## Hydraulic Kit Installation Guide

### Table of Components

<table>
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<th>Item</th>
<th>Component</th>
<th>Part Number</th>
<th>Qty</th>
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<td>7.</td>
<td>ADAPTER -S-LK, HM, NUT ELBOW #8</td>
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<td>8.</td>
<td>ADAPTER M27 SHALLOW PORT</td>
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<td>9.</td>
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<td>ADAPTER -RUN TEE ORFS F-M-M -6</td>
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<td>13.</td>
<td>ADAPTER -6MORB X -6F ORFS</td>
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<td>STRAIGHT THREAD ELBOW -6M ORFS, 9/16M SAE-ORB</td>
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<td>15.</td>
<td>KIT CABLE TIE HOSE ID</td>
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<td>16.</td>
<td>INSTRUCTIONS HOSE KIT CASE PUMA 210</td>
<td>602-0466-01</td>
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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 Case Puma Models**
- Large Frame: 165, 180, 195, 210
- Small Frame: 115, 125, 140, 155

**Supported New Holland Models**
- Large Frame: T7030, T7040, T7050, T7060
- Small Frame: T6030, T6050, T6070, T6080

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

**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.

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**Special Requirements**

**Tools**

This list consists of special tools required to complete the installation. The installer should have a complete set of common installation tools.

<table>
<thead>
<tr>
<th>Tool Description</th>
<th>Size/Type</th>
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<tbody>
<tr>
<td>#1 Phillips screwdriver</td>
<td>3/8” open wrench</td>
</tr>
<tr>
<td>#2 Phillips screwdriver</td>
<td>7/16” open wrench</td>
</tr>
<tr>
<td>#2 Phillips stubby screwdriver</td>
<td>1/2” open wrench</td>
</tr>
<tr>
<td>Pliers</td>
<td>9/16” open wrench (2)</td>
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<tr>
<td>1/2” socket and ratchet</td>
<td>11/16” open wrench</td>
</tr>
<tr>
<td>9/16” socket and ratchet</td>
<td>3/4” open wrench</td>
</tr>
<tr>
<td>15/16” socket and ratchet</td>
<td>13/16” open wrench</td>
</tr>
<tr>
<td>8mm socket and ratchet</td>
<td>7/8” open wrench</td>
</tr>
<tr>
<td>10mm socket and ratchet</td>
<td>15/16” open wrench</td>
</tr>
<tr>
<td>15mm socket and ratchet</td>
<td>1-1/8” open wrench</td>
</tr>
<tr>
<td>17mm socket and ratchet</td>
<td>Hack saw</td>
</tr>
<tr>
<td>18mm socket and ratchet</td>
<td>10 ft (3 meter) ladder</td>
</tr>
<tr>
<td>24mm socket and ratchet</td>
<td>Tape measure 12ft (3.6m) minimum</td>
</tr>
<tr>
<td>5000 PSI pressure gauge</td>
<td>Electrical tape</td>
</tr>
<tr>
<td></td>
<td>10mm Allen Wrench</td>
</tr>
<tr>
<td></td>
<td>4mm Allen wrench</td>
</tr>
<tr>
<td></td>
<td>5mm Allen Wrench</td>
</tr>
<tr>
<td></td>
<td>12mm Allen Wrench</td>
</tr>
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602-0466-01 REV A 2014-02
Set Up the Steering Valve

1. Use a 3/16” Allen key to remove the four cover screws.

2. Remove the six back cover bolts using a 1/2” socket and ratchet.

3. 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.
4. Locate the large external access plug identified in position 13B. Remove the external plug in position 13B using a 1/4” hex key.

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

6. Install the small plug inside the hole in position 13B. It will engage an existing thread about 1” below the surface. Tighten using a 1/8” hex key.

7. Re-install the large external plug in position 13B.
8. Locate the large external access plug identified in position 13A. Remove the external plug in position 13A using a 1/4” hex key.

