Hydraulic Kit Installation Guide

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Part Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>HOSE ASSY. 3/8&quot; X 132&quot; -8F X -8F ORFS</td>
<td>F451TC-JCJC080806-132</td>
<td>1</td>
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<tr>
<td>2.</td>
<td>HOSE ASSY. 3/8&quot; X 132&quot; -6F X -8F ORFS</td>
<td>F451TC-JCJC060806-132</td>
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</tr>
<tr>
<td>3.</td>
<td>HOSE ASSY. 1/4&quot; X 126&quot; -4F X -4F ORFS</td>
<td>F451TC-JCJC040404-126</td>
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<td>4.</td>
<td>HOSE ASSY. 3/8&quot; X 54&quot; -6F ORFS X -8F ORFS 90 DEG.</td>
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<tr>
<td>6.</td>
<td>ADAPTER RUN TEE ORFS F-M-M -8</td>
<td>8 R6LO-S</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>ADAPTER -8 M ORFS x M22 O-RING</td>
<td>8M22F87OMLO</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>ADAPTER 90 DEG -4 M ORFS x M12 O-RING</td>
<td>4M12C87OMLO</td>
<td>1</td>
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</table>
### 500-0321-01 Hydraulic Hose Kit Installation Guide

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Code</th>
<th>Quantity</th>
</tr>
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<tbody>
<tr>
<td>9</td>
<td>ADAPTER - RUN TEE F-M-M -4 ORFS</td>
<td>4 R6LO</td>
<td>1</td>
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<tr>
<td>10</td>
<td>ADAPTER - 45 DEG. ELBOW -8 ORFS</td>
<td>8 V6LO-S</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>ADAPTER, S-LK, F-M, NUT ELBOW #8</td>
<td>8 C6LO</td>
<td>2</td>
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<tr>
<td>12</td>
<td>DUST CAP 1/8&quot; (PD6-285)</td>
<td>PD6-285</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>ADAPTER TEST PORT NIPPLE 1/8&quot; X-4F ORFS</td>
<td>PD34BTL</td>
<td>1</td>
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<tr>
<td>14</td>
<td>KIT CABLE TIE HOSE ID</td>
<td>200-0467-01</td>
<td>1</td>
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<tr>
<td>15</td>
<td>ADAPTER M14 X -4M ORFS</td>
<td>4M14F87OMLO-S</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>ADAPTER SWIVEL NUT ELBOW #4 ORFS</td>
<td>4 C6LO</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>ADAPTER UNION -4 ORFS</td>
<td>4 HLO-S</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>INSTRUCTIONS HOSE KIT JD-7920</td>
<td>602-0484-01</td>
<td>1</td>
</tr>
</tbody>
</table>

---

**200-0457-02 Hydraulic Valve Kit**

---

1. [Diagram of hydraulic valve kit]

2. [Diagram of adapter M14 X -4M ORFS]

3. [Diagram of adapter union -4 ORFS]
### 500-0321-01 Hydraulic Hose Kit Installation Guide

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Part Number</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Valve Assembly</td>
<td>500-0287-02</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Harness Pressure Transducer</td>
<td>201-0404-01</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Pressure Transducer</td>
<td>500-0274-02</td>
<td>1</td>
</tr>
</tbody>
</table>

### Tools
This list consists of special tools required to complete the installation. A complete set of common installation tools is assumed.

<table>
<thead>
<tr>
<th>Allen Hex Key 1/4”</th>
<th>11/16” open wrench</th>
<th>16mm open wrench</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen Hex Key 3/16”</td>
<td>5/8” open wrench</td>
<td>17mm open wrench</td>
</tr>
<tr>
<td>Allen Key 5/32”</td>
<td>9/16” open wrench (2x)</td>
<td>18mm open wrench</td>
</tr>
<tr>
<td>Allen Hex Key 1/8”</td>
<td>1/2” open wrench</td>
<td>19mm open wrench</td>
</tr>
<tr>
<td>15/16” open wrench</td>
<td>7/16” open wrench</td>
<td>22mm open wrench</td>
</tr>
<tr>
<td>7/8” open wrench</td>
<td>1/2” 12 point ratcheting wrench</td>
<td>24mm open wrench</td>
</tr>
<tr>
<td>13/16” open wrench</td>
<td>15/16” socket wrench</td>
<td>18mm socket wrench</td>
</tr>
<tr>
<td>3/4” open wrench</td>
<td>13mm open wrench</td>
<td>22mm socket wrench</td>
</tr>
<tr>
<td>Breaker bar for 24mm socket</td>
<td>Hacksaw with steel cutting blade</td>
<td>24mm socket wrench</td>
</tr>
<tr>
<td>Torque wrench for 18/24/30mm sockets</td>
<td>Wire cutter small</td>
<td>30mm socket wrench</td>
</tr>
<tr>
<td>#1 Phillips screwdriver</td>
<td>Cleaning brush</td>
<td>5000 psi Pressure Gauge with a Short Hose and 1/8” Test Port Coupler that meets the SAE J1502 standard.</td>
</tr>
<tr>
<td>#2 Phillips screwdriver</td>
<td>Ten foot (3 meter) ladder</td>
<td>Tape measure (12ft minimum)</td>
</tr>
<tr>
<td>Cleaning rags</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Overview

