Two-Outlet Hydraulic Kit
2- and 3-Section Drills

Used with drill models:
• 2S-2600/F/HD/HDF
• 3S-3000/F/HD/HDF
• 3S-4000/F/HD/HDF
• 3S-5000/F/HD/HDF

General Information

These instructions explain how to install the Two-Outlet Hydraulic Kit. This combines the drill’s two Lift circuits (Opener and Transport) into a single circuit at the hitch. With this kit, a tractor having only two remotes can operate a drill which would otherwise require three circuits.

These instructions apply to:

<table>
<thead>
<tr>
<th>Kit</th>
<th>Kit Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>194-122A</td>
<td>3S TWO OUTLET TRACTOR HYD. KIT</td>
</tr>
</tbody>
</table>

This kit relies on some existing drill components. This kit includes some parts not required, depending on drill vintage, and drill options already present or also being installed at this time.

If Markers are also to be installed, install the Two-Outlet Hydraulic Kit first.

Notations and Conventions

“Left” and “Right” are facing in the direction of machine travel. An orientation rose in the line art illustrations shows the directions of Left, Right, Front, Back, Up, Down.

1 single-digit or single-letter callouts identify components in the currently referenced Figure or Figures.

11 to 24 two-digit callouts in the range 11 through 24 reference new parts from the list on page 9. The descriptions match those on the cartons, bags or item tags, as well as in your updated Parts Manual.

51 to 62 two-digit callouts in the range 51 through 62 reference affected existing parts from the table on page 9. The descriptions match those in your Parts Manual.

Each kit converts one drill.
Before You Start

Review these instructions, and make sure you understand which existing system components are re-used, and where they are located. The new components, and the existing components to be re-used or discarded, are located on the tongue of the drill, near the hitch.

Inventory the contents per “New Parts: Kit 194-122A” on page 9.

Tools Required

• basic hand tools
• a tractor with two hydraulic circuits and suitable hitch
• liquid thread sealant
  (for NPT fittings only - do not use PTFE tape)
• buckets for recovery of hydraulic oil from open hoses

These instructions presume a drill that has seen some use, and may have pressure in the hydraulic system. The installation may be done with the drill folded or unfolded.

Pre-Assembly Preparation

Inspect the Mounting Site

Refer to Figure 2

1. Examine the mounting site on the tongue. See if a valve is already on the valve mount ①, and if any hoses are under the clamps just aft of the mount.

2. Make sure the clamp hardware (⑥ or⑦) is present. It may be one of two different styles, depending on the drill vintage. If there are no hoses under the clamp, remove and save any: bolts, lock washers, flat washers, clamp hold-downs, clamps and hose guards.

If the drill does not have markers installed, a valve mount ① welded on the tongue is available. The Two-Outlet selector valve mounts there, and includes a bracket to provide a second mount point for another valve.

If the drill already has markers installed, the valve mount welded on the tongue already will already have a valve mounted on it. You can mount the Two-Outlet selector valve above it, or exchange their positions, using the bracket in this kit.

WARNING

Negative Tongue Weight Hazard:
If unfolded, the drill must be hitched to a tractor during Opener Lift, to avoid negative tongue weight. Hitch loads can range between +4000 pounds (folded) and -1000 pounds (unfolded), depending on drill model and configuration.
Hydraulic Pressure Relief

**WARNING**

*High Pressure Fluid Hazard:*
*Only trained personnel should work on system hydraulics!*

Escaping fluid under pressure can have sufficient pressure to penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, **NOT BODY PARTS**, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene will result.

Installation of this kit may require, at a later step, breaking sealed hydraulic connections at quick-disconnect couplers. It is crucial to safety that these lines be depressurized.

3. If the available tractor has hydraulic circuits with “float” capability, connect the Transport and Opener Lift circuits, and relieve any residual system pressure by floating the circuits.

If no suitable tractor is available, “crack” (carefully loosen) the connections for both Lift circuits the at the bleeding points specified in the drill Operator manual. Leave them cracked for later bleeding.

**NOTICE**

Bleed only at:
*JIC (Joint Industry Conference, 37° flare) or NPT (National Pipe Thread, tapered) fittings.*

Never bleed at:
*ORB (O-Ring Boss) or QD (Quick Disconnect) fittings.*

Assembly

Assemble Selector Valve

Note: Do not use thread sealant on ORB fittings.

Refer to Figure 3

4. Select: one new

   19 810-274C DOUBLE SELECTOR VALVE 3/4FORB

   The face openings of the valve are to machine left after installation.

5. Select: two new

   22 811-063C EL 3/4MJIC 3/4MORB

   Install the ORB ends of the elbows (22) in the face (center) of the valve body (19) (“1” and “2” are stamped into the valve body at those ports). Before tightening the jam nuts, orient the JIC ends so that they face forward when the valve is mounted.

