



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



When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!

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:

Kit	Kit Description
194-122A	3S TWO OUTLET TRACTOR HYD. KIT

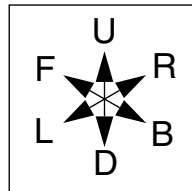
This kit relies on some existing drill components.

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 ⑳ 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.

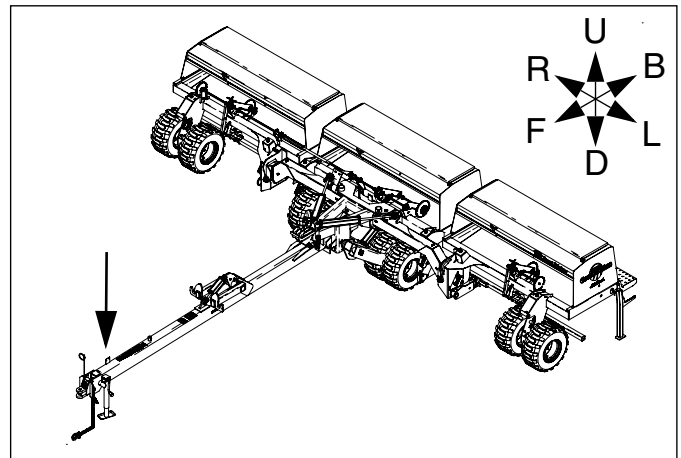


Figure 1
Location of New Valve

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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

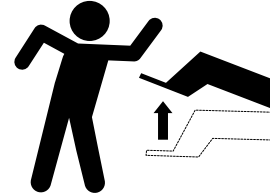
Inspect the Mounting Site

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 (A or B) 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.*

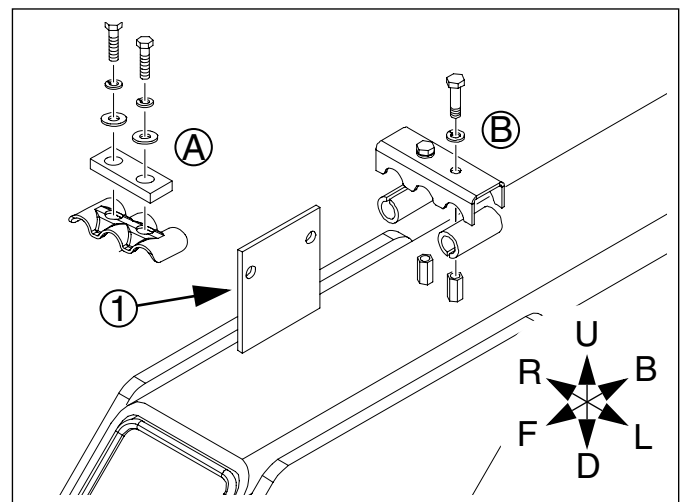


Figure 2
Valve Mount & Clamp

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Hydraulic Pressure Relief

WARNING

High Pressure Fluid Hazard:

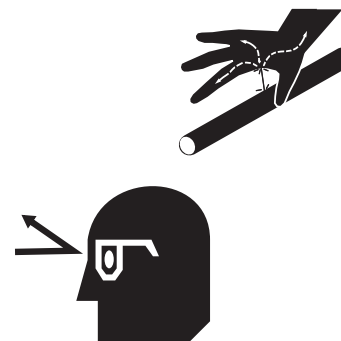
Only trained personnel should work on system hydraulics!

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.

- 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

- Select: one new
(19) 810-274C DOUBLE SELECTOR VALVE 3/4FORB

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

- 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.

- 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”).

