

Automated Steering Hydraulic Installation Kit

P/N: ED-WM8400

Fits Willmar Eagle 8400

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 Eagle 8400 sprayer. Please read this manual thoroughly before beginning the installation.

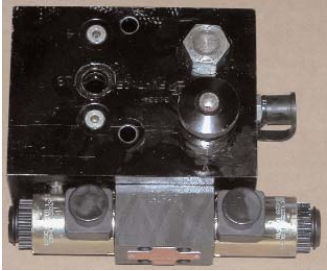





Machine Preparation









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	760-0003	1	Assy, Hyd Valve Block - LS	
Bag #1 of 4 includes B & C				
B	760-2056	2	Adapter, Hyd. - #6maleJIC x #6maleORB	
C	760-2058	3	Adapter, Hyd. 90 Elbow - #6maleJIC x #6maleORB	
D	640-0020	1	Hyd. Block Mnt - SPX3200	


Kit Contents (cont.)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPHS
Bag #2 of 4 includes 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	
Bag #3 of 4 includes F				
F	760-2077	4	Adapter, Hyd Run Tee - #8 JIC	
Bag #4 of 4 includes G, H, I, J, & K				
G	760-0002	1	Assy, Hyd Load Shuttle - #6femORB	
H	760-2058	1	Adapter, Hyd. 90 Elbow - #6maleJIC x #6maleORB	
I	760-2042	1	Adapter, Hyd. 90 Elbow - #6maleORB x #6femJICswiv	
J	760-2036	1	Adapter, Hyd. - #4maleJIC x #6maleORB	
K	760-2029	1	Adapter, Hyd. - #4femJIC x #6maleJIC	
L	760-1198	1	3/8" x 114", #6fJIC x #8fJIC90	

Kit Contents (cont.)

REF	P/N	QTY	DESCRIPTION	PHOTOGRAPH
M	760-1199	1	Hose, Hyd. - 3/8" x 104", #6fJIC x #8fJIC90	
N	760-1200	1	Hose, Hyd. - 3/8" x 172", #6fJIC x #8fJIC90	
O	760-1114	1	Hose, Hyd. - 3/8" x 38", #6fJIC x #8fJIC90	
P	760-1214	1	Hose, Hyd. - 1/4" x 166", #6fJIC x #6fJIC	

Kit Contents (cont.)

REF P/N	QTY	DESCRIPTION	PHOTOGRAPH
Q 051-0143	1	Cable, Interface - 15 ft.	
R 677-2001	20	Tie Strap, 11" Heavy Duty	Not Shown
S 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 (A) is clean and dust free.
- b. Remove the plastic plugs and install the elbow adapters (C) in the P, T, and LS ports.
- c. Install the straight adapter (K) in the A and B ports of the Automated Steering Block.

NOTE: To install the elbow fittings into the P and T ports, remove the pressure test port fitting. Reinstall the pressure test port fitting after the elbows are installed.

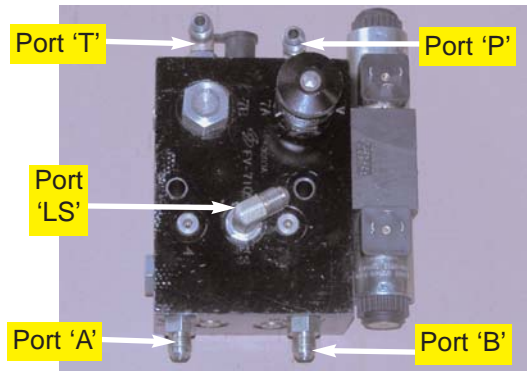


Figure 1. Prepared Automated Steering Block.

2. Mount Automated Steering Block:

- a. Locate and remove the bolt closest to the frame on the front side of the battery case support. (Figure 2a.)
- b. Attach the Automated Steering Block mounting bracket (D) to the battery case support using the existing bolt as shown. (Figure 2b.)
- c. Use the provided hardware (E) to attach the prepared Automated Steering Block (A) to the mounting bracket. (Figure 2c.)

