Automated Steering Kit Installation Guide

Kit P/N: ED-V550

Fits Versatile Tractor Models:

450 500 550

*(**Note:** This kit is suitable for machines with or without center-mounted weights - see picture inset at right. There is a slight variation in the hydraulic block installation for machines with center-mounted weights - see steps.)*

Read and Follow Safety Messages

- In these instructions, you will see the heading WARNING and the safety alert symbol ⚠. They indicate a hazardous situation that, if not avoided, could result in death or serious injury. The safety messages provide information to identify a hazard associated with potential injury.
- Before installing, operating, or performing maintenance or service on any part of the system:
  - Read and understand this installation guide and all of the safety information.
  - Read and understand the Automated Steering System User Guide.
- Do not allow anyone to operate without instruction.
- Keep these instructions and all related safety information with the manuals for your machine and other implements.

If you have questions or need assistance, contact your local dealer or distributor.

Overview

For the machine models listed above, a steering hydraulics kit has been developed for your automated steering system.

The items in the kit are detailed in the table that follows the safety warnings starting below. After the kit table there is a step-by-step installation section.

Please read this manual thoroughly before beginning the installation.

⚠WARNING:

To avoid serious injury or death during machine operation, install the appropriate kit for your machine make and model.

Machine Preparation

⚠WARNING:

Inspect the machine and perform any needed maintenance (for example, contaminated hydraulic fluid) before installing the automated steering kit. This kit cannot perform as intended on a machine that is not maintained properly. Errors in performance increase the risk of operator and bystander injury or death.

Failure to maintain clean hydraulic fluid and operational hydraulic components can cause loss of directional control resulting in serious injury or death.

To avoid serious injury, wear hand and eye protection and use wood or cardboard when checking for leaks.

Turn off the machine and power off the automated steering controller when installing or performing maintenance.

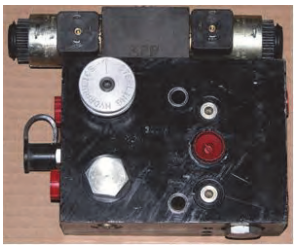
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as hydraulic hoses or electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

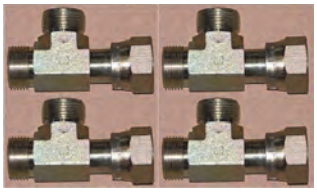
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and ORFF type fittings, referred to in the Kit Contents section, may be damaged by degreasing solvent cleaners. If a fitting is to be cleaned internally, the o-ring should first be removed and cleaned with a fiberless cloth.

Kit Contents

Unpack the hydraulics installation kit and identify the required parts as shown. Kit items are A, B, C etc.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	760-0004-000	1	Assembly, hydraulic valve block - LS eDrive (high flow) (Hydraulic steering block)	
Bag H1 of 4 contains B and C				
B	760-2074	4	Adapter, hyd 90 elbow - #8maleJIC x #6maleORB (P [pressure], T [tank] and A and B [steering] ports in A)	
C	760-2058	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (LS [load sense] port in A)	
D1	640-0122-000	1	Hydraulic steering block (A) mounting bracket (For machines without center-mounted weights. For machines with center-mounted weights, see D2)	

Kit Contents *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
D2	640-0161-000	1	Hydraulic steering block (A) mounting bracket (For machines with center-mounted weights. For machines without center-mounted weights, see D1)	
Bag H2 of 4 contains E				
E	675-2005	2	Bolt, 3/8NC x 3-1/4" Gr5, ZP	
	678-1054	2	Washer, narrow flat - 3/4"OD x 13/32"ID x 1/16" Thk, ZP	
	676-1035	2	Nut, nylock - 3/8NC, ZP (Mount A on D1 or D2)	
Bag H3 of 4 contains F				
F	760-2014	4	Adapter, hyd run-tee - #12ORFF (Pressure, tank and steering lines)	
G	760-0009	1	Hyd load sense valve - #6femORB	
Bag H4 of 4 contains H, I and J				
H	760-2040	1	Adapter, hyd 90 elbow - #6maleORB x #6femORFF (Use in HJ - source port)	
I	760-2048	1	Adapter, hyd - #6maleORFF x #6maleORB (Use in HJ - function port)	
J	760-2082	1	Adapter, hyd 90 elbow - #6maleJIC x #4maleORB (Use in HJ - to steering block LS port)	