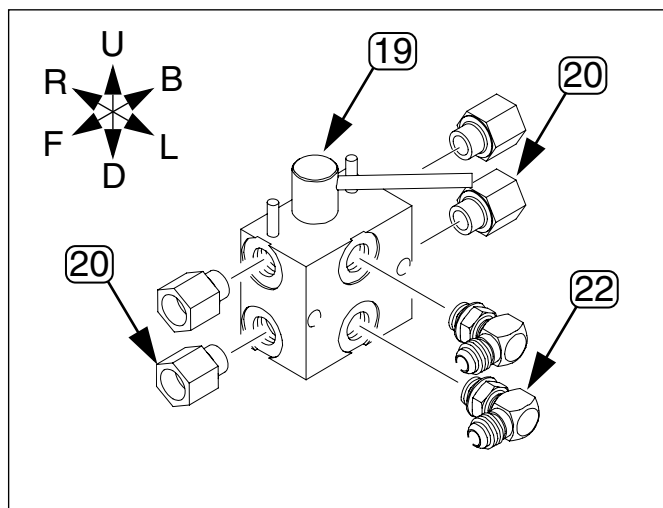


Figure 3
Valve and Fittings

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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
 (12) 194-249D BRACKET, 2ND SELECTOR VALVE,
 two new
 (16) 802-168C HHCS 3/8-16X3 1/4 GR5,
 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).

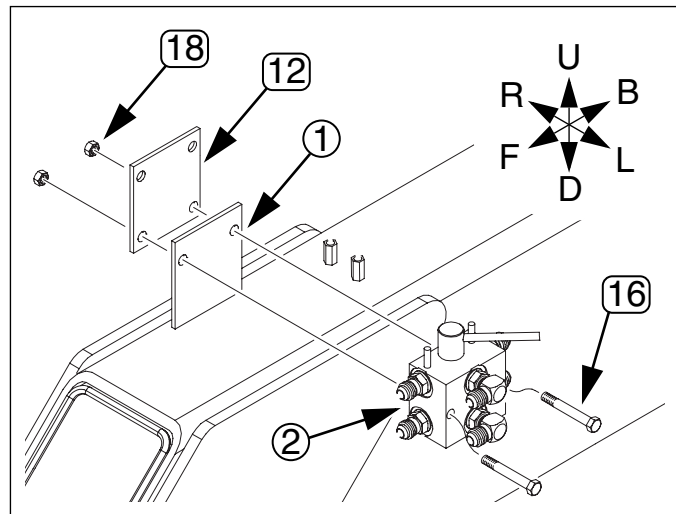


Figure 4
Mount as First Valve

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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
 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).

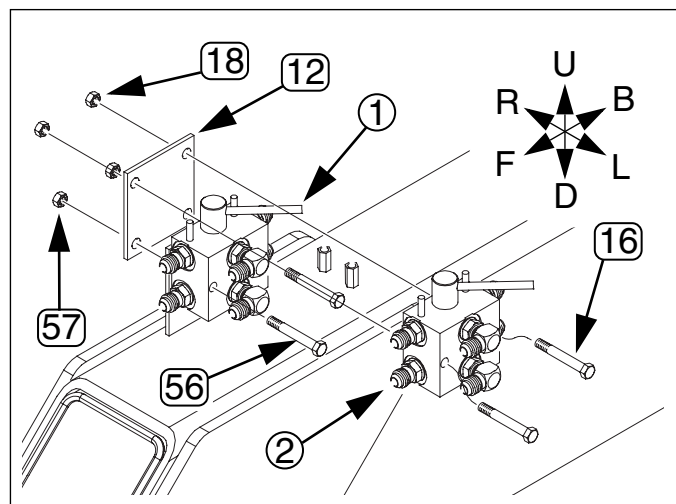


Figure 5
Mount as Second Valve

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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:
 - ⑥0 811-394C CP 3/4FORB MALE QD POPPET TYPE
 - ⑥2 811-919C 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.

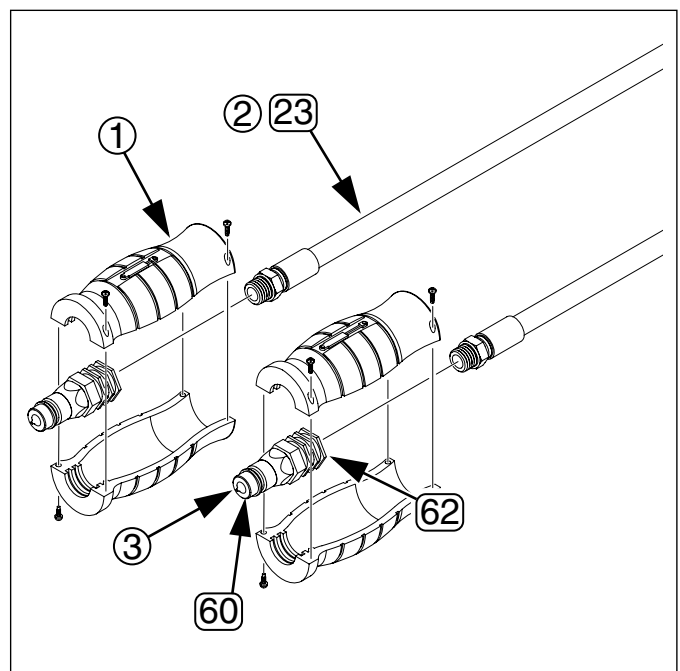


Figure 6 2012+
2012+ Transfer Hose Handles

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Note: Hose handles body halves are present in three varieties (in addition to color):

