Automated Steering Hydraulic Installation Kit

P/N: ED-MXTX

Fits McCormick and CaseIH Models:

MTX 120	***XTX 185***	***ZTX 230***
MTX 135	***XTX 200***	***ZTX 260***
MTX 150	***XTX 215***	***ZTX 280***
MTX 165	***MX 100***	***MX 135***
MTX 185	***MX 110***	***MX 150***
MTX 200	***MX 120***	***MX 170***

Overview

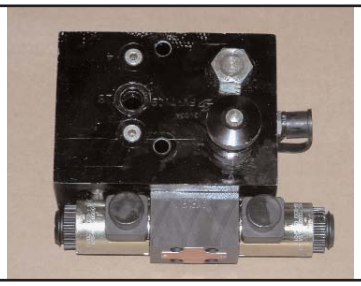
A series of equipment-specific kits has been developed to work in conjunction with your automated steering system. This kit contains the necessary components and
instructions to install automated steering hydraulics on the tractor models listed above. The installation instructions for **MTX**, **XTX,** and **MX** models begin on page **6** and the instructions for **ZTX** models begin on page **15**. Please read this manual thoroughly before beginning the installation.

Machine Preparation

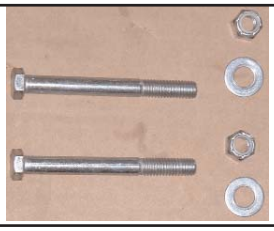
Before attempting to install the automated steering kit, park the machine on a clean, level floor with adequate clearance to work all around.

Kit Contents

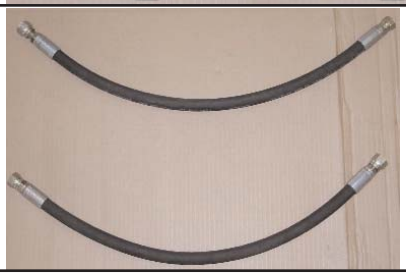
Unpack the installation kit and identify the required parts as shown.

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
A	760-0003	1	Assy, Hyd. Valve Block - LS	
	Bag #1 of 5 includes B & C			
B	760-2058	3	Adapter, Hyd. 90 Elbow - #6mJIC, #6mORB	
C	760-2056	2	Adapter, Hyd. - #6mJIC, #6mORB	
D	640-0049	1	Hyd Block Mnt	

Kit Contents (continued)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
	Bag #2 of 5 includes E, F & G			
E	675-2005 678-1054 676-1035	2 2 2	Bolt - 3/8NC x 3-1/4" Gr5, ZP Washer, Narrow Flat - 3/4” OD x 13/32” ID x 1/16” thk ZP Nut, NyLock - 3/8NC ZP	
F	675-2020 678-1053 676-1034	2 2 2	Bolt - 1/4NC x 2" Gr5, ZP Washer, Narrow Flat - 3/4” OD x 13/32” ID x 1/16” thk ZP Nut, Lock - 1/4NC ZP	
G	675-2003 678-1054 676-1035	2 2 2	Bolt - 3/8NC x 1" Gr5, ZP Washer, Narrow Flat - 3/8" ZP Nut, NyLock - 3/8NC ZP	
	Bag #3 of 5 includes H			
H	760-2069	2	Adapter, Hyd Run Tee-#8 ORF	
	Bag #4 of 5 includes J, K, L & M			
I	760-0009	1	Assy, Hyd. Dynamic Load Sense Valve	
J	760-2033	1	Adapter, Hyd. - #4 mORF, #6mORB	
K	760-2082	1	Adapter, Hyd. 90 Elbow - #6mJIC, #4mORB	
L	760-2089	1	Adapter, Hyd. 90 - #4mORB, #4fORF	
M	760-2090	1	Adapter, Hyd. - #6mORB, #4 fORB	
	Bag #5 of 5 includes N, O, P & Q			
N	760-2080	2	Adapter, Hyd. 90 Elbow - #8mJIC, #8mORB	

Kit Contents (continued)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
O	760-2083	2	Adapter, Hyd. - #8mORF, #8mORB	
P	760-2069	2	Adapter, Hyd Run Tee - #8ORF	
Q	760-2070	2	Adapter, Hyd 90 Elbow - #8mORF, #8fORF	
R	760-0001	1	Assy, Hyd. Counter Balance Valve - Reactive	
S	760-1267	2	Hoses, Hyd-3/8" x 40", #6fJIC90 x #8fORF	
T	760-1256	2	Hose, Hyd-1/2" x 28", #8fJIC x #8fORF	
U	760-1123	2	Hose, Hyd-3/8" x 40", #6fJIC x #8fORF90	

Kit Contents (continued)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
V	760-1077	1	Hose, Hyd -1/4" x 36", #6fJIC x #6fJIC	
W	051-0143	1	Cable, Interface - 15 ft.	
	677-2001	20	Tie Strap, 11" Heavy Duty	Not Shown
	710-0053	1	Kit, Steering Wheel Switch	Not Shown

WARNINGS

READ this entire installation guide **before** beginning installation. Failure to comply with warnings in this guide can result in personal injury or damage to equipment, and will void all warranties.

HIGH-PRESSURE FLUID HAZARD. Hydraulic oil may be hot and under high pressure. To prevent serious injury or death: Relieve system pressure and allow to cool before repairing or disconnecting. Wear proper hand and eye protection when searching for leaks, using wood or cardboard instead of hands. Keep all hydraulic components in good repair.

PINCH POINT HAZARD. To prevent serious injury or death, avoid unsafe practices while manually operating hydraulic steering circuit. Keep others away and stay clear of mechanical steering linkages.

PREVENT HYDRAULIC SYSTEM CONTAMINATION. It is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a spray cleaner such as 'Brake Clean' to prevent hydraulic system contamination. Note that o-rings used on ORB and ORFF type fittings may be damaged by solvent cleaners such as 'Brake Clean.' If a fitting is to be cleaned internally, the o-ring should first be removed and cleaned with a fiberless cloth.

INSTALLATION - MTX, XTX, and MX MODELS ONLY

1. Prepare Automated Steering Block:

a. Make sure the automated steering block (**A**) is clean and dust free.

b. Install the elbow adapter fittings (**B**) into the **LS**, **P** and **T** ports of the automated steering block. (Figure 1.)

NOTE: To install the elbow fittings (**B**) in the **P** and **T** ports, the pressure test port fitting must be removed.

c. Install the straight adapter fittings (**C**) into the **A** and **B** ports. (Figure 1.)

