Automated Steering Kit Installation Guide

Kit: EDX-SPX4260S, P/N 911-2026-000

Fits CaseIH Sprayer Models:

SPX3320
SPX4410
SPX4420

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 manual for your machine and other implements.

If you have any 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 on the next page. 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.

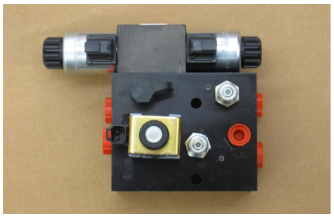
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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.

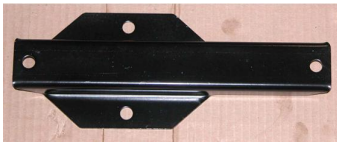
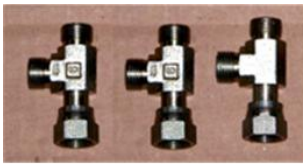
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and 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	Assembly, hyd valve block - 15L\proportional (Hydraulic steering block)	
Bag H1 contains HB and HC				
HB	760-2061-000	4	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB (P [pressure], T [tank] and A and B ports on hydraulic steering block)	
HC	760-2045-000	1	Adapter, hyd plug - #6maleORB (LS port on hydraulic steering block)	

Kit Contents - Steering Hydraulics *(continued)*

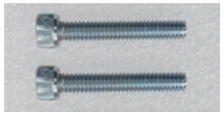
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HD	640-0015-000	1	Hydraulic steering block mounting bracket (Use with HE and HF [long or short bolts])	
HE	640-0035-000	1	Hydraulic steering block mounting hammer strap (Use with HD and HF [long or short bolts])	
Bag H2 contains HF				
HF	675-2007-000 675-2021-000 676-1035-000	2 2 2	Bolt - 3/8NC x 3/4" Gr5, ZP Bolt - 3/8NC x 2" Gr5, ZP Nut, nylock - 3/8NC ZP (Use to join HD and HE - use longer or shorter bolts as required)	
Bag H3 contains HG				
HG	675-2006 678-1054 676-1035	2 2 2	Bolt, 3/8NC x 3-3/4" Gr5, ZP Washer, narrow flat, 3/4"OD x 13/32"ID x 1/16" thk ZP Nut, nylock - 3/8NC ZP (Mount hydraulic steering block HA on HD)	
Bag H5 contains HK and HL				
HK	760-2069	1	Adapter, hyd run-tee - #8ORFF (Tank line)	
HL	760-2046	3	Adapter, hyd run-tee - #6ORFF (Pressure and steering lines)	

Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HM	760-1060	1	Hose, hyd - 3/8" x 98", #6femJIC swivel x #6femORFF 90 swivel (Pressure hose)	
HN	760-1059	1	Hose, hyd - 3/8" x 96", #6femJIC swivel x #8femORFF 90 swivel (Tank hose)	
HO	760-1324-000	2	Hose, hyd - 1/4" x 130", #6femJIC swivel x #6femORFF swivel (Steering hoses)	
HP	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.

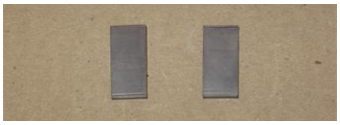
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI (‘wire connector’)	
WC	602-1087-000	1	Connector arm, steering	
WD	675-1191-000	2	Screw, mach, 8-32 x 3", PPH ZP	
WE	676-1054-000	4	Nut, nylock 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"	
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	675-2010-000 678-1077-000	2 2	Bolt, 5/16NC x 3/4" Gr5 ZP Washer, lock 5/16, ZP (Attach WAS assembly to WK)	

Kit Contents - Wheel Angle Sensor *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WK	640-0120-000	1	WAS assembly mounting bracket	
WL	640-0121-000	1	WAS rod link bracket	

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" thk, plain 1 (Only one is required for this installation)	
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	Assembly, steering wheel switch/cable	
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.

See Appendix B for a schematic of the hydraulic circuits.

