

# FIELDPILOT<sup>®</sup>


## USER MANUAL

Assisted Steering Hydraulic Installation Manual for  
Vehicle Kit Number 91-02312

Fits Only CAT C, D, & E, 65,75, 85 & 95E



*TeeJet*<sup>®</sup>  
TECHNOLOGIES

A Subsidiary of  Spraying Systems Co.<sup>®</sup>



## 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. 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.

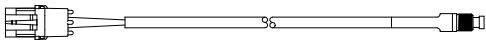


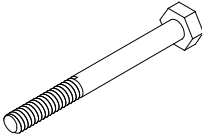
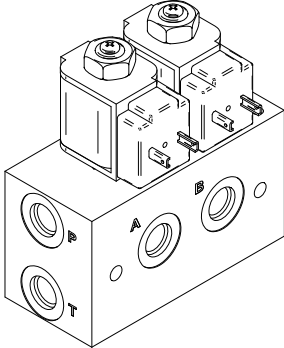
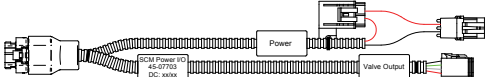
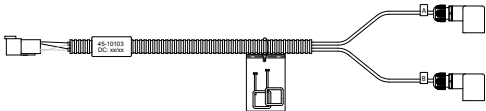
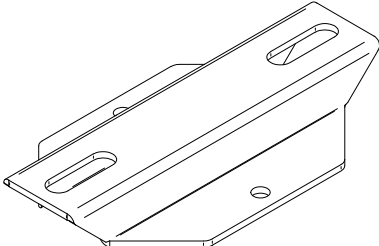


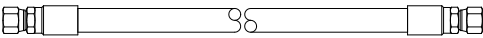
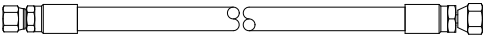
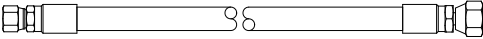
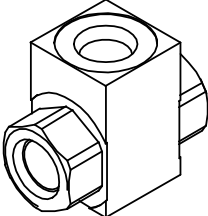
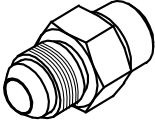
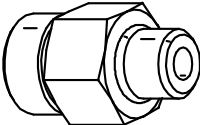
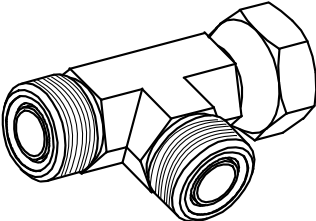
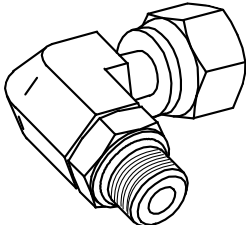
**WARNING: PINCH POINT HAZARD!** To prevent serious injury or death, avoid unsafe practice while manually operating hydraulic steering circuits. Keep others away and stay clear of mechanical steering linkages.

## KIT CONTENTS

Unpack the installation kit and identify the required parts.

Item	Part Number	Description	Quantity
A	32-04040	Switch, Engage/Disengage.....	1
B	350-0024	Washer, Flat, 1/4" SST.....	2
C	350-0083	Nut, Whiz-Lock, 1/4"-20 SST.....	2
D	350-0136	Bolt Hex, 1/4"-20 X 2-1/2" SST.....	2
E	35-02167	Valve FieldPilot CAT 65/75/85 C, D, & E.....	1
F	45-07703	Harness, SCM.....	1
G	45-10103	Harness, Valve.....	1
H	65-05170	Bracket Valve, CAT C, D, & E.....	1
I	68-01091	Hose, Hyd. - 3/8" x 36", #6FJIC Both Ends.....	2
J	68-01092	Hose, Hyd. - 3/8" x 40", #6FJIC x #6FORF.....	2
K	68-01254	Hose, Hyd. - 3/8" x 40", #6FJIC x #8FORF.....	2
L	68-02012	Shuttle Tee- #6FORB.....	2
M	68-02019	Adapter, Hyd. - #6MJIC x #6MORB.....	2
N	68-02025	Adapter, Hyd. - #8MORF x #6MORB.....	2
O	68-02026	Adapter, Hyd. Run Tee - #8 ORF.....	2
P	68-02028	Adapter, Hyd. 90° - #6MORB x #6FORF.....	2
Q	68-02071	Adapter, Hyd. Run Tee - #6 ORF.....	2
R	68-02073	Adapter, Hyd. - #6MORF x #6MORB.....	1
S	68-02080	Adapter, Hyd. 90° - #6MJIC x #6MORB.....	4
T	68-02085	Adapter, Hyd. - #8FORF x #6MORF.....	2
U	90-50013	Cable Tie Kit, 15.....	1
V	91-07011	Steering Wheel Switch Kit.....	1
W	98-05223	Installation Manual FP, CAT C, D, & E, 65, 75, 85 & 95E.....	1