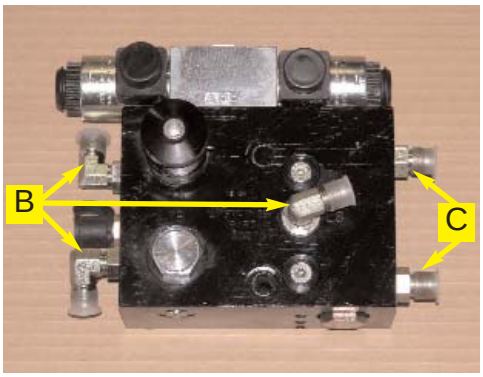


Figure 1. Prepared automated steering block.

2. Mount Automated Steering Block: If installing on a CaseIH MX tractor model, mount the automated steering according to step 2a. on page 7. If installing on a McCormick MTX or XTX tractor model continue below.

a. Locate the two bolts, in the muffler shield, on the right side of the tractor. (Figure 2a.)

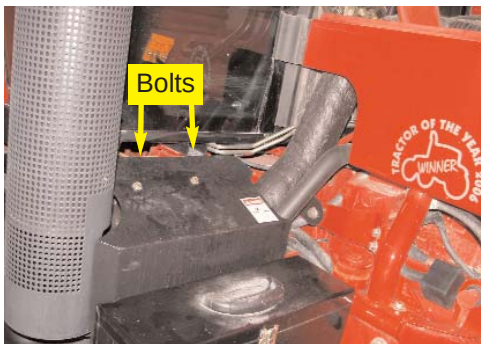


Figure 2a. Mounting location.

b. Use the existing bolts to install the mounting bracket (**D**) to the tractor. (Figure 2b.)

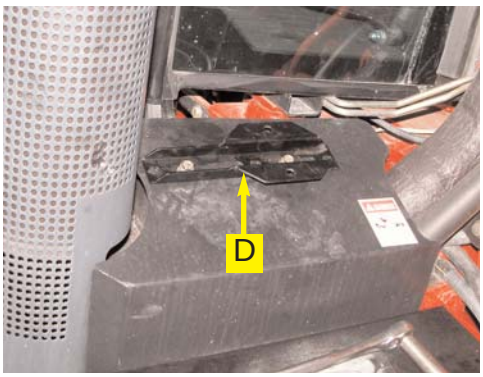


Figure 2b. Installed mounting bracket.

c. Use the provided mounting hardware in group (**E**) to attach the automated steering block, as prepared in step **1**, to the mounting bracket (**D**). (Figure 2c.)


Figure 2c. Mounted automated steering block.

2a. **Mount Automated Steering Block:** CaseIH MX models only.

a. Locate the sheild above the exhaust pipe on the right side of the tractor in front of the cab. Using the mounting bracket (**D**) as template, mark out and drill two **7/16”** holes in the sheild. (Figure 2a.)

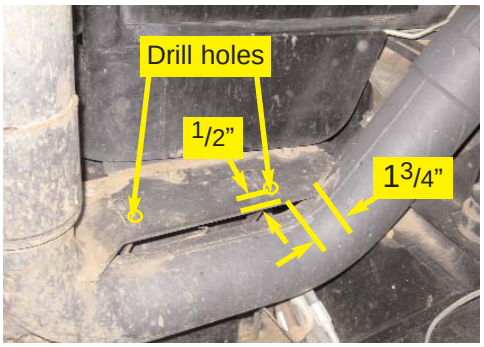


Figure 2a. Mounting location.

b. Use the bolts in hardware group (**G**) to install the mounting bracket (**D**) to the tractor exhaust sheild. (Figure 2b.)

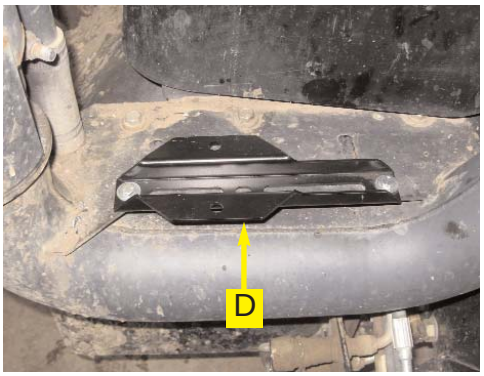


Figure 2b. Installed mounting bracket.

c. Use the provided mounting hardware in group (**E**) to attach the automated steering block, as prepared in step **1**, to the mounting bracket (**D**). (Figure 2c.)


Figure 2c. Mounted automated steering block.

3. Assemble Counter-Balance Valve:

a. Install the elbow fittings (**N**) into the **V1** and **V2** ports and straight adapter fittings (**O**) into the **C1** and **C2** ports of the counter-balance valve block (**R**). (Figure 3.)

b. Install the run tees (**P**) to the straight adapters (**O**). (Figure 3.)

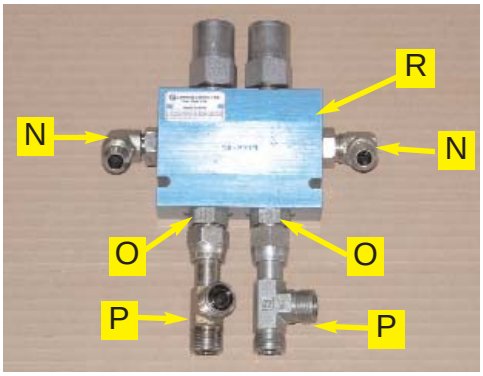


Figure 3. Assembled counter-balance valve block.

4. Install Counter-Balance Valve:

a. The counter-balance valve (**R**) will be installed inside the left hood support. (Figure 4a.)

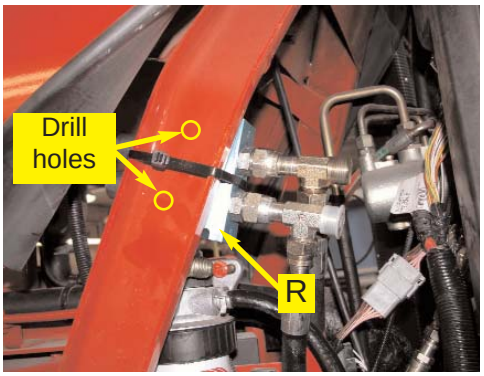


Figure 4a. Installed counter-balance valve block.

b. Use the counter-balance valve as a template to drill two **5/16”** holes as shown. (Figure 4b.)

c. Use the provided hardware in group (**F**) to attach the counter-balance valve block to the inside of the left hood support.


Figure 4b. Installed counter-balance valve block.

d. Locate the two tractor steering lines on the left side of the steering orbital. (Figure 4c.)

e. Remove the steering lines from the orbital.