**WARNING**

High-Pressure Fluid Hazard
Read this manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.

**WARNING**

SHOCK AND FIRE HAZARD
Avoid contact of hydraulic hose fittings with electrical terminals located on the firewall under the engine hood. Hydraulic hoses have a metallic braid and conduct electricity and will cause severe shorts if they contact the electrical terminals.

**CAUTION**

The engine hood is heavy and the removal requires at least two people. Do not attempt to lift and move the engine hood by yourself.

These instructions provide the procedure for installing the Novariant hydraulic system for the supported vehicles listed below. There may be some variations in the vehicles depending on the vehicles options.

*Note:* Only technicians trained for hydraulic valve installations should perform the installation procedures in this guide. If the vehicle requires a hydraulic steering valve to be installed, ensure a trained technician is available for the installation.

**Supported Vehicles**

The following models have been confirmed to be compatible with this Hydraulic Installation Kit:

**Supported John Deere MFWD Models = Non AutoTrac Ready**

- 7720
- 7820
- 7920

This kit is for installation on these models only. If your vehicle is a different model, contact your dealer for the correct installation kit.
Steering Valve Installation Procedure Overview

1. Install an internal plug to configure the Steering Valve for Power Beyond installation.
2. Install the Steering Valve bracket and Steering Valve on the vehicle.
3. Connect the six hoses between the Steering Valve and the vehicle.
4. Check for oil leaks.
5. Adjust the Pressure Relief Valve.
6. Perform a functional test to confirm correct Steering Valve operation.

WARNING

High-Pressure Fluid Hazard
Read this manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.

Configure the AutoSteer Valve

1. Use a 3/16” Allen key to remove the four cover screws.
2. Remove the front cover to access the hose connections, Pressure Transducer, and Relief Valve.
Configure the AutoSteer Valve

3. Use this illustration and the following table to identify the Steering Valve assembly hydraulic connection function.

**Note:** The ports shown here are upside-down relative to the illustration in steps 1 and 2.

<table>
<thead>
<tr>
<th>Hose Adapter</th>
<th>Fitting Type/Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESS = PUMP PRESSURE</td>
<td>-8 ORFS</td>
</tr>
<tr>
<td>TANK = TANK / RETURN</td>
<td>-6 ORFS</td>
</tr>
<tr>
<td>LS ORBITROL = LS FROM ORBITROL</td>
<td>-4 ORFS</td>
</tr>
<tr>
<td>LS OUT = LS</td>
<td>-4 ORFS</td>
</tr>
<tr>
<td>LEFT = LEFT STEERING CYLINDER</td>
<td>-6 ORFS</td>
</tr>
<tr>
<td>RIGHT = RIGHT STEERING CYLINDER</td>
<td>-6 ORFS</td>
</tr>
<tr>
<td>GP = DIAGNOSTICS PORT</td>
<td>1/8&quot; SAE ORB.</td>
</tr>
<tr>
<td>TRANS = PRESSURE TRANSDUCER</td>
<td>-4 SAE ORB.</td>
</tr>
</tbody>
</table>

An internal plug must be installed in the Steering Valve to configure it for Power Beyond operation.

**Note:** The Steering Valve will not operate correctly if you do not install the plug.

4. Remove the front Steering Valve cover using a 3/16” hex key to loosen the four screws.

5. Identify the threaded plug shipped with the Steering Valve in a parking position identified as “PLUG” on the front face.

