

Automated Steering Hydraulic Installation Kit

P/N: ED-WM7400

Fits Willmar Ranger Models:

7200

7400

Overview

A series of equipment-specific hydraulic installation kits has 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 Willmar Ranger model sprayers listed above. Please read this manual thoroughly before beginning the installation.

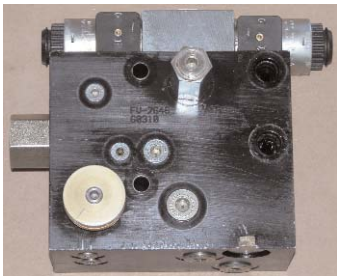





Machine Preparation








Before attempting to install automated steering hydraulics, 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	760-0007	1	Assy, Hyd. Valve Block - OC/HF Low Range	
Bag #1 of 3 includes B,C,D & E				
B	760-2009	1	Adapter, Hyd. - 90 elbow #10maleJIC x 12 male ORB	
C	760-2056	1	Adapter, Hyd. - #6maleJIC x #6maleORB	
D	760-2008	1	Adapter, Hyd. - #10maleJIC x #12maleORB	

Kit Contents (cont.)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
E	760-2058	2	Adapter, Hyd. 90 Elbow - #6maleJIC x #6maleORB	
F	640-0047	1	Hyd. Block Mnt - WM7400	
Bag #2 of 3 includes G				
G	675-2006	2	Bolt - 3/8NC x 3-3/4" 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 3 includes H & I				
H	760-2054	2	Adapter, Hyd. Run Tee - #6 JIC	
I	760-2077	1	Adapter, Hyd. Run Tee - #8 JIC	
J	760-1217	2	Hose, Hyd. - 3/8" x 56", #6fJIC x #6fJIC90	
K	760-1215	1	Hose, Hyd. - 1/2" x 62", #8fJIC x #10fJIC	

Kit Contents (cont.)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
L	760-1118	1	Hose, Hyd. - 3/8" x 48", #6fJIC x #8fJIC90	
M	760-1216	1	Hose, Hyd. - 1/2" x 55", #8mJIC x #10fJIC90	
N	051-0144	1	Cable, Interface - 10 ft.	
O	677-2001	20	Tie Strap, 11" Heavy Duty	Not Shown
P	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.

IMPORTANT:

INSTALLATION LOCATIONS will be referred to in the instructions with reference to the operator's position when the machine is operating in the forward direction of travel. For example, an installation location on the right side of the machine should be interpreted as being on the operator's right side when facing forward in the operator's station.

INSTALLATION

1. Prepare Automated Steering Block:

- a. Make sure the Automated Steering Block is clean and dust free. (Figure 1.)
- b. Remove the plastic plugs and install the small elbow adapters (**E**) in the **A** and **B** ports and the larger elbow adapter (**B**) in the **EF** port. (Figure 1.)
- c. Install the larger straight adapter (**D**) in the **P** port and the smaller straight adapter (**C**) in the **T** port of the Automated Steering Block. (Figure 1.)

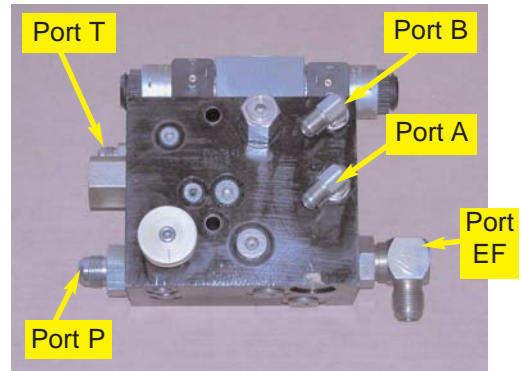


Figure 1. Prepared Automated Steering Block.

2. Mount Automated Steering Block:

- a. Locate the two bolts above the axle, on the right side, next to the muffler. (Figure 2a.)

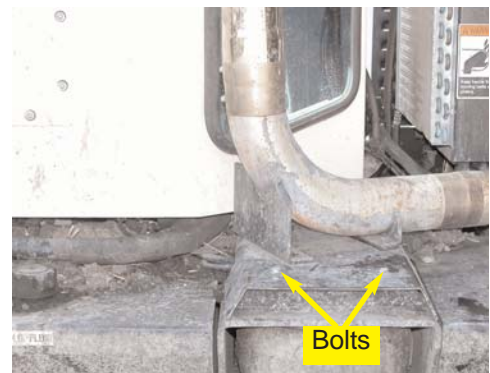


Figure 2a. Above right axle next to muffler.