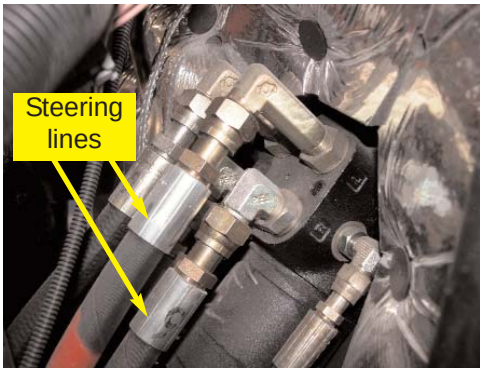


Figure 4c. Steering lines at the steering orbital.

4. Install Counter-Balance Valve (continued):

f. Reconnect the steering lines to the branches of the run tees (**P**) on the counter-balance valve. (Figure 4d.)

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.

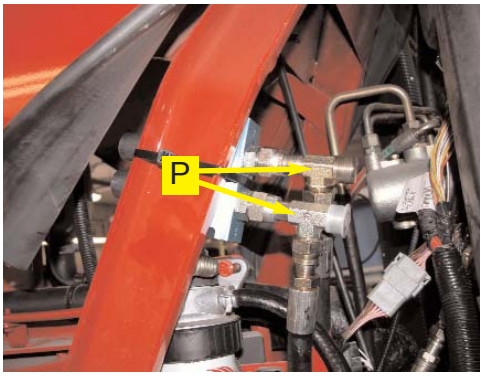


Figure 4d. Steering lines at counter-balance valve.

5. Install Steering Output Hoses:

a. Connect automated steering hose (**T**) from the **V1** port on the counter-balance valve to the port on the steering orbital that was originally connected to the tractor steering line. The steering hose (**T**) takes the place of the original steering line that is now connected to the **C1** port of the counter-balance valve. Repeat these steps for the second steering hose (**T**) for port **V2** corresponding to the tractor steering line on port **C2** of the counter-balance valve. (Figure 5a. and 5b.)

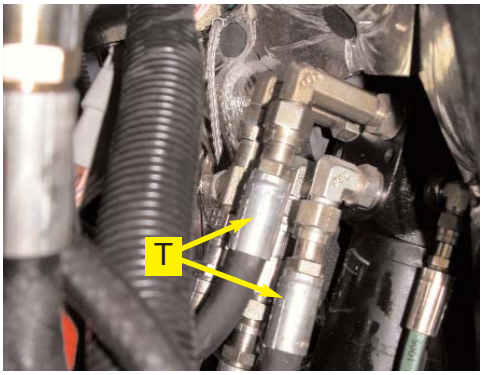


Figure 5a. Steering hoses at the orbital.

NOTE: Do not cross hose connections when installing hoses onto the counter-balance valve. The steering hose connected to the **V1** port will apply pressure to the cylinder port connected to the **C1** port. The same is true for the **V2** and **C2** ports.

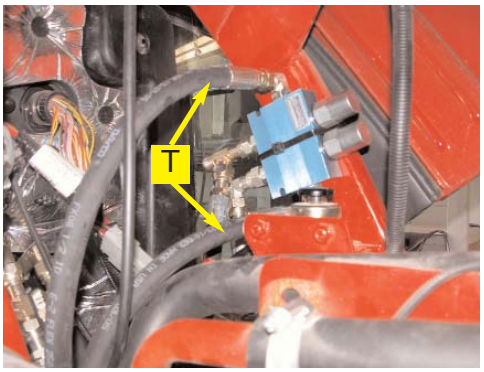


Figure 5b. Steering hoses at the counter-balance valve.

b. Connect the steering hoses (**U**) from the **A** and **B** ports on the automated steering block to the ends of the run tees on the counter-balance valve.(Figure 5c. and 5d.)

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

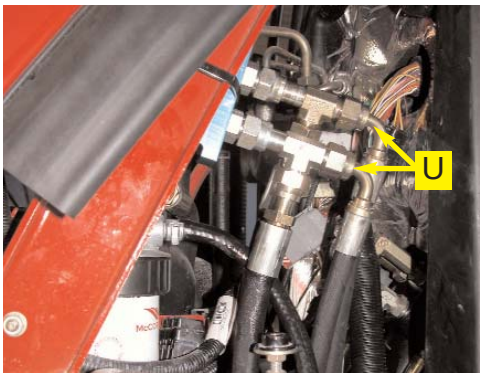


Figure 5d. Steering hoses at the counter-balance valve.

Figure 5c. Steering hoses at the automated steering block.

6. Install Pressure and Tank Fittings:

a. The automated steering block will make pressure and tank connections at the steering orbital. (Figure 6a.) Some tractor models will have elbow fittings on the hoses as shown in Figure 6b.

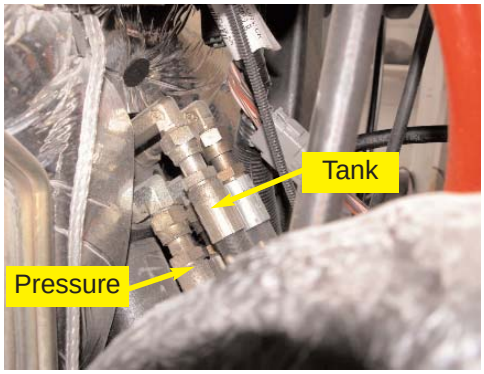


Figure 6a. Pressure and tank location.

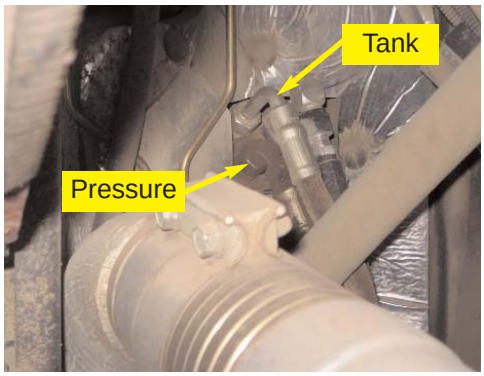


Figure 6b. Pressure and tank location.

b. The bottom right port on the steering orbital is the pressure port and the top right port is the tank port. Install the provided run tees (**H**) to the pressure and tank ports and reattach the lines to the ends of the run tees. (Figure 6c.) On tractor models equipped with elbow fittings on the hose ends you will need to use the provided elbow adapters (**Q**) to allow installation of the run tees as shown in Figure 6d.

