Automated Steering Kit Installation Guide

Kit: EDX-C9300, P/N 911-2002-000

Fits Case Steiger Tractor Models:

9170	**9270**	**9370**
9180	**9280**	**9380**
		9390

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.

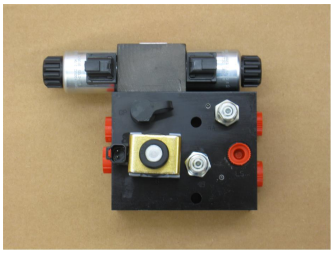
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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.

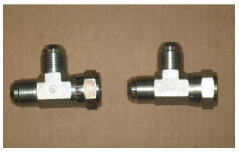
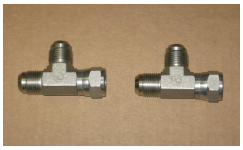
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a spray cleaner such as 'Brake Clean' to prevent hydraulic system contamination. Note that o-rings used on ORB and ORFF type fittings, referred to in the Kit Contents section, may be damaged by 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.

Kit Contents - Steering Hydraulics

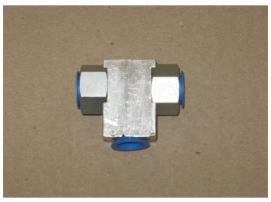
Unpack the hydraulics installation kit and identify the required parts as shown. Kit items are A, B, C etc. with an H (Hydraulic) prefix.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HA	760-0021-000	1	Assy, hyd valve block - 35L\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)	
HD	640-0009	1	Hyd block mnt, C9370	

Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag H2 contains HE and HF				
HE	675-2007	2	Bolt - 3/8NC x 3/4" Gr5 ZP	
	676-1035	2	Nut, nylock - 3/8NC ZP	
HF	675-2006-000	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	
Bag H4 contains HJ, HK, HL, and HM				
HJ	760-2016	2	Adapter, hyd run tee - #12JIC	
HK	760-2017	2	Adapter, hyd 90 elbow - #12maleJIC x #12femJICswiv	
HL	760-2006	2	Adapter, hyd run tee - #10JIC	
HM	760-2007	2	Adapter, hyd 90 elbow - #10maleJIC x #10femJICswiv	

Kit Contents - Steering Hydraulics *(continued)*

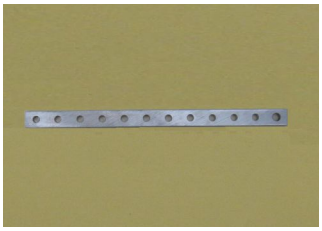
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag H5 contains HN, HO, HP, HQ, and HR				
HN	760-0002	1	Hyd load shuttle - #6femORB	
HO	760-2037	1	Adapter, hyd 90 elbow - #4maleJIC x #6maleORB	
HP	760-2058	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB	
HQ	760-2041	1	Adapter, hyd - #6maleORB x #6femJICswiv	
HR	760-2029	1	Adapter, hyd - #4femJIC x #6maleJIC	

Kit Contents - Steering Hydraulics *(continued)*

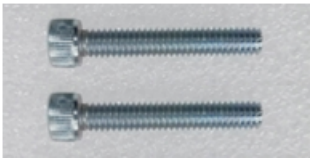
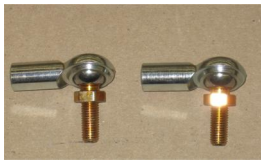
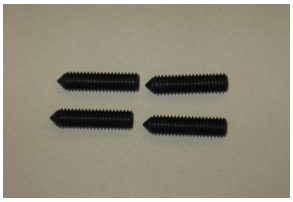
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HS	760-1027	2	Hose, hyd - 3/8" x 67", #6femJICswiv x #10femJICswiv	
HT	760-1028	1	Hose, hyd - 1/4" x 78", #6femJIC x 6femJIC swiv both ends	
HU	760-1029	1	Hose, hyd - 1/2" x 60", #6femJICswiv x 12femJICswiv	
HV	760-1030	1	Hose, hyd - 1/2" x 77", #6femJICswiv x #12femJICswiv	
HW	677-2001	20	Tie strap, 11" heavy duty	

Kit Contents - Wheel Angle Sensor

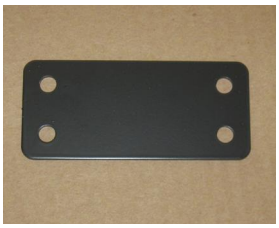
Unpack the wheel angle sensor kit and identify the required parts as shown. Kit items are A, B, C etc. with a W (Wheel) prefix.

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	

Kit Contents - Wheel Angle Sensor *(continued)*

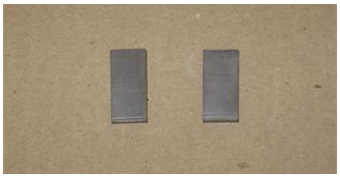
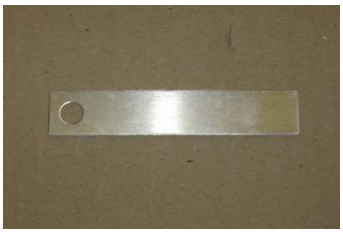
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WF	675-1150-000	2	Screw, 8-32 x 1", Allen socket cap, ZP	
WG	675-2031-000	1	Threaded rod, 5/16-24 x 12"	
WH	676-1053-000	4	Nut, 5/16-24 standard ZP	
WI	760-0018-000	2	Rod end swivel with stud, 5/16-24	
WJ	675-2010	2	Bolt - 5/16NC x 3/4 Gr5 ZP	
	678-1077-000	2	Washer, lock 5/16, ZP	
Bag W3 contains WK and WL				
WK	675-2010	2	Bolt - 5/16NC x 3/4 Gr5 ZP	
	676-1036	2	Nut, nylock - 5/16NC ZP	
WL	675-2043-000	4	Cone point Allen, 3/8"-16 x 1-1/2", SSS, BO	

Kit Contents - Wheel Angle Sensor *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WM	675-0126-000	1	Threadlocker, Loctite 242, single use	
WN	640-0073-000	1	Bracket, EDX extension	
WO	640-0074-000	1	Bracket, EDX rod	
WP	640-0085-000	1	Bracket, EDX clamp	
WQ	640-0089-000	1	Bracket, EDX rod clamp	

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	
SB	675-0077	1	Epoxy, Hardman 04001 - single double bub	
SC	602-1062	1	Bracket, steering wheel switch mounting	
SD	726-1054 or 051-0443-10	1	Assy, steering wheel switch	
SE	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.

