

FIELDPILOT[®]

USER MANUAL

Assisted Steering Hydraulic Installation Manual for
Vehicle Kit Number 91-02224 or 91-02295
Fits Only John Deere 8x00 and 8x10 Series Wheel Tractors



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.



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.



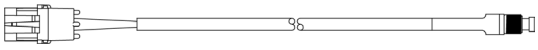

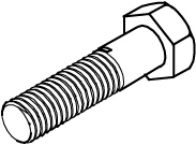
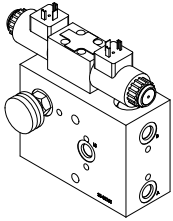
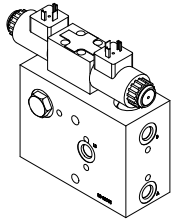
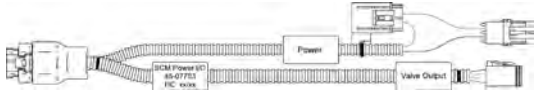
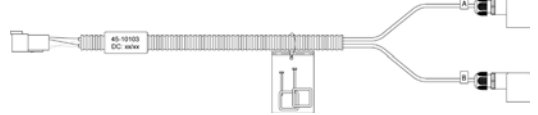
WARNING: PINCH POINT HAZARD! To prevent serious injury or death, avoid unsafe practice while manually operating hydraulic steering circuits. Keep others away and stay clear of mechanical steering linkages.

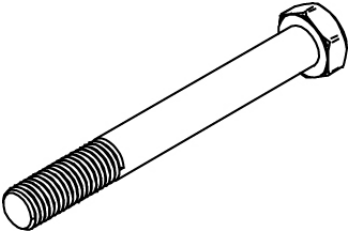

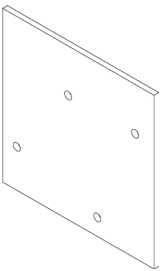
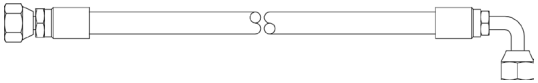
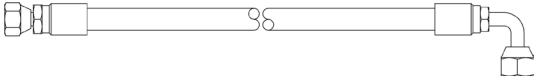
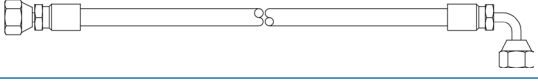
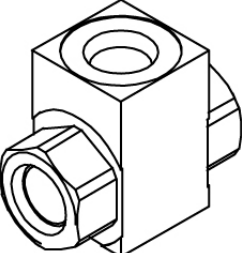
KIT CONTENTS

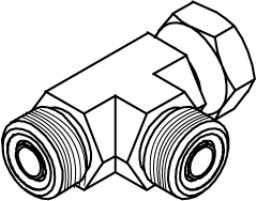
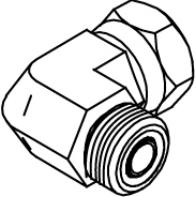
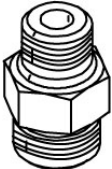
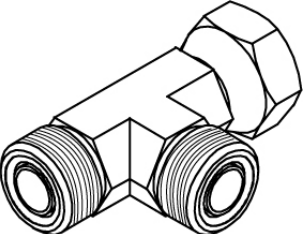
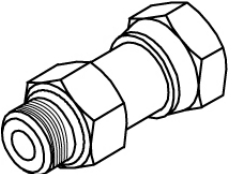
Unpack the installation kit and identify the required parts.

