

Automated Steering Kit Installation Guide


P/N: ED-VLHP / ED-VHHP

Fits Versatile Tractor Models:

VLHP	305	340	375	400
VHHP	435	485	535	



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

A series of equipment specific kits has been developed to work in conjunction with your automated steering system. This kit contains the components and instructions to install automated steering hydraulics on the machine models listed above.

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 eDrive when installing or performing maintenance.






Before attempting to install hydraulics, 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.

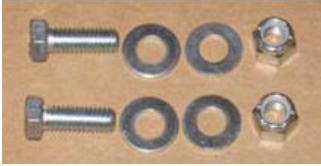

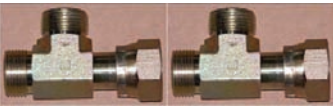
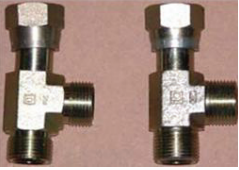
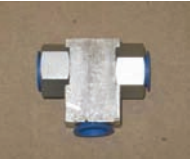



To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and 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 installation kit and identify the required parts as shown.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	760-0004	1	Assembly, hydraulic steering block - LS high flow	
Bag 1 of 4 contains B, C and D				
B	760-2073	3	Adapter, hyd - #8maleJIC x #6maleORB (P, A and B ports on hydraulic steering block)	
C	760-2074	1	Adapter, hyd 90 elbow- 8#maleJIC x #6maleORB (T port on hydraulic steering block)	
D	760-2058	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (LS port on hydraulic steering block)	
E	640-0049	1	Hydraulic steering block mounting bracket	

Kit Contents (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 2 of 4 contains F and G				
F	675-2003	2	Bolt - 3/8NC x 1" Gr5 ZP	
	678-1054	4	Washer, narrow flat - 3/4"OD x 13/32"ID x 1/16" thk ZP	
	676-1035	2	Nut, nylock - 3/8NC ZP	
G	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	
Bag 3 of 4 contains H and I				
H	760-2014	2	Adapter, hyd run-tee - #12 ORFF	
I	760-2004	2	Adapter, hyd run-tee - #10 ORFF	
Bag 4 of 4 contains J, K, L and M				
J	760-0002	1	Hyd load shuttle - #6femORB	
K	760-2056	1	Adapter, hyd - #6maleJIC x #6maleORB	
L	760-2040	1	Adapter, hyd 90 elbow - #6maleORB x #6femORFF swivel	
M	760-2048	1	Adapter, hyd - #6maleORFF x #6maleORB	

Kit Contents (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
NL	760-1293-000	1	Hose, hyd - 1/2" x 60" , #8femJIC90 x #12femORFF (Pressure hose - VLHP kit)	
NH	760-1235-000	1	Hose, hyd - 1/2" x 70" , #8femJIC90 x #12femORFF (Pressure hose - VHHP kit)	
O	760-1319-000	1	Hose, hyd - 1/2" x 78" , #8femJIC x #12femORFF 90 (Tank hose)	
P	760-1294-000	1	Hose, hyd - 1/4" x 18" , #6femJIC x #6femJIC (Load sense hose)	
QL	760-1289-000	1	Hose, hyd - 1/2" x 110" , #8femJIC x #10femORFF90 (Steering hose - VLHP kit)	
QH	760-1233-000	1	Hose, hyd - 1/2" x 122" , #8femJIC x #10femORFF90 (Steering hose - VHHP kit)	
RL	760-1290-000	1	Hose, hyd - 1/2" x 128" , #8femJIC x #10femORFF90 (Steering hose - VLHP kit)	
RH	760-1234-000	1	Hose, hyd - 1/2" x 146" , #8femJIC x #10femORFF90 (Steering hose - VHHP kit)	
S	051-0143	1	Valve control cable - 15 ft	
T	677-2001	20	Tie strap, 11" heavy duty	
	710-0053	1	Kit, steering wheel switch, not shown	

INSTALLATION

⚠ 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.

NOTE: Make sure the hydraulic steering block is clean and dust free.

Remove the plastic plugs from the hydraulic steering block **A** and install the adapters as follows (Figure 1).

- **B** in the P, A and B ports
- **C** in the T port
- **D** in the LS port

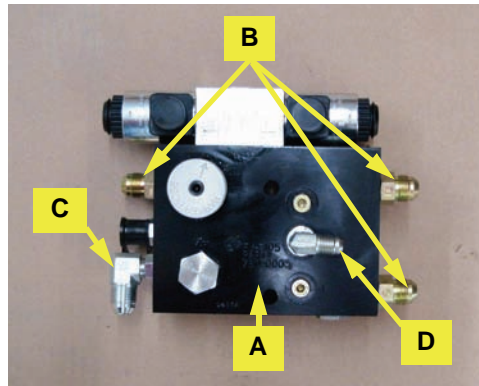


Figure 1: Prepared steering block

2. Mount the hydraulic steering block.

- a. Locate the two bracket mounting holes on the front side of the firewall. Relocate the horn to the mounting hole as shown (Figure 2a).

