

FIELDPILOT[®]

USER MANUAL


Assisted Steering Hydraulic Installation Manual for
Vehicle Kit Number 91-02225 and 91-02282

Fits Only Case MX Magnum Tractor

Models 180, 200, 210, 220, 230, 240, 270, 285 (prior to SN: JAZ126070)



TeeJet[®]
TECHNOLOGIES

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 or raise 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.



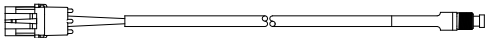

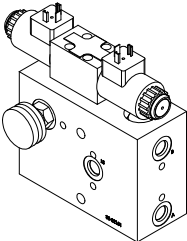
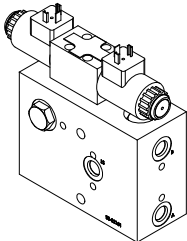
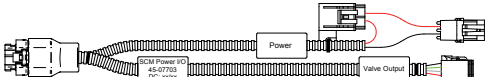
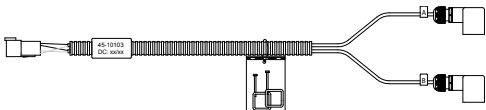
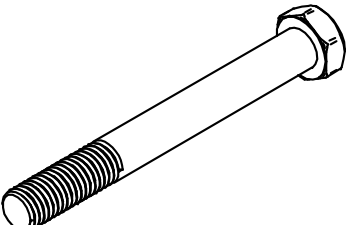
WARNING: PINCH POINT HAZARD! To prevent serious injury or death, avoid unsafe practice while manually operating hydraulic steering circuits. Keep others away and stay clear of mechanical steering linkages.


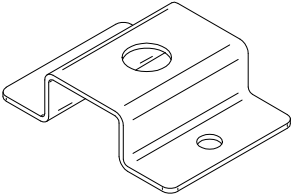
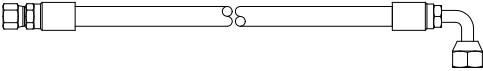
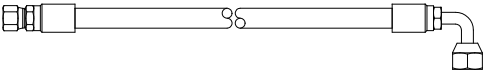
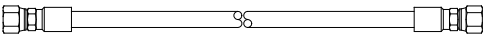
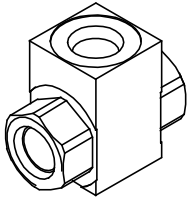
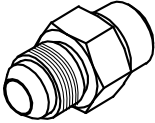
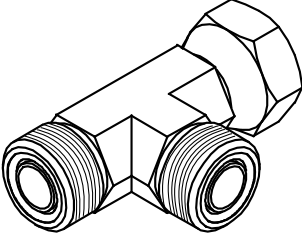
KIT CONTENTS

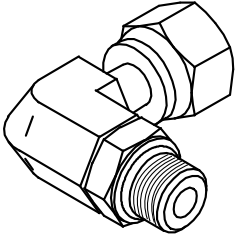
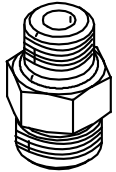
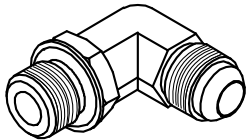
Unpack the installation kit and identify the required parts.

| 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, CC LS, PWM..... | 1 |
| D | 45-07703 | Cable, SCM to Valve Interface Cable | 1 |
| E | 45-10103 | Cable, Hydraulic Valve Interface..... | 1 |
| F | 60-04087 | Bolt, Hex, SST, 3/8" _16 x 3.25" | 2 |
| G | 60-07027 | Nut, SST, 3/8" _16 Nylock..... | 2 |
| H | 65-05134 | Bracket, Valve Mounting | 1 |
| I | 68-01028 | Hose, Hydraulic 3/8" x 52", #6FJICswiv x #8FORFswiv90° | 2 |
| J | 68-01029 | Hose, Hydraulic 3/8" x 45", #6FJICswiv x #8FORFswiv90° | 2 |
| K | 68-01030 | Hose, Hydraulic 1/4" x 43", #6FJICswiv both ends..... | 1 |
| L | 68-02012 | Hydraulic Load Shuttle #6FORB..... | 1 |
| M | 68-02019 | Adapter, Hydraulic #6MORB_#6MJIC | 3 |
| N | 68-02026 | Adapter, Run Tee, #8ORF, F-M-M | 4 |
| O | 68-02028 | Adapter, 90 Elbow, #6MORB x #6FORF | 1 |
| P | 68-02073 | Adapter, Hydraulic, #6MORB_#6MORF | 1 |
| Q | 68-02080 | Adapter, Hydraulic, 90°, #6MJIC x #6MORB..... | 3 |
| R | 90-50013 | Cable Tie Kit | 2 |
| S | 91-07011 | Kit, Steering Wheel Switch | 1 |
| T | 98-05144 | Installation Manual, Case MX Magnum Series..... | 1 |