Kit Contents *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
K	760-1319-000	1	Hose, hyd - 1/2" x 78", #8femJIC x #12femORFF90 (Pressure hose)	
L	760-1341-000	1	Hose, hyd - 1/2" x 160", #8femJIC x #12femORFF90 (Tank hose)	
M	760-1342-000	1	Hose, hyd - 1/4" x 80", #6femJIC x #6femJIC 90 (Load sense hose)	
N	760-1081-000	2	Hose, hyd - 1/2" x 85", #8femJIC x #12femORFF (Steering hoses)	
O	051-0143	1	Cable, interface - 15ft	
P	677-2001	30	Tie strap, 11" heavy duty	

Installation - Automated Hydraulic Steering Kit

⚠WARNING:

Before installing, disconnecting or repairing the hydraulic hoses and components, turn off the machine and relieve all pressure from the hydraulic system by turning the steering wheel left and right. Failure to remove the pressure can result in serious injury or death from unexpected machine movement.

To avoid burn injury when installing, disconnecting or repairing the hydraulic hoses and components, turn off the machine and allow the system to cool down prior to touching the parts of the machine that are heated.

1. Prepare the hydraulic steering block.

Make sure the hydraulic steering block (**A**) is clean and dust free then remove the plastic plugs from the block and install the adapters **B** in the **A, B, P** and **T** ports and **C** in the **LS** port (Figure 1).

2. Mount the hydraulic steering block.

NOTE: *At step a, adjust the nuts on the 'U-bolt' bracket to provide more thread above the frame.*

a. Locate the 'U-bolt' hose support bracket mounted front-center of the rear section of the machine. Using the support bracket's (adjusted) studs/nuts (Figure 2a bottom inset) mount **D1** (no center weights) or **D2** (with center weights) as follows:

D1: On the frame with its flanges upward and extended side to the right (Figure 2a and top inset).

D2: With its short side on the frame and its long side forward and upward (Figure 2b-ii - see Note).

b. Using hardware **E**, attach prepared hydraulic steering block **A** to bracket **D1** or **D2** as follows:

D1: Mount **A** with its left and right solenoids rearward (so **P** and **T** ports to the right - Figure 2b-i).

D2: Mount **A** with its left and right solenoids upward (so **P** and **T** ports to the right - not shown, but see note following).

NOTE: *Figure 2b-ii shows bracket D2 in an eDriveX installation. Mount your eDrive hydraulic block the same way.*

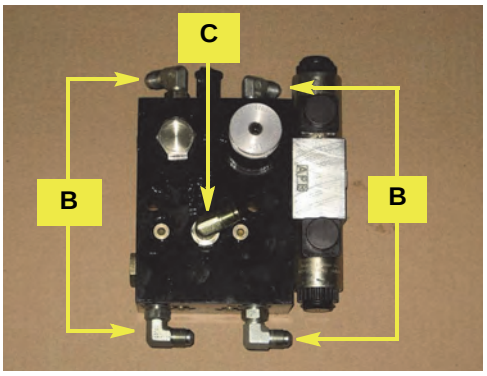


Figure 1: Prepared hydraulic steering block

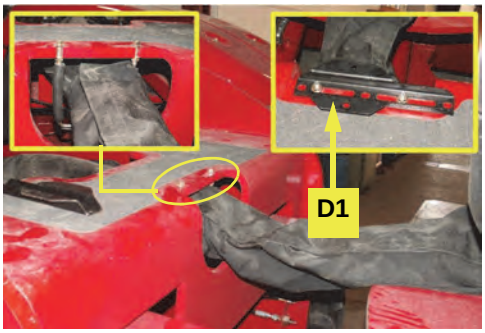


Figure 2a with insets: Steering block mounting location and, inset, mounting bracket D1 installed