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

2. Install the steering block mounting bracket.

a. Locate the air cleaner on the left front fender of the tractor. You will mount the hydraulic steering block on the underside of the air cleaner mount bracket.

Using the right rear most mounting bolt on the air cleaner and the hardware provided in group **HE**, secure the mount bracket **HD** (Figure 2).

NOTE: *If necessary, drill a 7/16" hole in the air cleaner bracket to use hardware group **HE**.*

3. Install the hydraulic steering block

a. Mount the hydraulic steering block **HA** onto the bracket **HD** with hardware **HF** (Figure 3b).

b. Figure 3b 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

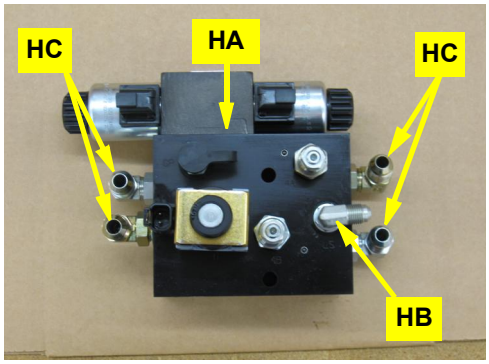


Figure 1: Prepared hydraulic block

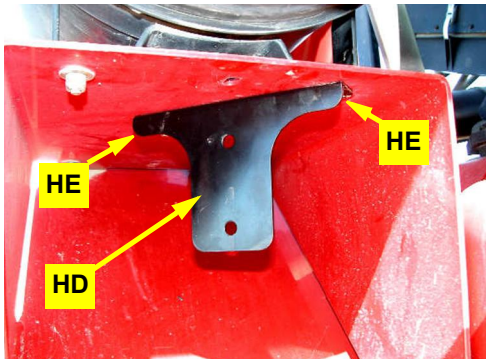


Figure 2: Installed steering block mounting bracket

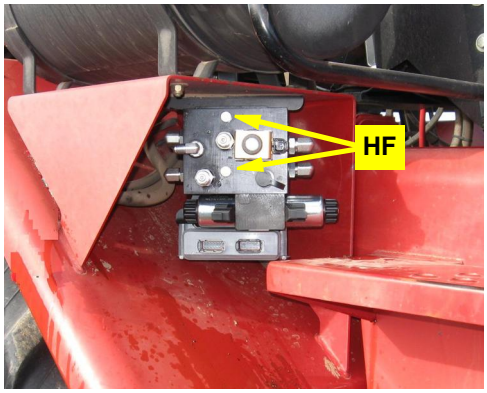


Figure 3b: Installed hydraulic block

4. Install the pressure and tank fittings.

a. Locate the pressure supply port on the steering orbital. It is the lower right line (Figure 4a-i).

Remove the pressure hose from the steering orbital and install the run tee fitting **HJ**. Reinstall the pressure hose just removed to the end of the run tee just installed (Figure 4a-ii).

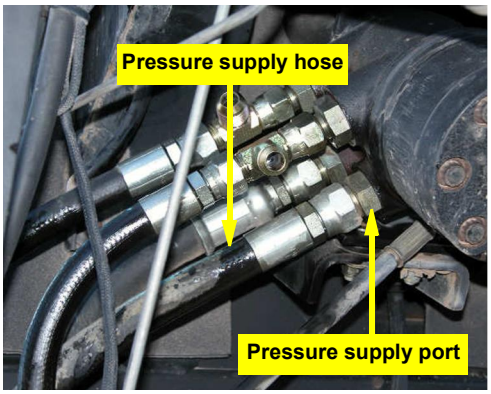


Figure 4a-i: Pressure supply port on steering orbital

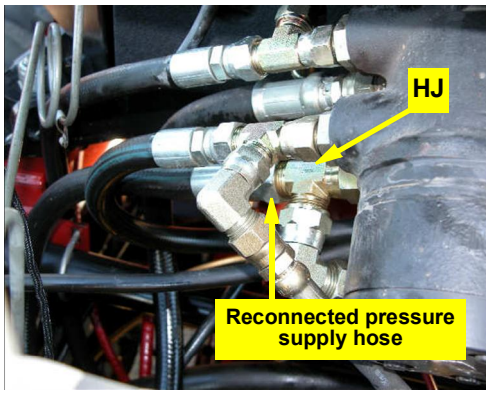


Figure 4a-ii: Installed run tee and reconnected pressure hose (other connections will be described later)

b. Locate the steel tank drain line inside the tractor frame on the right side of the tractor. Remove the hose running up to the steering orbital and install run tee **HJ** (Figures 4b-i and 4b-ii).

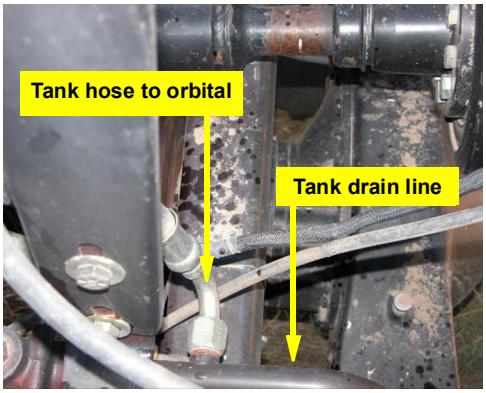


Figure 4b-i: Tank hose at tank drain line

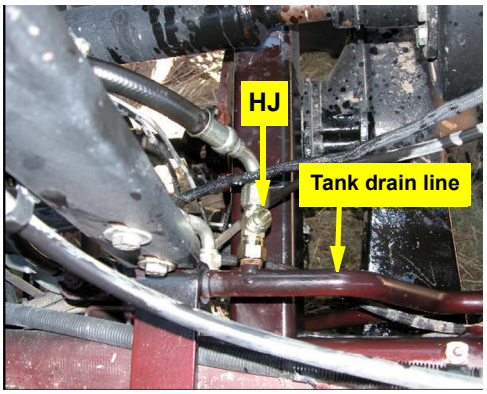


Figure 4b-ii: Installed run tee at tank drain line. Tank hose to orbital reconnected to run tee

NOTE: *Leave run tees 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.*

5. Prepare and install the load sense shuttle valve.

a. Assemble the load sense shuttle valve **HN** with fittings **HO, HQ, HR** and **HP** (Figure 5a).

