

# FIELDPILOT<sup>®</sup>

## USER MANUAL

Assisted Steering Hydraulic Installation Manual for  
Vehicle Kit Number 91-02342

Fits Only Willmar 7200, 7250, 7400 and 7450



A Subsidiary of  Spraying Systems Co.®

## FIELDPILOT®

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## PREPARATION

1. Before beginning the installation, thoroughly clean the vehicle to remove dirt and contaminants that might get into the hydraulic circuit.
2. Park the vehicle on a clean, level floor with adequate clearance to work around.
3. Do not attempt to loosen any hydraulic fittings while the engine is running.
4. Allow the motor and the hydraulics to cool until it is no more than warm to the touch before proceeding.
5. Carefully trace the EF line from the prioritized pump to be sure there are no aftermarket components that may be damaged by high pressure if they are upstream from the new electric/hydraulic steering valve.
6. Prior to loosening any hydraulic fittings, be sure to have the appropriate plugs and caps available in order to limit loss of hydraulic fluid from the open fittings.



**PREVENT HYDRAULIC SYSTEM CONTAMINATION.** It is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing them. 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**

**TO AVOID EXCESS LEAKAGE, DO NOT TURN THE STEERING WHEEL WHILE THE FITTINGS ON THE MANUAL STEERING VALVE ARE DISCONNECTED.**



**WARNING: HOT, HIGH PRESSURE FLUID HAZARD.** Hydraulic oil may be hot and under extreme pressure. To prevent serious injury or death, relieve system pressure and allow the system 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.



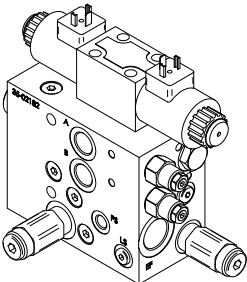
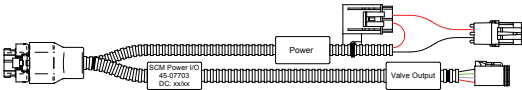
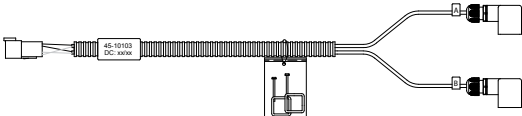
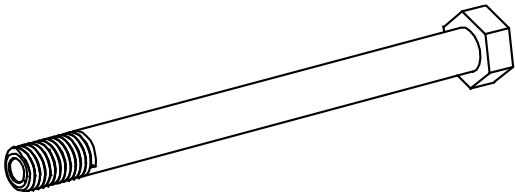



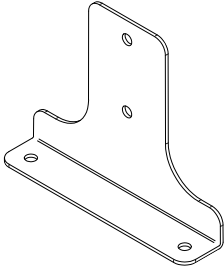
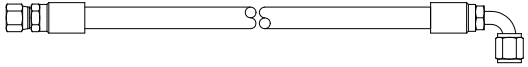
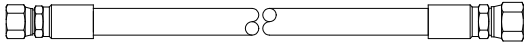
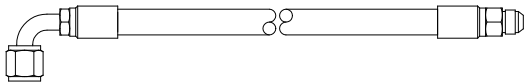
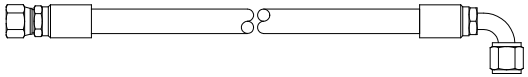
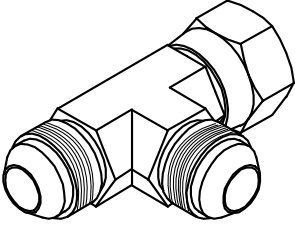
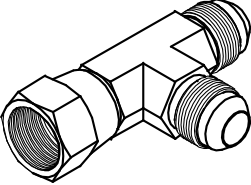
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## KIT CONTENTS

Unpack the installation kit and identify the required parts.