1. Prepare the hydraulic steering block.

NOTE: *Make sure the hydraulic steering block **HA** is clean and dust free. If required, loosen the solenoid end nuts and reposition the solenoids to improve access to the connector sockets. Hand tighten the end nuts only.*

Remove the plastic plugs from hydraulic steering block **HA** and install adapter fittings **HB** in the **P**, **T**, **A** and **B** ports and adaptor plug **HC** in the **LS** port (Figure 1).

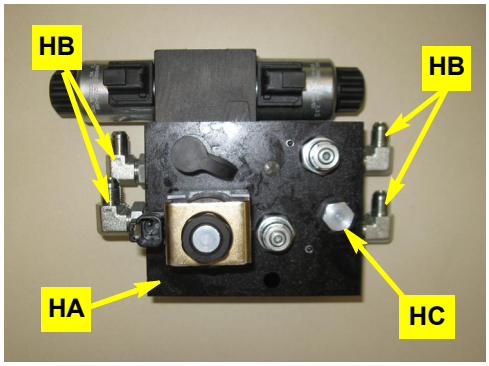


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

Using hardware **HF** (either the long or short bolts as required) install bracket **HD** and hammer strap **HE** (not visible) just to the left of the fuel filter on the cross member behind the fuel tank (Figure 2).

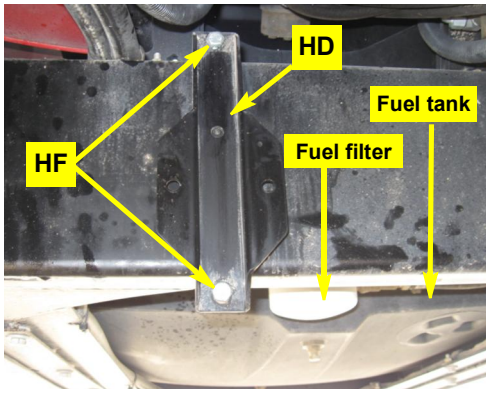


Figure 2: Installed steering block mounting bracket

3. Install the hydraulic steering block and steering controller mounting bracket.

Using hardware **HG**, attach hydraulic steering block **HA** to bracket **HD** as follows (Figure 3):

- Mount **HA** with its solenoids to the right and vertical (so **A** and **B** steering ports downward).

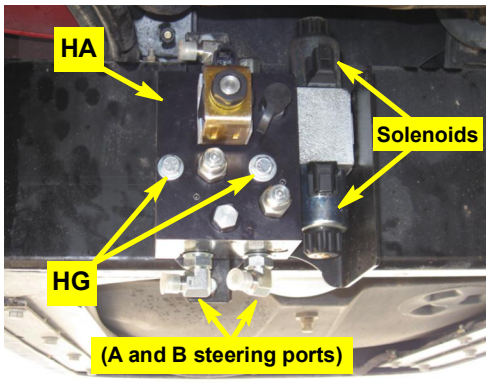


Figure 3: Installed steering block

4. Install the steering output fittings.

At the inner, blind end (non-piston rod end) of the left and right steering cylinders (Figure 4, left and right insets) install a run-tee **HL**. Reconnect the machine's steering line to the open 'T' end of each run-tee (Figure 4 - right steering cylinder shown).

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.*

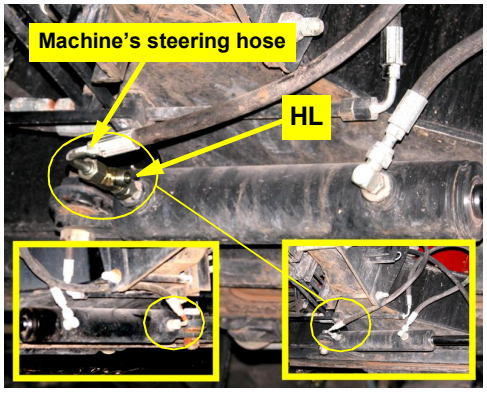


Figure 4 with insets: Run-tee at steering cylinder, machine's steering hoses reconnected

5. Install the steering hoses.

Connect the o-ring face swivel ends of the steering hoses **HO** to the stems of the run-tees installed in step 4 and route the hoses forward over the axle to the hydraulic steering block. Connect the hoses to the **HB** fittings in the **A** and **B** ports of the hydraulic steering block (Figure 5-i to 5-iii with inset).