- Extended cylinder icon (upper left handle in *Figure 6*)
- Retracted cylinder icon (upper right handle in *Figure 6*)
- No icon (lower handles halves in *Figure 6*)

Note: If the existing hoses have a metal hose clamps or plastic label with cylinder aspect icons, leave that clamp or icon in place for future hose identification.

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 ⑥1 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 ②3 811-272C HH1/2R2 096 3/4MORB 3/4FJIC (96 inch hoses) and two new:
②4 811-394C CP 3/4FORB MALE QD POPPET TYPE

Attach the two new QD couplers ②4 to the new hoses ②3.

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.

17. Continue at “**Connect Lift Circuit Hoses**” on page 7.

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 ②1 811-023C AD 1/2MNPT 3/4FORB

Attach these adaptor to each existing lift hose ②.

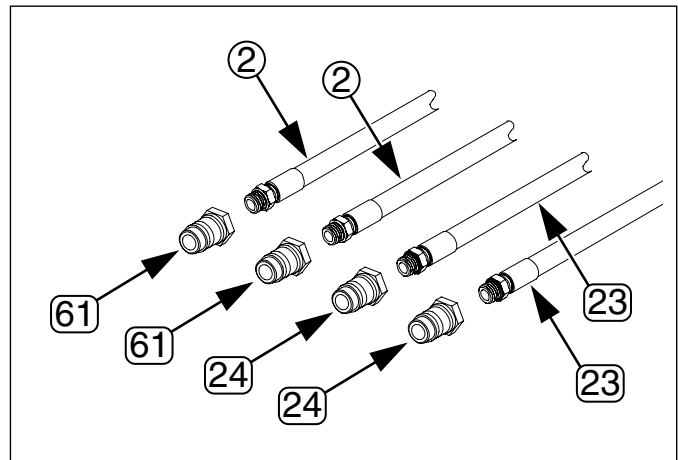


Figure 7 2011-
Remove/Add Quick Disconnects

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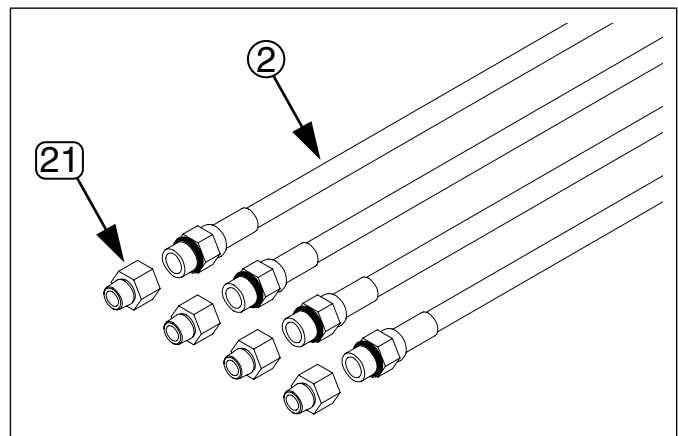


Figure 8 2012+
Add MNPT-FORB Adaptors

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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 (20) 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 (B) 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 (A) 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 (23) 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 (20) or cylinder JIC connections loosened for these steps.