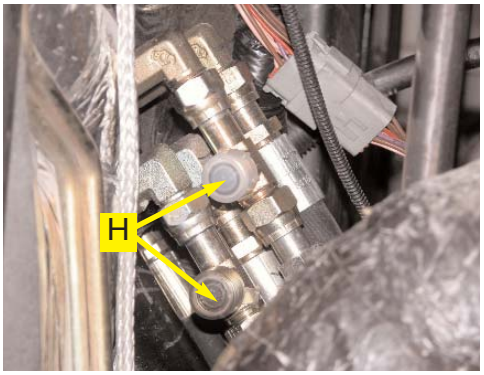


Figure 6c. Installed pressure and tank run tees.

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.

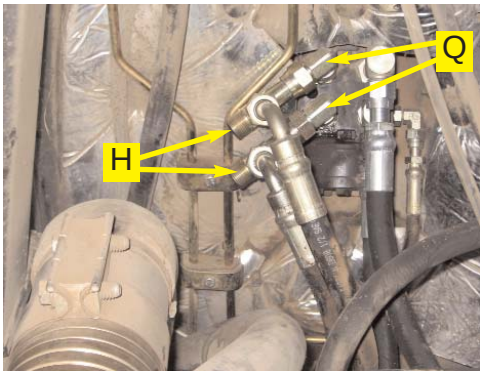


Figure 6d. Installed pressure and tank run tees.

7. Install Pressure and Tank Hoses:

Connect the pressure hose (**S**) from the **P** port on the automated steering block to the pressure run tee fitting (**H**) installed in step **6**. Connect the tank hose (**S**) from the **T** port on the Automated Steering Block to the tank run tee fitting (**H**) installed in step **6**. (Figure 7a., 7b. and 7c.)

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

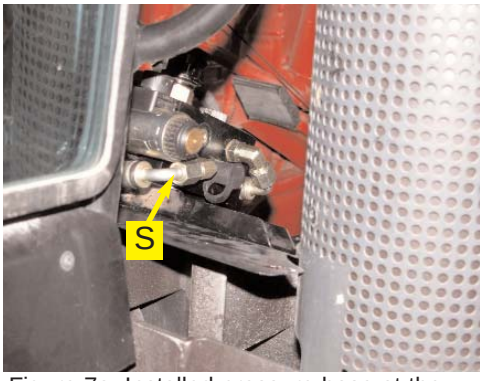


Figure 7a. Installed pressure hose at the automated steering block.

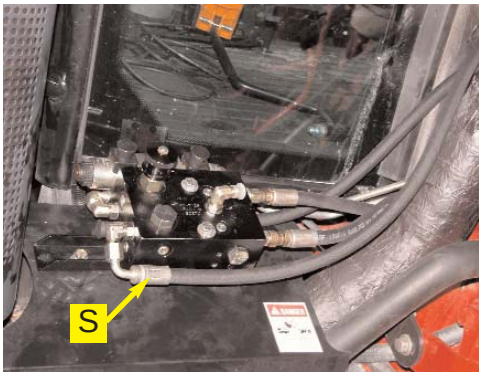


Figure 7b. Installed tank hoses at the automated steering block.

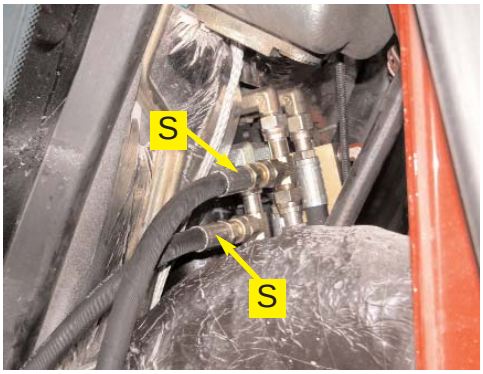


Figure 7c. Installed pressure and tank hoses at the steering orbital.

8. Install Dynamic Load Sense Valve:

a. Assemble the load sense valve (**I**) with adapter fittings (**J**), (**K**), (**L**) and (**M**). (Figure 8a.)

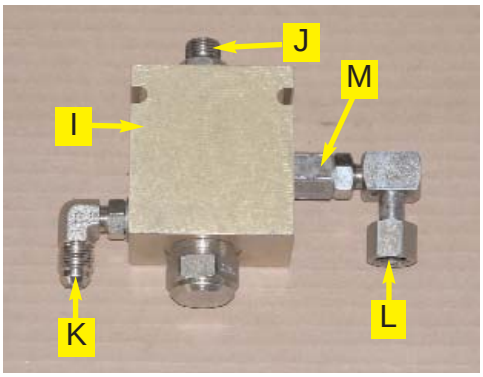


Figure 8a. Assembled load sense shuttle.

b. Locate the load sense line on the left side of the steering orbital. (Figure 8b.)

c. Disconnect the load sense line from the orbital.

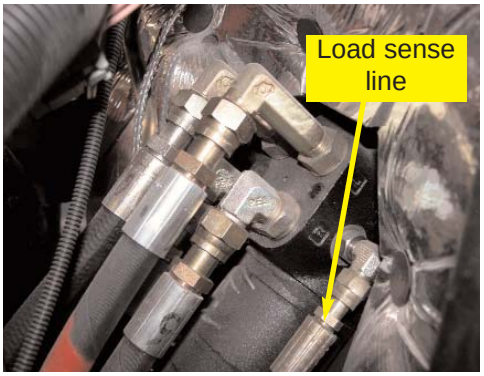


Figure 8b. Load sense line.

d. Install port **B** (fitting (**L**)) of the load sense valve to load sense port on the orbital. Reattach the load sense line to port **A** (fitting (**J**)) of the load sense valve. (Figure 8c.)

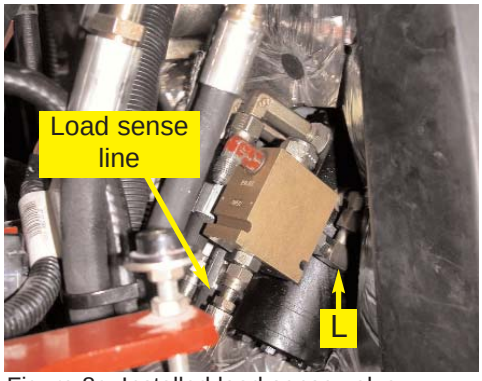


Figure 8c. Installed load sense valve.

9. Install Load Sense Valve Hose

Connect the load sense hose (**V**) from the **LS** port on the automated steering block to the **PILOT** port (fitting **K**) on the load sense valve (**I**). (Figure 9a. and 9b.)