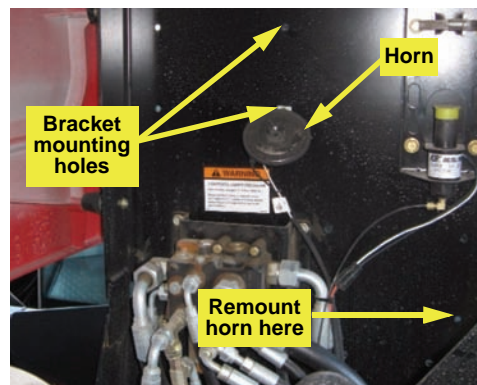


Figure 2a: Steering block and new horn mounting locations

- b. Using the provided hardware **F**, install the mounting bracket **E** (Figure 2b).

NOTE: If there are no holes in the firewall, use bracket **E** as a template and drill two 3/8" mounting holes in the location shown in Figure 2b.

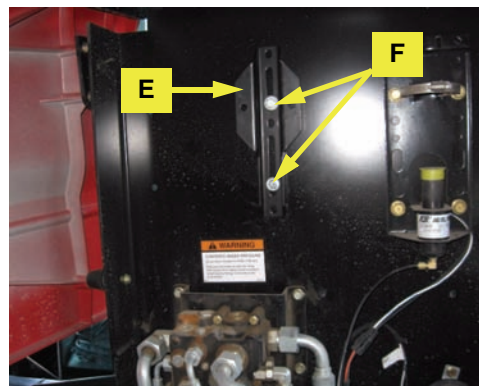


Figure 2b: Steering block mounting bracket

2. **Mount the hydraulic steering block (continued).**
- c. Using the provided hardware **G**, attach the prepared hydraulic steering block **A** to bracket **E** (not visible) (Figure 2c).

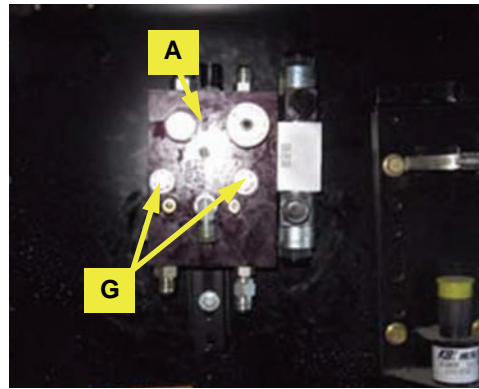


Figure 2c: Steering block - mounted

3. **Install the pressure and tank fittings.**

The hydraulic steering block will receive pressure from the hydraulic divider mounted on the front side of the firewall (Figure 3a).

- a. Disconnect the pressure line from the top left of the hydraulic divider (Figure 3a).

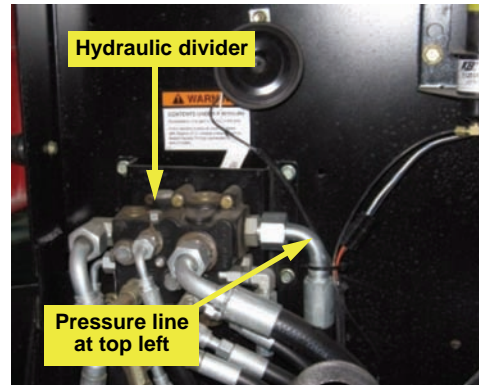


Figure 3a: Pressure line location

- b. Install the run-tee **H** then reconnect the pressure line to the end of it (Figure 3b).
The hydraulic steering block will return tank flow to the reservoir via the steering orbital.

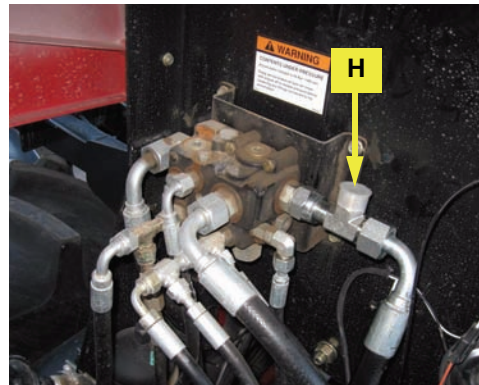


Figure 3b: Pressure line fitting installed

- c. Disconnect the tank line from the fitting in the top right port of the steering orbital and install run-tee **H**. Reconnect the tank line to the open 'T' end of **H** (Figure 3c).

