


FIELDPILOT[®]

USER MANUAL

Assisted Steering Hydraulic Installation Manual for
Vehicle Kit Number 91-002252 and 91-02306

Fits Only Ford NH 8670, 8770, 8870 and 8970
(Super Steer Models Only)



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. 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.
6. Remove the hood and side panels around the engine compartment to allow access to the hydraulic system



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.

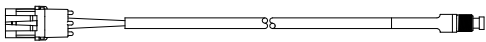

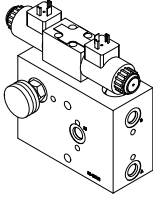
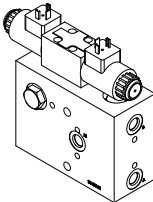

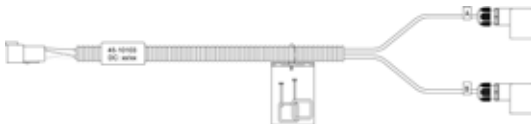
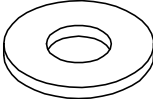
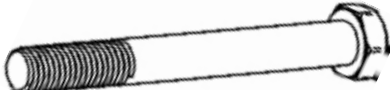
KIT CONTENTS

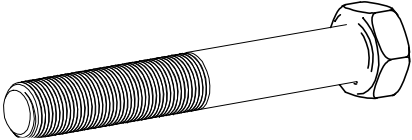


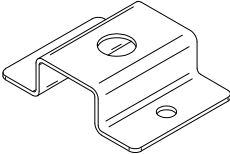
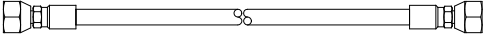
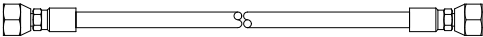
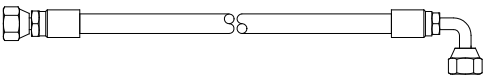
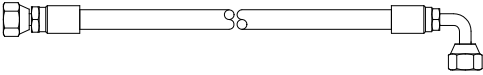
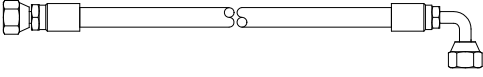
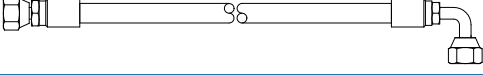
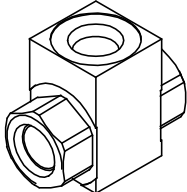
Unpack the installation kit and identify the required parts.

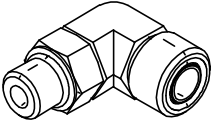
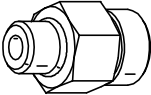
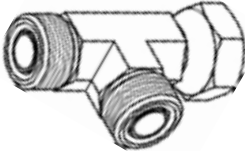
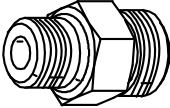
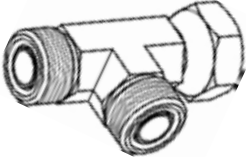
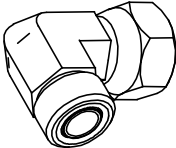
Item	Part Number	Description	Quantity
A	32-04040	Switch, Engage/Disengage.....	1
B	350-0037	Washer, Flat - 3/8" SST	2
C*	35-02151	Valve, Fieldpilot, CC, LS	1
C*	35-02180	Valve, Fieldpilot, PWM, CC, LS	1
D	45-07703	Cable, SCM to Valve Interface Cable	1
E	45-10103	Cable, Hydraulic Valve Interface	1
F	60-01016	Washer, Flat, 5/8" SST.....	2
G	60-04087	Bolt, Hex, SST, 3/8" _16 x 3.25"	2
H	60-04093	Bolt, Hex, SST 5/8" _11 x 4.5"	1
I	60-07027	Nut, SST, 3/8" _16 Nylock	2
J	60-07028	Nut, Whiz-Lock, SST, 5/8" _11	1
K	65-05134	Bracket, Hydraulic Block Mount.....	1
L	68-01149	Hose, Hydraulic 1/4" x 24" #6FORF x #6FORF	1
M	68-01150	Hose, Hydraulic 1/4" x 58" #6FORF x #6FORF	1
N	68-01151	Hose, Hydraulic 3/8" x 56" #8FORF x #8FORF 90°	1
O	68-01152	Hose, Hydraulic 3/8" x 53" #8FORF x #8FORF 90°	1
P	68-01153	Hose, Hydraulic 3/8" x 38" #8FORF x #8FORF 90°	1
Q	68-01154	Hose, Hydraulic 3/8" x 43" #8FORF x #8FORF 90°	1
R	68-02012	Shuttle Tee	1
S	68-02024	Adapter, Hydraulic 90° #8MORF x #6MORB.....	2
T	68-02025	Adapter, Hydraulic #8MORF x #6MORB	6
U	68-02026	Adapter, Hydraulic Run Tee #8ORF.....	4
V	68-02073	Adapter, Hydraulic #6MORF x #6MORB	1
W	68-02074	Adapter, Hydraulic 90° #6MORFF x #6MORB	4
X	68-02088	Adapter, Hydraulic 90° #8MORFF x #8FORFF	2
W	90-50013	Cable Tie Kit	1
Z	91-07011	Kit, Steering Wheel Switch	1