NOTE: *Route all hoses with other sprayer plumbing free from entanglement and secured with heavy tie straps **HP**. Securely tighten all hose fittings and connections when hose installation is complete.*

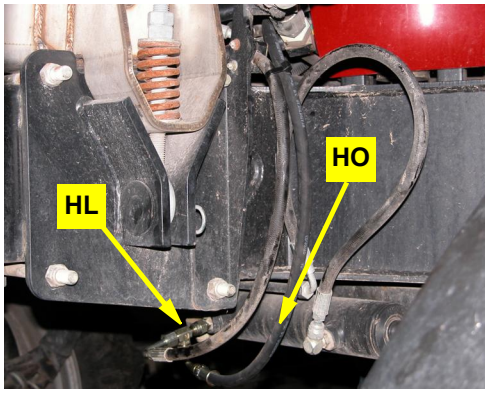


Figure 5-i: Steering hose routed from right steering cylinder to steering block

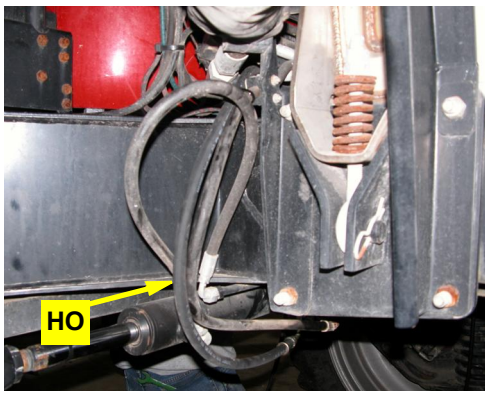


Figure 5-ii: Steering hose routed from left steering cylinder to steering block

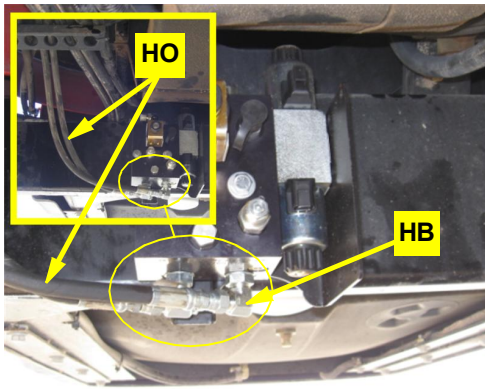


Figure 5-iii with inset: Steering hoses connected at steering block

6. Install the pressure and tank fittings.

NOTE: *You will tee into the pressure and tank hydraulic circuits at the junction of their rubber hose and steel line. Use figures 6a-i to 6a-iii to identify the P and T lines but confirm that you are teeing into the correct line by tracing its rubber hose forward to the correct (P or T) port on the orbital under the cab. Note that the location of the P and T junctions is different for the SPX3320—see note below step b.*

NOTE: *Leave the 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.*

a. Locate the pressure and tank lines in the hydraulic plumbing behind the front axle member and above the left or right steering cylinder's inner mount. The pressure line is on the left side (Figure 6a-i) and the tank line is on the right side (Figure 6a-ii).

b. Install run-tees **HL** and **HK** in the pressure line and tank line respectively. Reconnect the machine's pressure and tank hoses to the open 'T' ends of their respective run-tees (Figures 6a-i to 6a-iii insets).

NOTE: *On SPX3320 models the pressure and tank lines are both located on the left side (Figure 6a-iii). Install run-tees **HL** and **HK** in the pressure and tank lines respectively and reconnect the machine's hoses to the open 'T' ends of the run-tees.(You will install the provided pressure and tank hose shown in Figure 6a-iii in the next step.)*

7. Install the pressure and tank hoses.

NOTE: *Route hoses with other machine plumbing and clear of moving parts. Secure hoses with heavy duty tie straps **HP**. Tighten all hoses, run-tees and steering block fittings.*

Install the pressure hose **HM** and tank hose **HN** between the open stems of run-tees **HL** and **HK** respectively (ORFF elbow ends - Figure 7-i with insets) and fittings **HB** in the **P** and **T** port on the top (as mounted) of the hydraulic steering block (Figure 7-ii). Route the hoses forward over the axle to the hydraulic steering block (Figure 7-ii inset).