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.

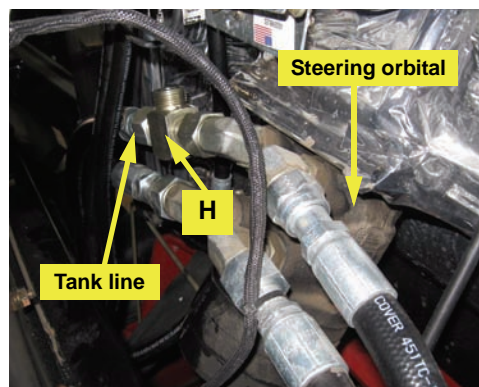


Figure 3c: Tank line run-tee installed, tank line reconnected

4. **Install the load sense shuttle.**

a. Assemble the load sense shuttle **J** with adapter fittings **K**, **L**, and **M** (Figure 4a).

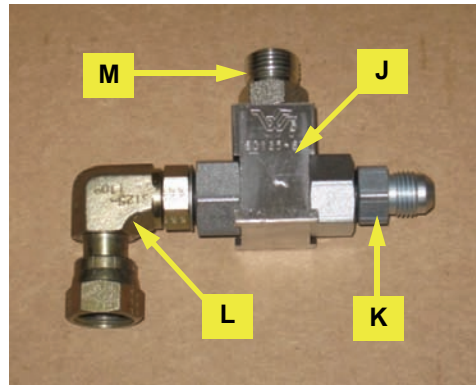


Figure 4a: Assembled load sense shuttle

b. Locate the front hydraulic pump on the front left side of the engine. Locate the load sense line (Figure 4b).

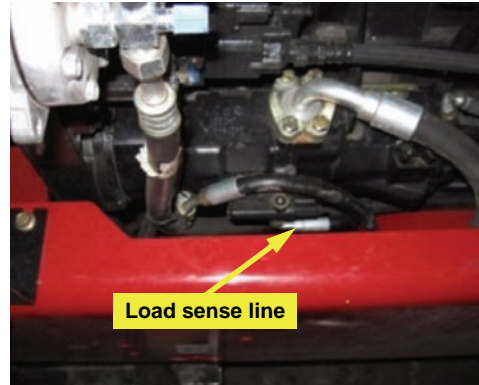


Figure 4b: Pump load sense line

c. Trace the load sense line to the hydraulic divider mounted on the front side of the firewall. Disconnect the load sense line from its run-tee (Figure 4c).

NOTE: *The load sense line could be the first or the second straight line from the hydraulic divider.*

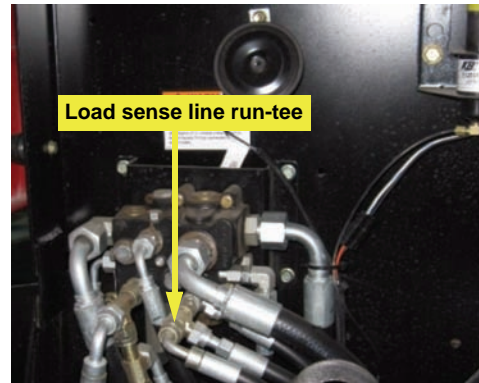


Figure 4c: Load sense line

d. Connect the female elbow fitting **L** of the load sense shuttle **J** to the open stem of the load sense run-tee (Figure 4d).

e. Reconnect the load sense line to load sense shuttle fitting **M** (Figure 4d).

NOTE: *Leave the load sense shuttle connections loose to allow for easier installation. Tighten them after all connections are made.*

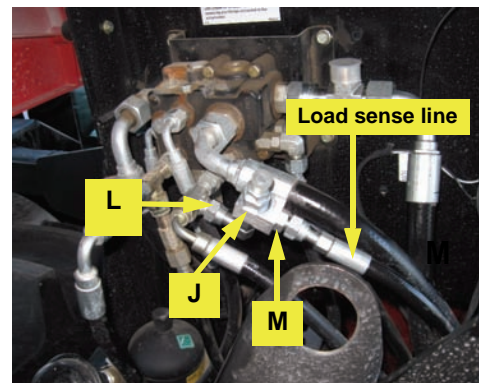


Figure 4d: Installed load sense shuttle

5. Install the pressure, tank, and load sense hoses.

NOTE: Use the *L* or alternative *H* hose (as supplied in your kit) for VLHP or VHHP models respectively.

a. Install the pressure hose **NL** (or **NH**) between the fitting **B** in the **P** port of the hydraulic steering block (Figure 5a) and the run-tee **H** installed on the hydraulic divider valve (Figure 5c).

