow reveals compaction. A heavier setting may be needed if additional soil firming is needed.

Using High Definition Mapping - The Down Force high definition map displays weigh pin readings through the field. This can be used to look for any row units that are consistently showing a loss of ground contact, as represented by a blue dot. If these dots are showing up frequently through the field, consider increasing the DeltaForce target.

Looking in Ground- Investigating the furrow is vital for properly setting downforce. After selecting a downforce setting, drive a few hundred feet with the closing system held up on a few rows.

The ideal furrow should have formed sidewalls that do not crumble without being touched. If the side wall was manipulated or pressure was applied, the side wall should start to collapse or cave from the bottom up.

If digging reveals slick sidewalls or sheen development, these are good indicators of moisture present in the furrow that could cause compaction. This is something to take into consideration when finding the proper setting. The seed should also be placed at a depth where there is a consistent moisture layer on either side.

Lastly, if the closing system was set, it should be difficult to try and go back and dig to find the furrow. If an in-ground evaluation shows the setting should be lighter the operator will need to re-evaluate if they are as close as they can be to 100% ground contact.

Bear in mind that 100% ground contact is simply the point where the downforce system has engaged the mechanical depth stop on a row unit. More firming force may be needed to firm the sidewall and hold the furrow open for the whole row unit pass. Finding the right DeltaForce target requires finding the setting that forms the furrow for optimal seed placement, soil structure, and plant development.

In-Season Adjustments- To optimize the downforce management system, it may be necessary to change DeltaForce target settings as environment and soil conditions change. One example that may help illustrate this point is a significant rain event. It would be reasonable to think a lighter setting may be needed to still form the proper furrow after the event occurs. Even though factors in the field may change, the ways to evaluate the proper setting will remain the same.

The HD maps and monitor metrics will show a grower information that would be difficult to see in the field. Digging and evaluating the furrow will show conditions that would not be viewable on a map. Thus, for best results a grower should balance using these tools. Although the 20|20 and HD Maps are useful tools, no number on a map can replace checking in ground to make sure a good furrow is being formed. It is conceivable that a map shows minimal/no loss of ground contact or excess downforce and still not be the appropriate target. For example, a field report

may show 100% ground contact but digging in ground reveals (sidewall compaction or) crumbling furrow walls.

Home Screen

In the Down Force Metrics box the monitor will display Margin, Ground Contact, and the lowest and the highest weigh pin readings.

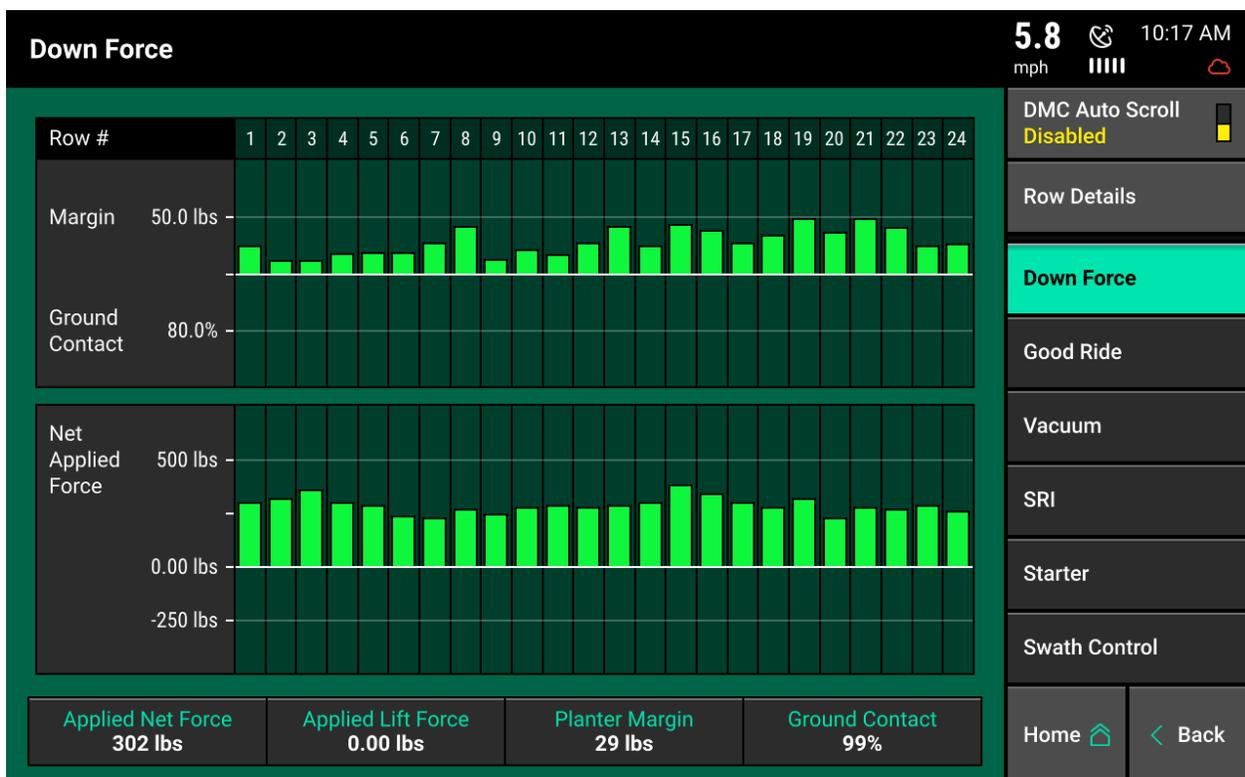
Margin-The lowest measured load cell reading in a given period of time on each row (varies with down force system installed). The Margin value displayed on the home screen Down Force button is an average of this value across all load cell-equipped rows on the planter.



