

DeltaForce®

John Deere 2100 DeltaForce Installation

Precision Planting®

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John Deere 2100 Row Unit Install (Long Parallel Arm)

Step 1:

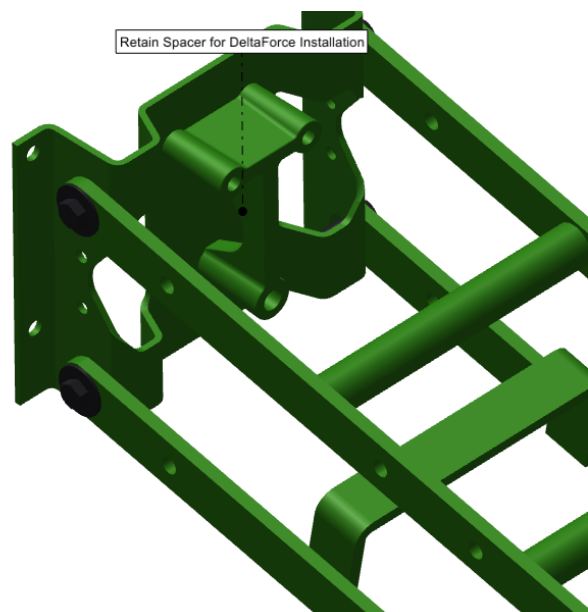
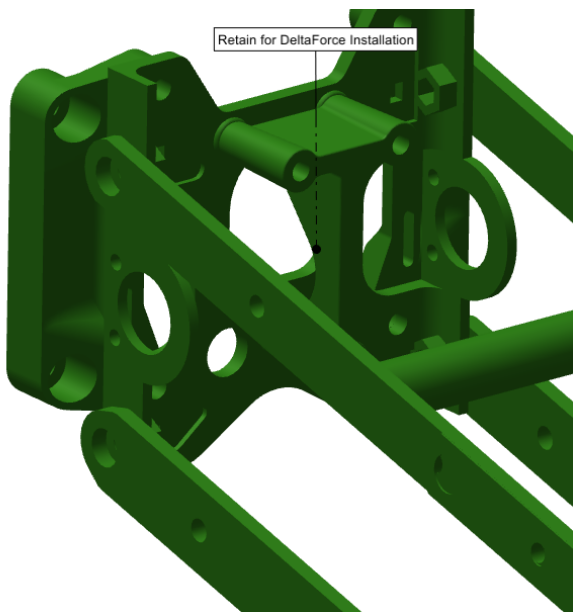
Remove the current downforce spring system by removing the three bolts mounting the heavy duty spring from the 'W' mounting plate.

Note: It may also be necessary to loosen the w plate to get the long bolts out that hold the OEM system in place.



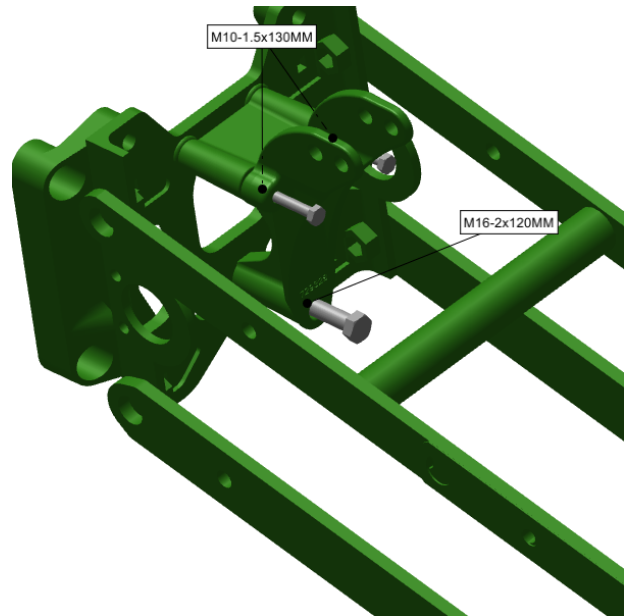
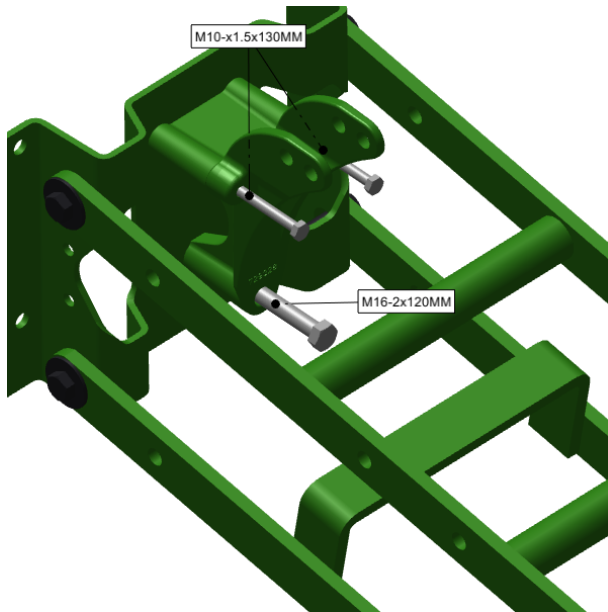
Step 2:

Retain the spacer that is between the downforce spring bracket and the 'w' plate.



Step 3:

Using the two supplied M10X1.5 x 130 hex head bolts and the M16X2 x 120 hex head bolt reinstall the OEM spacer and Precision Planting cylinder mount bracket.