**Note:** The plug does not have a hole and must not be mistaken with the two orifices that are also shipped next to the plug on the Steering Valve.

<table>
<thead>
<tr>
<th>Type of Installation</th>
<th>13A</th>
<th>13B</th>
<th>13C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory Default Configuration</td>
<td>Plug</td>
<td>Open</td>
<td>Plug</td>
</tr>
<tr>
<td>Power Beyond Configuration</td>
<td>Plug</td>
<td>Plug</td>
<td>Plug</td>
</tr>
</tbody>
</table>

**Note:** Valves manufactured after November 2013 do not have plug 13C.

Note: The plug in position 13A must be replaced by a 0.022” orifice if the pump does not stroke down when the AutoSteer is not turning the wheels. The optional 0.022” orifice works as a Load Sense bleed-down orifice for the Load Sense signal when required.
Configure the AutoSteer Valve

7. Identify the large external access plug identified in position 13B.
8. Remove the external plug in position 13B using a 1/4” hex key.

9. Remove the small plug from position “PLUG” using a 1/8” hex key.

10. Install the small plug inside the hole in position 13B. It will engage an existing thread about 1” below the surface. Do not over tighten the plug.
11. Re-install the large external plug in position 13B.
Removing Access Panels

In order to install the Steering Valve and system components you will need to open or remove panels and covers. The following protective coverings need to be removed:

- Right Side Plastic Cover
- Exhaust Shroud

**Remove the Right Side Plastic Cover**

1. Loosen the plastic threaded knob to remove the plastic cover in front of the fuel tank.

2. Once the plastic cover is removed, clear the area used to install the Steering Valve.
Exhaust Shroud

Remove the Exhaust Shroud

1. Remove the four screws that secure the steel exhaust shroud.

2. This illustration shows the shroud removed.

*Note:* Removing the shroud provides hose routing access under the cab and to the rear-mounted Power Beyond. Replace the exhaust shroud when all the hydraulic hoses have been installed.
Install the Steering Valve Bracket

A Steering Valve bracket is secured to the vehicle using the bolts provided in your kit.

1. Locate the two holes on the flat plate under the fuel tank on the right side of the vehicle.

2. Install the Steering Valve bracket in the position.

3. Use one M8 bolt and one M10 bolt to secure the bracket to the steel plate.

4. Tighten the two mounting bolts.

   **Note:** You can install the Steering Valve on the bracket before installing the bracket.
Install the Steering Valve Bracket

5. Install the Steering Valve in the position shown in the illustration.

   **Note:** The hole pattern on the bracket and Steering Valve enables several mounting positions. Install the Steering Valve in a higher position and towards the left. The Steering Valve should be located further from the vehicle frame to enable easier hose routing through the frame opening.

6. Secure the Steering Valve onto the bracket in the position shown using four 5/16” hex screws.

7. Tighten the four screws using a 1/2” ratchet wrench.

Hydraulic Hose Connection Overview

Follow the order of installing hoses described below to enable easier hose connections on the Steering Valve. Refer to the illustration below for hose identification numbers.


   **Note:** You must use a metric thread adapter on the Tank port on Power Beyond.


3. Connect a long 1/4” hose [4] from the LS ORBITROL port on the Steering Valve to the tee adapter installed on the steering Test port at the vehicle rear.


   **Note:** You must install a run tee on the Right Steer line to allow the hose connection.

**Note:** You must use a metric thread adapter on the Power Beyond port.


**Note:** You must install a run tee on the Left Steer line to allow the hose connection.

7. Double check all hose connections and confirm they are connected correctly at both ends.

**Note:** It is very important the Tank/Return hose be correctly connected to allow proper operation of the Relief Valve. Confirm both ends of the Tank/Return hose are connected to the proper ports.

8. Tighten all hose connections at both ends.

**Power Beyond Hydraulic Connection Diagram**
Install Steering Valve and Hydraulic Components

The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram above and the instructions in the “Hydraulic Hose Connection Overview” section for detailed information on connecting the hydraulic hoses. All Power Beyond ports use metric threads.