Ground Contact- The percentage of time the system can confirm that the gauge wheels have met the depth stop, which generally indicates that the row unit is planting at the depth to which it has been set. This is calculated by the percentage of time that the load cell is measuring 20 pounds or more.

Low and High Row – Shows the average weigh pin readings for the lowest and highest rows.

Select the Down Force metric to view row by row load cell information.



This page displays the Margin, Ground Contact, and Net Applied Force for each row that has a load cell. The planter average Net Applied Force, Applied Lift Force, Margin, and Ground Contact are displayed at the bottom of the page.

Note: Net Applied Force is the commanded amount of force being applied to the row unit.

Down Force Summary

The Down Force Summary displays row by row information for average Down Force value (as determined by the load cell), Margin, Ground Contact, and Ride Quality. These values are averages for the entire field or the last pass through the field for each individual row. Planter wide averages are available at the bottom of the screen. To access the Down Force Summary select one of the acre counters from the home screen. Then press “Down Force Summary” on the navigation pane.

The screenshot shows the 'Down Force Summary' application interface. At the top, it displays '0.0 mph' and '3:57 pm'. The main content is a table with the following data:

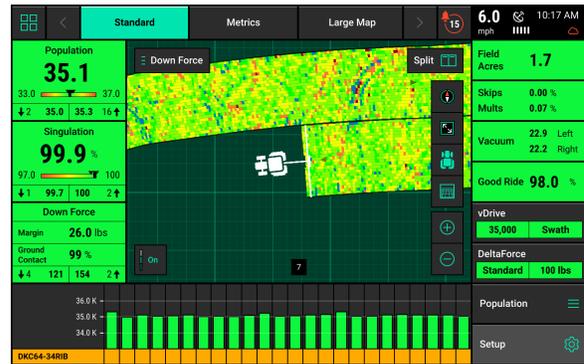
Row	Down Force	Margin	Ground Contact	Ride Quality
1	-0.4	0.31	0.0%	100.0%
2	-0.1	0.00	0.0%	100.0%
3	0.08	0.00	0.0%	100.0%
4	-0.0	0.00	0.0%	100.0%
5	-0.1	0.00	0.0%	100.0%
6	-0.0	0.00	0.0%	100.0%
7	-0.1	0.00	0.0%	100.0%
8	-0.0	0.00	0.0%	100.0%
9	-0.1	0.00	0.0%	100.0%
10	-0.0	0.00	0.0%	100.0%
11	0.07	0.00	0.0%	100.0%
12	-0.0	0.00	0.0%	100.0%
12	-0.0	0.00	0.0%	100.0%
Average	-0.1	0.00	0.0%	100.0%

On the right side, there is a navigation pane with the following items: 'Last Pass' (highlighted in green), 'Field', 'Counter Details', 'Seeding Summary', 'SmartFirm Summary', 'Down Force Summary' (highlighted in blue), and 'Home' (with a house icon) and 'Back' (with a left arrow icon) at the bottom.