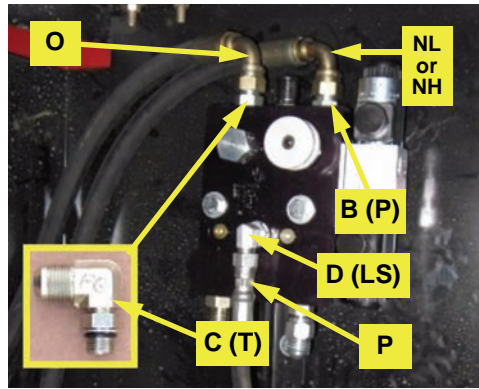


Figure 5a: Installed pressure, tank, and load sense hoses at steering block

b. Install the tank hose **O** between the fitting **C** in the **T** port of the hydraulic steering block (Figure 5a) and the run-tee **H** installed in the steering orbital (Figure 5b).

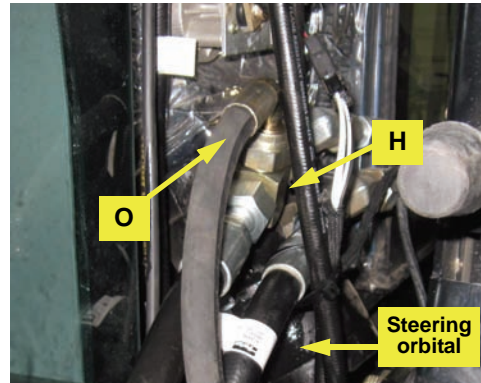


Figure 5b: Installed tank hose at steering orbital

c. Install the load sense hose **P** between the fitting **D** in the **LS** port on the hydraulic steering block (Figure 5a) and **K** on the load sense shuttle (Figure 5c).

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

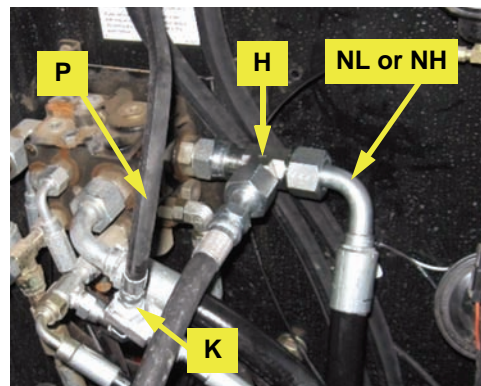


Figure 5c: Installed pressure and load sense hoses at hydraulic divider valve

6. Install the steering output fittings.

- a. Locate the left steering cylinder in the middle of the tractor (Figure 6a).

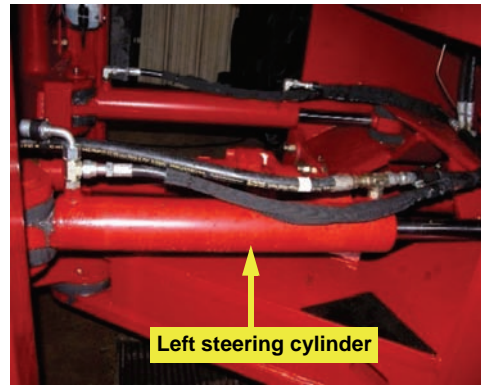


Figure 6a: Steering output location

- b. Install the run-tees **I** to the steering lines at each end of the steering cylinder (Figure 6b).

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.

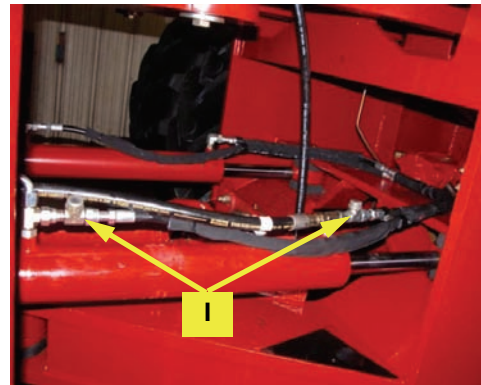


Figure 6b: Installed steering run-tees

7. Install steering output hoses.

NOTE: Use the **L** or alternative **H** hose (as supplied in your kit) for **VLHP** or **VHHP** models respectively.

Connect the hydraulic steering hoses **QL** (or **QH**) and **RL** (or **RH**) from the **A** and **B** ports on the hydraulic steering block to the open stems on the steering cylinder run-tees **I**. The longer steering line **RL** (or **RH**) attaches to the back run-tee (Figures 7a and 7b).

