Automated Steering Hydraulic Installation Kit

P/N: ED-MF9000

Fits Massey Ferguson and Challenger:

MF 9690 ***Challenger 660***

MF 9790 ***Challenger 670***

Overview

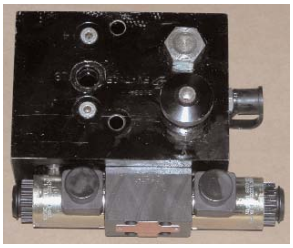
A series of equipment-specific kits have been developed to work in conjunction with your automated steering system. This kit contains the necessary components and instructions to install the automated steering hydraulics on the Challenger and Massey Ferguson combines listed above. Please read this manual thoroughly before beginning the installation.

Machine Preparation

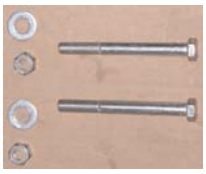
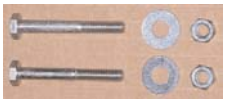
Before attempting to install the automated steering kit, park the machine on a clean, level floor with adequate clearance to work all around.

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 4 includes B & C			
B	760-2056	4	Adapter, Hyd. - #6maleJIC x #6maleORB	
C	760-2058	1	Adapter, Hyd. 90 Elbow - #6maleJIC x #6maleORB	
D	640-0049	1	Hyd. Block Mnt	

Kit Contents (continued)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
	Bag #2 of 4 includes E, F & G			
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	
F	675-2010	2	Bolt - 5/16NC x 3/4" Gr5, ZP	
	678-1055	2	Washer, Narrow Flat - 5/16" ZP	
	676-1036	2	Nut, lock - 5/6NC ZP	
G	675-2020	2	Bolt - 1/4NC x 2" Gr5, ZP	
	678-1053	2	Washer, Narrow Flat - 1/4"ZP	
	676-1034	2	Nut, lock - 1/4NC ZP	
	Bag #3 of 4 includes H & I			
H	760-2077	3	Adapter, Hyd. Run Tee - #8 JIC	
I	760-2054	1	Adapter, Hyd. Run Tee - #6 JIC	
	Bag #4 of 4 includes J, K, L & M			
J	760-0009	1	Assy. Hyd. Dynamic Load Sense Valve	
K	760-2082	1	Adapter, Hyd. 90 Elbow - #6maleJIC x #4maleORB	
L	760-2056	1	Adapter, Hyd. - #6maleJIC x #6maleORB	
M	760-2037	1	Adapter, Hyd. 90 Elbow- #4maleJIC x #6maleORB	
N	760-1238	2	Hose, Hyd. - 3/8" x 42", #6fJIC x #8fJIC	

Kit Contents (continued)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
O	760-1239	1	Hose, Hyd. - 3/8" x 20", #6fJIC x #6fJIC90	
P	760-1240	1	Hose, Hyd. - 3/8" x 21", #6fJIC x #8fJIC90	
Q	760-1241	1	Hose, Hyd. - 1/4" x 14", #6fJIC90 x #6fJIC	
R	760-1242	1	Hose, Hyd. - 1/4" x 30", #6fJIC90 x #4fJIC	
S	051-0144	1	Cable, Interface - 10 ft.	
	677-2001	20	Tie Strap, 11" Heavy Duty	Not Shown
	710-0053	1	Kit, Steering Wheel Switch	Not Shown

WARNINGS

ATTENTION: **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.

WARNING: **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.

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.

IMPORTANT: **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

1. Prepare Automated Steering Block:

a. Make sure the Automated Steering Block is clean and dust free.

b. Install the small elbow adapter fitting (**C**) in the **LS** port. (Figure 1.)

c. Install the straight adapter fittings (**B**) in the **A**, **B**, **P** and **T** ports. (Figure 1.)

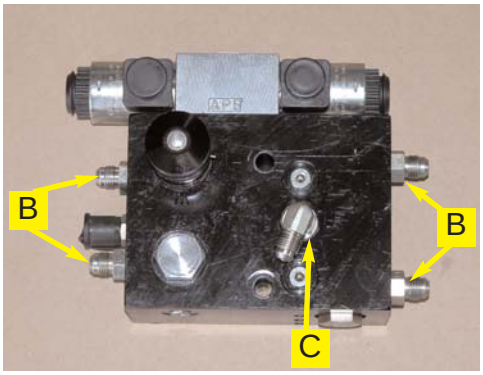


Figure 1. Prepared Automated Steering Block.