9. Remove the small plug from position 13A using a 1/8” hex key.

**Note:** This plug is the internal plug which lies about an inch from the surface (on the left in the illustration).

10. Remove the orifice labeled .022 using a using a 1/8” hex key.
Set Up the Steering Valve

11. Insert the orifice into the 13A hole and tighten with a 1/8” hex key.

12. Insert the large plug back into the 13A hole and tighten with a 1/4” hex key.

The table below shows the summary of all plug and orifice configurations for this procedure.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>13A</th>
<th>13B</th>
<th>13C</th>
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<tbody>
<tr>
<td>Power beyond with LS Bleed Down</td>
<td>0.022” Plug</td>
<td>Plug</td>
<td></td>
</tr>
</tbody>
</table>

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

Mount the Steering Valve

1. Mount the Steering Valve on the bracket by placing the block backing plate between the valve and the bracket and using the four existing screws which are located on the back of the block.
Mount the Steering Valve

2. Identify the area on the left side of and below the rear of the hood (next to fuel tank) to mount the Steering Valve.

3. Remove the plastic covers to reveal the threaded holes.

4. Mount the bracket as shown, using two bolts and washers.
Hose Connection Diagram

Figure 1 shows an overview of the hydraulic installation.

Figure 1   T6000/7000 Hydraulic Hose Diagram
Hydraulic Hose Connection Procedures

Note: Verify all the hoses and fittings are in the correct orientation shown in the figures prior to tightening them. Failure to put them in the proper orientation may cause the hoses to be damaged or not reach the intended connection.

This section contains the following sub-sections:
- Connect Hoses on Large Frame Vehicle
- Connect Hoses on Small Frame Vehicle

Connect the Hoses to a Large Frame Vehicle

1. Find the following ports and lines on top of the Power Beyond.
   - Pressure port, which is the M22 with a 27mm head.
   - Load Sense port, which is the small M12 with a 5mm hex socket.
   - Tank/Return line, which is behind the valve stack (highlighted with a circle).

WARNING

High-Pressure Fluid Hazard
Read the Owner’s Manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.
2. Find the Tank/Return port on back the Power Beyond.

   **Note:** To see this you must look between the cab and the Power Beyond block. This is a large M27 fitting with a 12mm hex socket (shown here with a circle).

3. Open the hood by pressing on the black rubber grommet and lifting up the front handle.

4. Remove side guards by loosening the two bolts using a large flat-head screw driver; then slide the panel forward.
5. Find the Left Steer and Right Steer lines, which are behind the panel removed in Step 4.

6. Find the Pressure line and Left Steer and Right Steer lines on the Orbitrol.

7. Connect a long 3/8" hose (the PRESSURE hose) to the P port on the Power Beyond. You must use a M22 metric to -8 ORFS male adapter to connect this hose to the Power Beyond. Then route the hose under the cab to the Steering Valve.
8. Connect a long 1/4” hose (the LS OUT hose) to the LS port on the Power Beyond. You must use a M12 metric to -6 ORFS male elbow adapter to connect the end of the hose to the Power Beyond. Then route the hose under the cab to the Steering Valve.

9. Connect a short 3/8” hose (the TANK hose) from the TANK port on the AutoSteer valve to the T port on the Power Beyond. You must use a M27 metric to -8 ORFS male adapter to connect the end of the hose to the Power Beyond. Then route the hose under the cab to the Steering Valve.

10. Connect the LS OUT hose from Step 8 to the LS OUT port on the Steering Valve.

11. Connect the TANK hose from Step 9 to the LS OUT port on the Steering Valve.

12. Connect the PRESSURE hose from Step 7 to the PRESS port on the Steering Valve.
13. Remove the Pressure, Steer Left, and Steer Right hoses from the Orbitrol.

14. Connect a long 1/4” hose (the LS ORBITROL hose) from the LS ORBITROL port on the Steering Valve and the PRESSURE port on the side of the tractor’s steering unit (Orbitrol). You must install a run tee and a reducer before connecting the hose to the Orbitrol.

   **Note:** If you can’t screw the original pressure hose back on because it is on the wrong angle, follow the next four steps; if not, proceed to Step 19.

