

Automated Steering Kit Installation Guide

Kit: EDX-C8900-A, P/N 911-2001-000

EDX-C8900-CBV, P/N 911-2060-10

Fits Case IH Tractor Models:

911-2060-10


7110 7210
7120 7220
7130 7230
7140 7240
7150 7250

911-2001-000

8910
8920
8930
8940
8950



Read and Follow Safety Messages

- In these instructions, you will see the heading **WARNING** and the safety alert symbol . They indicate a hazardous situation that, if not avoided, could result in death or serious injury. The safety messages provide information to identify a hazard associated with potential injury.
- Before installing, operating, or performing maintenance or service on any part of the system:
 - Read and understand this installation guide and all of the safety information.
 - Read and understand the Automated Steering System User Guide.
- Do not allow anyone to operate without instruction.
- Keep these instructions and all related safety information with the manuals for your machine and other implements.

If you have questions or need assistance, contact your local dealer or distributor.

Overview

A series of equipment specific kits has been developed to work in conjunction with your automated steering system. For the machine models listed above, these kits contain the components for:

- the steering hydraulics
- the wheel angle sensor (WAS)
- the steering wheel switch (SWS - for steering override)

The items in each kit are detailed in the tables that follow the safety warnings below. After the kit tables there are four step-by-step installation sections, one for each of the kits.

Please read this manual thoroughly before beginning the installation.

WARNING:

To avoid serious injury or death during machine operation, install the appropriate kits for your machine make and model.

Machine Preparation

⚠ WARNING:

Inspect the machine and perform any needed maintenance (for example, contaminated hydraulic fluid) before installing the automated steering kit. This kit cannot perform as intended on a machine that is not maintained properly. Errors in performance increase the risk of operator and bystander injury or death.

Failure to maintain clean hydraulic fluid and operational hydraulic components can cause loss of directional control resulting in serious injury or death.

To avoid serious injury, wear hand and eye protection and use wood or cardboard when checking for leaks.

Turn off the machine and power off the automated steering controller when installing or performing maintenance.

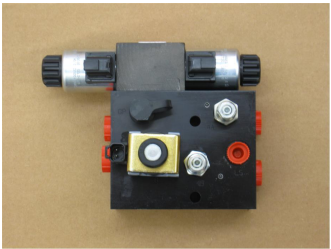


Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as hydraulic hoses or electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and ORFF type fittings, referred to in the Kit Contents section, may be damaged by degreasing solvent cleaners. If a fitting is to be cleaned internally, you should first remove and clean the o-ring with a fiberless cloth.

Kit Contents - Steering Hydraulics








Unpack the hydraulics installation kit and identify the required parts as shown. Kit items are A, B, C etc. with an H (Hydraulic) prefix.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HA	760-0020-000	1	Assy, hyd valve block - 15L/Proportional (Hydraulic steering block)	
Bag H1 contains HB and HC				
HB	760-2058	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (LS port on hydraulic steering block)	
HC	760-2061-000	4	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB (P, T, A and B ports on hydraulic steering block)	




Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HD	640-0004	1	Hydraulic steering block mounting bracket	
Bag H2 contains HE and HF				
HE	675-2012	2	Bolt - 5/8NC x 4-1/2" Gr5 ZP	
	676-1037	2	Nut, lock - 5/8NC ZP (Mount HD to machine frame)	
HF	675-2006	2	Bolt - 3/8NC x 3 3/4" Gr5 ZP	
	678-1054	2	Washer, narrow flat - 3/4"OD x 13/32"ID x 1/16" thk ZP	
	676-1035	2	Nut, nylock - 3/8NC ZP (Mount hydraulic steering block HA on HD)	
Bag H4 contains HJ				
HJ	760-2069	4	Adapter, hyd run tee - #8ORFF (Steering, pressure and tank ports at orbital)	
Bag H5 contains HK, HL, HM, HN, HO and HP				
HK	760-0002	1	Hydraulic load shuttle sense shuttle valve - #6femORB	
HL	760-2058	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (Load sense shuttle - if applicable)	

Kit Contents - Steering Hydraulics *(continued)*



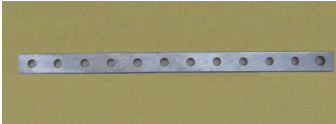

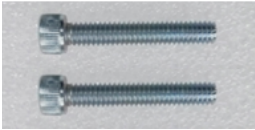

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HM	760-2034	1	Adapter, hyd 90 elbow - #4maleORFF x #6maleORB (Load sense shuttle - if applicable)	
HN	760-2056	2	Adapter, hyd - #6maleJIC x #6maleORB (Load sense shuttle - 1 or 2 as applicable)	
HO	760-2048	1	Adapter, hyd - #6maleORFF x #6maleORB (Load sense shuttle - if applicable)	
HP	760-2032	1	Adapter, hyd 90EL - #4maleORFF x #6femORFFswivel (Load sense port on orbital - if applicable)	
HQ	760-1023	3	Hose, hyd - 3/8" x 58", #6femJIC x #8femORFF90 (Tank and steering hoses)	
HR	760-1024	1	Hose, hyd - 3/8" x 52", #6femJIC x #8femORFF90 (Pressure hose)	
HS	760-1025	1	Hose, hyd - 3/8" x 13", #8maleORFF x #8femORFF90 (Replacement pressure line at orbital)	

Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HT	760-1022	1	Hose, hyd - 1/4" x 14", #6femJIC x #4femORFF (Load sense port on orbital to load sense shuttle valve)	
HU	760-1026	1	Hose, hyd - 1/4" x 43", #6femJIC x #6femJIC (Load sense hose)	
HV	677-2001	20	Tie strap, 11" heavy duty	