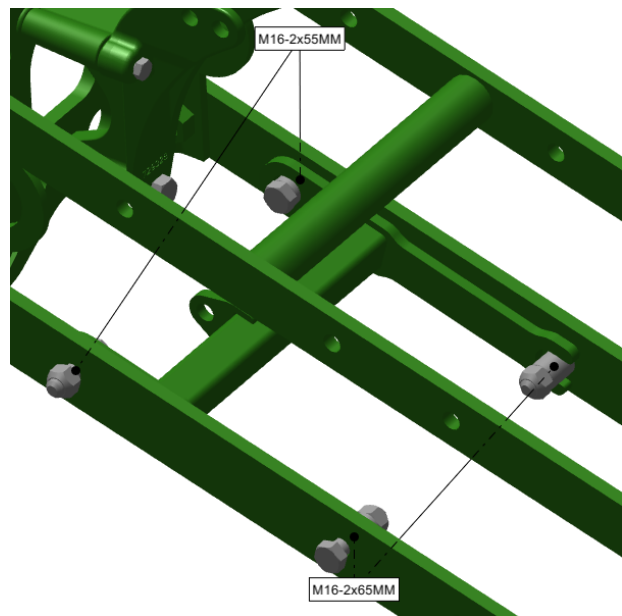
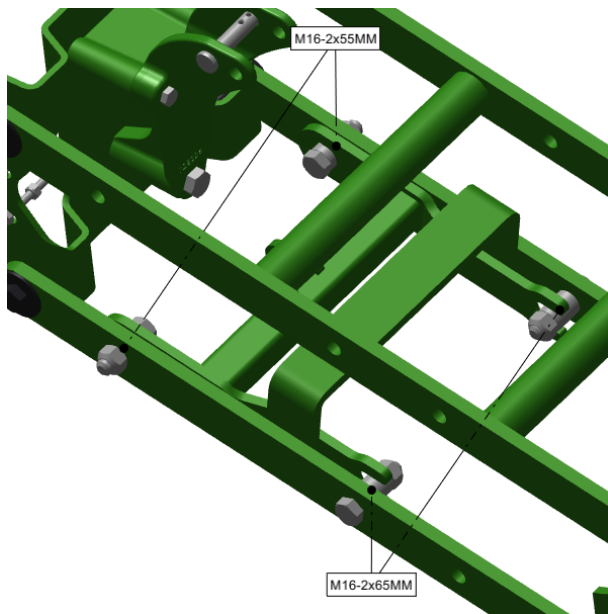
Step 4:

Install the lower parallel arm bracket.

Note: Bolt heads should be on the outside of the parallel arms (shown below)

- The two M16X2 x 55 bolts will be used in the holes that are close to the planter bar.
- The smaller bushing should also be used with these bolts and mounted on the inside of the parallel arms.
- The M16X2 x 65 bolts (longer) should be used in the holes further from the planter bar and the longer bushings will also be installed on the inside of the parallel arms.

Note: On the Pre 2015 bracket (721101) Install the lower parallel arm bracket so the “TOP” wording is facing upward and the wider portion on the bracket is closer to the planter bar.

**Step 5:**

Orient the cylinder so that the solenoid connection faces the back of the planter. Next, using the forward facing hole (closer to the planter bar) on the cylinder bracket, pin the top portion of the cylinder with one of the pins provided and a cotter pin. . Secure the bottom hole of the cylinder with a zip tie until running the air purge test.

Note: After the air purge test has been successfully completed, the bottom hole of the cylinder can be pinned.



John Deere 2100 Row Unit Install (Short Parallel Arm)

Step 1:

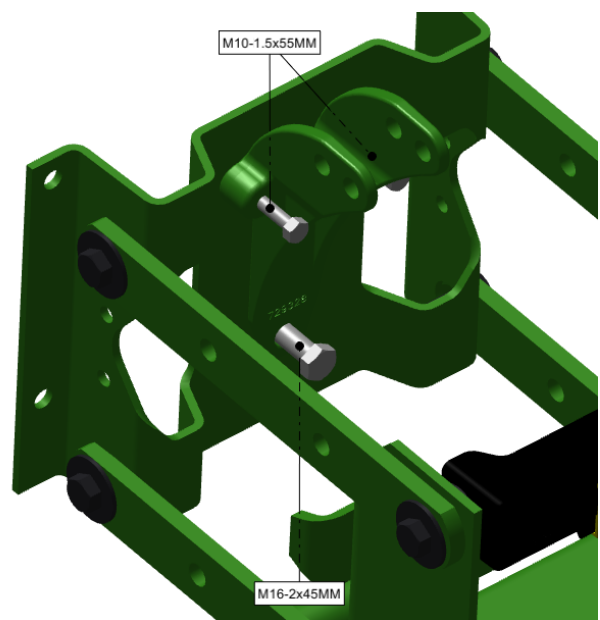
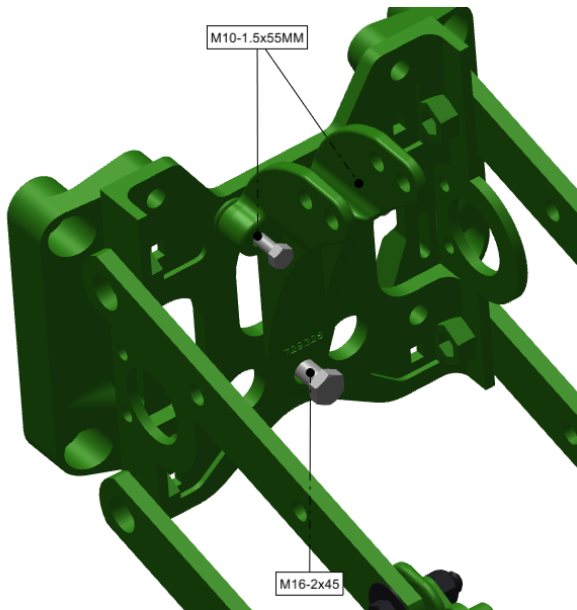
Remove the current downforce spring system by removing the three bolts mounting the heavy duty spring from the 'W' mounting plate.

Note: It may also be necessary to loosen the w plate to get the long bolts out that hold the OEM system in place.