The subsections in the sections are as follows:

- Connect the Load Sense Hose to the Power Beyond
- Connect the Tank/Return Hose to the Power Beyond
- Connect the Pressure Hose to the Power Beyond
- Connect the Orbitrol Load Sense Signal Hose
- Connect the Right Steering Hose
- Connect the Left Steering Hose

Connect the Load Sense Hose to the Power Beyond

1. Locate the Load Sense plate on the left side of the vehicle.

   **Note:** The Load Sense plate can sometimes be located on the vehicle’s right side in different market locations.

2. Remove the plugs on the bottom and side of the plate and replace by using the metric thread hose adapters provided in your hose kit.

   **Note:** The Power Beyond ports can sometimes be located in a different position depending on the exact vehicle model and year. An extra metric M14 hose adapter is provided in the hose kit to account for installations on vehicles that use a 14mm LS port.
3. Connect a long 1/4" hose to the Power Beyond LS port.

4. Route the three Power Beyond hoses under the Rockshaft and then under the cab towards the Steering Valve.

5. Hoses can be routed under the cab right side above the steel lines.

   **Note:** A fiberglass cable puller or a long wire can help pull the hose under the cab. Keep the hose ends capped during the installation to avoid contamination.
6. Secure the hoses with nylon cable ties.

7. Route the hoses from the Power Beyond through the vehicle frame opening as shown here.

**Note:** Do not allow the hoses to contact the rotating drive shaft between the engine and the transmission. Secure the hoses away from the drive shaft using cable ties.

8. Connect the other hose end to the Steering Valve LS OUT port.
Connect the Tank/Return Hose to the Power Beyond

The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram above and the instructions in the “Hydraulic Hose Connection Overview” section for detailed information on connecting the hydraulic hoses. The hoses must be connected in the correct order for best fit and ease of installation.

<table>
<thead>
<tr>
<th>Connect the Tank/Return Hose to the Power Beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Tank/Return Hose Connection" /></td>
</tr>
</tbody>
</table>

1. Locate the Power Beyond Tank port on the vehicle rear as shown here.
2. Connect the Tank/Return hose to the Tank port.

| ![Tank Port Connection](image2) |

3. Connect the other end of the Tank/Return hose to the TANK port on the Steering Valve.
Connect the Pressure Hose to the Power Beyond

The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram above and the instructions in the “Hydraulic Hose Connection Overview” section for detailed information on connecting the hydraulic hoses. The hoses must be connected in the correct order for best fit and ease of installation.

Connect the Pressure Hose to the Power Beyond

1. Connect the Pressure hose to the top hose adapter as shown here.

2. Connect the other end of the Pressure hose to the Steering Valve PRESS port.

Connect the Orbitrol Load Sense Signal Hose

The Orbitrol Load Sense hose is connected from a tee adapter installed on the steering Test port at the back of the vehicle and the Steering Valve. This hose provides a pressure signal to kick-out AutoSteer when the driver turns the steering wheel. Refer to the hose connection diagram in the “Hydraulic Hose Connection Overview” section.

The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram above and the instructions in the “Hydraulic Hose Connection Overview” section for detailed information on connecting the hydraulic hoses. The hoses must be connected in the correct order for best fit and ease of installation.
1. Locate the three Test ports on the rear valve stack as shown here.

   **Note:** The top right Test port is used to connect the LS Orbitrol hose. This hose provides a pressure signal for AutoSteer kick-out when the steering wheel is turned.

2. Remove the top right Test port and keep it for future replacement.

3. Install an M14 hose adapter, elbow adapter, run tee, and test coupler provided with the hose kit.

4. Connect the LS Orbitrol hose to the run tee using an elbow adapter.

   **Note:** This installation maintains the Test port original functionality for troubleshooting the vehicle hydraulics.

5. Connect the other hose end to the Steering Valve port labeled as LS Orbitrol.

6. Tighten all fittings.

7. Confirm all swivel nuts are tight.

8. Secure the LS Orbitrol hose using one or more cable ties.
**Connect the Right Steering Hose**

The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram above and the instructions in the “Hydraulic Hose Connection Overview” section for detailed information on connecting the hydraulic hoses. The hoses must be connected in the correct order for best fit and ease of installation.