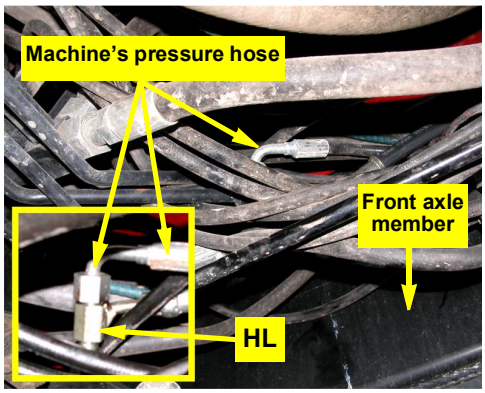


Figure 6a-i with inset: Pressure line and (inset) run-tee with pressure hose reconnected

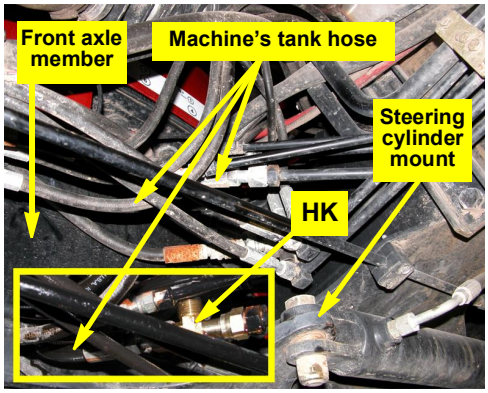


Figure 6a-ii with inset: Tank line and (inset) run-tee installed with tank hose reconnected

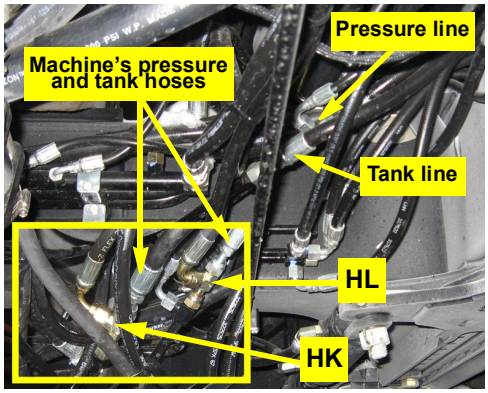


Figure 6a-iii: Run-tees installed on SPX3320

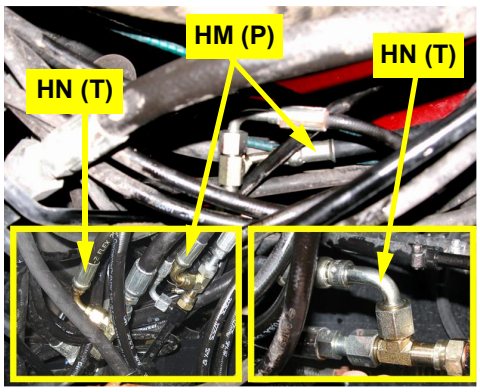


Figure 7-i with insets: Installed pressure and tank hoses (SPX3320 left inset)

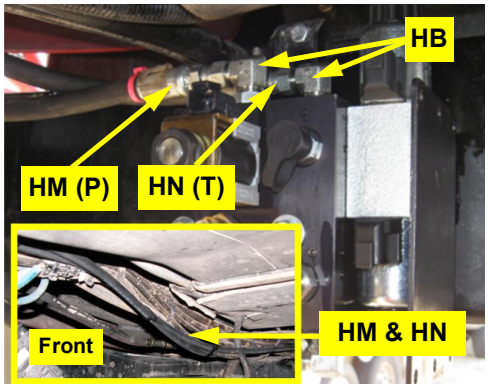


Figure 7-ii with inset: Pressure and tank hoses routed to steering block (inset) and connected

8. 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 machine and make certain that it is safe to operate.

b. Start the machine and check hydraulic connections for any leaks.