Item	Part #	Description	Illustration
A	32-04040	Switch, Engage/Disengage, Momentary	
B	350-0024	Washer, Flat, 1/4" SST	
C	350-0083	Nut, Whiz-Lock, 1/4"-20 SST	
D	350-0136	Bolt Hex, 1/4"-20 X 2-1/2" SST	
E	35-02167	Valve FieldPilot CAT 65/75/85 C, D, & E	
F	45-07703	Harness, SCM	
G	45-10103	Harness, Valve	
H	65-05170	Bracket Valve, CAT C, D, & E	

Item	Part #	Description	Illustration
I	68-01091	Hose, Hyd. - 3/8" x 36", #6FJIC Both Ends	
J	68-01092	Hose, Hyd. - 3/8" x 40", #6FJIC x #6FORF	
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O	68-02026	Adapter, Hyd. Run Tee - #8 ORF	
P	68-02028	Adapter, Hyd. 90° - #6MORB x #6FORF	

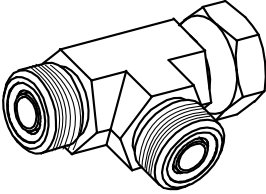
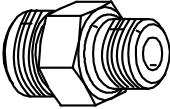
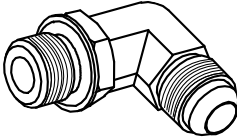
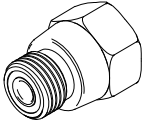
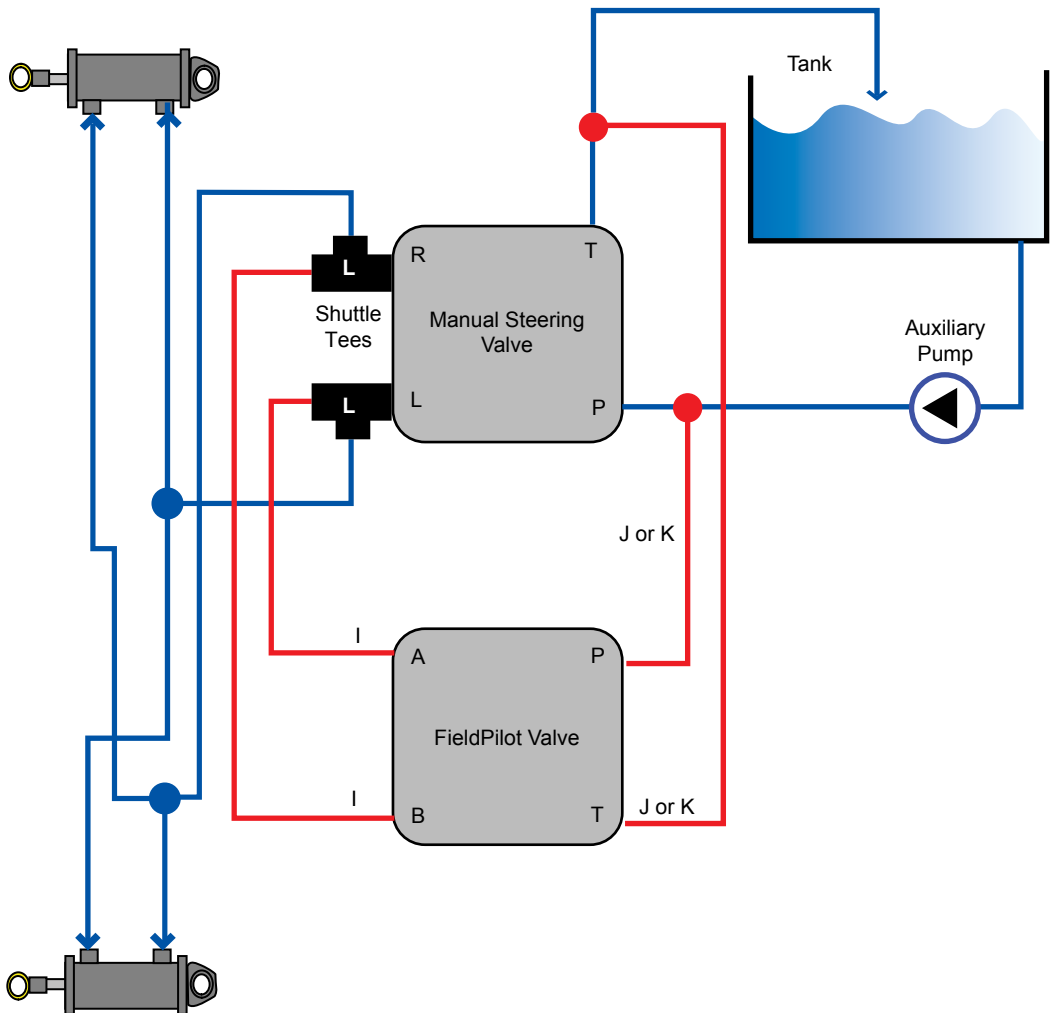
Item	Part #	Description	Illustration
Q	68-02071	Adapter, Hyd. Run Tee - #6 ORF	
R	68-02073	Adapter, Hyd. - #6MORF x #6MORB	
S	68-02080	Adapter, Hyd. 90° - #6MJIC x #6MORB	
T	68-02085	Adapter, Hyd. - #8FORF x #6MORF	
U	90-50013	Cable Tie Kit, 15	
V	91-07011	Steering Wheel Switch Kit	
W	98-05223	Installation Manual FP, CAT C, D, & E, 65, 75, 85 & 95E	