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Locate the steering hose connected to the steering cylinder on the right side of the front axle.</td>
</tr>
<tr>
<td>2.</td>
<td>Loosen the original steering hose.</td>
</tr>
<tr>
<td>3.</td>
<td>Install a run tee adapter.</td>
</tr>
<tr>
<td>4.</td>
<td>Reconnect the original hose to the end of the tee adapter.</td>
</tr>
</tbody>
</table>
| 5.   | Connect the Steering Valve Right Steer hose to the tee adapter.  
**Note:** Route the hose so that it does not get pinched when the wheels turn from full left to full right and when the front axle oscillates up and down at full travel. |
| 6.   | Connect the Steering Valve Right Steer hose to the RIGHT port on the Steering Valve. |
| 7.   | Secure this hose to an existing hole under the frame using heavy duty cable ties.  
**Note:** Secure the hose so that it does not drop down below the frame and does not touch the drive shaft shield. Use several cable ties to secure the hose in a safe position. |
| 8.   | Tighten the hose fittings. |
Connect the Left Steering Hose

The hoses must be connected in the correct order for best fit and ease of installation. Refer to the hose diagram above and the instructions in the “Hydraulic Hose Connection Overview” section for detailed information on connecting the hydraulic hoses. The hoses must be connected in the correct order for best fit and ease of installation.

### Connect the Left Steering Hose

1. Locate the steering hose connected to the steering cylinder on the left side of the front axle.
2. Loosen the original steering hose.

### Connect the Left Steering Hose

3. Install a run tee adapter.
4. Reconnect the original hose to the end of the tee adapter.
5. Connect the Steering Valve Left Steer hose to the tee adapter.

**Note:** Route the hose so that it does not get pinched when the front axle oscillates up and down at full travel. Secure the hose with cable ties so that it does not drop below the vehicle.

6. Connect the Steering Valve Right Steer hose to the LEFT port on the Steering Valve.
7. Tighten the hose fittings.
Install the Pressure Transducer

1. Install the Pressure Transducer on the Steering Valve TRANS port.
2. Tighten the Pressure Transducer with a 3/4” wrench.

**Note:** Do not over tighten the Pressure Transducer.

3. Connect the short transducer harness to the Pressure Transducer.

**Note:** Loop the excess harness inside the rear Steering Valve cover and secure with a small cable tie on the two holes on the rear Steering Valve cover.

4. Connect the 4-pin and 10-pin connectors to the SA Module Harness.

**Note:** Secure the Pressure Transducer cable and connector with cable ties in a protected position.

Adjusting the Pressure Relief Valve

The Steering Valve has a built-in Load Sense Pressure Relief Valve that limits the maximum pump pressure when using the AutoSteer system. The Pressure Relief Valve must be adjusted after you have completed the hydraulic installation and before you turn on AutoSteer. The AutoSteer system must be fully installed and functional before adjusting the Pressure Relief Valve.

To do so, refer to the “Pressure Relief Valve Adjustment” section of the “Post-Installation Procedures” at the end of this guide, after completing the rest of the AutoSteer installation. Do not forget to set the Pressure Relief Valve or system damage could occur.

Install John Deere Power Beyond

Your vehicle may already have Power Beyond installed. If your vehicle does not have Power Beyond installed, you must perform the following installation procedure.

**Note:** The pictures and information provided in this procedure are for reference only. Always follow the vehicle manufacturer’s instructions provided with your Power Beyond kit. Any references to part numbers in this section are for reference only. Always provide your dealer with your vehicle’s model, year, and serial number when purchasing service parts.
Depending on the exact vehicle model, optional accessories and market, your Power Beyond kit may be used differently in this procedure.

## Install John Deere Power Beyond

1. Identify the plate on the left side of the valve stack. This plate is replaced by the Power Beyond plate.

   **Note:** To avoid oil contamination, clean the plate before removing.

2. Secure all left valve stacks to the center valve using long cable ties.

   **Note:** Securing the valve stack helps keep the valves from falling or becoming dislodged when you loosen the nuts.

3. Remove the three nuts and carefully remove the plate. Keep the plate for future use.

4. Look for the tiny shuttle disk as soon as you open the Power Beyond unit.

   **Note:** The disk can get stuck to the temporary black gasket material used for packaging and easily get lost.
Install John Deere Power Beyond

5. Apply grease in the round cavity to retain the shuttle disk during assembly.

6. Pre-assemble the Power Beyond plate.
7. Install the shuttle disk in the round cavity.
8. Install the large O-ring.

**Note:** If needed, use grease in the O-ring groove to secure the O-ring during assembly.

9. Clean all mating surfaces.

10. Carefully align the Power Beyond plate with the three threaded studs.
11. Close the plate against the valve stack while checking to see if the shuttle disk and O-ring are in place.