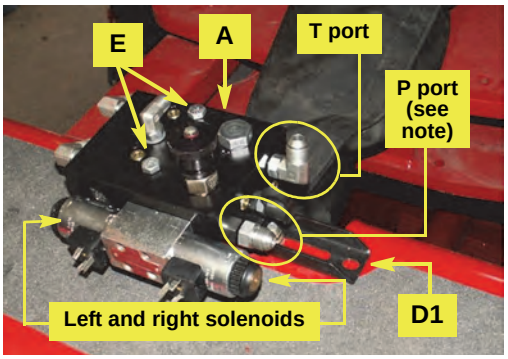


Figure 2b-i: Steering block installed

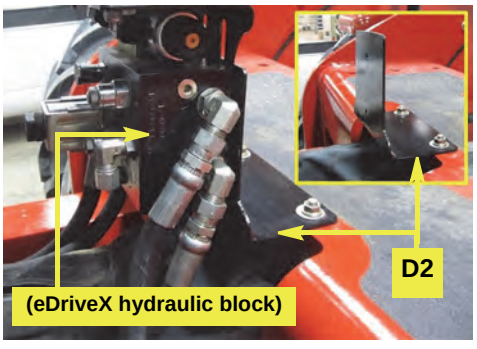


Figure 2b-ii: D2 installed. (No weights currently installed. eDriveX installation shown.)

NOTE: *Figure 2b-i and the remaining figures in this section (except Figure 2b-ii) show a straight fitting in the P port. They also show the pressure hose's elbow end connected to it. You will use an elbow fitting in the P port (see Figure 1) and connect the straight end of the pressure hose.*

3. Install the pressure fitting and hose.

NOTE: *Route all hoses with other machine plumbing free from entanglement and secured with heavy tie straps **P.***

a. Locate the machine's valve control block on the left inside face of the compartment under the cab (accessed from the articulation space - Figure 3a and inset).

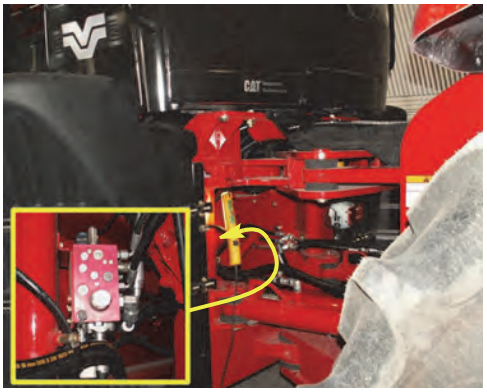


Figure 3a with inset: Machine's valve control block (inset) and location

b. Disconnect the machine's pressure hose from the elbow fitting in the lower left corner of the inward face of the valve control block. Install run-tee **F** on the elbow fitting in the block and reconnect the machine's pressure hose to the open 'T' end of **F** (Figure 3b and inset).

NOTE: *Leave the run-tee loose to allow for alignment when attaching hoses. Plastic caps placed on the open ends of the fittings will prevent excessive leakage prior to hose installation.*

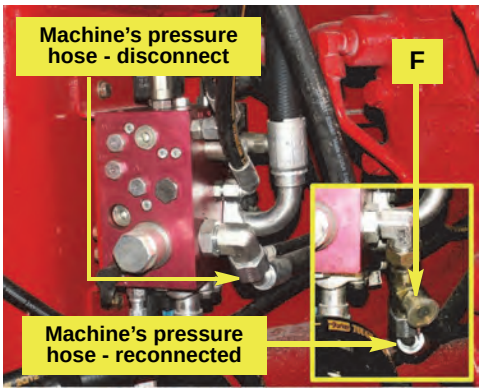


Figure 3b with inset: Pressure run-tee installed, machine's pressure hose reconnected

c. Install pressure hose **K** between the stem of run-tee **F** (elbow end of **K** - Figure 3c-i and inset) and the fitting **B** in the **P** port of the hydraulic steering block (Figure 3c-ii - see Note after step 2b, page 5).

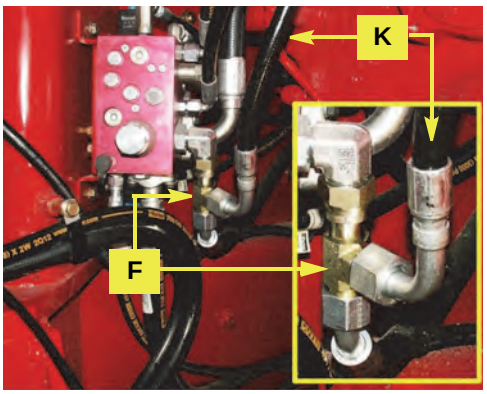


Figure 3c-i with inset: Pressure line installed

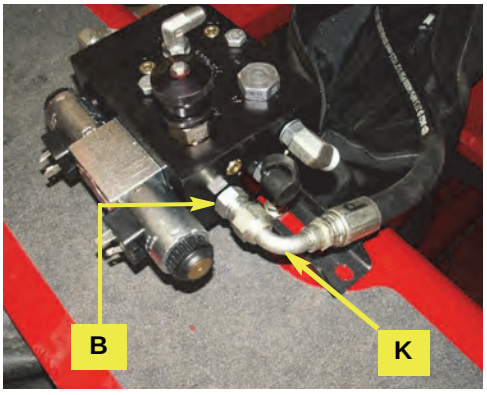


Figure 3c-ii: Pressure hose connected at hydraulic steering block

4. Install the tank fitting and hose.

Locate the hydraulic filter/connections manifold beneath the front right frame of the machine.