NOTE: All hoses should be routed with other tractor plumbing free from entanglement and secured with the heavy tie straps **T** provided.

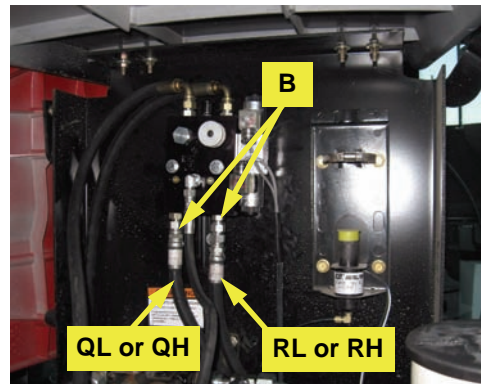


Figure 7a: Installed steering hoses at steering block

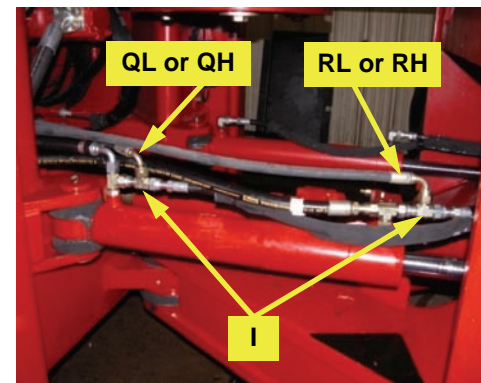


Figure 7b: Installed steering hoses at steering cylinder

8. **Install the valve control cable.**

Route the valve control cable **S** from the hydraulic steering block under the cab and through the access hole on the right rear corner of the cab (Figures 8a and 8b).

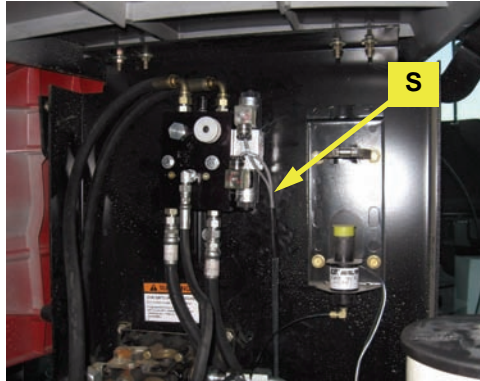


Figure 8a: Valve cable installed at steering block

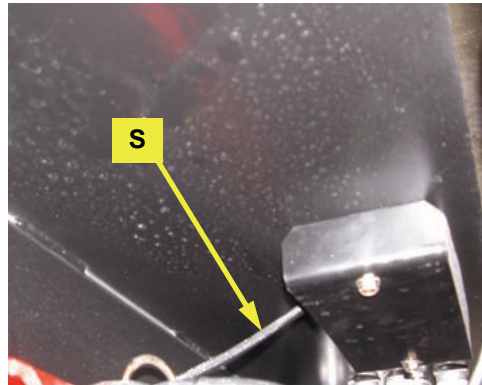


Figure 8b: Valve cable routed in access hole

9. **Verify operation and set automated steering control rate.**

⚠ WARNING: *During tests of the hydraulic response, the tractor may move unexpectedly. Be prepared for vehicle 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 the connections and clean up the installation area around the machine and make certain that it is safe to operate.
- b. Start the machine and check the steering connections for 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 $1\frac{3}{4}$ turns from completely closed. To adjust the knob:
 - Turn clockwise to reduce flow.
 - Turn counter clockwise to increase flow (Figure 9).
- 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 9).

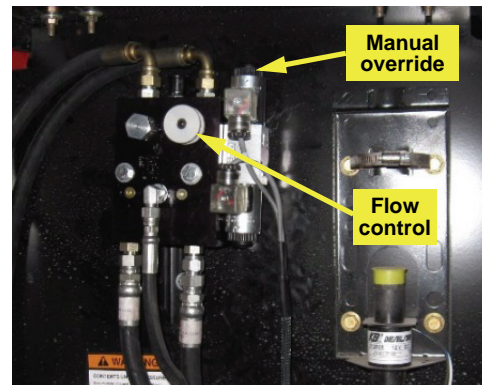


Figure 9: Steering block manual override and flow control button

NOTE: *To activate the manual overrides, a tool such as a small screwdriver or Allen wrench must be inserted 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 (Figure 9).
- g. Adjust the automated steering oil flow control to achieve an end-to-end steering cycle time of approximately 40 seconds. Use the knurled locking nut to secure the final flow control setting.

10. 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.

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