AA 98-05129 Installation Manual, Ford NH 8670, 8770, 8870 and 8970
 (Super Steer Models Only) 1

* The valve included depends upon which vehicle kit was ordered.

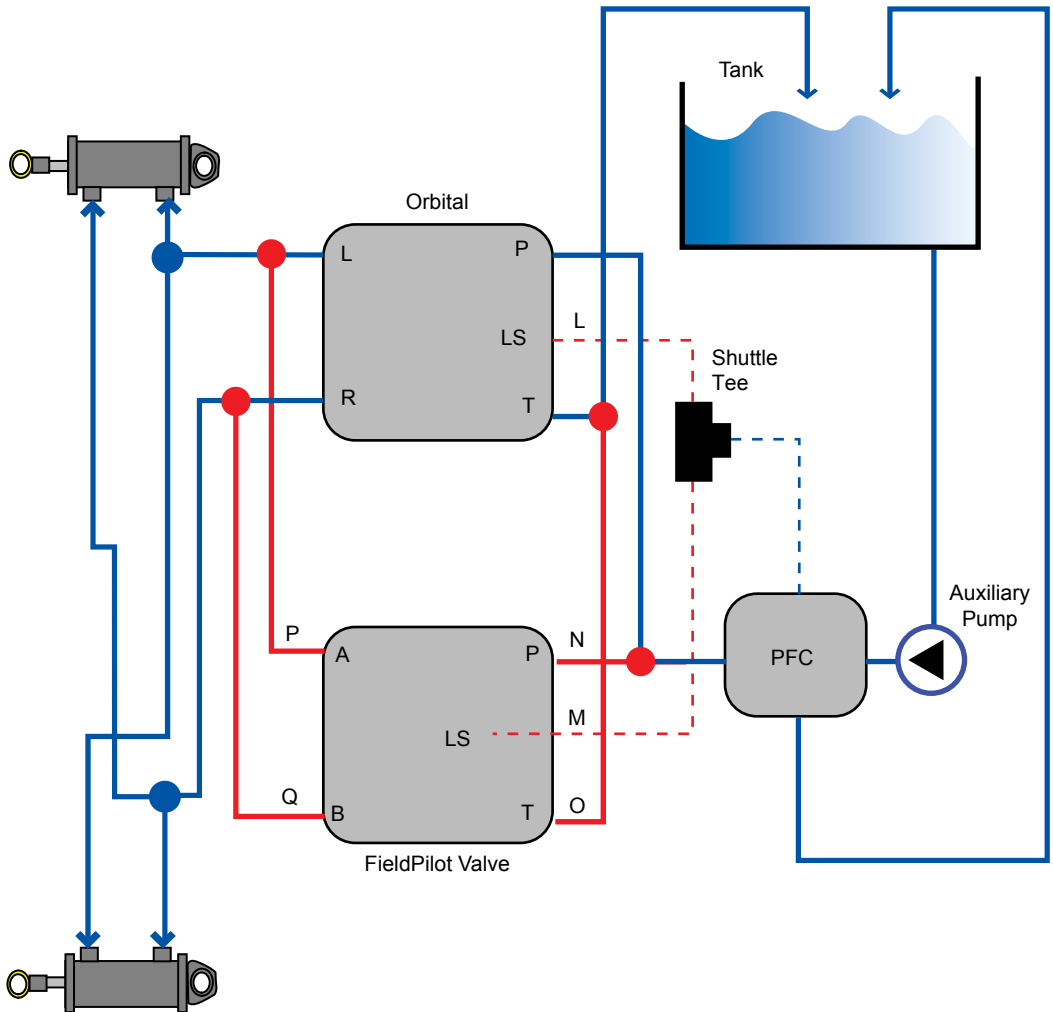
Item	Part #	Description	Illustration
A	32-04040	Switch, Engage/Disengage, Momentary	
B	350-0037	Washer, Flat - 3/8" SST	
C	35-02151	Valve, Fieldpilot, CC, LS	
C	35-02180	Valve, Fieldpilot, PWM, CC, LS	
D	45-07703	Cable, SCM to Valve Interface Cable	
E	45-10103	Cable, Hydraulic Valve Interface	
F	60-01016	Washer, Flat, 5/8" SST	
G	60-04087	Bolt, Hex, SST, 3/8" _16 x 3.25"	