6. Select: four new

   20 811-021C AD 1/2FNPTS 3/4MORB

   Install the adaptors (20) in the end ports of the valve body (19) (ports stamped “1A”, “1B”, “2A” and “2B”).
Install Valve Mount

If markers are already installed, and a valve is already present at the mount, skip to Step 8 on page 4.

**Mount as First Valve**

Refer to Figure 4

7. Select: one new
   
   1. 194-249D BRACKET, 2ND SELECTOR VALVE,
   
   2. two new
   
   16. 802-168C HHCS 3/8-16X3 1/4 GR5,
   
   3. and two new
   
   18. 803-013C NUT LOCK 3/8-16 PLT.

Position the valve assembly 2 to the left of the tongue valve mount 1, handle pointing to machine left. Position the new bracket 12 to the right of the mount 1, with the bottom holes of the bracket aligned with the mount holes.

Insert the screws 16 through the valve, mount and bracket. Secure with lock nuts 18.

**Mount as Second Valve**

Refer to Figure 5 (shown with hoses disconnected from existing valve for clarity)

If markers are already installed, a valve 1 is already present on the tongue mount. The new valve mounts on the bracket from the kit, but the old valve screws must be removed to mount the bracket.

8. Select: one new
   
   12. 194-249D BRACKET, 2ND SELECTOR VALVE

Remove the existing nuts 57 from the existing screws 56 and install the bracket 12. Align the bottom holes of the new bracket with the screws.

9. Select: two new
   
   16. 802-168C HHCS 3/8-16X3 1/4 GR5
   
   2. and two new
   
   18. 803-013C NUT LOCK 3/8-16 PLT

Mount the new valve assembly 2 on the left side of the new bracket 12, above the existing valve 1. Insert the screws 16 from the left and secure with lock nuts 18.

Note: Although this sequence leaves the marker/fold selector valve on the bottom, you may prefer to have it on top (a more intuitive location, as the markers are above the lift cylinders). The existing valve may be moved, or you can change the hose connections later (the valves are identical parts).
Prepare New Hitch Hoses
Two circuits (Transport Lift and Opener Lift), which were intended for direct connection to tractor remote ports, are reconnected to the new selector valve starting at step 19. Any Quick Disconnects (QDs) or hose handles on those hoses are transferred or replaced.

The kit includes two new hitch hoses to the tractor. For newer drills (with hose handles), continue at “2012+ Remove/Transfer Hose Handles”. For older drills (without hose handles), continue at “2011- Remove/Add Quick Disconnects” on page 6.

2012+ Remove/Transfer Hose Handles
10. Identify the two existing lift hoses.
   • Transport Lift - Base End and Rod End
   • Opener Lift - Base End and Rod End

   Typically one set has blue hose handles ① and the other red.

   Verify that pressure is relieved, per step 3 on page 3, in all four hoses.

Refer to Figure 6
11. Remove and save four sets of hose handle bodies ① from both sets of existing lift hoses ②.

   Save the blue handles. The red handles are not reused.

   Protect the exposed MORB-threaded hose ends from contamination.

12. Remove four QD assemblies ③ consisting of:

   ⑥ 811-394C CP 3/4FORB MALE QD POPPET TYPE
   ⑩ 811-919C AD 3/4MORB 3/4FORB (HG)

   Do not disassemble these fittings.

   Save one set of QD assemblies ③. The other set is not reused.

13. Select: two new

   ②③ 811-272C HH1/2R2 096 3/4MORB 3/4FJIC

   Attach one QD assembly ③ to each hose ②③.

   Re-assemble the blue hose handles on these hose assemblies. Ensure that a no-icon handle half is on each hose.

Continue at “2012+ Prepare Circuit Hoses” on page 6.
2011- Remove/Add Quick Disconnects

If the drill lift circuits have hose handles, follow the steps at “2012+ Remove/Transfer Hose Handles” on page 5.

The new hitch hoses provided in the kit are terminated with MORB fittings. Older drills would have FNPT QDs. The kit includes new FORB QDs.

Refer to Figure 7 (new hoses not shown)

14. Identify four hydraulic hoses ② for the following:
   - Transport Lift - Base End and Rod End
   - Opener Lift - Base End and Rod End

15. Remove the QD couplers ① or hose handles at their FNPT threaded ends. They are not reused.

   Protect the exposed NPT-threaded hose ends from contamination.

16. Select: two new
   ③ 811-272C HH1/2R2 096 3/4MORB 3/4FJIC
   (96 inch hoses) and two new:
   ④ 811-394C CP 3/4FORB MALE QD POPPET TYPE

   Attach the two new QD couplers ④ to the new hoses ③.