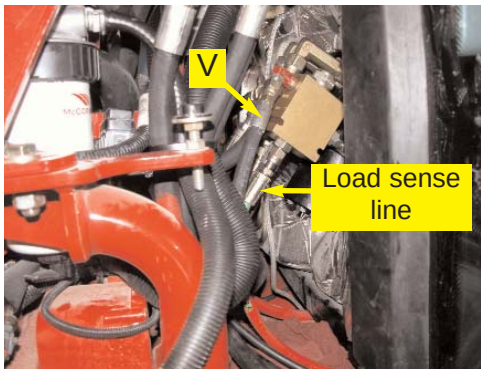


Figure 9b. Installed load sense hose at valve.

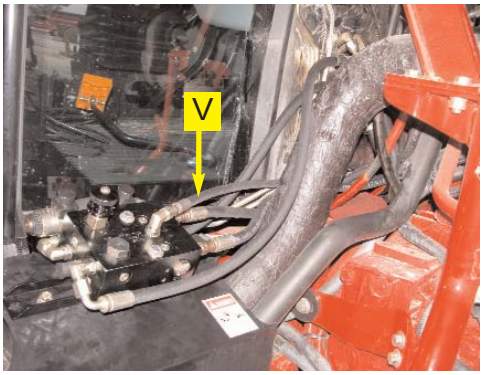


Figure 9a. Installed load sense hose at the automated steering block.

10. Install the Valve Control Cable:

Route the valve control cable (**W**) from the Automated Steering Block under the cab and through the rear window access panel. Secure the valve cable with heavy tie straps (provided). (Figure 8a. and 8b.)

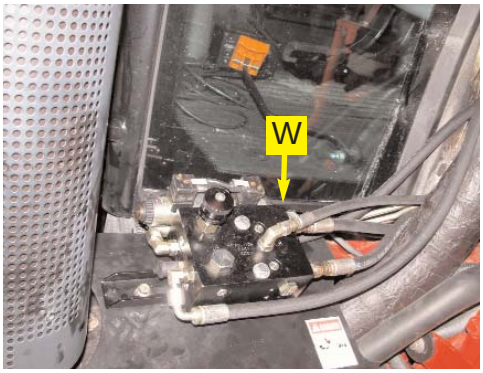


Figure 10a. Installed valve cable at the automated steering block.

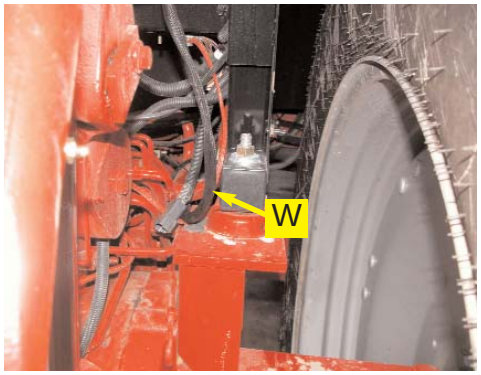


Figure 10b. Valve cable routed under the cab.

Figure 10c. Valve cable routed in cab.

11. Verify Operation and Set Automated Steering Control Rate:

a. Clean up the installation area around the machine and make certain that it is safe to operate.

b. Make sure all hydraulic hoses are tightened.

c. Start the machine and check the automated steering connections for any leaks.

WARNING: **PINCH POINT HAZARD.** To prevent serious injury or death, avoid unsafe practices while manually operating hydraulic steering circuit. Keep others away and stay clear of mechanical steering linkages.

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

e. Adjust the automated steering oil flow control knob to a starting position of 2 turns from completely closed. To adjust the knob:
• Turn clockwise to reduce flow.
• Turn counter-clockwise to increase flow.
(Figure 11.)

f. The coils on the automated steering block have manual push button overrides. Push either manual override to move the steering wheels all the way to one extreme.

NOTE: To activate the manual overrides, a tool such as a small screw driver or allen wrench must be inserted into the end of the coil to depress the override button.

g. Count the number of seconds for the steering wheels to move all the way in the opposite direction while pressing the manual override of the other coil.

h. Adjust the automated steering oil flow control to achieve an end-to-end steering cycle time of approximately **16** seconds.

12. 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.

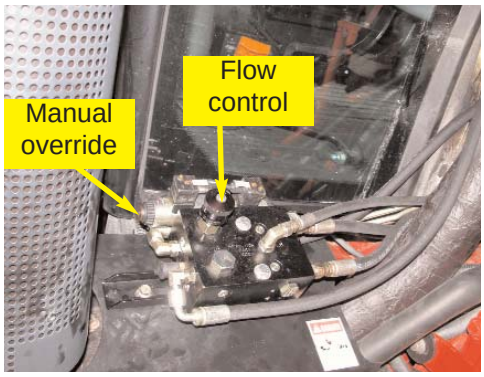


Figure 11. Automated steering oil flow control knob and manual override button.

INSTALLATION - ZTX MODELS ONLY

1. Prepare Automated Steering Block:

a. Make sure the automated steering block (**A**) is clean and dust free.

b. Install the elbow adapter fittings (**B**) into the **LS**, **A** and **B** ports of the automated steering block. (Figure 1.)

c. Install the straight adapter fittings (**C**) into the **P** and **T** ports. (Figure 1.)

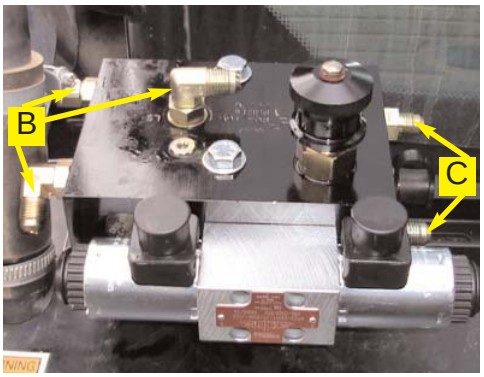


Figure 1. Prepared automated steering block.

2. Mount Automated Steering Block:

a. Locate the two bolts, in the muffler shield, on the right side of the tractor. (Figure 2a.)

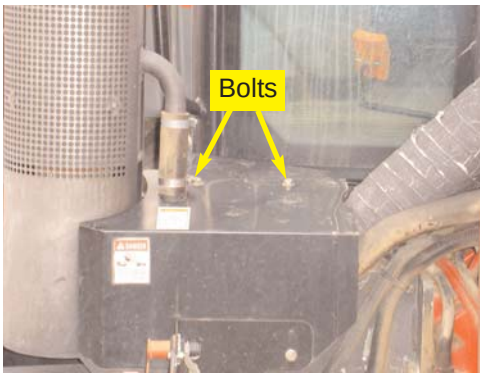


Figure 2a. Mounting location.

b. Use the existing bolts to install the mounting bracket (**D**) to the tractor as shown. (Figure 2b.)