2. Mount Automated Steering Block:

a. Locate the two left-most holes in the brace under the cab. (Figure 2a)

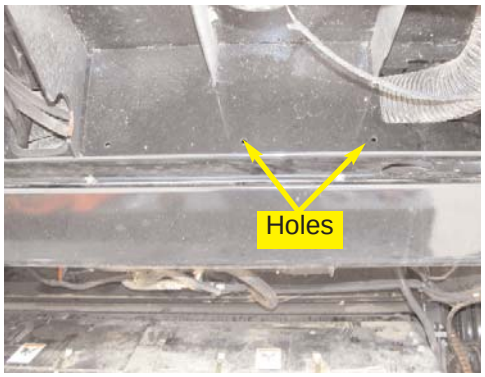


Figure 2a. Mounting location.

b. Use the provided hardware (**F**) to mount the bracket (**D**) to the brace as shown in Figure 2a. You may need to remove the blower tube in order to reach behind the brace to mount the bracket. (Figure 2b.)

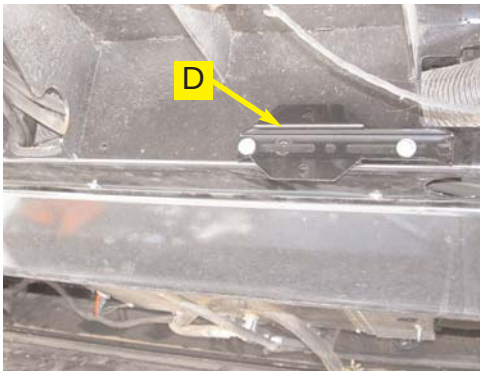


Figure 2b. Installed mounting bracket.

c. Use the provided mounting hardware in group (**E**) to attach the Automated Steering Block, as prepared in step **1**, to the mounting bracket. (Figure 2c.)

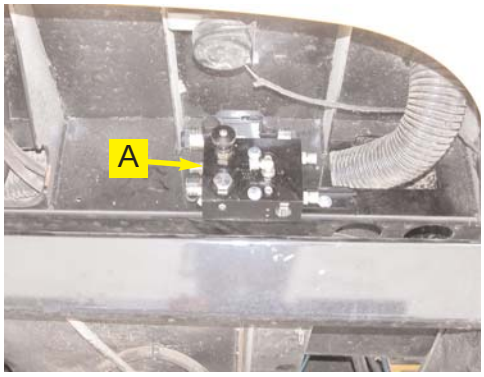


Figure 2c. Mounted Automated Steering Block.

3. Install Dynamic Load Sense Valve:

a. Pre-assemble the dynamic load sense valve (**J**) with the adapter fittings **K**, **L,** and **M** as shown. (Figure 3a.)

Leave the dynamic load sense valve connections loose to allow for easier installation and tighten after all connections are made.

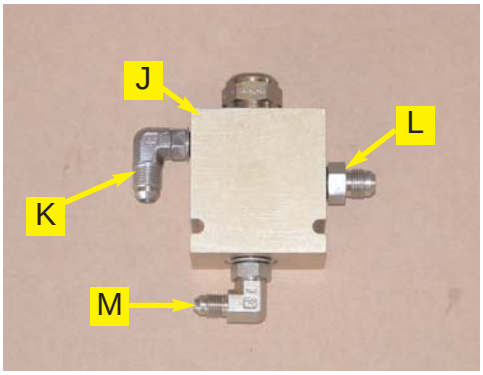


Figure 3a. Pre-assembled load sense valve.

b. Install the dynamic load sense valve (**J**) with the included hardware (**G**) to the front cab brace. Use the existing hole and drill an additional hole using the shuttle as a template. (Figure 3b.) The **PILOT** port on the dynamic load sense valve needs to be installed toward the right side of the machine. (Figure 3c.)

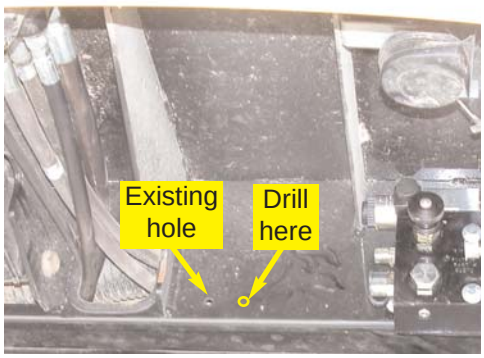


Figure 3b. Holes drilled.