Figure 1-1: Hydraulic Diagram



Existing Hoses

Hoses From Kit

## 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 just ahead of the cab.
- The hydraulic connections will all be made at the machine's steering valve.
- The cables will enter the cab from the bottom-right-rear.
- The GPS antenna will mount on the cab as far forward as possible.

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

*Figure 1-2: Overview of the Machine*



**FieldPilot  
Valve**

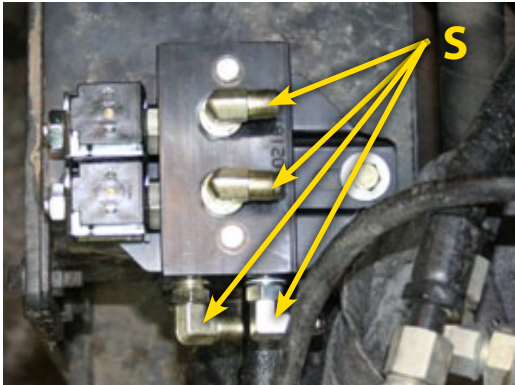
**Hydraulic  
Connections**

**Cable  
Entrance**

## 1. PREPARE THE FIELDPILOT VALVE

Install adapters **(S)** in the P, T, A, & B ports of the FieldPilot valve.

*Figure 1-3: Prepare the FieldPilot Valve*



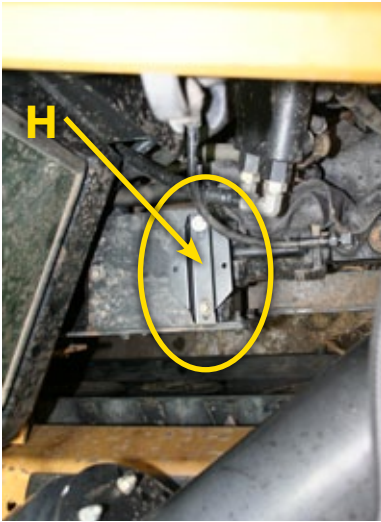
## 2. INSTALL THE FIELDPILOT VALVE BRACKET

### C and D Series

Locate the two bolts on the brake valve cover on the right side of the machine just in front of the cab. Remove the two bolts as indicated and install bracket **(H)** as shown using the original bolts.