NOTE: *Steps a and b are those recommended to minimize hydraulic fluid loss.*

a. Route the elbow end of tank hose **L** from the hydraulic steering block to the hydraulic filter/connections manifold. With the non-swivel 'T' end of **F** capped, connect **L** to the stem of run-tee **F**.

Disconnect the machine's tank hose from the elbow fitting in the manifold and plug it. Connect the swivel 'T' end of **K** to the manifold (Figure 4a-i).

Unplug the machine's hose and uncap **K**. Connect the hose to the open 'T' end of **K** (Figure 4a-ii).

b. Connect the straight end of **L** to fitting **B** in the **T** port of the hydraulic steering block (Figure 4a-ii).

5. Prepare and install the load sense valve.

NOTE: *At step a, leave fittings HK and HM loose enough to allow for easier connections. Tighten after all connections are made.*

a. Prepare the load sense valve **G** by installing fittings **H**, **I** and **J** as follows (Figure 5a):

- **H** in the source port (connects directly to machine)
- **I** in the function port (machine's load sense hose [re]connects)
- **J** in the load sense port (connects to the hydraulic steering block)

b. Disconnect the machine's load sense hose from the elbow fitting in the front left port in the bottom of the valve control block (at which you modified the pressure line - Figure 5b-i). Connect **G**'s adapter **H** to the block's elbow fitting (Figure 5b-i top inset) then (re)connect the machine's load sense hose to **G**'s fitting **I** (Figure 5b-i bottom inset).

Install load sense hose **M** between **G**'s fitting **J** (elbow end of **M**) and fitting **C** in the **LS** port of the hydraulic steering block (Figure 5b-ii and inset).