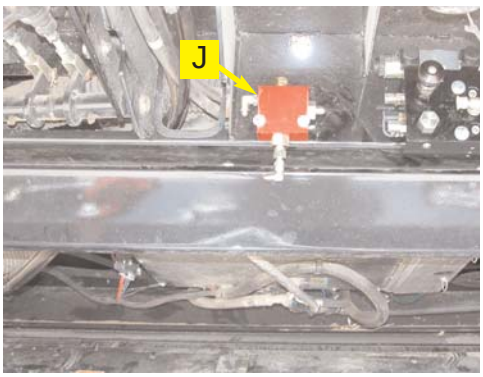


Figure 3c. Installed load sense valve.

c. Locate the load sense line on the right side of the orbital. (Figure 3c.)

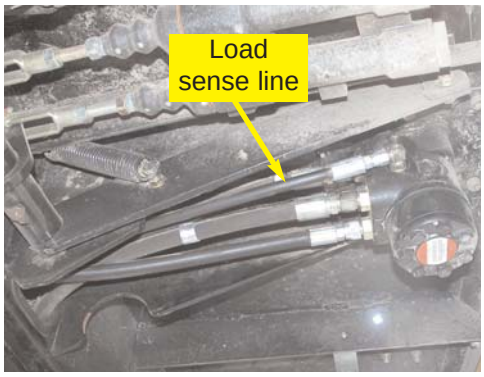


Figure 3d. Load sense line.

d. Disconnect the load sense line from the orbital and connect it to the bottom port (port **A**) on the dynamic load sense valve. (figure 3e.)

e. Connect the load sense hose (**Q**) from the **LS** port on the Automated Steering Block to the **PILOT** port the dynamic load sense valve. (figure 3e.)

f. Connect the load sense hose (**R**) from the load sense port on the steering orbital to port **B** on the dynamic load sense shuttle. (figure 3d.)

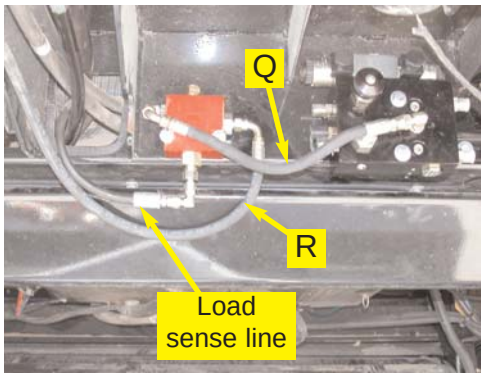


Figure 3e. Installed load sense hoses.

3. Install Dynamic Load Sense Shuttle (continued):

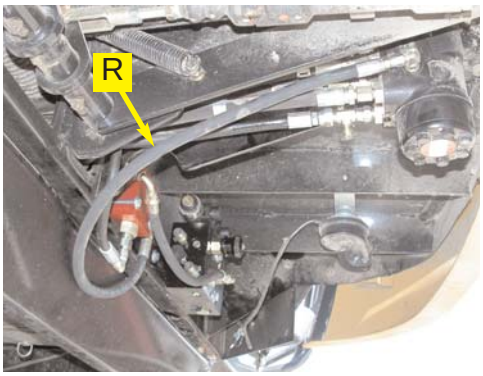


Figure 3e. Installed load sense line.

4. Install Pressure and Tank Fittings:

a. The Automated Steering Block will receive pressure and from the steering orbital. (Figure 4a.)

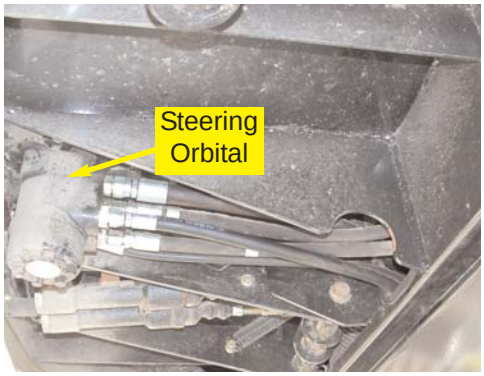


Figure 4a. Pressure and tank location.

b. Remove the bottom left line (pressure) from the orbital, install the run tee (**I**) and reattach the line to the end of it. (Figure 4b.)

c. Remove the top left line (tank) from the steering orbital, install the run tee (**H**) and reattach the line. (Figure 4b.)