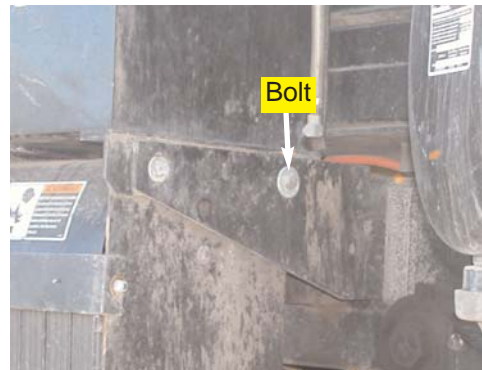


Figure 2a. Remove bolt.

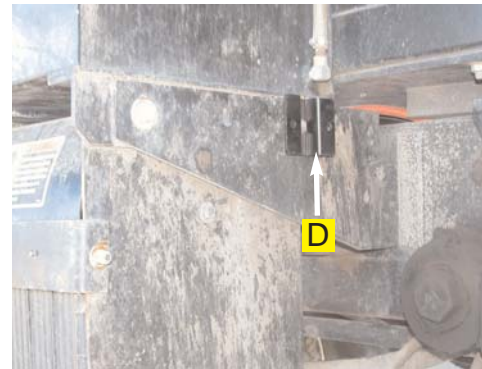


Figure 2b. Installed mounting bracket.

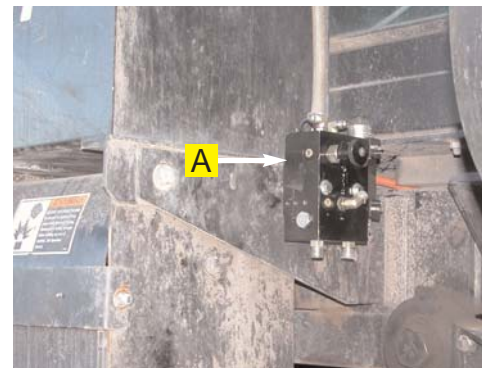


Figure 2c. Automated Steering Block (installed).

3. Install Pressure, Tank, and Load Sense Connections:

- a. The Automated Steering Block will receive pressure and load sense connections from the priority valve located inside the left frame at the rear of the machine. Install one of the run tees (F) into the pressure line that leads to the steering orbital. (Figure 3a.)

NOTE: Use plastic caps on open ports to prevent excess leakage. (Figure 3a.)

- b. Locate the steering orbital load sense line on the bottom of the priority divider and disconnect it. (Figure 3a.)

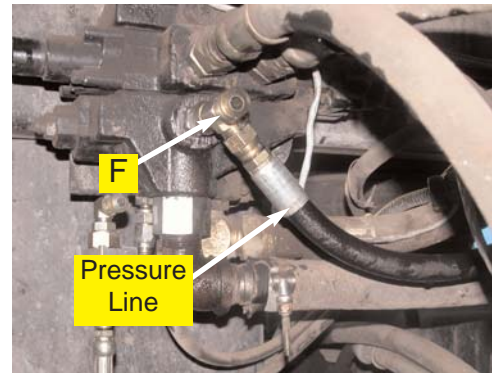


Figure 3a. Installed run tee.

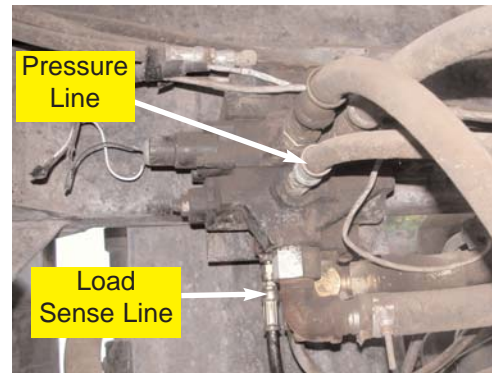


Figure 3b. Steering load sense line.