Kit Contents - Wheel Angle Sensor

Unpack the wheel angle sensor kit and identify the required parts as shown. Kit items are A, B, C etc. with a W (Wheel) prefix.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI	
WC	602-1087-000	1	Connector arm, steering, long	
WD	675-1191-000	2	Screw, mach, 8-32 x 3" PPH ZP	
WE	676-1054-000	4	Nut, nylock - 8/32NC ZP	
WF	675-1150-000	2	Screw, 8-32 x 1", Allen socket cap, ZP	
WG	675-2031-000	1	Threaded rod, 5/16-24 x 12"	

Kit Contents - Wheel Angle Sensor *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WH	676-1053-000	4	Nut, 5/16-24 standard ZP	
WI	760-0018-000	2	Rod end swivel with stud, 5/16-24	
WJ	675-2010	2	Bolt - 5/16NC x 3/4" Gr5 ZP	  (Bolts WAS assy to mounting bracket WK)
	678-1077-000	2	Washer, lock 5/16, ZP	
WK	640-0071-000	1	WAS assy mounting bracket	
WL	640-0070-000	1	WAS assy link rod mounting bracket (Use with WM)	
Bag W3 contains WM and WN				
WM	675-0107-000#	2	Clamp, 1-1/2" polypropylene	
	<i>or</i>	<i>or</i>		
	675-0106-000#	2	Clamp, 1-1/4" polypropylene (Use according to tie rod diameter)	
WN	675-2005	2	Bolt - 3/8NC x 3-1/4" Gr5 ZP	
	678-1054	2	Washer, narrow flat - 3/4"OD x 13/32"ID x 1/16" thk ZP	
	676-1035	2	Nut, nylock - 3/8NC ZP (Use with WM and WL)	

Kit Contents - Steering Wheel Switch

Unpack the steering wheel switch kit and identify the required parts as shown. Kit items are A, B, C etc. with an S (Switch) prefix.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
SA	478-0008	2	Magnet, flex - 1/2"W x 1"L x 1/8"T, plain, 1 (You will use only one magnet on this installation)	
SB	675-0077	1	Epoxy, Hardman 04001 - single double bub	
SC	675-0123-000	1	Epoxy, Hardman 04007 - single double bub	
SD	602-1062	1	Bracket, steering wheel switch mounting	
SE	726-1054 or 051-0443-10	1	Assy, steering wheel switch	
SF	677-2002	4	Tie strap, 7" releasable	

Installation - Automated Hydraulic Steering Kit

⚠ WARNING:

Before installing, disconnecting or repairing the hydraulic hoses and components, turn off the machine and relieve all pressure from the hydraulic system by turning the steering wheel left and right. Failure to remove the pressure can result in serious injury or death from unexpected machine movement.

To avoid burn injury when installing, disconnecting or repairing the hydraulic hoses and components, turn off the machine and allow the system to cool down prior to touching the parts of the machine that are heated.

See Appendix B for a schematic of the hydraulic circuits.

1. Prepare the hydraulic steering block.

NOTE: Make sure the hydraulic steering block is clean and dust free.

Remove the plastic plugs and install elbow adapters **HC** in the **P, T, A** and **B** ports and adapter **HB** in the **LS** port (Figure 1).

2. Install the mounting bracket.

- a. Locate the holes in the left side tractor frame in front of the cab. If the tractor is equipped with a toolbox in this location, remove it and relocate it to the right hand side of the tractor. Attach the hydraulic steering block mounting bracket **HD** to the frame here using the mounting hardware **HE** (Figures 2a-i [with inset] and 2a-ii).

3. Install the hydraulic steering block

- a. Tighten the block mounting **HD** to the frame (hardware **HE**) and the block to the bracket **HD** using hardware **HF** (Figure 3a-ii).
- b. Figure 3a-ii shows a gray control box that is used with eDriveX/XC controllers only. For detailed install instructions refer to the eDriveX/XC ECU install guide

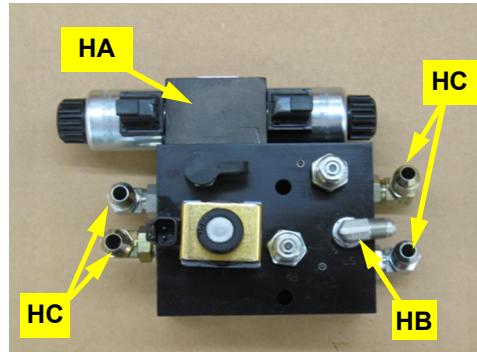
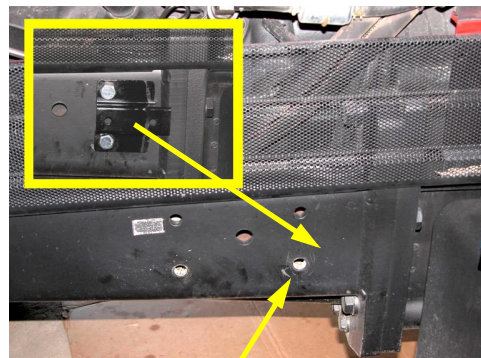