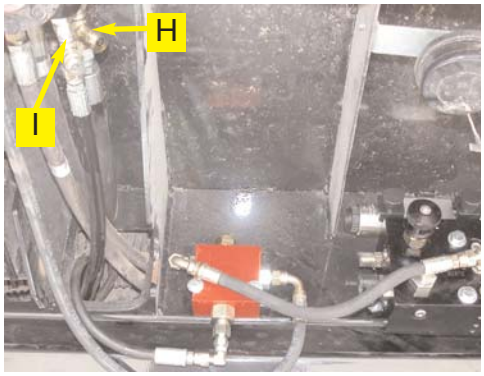


Figure 4b. Pressure and tank fittings installed.

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.

5. Install Pressure and Tank Hoses:

a. Connect the pressure hose (**O**) from the **P** port of the Automated Steering Block and the run tee (**I**) installed on the steering orbital. (Figure 5a. and 5b.)

b. Connect the tank hose (**P**) from the **T** port of the Automated Steering Block to the run tee (**H**) installed on the steering orbital. (Figure 5a. and 5b.)

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

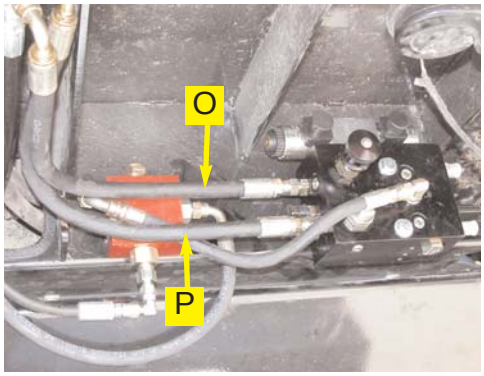


Figure 5a. Installed pressure and tank hose at block.

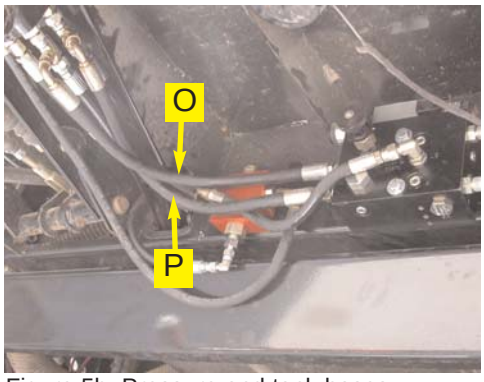


Figure 5b. Pressure and tank hoses installed.

6. Install Steering Output Fittings:

a. Locate the steering lines under the entry platform on the left side of the combine. (Figure 6a.)

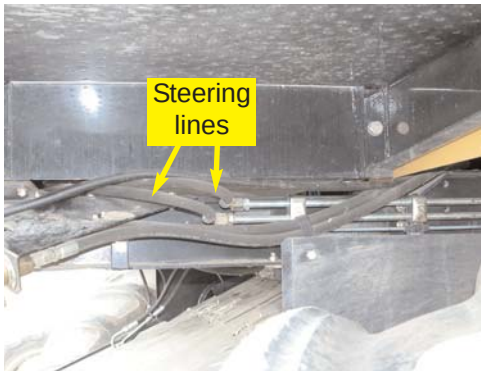


Figure 6a. Steering output location.

b. Install the run tees (**H**) between the rubber and steel hydraulic lines. (Figure 6b.) Plastic caps placed on the open ends of the fittings will pre vent excessive leakage prior to hose installation.

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.

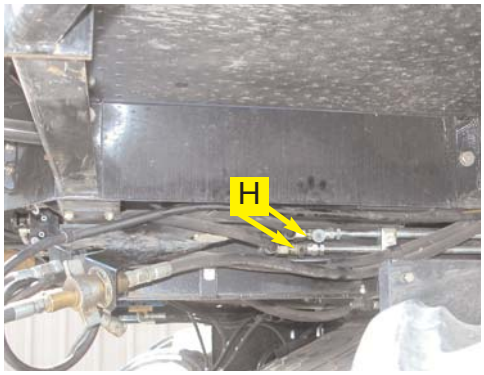


Figure 6b. Steering output fittings installed.

7. Install Steering Output Hoses:

a. Connect the hydraulic steering hoses (**N**) between the **A** and **B** ports on the Automated Steering Block and the branches on the steering run tees. (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).

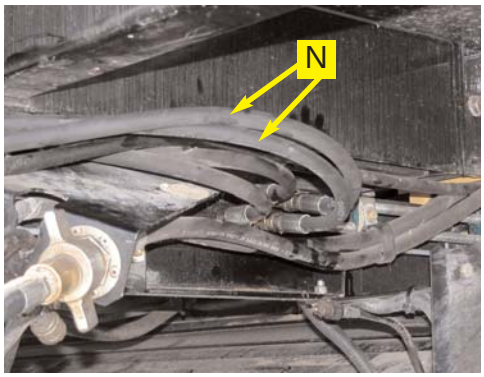


Figure 7a. Installed steering hoses at run tees.