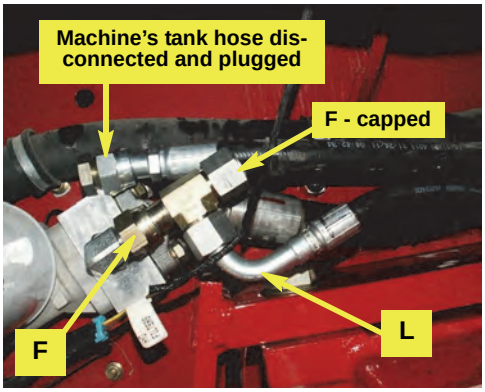


Figure 4a-i: Tank line run-tee installed

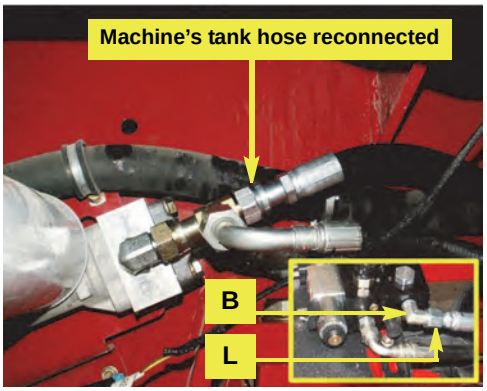


Figure 4a-ii: Tank run-tee connections completed

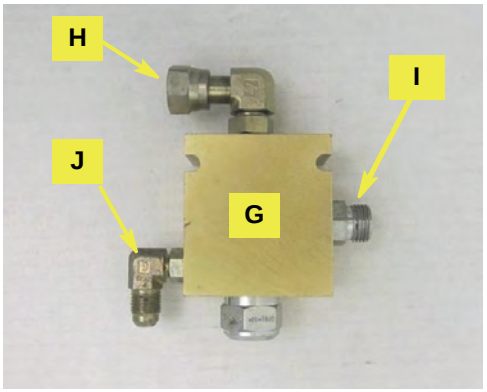


Figure 5a: Prepared dynamic load sense valve

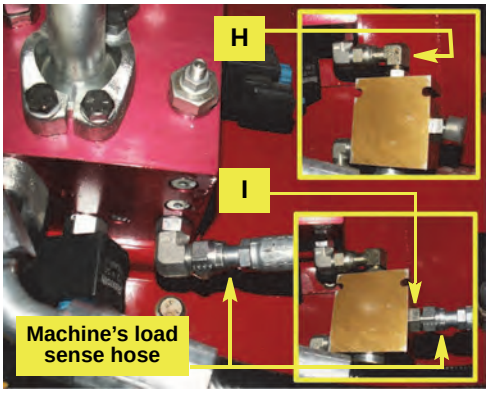


Figure 5b-i with insets: Load sense valve installed

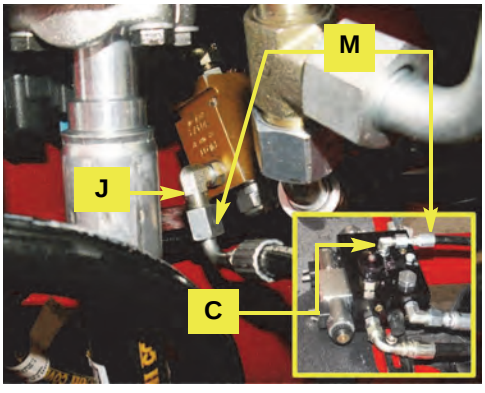


Figure 5b-ii with inset: Load sense hose installed

6. Install the steering output fittings and hoses.

NOTE: *Leave the run-tee fittings loose to allow for alignment when attaching hoses. Plastic caps placed on the open ends of the fittings will prevent excessive leakage prior to hose installation.*

a. Locate the steering line coupling points on the right inside face of the compartment under the cab (accessed from the articulation space - Figure 6a).

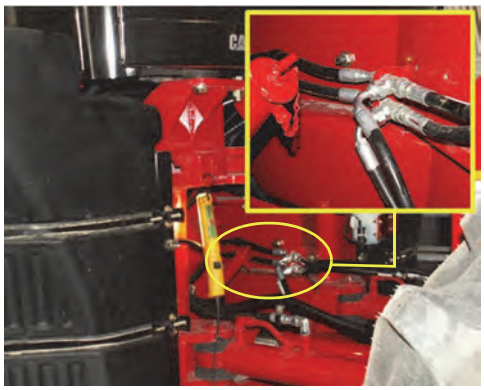


Figure 6a: Steering coupling points

NOTE: *Disconnecting/reconnecting the machine's steering hoses can be made easier by removing the hose clamp (Figure 6b inset). Refit the clamp on completion.*

b. Disconnect the machine's lower steering hose, install a run-tee **F** and (re)connect the machine's steering hose to the open 'T' end of **F** (Figure 6b).

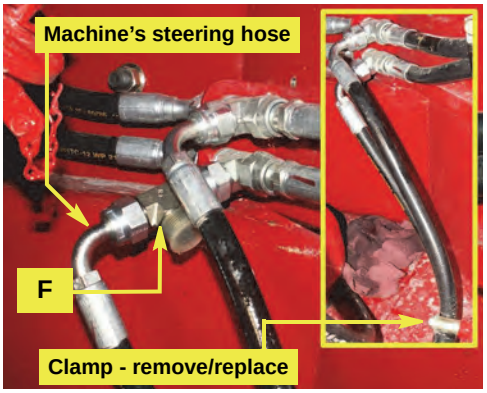


Figure 6b: Steering run-tee installed, machine's hose reconnected

c. Install steering hose **N** between the stem of run-tee **F** (Figure 6c) and fitting **B** in the **A** or **B** port in the hydraulic steering block (Figure 6d inset).

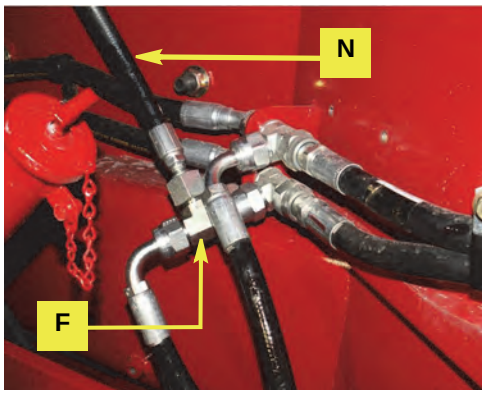


Figure 6c: Steering hose (first) installed at run-tee

d. Repeat steps b and c for the upper steering hose (Figure 6d). Refit the hose clamp if removed (Figure 6b inset).