*Figure 1-4: Install Mounting Bracket for FieldPilot Valve*





## E Series

Locate the two bolts on the brake valve cover on the right side of the machine just in front of the cab. Remove the two bolts as indicated and install bracket (H) as shown using the original bolts. On the E-Series the cover is vertical instead of horizontal.

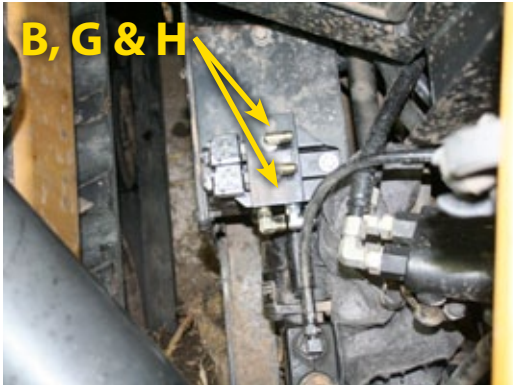
Figure 1-5: Install Mounting Bracket for FieldPilot Valve



### 3. MOUNT THE FIELDPILOT VALVE

Using parts **(B, G & H)**, mount the FieldPilot valve **(E)** to the bracket **(H)**.

*Figure 1-6: Mount the FieldPilot Valve*

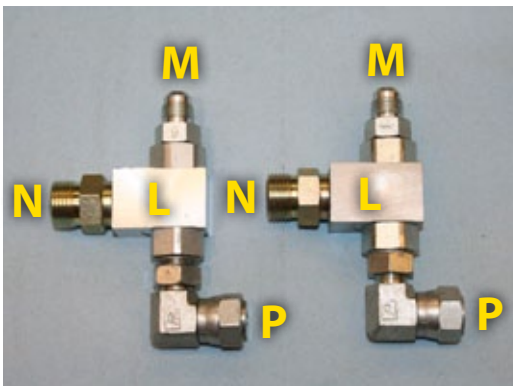


### 4. INSTALL THE SHUTTLE TEE

#### **C and D Series**

A shuttle tee will be used on each of the steering lines. Using parts **(L, M, N & P)** assemble both shuttle tees as shown.

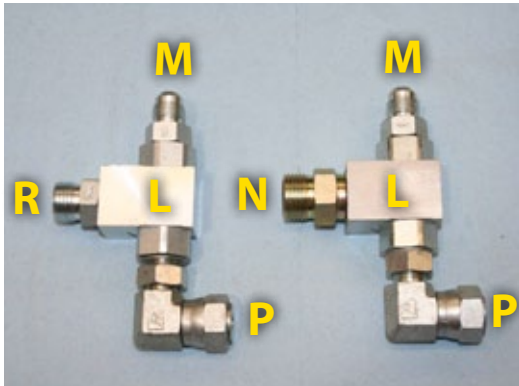
*Figure 1-7: Install the Shuttle Tee and Adapters*



## E Series

A shuttle tee will be used on each of the steering lines. Using parts **(L, M, P & R)** assemble one shuttle tee as shown. Then using parts **(L, M, N & P)** assemble the other shuttle tee as shown.

Figure 1-8: Install the Shuttle Tee and Adapters



## 5. PREPARE THE STEERING PORTS ON THE STEERING VALVE

### C & D Series

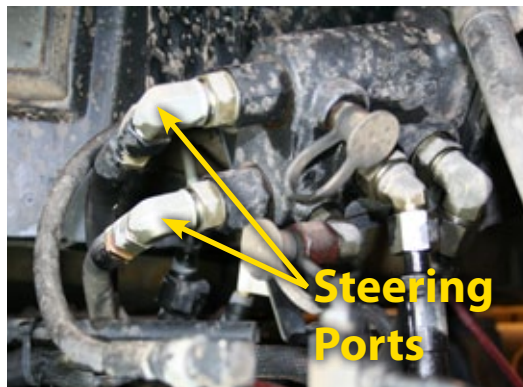
Label the steering hoses and disconnect them from the machine's steering valve. Install adapter **(T)** on both fittings on the steering valve.

### E Series

Label the steering hoses and disconnect them from the machine's steering valve. Install only one adapter **(T)** on the fitting on the steering valve.