Item	Part Number	Description	Quantity
A	32-04040	Switch, Engage/Disengage.....	1
B	350-0037	Washer, Flat - 3/8" SST .....	2
C	35-02182	Valve, FieldPilot, PWM OC, 4.0GPM.....	1
D	45-07703	Harness, SCM .....	1
E	45-10103	Harness, Valve.....	1
F	60-04089	Bolt Hex, 3/8" -16 X 3-3/4" SST .....	2
G	60-07027	Nut, NyLock 3/8-16, SST .....	2
H	65-05155	Bracket, Hyd. Block Mount - WM72/7400.....	1
I	68-01081	Hose, Hyd. - 3/8" x 56", #6FJIC x #6FJIC90° .....	2
J	68-01082	Hose, Hyd. - 1/2" x 62", #8FJIC x #10FJIC.....	1
K	68-01083	Hose, Hyd. - 1/2" x 55", #10FJIC90° x #8MJIC.....	1
L	68-01144	Hose, Hyd. - 1/2" x 47", #8FJIC x #8FJIC 90° .....	1
M	68-02009	Adapter, Hyd. Run Tee - #8 JIC .....	1
N	68-02022	Adapter, Hyd. Run Tee - #6 JIC .....	2
O	68-02045	Adapter, Hyd. 90° - #10MJIC x #10FJIC.....	1
P	68-02046	Adapter, Hyd. - #10MJIC x #12MORB.....	2
Q	68-02078	Adapter, Hyd. 90° - #6MJIC x #6FJIC.....	2
R	68-02082	Adapter, Hyd. - #6MJIC x #8MORB.....	2
S	68-02094	Adapter, Hyd. - #8MJIC x #8MORB.....	1
T	90-02472	Kit, Patch Antenna EXT 10'.....	1
U	90-50013	Cable Tie Kit, 15 .....	2
V	91-00022	Kit, Articulated Gyro Module .....	1
W	91-07011	Kit, Steering Wheel Switch .....	1
X	98-05098	Installation Manual, Willmar 7200, 7250, 7400 and 7450.....	1