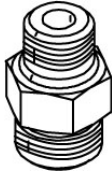


Item	Part Number	Description	Quantity
A	32-04040	Switch, Engage/Disengage	1
B	350-0037	Washer, Flat, SST, 3/8	2
C	60-04095	Bolt, Hex, SST, 3/8_16 x 1.5	2
D*	35-02151	Valve, FieldPilot, CC LS.....	1
D*	35-02180	Valve, FieldPilot, CC LS, PWM.....	1
E	45-07703	Cable, SCM to Valve Interface Cable	1
F	45-10103	Cable, Hydraulic Valve Interface	1
G	60-04087	Bolt, Hex, SST, 3/8_16x3.25	2
H	60-07027	Nut, Hex, Nylock, SST, 3/8_16	4
I	65-05176	Valve Bracket	1
J	68-01104	Hose, Hydraulic, 3/8x153", 8 FORF-6FORF 90°	2
K	68-01105	Hose, Hydraulic, 3/8x20", 6FORF-6FORF 90°	2
L	68-01106	Hose, Hydraulic, 1/4 x 18", 6FORF-6FORF 90°	1
M	68-02012	Shuttle Tee Valve	1
N	68-02071	6 ORFF Run Tee (F-M-M)	1
O	68-02072	6 MORFF - 90 - 6 FORFF	1
P	68-02073	6 MORB - 6 MORFF	7
Q	68-02026	8 ORFF Run Tee (F-M-M)	2
R	68-02110	6 MORB - 6 FORFF	1
S	68-02118	M14 MORB - 6 MORFF	3
T	68-02119	John Deere Spacer	1
U	68-02120	John Deere Shuttle Disc	1
V	90-50013	Kit, Zip Ties (no pictured)	1
W	91-07011	Steering Wheel Switch Kit	1

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

Item	Part #	Description	Illustration
A	32-04040	Switch, Engage/Disengage	
B	350-0037	Washer, Flat, SST, 3/8	
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E	45-07703	Cable, SCM to Valve Interface Cable	
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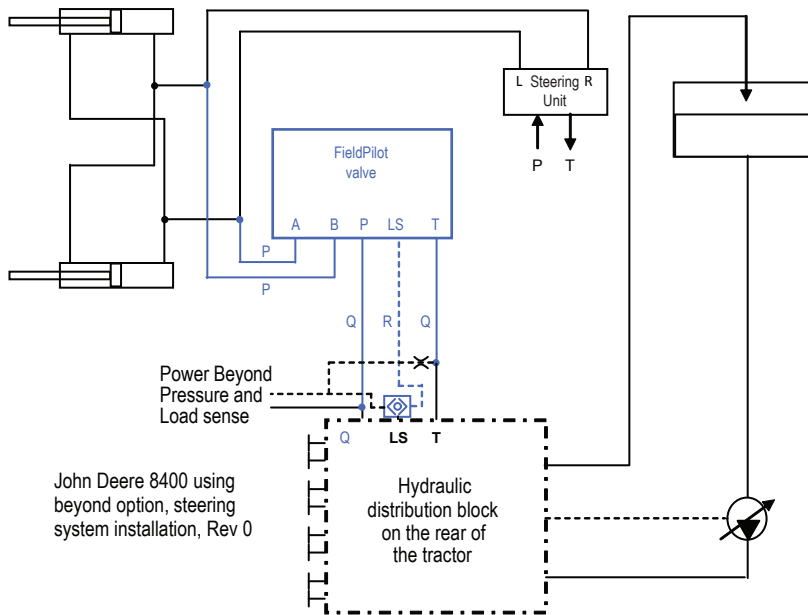
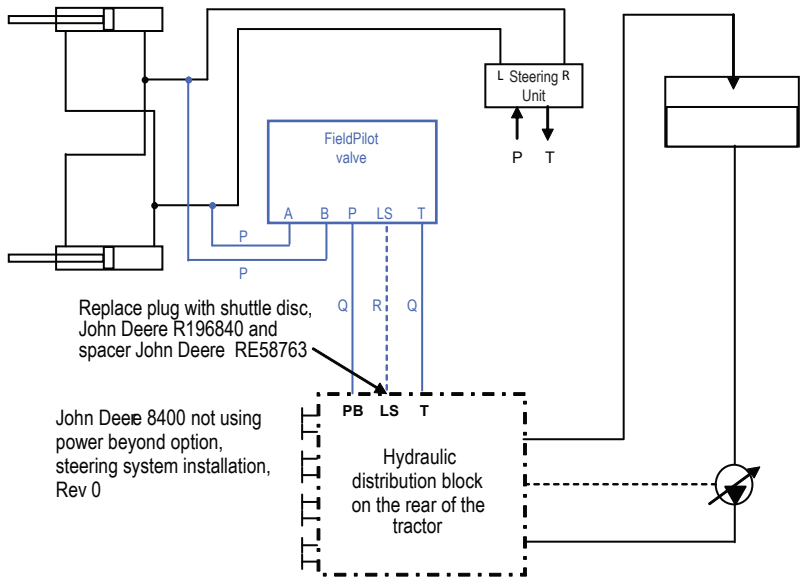
Item	Part #	Description	Illustration
G	60-04087	Bolt, Hex, SST, 3/8_16x3.25	
H	60-07027	Nut, Hex, Nylock, SST, 3/8_16	
I	65-05176	Valve Bracket	
J	68-01104	Hose, Hydraulic, 3/8x153", 8 FORF-6FORF 90°	
K	68-01105	Hose, Hydraulic, 3/8x20", 6FORF-6FORF 90°	
L	68-01106	Hose, Hydraulic, 1/4 x 18", 6FORF-6FORF 90°	
M	68-02012	Shuttle Tee Valve	