15. Remove the right-hand front guard by removing the three screws with a #2 Phillips screw driver.

   **Note:** Only complete this step if you could not complete Step 14.

16. Loosen the fitting as shown here.

17. Retry to screw in the hose from Step 14.

18. Re-tighten the fittings from Step 16 and replace the right hand side front guard.

   **Note:** Only complete the above steps if you could not complete Step 14.
19. Connect a 3/8” hose (the RIGHT hose) from the RIGHT port on the Steering Valve to the Right Steer Hose on the tractor. You must install a run tee on the Right Steer Hose to allow the hose connection.

20. Connect a 3/8” hose (the LEFT hose) from the LEFT port on the Steering Valve to the Left Steer Hose on the tractor. You must install a run tee on the Left Steer hose to enable the hose connection.

21. Prepare the two solenoid valves by attaching the adapters and elbows as shown here. Confirm the valve hex is tight and the coil nut is firm.

22. Place one solenoid assembly directly on to the L port on top of the steering unit (Orbitrol) and connect the Left Steer line into the other side of the solenoid assembly.
Connect the Hoses to a Large Frame Vehicle

23. Place the second solenoid assembly directly on to the R port on top of the steering unit (Orbitrol) and connect the Right Steer line into the other side of the solenoid assembly.

24. Double-check all hose connections and confirm they are connected correctly at both ends. The Tank/Return hose must be correctly connected to allow proper operation of the LS Relief Valve.

25. Tighten all hose connections at both ends.

26. Check that all hoses are connected to the correct ports at each hose end before starting the engine.

27. Turn on the engine momentarily (3-4 seconds) then turn off the engine.

28. Check for oil leaks.

29. Turn the engine on long enough to enable you to turn the steering wheel one turn right and one turn left.

30. Turn the engine off.

31. Check for oil leaks.

Connect the Hoses to a Small Frame Vehicle

1. Find the following Power Beyond ports on the rear valve stack.
   - Pressure has a 10 mm hex socket.
   - Load Sense has a 5mm hex socket.
   - Tank/Return has a 12 mm hex socket.
2. Find the Load Sense port, which has a 5mm hex socket.

3. Open the hood by pulling the latch and raising the hood.

4. Find the Left Steer and Right Steer lines, which are on the left-hand side of the tractor beneath the hood.
Connect the Hoses to a Small Frame Vehicle

5. Find the Pressure line and Left Steer and Right Steer lines on the Orbitrol.

6. Remove plug from Pressure port using a 10mm Allen wrench.

7. Connect a long 3/8” hose (the PRESSURE hose) to the P port on the Power Beyond. You must use a M22 metric to -8 ORFS male adapter to connect this hose to the Power Beyond. Then route the hose under the cab to the Steering Valve.

8. Remove the plug from Return Line using a 12mm Allen wrench.

9. Connect a short 3/8” hose (the TANK hose) from the TANK port on the Steering Valve to the T port on the Power Beyond. You must use a M27 metric to -8 ORFS male adapter and an elbow to connect the end of the hose to the Power Beyond. Then route the hose under the cab to the Steering Valve.
10. Remove plug from load sense using a 5mm Allen wrench.

11. Connect the LS OUT hose to the LS port on the Power Beyond. You must use a M12 metric to -6 ORFS male elbow adapter to connect the end of the hose to the Power Beyond. Then route the hose under the cab to the Steering Valve.

12. Connect the TANK hose from Step 9 to the TANK port on the Steering Valve.

13. Connect the LS OUT hose from Step 11 to the LS OUT port on the Steering Valve.

14. Connect the PRESSURE hose from Step 7 to the PRESS port on the Steering Valve.

15. Remove the Pressure, Steer Left, and Steer Right hoses from the Orbitrol.

16. Connect a 1/4” hose (the LS ORBITROL hose) from the LS ORBITROL port on the Steering Valve to the PRESSURE port on the side of the tractor’s steering unit (Orbitrol). You must install a run tee and a reducer before connecting the hose to the Orbitrol.