Maps

DownForce Map

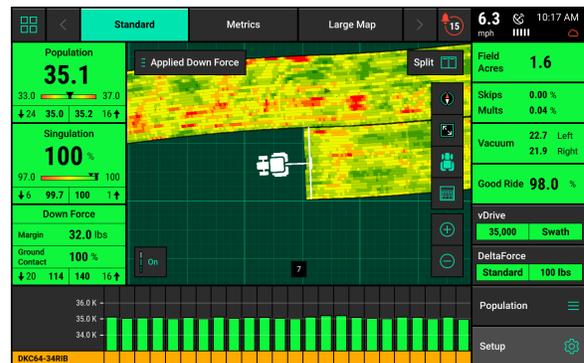
The Down Force map plots load cell readings on a row by row basis. Each box on the map represents one fifth of a second and will display the lowest load cell reading in that time period. A blue dot on the Down Force map signifies a loss of ground contact. Refer to the section of this manual on how to set DeltaForce for how to use this map.



Touch the legend to edit the range and number of steps used to map downforce.

Applied Force Map

The Applied Force Map is mapping what the cylinder is being commanded to do on a row by row basis. As more or less force is needed to achieve the desired target, DeltaForce will automatically adjust the force applied to meet the target. This map will show the applied force in pounds.



This map can be very helpful for diagnosing potential issues. For example, if a row unit is constantly applying the maximum amount of applied force to achieve ground contact and surrounding rows are not, there may be a mechanical problem causing the row unit to have ground engagement issues. For help troubleshooting DeltaForce and down force issues consult the DeltaForce Diagnostic Trees in the Dealer Service Manual.

Much like the Down Force map, the Applied Force map legend can be adjusted by touching it and making the desired adjustments. The maximum applied force is 650 lbs and the maximum lift is -450 lbs as previously stated.

DeltaForce Diagnostic Information

Prior to planting, ensure that all planter diagnostic information is ok. Select “Setup” – “Diagnose”. Everything should be green on the diagnose page. If there is an issue on a row or rows, it will be indicated on the level 1 diagnose page by displaying the system that is having an issue in a color other than green.

Color Legend:

Green - the system is working correctly and communications are good. Select “Color Legend” to view an explanation of what each color indicates.

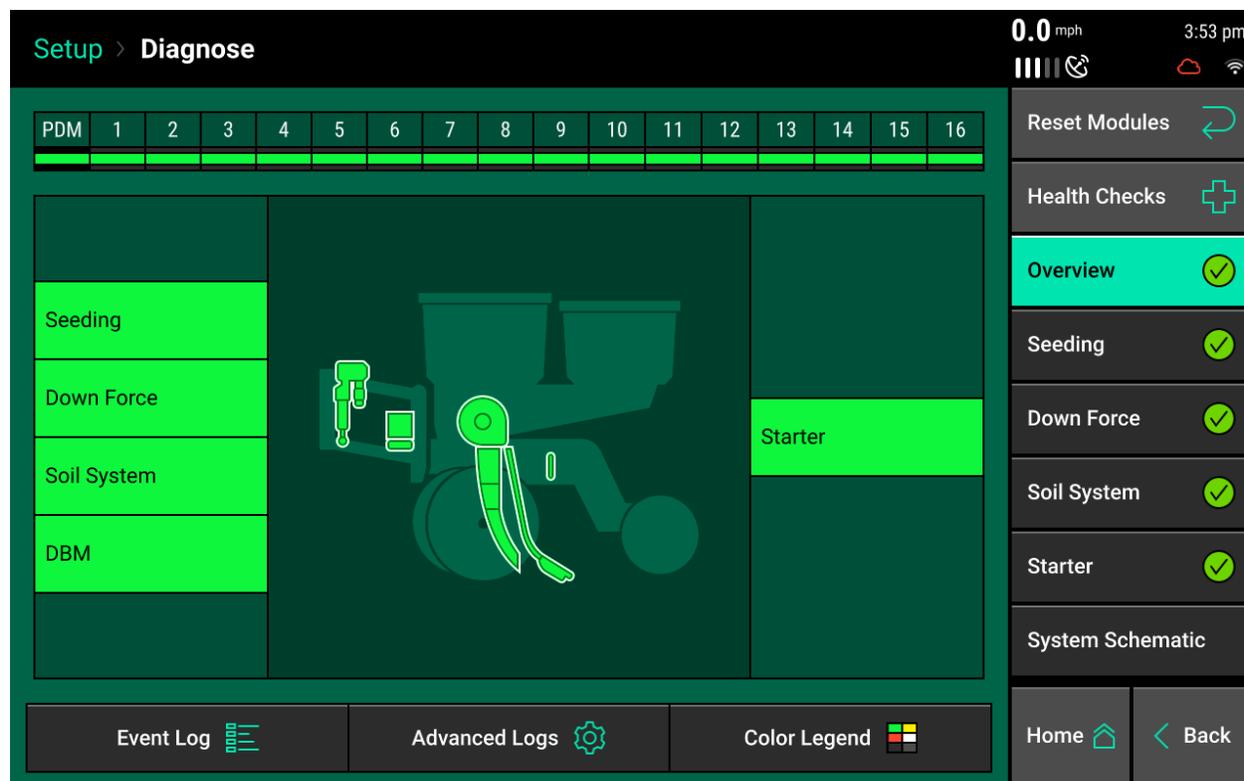
Yellow – a Device or sub-component is not 100%.