Item	Part #	Description	Illustration
N	68-02071	6 ORFF Run Tee (F-M-M)	
O	68-02072	6 MORFF - 90 - 6 FORFF	
P	68-02073	6 MORB - 6 MORFF	
Q	68-02026	8 ORFF Run Tee (F-M-M)	
R	68-02110	6 MORB - 6 FORFF	

Item	Part #	Description	Illustration
S	68-02118	M14 MORB - 6 MORFF	
T	68-02119	John Deere Spacer	
U	68-02120	John Deere Shuttle Disc	
V	90-50013	Kit, Zip Ties (no pictured)	
W	91-07011	Steering Wheel Switch Kit	

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

Figure 1-1: Figure 1-2: Hydraulic Diagram



INSTALLATION



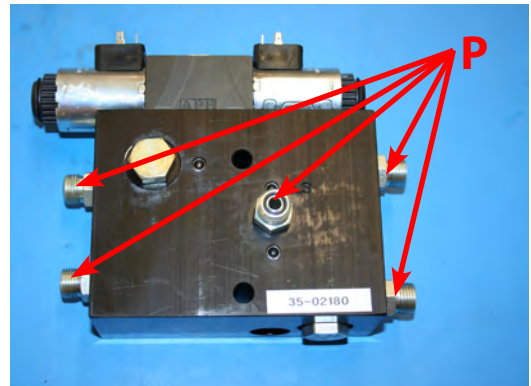
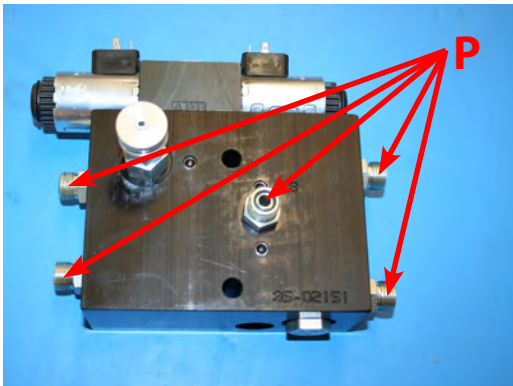
If there are questions concerning the installation of the FieldPilot system on this vehicle, or due to the changes in component specifications the parts supplied in the kit are not exactly as presented in this document, please contact your dealer or TeeJet Customer service representative for clarification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

1. PREPARE THE FIELDPILOT VALVE BLOCK

Make sure the FieldPilot valve block is clean and free of dust. Work on a clean bench. Remove the plastic plugs and install straight adapter (**P**) in the P, T, A, B, and LS ports. Take care not to damage the o-rings on the adapters during this process.