- a. Install the Automated Steering Block mounting bracket (**F**) next to the muffler with the existing bolts. (Figure 2b.)



Figure 2b. Installed mounting bracket.

- b. Install the Automated Steering Block, as prepared in step 1, to the mounting bracket using the hardware in group (**G**). (Figure 2c.)

NOTE: Be sure the Automated Steering Block is oriented with the **EF** port pointing forward.

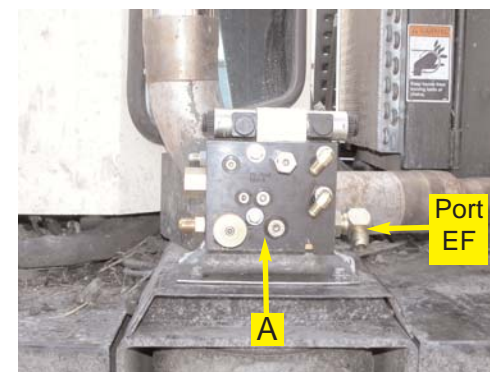


Figure 2c. Mounted Automated Steering Block.

3. Locate Pressure, Tank, and Excess Flow Connections:

- a. The Automated Steering Block will receive pressure from the excess-flow port on the priority valve. The priority valve is located inside the left frame behind the front axle. (Figure 3a.)
- b. The excess-flow port is the top port on the left side of the priority divider. Excess-flow from the Automated Steering Block will be returned to the excess-flow line attached at the priority divider. (Figure 3a.)



Figure 3a. Excess-flow location at priority valve.



Figure 3b. Tank line at steering orbital.

- c. Tank flow from the Automated Steering Block will be returned to the tank line at the steering orbital. (Figure 3b.) Remove the top right line from the orbital and install the provided run tee (I). (Figure 3c. and 3d.)

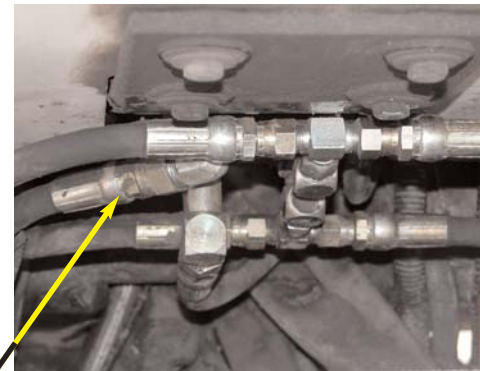


Figure 3c. Tank line at steering orbital.

- d. Re-attach the tank line to the end of the run tee (I). (Figure 3d.)

Tank Line

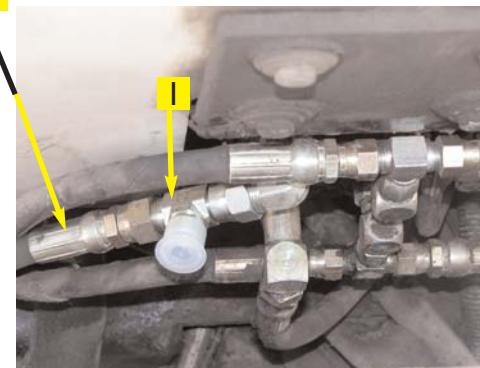


Figure 3d. Run tee installed in steering orbital tank line

NOTE: Use plastic caps to prevent excess leakage from the open ports.

4. Install Pressure, Tank, and Excess Flow Hoses:

- a. Install the provided tank hose (**L**) between the **T** port of the Automated Steering Block and the branch of the run tee installed in step 3. (Figure 4a. and 4b.)

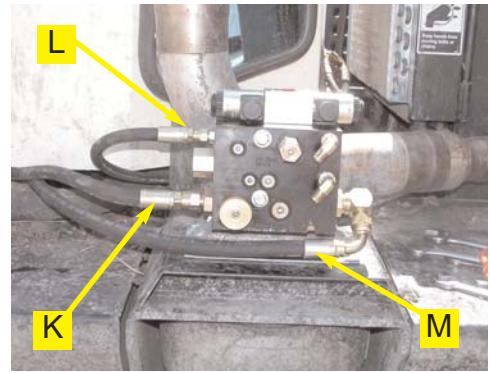


Figure 4a. Hoses attached to Automated Steering Block.