Step 2:

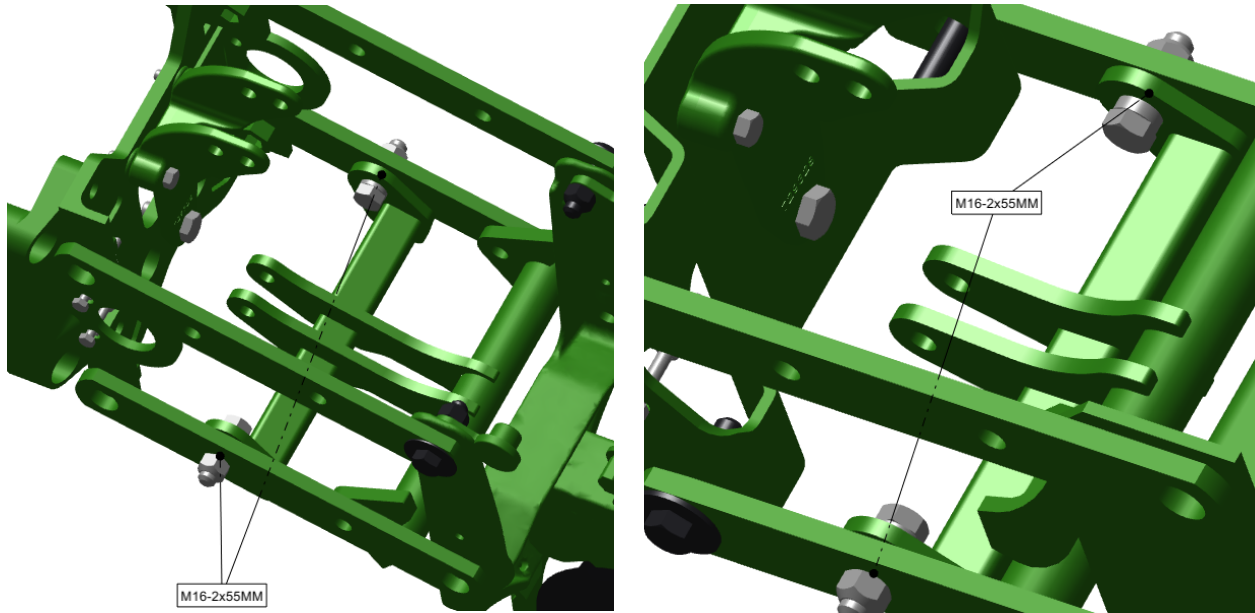
Mount the Precision Planting cylinder mount bracket to the 'w' plate using the two provided M10-1.5x55 bolts at the top of the bracket and the M16-2x45 at the bottom.



Step 3:

Using the two supplied M16-2 x 55 bolts and the two bushings install the lower parallel arm bracket. The bushings should be installed on the inside of the parallel arms. The tabs on the bracket that have the bolt holes should be oriented up.

Note: Bolt heads should be on the outside of the parallel arms (shown below)

**Step 4:**

Orient the cylinder so that the solenoid connection faces the back of the planter. Next, using the forward facing hole (closer to the planter bar) on the cylinder bracket, pin the top portion of the cylinder with one of the pins provided and a cotter pin. . Secure the bottom hole of the cylinder with a zip tie until running the air purge test.

Note: After the air purge test has been successfully completed, the bottom hole of the cylinder can be pinned.



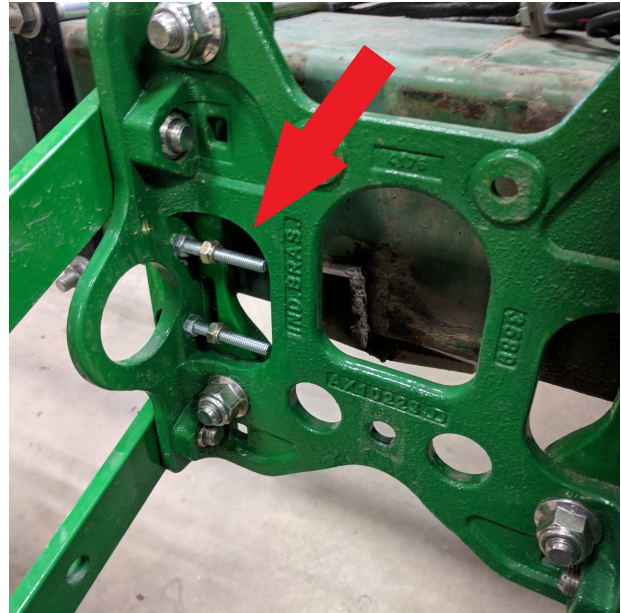
Installing with Cable Drive

Step 1:

If DeltaForce is being installed with cable drives, the Proshaft drive will need to be shifted. Remove the existing mounting bolts.

Step 2:

Use the provided M8X1.25 x 70 full thread hex head bolts and slide those into the existing holes.