Red – Device has failed, or is expected, but not detected.

White – Device is detected, but is not expected.

Black – Row has been disabled in the planter configuration.

Gray – Device is being detected, updating firmware, or unreachable.



Note: Modules may be updating during initial connection. Once updates are complete, all modules should be green. If the modules are not green, confirm that the number of rows and planter setup is correct. If still experiencing issues, refer to the Dealer Service Manual.

The DeltaForce button will be green if the system is configured and communication is established. If it is not green, press it to view DeltaForce level 2 row-by-row diagnostics.

Load Cell (lbs) – Displays the current weight being measured on each individual row by the load cell.

Solenoid Volts – Voltage being sent to the solenoid controlling the valve for the DeltaForce cylinder.

Commanded Pressure – The pressure that the DeltaForce system is commanding each row to apply.

Commanded Force (lbs) – The amount of weight in pounds which the DeltaForce system is commanding each row to apply. Negative values represent lift while positive values represent applied force.

Net Applied Downforce (lbs) – Amount of weight that the DeltaForce system is adding or subtracting to the weight of the row unit.

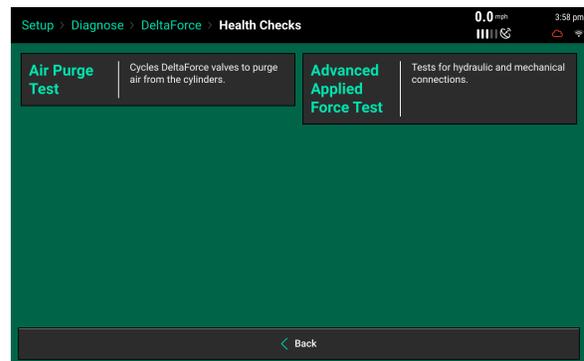
Row	Load Cell (lbs)	Solenoid Volts	Commanded Pressure (psi)	Commanded Force (lbs)	Net Applied Downforce (lbs)
PDM		0.00	0	0	
1	0	0.00	0	0	0
2	0	0.00	0	0	0
3	0	0.00	0	0	0
4	0	0.00	0	0	0
5	0	0.00	0	0	0
6	0	0.00	0	0	0
7	0	0.00	0	0	0
8	0	0.00	0	0	0
9	0	0.00	0	0	0
10	0	0.00	0	0	0
11	0	0.00	0	0	0

System Status: Lift State: Lowered, Supply Press: 17 psi, Radar Speed: 4.3 mph, GPS Speed: 0.0 mph, Master Plant: Off, Control Mode: Enabled

At the bottom of the DeltaForce diagnostic page there is an indicator for the state of the Lift Switch, Master Plant Switch, and the Control Mode. The Supply Pressure value is the current pressure reading on the lift valve of the Lift Manifold (Pressure must be greater than 2250 for optimal performance from DeltaForce). Additionally, both GPS and Radar speed readings are displayed.