Item	Part #	Description	Illustration
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B	350-0037	Washer, Flat - 3/8" SST	
C	35-02182	Valve, FieldPilot, PWM OC, 4.0GPM	
D	45-07703	Harness, SCM	
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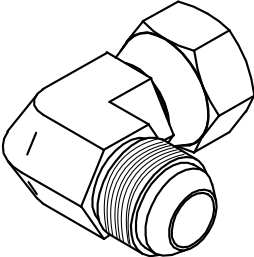
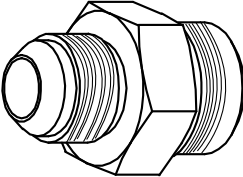
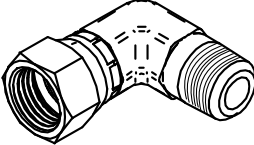
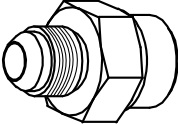
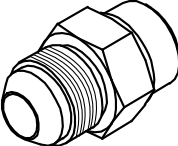
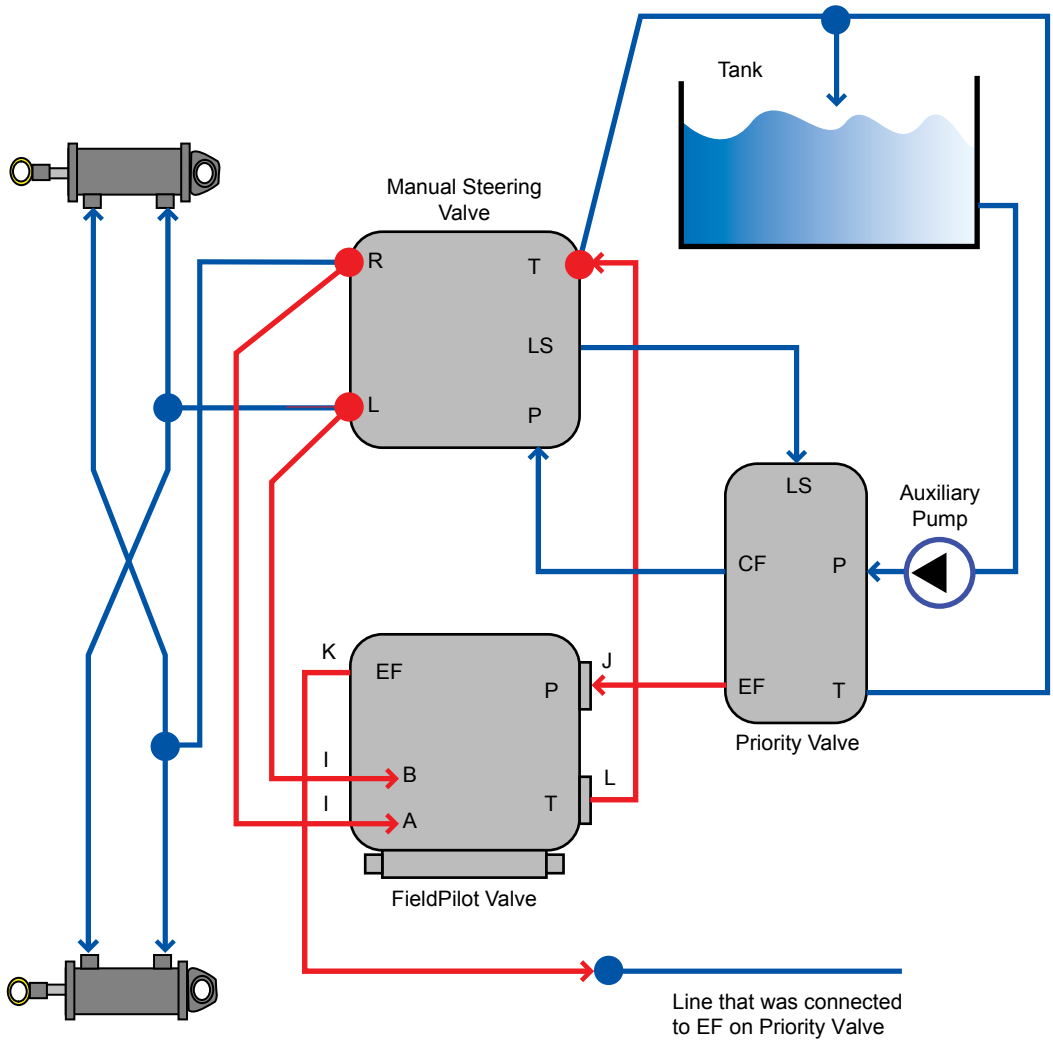
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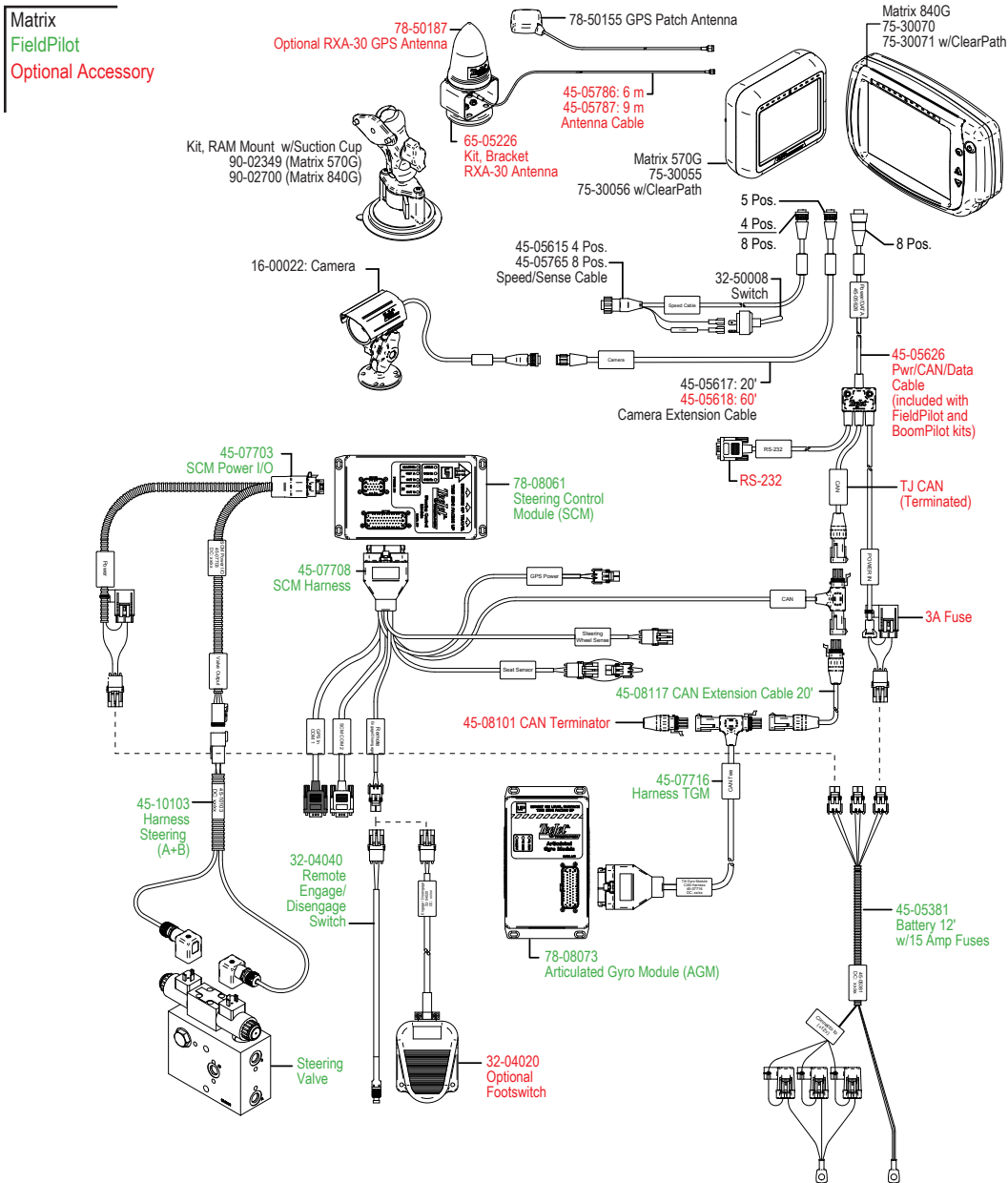
Figure 1-1: Hydraulic Diagram