Figure 1: Prepared hydraulic block



Figures 2a-i and 2a-ii: Hydraulic block mounting bracket installation location

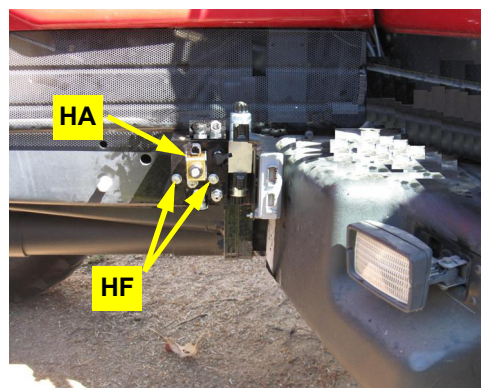


Figure 3a-ii: Installed hydraulic block

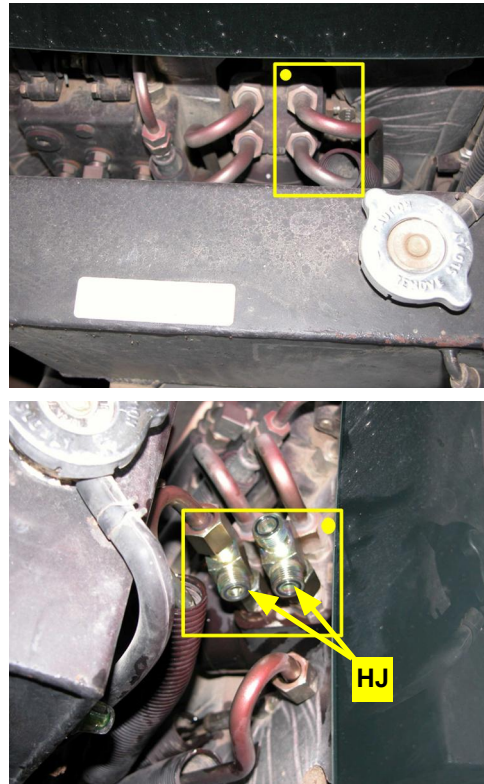
4. Install the steering output fittings.

NOTE:

7100 and 7200 series tractors will require the installation of a counter balance valve kit. Using the parts and installation manual included in the kit continue the installation. When you have completed the counter balance valve installation, continue on to step 6.

8900 series tractors continue to follow the steps listed below.

- a. Locate the tractor steering orbital in front of the cab, just below the windshield. The two lines coming out of the left side of the steering orbital are the steering output lines and are stamped **R** and **L** on the casting (Figure 4a).
- b. Remove the steel line fittings from the steering orbital and install the run-tee fittings **HJ** as shown. Reattach the steel line fittings (Figure 4b).
- c. Leave the run-tee fittings **HJ** loose to allow for alignment when attaching hoses. Plastic caps placed on the open ends of the fittings will prevent excessive leakage prior to hose installation.



Figures 4a and 4b: Installed steering output fittings

5. Install the steering output hoses.

- a. Connect the steering output hoses **HQ** to the run-tee fittings **HJ** and route the hoses adjacent to the tractor firewall down towards the hydraulic steering block (Figure 5a).
- b. Connect the straight fitting ends of the steering output hoses **HQ** to the **A** and **B** ports of the hydraulic steering block (Figure 5b).
- c. Carefully check the hose routing for clearance of sharp edges and securely tighten all steering output hose fittings, both at the run-tees and at the hydraulic steering block.

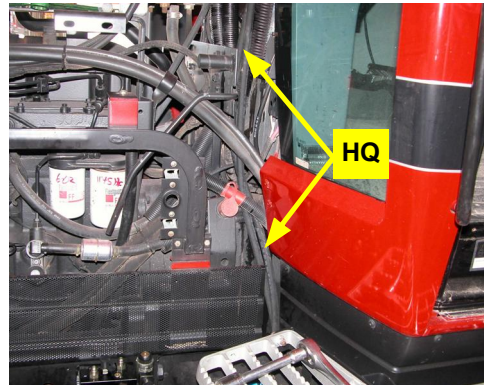


Figure 5a: Installed steering output hoses

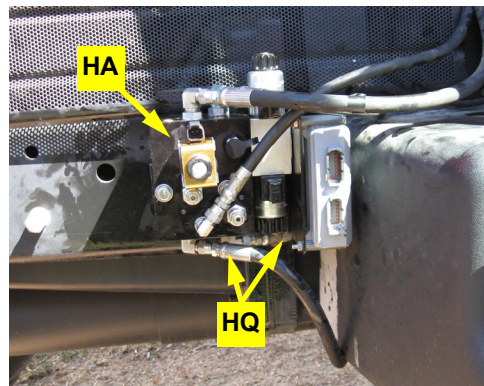
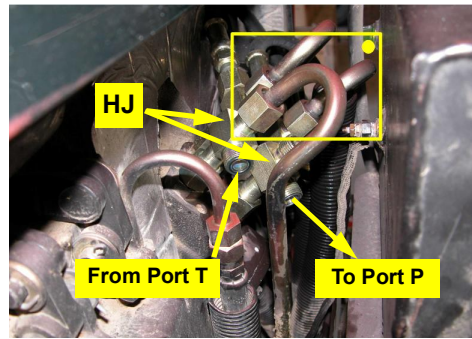
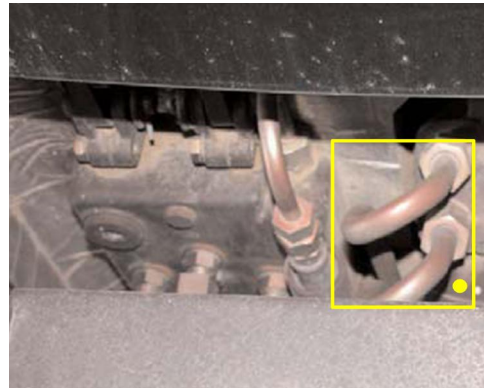


Figure 5b: Output hoses connected to the steering block

6. Install the tractor pressure and tank fittings.

- a. Locate the tractor steering orbital in front of the cab, just below the windshield. The two lines coming out of the right side of the steering orbital are the tractor pressure and tank line, stamped **P** and **T** on the casting (Figure 6a).
- b. Remove the steel line fittings from the steering orbital and install the run-tee fittings **HJ** as shown. Reconnect the steel tank line fitting. You will replace the steel pressure line in step 7 (Figure 6b).
- c. Leave the run-tee fittings **HJ** loose to allow for alignment when attaching hoses. Plastic caps placed on the open ends of the fittings will prevent excessive leakage prior to hose installation.



Figures 6a and 6b: Installed pressure and tank fittings—tank line (only) reconnected

7. Replace the steel pressure line on orbital.

Remove the short steel portion of the steering orbital pressure line and replace it with hydraulic hose **HS** (Figures 7a-i and 7a-ii).