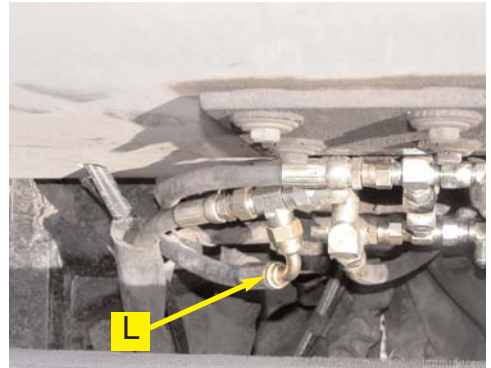


Figure 4b. Installed tank hose.

- b. Disconnect the excess-flow line from the priority divider. (Figure 4c.)



Figure 4c. Disconnected excess-flow line.

- c. Connect the Automated Steering pressure hose (**K**) to the **P** port of the Automated Steering Block and the excess flow port of the priority divider. (Figure 4a. and 4d.)
- d. Connect the excess-flow hose (**M**) from the **EF** port on the Automated Steering Block to the line removed from the priority divider. (Figure 4a. and 4d.)

NOTE: Use heavy tie-straps provided to secure the hoses to the machine frame away from moving parts. Tighten all hydraulic connections securely to prevent leaks.

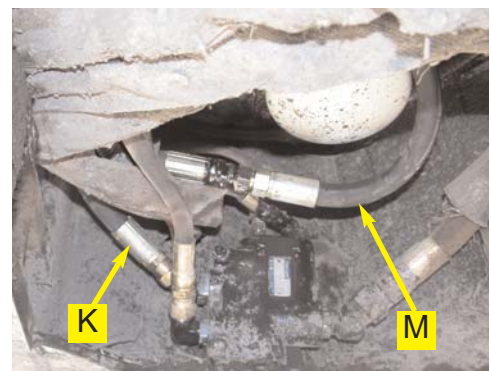


Figure 4d. Excess flow hose connected to line removed from priority divider, and pressure hose connected to excess-flow port.

5. Install Steering Output Fittings:

- a. Locate the steering lines which are the two left ports on the steering orbital. (Figure 5a.)

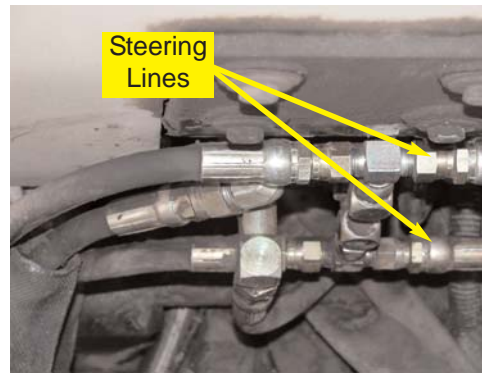


Figure 5a. Steering lines.

- b. Install the provided run-tees (**H**) in the steering lines as shown. (Figure 5b.)

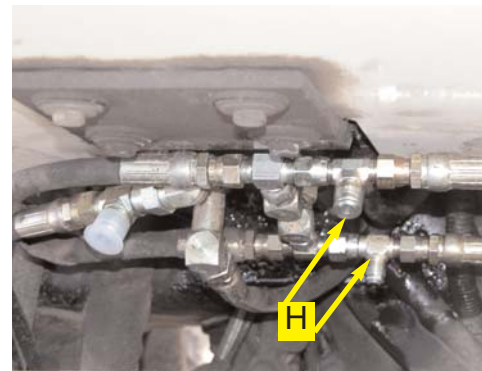


Figure 5b. Installed run tees.

NOTE: Use plastic caps to prevent excess leakage from the open run-tee ports.

6. Install Steering Output Hoses:

- a. Install the provided steering output hoses (**J**) between the run tees installed in step 5 and the **A** and **B** ports of Automated Steering Block. (Figure 6a.)