Existing Hoses

Hoses From Kit

Figure 1-2: System Diagram



## INSTALLATION



If there are questions concerning the installation of the FieldPilot system on this vehicle, or due to the changes in component specifications the parts supplied in the kit are not exactly as presented in this document, please contact your dealer or TeeJet Customer service representative for clarification before installation. TeeJet Technologies is not responsible for misuse or incorrect installation of the system.

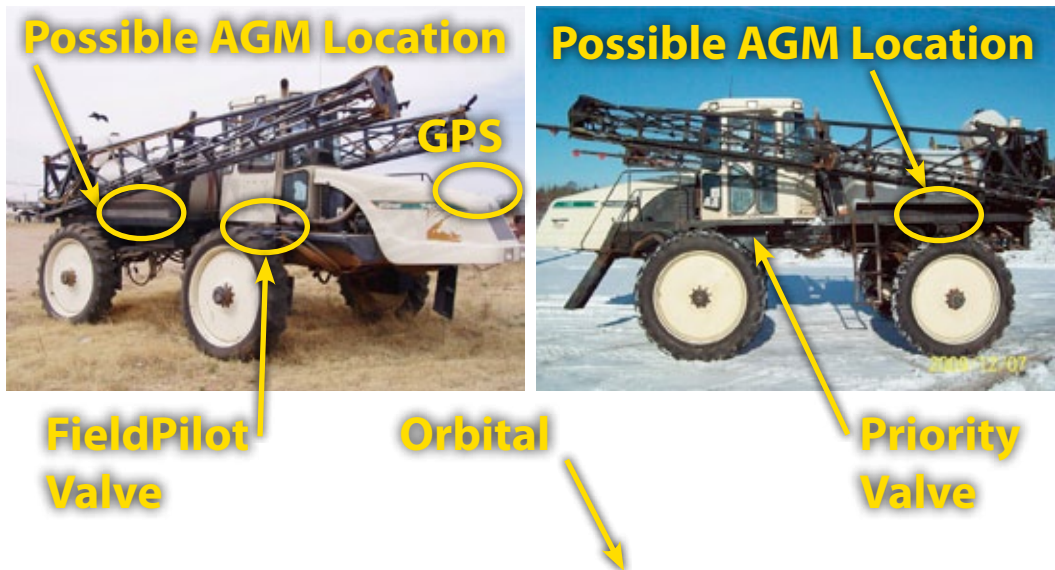
**NOTE: BE VERY CAREFUL TO ABSOLUTELY SECURE ALL CABLES AND HOSES SO THAT THEY DON'T INTERFERE WITH THE MANY MOVING PARTS OF THE MACHINE!**

## Overview of the Machine

- The FieldPilot valve will mount on the right side of the machine.
- The EF oil from the priority valve will route through the FieldPilot valve.
- Priority valve is located inside the left frame rail behind the front axel.
- The steering and tank connections will be at the orbital.
- The AGM will mount on the rear half of the machine.