**Note:** Ensure the shuttle disk does not drop out during assembly. The Power Beyond will not work without the shuttle disk. Do not attempt to mount the Power Beyond without using grease to hold the shuttle disk during assembly.

12. Tighten the three nuts in a sequential pattern as you increase the torque.

13. Install and tighten the three hose adapters.
Steering Valve Installation Checklist

1. Steering Valve bracket bolts are tight.
2. Mounting screws securing the Steering Valve are tight.
3. Pressure hose is connected to correct port on Steering Valve and Power Beyond.
4. Tank/Return hose is connected to correct port on Steering Valve and Power Beyond.
5. LS-OUT hose connected to correct port on Steering Valve and LS on vehicle Power Beyond.
6. LS ORBITROL hose is connected correctly at both ends.
7. Right Steer hose is connected correctly at both ends.
8. Left Steer hose is connected correctly at both ends.
9. Pressure Transducer installed and tight.
10. Check that all hose fittings are tight.
11. Check hose routing and ensure cable ties are on all hoses.
12. Ensure all hoses are clear of moving parts, such as the drive shaft and front axle shaft.
13. SA Module Harness is connected to the two Steering Valve connectors.
14. 5000psi pressure gauge is installed on the Steering Valve Test port.
15. Install Early Model Valve and Hydraulic Components

Post System Installation Procedures

This section provides information in the following sub-sections:

- Hydraulic Leak Test
- Create New Vehicle
- Pressure Relief Valve Adjustment Procedure

Once the entire AutoSteer system, including the Display and Display Harnesses, have been installed on the vehicle, the procedures and notes provided in this section must be followed to complete the installation and prepare the vehicle for full AutoSteer capabilities.

Note: Always perform these steps after the complete installation or system damage may occur and/or poor performance may occur. DO NOT START THE VEHICLE BEFORE PERFORMING A LEAK TEST.
Hydraulic Leak Test

On completion of installing the entire AutoSteer system including the Roof Module and Display, the system needs to be checked for leaks. Follow the procedure below to check for leaks.

⚠️ WARNING

High-Pressure Fluid Hazard
Read and understand the vehicle’s user manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.

⚠️ WARNING

Prior to starting the vehicle, verify all people and equipment are clear from around the vehicle and the AutoSteer system is powered down. The vehicle could move unexpectedly and cause injury or death to bystanders.

**Note:** The following steps need to be performed after the complete AutoSteer system has been installed, the AutoSteer System has powered up (BUT NOT THE VEHICLE), and the vehicle has been created in the AutoSteer system.

After the entire AutoSteer system installation has been completed, the system needs to be checked for leaks. Follow the procedure below to check for leaks.

**Note:** If an oil leak is noticed during any part of this test, immediately shut down the vehicle and repair the leak.
1. Clear any bystanders away from the vehicle.

2. Put the vehicle into Park and/or set the park brake to prevent the vehicle from moving.

3. Turn the vehicle over for a few seconds and if the vehicle starts, immediately shut it down.

4. Walk around the vehicle and check all the hydraulic fittings that were opened. Look for any oil leaks.

5. Once any leaks have been repaired, or if none are found, start the vehicle again and let it run at a low idle.

6. Take the vehicle out of Park and/or remove the parking brake. Turn the steering wheel manually to the right and left stops two or more times to get any air out of the hoses.

7. Confirm the vehicle turns in the correct direction when the steering wheel is turned manually.

8. Confirm the steering system behaves the same as it did prior to installing the AutoSteer System. Measure the times it takes to manually turn the steering wheel from full left to right and full right to left and compare to the times recorded before the installation. If the times are different, determine why there is a difference and repair.

9. Put the vehicle back into Park and/or reset the parking brake. Shut down the vehicle, walk around it again, and check for any hydraulic leaks.

10. Once any leaks have been repaired, or if none are found, start the vehicle again and let it run at a low idle.

11. Take the vehicle out of Park and/or remove the parking brake and leave the vehicle running.

12. Power up the AutoSteer system and navigate to the steering components test screen. If the safety screen requirements have been met, press the **Continue** or **Accept** button.

13. Press the **Hard Right** and the **Hard Left** buttons several times to force the Steering Valve to turn the steering wheels or steering mechanism to the full right and full left positions and get the air out of the lines.