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 visible), 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).

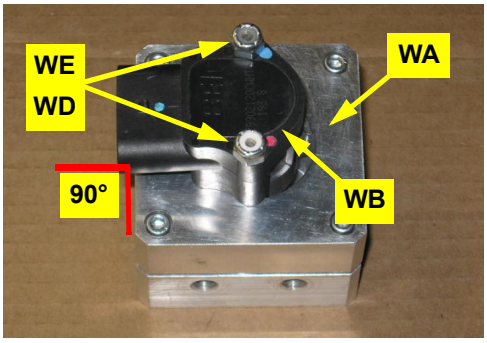


Figure 1a: Prepared WAS housing\connector

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

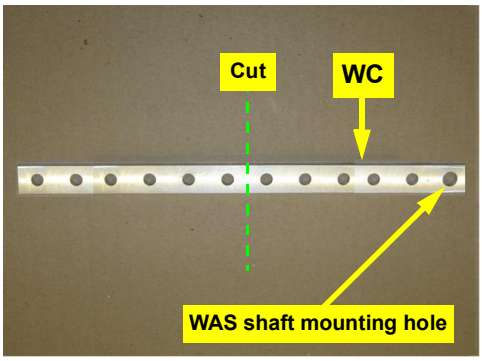


Figure 1b: WAS arm preparation

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

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

d. Cut threaded rod **WG** to 6¼" long (Figure 1d-i) then screw swivel rod ends **WI** onto the cut rod to achieve a center-to-center stud measurement of 7½" (Figure 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2f.

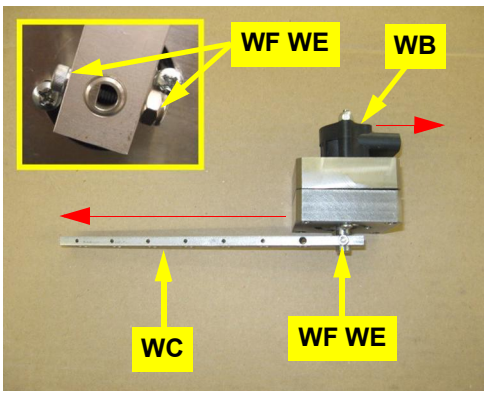


Figure 1c with inset: WAS arm installed

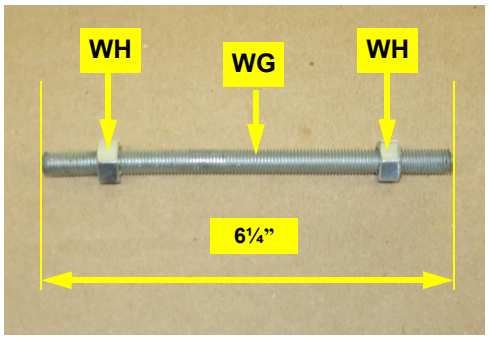


Figure 1d-i: Threaded link rod preparation

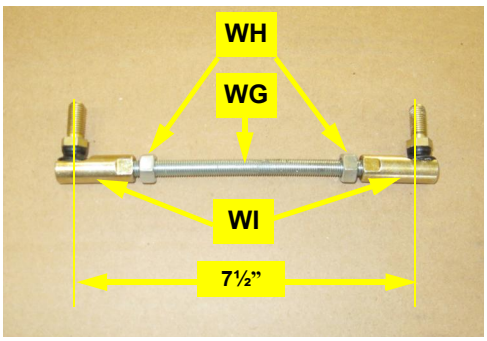


Figure 1d-ii: Assembled threaded link rod

2. Mount the wheel angle sensor.

NOTE: *Some figures in this section show prototype brackets and fittings. Install your brackets and fittings as described.*

a. Using hardware **WJ** mount the WAS assembly from step 1 on the outer face of bracket **WK.** Mount the WAS assembly with the base of wire connector **WB** flush with the bend in **WK** and connector arm **WC** arcing away from the long side of **WK** (Figure 2a).