- c. Assemble the Load Sense Shuttle (G) with hydraulic adapters (H), (I), (J), and (K). (Figure 3c.)
- d. Connect the center port (K) of the assembled Load Sense Shuttle (G) to the priority divider. (Figure 3c. and 3d.)

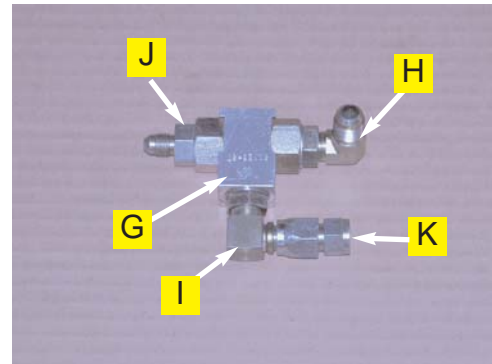


Figure 3c. Assembled Load Sense Shuttle.

- e. Reconnect the steering load sense line to the straight adapter (J) on the Load Sense Shuttle (G). (Figure 3d.)

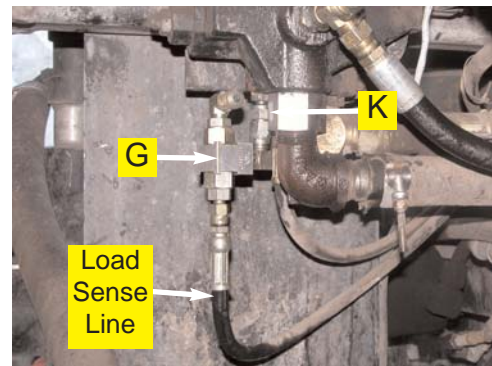


Figure 3d. Connected load sense line and Load Sense Shuttle.

3. Install Pressure, Tank, and Load Sense Connections (con't):

- e. Tank flow from the Automated Steering Block will be returned to the return oil manifold. (Figure 3e.) The return oil manifold is located inside the right frame rail next to the Automated Steering Block mounting location.



Figure 3e. Return manifold location.

- f. Install one of the run tees (F) in the return oil line. (Figure 3f.)

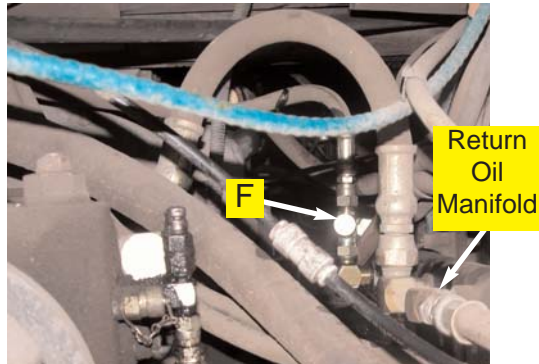


Figure 3f. Installed run tee.

4. Install Pressure, Tank, and Load Sense Hoses:

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

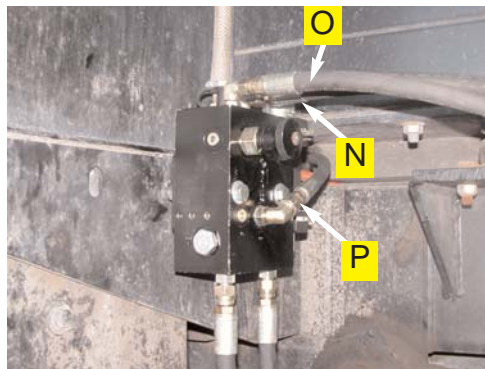


Figure 4a. Installed hoses to the Automated Steering Block.

- b. Connect the pressure hose (N) to the P port of the Automated Steering Block and the run tee (from step 3a) in the pressure line at the priority divider. (Figure 4a. and 4c.)