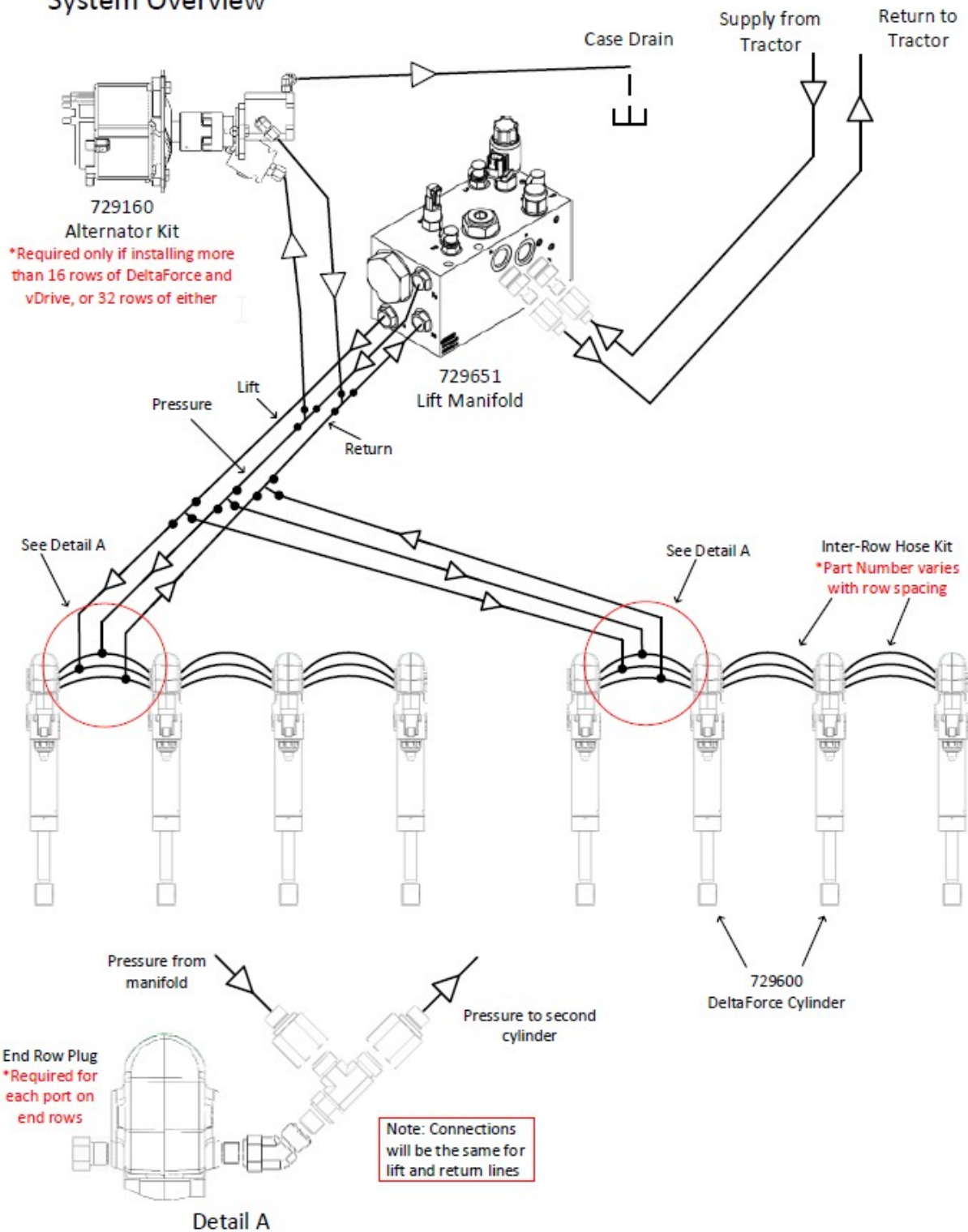
Step 3:

Thread the M8X1.25 nut onto the bolt from the inside of the of the row unit until the cable drive can be reinstalled against it so that it is aligned with the meter drive. Use the provided lock nut to secure the cable drive in place.



Hydraulic System Overview

DeltaForce Hydraulic System Overview



Hydraulic Hose Cutting and Cleaning

DeltaForce: 1/4 GPM Per Row

Alternator (See order guide to know when necessary): 6 GPM

Gallon Per Minute	Hose Size	ORB/ORFS Fitting Size
2–6	3/8"	-6
6–12	1/2"	-8
12–20	5/8"	-10
20–30	3/4"	-12

Note: *See Hydraulic Hose Sizing Guide in Tech Docs for further hose sizing recommendations

Proper Hose Making Practices

It will be necessary to make custom hoses to go from the lift manifold to each section of the planter. Depending on the mounting location of the Lift Manifold, one section of the planter can likely be plumbed using an inter-row hose kit. Supply hoses from tractor to lift manifold will also be custom made.

The greatest risk to hydraulic systems is during the hose making process and installation. Contamination risk can be greatly reduced by proper hose making techniques and cleaning hydraulic hose with Projectiles.

Tools Needed
Hydraulic Hose Cutting Saw: Below are two examples. Any saw designed to cut hydraulic hose will work.



Hydraulic Hose Cutting Blade (Knife):

Two examples are listed below. There are more styles of blades designed to cut hydraulic hose that are acceptable.

Smooth or Scalloped

Abrasive cut off wheels are **NOT** to be used



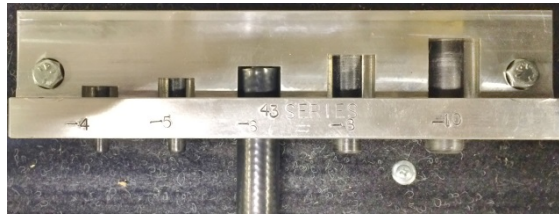
Projectile Kit:

Launcher and Projectiles



Insertion Depth Block:

#1 field failure of hoses is fitting not being fully seated

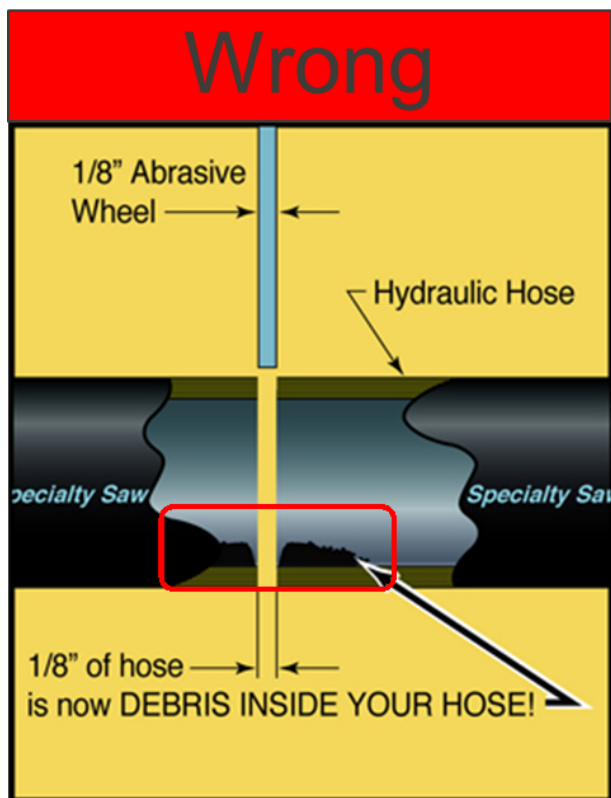


Making of Hydraulic Hose

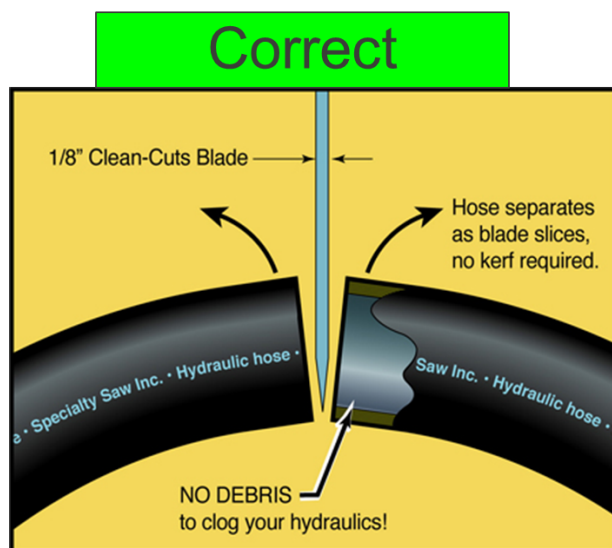
Step 1:

Use a saw and blade designed to cut hydraulic hose and cut to length. It is important that the hose is pulled apart by the bracket that is holding the hose to reduce heat.