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

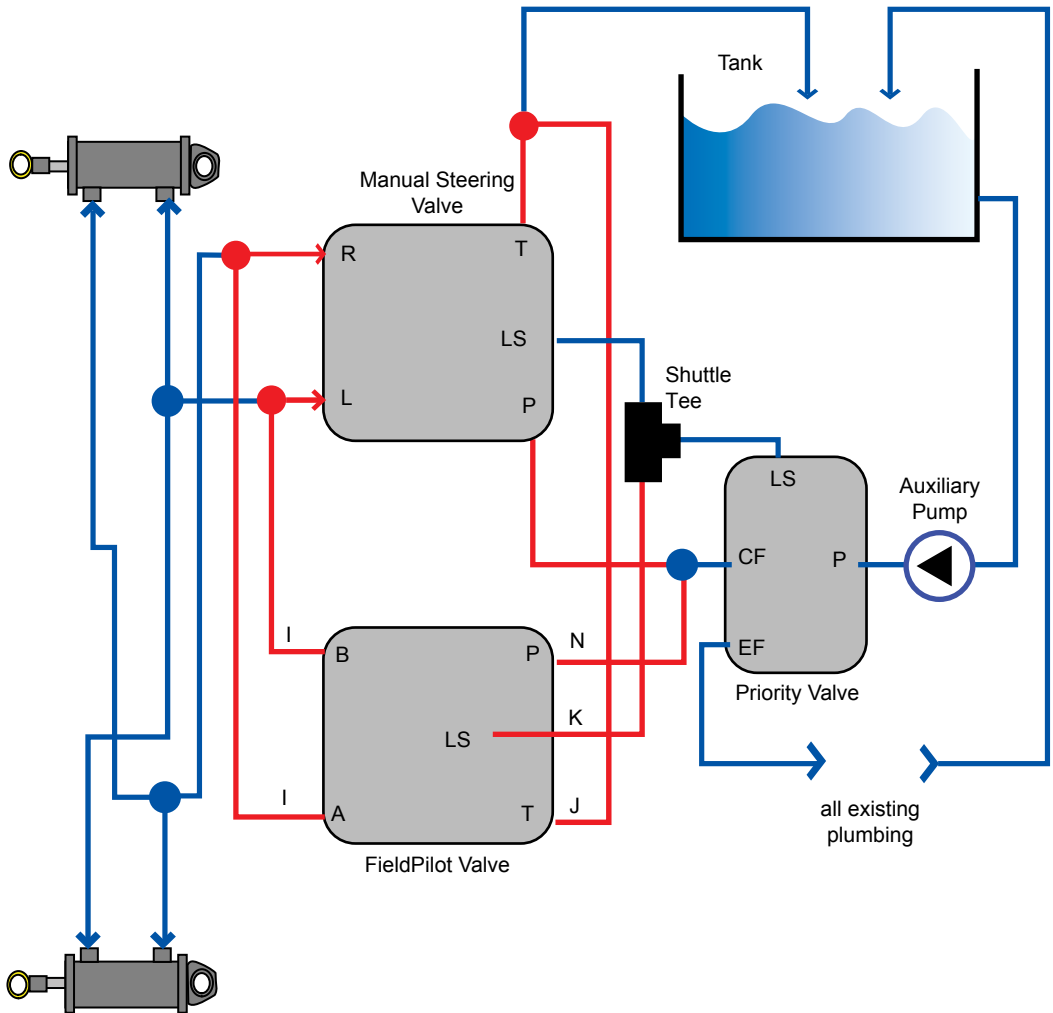
| Item | Part # | Description | Illustration |
|------|----------|-------------------------------------|--|
| A | 32-04040 | Switch, Engage/Disengage, Momentary |  |
| B | 350-0037 | Washer, Flat - 3/8" SST |  |
| C* | 35-02151 | Valve, FieldPilot, CC LS |  |
| C* | 35-02180 | Valve, FieldPilot, CC LS, PWM |  |
| D | 45-07703 | Cable, SCM to Valve Interface Cable |  |
| E | 45-10103 | Cable, Hydraulic Valve Interface |  |
| F | 60-04087 | Bolt, Hex, SST, 3/8" _ 16 x 3.25" |  |