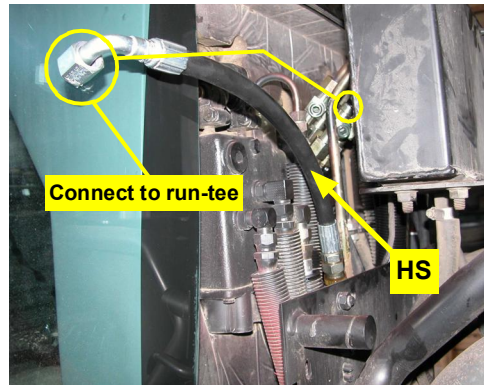


Figure 7a-i: Pressure line replaced

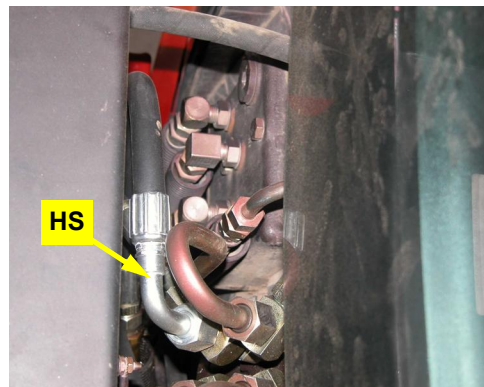


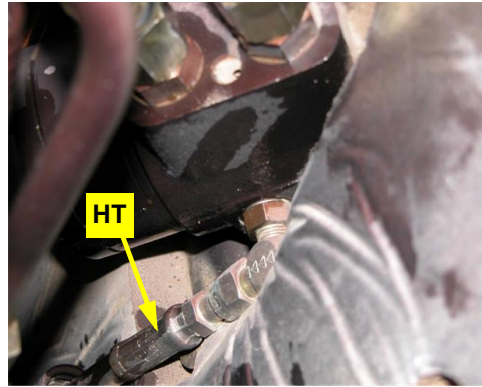
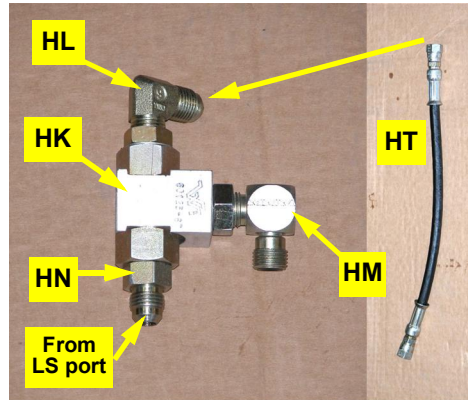
Figure 7a-ii: Replacement steering pressure line connected to run-tee at orbital

8. Install the tractor load sense shuttle/fittings.

The load sense port on the steering orbital will be located on the left side, the front, or the top of the steering orbital depending on tractor model. If the load sense port is located on the left side, refer to step **8-1**. If the load sense port is located on the front or the top of the steering orbital, refer to step **8-2** or step **8-3** respectively.

8-1 Load sense port located on left side of orbital.

- a. Prepare the load sense shuttle **HK** with the fittings **HL**, **HM**, and **HN** (Figure 8-1a).
- b. Locate the tractor load sense hydraulic hose on the left side of the steering orbital (Figure 8-1b).
- c. Remove the tractor load sense hose from the steering orbital and connect it to the center elbow fitting **HM** of the load shuttle assembly **HK**. Install the provided hydraulic hose **HT** between the top elbow fitting **HL** on the load shuttle assembly and the steering orbital load sense fitting (Figures 8-1a and 8-1b).



Figures 8-1a and 8-1b: Connecting the load sense shuttle and supplied hose

8-2 Load sense port located on front of orbital.

a. Prepare the load sense shuttle **HK** with the fittings **HN** and **HO** (Figure 8-2a).

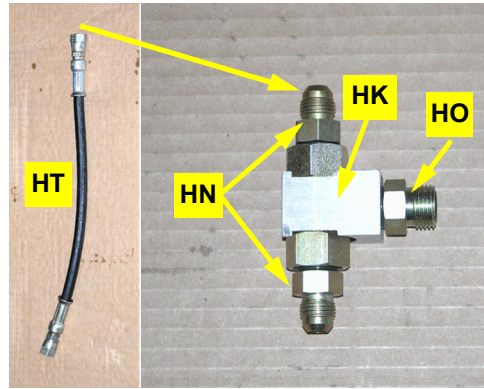


Figure 8-2a: Prepared load sense shuttle

b. Locate the tractor load sense hydraulic hose on the front of the steering orbital (Figure 8-2b).

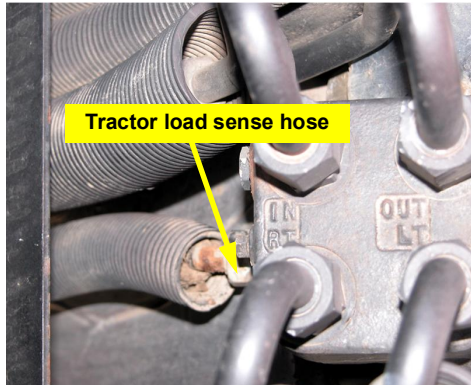


Figure 8-2b: Locating the load sense hose

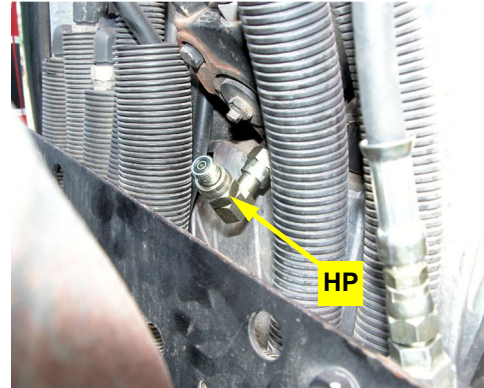


Figure 8-2c: Elbow adapter installed at LS port

c. Disconnect the tractor load sense hydraulic hose from the steering orbital and install the elbow adapter fitting **HP** to the load sense port on the steering orbital (Figure 8-2c).

d. Connect the tractor load sense hose (disconnected at c) to **HO** on the prepared load sense shuttle **HK** (Figure 8-2d).