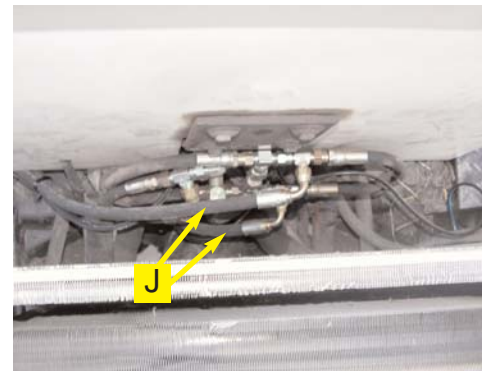


Figure 6a. Installed steering output hoses.

- b. Attach the hose ends equipped with the 90-degree elbows to the run tees.

- c. Route the steering output hoses (**J**) from the steering orbital under the cab, behind the exhaust, and to the Automated Steering. (Figure 6c.)



Figure 6c. Routed hoses.

6. Install Steering Output Hoses (cont.):

- d. Attach the straight ends of the steering output hoses to the Automated Steering Block. (Figure 6b.)

NOTE: Use the heavy tie-straps provided to secure the hoses away from moving parts.

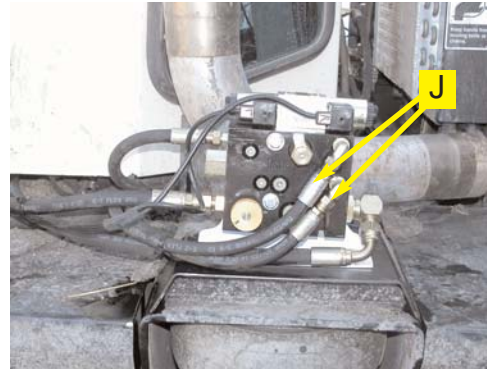


Figure 6b. Straight hose ends attached to Automated Steering Block.

7. Install the Valve Control Cable:

- a. Install the Automated Steering valve control cable (N) at the Automated Steering Block by attaching the DIN connectors to the coil. (Figure 7a.)

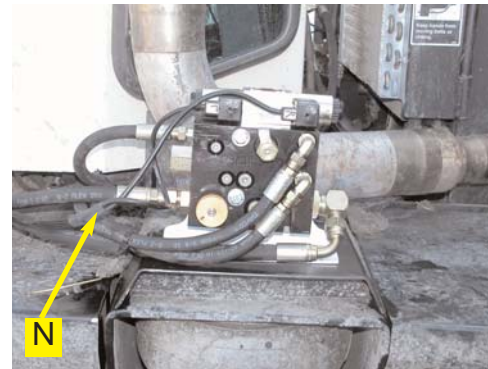


Figure 7a. Installed valve control cable at Automated Steering Block.


- b. Route the valve control cable (N) with the steering lines then into the cab near the steering orbital. Secure the cable using the provided tie straps as necessary. (Figure 7b.)



Figure 7b. Routed valve cable into the cab near the orbital.

8. Verify Operation and Set Steering Control Rate:

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

 **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.

- 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 hydraulic oil flow control knob to a starting position of **1 1/2** Turns from completely closed. To adjust the knob:
 - turn clockwise to reduce flow.
 - counter-clockwise to increase flow.(Figure 8.)

NOTE: The coils on the control block have manual push button overrides.

- e. Push either manual override to move the steering linkage 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.

- f. Count the number of seconds for the steering linkage to move all the way in the opposite direction while pressing the manual override of the other coil.
- g. Adjust the hydraulic oil flow control to achieve an end to end steering cycle time of approximately **30** seconds.
- h. 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.

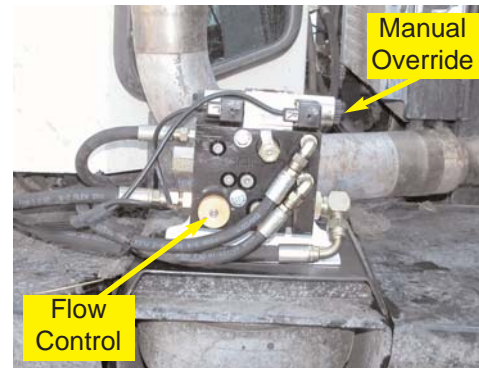


Figure 8. Flow control and manual override.