Figure 1-9: Prepare the Steering Ports On the Steering Valve

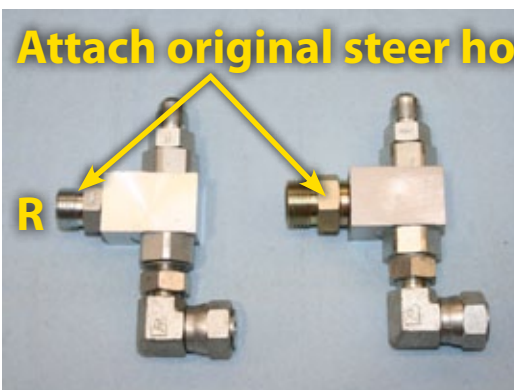


## 6. INSTALL THE SHUTTLE TEES

Install the two prepared shuttle tees on to the steering ports as shown.

On E-Series machines the shuttle tee with adapter **(R)** must be attached to the port without adapter **(T)**. Then reattach the original steer hoses to the center port of the appropriate shuttle tee. (E Series will look slightly different than pictures.)

*Figure 1-10: Install the Shuttle Tees*



**Attach original steer hoses here**

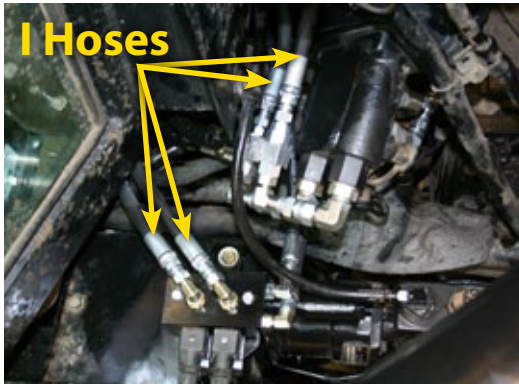
**R**

## 7. INSTALL STEER HOSES

Connect the steering hoses (I) from the open branch of the shuttle tees to the A & B ports on the FieldPilot valve.

*Figure 1-11: Install Steer Hoses*

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## 8. INSTALL THE PRESSURE AND TANK ADAPTERS