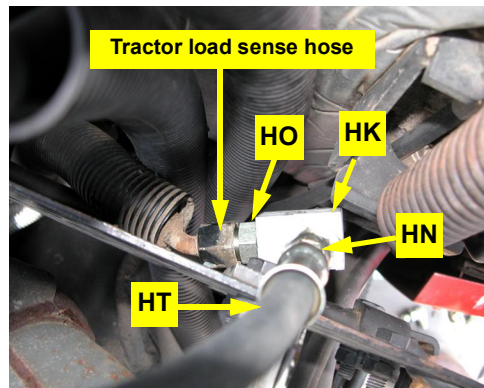


Figure 8-2d: Load sense line to shuttle

e. Install the provided hose **HT** between the elbow adapter **HP** installed at the orbital and **HN** on the prepared load sense shuttle (Figure 8-2e).

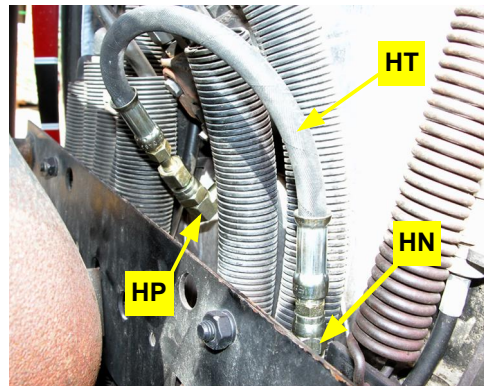
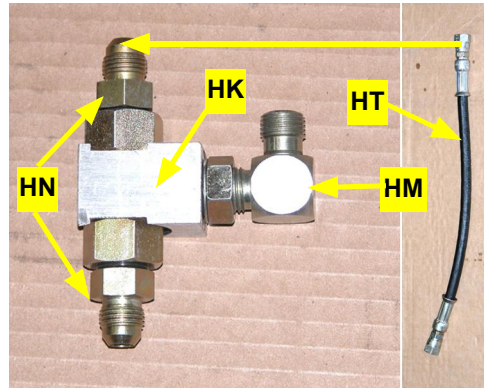


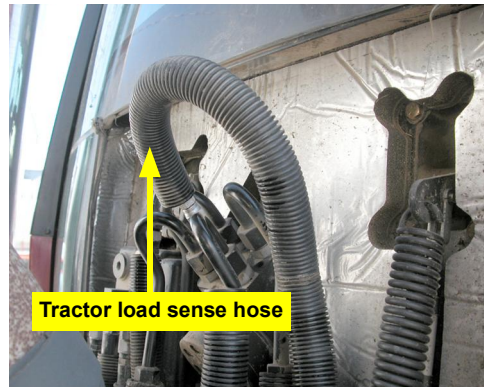
Figure 8-2e: Hydraulic hose between orbital load sense port and shuttle

8-3 Load sense port located on top of orbital.

a. Prepare the load sense shuttle **HK** with the fittings **HN** and **HM** (Figure 8-3a).



b. Locate the tractor load sense hydraulic hose on top of the steering orbital (Figure 8-3b).



c. Disconnect the tractor load sense hose from the load sense port of the steering orbital (Figure 8-3c).

Figures 8-3a and 8-3b: Connecting the load sense hose to the shuttle

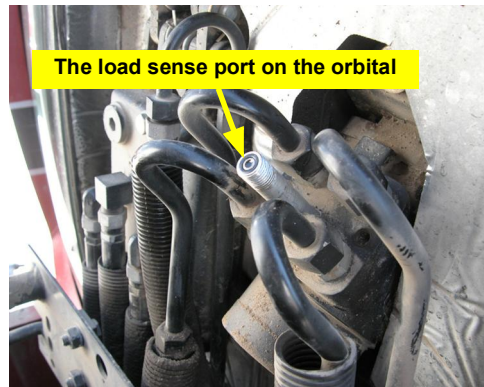


Figure 8-3c: Load sense hose disconnected from load sense port

d. Connect the tractor load sense hose to fitting **HM** on the load sense shuttle **HK** (Figures 8-3d).

e. Install the provided hose **HT** between the load sense port on the steering orbital and the fitting **HN** on the load sense shuttle **HK** (Figure 8-3d).

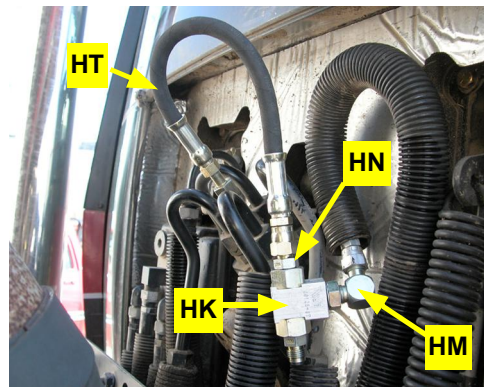


Figure 8-3d: Connecting the shuttle to the load sense port

9. Install the pressure, tank, and load sense hoses.

- a. Install the hydraulic hose **HU** between the **LS** port of the hydraulic steering block and the open end of the load sense shuttle assembly (**HN**) installed in step **8** (Figures 9a and 9b). Use a supplied heavy tie strap to secure load shuttle assembly to the tractor framework.
- b. Install the pressure **HR** and tank **HQ** hydraulic hoses between the **P** and **T** ports of the hydraulic steering block respectively and the corresponding run-tees installed in step **6** (Figure 9b). Make certain that the connections are not reversed.
- c. Make sure all hoses are routed properly and free from entanglement. Use supplied heavy tie straps as required. Securely tighten all hydraulic hose fittings and adapters.