NOTE: *Route all hoses with other machine plumbing free from entanglement and secured with the heavy tie straps **P**.*

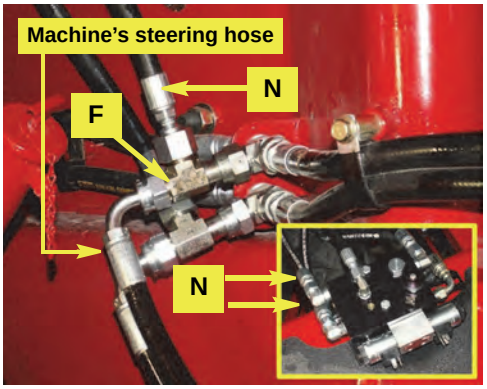


Figure 6d: Steering hose (second) installed at run-tee and, inset, steering hoses connected at steering block

7. Install the valve control cable.

Connect the two DIN connectors of control interface cable **O** (not shown) to the two coils on the steering block and route the cable into the cab (Figure 7 - D1 shown. Note that your **P** port fitting will be an elbow, your pressure hose end, straight - see Note after step 2b, page 5.)

8. Verify operation.

⚠WARNING: *During tests of the hydraulic system, the machine may move unexpectedly. Be prepared for machine movement to avoid injury.*

Keep others away and stay clear of mechanical steering linkages to prevent serious injury or death from pinch point hazards while manually operating the hydraulic steering circuit.

a. Tighten all connections and clean up the installation area. Ensure that the machine is safe to operate.

NOTE: *Figure 8 does not show interface cable O connected. Your cable will be connected at this stage.*

b. Start the machine and check hydraulic connections for any leaks.

c. Rotate the steering wheel from one extreme to the other and back.

d. Adjust the automated steering oil flow control knob to a starting position of **2** turns from completely closed. To adjust the knob (Figure 8 - D1 shown):

- Turn clockwise to reduce flow.
- Turn counterclockwise to increase flow.

e. The coils on the hydraulic steering block have manual push button overrides. Push either manual override to move the steering wheels all the way to one extreme (Figure 8).

NOTE: *To activate the manual overrides, insert a small screwdriver or Allen wrench (or similar) into the end of the coil to depress the override button.*

f. While pressing the override button of the other coil, count the number of seconds for the steering wheels to move all the way in the opposite direction.

g. Adjust the automated steering oil flow control to achieve an end-to-end steering cycle time of approximately **14** seconds. Use the knurled locking nut to secure the final flow control setting.

9. Complete automated steering electronic installation and setup.

Refer to the owner's manual supplied with your automated steering system to complete the electronic installation and setup.

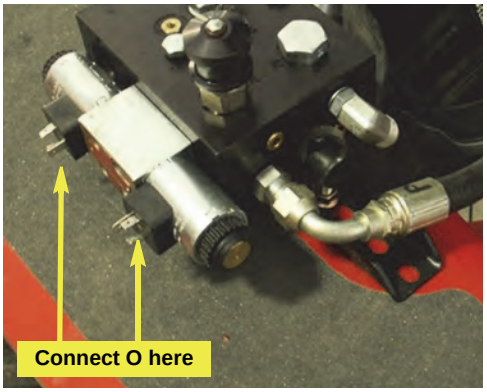


Figure 7: Valve control cable coil connections (D1 installation)

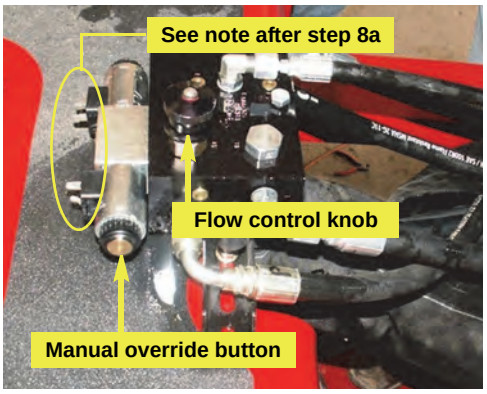


Figure 8: Steering flow control knob and manual override button (D1 installation)