**Note:** If you can’t screw the hose back on because it is on the wrong angle follow the next three steps; if not proceed to Step 20.
Connect the Hoses to a Small Frame Vehicle

17. Loosen the fitting as shown here.
18. Retry to screw in the hose from Step 16.
19. Re-tighten the fittings from Step 17.

**Note:** Only complete the above steps if you could not complete Step 16.

20. Connect the RIGHT hose from the RIGHT port on the Steering Valve to the Right Steer Hose on the tractor. You must install a run tee on the Right Steer Hose to allow the hose connection.
21. Connect the LEFT hose from the LEFT port on the Steering Valve to the Left Steer Hose on the tractor. You must install a run tee on the Left Steer hose to enable the hose connection.

22. Prepare the two solenoid valves by attaching the adapters and elbows as shown here. Confirm the valve hex is tight and the coil nut is firm.
23. Place one solenoid assembly directly on to the L port on top of the steering unit (Orbitrol) and connect the Left Steer line into the other side of the solenoid assembly.

24. Place the second solenoid assembly directly on to the R port on top of the steering unit (Orbitrol) and connect the Right Steer line into the other side of the solenoid assembly as shown here.

25. Double-check all hose connections and confirm they are connected correctly at both ends. The Tank/Return hose must be correctly connected to allow proper operation of the LS Relief Valve.

26. Tighten all hose connections at both ends.

27. Check that all hoses are connected to the correct ports at each hose end before starting the engine.

28. Turn on the engine momentarily (3-4 seconds) then turn off the engine.

29. Check for oil leaks.

30. Turn the engine on long enough to enable you to turn the steering wheel one turn right and one turn left.

31. Turn the engine off.

32. Check for oil leaks.
Adjust the Relief Valve

The AutoSteer steering valve has a built-in Load Sense Relief Valve that limits the maximum pump pressure when using the AutoSteer system. You must adjust the Relief Valve after you have completed the hydraulic installation and before you turn on the AutoSteer system using the procedure below.

1. Remove the Relief Valve cover by removing the four screws with a 3/16” Allen wrench.
2. Install a 5000 psi pressure gauge on the Steering Valve diagnostics port labeled as GP. Use a short extension hose on the pressure gauge if necessary for easier reading.
3. Put transmission into “neutral” or “park” position and turn on the hand brake.
4. Start the engine and leave it at low idle.
5. Immediately check for oil leaks on all hose connections that were opened.
6. Turn the steering wheel full right and then full left and check for correct manual steering response. Immediately check for oil leaks on all hose connections that were opened. Air in the hoses may cause a slight steering delay when the system is first powered up.
7. Observe the standby pump pressure shown on your pressure gauge. Standby pressure should be low or around 350psi. If standby pump pressure is zero, less than 100psi, or very high, such as 3000psi, you might have a plumbing error. A high pressure could indicate Pressure and Tank hoses inverted, but before starting to troubleshoot this, be aware other functions on the tractor can also cause the pressure to go high, such as lifting the hitch or activating a remote valve.
Adjust the Relief Valve

Note: On this vehicle, turning the steering wheel should not affect the pressure reading on the gauge connected to the block. To read the manual steering pressure, the gauge would have to be teed into the Pressure line to the Orbitrol.

8. Clear any bystanders from around the tractor because you will be moving the front wheels in the next step.

9. Press the right or left manual override button on the end of the Steering Valve. The front wheels will turn towards the stops. Maximum pump pressure will be indicated on the pressure gauge when the wheels hit the stops.

10. Adjust the Relief Valve using a 5/32” Allen wrench and a 1/2” wrench, so the maximum pump pressure is 2500psi when the wheels hit the stops.

11. Tighten the jam nut on the relief valve once the correct pressure setting has been adjusted.

12. Remove pressure gauge by sliding the sleeve on the quick coupler.
Hydraulic Installation Checklist

1. Steering Valve Bracket is installed and all fasteners are tight. □
2. Steering Valve is installed and all fasteners are tight. □
3. All hose fittings are tight. □
4. Check for oil leaks on all hydraulic connections. □
5. All hoses are routed and secured with cable ties. □
6. Manual steering is normal after the AutoSteer installation. □
7. Relief Valve is adjusted. □