*NOTE: All references to left and right are stated as if the user is seated in the driver's seat.*

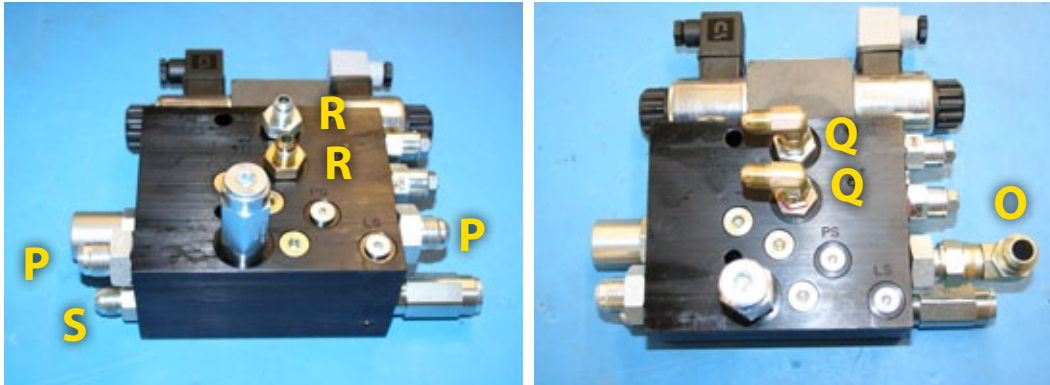
Figure 1-3: Overview of the Machine



## 1. PREPARE THE FIELDPILOT VALVE

Install adapters **(P)** in the EF & P ports. Install adapters **(R)** in the A & B ports. Install adapter **(S)** in the T port. Then attach adapters **(Q)** to **(R)** in the A & B ports. Finally attach adapter **(O)** to **(P)** in the EF port.

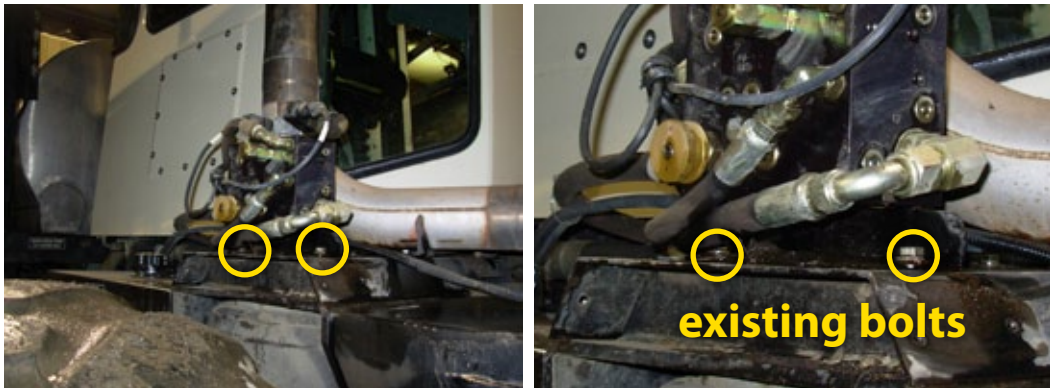
Figure 1-4: Prepare the FieldPilot Valve



## 2. INSTALL THE FIELDPILOT VALVE BRACKET

Locate the two bolts above the axle on the right side next to the muffler. Install the mounting bracket **(H)** next to the muffler using the existing bolts.

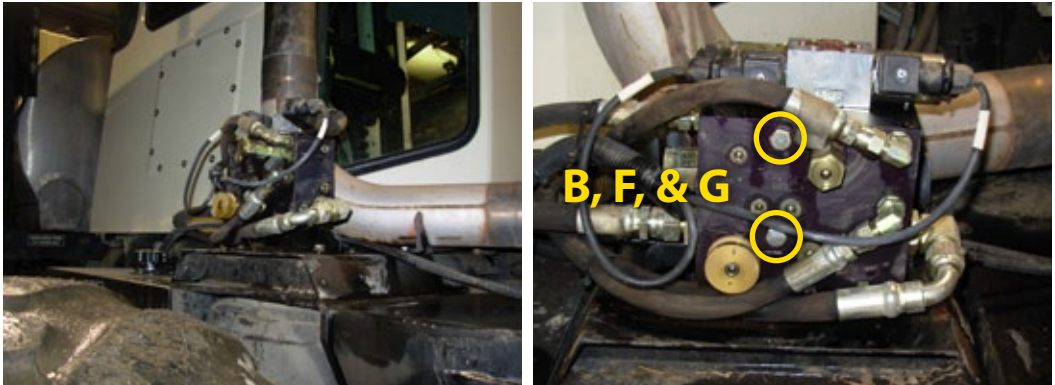
Figure 1-5: Install Mounting Bracket for FieldPilot Valve