   If any blue cable ties or blue electrical tape is available, use ties or tape to color-code the new hoses near the QD end.


2012+ Prepare Circuit Hoses

For older drills with MNPT-terminated lift hoses, continue at “Connect Lift Circuit Hoses” on page 7.

Refer to Figure 8

18. Select: four new
   ⑤ 811-023C AD 1/2MNPT 3/4FORB

   Attach these adaptor to each existing lift hose ⑤.
Connect Lift Circuit Hoses

Refer to Figure 9 (depicting 2012+ hoses - 2011- hoses are MNPT-terminated without adaptors)

Note: Do not use thread sealant on JIC or ORB connections.

Note: It may be necessary to loosen the FNPTS-MORB adaptors on the valve in order to tighten hose NPT connections without twisting the hoses. Alternatively, hoses can be disconnected at cylinder-end JIC connections.

19. Connect the Transport Lift hoses to the forward valve ports (stamped “1B” and “2B”).

   Connect the rod (retract) hose to the upper port (stamped “1B”). Connect the base (extend) hose to the lower port (stamped “2B”).

20. Connect the Opener Lift hoses to the aft valve ports (stamped “1A” and “2A”).

   Connect the rod (retract) hose to the upper port (stamped “1A”). Connect the base (extend) hose to the lower port (stamped “2A”).

21. Connect the new common Lift hoses to the center (face) valve ports (stamped “1” and “2”).

   Connect one hose to the upper port (stamped “1”). Connect the other hose to the lower port (stamped “2”).

22. Re-tighten any adaptor or cylinder JIC connections loosed for these steps.
Secure Hoses

Refer to Figure 10

There are two or four hoses to clamp, requiring one or two clamps. How to clamp them depends on the available hardware. Figure 10 shows the recommended stacking for four possible combinations.

The clamp components are:

13. 196-146D 3-HOSE CLAMP BRACKET
14. 196-885D HOSE CLAMP HOLDOWN
15. 802-010C HHCS 5/16-18X1 1/4 GR5
17. 802-172C HHCS 5/16-18X2 1/2 GR5
51. 1/4 MARKER HYD HOSE GUARD
52. HOSE CLAMP BRACKET
55. HHCS 5/16-18X1 1/4 GR5
58. WASHER LOCK SPRING 5/16 PLT
59. WASHER FLAT 5/16 USS PLT

23. Clamp new and any existing hoses. If markers are yet to be installed, place the upper clamp hardware in preparation for marker hoses.

Closeout

24. If no additional hydraulic options are to be installed at this time, bleed the Lift systems per the instructions in the drill Operator Manual. Follow hitching instructions carefully, due to high positive and negative hitch loads in various drill configurations.

25. Confirm selector valve handle(s) forward is Transport, handle(s) aft is Field, and all Extend/Retract settings operate Base/Rod cylinder ends as expected.
Parts Lists

New Parts: Kit 194-122A
The part call-out numbers in this list match all Figures in the installation instructions.

<table>
<thead>
<tr>
<th>Callout</th>
<th>Quantity</th>
<th>Part Number</th>
<th>Part Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td>194-033M</td>
<td>MANUAL TWO OUTLET HYD KIT</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>194-249D</td>
<td>BRACKET, 2ND SELECTOR VALVE</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>196-146D</td>
<td>3-HOSE CLAMP BRACKET</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>196-885D</td>
<td>HOSE CLAMP HOLDDOWN</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>802-010C</td>
<td>HHCS 5/16-18X1 1/4 GR5</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>802-168C</td>
<td>HHCS 3/8-16X3 1/4 GR5</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>802-172C</td>
<td>HHCS 5/16-18X2 1/2 GR5</td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>803-013C</td>
<td>NUT LOCK 3/8-16 PLT</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
<td>810-274C</td>
<td>DOUBLE SELECTOR VALVE 3/4FORB</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>811-021C</td>
<td>AD 1/2FNPTS 3/4MORB</td>
</tr>
<tr>
<td>21</td>
<td>4</td>
<td>811-023C</td>
<td>AD 1/2MNPT 3/4FORB</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>811-063C</td>
<td>EL 3/4MJIC 3/4MORB</td>
</tr>
<tr>
<td>23</td>
<td>2</td>
<td>811-272C</td>
<td>HH1/2R2 096 3/4MORB 3/4FJIC</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>811-394C</td>
<td>CP 3/4FORB MALE QD POPPET TYPE</td>
</tr>
</tbody>
</table>

Existing Parts Affected
The following existing parts may be involved in the kit installation. Which clamp bracket and fasteners are present depends on drill vintage. The Disposition column indicates whether parts are left in place, moved or not re-used.