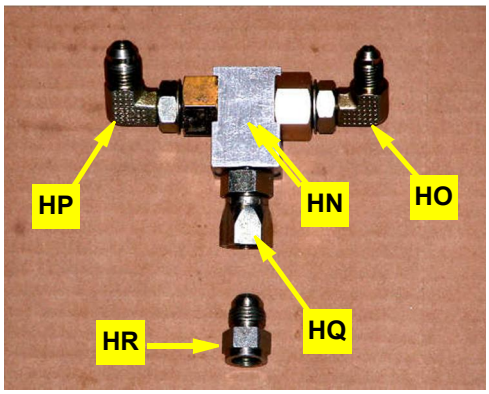


Figure 5a: Prepared load sense shuttle valve

b. Locate the small load sense hydraulic line on the underside of the steering orbital and trace it down to the frame where it connects to a valve block. (Figure 5b-i).

Disconnect the load sense line from the valve block and install the provided adapter **HR** in the valve block (Figure 5b-i).

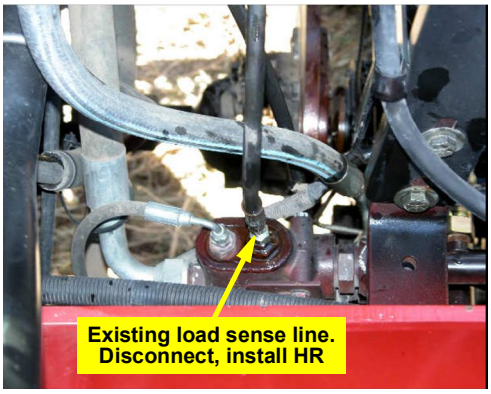


Figure 5b-i: Existing load sense line

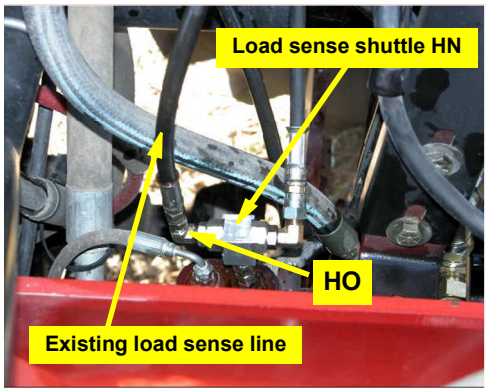


Figure 5b-ii: Installed load sense shuttle. Load sense hose connection is described at step 6c.

c. Install the load sense shuttle by connecting adapter **HQ** to **HR**. Connect the load sense line that you disconnected from the valve block to the load sense shuttle adapter **HO** (Figure 5b-ii).

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

a. Install elbow adapter **HK** at the branch of the run tee **HJ** installed on the steering orbital at step 4a. Connect the pressure hose **HU** to adapter **HK** (Figure 6a).

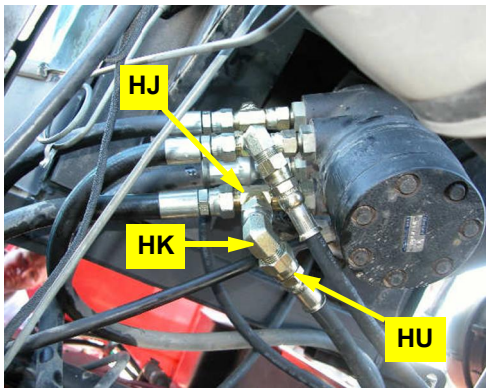


Figure 6a: Pressure hose connected at orbital

6. Install the pressure, tank, and load sense hoses *(continued)*.

b. Install elbow adapter **HK** at the branch of the run tee **HJ** installed on the steel tank drain line at step 4b. Connect the tank drain hose **HV** to adapter **HK** (Figure 6b).

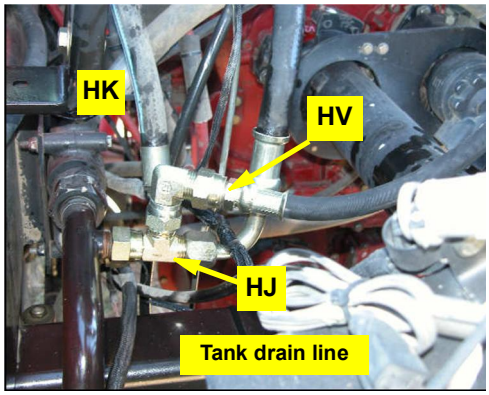


Figure 6b: Tank drain hose connected at run tee

c. Connect the load sense hose **HT** to the open end of the load sense shuttle **HN** installed at step 5c (Figure 6c).

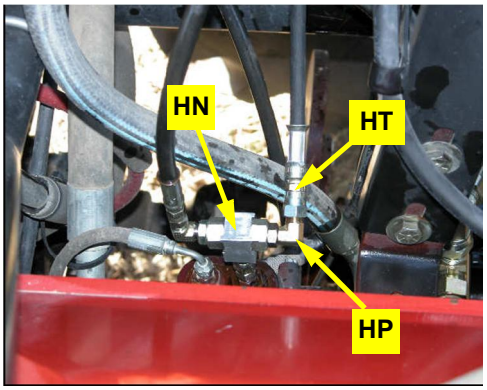


Figure 6c: Load sense hose connected at load sense shuttle

d. Route the pressure, tank and load sense hoses **HU, HV** and **HT** down and across to the hydraulic steering block. Use tie straps **HW** as required to secure the hoses for problem-free operation (Figures 6d-i to 6d-iii).