Figure 1-2: Preparing FieldPilot Valve Block



2. MOUNT THE VALVE BRACKET ON THE VEHICLE

Find the two holes in the rear casting gusset plate on the right side of the tractor. Using the two bolts (G) with nuts (H) and washers (B), attach the bracket (I) so that the mounting holes for the valve are up and to the rear.

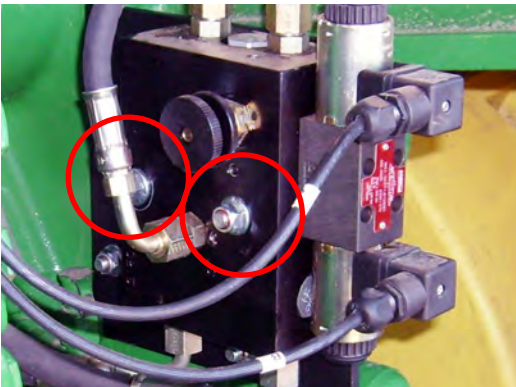
Figure 1-3: Mount the Valve Bracket



3. INSTALL FIELDPILOT VALVE ON MOUNTING BRACKET

Using the bolts and nuts (G) and (C) attach the FieldPilot valve to the bracket (I) so that Electronic actuator is positioned to the rear and the manual adjust knob is positioned toward the center of the tractor.

Figure 1-4: Install Mounting Bracket on FieldPilot Valve

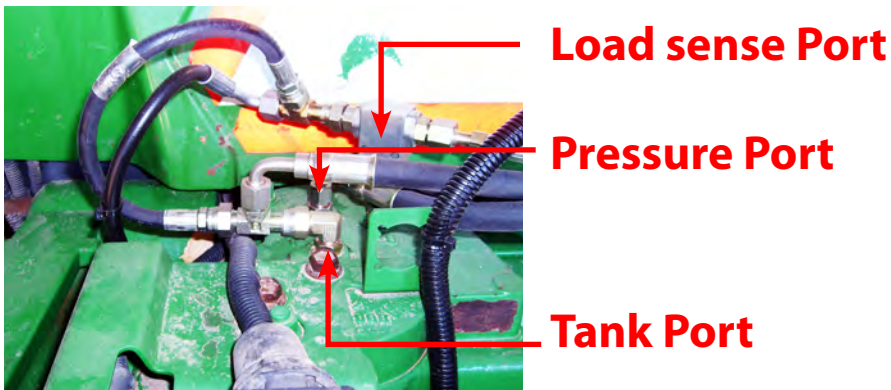


4. TRACTORS USING “POWER BEYOND” OPTION

NOTE: If vehicle is NOT using the John Deere “Power Beyond” option, skip to Step 6.

“Power Beyond” is accessed on the top of the rear valve block on the tractor. The load sense port will have a run tee installed with one drop going to the power beyond load sense and the other going to the tank port on top of the block. Where the tank line from the power beyond load sense enters the block, there is also an orifice plate. The pressure port is on the top of the valve block between the tank and the load sense ports. It may have an additional line or it may be plugged, depending on whether or not the power beyond feature is active on the tractor.

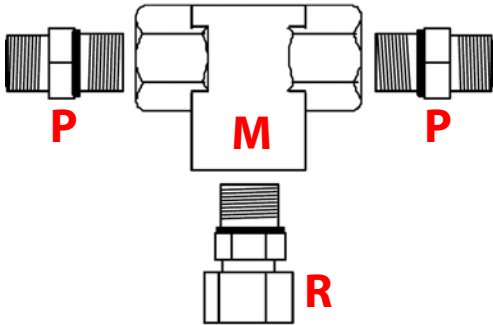
Figure 1-5: Power Beyond Option



5. MODIFYING THE POWER BEYOND INSTALLATION

It is necessary to install a shuttle tee valve (**M**) in the power beyond load sense port to allow either the installed power beyond function or the FieldPilot valve (**D**) to trigger the load sense to the pump. Prepare the shuttle tee valve by installing adapter (**R**) into the common port on the shuttle tee valve (**M**). Install two of the adapters (**P**) into the other two ports of the shuttle tee valve (**M**).