Chop saw abrasive cut off wheel



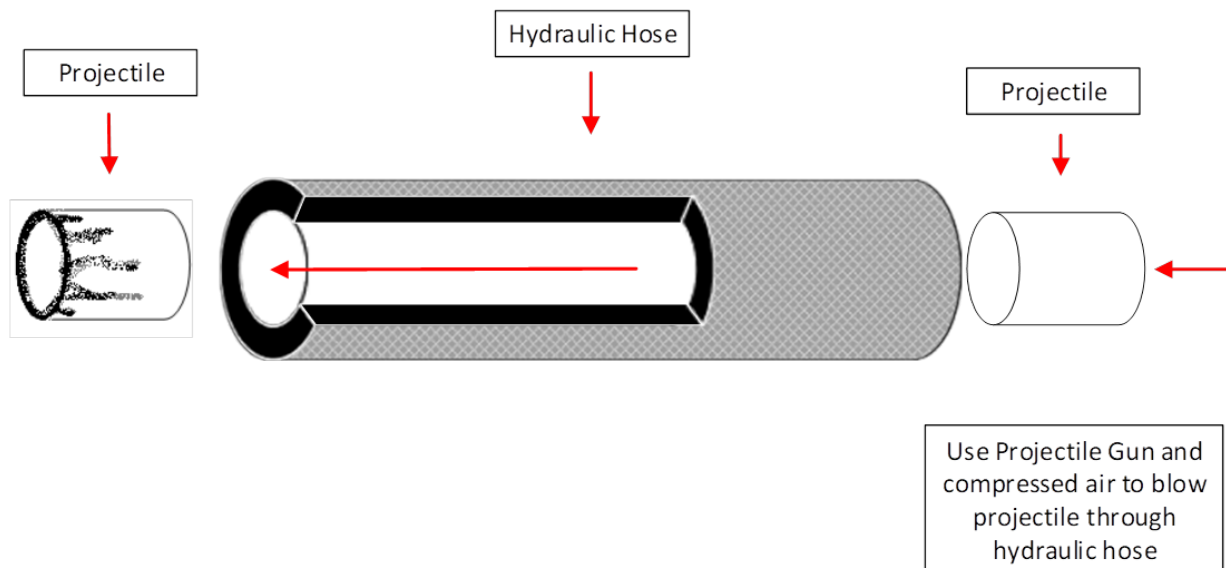
Saw designed to cut hydraulic hose with proper blade



Note: Using a saw/blade not designed to cut hydraulic hose creates contaminants that greatly increase the risk of valve failure in a DeltaForce System.

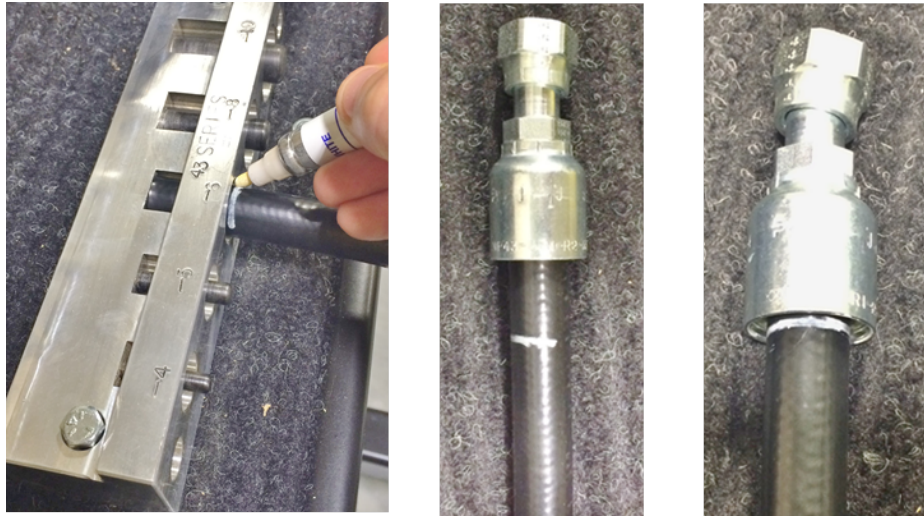
Step 2:

After the hose has been cut, use compressed air and the projectile launcher to run a projectile (sized accordingly to hydraulic hose) through the hose. Repeat this process on both ends of the hydraulic hose.



Step 3:

Using an insertion depth block, insert the hose to the proper depth stop and mark the hose. This mark gives a visual of where the fitting needs to be for the hose to be completely seated.

**Step 4:**

Install fitting onto hose. Make sure the fitting is fully seated by using the mark made in step 3. (See Above)

Step 5:

Using corresponding dye, crimp fitting onto end of hydraulic hose.

Step 6:

Run projectile through fitting and hose from the un-crimped end to the crimped end completed on setup 5. This helps eliminate any burrs or debris that may have entered hose as a result of putting fitting on end of hose.

Step 7:

Mark other end of hose in insertion depth block.

Step 8:

Install fitting on end of hydraulic hose.

Step 9:

Crimp fitting on end of hose.

Step 10:

Run projectile through second fitting & hose from the previously installed fitting on step 5 through the new fitting.

Step 11:

CAP ENDS UNTIL INSTALLATION.

Installation of Hydraulic Systems

Note: DeltaForce must be installed with a closed center hydraulic system. DeltaForce is not compatible with open center hydraulic system.