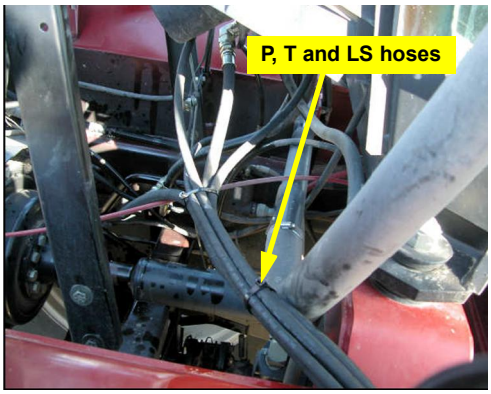


Figure 6d-i: Hoses routed to steering block

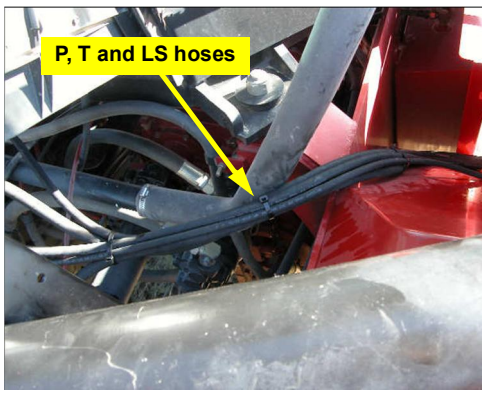


Figure 6d-ii: Hoses routed to the steering block

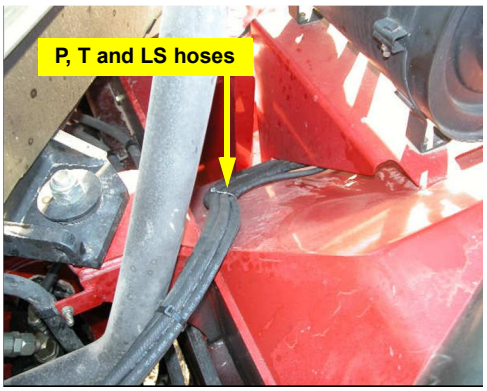


Figure 6d-iii: Hoses routed to the steering block

7. Connect pressure, tank, and load sense hoses to the hydraulic steering block.

Connect the pressure, tank and load sense hoses **HU, HV** and **HT** to the **P, T** and **LS** ports of the hydraulic steering block respectively (Figure 7).

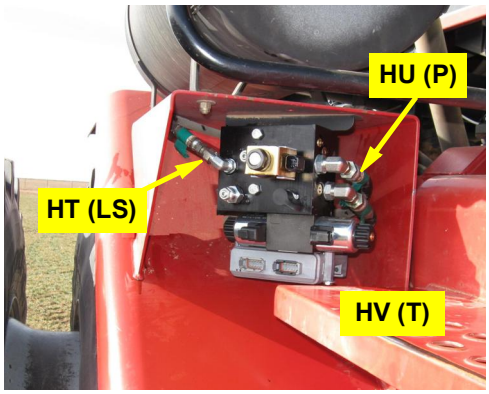


Figure 7: Pressure, tank and load sense hoses connected to steering block

8. Install steering output fittings.

a. Locate the two smaller lines coming out of the orbital. They are the left (L) and right (R) steering lines (Figure 8a).

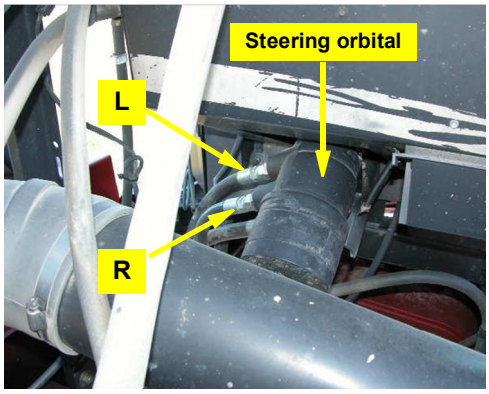


Figure 8a: Left and right steering hoses at orbital

b. Remove the right and left steering hoses and install the run tee fittings **HL.** Reconnect the left and right steering hoses (Figure 8b).

NOTE: *Leave run tees 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.*

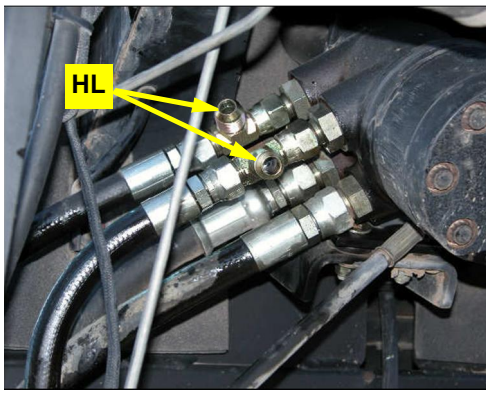


Figure 8b: Run tees installed, left and right steering hoses reconnected

9. Install steering output hoses.

a. Install the two elbow adapters **HM** on the branches of the run tee fittings **HL** installed at step 8b. Connect the larger JIC straight connectors of the steering output hoses **HS** to the elbow adapters (Figure 9a).

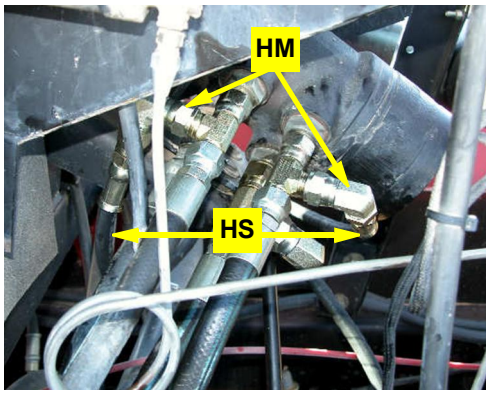


Figure 9a: Steering output hoses connected to run tees using elbow adapters

9. Install steering output hoses *(continued)*.

b. Route the steering output hoses **HS** down to the hydraulic steering block (Figure 9b-i and 9b-ii).