Figure 1-6: Shuttle Tee Valve

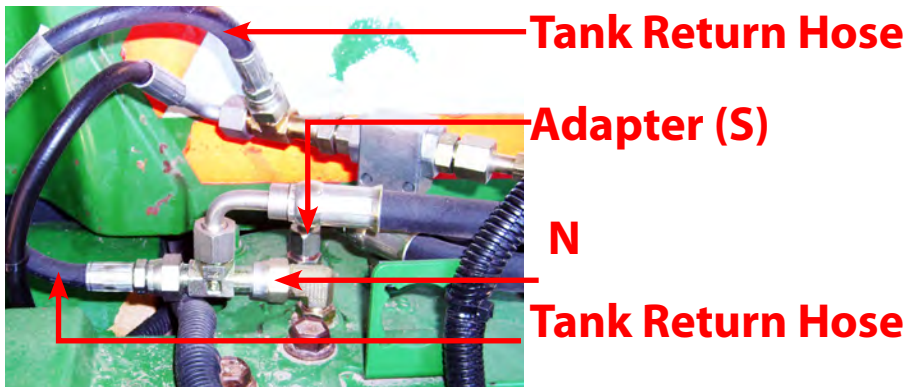


Remove the run tee with the power beyond load sense and the tank return hose, from the adapter in the load sense port on the tractor valve block. Connect adapter (**R**) previously installed on the common port of the shuttle tee (**M**) on this adapter, in its place. Install the run tee that was removed to one port of the shuttle tee valve (**M**) as shown. Remove the other end of the tank return hose from the elbow adapter in the tank return port on the tractor valve block. Install a run tee (**N**) on the elbow adapter and install the power beyond tank return hose to the end of the run tee.

NOTE: The "Power Beyond" tank return line has an orifice plate in it. Be sure this is still in place.

Remove the plug from the pressure port on top of the valve block and install adapter (**S**) in this opening.

Figure 1-7: Modifying Power Beyond Installation

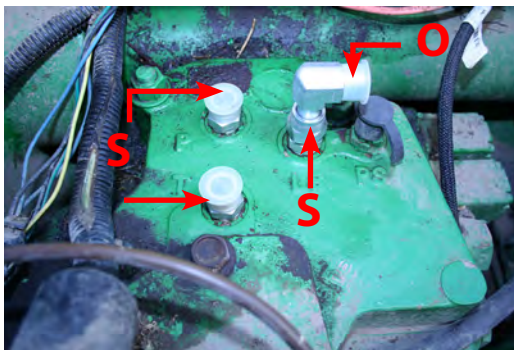
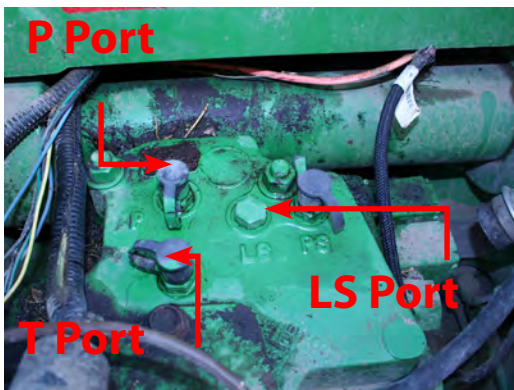


6. TRACTORS NOT USING THE “POWER BEYOND” OPTION

If the tractor is not using the John Deere “Power Beyond” option, remove the plug from the load sense port on the top of the rear tractor hydraulic valve block and install the John Deere shuttle disc R196840 **(U)** and spacer RE58763 **(T)** into the port opening (threaded end up). Install one of the adapters **(S)** in the port. Install the 90° adapter **(O)** on adapter **(S)** with the opening facing the right side of the tractor.

Remove the plug from the Tank port on top of the rear valve block and install an adapter **(S)** in this opening. Remove the plug from the pressure port on top of the valve block and install an adapter **(S)** in this opening as well.