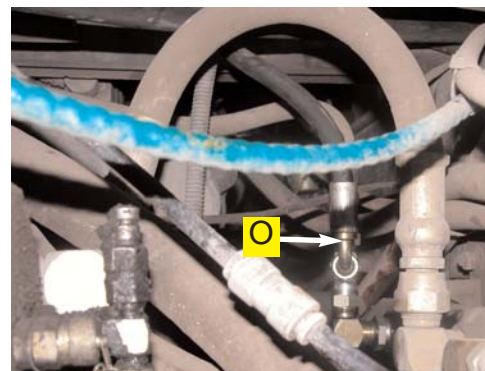


Figure 4b. Tank hose at return manifold.

4. Install Pressure, Tank, and Load Sense Hoses (cont):

- c. Connect the load sense hose (**P**) to the **LS** port of the Automated Steering Block and the Load Sense Shuttle (**G**). (Figure 4a., 4b, and 4c.)

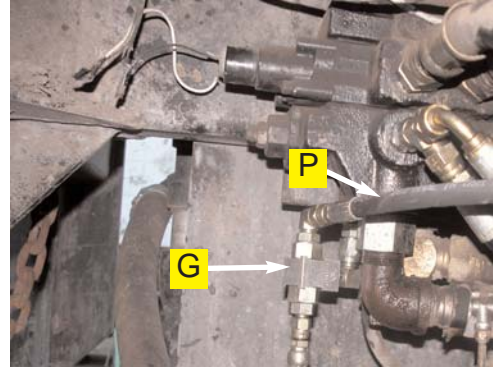


Figure 4c. Load sense hose at load shuttle.

- d. The pressure hose (**N**) and load sense hose (**P**) run along the frame with existing plumbing. Use the provided heavy tie straps that are provided to secure the hoses to the machine and the frame, away from moving parts. (Figure 4d. and 4e.)

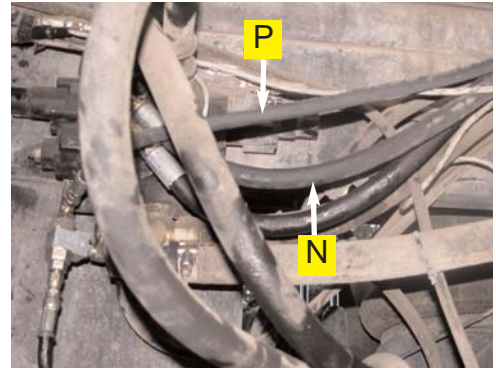


Figure 4d. Pressure hose and load sense hose at the priority divider.

NOTE: Tighten all the connections securely to prevent leaks.

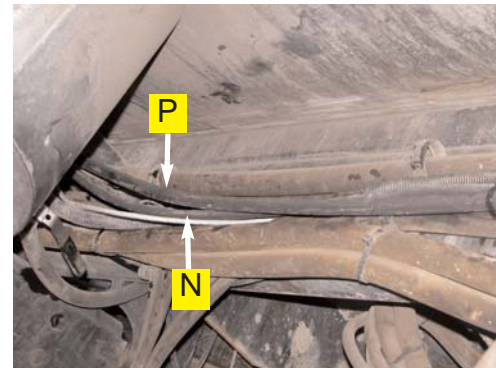


Figure 4e. Pressure hose and load sense hoses routed along frame.

5. Install the Automated Steering Output Fittings:

- a. Locate the steering lines on the front steering cylinder. (Figure 5a.)

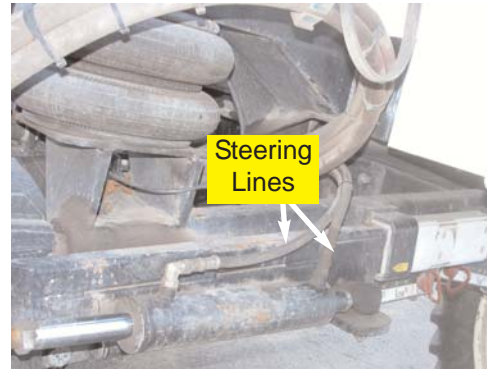


Figure 5a. Steering lines connected to the steering cylinder.