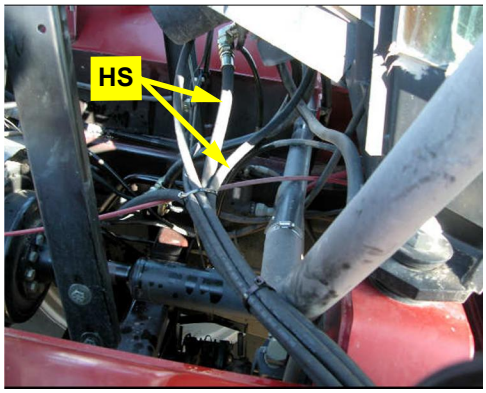


Figure 9b-i: Steering output hoses routed to steering block

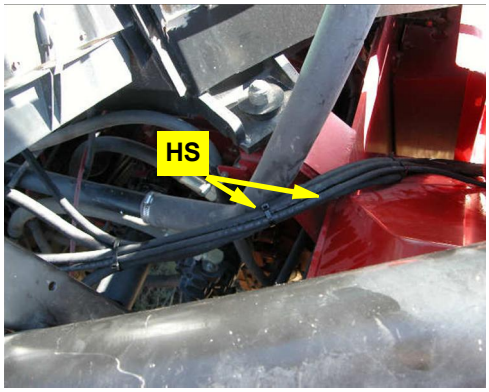


Figure 9b-ii: Steering output hoses routed to steering block

c. Connect the hose ends with the smaller JIC straight connectors to the **A** and **B** ports on the hydraulic steering block (Figure 9c).

d. Ensure that the hoses are secure for problem-free operation.

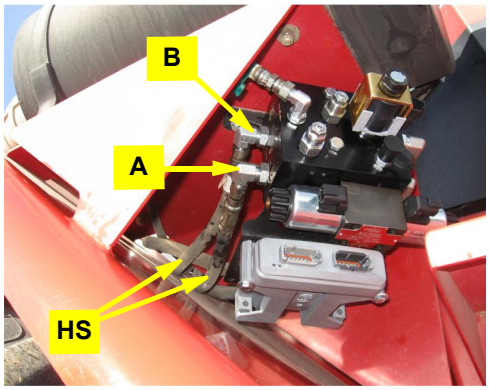


Figure 9c: Steering output hoses connected to steering block

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.

a. 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 45° to any of the WAS housing **WA** sides (Figure 1a).

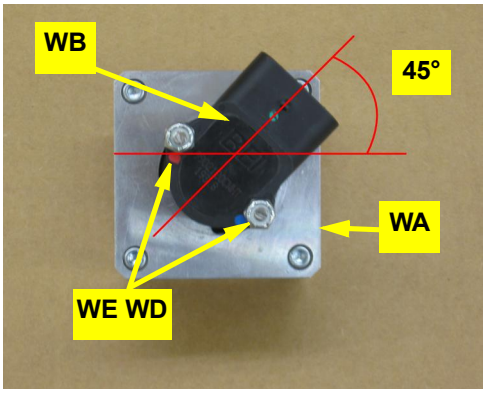


Figure 1a: Prepared WAS housing\connector

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

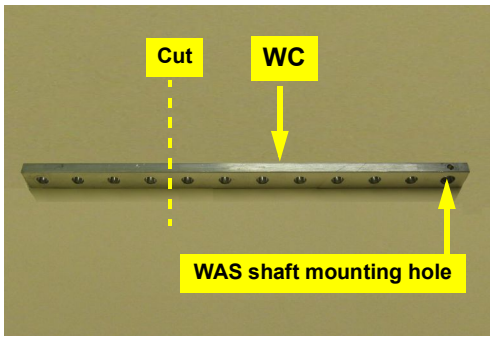


Figure 1b: WAS arm preparation

c. 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).

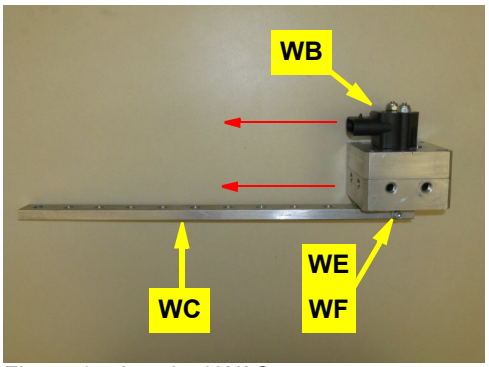


Figure 1c: Attached WAS arm

NOTE: *Before you cut the rod at steps 1d or 1e, 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.*

For the 9370, 9380, 9390 series

d. Cut the provided threaded rod **WG** 5¾″ long then screw the swivel rod ends **WI** onto the cut threaded rod to achieve a center-to-center stud measurement of 7″ (Figures 1d-i and 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2j.

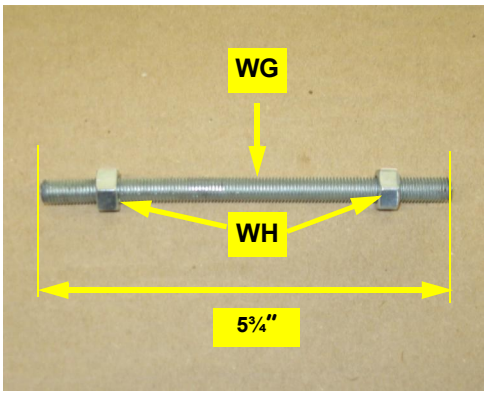


Figure 1d-i: Cut threaded rod

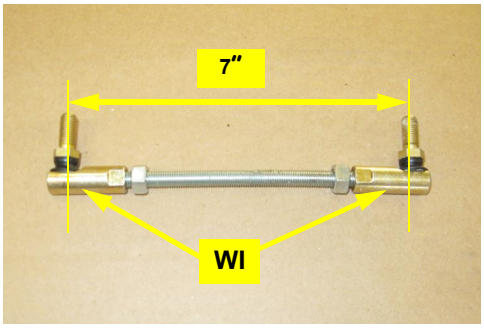


Figure 1d-ii: Assembled threaded rod

1. Prepare the wheel angle sensor *(continued)*.

For the 9170, 9270, 9180, 9280 series

e. Cut the provided threaded rod **WG** 2¾″ long then screw the swivel rod ends **WI** onto the cut threaded rod to achieve a center-to-center stud measurement of 4″ (Figures 1e-i and 1e-ii). Leave **WH** loose until you complete linkage adjustment at step 2j.