| Item | Part # | Description | Illustration |
|------|----------|--|--|
| G | 60-07027 | Nut, SST, 3/8" _16 Nylock |  |
| H | 65-05134 | Bracket, Valve Mounting |  |
| I | 68-01028 | Hose, Hydraulic 3/8" x 52", #6FJICswiv x #8FORFswiv90° |  |
| J | 68-01029 | Hose, Hydraulic 3/8" x 45", #6FJICswiv x #8FORFswiv90° |  |
| K | 68-01030 | Hose, Hydraulic 1/4" x 43", #6FJICswiv both ends |  |
| L | 68-02012 | Hydraulic Load Shuttle #6FORB |  |
| M | 68-02019 | Adapter, Hydraulic #6MORB_#6MJIC |  |
| N | 68-02026 | Adapter, Run Tee, #8ORF, F-M-M |  |

| Item | Part # | Description | Illustration |
|------|----------|--|--|
| O | 68-02028 | Adapter, 90 Elbow, #6MORB x #6FORF |  |
| P | 68-02073 | Adapter, Hydraulic, #6MORB_#6MORF |  |
| Q | 68-02080 | Adapter, Hydraulic, 90°, #6MJIC x #6MORB |  |
| R | 90-50013 | Cable Tie Kit | |
| S | 91-07011 | Kit, Steering Wheel Switch | |
| T | 98-05144 | Installation Manual, Case MX Magnum Series | |

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

Figure 1-1: Hydraulic Diagram



Existing Hoses

Hoses From Kit

INSTALLATION



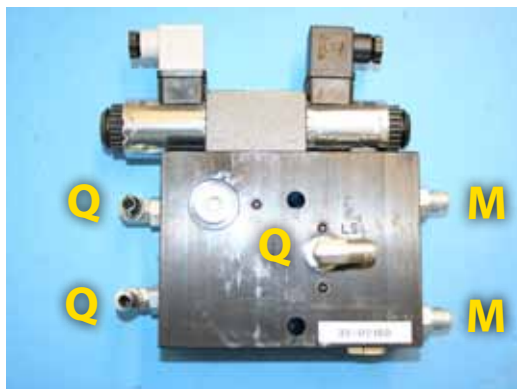
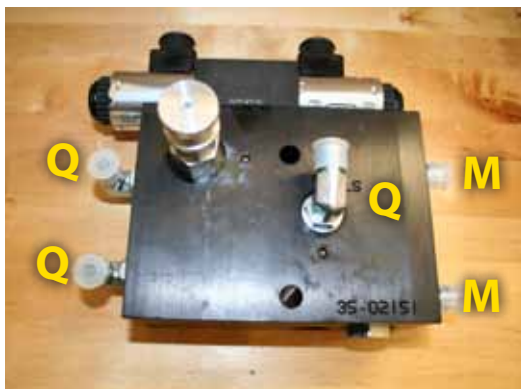
If there are questions concerning the installation of the FieldPilot system on this vehicle, or due to the changes in component specifications the parts supplied in the kit are not exactly as presented in this document, please contact your dealer or TeeJet Customer service representative for clarification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

1. PREPARE THE FIELDPILOT VALVE

Make sure the FieldPilot valve (**C**) is clean and free of dust. Work on a clean bench. Remove the plastic plugs and install the straight adapters (**M**) in the A and B ports and the 90° adapters (**Q**) in the P, T and LS ports

Figure 1-2: Prepare the FieldPilot Valve



2. INSTALL THE FIELDPILOT VALVE BRACKET

The FieldPilot valve will be mounted to the tractor frame on the left side, below the cab, and beside the fuel tank. Locate and remove the lower of the two bolts securing the step mounting bracket to the tractor frame. Using that bolt, secure the hydraulic mount bracket (**H**) to the tractor frame.