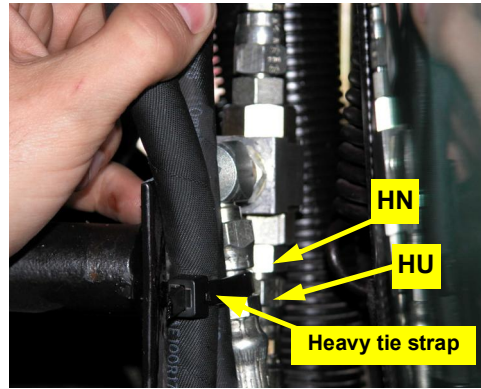


Figure 9a: Connecting the LS port and the shuttle and securing the shuttle assembly

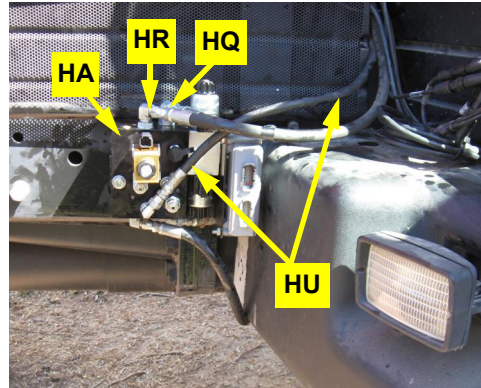


Figure 9b: Installing the pressure and tank hoses (and LS hose)

10. Verify operation.

⚠ WARNING: *During tests of the hydraulic system, the machine may move unexpectedly. Be prepared for machine movement to avoid injury.*

Keep others away and stay clear of mechanical steering linkages to prevent serious injury or death from pinch point hazards while manually operating the hydraulic steering circuit.

- a. Tighten all connections and clean up the installation area around the tractor and make certain that it is safe to operate.
- b. Start the tractor and check hydraulic connections for any leaks.
- c. Rotate the steering wheel from one extreme to the other and back.

Installation - Wheel Angle Sensor (WAS)

⚠ WARNING:

Switch off the machine's engine while installing or adjusting the WAS. Keep others away and stay clear of mechanical steering linkages to prevent serious injury or death from pinch point hazards while manually operating the hydraulic steering circuit.

1. Prepare the wheel angle sensor.

- Using the provided hardware **WE** (nuts) and **WD** (bolts - not shown), attach the WAS wire connector **WB** to the WAS housing **WA**. Install the bolts up through the bottom of the housing. The WAS wire connector **WB** can be mounted 90° to any of the WAS housing **WA** sides (Figure 1a).

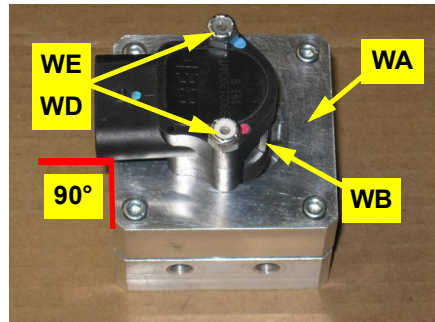


Figure 1a: Prepared WAS housing/connector

- Cut five holes off the WAS arm **WC** at the opposite end from the WAS shaft mounting hole (Figure 1b).

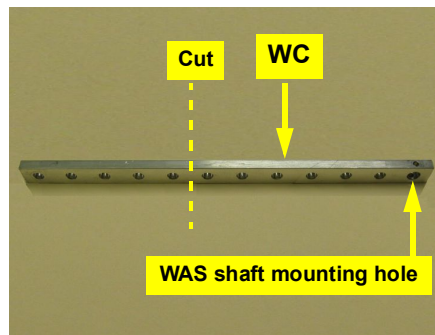


Figure 1b: WAS arm preparation

- Using hardware **WE** (nut) and **WF** (screw), attach the cut WAS arm **WC** to the WAS assembly. Mount the arm in the same direction as the WAS wire connector **WB** (Figure 1c).

NOTE:

*Before you cut the rod at step 1d, screw the provided nuts **WH** onto the rod so that they are inside the cut you will make. After you have cut the rod, the nuts can help clean the threads.*

- Cut the provided threaded rod **WG** 3½" long then screw the swivel rod ends **WI** onto the cut threaded rod to achieve a center-to-center stud measurement of 4¾" (Figures 1d-i and 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2f.

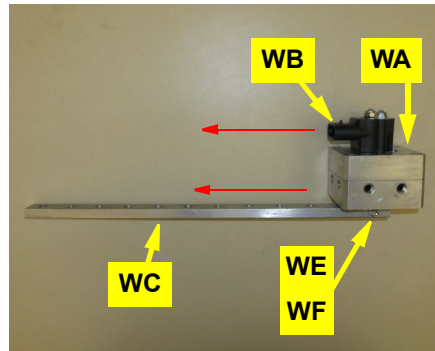


Figure 1c: Attached WAS arm

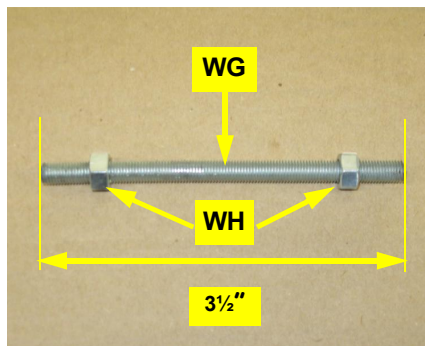


Figure 1d-i: Cut threaded rod

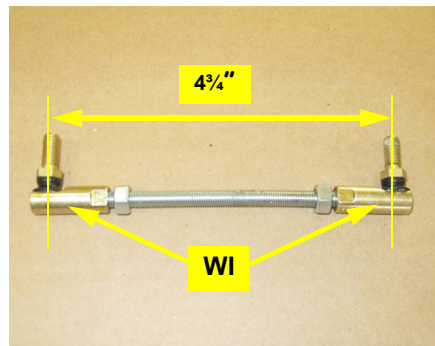


Figure 1d-ii: Assembled threaded rod

2. **Mount the wheel angle sensor.**
- a. Locate the tie rod and axle stops on the right hand side of the steering axle (Figure 2a).