- b. Install two of the provided run tees (**F**) to the steering lines. (Figure 5b.)



Figure 5b. Installed run tees.

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

6. Install the Automated Steering Output Hoses:

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



Figure 6a. Automated Steering output hoses at the run tees.

- b. Attach the hose ends equipped with 90-degree elbows to the run tees (**F**) and attach the straight hose ends to the Automated Steering Block. (Figure 6a. and 6b.)

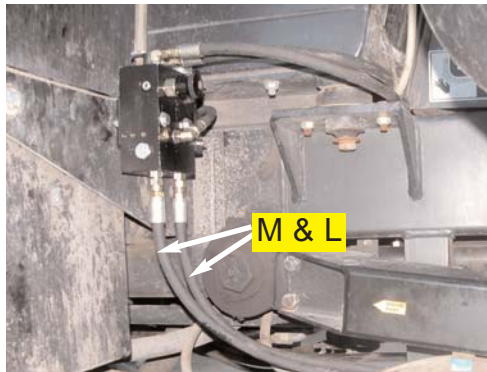


Figure 6b. Automated Steering hoses at Automated Steering Block.

6. Install the Automated Steering Output Hoses (con't):

- c. Route the Automated Steering hoses (**L** and **M**) along the existing steering lines. (Figure 6c.)

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

NOTE: Make sure all hoses and fittings have been tighten.

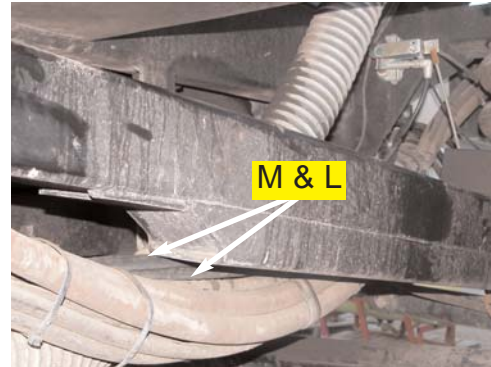


Figure 6c. Automated Steering hose.

7. Install the Automated Steering Valve Control Cable:

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



Figure 7a. Valve control cable attached to the Automated Steering Block.


- b. Route the valve control cable (**Q**) along the frame and through the right side window. (Figure 7b.)
- c. Secure the cable using the provided tie straps as necessary.




Figure 7b. Routed valve control cable.

8. 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.

 **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 the Automated Steering 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:
 - Turn clockwise to reduce flow.
 - Turn counter-clockwise to increase flow. (Figure 8.)
- e. Push either manual override to move the sprayer wheels all the way to one extreme.

 **NOTE:** The coils on the Automated Steering Block have manual push button overrides. 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 sprayer wheels to move all the way in the opposite direction while pressing the manual override of the other coil. (Figure 8.)
- f. 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. (Figure 8.)

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.

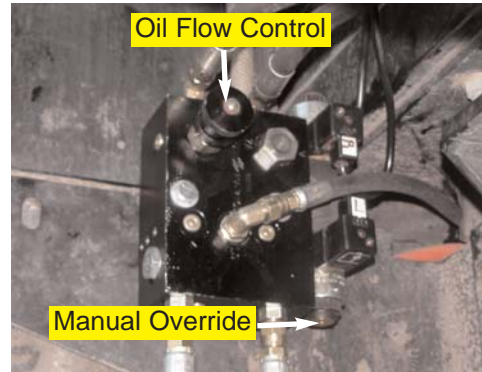


Figure 8. Automated Steering oil flow control knob and manual override.