Item	Part #	Description	Illustration
H	60-04093	Bolt, Hex, SST 5/8" _11 x 4.5"	
I	60-07027	Nut, SST, 3/8" _16 Nylock	
J	60-07028	Nut, Whiz-Lock, SST, 5/8" _11	
K	65-05134	Bracket, Hydraulic Block Mount	
L	68-01149	Hose, Hydraulic 1/4" x 24" #6FORF x #6FORF	
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P	68-01153	Hose, Hydraulic 3/8" x 38" #8FORF x #8FORF 90°	
Q	68-01154	Hose, Hydraulic 3/8" x 43" #8FORF x #8FORF 90°	
R	68-02012	Shuttle Tee	

Item	Part #	Description	Illustration
S	68-02024	Adapter, Hydraulic 90° #8MORF x #6MORB	
T	68-02025	Adapter, Hydraulic #8MORF x #6MORB	
U	68-02026	Adapter, Hydraulic Run Tee #8ORF	
V	68-02073	Adapter, Hydraulic #6MORF x #6MORB	
W	68-02074	Adapter, Hydraulic 90° #6MORFF x #6MORB	
X	68-02088	Adapter, Hydraulic 90° #8MORFF x #8FORFF	
W	90-50013	Cable Tie Kit	
Z	91-07011	Kit, Steering Wheel Switch	
AA	98-05129	Installation Manual, Ford NH 8670, 8770, 8870 and 8970 (Super Steer Models Only)	

* The valve included depends upon which vehicle kit was ordered.

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!

The Ford NH 8770 has a closed center steering with steel lines coming to and from the Orbital Valve. The Pressure and Tank lines from the FieldPilot Valve ports will tee with the orbital under the Cab floor panel. The LS line from the FieldPilot valve will Tee with the Orbital LS via shuttle tee where the branch of the tee returns to the Priority Flow Control valve on the tractor. Again, this is under the cab floor panel. The A and B lines from the FieldPilot valve will tee in the front of the tractor at the steering cylinders. The connections will be as follows:

FieldPilot – Orbital

T	-	T
P	-	P
A	-	L
B	-	R
LS	-	LS

1. PREPARE THE FIELDPILOT VALVE

Install adapters **(S)** in the B and LS ports. Install adapters **(T)** in the A, P, and T ports. Attach fitting **(X)** to the adapter **(T)** in the A port.

Figure 1-2: Prepare the FieldPilot Valve



2. PREPARE THE SHUTTLE TEE

Install adapter **(V)** into the branch of the shuttle tee **(R)**. Install adapters **(W)** into both ends of the run of the tee. Point the **(W)** adapters in opposite directions.