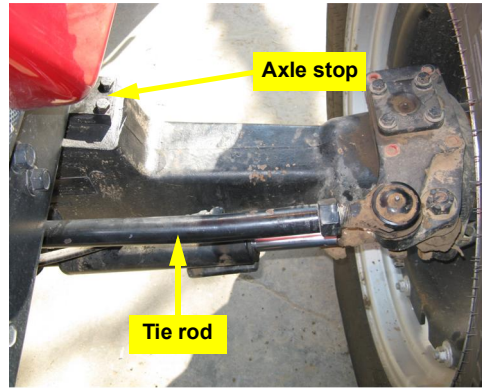


Figure 2a: Axle and tie rod location

- b. **7100 Series:**
- Using hardware **WN**, attach plastic clamp **WM** ($1\frac{1}{2}$ " or $1\frac{1}{4}$ " according to tie rod diameter) and link rod bracket **WL** to the tie rod next to the locking nut. Install bracket **WL** at the bottom of clamp **WM** with its rod hole toward the steering cylinder (Figure 2b-i).

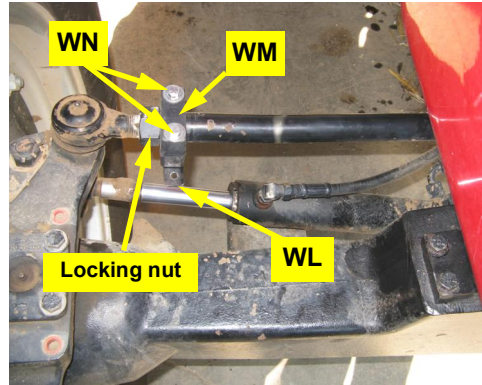


Figure 2b-i: Installed clamp (7100 series)

- 8900 Series:**
- Using hardware **WN**, attach plastic clamp **WM** ($1\frac{1}{2}$ " or $1\frac{1}{4}$ " according to tie rod diameter) and link rod bracket **WL** (as in Figure 2b-i) to the tie rod $4\frac{1}{2}$ " from the center of the ball joint to the center of clamp **WM** (Figure 2b-ii - WM not shown).

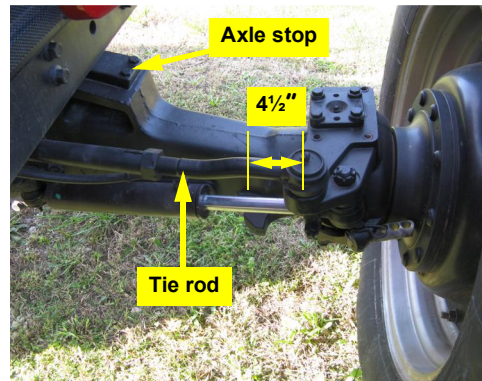


Figure 2b-ii: Clamp location (8900 series)

- c. Remove the two axle stop bolts and attach bracket **WK** using the axle stop bolts (Figure 2c).

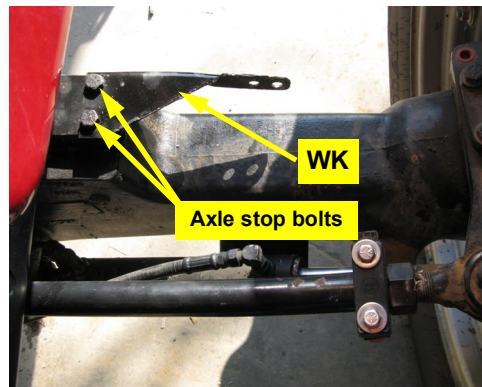


Figure 2c: Installed bracket at axle stop

2. **Mount the wheel angle sensor (continued).**
- d. Attach the WAS assembly from steps 1a and 1b to bracket **WK** using hardware **WJ** with the WAS connector facing the center of the machine (Figure 2d).

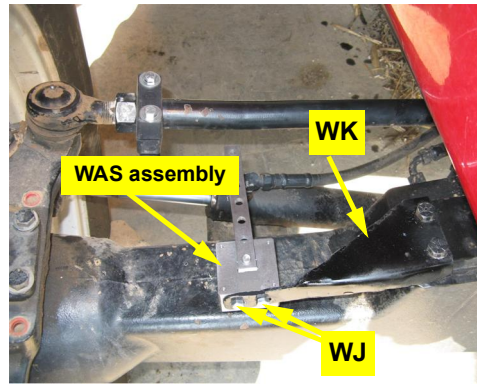


Figure 2d: Installed WAS assembly

- e. Using the remaining hardware **WH**, install the assembled WAS linkage from step 1d between the rod bracket **WL** on the tie rod clamp and the last hole in the WAS connector arm **WC**. Install the linkage with the swivel studs downwards but leave the swivel stud nuts **WH** loose (Figure 2e).
- f. With all hardware **WH** loose, slowly turn the wheels full left lock then full right lock (Figures 2f-i and 2f-ii). Check that the linkage moves freely without binding and adjust the linkage if necessary.
- g. When the linkage does move freely and without binding, tighten hardware **WH** on the rod and the swivels.