Figure 1-8: Modifying without Power Beyond Installation



7. PREPARING THE LEFT AND RIGHT STEERING CONNECTIONS

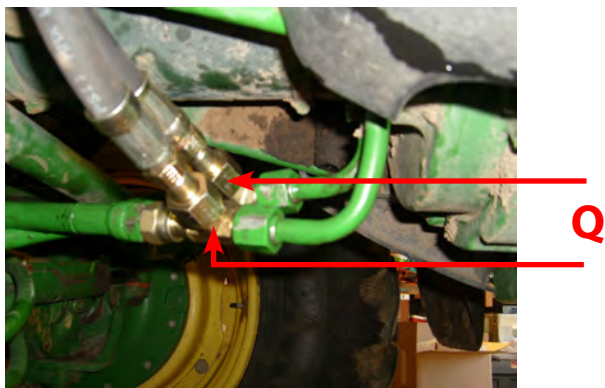
Underneath the tractor, just behind the front differential, find the left and right steering cylinder hoses and their connection point to the steel lines from under the cab.

Figure 1-9: Preparing the Left and Right Steering Connections



Uncouple the hoses from the steel lines (be sure to keep track of which hose is connected to which steel line), and install Run Tees (**Q**) into the end of the steel lines. Then reattach the steering cylinder hoses to the other ends of these run tees.

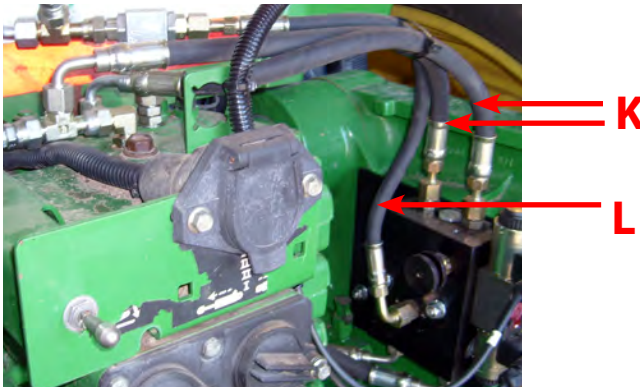
Figure 1-10: Uncouple the Hoses



8. FIELDPILOT VALVE HOSE CONNECTIONS

The Pressure port of the FieldPilot Valve (**D**) will be connected to the pressure port on top of the rear tractor hydraulic block using one hose (**K**). The T port from the FieldPilot Valve (**D**) will be connected to the open fitting on the tank return port on the top of the rear tractor hydraulic block using the second hose (**K**). The LS port on the FieldPilot Valve (**D**) will be connected to the open fitting at the load sense port on the top of the rear tractor hydraulic block using hose (**L**). Refer to the hydraulic diagrams to understand how the FieldPilot Valve (**D**) should fit in the system.

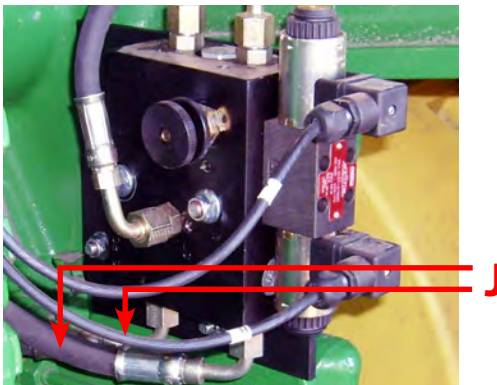
Figure 1-11: Install FieldPilot Valve Hoses



9. INSTALL STEERING OUTPUT HOSES

Kit hoses (**J**) are first connected to the A and B steering ports on the FieldPilot Valve (**D**).

Figure 1-12: Install Steering Output Hoses



Hoses (J) are routed forward under the cab to come out along the left side of the engine. It is best to remove the engine cover on the left side of the tractor to allow easy access to this area.