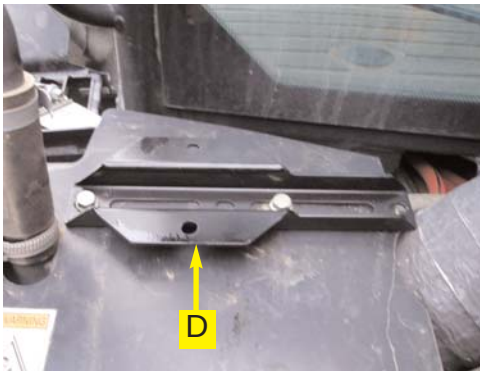


Figure 2b. Installed mounting bracket.

c. Use the provided mounting hardware in group (**E**) to attach the automated steering block, as prepared in step **1**, to the mounting bracket (**D**). (Figure 2c.)


Figure 2c. Mounted automated steering block.

3. Assemble Counter-Balance Valve:

a. Install the elbow fittings (**N**) into the **V1** and **V2** ports and straight adapter fittings (**O**) into the **C1** and **C2** ports of the counter-balance valve block (**R**). (Figure 3.)

b. Install the run tees (**P**) to the straight adapters (**O**). (Figure 3.)

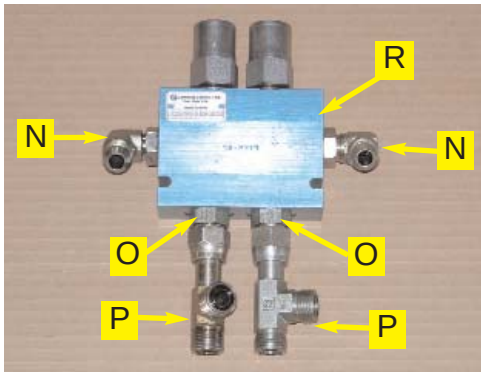


Figure 3. Assembled counter-balance valve block.

4. Install Counter-Balance Valve:

a. The counter-balance valve (**R**) will be installed inside the right horizontal hood support. (Figure 4a.)

b. Use the counter-balance valve as a template to drill two **5/16”** holes as shown. The counter-balance valve should be installed as far back on the horizontal hood support as possible but still allow clearance for the side adapter fitting (**N**) against the vertical support. (Figure 4a.)

Figure 4a. Installed counter-balance valve block.

c. Use the provided hardware in group (**F**) to attach the counter-balance valve block to the inside of the right hood support. (Figure 4b.)

Figure 4b. Installed counter-balance valve block.

d. Locate the two tractor steering lines on the left side of the steering orbital. (Figure 4c.)

e. Remove the steering lines from the orbital and re-route them up near the run tees on the counter-balance valve.

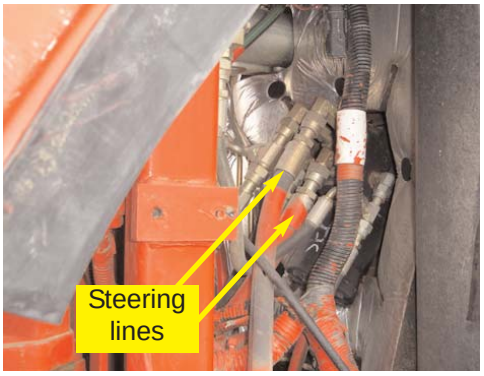


Figure 4c. Steering lines at the steering orbital.

4. Install Counter-Balance Valve (continued):

f. Use the elbow adapter fittings (**Q**) to reconnect the steering lines to the ends of the run tees (**P**) on the counter-balance valve. (Figure 4d.)

NOTE: Leave the adapter 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.

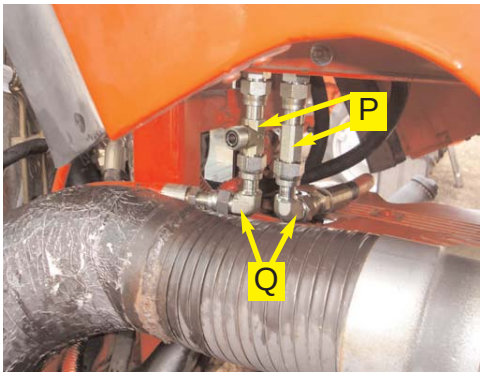


Figure 4d. Steering lines connected at counter-balance valve.

5. Install Steering Output Hoses:

a. Connect automated steering hose (**T**) from the **V1** port on the counter-balance valve to the port on the steering orbital that was originally connected to the tractor steering line. The steering hose (**T**) takes the place of the original steering line that is now connected to the **C1** port of the counter-balance valve. Repeat these steps for the second steering hose (**T**) for port **V2** corresponding to the tractor steering line on port **C2** of the counter-balance valve. (Figure 5a. and 5b.)

NOTE: Do not cross hose connections when installing hoses onto the counter-balance valve. The steering hose connected to the **V1** port will apply pressure to the cylinder port connected to the **C1** port. The same is true for the **V2** and **C2** ports.

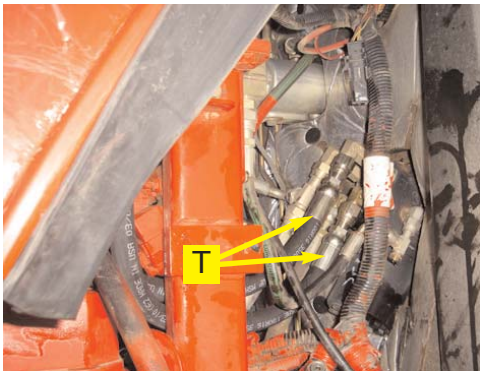


Figure 5a. Steering hoses at the orbital.

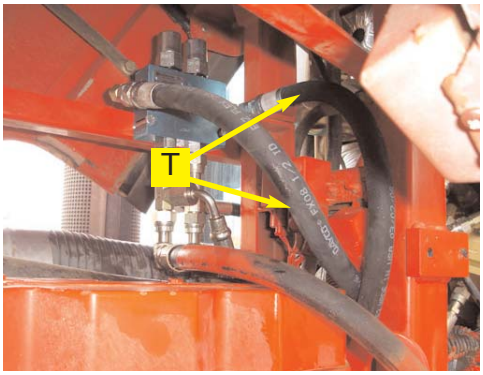


Figure 5b. Steering hoses at the counter-balance valve.

b. Connect the steering hoses (**U**) from the **A** and **B** ports on the automated steering block to the branches of the run tees on the counter-balance valve.(Figure 5c. and 5d.)