Figure 1-3: Prepare the shuttle tee



3. INSTALL THE FIELDPILOT VALVE BRACKET

The valve bracket will mount to the vehicle's frame on the left side. Using the existing hole just below the Engine Oil Cap, mount the **(K)** bracket with (1) **(H)** 5/8" bolt, (1) **(J)** 5/8" nut and (2) **(F)** 5/8" washers.

Figure 1-4: Install Mounting Bracket for FieldPilot Valve



4. MOUNT THE FIELDPILOT VALVE

Mount the FieldPilot Valve to the **(K)** bracket using parts **(B, G & I)**. Mount it so the P and T ports are pointed toward the cab and the A and B ports point away from cab. The solenoids should be on the bottom.

Figure 1-5: Mount the FieldPilot Valve



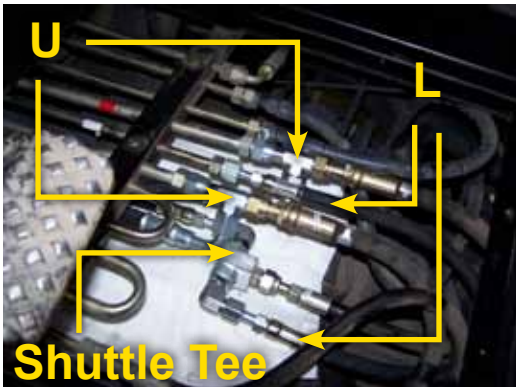
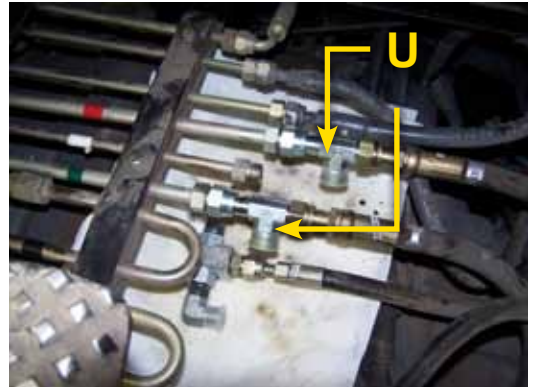
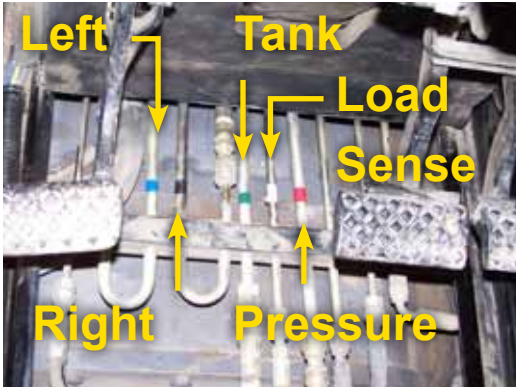
5. PREPARE FOR CONNECTION TO ORBITAL VALVE

The connections to the orbital are done under the floor panel in the cab. Remove the rubber floor mat. Remove the metal cover. For ease of visual identification, colored tape was used.

Blue = Left
Black = Right
Green = Tank
White = Load Sense
Red = Pressure.

Disconnect the pressure line and attach the **(U)** Run Tee to the steel line. Reconnect the pressure hose to the end of the run. The branch of the tee should point to the left and down. Repeat the above steps for the Tank line. It also uses a **(U)** Run Tee. Disconnect the Load Sense line. Connect the hose end to the Branch of the Shuttle Tee. Connect one end of **(L)** hose to the adapter from the run of the Shuttle Tee pointing to the rear of the tractor and the other end of **(L)** hose to the steel line.