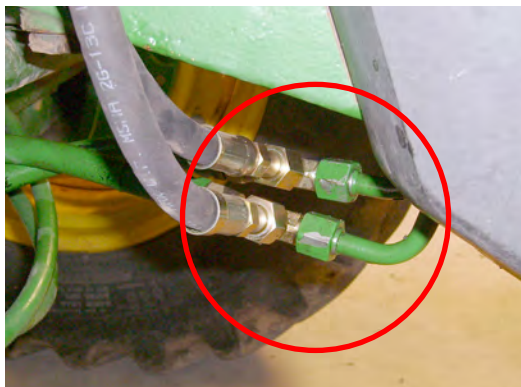
Figure 1-13: Install Steering Output Hoses



Steering Hoses (J)

Finally, connect the end of the steering hoses (J) to the center drops of the run tees previously installed on the steering cylinder hoses.

Figure 1-14: Install Steering Output Hoses (Continued)



This completes the hydraulic kit installation. Be sure all fittings are tight and all hoses are supported and there are no chafe points in the hose runs.

10. INSTALL THE VALVE CONTROL CABLE

The valve control cable (**F**) will connect to the solenoids on the FieldPilot valve and will route into the rear of the cab.

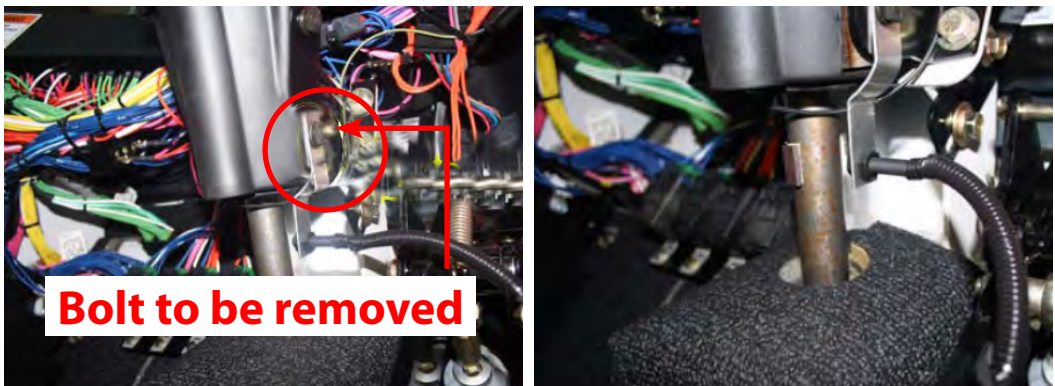
Figure 1-15: Control Cable Location



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

On the right hand side of the steering column in the cab, remove the lower bolt as indicated. Drill a hole in the aluminum bracket from Kit 91-07011 for the bolt to fit through. Install the aluminum bracket and bend it as illustrated. Attach the magnets (included) to the steering shaft. The magnets may need to be cut in two. If the magnets are labeled North and South, alternate between them. The more magnets installed, the more sensitive the disengage feature. Install the sensor and adjust to 1/8" clearance. Connect the sensor to the cable labeled Steering Wheel Sense. Tie up the cable so it does not interfere with any moving parts.

Figure 1-16: Figure 1-16: Installing Steering Disengage Switch



12. INSTALL THE ENGAGE/DISENGAGE SWITCH

Connect item **(D)** 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 **(D)** is not required if the optional foot switch 32-04020 is used.

Figure 1-17: Engage/Disengage Switch



13. RECOMMENDED ELECTRONICS INSTALLATION

The Steering Control Module (SCM) should be mounted securely to the floor of the cab. 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 1-18: 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.

If using a Matrix series console and PWM control, then the oil flow rate adjustment is accomplished through the console. The target lock to lock time is 5 seconds. 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 2½ turns 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 **16 seconds** is observed using a CenterLine® 220. Adjust to **12 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[®]

U S E R M A N U A L

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 John Deere 8x00 and 8x10 Series wheel tractors. Please review this manual thoroughly before beginning the installation process.



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