### 3. MOUNT THE FIELDPILOT VALVE

Using parts **(B, F, & G)**, mount the FieldPilot valve **(C)** to the bracket **(H)**. The P & T ports will face down.

*Figure 1-6: Mount the FieldPilot Valve*

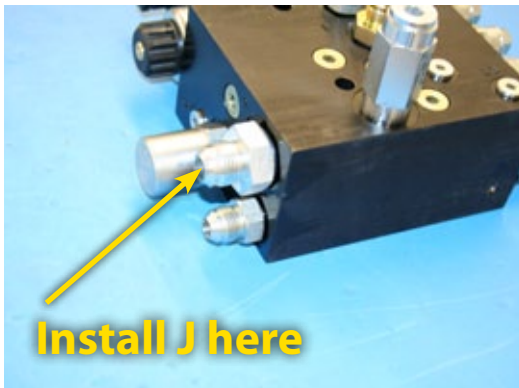


### 4. INSTALL PRESSURE AND EF HOSES

The FieldPilot valve 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. The EF port is the top port on the left side of the priority valve. Excess Flow from the FieldPilot valve will be returned to the hose originally connected to the EF port on the priority valve. Disconnect the hose from the EF port on the priority valve. Connect hose **(K)** to that hose and route it to the EF port on the FieldPilot valve. Then install hose **(J)** from the EF port on the priority valve to the P port on the FieldPilot valve.

*Figure 1-7: Install Pressure and EF Hoses*





## 5. INSTALL TANK ADAPTER AND HOSE

The FieldPilot valve will connect the tank hose at the orbital. Disconnect the tank hose at the orbital. Install run tee (M) and reconnect tank hose to the run of the tee. Then install hose (L) from the branch of the run tee (M) to the T port of the FieldPilot valve.

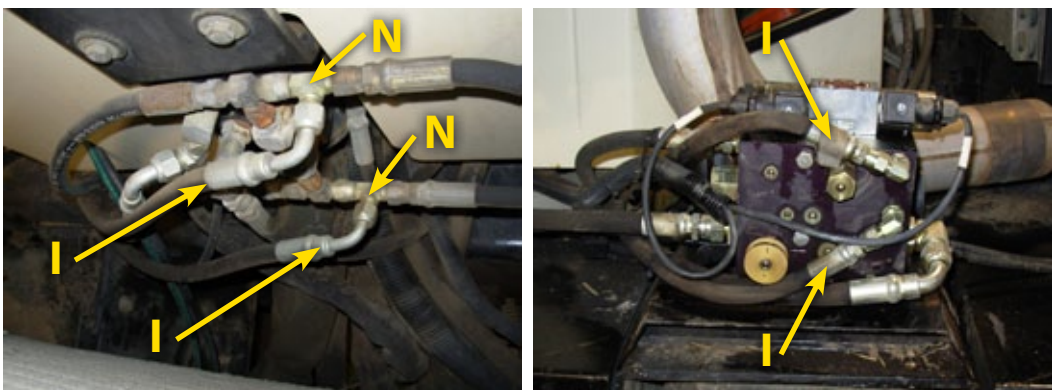
Figure 1-8: Install Tank Adapter and Hose



## 6. INSTALL STEERING ADAPTERS AND HOSES

The FieldPilot valve will connect the steering hoses at the orbital. Disconnect the two steering lines at the orbital (label the hoses first). Install run tees (N) and reconnect the original steer hoses. Then install hoses (I) from the branch of each tee to the A & B ports of the FieldPilot valve.