14. Verify that the vehicle turns in the correct direction it is commanded. Measure the time it takes the AutoSteer System to turn the steering wheel from full left to right and full right to left and compare to the times recorded to the times for manual movement. It should not take more than 3 to 4 seconds to go from lock to lock.

**Note:** If the wheels turn in the wrong direction, the hoses were attached to the wrong ports on the Steering Valve or to the incorrect steer lines. The steer hoses need to be switched.

15. Power down the Display, put the vehicle into Park and/or reset the parking brake, and shutdown the vehicle.

16. Once again check the vehicle for hydraulic leaks and repair any that are found.
Load Sense Pressure Relief Valve Adjustment

Note: Do not start the vehicle until after the Hydraulic Leak Test has been performed on the vehicle.

The Steering Valve has a built-in Load Sense Pressure Relief Valve that limits the maximum pump pressure when using the AutoSteer system. The Load Sense Pressure Relief Valve must be adjusted after the entire AutoSteer system has been installed and the system has been checked for hydraulic leaks.

Note: Always shut down the vehicle prior to adjusting the Load Sense Pressure Relief Valve adjustment screw.

Load Sense Pressure Relief Valve Adjustment

1. Ensure that the vehicle is still in Park and/or the park brake is set to prevent the vehicle from moving and the engine is off.
2. Clear any bystanders from around the vehicle to prevent anyone getting injured when the steering wheels are moved in the following steps.

3. Attach a short extension hose to the diagnostics port labeled GP on the Steering Valve. Attach a 5000 psi pressure gauge to the extension hose.
4. With a 1/2” wrench and 5/32” Allen wrench, loosen the jam nut holding the pressure relief valve adjustment screw.

**Note:** This illustration shows the Steering Valve with the hoses disconnected for clarity. The Steering valve must be fully connected to the vehicle to adjust the pressure relief valve.

5. Turn the adjustment screw counter-clockwise two turns.

6. Start the vehicle and leave the engine at a low idle.

7. Check the standby pump pressure shown on the pressure gauge. The standby pressure should be around 350 PSI (24 Bar).

**Note:** If the standby pump pressure is zero or less than 100 PSI (7 Bar), the Pressure and Return/Tank hoses may have been inverted. Confirm the hoses have been attached properly before continuing.

8. If the standby pump pressure is above 1000 PSI (69 Bar), it is too high. Determine what is causing the pressure to spool up and repair before moving on. Two most likely causes are that some of the hoses have been inverted or an incorrect orifice or plug has been installed in the Steering Valve.

9. Record the actual standby pressure: ______________________ PSI (Bar).

10. Power up the Display.

11. Follow the instructions in the Display user manual to navigate to the Vehicle window from the AutoSteer Setup screen. Select Steering Components; then select Hydraulic Valve. If the safety screen requirements have been met, press the Continue button.

12. Press the Steer Right button to command the wheels to turn to the right. Allow the steering axle to reach the right stop and hold it there.

13. The maximum pump pressure allowed by the Steering Valve will be displayed on the pressure gauge.

14. Adjust the pressure relief valve with a 5/32” Allen wrench until the pressure reads 2400 PSI (165 Bar) while the AutoSteer system is commanding a Right turn.

**Note:** Turn off the engine before adjusting the pressure relief valve. Do not adjust the pressure relief valve with the engine running as there is a chance that a person could get injured if the steering wheels move while working on the valve.

**Note:** Turn the adjustment screw clockwise to increase the pressure and counter-clockwise to reduce the pressure.
15. Once the pressure relief valve has been adjusted properly, retighten the jam nut with a 1/2” wrench while holding the adjustment screw with a 5/32” Allen wrench to lock it into place.

16. Record the final maximum pressure the pressure relieve valve is set to: _________________________ PSI (Bar).

17. Press the Stop button and confirm that the pressure drops back to the standby pressure within a second.

**Note:** If the pump pressure remains high after pressing the Stop button, the pump is remaining stroked up. Confirm that the Orifice has been installed in port 13A and that the Orifice hole is not plugged.

18. Shut down the Display, turn off the engine, and remove the pressure gauge from the Steering Valve by sliding the sleeve on the quick release coupler.

19. Replace the Steering Valve cover on the valve and tighten the four Allen screws with 3/16” Allen wrench.