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

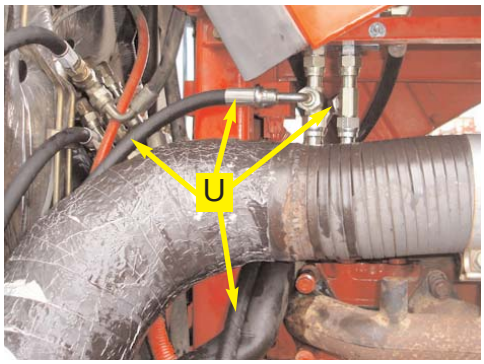


Figure 5d. Steering hoses at the counter-balance valve.

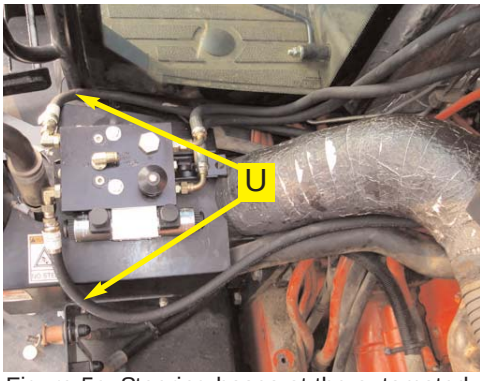


Figure 5c. Steering hoses at the automated steering block.

6. Install Pressure and Tank Fittings:

a. The automated steering block will make pressure and tank connections at the steering orbital. Some ZTX models will have multiple run tees installed in the tank line of the steering orbital to accommodate other tractor functions. (Figure 6a.)

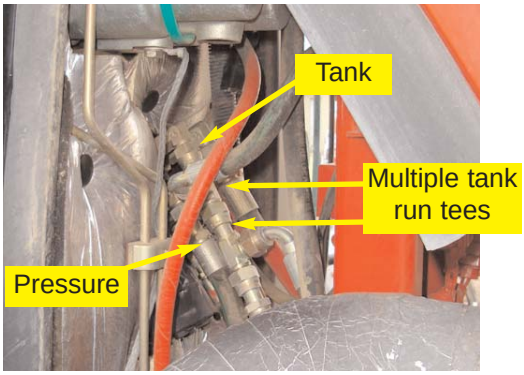


Figure 6a. Pressure and tank location.

b. The bottom right port on the steering orbital is the pressure port and the top right port is the tank port. Install the provided run tees (**H**) into the pressure and tank lines. When multiple run tees are present in the tank line it may be necessary to install the run tee (**H**) onto the branch of an existing run tee as shown. (Figure 6b.)

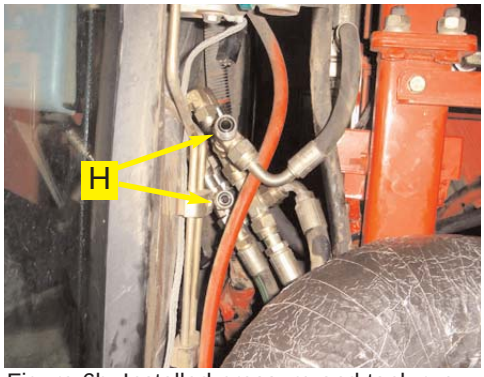


Figure 6b. Installed pressure and tank run tees.

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.

7. Install Pressure and Tank Hoses:

Connect the pressure hose (**S**) from the **P** port on the automated steering block to the pressure run tee fitting (**H**) installed in step **6**. Connect the tank hose (**S**) from the **T** port on the Automated Steering Block to the tank run tee fitting (**H**) installed in step **6**. (Figure 7a. and 7b.)

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

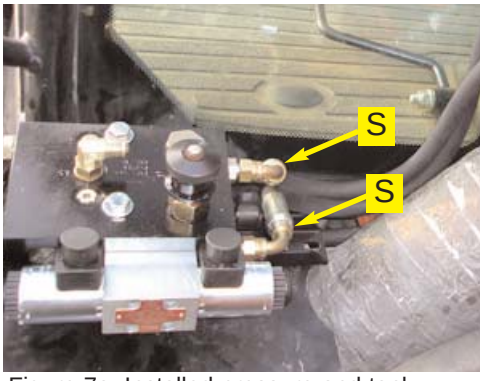


Figure 7a. Installed pressure and tank hoses at the automated steering block.

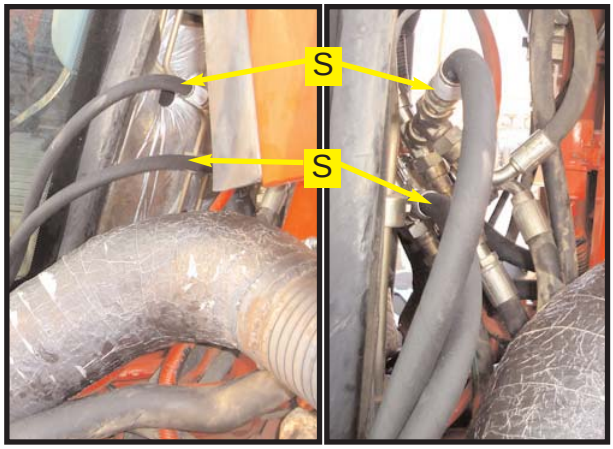


Figure 7b. Installed pressure and tank hoses at the steering orbital.

8. Install Dynamic Load Sense Valve:

a. Assemble the load sense valve (**I**) with adapter fittings (**J**), (**K**), (**L**) and (**M**). (Figure 8a.)

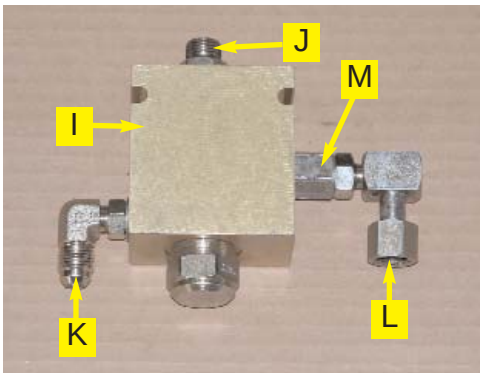


Figure 8a. Assembled load sense shuttle.

b. Locate the load sense line on the left side of the steering orbital. (Figure 8b.)

c. Disconnect the load sense line from the orbital. If there is a run tee in the load sense line, disconnect the line below the tee.