Figure 1-9: Install Steering Adapters and Hoses

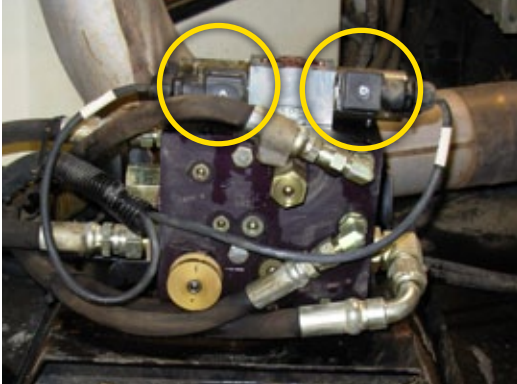


## 7. INSTALL THE VALVE CONTROL CABLE

Connect the valve control cable (E) to the FieldPilot valve and route it into the cab.

*Figure 1-10: Install the Valve Control Cable*

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## 8. INSTALLATION OF ENGAGE/DISENGAGE SWITCH

Connect item (A) to the connector on the SCM harness labeled Remote Engage/Disengage. Install the push button in a location that is easily accessible during operation of the machine. This switch (A) is not required if the optional foot switch 32-04020 is used.

*Figure 1-11: Engage/Disengage Switch*

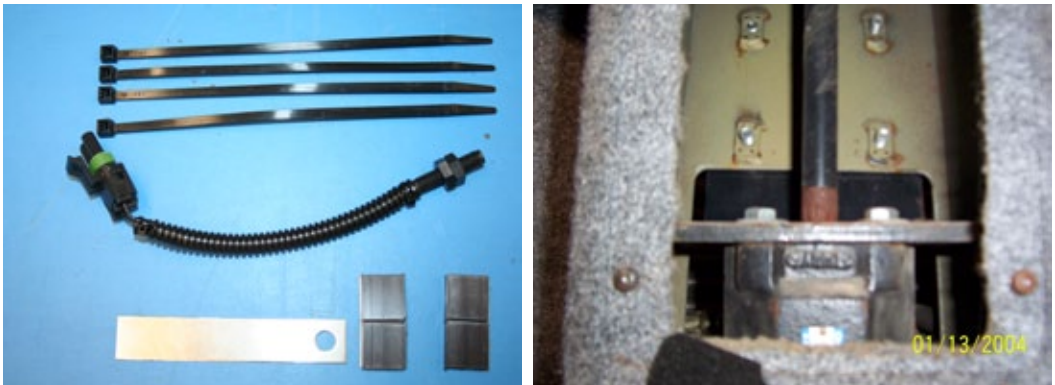
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## 9. INSTALL STEERING DISENGAGE SWITCH (KIT 91-07011)

The steering disengage kit (**W**) is used to automatically disengage FieldPilot when the steering wheel is turned. The magnets mount on the steering shaft and the sensor detects the rotation of the shaft. Set the clearance between the sensor and magnets to 1/8" and rotate the steering wheel in both directions to be sure that the sensor does not contact the magnets or the shaft. Connect the sensor to the Steering Control Module Cable labeled 'Steering Wheel Sense' and secure the cables in position so that they cannot interfere with the rotation of the steering shaft.

Figure 1-12: Install Steering Disengage Switch (Kit 91-07011)



## 10. RECOMMENDED ELECTRONICS INSTALLATION

The SCM should be mounted as far forward in the cab as possible. The control console can be mounted to the operator's preference. The GPS antenna should be mounted hood on a metal surface of at least 4" square. The AGM (**V**) should be mounted on the rear portion of the machine.

Figure 1-13: Recommended Electronics Installation



## 11. VERIFY OPERATION OF HYDRAULICS AND SET THE STEERING CONTROL RATE

Clean and pick up the area around the vehicle and make certain that it is safe to operate. Start the engine and check hydraulic connections for leaks. Rotate the steering wheel from one extreme to the other and back to center, check for leaks. While steering through the extremes of movement, check the cables and hoses for wear points and strain, adjust as necessary.

**The final oil flow rate adjustment is accomplished through the Matrix console. The target lock to lock time is 8 seconds and the valve frequency is 175. Refer to the Matrix manual for further instructions.**

*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.*



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

## 12. COMPLETE ELECTRONIC INSTALLATION

Refer to the owner's manual supplied with the automated steering system to complete the electronic installation and setup.

# FIELDPILOT®


## USER MANUAL

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A series of equipment-specific hydraulic installation kits have been developed to work in conjunction with your assisted steering system. This kit contains the necessary components and instructions to install assisted steering hydraulics on the Willmar 7200, 7250, 7400 and 7450. Please review this manual thoroughly before beginning the installation process.



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