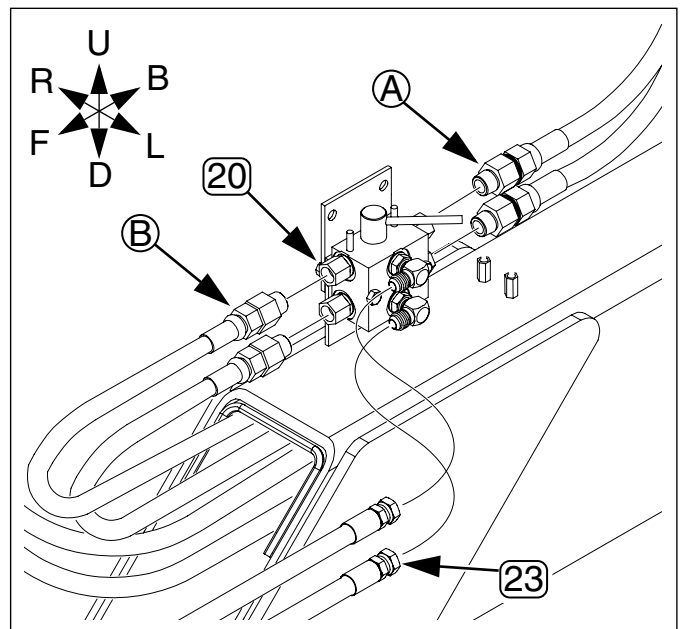


Figure 9
Connect Hoses to Valve

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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 HOLDDOWN
- 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.

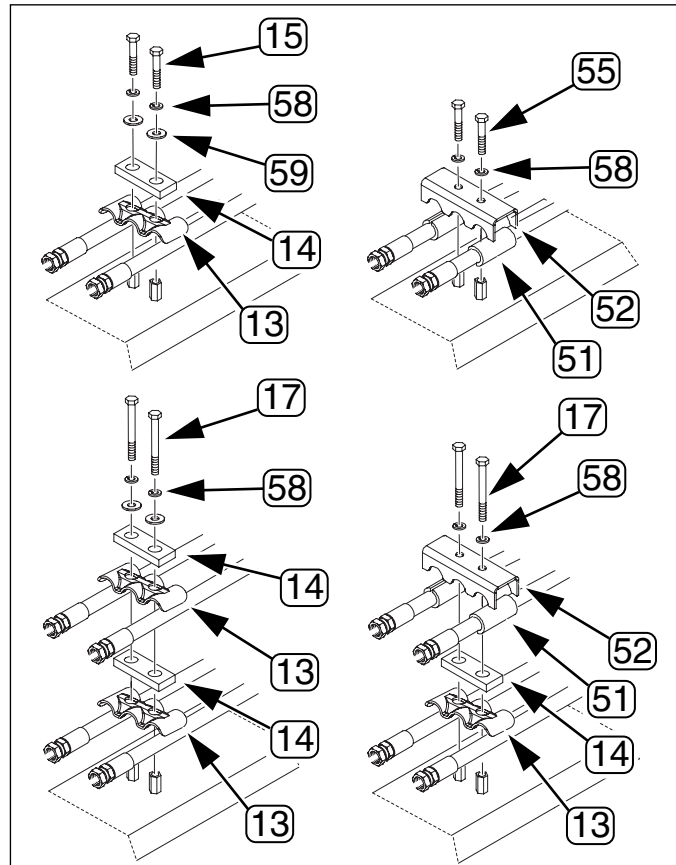


Figure 10
Hose Clamp Combinations

27030

Parts Lists

New Parts: Kit 194-122A

The part call-out numbers in this list match all Figures in the installation instructions. Your kit includes the following parts.

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

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.

The part call-out numbers in the list match all Figures in the installation instructions. Descriptions match those in your drill Parts manual.

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.

Existing Parts List

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

Reference Information

Abbreviations

AD	Adaptor
CP	Coupler
EL	Elbow
GR	Grade
HG	Hose Grip
HH	Hydraulic Hose
HHCS	Hex Head Cap Screw (Bolt)
HYD	Hydraulic
JIC	(Female/Male) Joint Industry Conference 37° flare fittings
NPT	(Female/Male) National Pipe Thread
NPTS	NPT Swivel
ORB	(Female/Male) O-Ring Boss
PLT	Plated
QD	Quick Disconnect
USS	U.S. Standard

Torque Values

Fastener/Fitting	Ft-Lbs	N-m
$\frac{3}{8}$ -16 Grade 5	31	42
$\frac{1}{2}$ NPT	1 $\frac{1}{2}$ -3 turns past finger tight	
$\frac{5}{16}$ -18 Grade 5	24	17
$\frac{3}{4}$ JIC	27-39	37-53

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