Note: The DeltaForce system requires 1/4 GPM (Gallons Per Minute) per row at 2250 psi (2500 psi recommended; max 3000 psi) with continuous flow. If the system is equipped with an alternator, an additional 6 GPM is required. The alternator option also requires a 3/8" case drain.

Note: While the flow requirements suggest the system could be tied into similar locations as the AirForce hydraulic compressor, the pressure requirements limit what existing lines could be used. Do not tie the DeltaForce system into the lift and lower/CCS circuit on the planter. Hydraulics for the DeltaForce System should be supplied by:

1. Power Beyond
2. SCV with Power Beyond Return
3. SCV
4. Tied into existing hydraulic motors
5. PTO Pump — must be purchased from Rowe Manufacturing

Note: Due to the close proximity of all of the required fittings, you may not be able to install and, more importantly, tighten all of the fittings for all rows in this exact order. Leave all dust caps on fittings and hoses until you are ready to connect them to prevent dirt from entering the system.

Determine mounting location for the lift manifold. The lift manifold should be within three feet of the PDM.

Use the provided hardware and bracket to mount the lift manifold. The hardware will allow mounting to a 7X7 inch frame or a 5X7 inch frame.

Note: If necessary, a plate can be fabricated to mount the lift manifold in a safe location. The lift manifold must be rigid.

Determine how many outputs will be used. Generally, two outputs are utilized for cleaner hose routing. Install the union adapters into the lift manifold block for the outputs that will be used.

Note: The inlet ports are a -10 (5/8") for a -6 (3/8"), -8 (1/2") or a -10 (5/8") hose. The outlet ports are -8 (1/2") for -6 (3/8") hose. Refer to the hose sizing document under the DeltaForce tab on the cloud for more information.

Note: Before pressurizing the system, ensure all plastic caps have been removed and fittings are tight.

Note: The following steps should be completed with one hydraulic hose at a time to ensure that the system does not become contaminated.

Loosen all caps on the cylinders. Then one port at a time, replace the cap with the proper fitting.

Note: Oil will leak when the caps are removed.

Note: The paint on the caps can crack and chip. Begin by loosening the caps then use an air gun or brush to remove all loose paint.

Thread 45 degree adapters into both sides of the cylinder manifolds. Orientation of the fitting will be determined by the hose routing to the next row.

Install end row caps on the first and last cylinder of each section. The first cylinder will have the end row caps installed on the left hand side of the cylinder. The last cylinder will have the end row caps install on the right hand side of the cylinder.

Note: Use the diagnostic ports as end caps on the first row of the planter and the last row of the planter. The diagnostic ports are supplied with the lift manifold fitting kit.

Note: Take care when tightening the 45 degree adapters and the end row caps. The cylinder can rotate when tightening the fittings.

Determine the location to “T” the supply lines in between each section. Typically, this is in the center of each section.

Note: 90 degree elbows are included in the 2 and 3 frame fitting kits if necessary.

Note: A maximum of 11 rows on either side of where the “T” is located is allowed. In other words after a “T” the 11th cylinder would have to be capped at the end.

Note: It is recommended that one output of the lift manifold supply the center section and the right section of the planter. Install a “T” to supply hydraulics to the right wing of the planter. Still utilize a “T” to supply hydraulics to the center section. This will not count towards the maximum of 11 rows due to being installed prior to flowing through any cylinder.

Install the inter-row hoses between each row. Ensure that the line from “P” on the first cylinder goes the “P” on the second cylinder. Ensure that the line from “R” on the first cylinder goes the “R” on the second cylinder. Ensure that the line from “L” on the first cylinder goes the “L” on the second cylinder.



Note: Utilize the colored zip ties that are include in the DeltaForce Base kit. The colored zip ties should be used as each hydraulic hose is installed. The “Red” zip ties should be installed on the “Pressure” hose. The “Blue” zip ties should be installed on the “Return” hose. The “Yellow” zip ties should be installed on the “Lift” hose. There are enough colored zip ties for only the inter-frame hoses.

Plan out the install of the hoses from the Lift Manifold to each section of the planter. These hoses will need to be custom made for each planter.

Note: Do not remove the -10 (5/8") fittings on the input side of the manifold. Utilize the provided reducers to adapt to smaller hoses.

Ensure all fittings are tight.

Connect the supply hydraulics to a SCV. Turn the flow on the SCV down to 10%.

Gently engage hydraulics. Check for leaks.

If leaks are found, tighten fittings. Repeat test.

If no leaks are found, turn the flow on the SCV to 100%. Check for leaks.

If leaks are found, tighten fittings. Repeat test.

DeltaForce Spare Parts Mount

Use the spare parts mount to hold the DeltaForce spare parts kit with the lift manifold. The DeltaForce spare parts kits includes a 3000 PSI gauge that is used for diagnostic purposes. It will install with the Lift Manifold mounting bracket under the lift manifold.

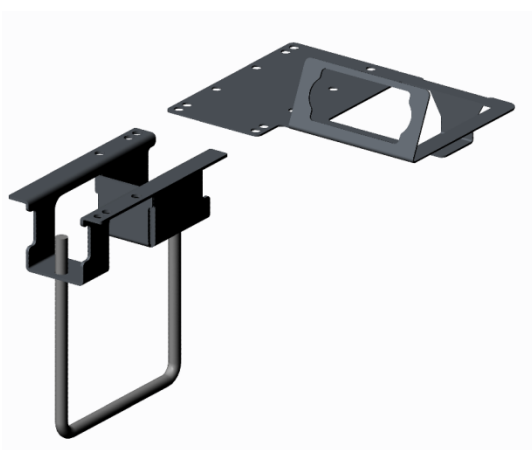


Figure 1.