On an existing drill that has seen some use, and on which markers have never been installed, the clamp may be missing.

Part numbers are provided for ordering replacements. The current bracket set is at left above, based on clamp 196-146D, which has replaced clamp 196-112D.

Quick Disconnects may vary from these parts.

<table>
<thead>
<tr>
<th>Callout</th>
<th>Part No.</th>
<th>Part Description</th>
<th>Part Disposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>113-370D</td>
<td>1/4 MARKER HYD HOSE GUARD</td>
<td>Re-used unless no markers are present, and you use the newer 196-146D clamp.</td>
</tr>
<tr>
<td>52</td>
<td>196-112D</td>
<td>HOSE CLAMP BRACKET</td>
<td>Re-used unless no markers are present, and you elect to replace it with the newer 196-146D clamp.</td>
</tr>
<tr>
<td>53</td>
<td>196-146D</td>
<td>3-HOSE CLAMP BRACKET</td>
<td>Saved and re-used. Re-mount even if no use planned.</td>
</tr>
<tr>
<td>54</td>
<td>196-885D</td>
<td>HOSE CLAMP HOLDDOWN</td>
<td>Saved and re-used. Re-mount even if no use planned.</td>
</tr>
<tr>
<td>55</td>
<td>802-010C</td>
<td>HHCS 5/16-18X1 1/4 GR5</td>
<td>Not re-used. Identical parts are provided in the kit.</td>
</tr>
<tr>
<td>56</td>
<td>802-168C</td>
<td>HHCS 3/8-16X3 1/4 GR5</td>
<td>Saved and re-used.</td>
</tr>
<tr>
<td>57</td>
<td>803-013C</td>
<td>NUT LOCK 3/8-16 PLT</td>
<td>Saved and re-used.</td>
</tr>
<tr>
<td>58</td>
<td>804-009C</td>
<td>WASHER LOCK SPRING 5/16 PLT</td>
<td>Saved and re-used.</td>
</tr>
<tr>
<td>59</td>
<td>804-010C</td>
<td>WASHER FLAT 5/16 USS PLT</td>
<td>May be re-used.</td>
</tr>
<tr>
<td>60</td>
<td>811-394C</td>
<td>CP 3/4FORB MALE QD POPPET TYPE</td>
<td>If present, 2 of 4 are saved and re-used.</td>
</tr>
<tr>
<td>61</td>
<td>811-856C</td>
<td>CP 1/2FNPT MALE QD</td>
<td>If present, not re-used.</td>
</tr>
<tr>
<td>62</td>
<td>811-919C</td>
<td>AD 3/4MORB 3/4FORB (H3)</td>
<td>If present, 2 of 4 are saved and re-used.</td>
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</tbody>
</table>
# Reference Information

## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AD</td>
<td>Adaptor</td>
</tr>
<tr>
<td>CP</td>
<td>Coupler</td>
</tr>
<tr>
<td>EL</td>
<td>Elbow</td>
</tr>
<tr>
<td>GR</td>
<td>Grade</td>
</tr>
<tr>
<td>HG</td>
<td>Hose Grip</td>
</tr>
<tr>
<td>HH</td>
<td>Hydraulic Hose</td>
</tr>
<tr>
<td>HHCS</td>
<td>Hex Head Cap Screw (Bolt)</td>
</tr>
<tr>
<td>HYD</td>
<td>Hydraulic</td>
</tr>
<tr>
<td>JIC</td>
<td>Joint Industry Conference 37° flare fittings</td>
</tr>
<tr>
<td>NPT</td>
<td>National Pipe Thread</td>
</tr>
<tr>
<td>NPTS</td>
<td>NPT Swivel</td>
</tr>
<tr>
<td>ORB</td>
<td>O-Ring Boss</td>
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<tr>
<td>PLT</td>
<td>Plated</td>
</tr>
<tr>
<td>QD</td>
<td>Quick Disconnect</td>
</tr>
<tr>
<td>USS</td>
<td>U.S. Standard</td>
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## Torque Values

<table>
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<th>Fastener/Fitting</th>
<th>Ft-Lbs</th>
<th>N-m</th>
</tr>
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<tbody>
<tr>
<td>3/8&quot;-16 Grade 5</td>
<td>31</td>
<td>42</td>
</tr>
<tr>
<td>1/2 NPT</td>
<td>11/2-3 turns past finger tight</td>
<td></td>
</tr>
<tr>
<td>5/16-18 Grade 5</td>
<td>24</td>
<td>17</td>
</tr>
<tr>
<td>3/4 JIC</td>
<td>27-39</td>
<td>37-53</td>
</tr>
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