Figure 1-3: Install Mounting Bracket for FieldPilot Valve



3. MOUNT FIELDPILOT VALVE

Use bolts (**F**), washers (**B**) and nuts (**G**) to mount the FieldPilot Valve to the bracket.

NOTE: It may be necessary to initially mount with one (1) bolt so that the valve can be rotated to install the rear hoses.

Figure 1-4: Mount the FieldPilot Valve



4. INSTALL STEERING OUTPUT ADAPTERS

Locate the tractor steering orbital in front of the cab just below the windshield. The two lines projecting from the steering orbital on the left side are the right and left turn output lines and will be stamped R and L on the casting. Remove the right and left turn steering hoses and install two of the run-tees (**N**). Leave the run-tee fittings loose to allow for alignment when attaching hoses.

Figure 1-5: Install Steering Output Adapters



5. INSTALL STEERING OUTPUT HOSES

Install steering hoses (**I**) to the branches of the run-tees installed in Step 4. Route the hoses down to the FieldPilot valve as illustrated and connect to the A and B ports. Make sure hoses are secure and routed for problem free operation. Securely tighten all connections.

Figure 1-6: Install Steering Output Hoses

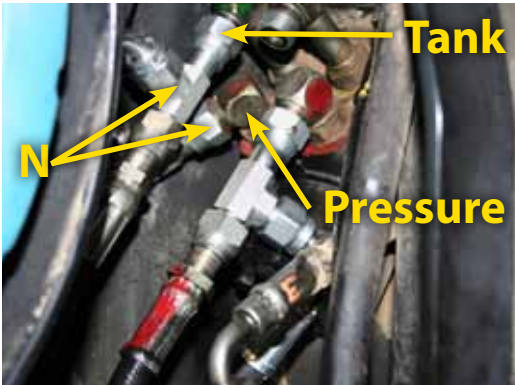




6. INSTALL PRESSURE AND TANK ADAPTERS

On the tractor steering orbital, the top right line is the tank return port and the lower right line is the pressure supply. These ports will be stamped P and T respectively on the orbital casting. Remove the hoses from these two ports on the steering orbital and install run-tees (**N**) provided. Leave the run-tees loose to allow for alignment when attaching hoses.

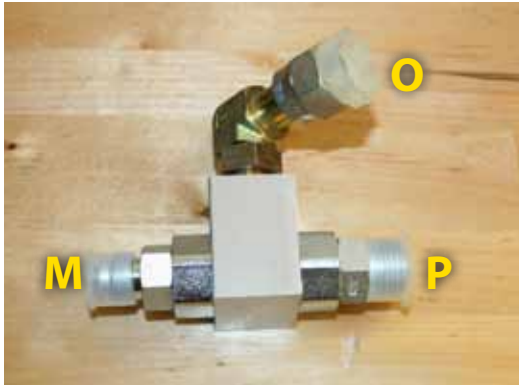
Figure 1-7: Install Pressure and Tank Adapters