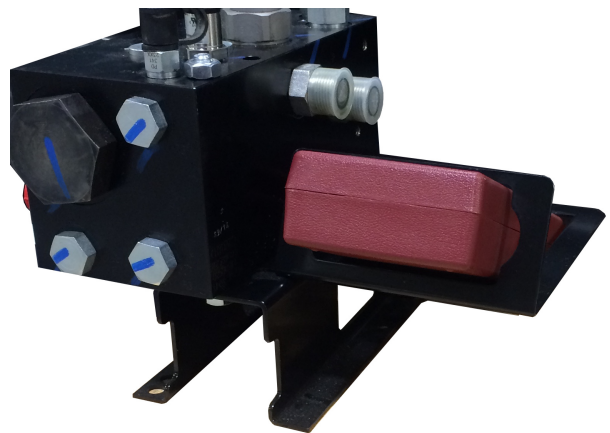


Figure 2.

Hydraulic Specifications

- Hose Sizes
 - —8 (1/2") minimum supply and return hose size.
 - —6 (3/8") hose from lift manifold to frame sections.
 - —6 (3/8") hose for case drain if an alternator is installed.
 - For more information on hose sizing and when to add an alternator please consult the Order Guide and Hydraulic Hose Sizing Chart on the Cloud.

Note Installation of a -8 (1/2") for Supply and Return hoses is recommended even on planters that do not currently require an alternator to allow for easier installation in the future for any additional systems that might be added.

- Hydraulic Flow
 - 1/4 Gallon per Minute per row.
 - 6 Gallon per Minute Hydraulic Alternator. (If installed)
 - System pressure greater than 2250 PSI.
- Hydraulic Supply Source
 - Power Beyond.
 - Selectable Control Valve (SCV) with Power Beyond Return.
 - Dedicated SCV.
 - Tied in with hydraulic drive motors.

Normal Operating Ranges

- Pressure Sensor on lift manifold – Up to 3000 psi
- “P” port on lift manifold – Up to 3000 psi
- “R” port on lift manifold – Less than 100 psi
- “L” port on lift manifold – 200-System Pressure*
- “P” port on cylinder —Up to 3000 psi
- “R” port on cylinder —Less than 100 psi
- “L” port on cylinder— 200-System Pressure*
- Cylinder Pressure — 200–System Pressure*
 - *Will only read when the system is activated. When the system is deactivated, should read less than 100 psi.
- In order for DeltaForce to operate correctly the following conditions must be met:
 1. Speed Source set up and the planter moving.
 2. Planter lowered.
 3. Master Plant switch on.
 4. DeltaForce enabled (DeltaForce Control Page).

Hydraulic Fittings

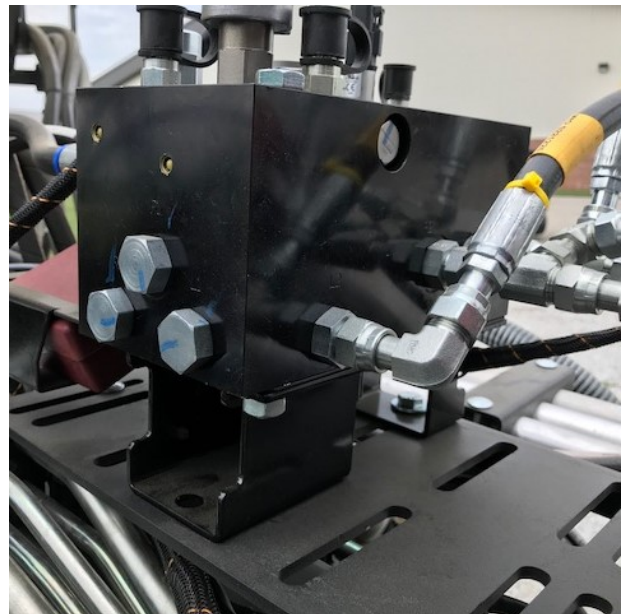
Hydraulic Fittings						
Kit Part Number	Quantity	Part Number	A	B	Description	
729615	6	729247	-6 ORB-M	-6 ORFS-M	Custom Long Adapter	
729627	6	780153	-6 ORB-M	-6 ORFS-M	Adapter	
729614	6	780104	-6 ORB-M		Plug	
729620	6	780182	-6 ORB-M	-6 ORB-F	90 Deg Fitting	
729621	6	780214	-6 ORB-M	-6 ORB-F	Swivel Nut Run T	
729628	4	780142	-6 ORB-M	-6 ORFS-M	90 Deg Adapter	
	2	780250	-6 ORB-M	-6 ORFS-M	90 Deg Long Adapter	

Lift Manifold Installation

Step 1:

Mount the Lift manifold directly to the planter bar near the PDM mounting location.

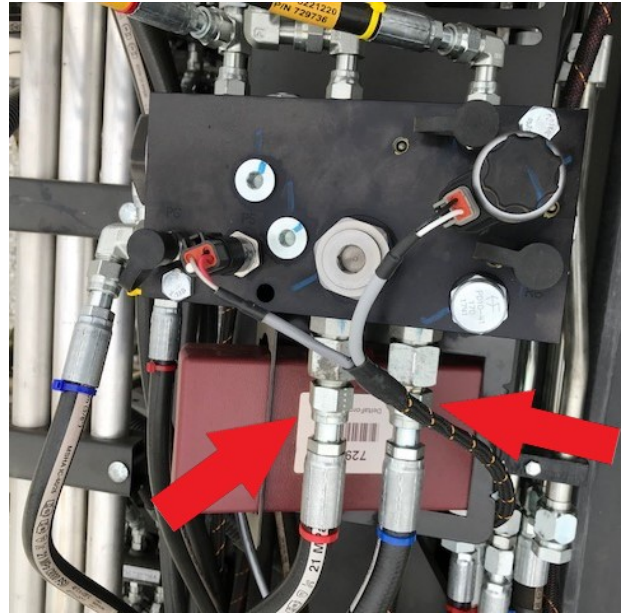
Note: Lift Manifold extension harnesses are available if necessary.