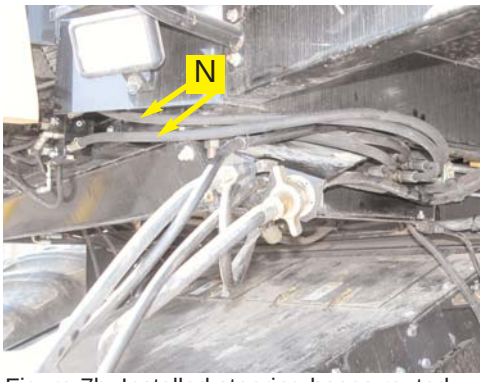


Figure 7b. Installed steering hoses routed.

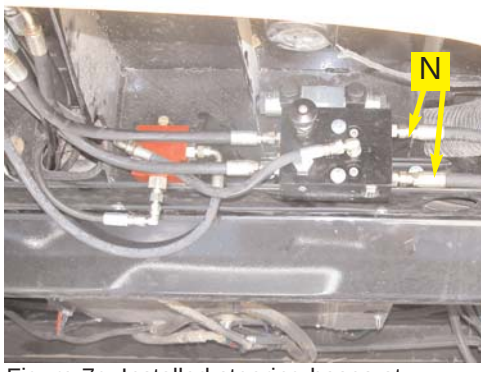


Figure 7c. Installed steering hoses at Automated Steering Block.

8. Install the Valve Control Cable:

a. Route the valve control cable (**S**) from the Automated Steering Block, under the cab and through the side access door. (Figure 8a. and 8b.)

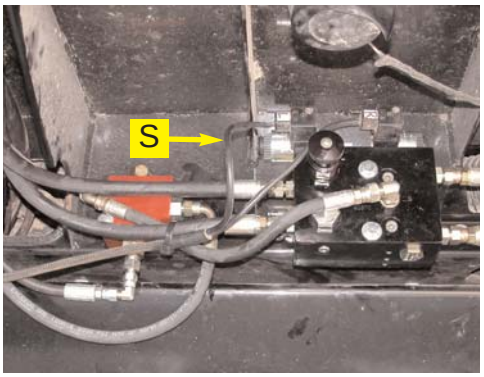


Figure 8a. Valve cable installed at block.

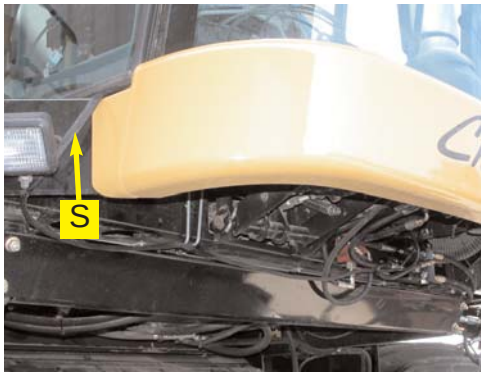


Figure 8b. Valve cable routed in access door.

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. Start the machine and check the automated steer ing 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 1/2** turns from completely
closed. To adjust the knob:
• Turn clockwise to reduce flow.
• Turn counter-clockwise to increase flow.
(Figure 11.)

e. 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. (Figure 11.)

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.

f. Count the number of seconds for the steering wheels to move all the way in the opposite direc tion while pressing the manual override the other coil. (Figure 11.)

g. Adjust the Automated Steering oil flow control to achieve an end-to-end steering cycle time of approximately **12** seconds. (Figure 11.)

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.

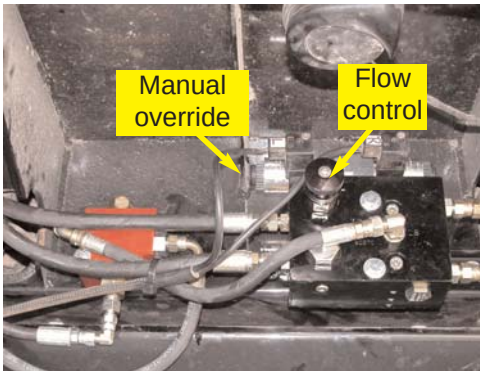


Figure 11. Automated steering flow control knob and manual override button.