7. INSTALL LOAD SENSE SHUTTLE AND ADAPTERS

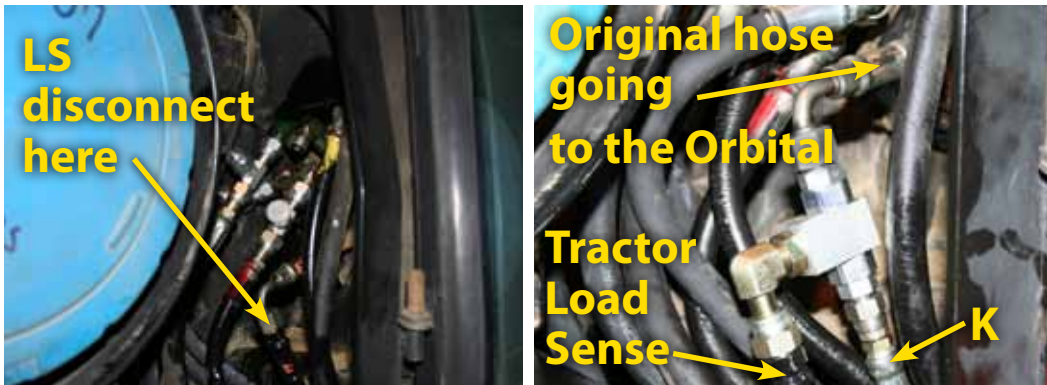
Pre-assemble the load sense shuttle (**L**) with adapters (**P**), (**O**), and (**M**).

Figure 1-8: Install Load Sense Shuttle and Adapters



Locate the small load sense hydraulic line on the left side of the steering orbital. Disconnect it as shown.

Figure 1-9: Install Load Sense Shuttle and Adapters



Attach the end of the load sense shuttle with the o-ring face adapter to the hose going back to the steering orbital. Attach the tractor load sense line to the o-ring face female elbow in the center position of the shuttle as shown.

8. INSTALL PRESSURE, TANK AND LOAD SENSE HOSES

Install pressure and tank hoses (**J**) to the branches of the run-tees installed in Step 6. Route the hoses down the FieldPilot valve as shown.

Figure 1-10: Install Pressure, Tank and Load Sense Hoses



Connect the hose from the P port on the orbital to the P port on the FieldPilot valve. Connect the hose from the T port on the orbital to the T port on the FieldPilot valve.

Install the load sense hose (**K**) to the JIC fitting (**M**) on the end of the load sense shuttle installed in Step 7. Route the hose down to the hydraulic control block as shown and connect to the LS port on the block.

Make sure the hoses are secure and routed for problem free operation. Securely tighten all connections.

Figure 1-11: Install Pressure, Tank and Load Sense Hoses



9. INSTALL VALVE CONTROL CABLE

Route the valve cable from the valve, underneath the cab, and into the cab through the cable grommet in the back right of the cab.

Figure 1-12: Install the Valve Control Cable

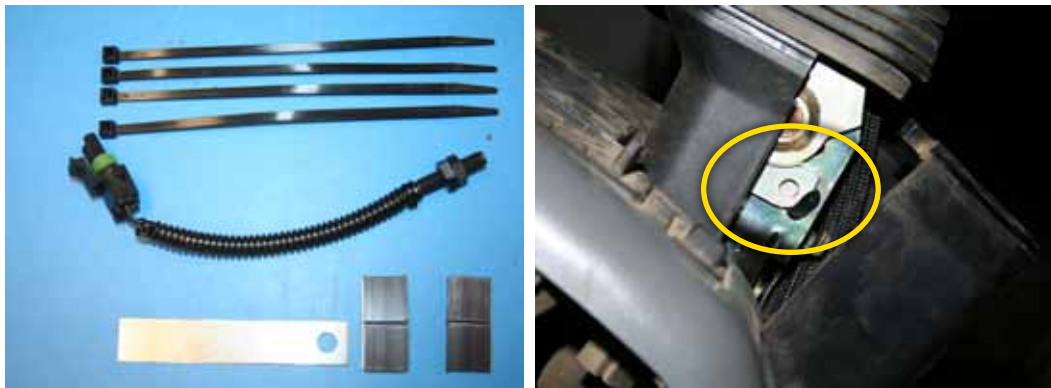


10. INSTALL STEERING DISENGAGE SWITCH (KIT 91-07011)

The steering disengage kit (**S**) 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. One option is to remove the cowling around the steering column. Drill a hole as indicated and mount the sensor inside the cowling. Usually three or four magnets are adequate.

Pictures: 8143, 2915, 2916

Figure 1-13: Install Steering Disengage Switch (Kit 91-07011)





11. 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 1-14: Engage/Disengage Switch



12. 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 1-15: Recommended Electronics Installation



13. 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 and the valve frequency is 110Hz. 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 2 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.

14. 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 Case MX Magnum Series Tractors. Please review this manual thoroughly before beginning the installation process.



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