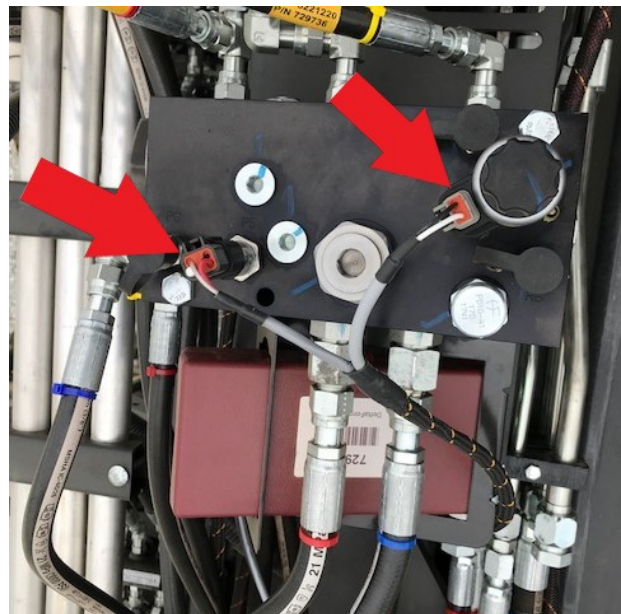
Step 2:

Connect the pressure and return ports from the tractor to the ports labeled 'P' and 'R'.

Note: Adapters may be necessary to connect to the hydraulic hose fittings.

**Step 3:**

Connect the PDM pressure sensor connection and the Lift PWM connection from the PDM harness into the respective connection on the Lift Manifold.

**Step 4:**

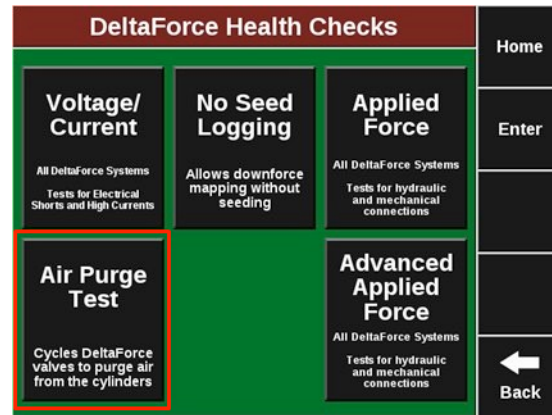
Connect the Alternator (if applicable) and DeltaForce section hoses to the remaining Pressure (P), Lift (L), and Return (R) ports. Each available side of the Lift manifold is labeled with a side number. (P1, P2, etc). Refer to the Hydraulic System Overview and the Installation of Hydraulic Systems sections of this manual for further details.

Air Purge Test

Note: Before proceeding, ensure that the system electronics are properly functioning. Refer to the “vDrive and DeltaForce Harness Installation Manual.”

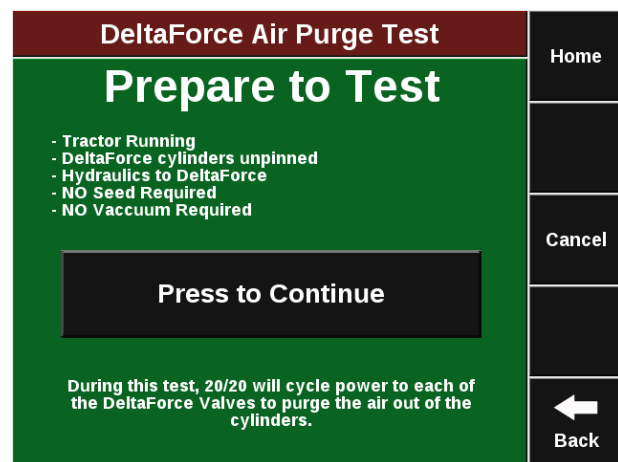
Step 1:

Select “Setup,” “Diagnose,” “DeltaForce,” “Health Check,” “Air Purge Test” from the home screen on the 20/20 Display.



Step 2:

Confirm the requirements are met. Press the “Press to Continue” button.

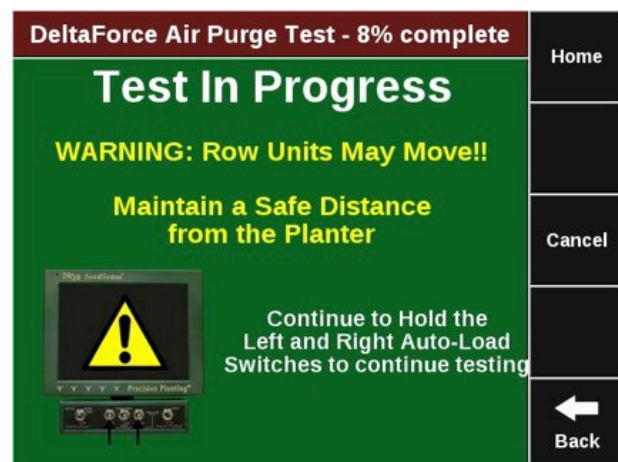


Step 3:

Turn the “Master Plant” switch on the Cab Control Module. Lift and hold the left and right auto—load switches to begin the test.

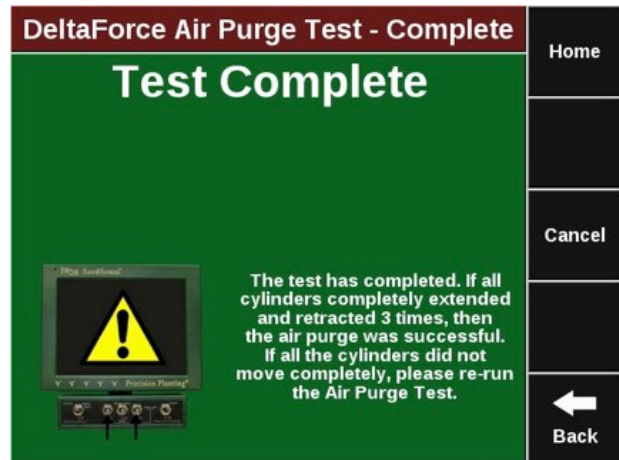
Step 4:

The percent complete will be displayed on the top of the screen. If there are any hydraulic leaks, stop the test, by letting go of the toggle switches, and tighten the fittings.



Step 5:

The operator will be informed when the test is complete. The cylinders should have extended and retracted 3 times. If the cylinders do not finish in a completely extended position, confirm hose routing is correct. Re—run the Air Purge Test.

**Step 6:**

Change the supply hydraulics from the SCV to the connection that will be used when planting.