DeltaForce Health Checks

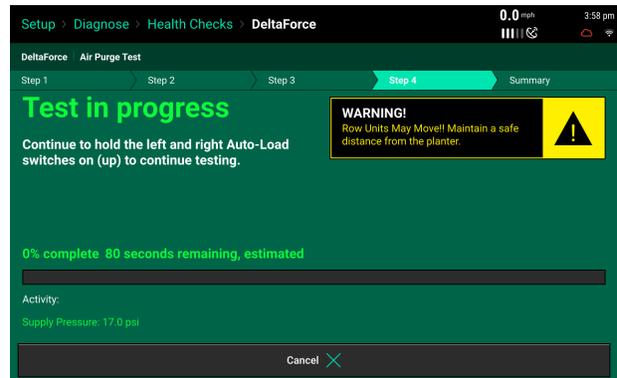
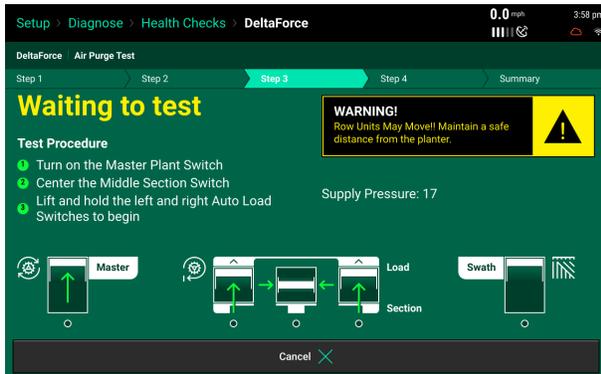
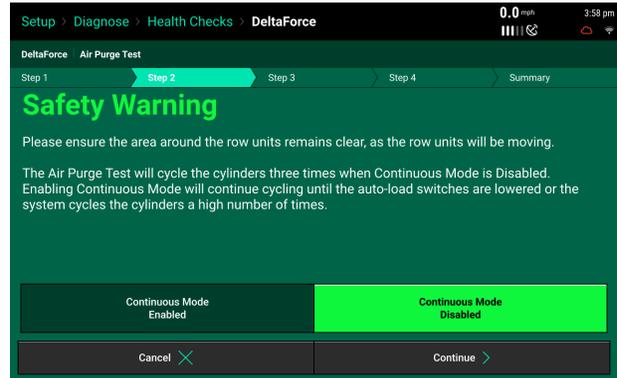
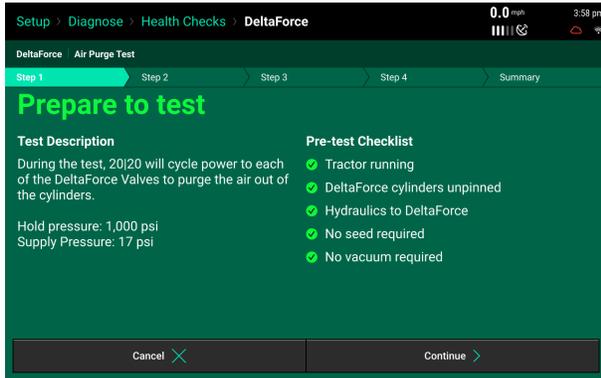
Always perform a health check on the DeltaForce system after installation and at the start of every season. Perform any health checks in yellow before planting. Access the DeltaForce health check page by selecting “Setup” – “Diagnose” – “Health Checks” or by pressing the DeltaForce Health Checks button on the DeltaForce level 2 diagnose page. There are two DeltaForce Health Checks that can be run.



The Air Purge Test, Applied Force Test, and Advanced Applied Test are visual tests and the operator must determine if the system passed or failed the health check.

Follow the on screen instructions when performing the tests. Below is a brief explanation of each test.

Air Purge Test: Cycles pressure to each DeltaForce cylinder to purge air from the system. It is necessary to run this test after doing an installation or opening up any lines in the hydraulic system. The bottom pin used to pin the DeltaForce cylinder to the bottom bracket **MUST BE UNPINNED**. At the completion of the test, the cylinders should be extended. It may be necessary to run the Air Purge Test multiple times to fully purge air from the hydraulic system. Visually inspect each row before reinstalling the bottom pin.



Advanced Applied Force Test: Tests the health of the DeltaForce hydraulic and mechanical system. Ensure that everyone is clear of the planter before performing this health check. During this test, row units will rise and then lower, one at a time, in order. This test may be ran if the planter cannot pass or has issues with an Applied Force Test and further diagnostics are needed. This is a visual test – Pass or Fail must be determined by the operator. If each row does not rise and then lower one at a time in order, see the DeltaForce Diagnostic Trees in the Dealer Service Manual.