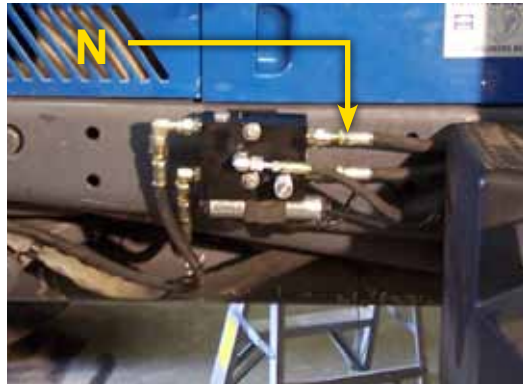
Figure 1-6: Prepare for Connection to Orbital Valve



6. INSTALL THE PRESSURE HOSE

Route the **(N)** 90° hose end between the fuel tank and the frame under the cab. Attach it to the branch of the Tee. Connect the Straight end of the hose to the P port on the FieldPilot Valve.

Figure 1-7: Install the Pressure Hose



7. INSTALL THE TANK HOSE

Route the (O) 90° hose end between the fuel tank and the frame under the cab. Attach it to the branch of the Tee. Connect the Straight end of the hose to the T port on the FieldPilot Valve.

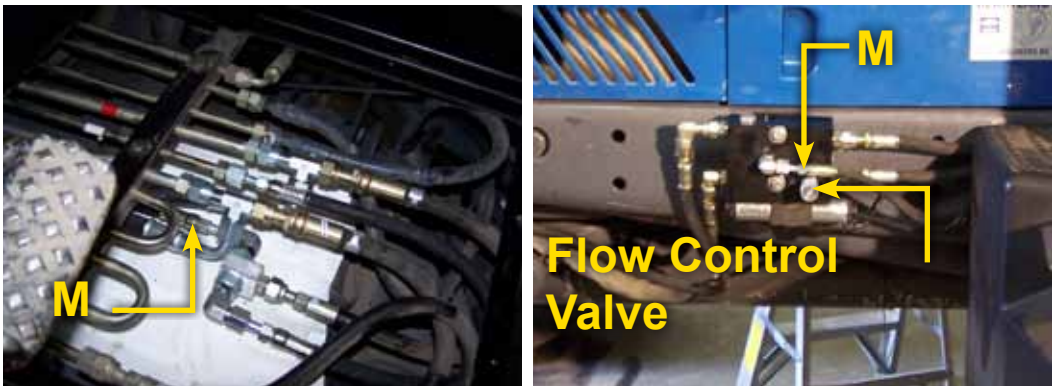
Figure 1-8: Install the Tank Hose



8. INSTALL THE LOAD SENSE HOSE

Connect the Straight end of (M) hose to the LS port on the FieldPilot Valve. Route the hose between the fuel tank and the frame up the cab. Attach the other hose end to the run of the Shuttle Tee with the adapter pointing towards the front of the vehicle.