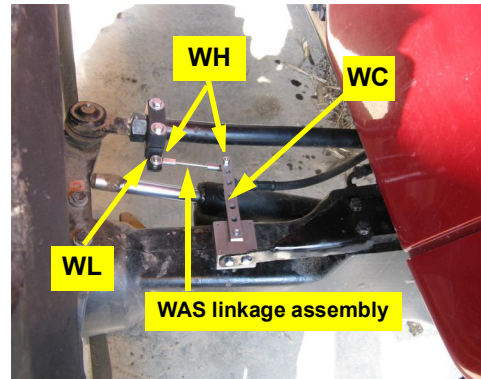


Figure 2e: Installed linkage assembly



Figure 2f-i: WAS at full right lock

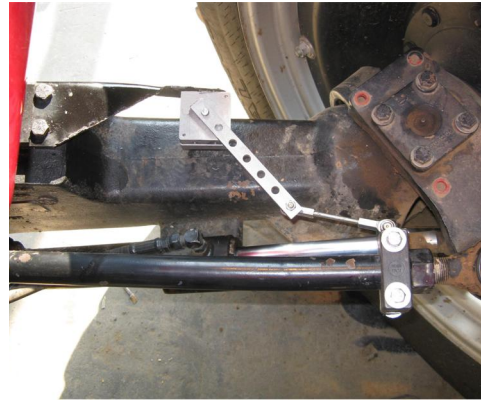


Figure 2f-ii: WAS at full left lock

Installation - Steering Wheel Switch (SWS)

1. Install the steering wheel switch.

- a. Remove the left and right side panel of the steering console (Figure 1a).

NOTE: To facilitate reassembly, be sure to note the placement of fasteners while removing paneling.



Figure 1a: Console panel - left side

- b. Remove the electronic instrument cluster and the top console panel. (Figure 1b).

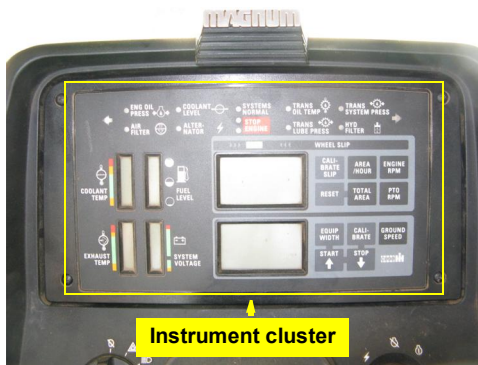


Figure 1b: Instrument cluster

- c. Locate the steering shaft and the cast aluminum housing. Using a file, remove the casting line on the top left face of the aluminum housing. Clean the area and be sure the top face is flat (Figure 1c).

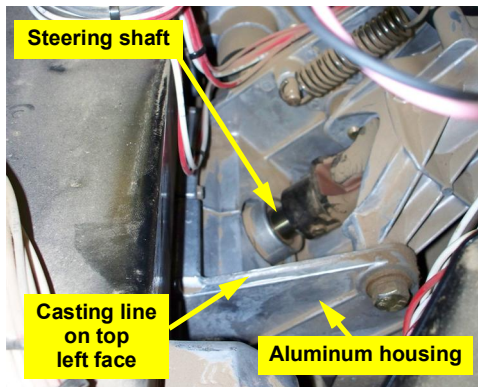


Figure 1c: Aluminum housing and steering shaft

- d. Cut one of the magnets **SA** in half. Using the two-part epoxy **SB** attach the two magnet halves 180° apart from each other on the metal steering shaft (Figure 1d).

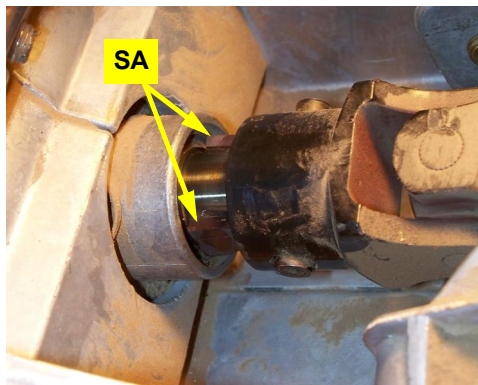


Figure 1d: Installed magnets

1. **Install the steering wheel switch (continued).**

- e. Assemble the aluminum mounting bracket **SD** and sensor **SE** (Figure 1e).

NOTE: *The aluminum bracket **SD** might have a plastic coating. If it has, remove the plastic coating before installation.*

Using a generous amount of epoxy **SC** attach the assembled mounting arm and sensor to the top face of the steering housing. Align the mounting bracket and sensor with the magnets on the steering shaft. Hold the mounting bracket in place with locking pliers. Adjust the sensor face to 1/8" to 1/4" from the magnet (Figure 1e).

- f. Route the cable **SE** up from the sensor at the steering shaft through the bottom of the steering console (Figure 1f).
- g. After the epoxy dries reassemble the steering console.

NOTE: *Allow the epoxy to fully harden to decrease the chance of misalignment of the magnets and sensor.*

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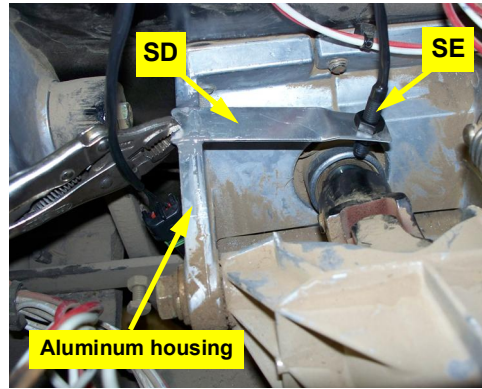


Figure 1e: Installed mounting bracket and sensor

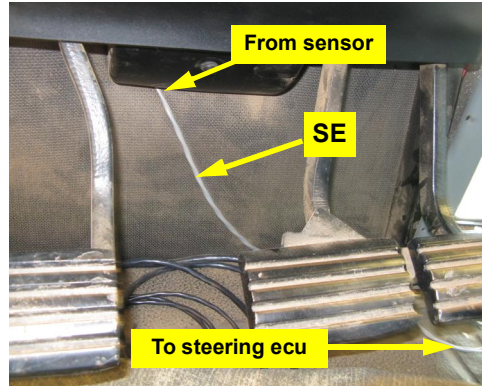


Figure 1f: Cable routing

Appendix B - Hydraulic Circuits