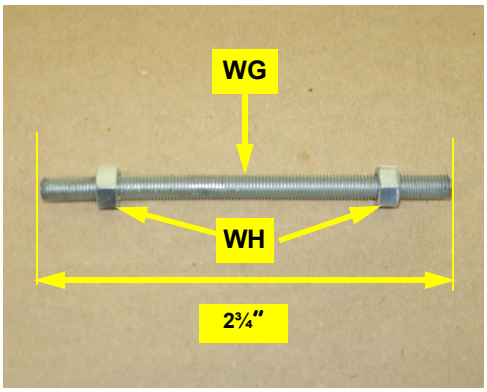


Figure 1e-i: Cut threaded rod

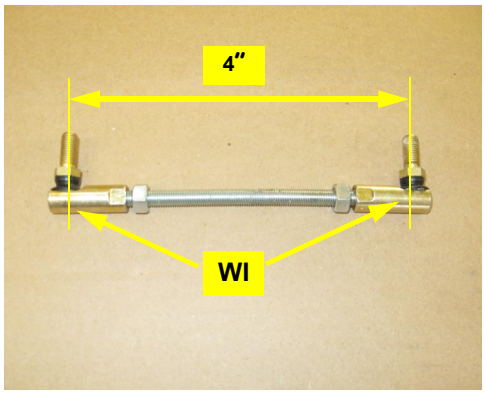


Figure 1e-ii: Assembled threaded rod

2. Mount the wheel angle sensor.

For the 9370, 9380, 9390 series

a. Using hardware **HE**, fasten bracket **WP** to bracket **WN** with the welded nuts on **WP** at the bottom. Fasten bracket **WN** to the top holes in bracket **WP** (Figure 2a).

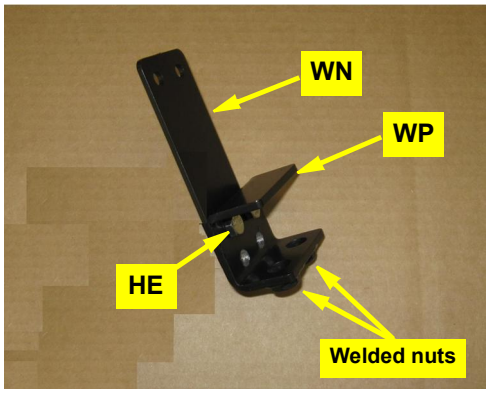


Figure 2a: Assembled WAS brackets

b. Locate the top frame brace near the articulation point of the tractor (Figure 2b).

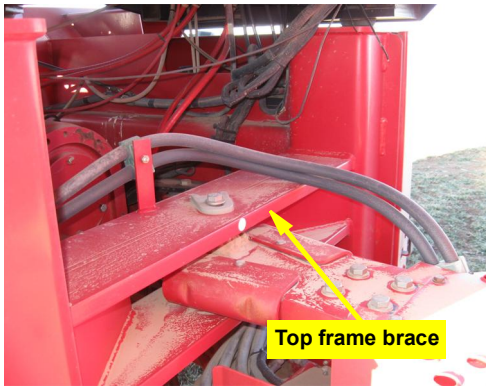


Figure 2b: Top frame brace

2. Mount the wheel angle sensor *(continued)*.

For the 9370, 9380, 9390 series *(continued)*

c. To ensure a solid bracket mounting, apply the recommended amount of threadlocker **WM** to the cone point Allen set screws **WL** (not shown) and attach the assembled brackets **WP** and **WN** to the back lip of the top frame brace (Figure 2c-i). The center of the assembled brackets must be 6″ from the center of the articulation point (Figure 2c-ii).

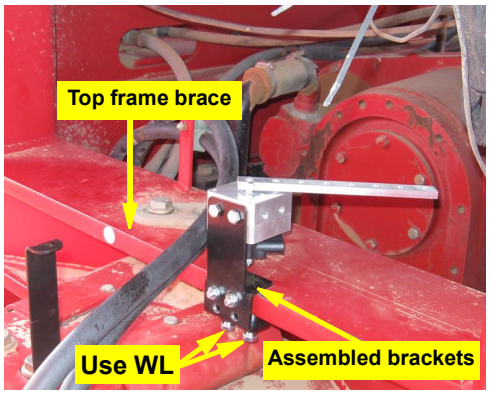


Figure 2c-i: Installed brackets (see step 2d for WAS assembly installation)

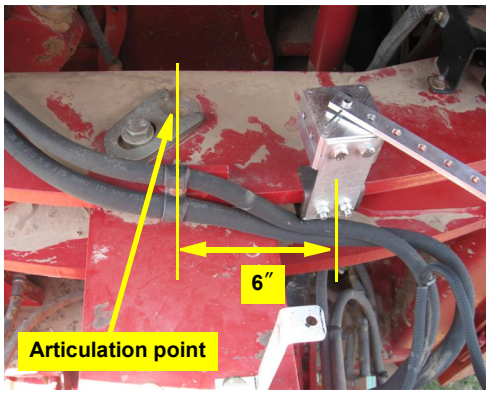


Figure 2c-ii: Brackets location (see step 2d for WAS assembly installation)

d. Using hardware **WJ**, attach the WAS assembly (from step 1) to bracket **WN**. The wire connector **WB** must face the right front section of the tractor (Figure 2d).