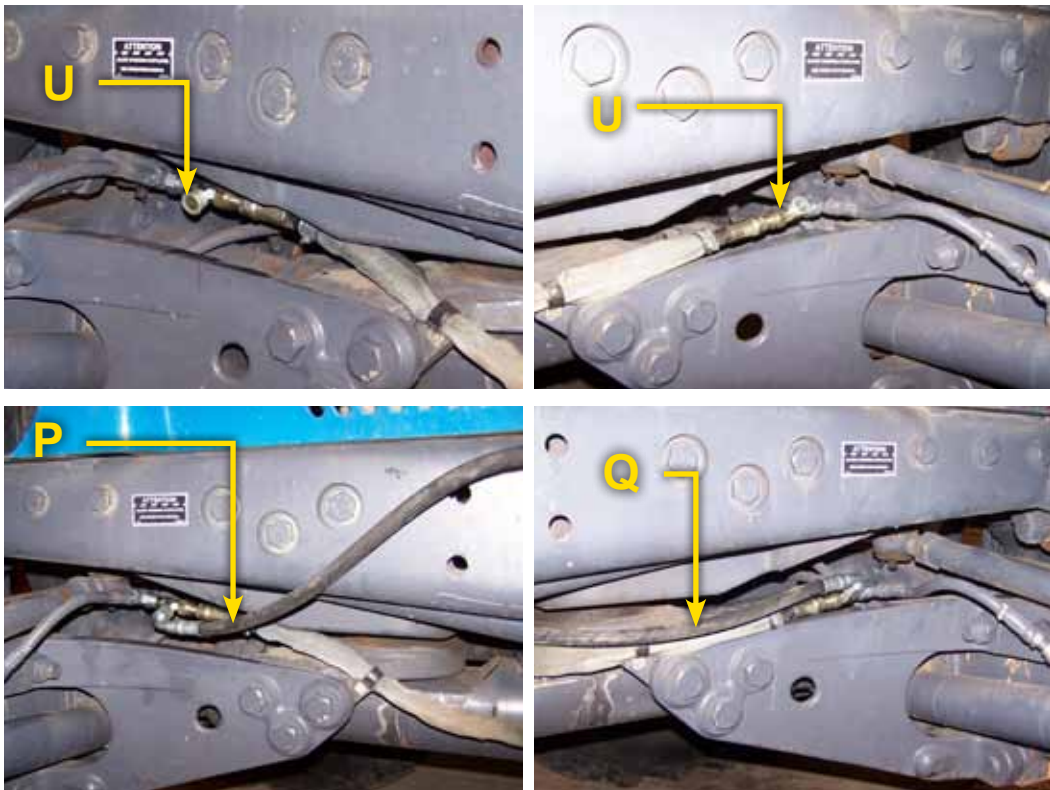
Figure 1-9: Install the Load Sense Hose



9. INSTALL LEFT AND RIGHT STEER HOSES

The steering hoses will connect to run tees installed at the front steering cylinder. Disconnect the left side hose from the inline Tee. Attach the run of the new (U) Tee to the branch of the existing Tee. Reconnect the existing hose to the run of the (U) Tee. Connect the (P) 90° hose end to the branch of the (U) Tee. Connect the straight hose end to port A on the FieldPilot valve. Disconnect the right side hose from the inline Tee. Attach the run of the new (U) Tee to the branch of the existing Tee. Reconnect the existing hose to the run of the (U) Tee. Connect the (Q) 90° hose end to the branch of the (U) Tee. Connect the straight hose end to port B on the FieldPilot valve.

Figure 1-10: Install Left and Right Steer Hoses



10. INSTALL THE VALVE CONTROL CABLE

Connect the FieldPilot valve control cable (E) to the coils on the FieldPilot valve and route the cable into the cab. Connect it to the SCM harness. Do not be concerned at this time about which connector is connected to which solenoid coil.

11. INSTALL STEERING DISENGAGE SWITCH (KIT 91-07011)

The steering disengage kit (**Z**) is used to automatically disengage FieldPilot when the steering wheel is turned. The magnets mount on the steering shaft or other rotating part of the steering wheel and the sensor mounts so that there is a 1/8" clearance between the sensor and magnet.

Figure 1-11: Install Steering Disengage Switch (Kit 91-07011)



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 1-12: 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 top of the cab on a metal surface of at least 4" square.

Figure 1-13: 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. 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 6 seconds and the valve frequency is 110. Refer to the Matrix manual for further instructions.

If using a CL220 or CL230 console then refer to the following instructions for adjusting the oil flow rate.

Adjust the hydraulic oil flow control knob on the FieldPilot valve to a starting position of 1 turn from completely closed. Adjust the oil flow by turning the knob clockwise to reduce flow (increase seconds) and counter-clockwise to increase flow (decrease seconds).

Use the electronic steering control console to perform the left to right steering test, counting the seconds to move the wheels from full left to full right and also in the opposite direction. It is a good idea to have the vehicle moving forward very slowly during these tests so there is not excessive side pressure on the tires. 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 coils.

Do this a number of times, adjusting the oil flow between tests, until a lock to lock steering response of approximately **18 seconds** is observed using a CenterLine® 220. Adjust to **14 seconds** when using a CenterLine® 230BP. Use the locking nut to secure this flow setting. The coils on the FieldPilot valve also have manual push button overrides.

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

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 Ford NH 8670, 8770, 8870 and 8970 (Super Steer Models Only). Please review this manual thoroughly before beginning the installation process.



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