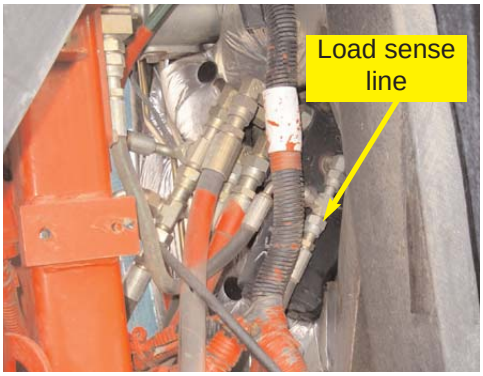


Figure 8b. Load sense line.

d. Install port **B** (fitting (**L**)) of the load sense valve to the load sense port (or run tee) on the orbital. Reattach the load sense line to port **A** (fitting (**J**)) of the load sense valve. (Figure 8c.)

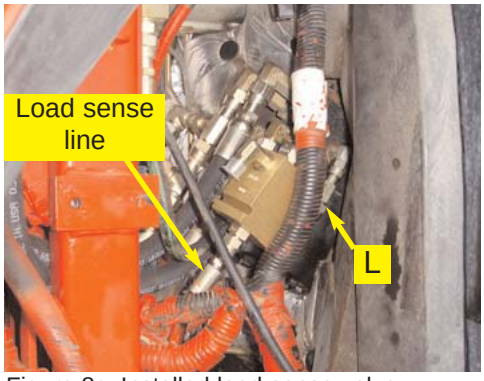


Figure 8c. Installed load sense valve.

9. Install Load Sense Valve Hose

Connect the load sense hose (**V**) from the **LS** port on the automated steering block to the **PILOT** port (fitting **K**) on the load sense valve (**I**). (Figure 9a. and 9b.)

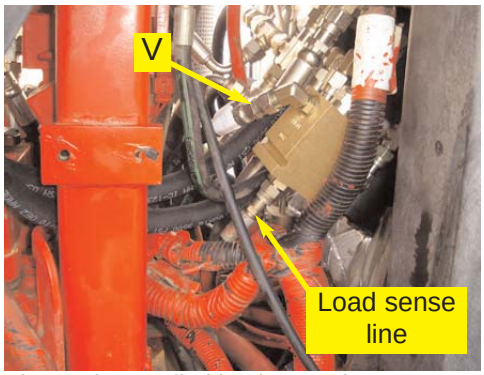


Figure 9b. Installed load sense hose at valve.

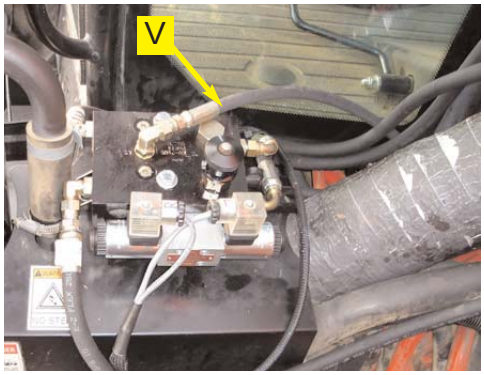


Figure 9a. Installed load sense hose at the automated steering block.

10. Install the Valve Control Cable:

Route the valve control cable (**W**) from the Automated Steering Block and into the cab and through the right side access door. Secure the valve cable with heavy tie straps (provided). (Figure 10a. and 10b.)

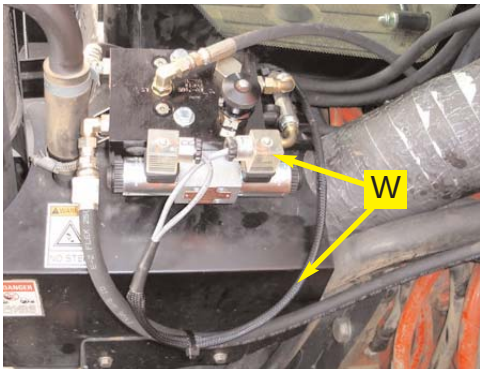


Figure 10a. Installed valve cable at the automated steering block.

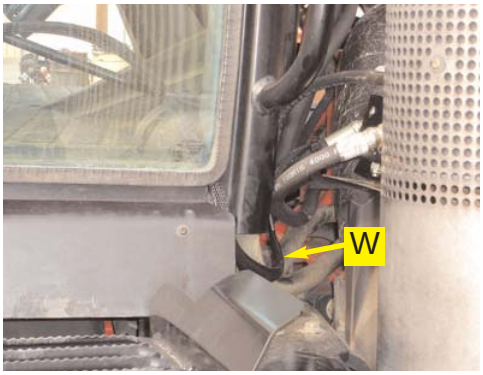


Figure 10b. Valve cable routed into the cab.

11. Verify Operation and Set Automated Steering Control Rate:

a. Clean up the installation area around the machine and make certain that it is safe to operate.

b. Make sure all hydraulic hoses are tightened.

c. Start the machine and check the automated steering connections for any leaks.

WARNING: **PINCH POINT HAZARD.** To prevent serious injury or death, avoid unsafe practices while manually operating hydraulic steering circuit. Keep others away and stay clear of mechanical steering linkages.

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

e. Adjust the automated steering oil flow control knob to a starting position of 2 turns from completely closed. To adjust the knob:
• Turn clockwise to reduce flow.
• Turn counter-clockwise to increase flow.
(Figure 11.)

f. The coils on the automated steering block have manual push button overrides. Push either manual override to move the steering wheels all the way to one extreme.

NOTE: To activate the manual overrides, a tool such as a small screw driver or allen wrench must be inserted into the end of the coil to depress the override button.

g. Count the number of seconds for the steering wheels to move all the way in the opposite direction while pressing the manual override of the other coil.

h. Adjust the automated steering oil flow control to achieve an end-to-end steering cycle time of approximately **16** seconds.

12. 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.

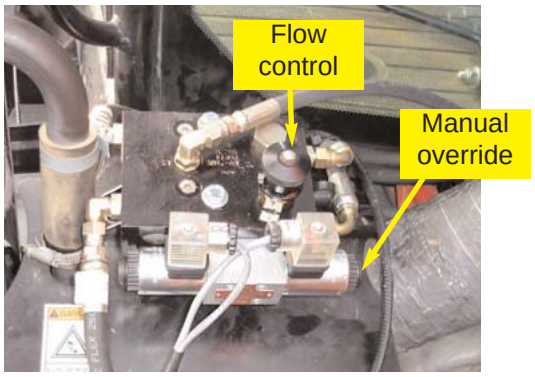


Figure 11. Automated steering oil flow control knob and manual override button.