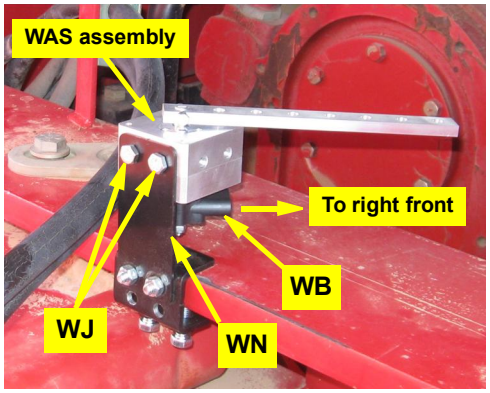


Figure 2d: Installed WAS assembly

e. Remove the front right bolt from the articulation linkage (Figure 2e-i).

Using the removed bolt, attach rod bracket **WO** to the articulation linkage. Mount the bracket at 90° right to the articulation linkage (Figure 2e-ii).

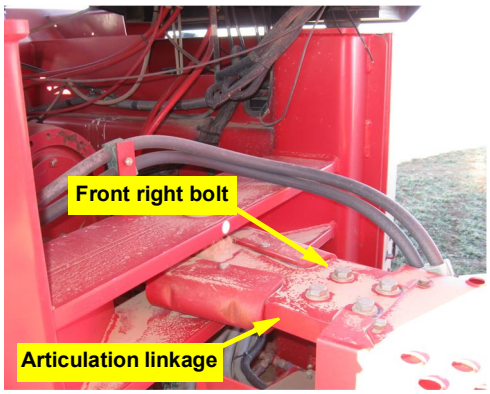


Figure 2e-i: Front right bolt location

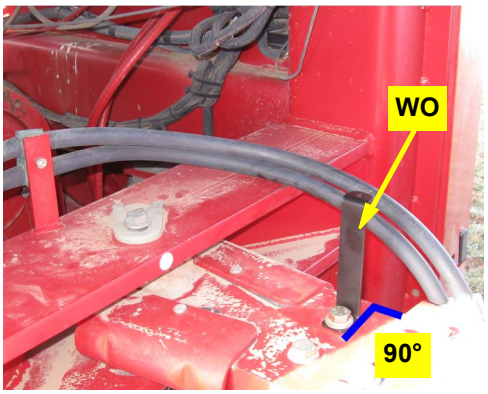


Figure 2e-ii: Installed WAS rod bracket

Continue at step 2i.

2. Mount the wheel angle sensor *(continued)*.

For the 9170, 9180, 9270, 9280 series

f. To ensure a solid bracket mounting, apply the recommended amount of threadlocker **WM** to the cone point Allen set screws **WL** (not shown) and attach rod clamp bracket **WQ** to the right articulation stop. Align the vertical elbow of the bracket with the edge of the rear frame (Figure 2f).

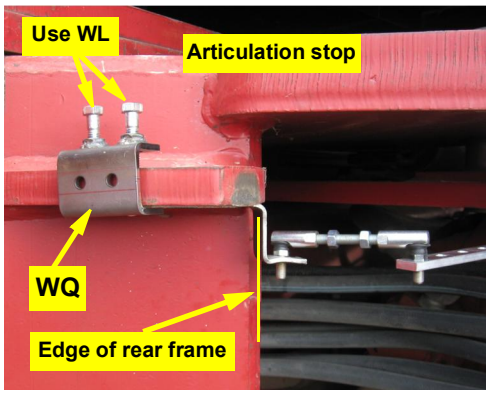


Figure 2f: Installed rod clamp bracket (see step 2i for linkage installation)

g. Using hardware **WJ**, attach the WAS assembly to bracket **WP** using the lower holes. The wire connector will face the left rear section of the tractor (Figure 2g).

h. To ensure a solid bracket mounting, apply the recommended amount of threadlocker **WM** to the cone point Allen set screws **WL** (not shown) and attach the WAS assembly and bracket **WP** to the back lip of the lower frame brace. The center of the assembly must be 5″ from the center of the articulation point (not shown) (Figure 2h).

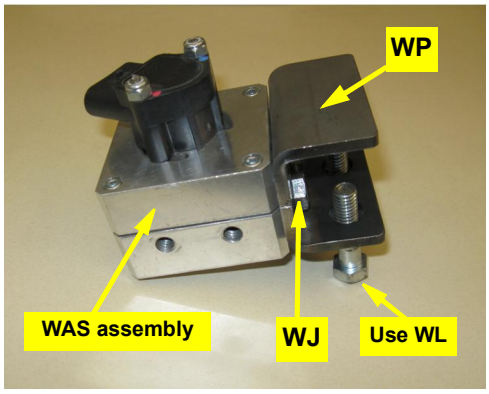


Figure 2g: WAS mounted on clamp bracket

i. Using the remaining hardware **WH**, install the assembled WAS linkage from steps 1d or 1e between the rod bracket **WO** (or **WQ**) 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 (Figures 2i-i and 2i-ii).

j. With all hardware **WH** loose, slowly turn the wheels full left lock then full right lock. Check that the linkage moves freely without binding and adjust the linkage if necessary.

k. When the linkage does move freely and without binding, tighten hardware **WH** on the rod and the swivels.