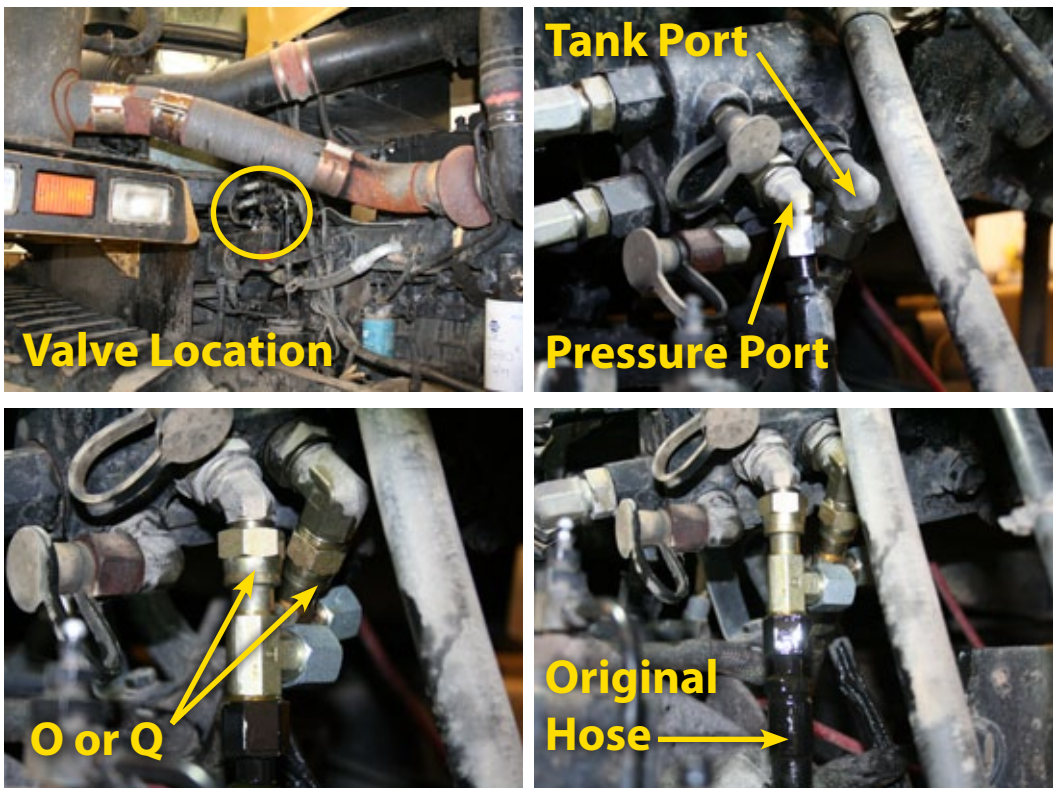
### C & D Series

Label and disconnect the Pressure and Tank hoses from the machine's steering valve. Install run tees (O) on each port and reconnect the original pressure and tank hoses.

### E Series

Label and disconnect the Pressure and Tank hoses from the machine's steering valve. Install run tees (Q) on each port and reconnect the original pressure and tank hoses. (E Series will look slightly different than pictures.)

Figure 1-12: Install the Pressure and Tank Adapters



## 9. INSTALL THE PRESSURE AND TANK HOSES

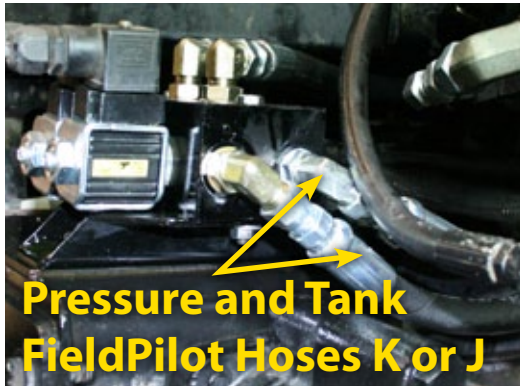
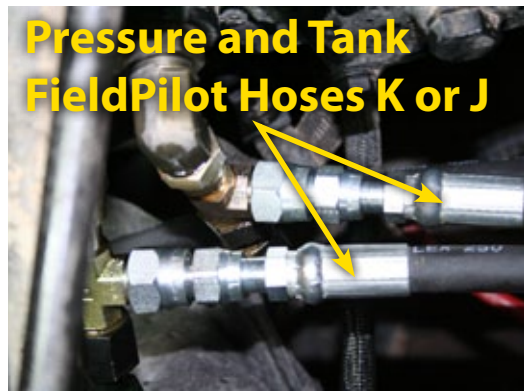
### C & D Series

On C & D Series machines connect and route hoses **(K)** from the branch of the run tees **(O)** to the appropriate P & T ports on the FieldPilot valve.

### E Series

On E Series machines connect and route hoses **(J)** from the branch of the run tees **(Q)** to the appropriate P & T ports on the FieldPilot valve. (E Series will look slightly different than pictures.)

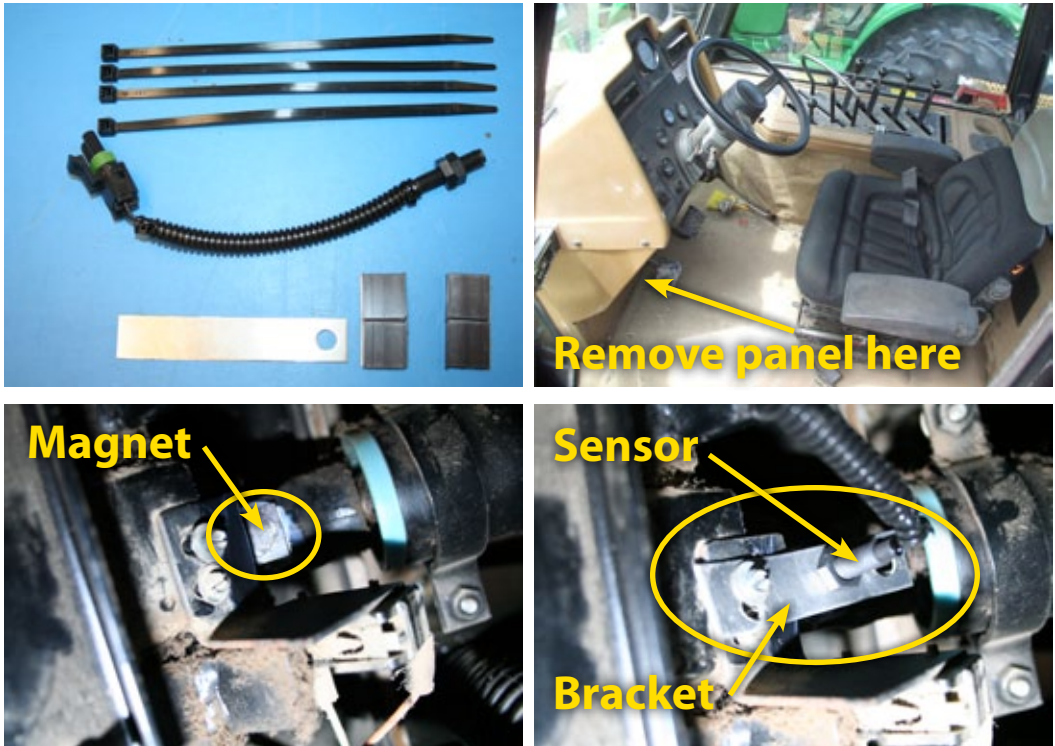
*Figure 1-13: Install the Pressure and Tank Hoses*