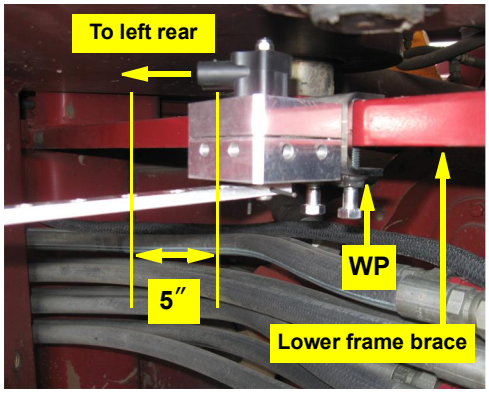


Figure 2h: Installed WAS assembly

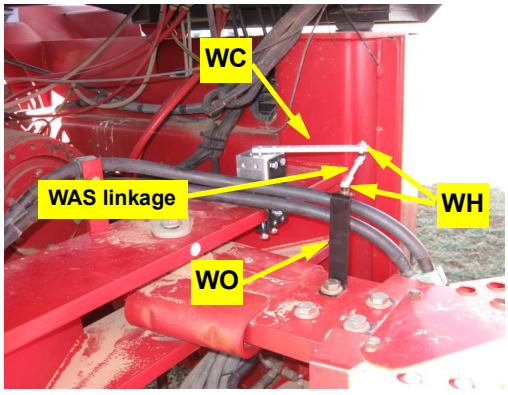


Figure 2i-i: Installed WAS linkage - 9300 series

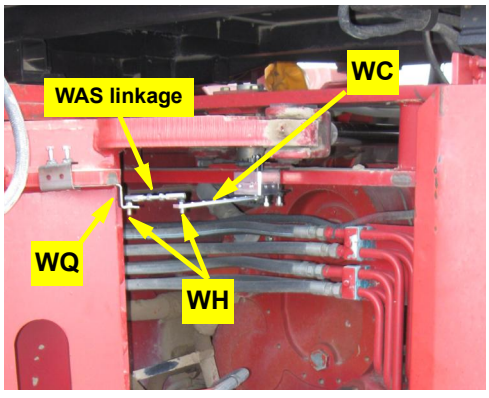


Figure 2i-ii: Installed WAS linkage - 9100 and 9200 series

Installation - Steering Wheel Switch (SWS)

1. Install the steering wheel switch.

a. Locate the steering shaft under the steering console near the cab floor. The shaft is inside a metal shield (Figure 1a).

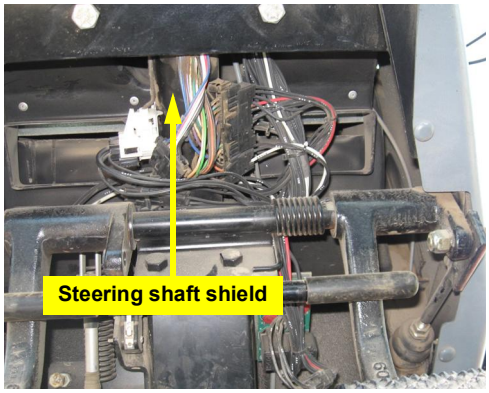


Figure 1a: Steering shaft shield location

b. Cut the sensor bracket **SC** to a total length of 1 3/8″. Drill a 5/16″ hole at the opposite end to the pre-drilled hole in the sensor arm (Figure 1b).

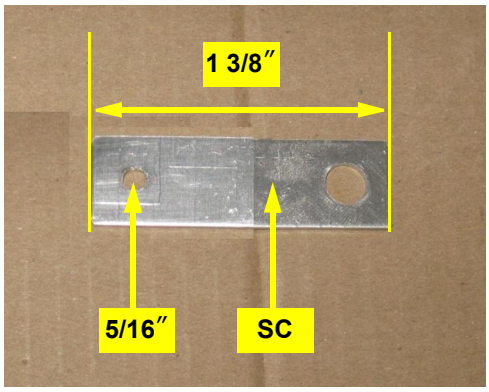


Figure 1b: Cut and drilled sensor arm

c. Remove the lower steering console bracket bolt (Figure 1c).

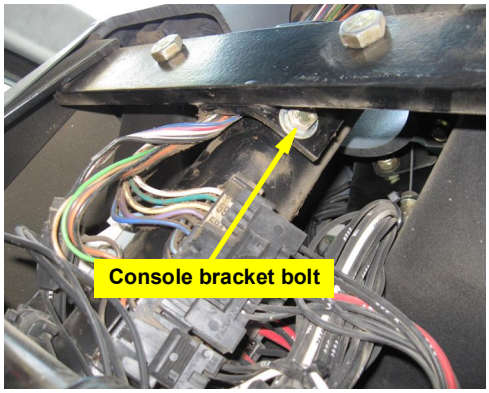


Figure 1c: Steering console bracket bolt

d. Using the cut sensor arm as a template, drill a 1/2 inch hole in the steering shaft shield (Figure 1d).

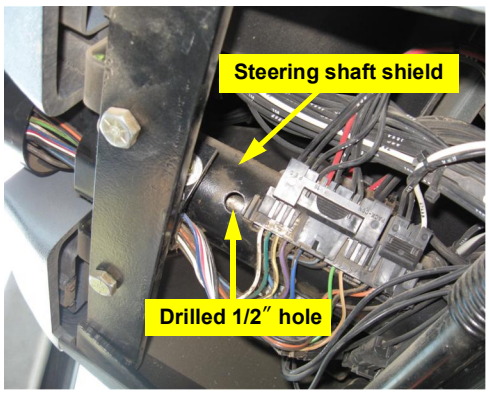


Figure 1d: Drilled hole in steering shaft shield

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

e. Cut one of the two magnets **SA** in half. Using the two-part epoxy **SB**, attach one half of the magnet to the inner steering shaft. Turn the shaft 180° and attach the other half of the magnet.

NOTE: *You do not need to use the second magnet on this installation.*

f. Attach sensor **SD** to sensor arm **SC**. Using the removed steering console bracket bolt, attach the sensor/sensor arm to the steering console bracket (Figure 1e).

g. Align sensor **SD** with the magnets **SA** and adjust the sensor face to 1/8″ to 1/4″ away from the magnets.

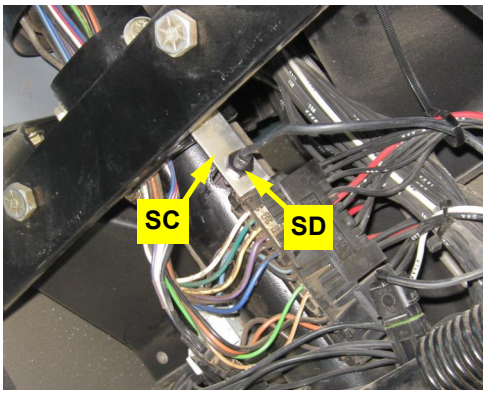


Figure 1e: Installed sensor arm and sensor