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

Remove the shields to gain access to the steering column in the cab. Glue magnets to the steering shaft (the magnets will need to be cut in half because the shaft is small). Mount the bracket from kit (V) as shown. Install the sensor in the bracket. Set the clearance between the magnet and the sensor as close to  $\frac{1}{8}$ " as possible.

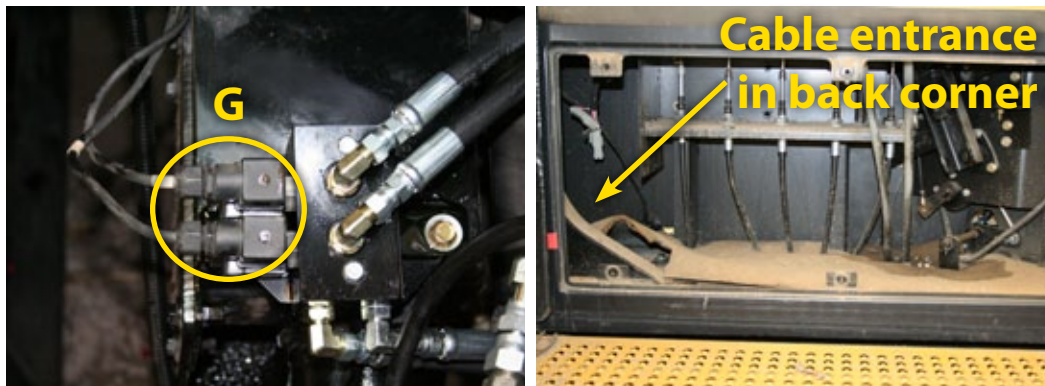
Figure 1-14: Install Steering Disengage Switch (Kit 91-07011)



## 11. INSTALL THE VALVE CONTROL CABLE

Connect the valve control cable (**G**) to the FieldPilot valve and route it to the bottom-right-rear of the cab and into the cab.

*Figure 1-15: Install the Valve Control Cable*



## 12. 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 1-16: Engage/Disengage Switch*



### 13. RECOMMENDED ELECTRONICS INSTALLATION

The Steering Control Module (SCM) should be mounted securely to the floor of the cab 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 as far forward as possible on the cab on a metal surface of at least 4" square.

*Figure 1-17: Recommended Electronics Installation*



## 14. 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. Check the cables and hoses for wear points and strain, adjust as necessary.

*NOTE: The “lock-to-lock” on tracked vehicles refers to an approximate 90° turn either left to right or right to left.*

**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 110. Refer to the Matrix manual for further instructions.**

Use the Matrix console to perform the left to right steering test, counting the seconds to move the left and right approximately 90°. The vehicle should be moving forward very slowly during these tests. If you find that the machine steers in the opposite direction from that being commanded in this steering test sequence, switch the valve connectors at the FieldPilot valve

*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.

## 15. 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 CAT C, D, & E, 65,75, 85 & 95E. Please review this manual thoroughly before beginning the installation process.



1801 Business Park Drive  
Springfield, Illinois 62703 USA  
Tel: (217) 747-0235 • Fax: (217) 753-8426  
[www.teejet.com](http://www.teejet.com)

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