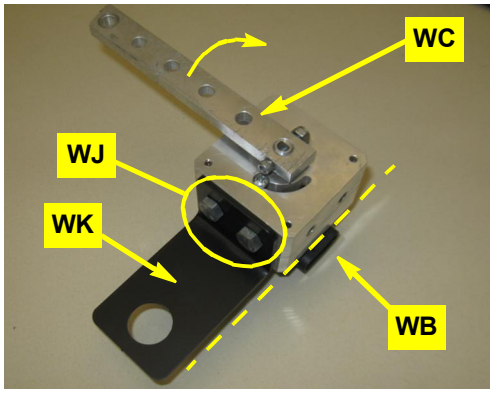


Figure 2a: WAS assembly on mounting bracket

b. Remove the right side track adjusting cylinder's outer mounting bolt (Figure 2b inset). Using this bolt, mount the WAS and bracket assembly. Mount the assembly with connector arm **WC** uppermost (Figure 2b).

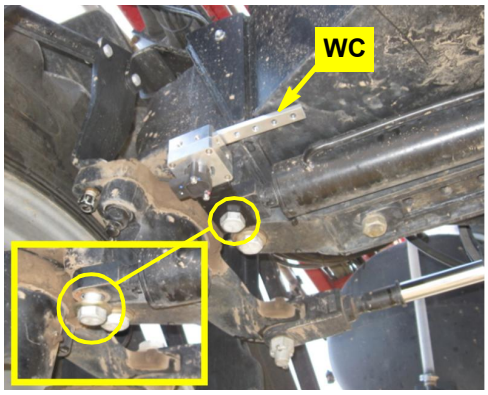


Figure 2b with inset: WAS assembly installed

c. Remove the nut from the right side front fender bracket bolt on the steering arm. Using this nut, mount WAS link rod bracket **WL** (Figure 2c). Ensure **WL** is pointing directly forward.

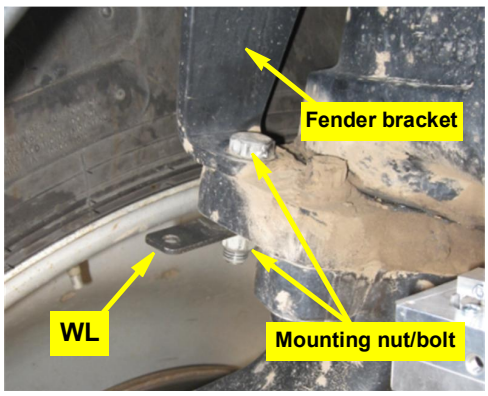


Figure 2c: WAS link rod bracket installed on fender bracket nut/bolt

d. Using hardware **WH**, install the link rod assembly from step 1 between the last hole in WAS arm **WC** and bracket **WL**. Set the swivel studs downward at both ends (Figure 2d). Leave swivel nuts **WH** loose.

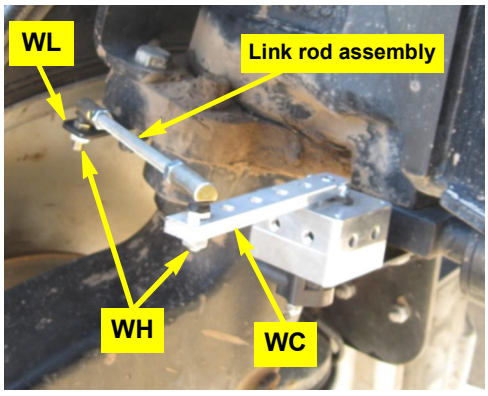


Figure 2d: WAS link rod assembly installed

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

e. 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 as necessary (Figures 2e-i and 2e-ii). (You will connect the ECU WAS cable to **WB** later.)

f. When the linkage does move freely and without binding, tighten hardware **WH** on the rod and the swivels (Figure 2e-ii).

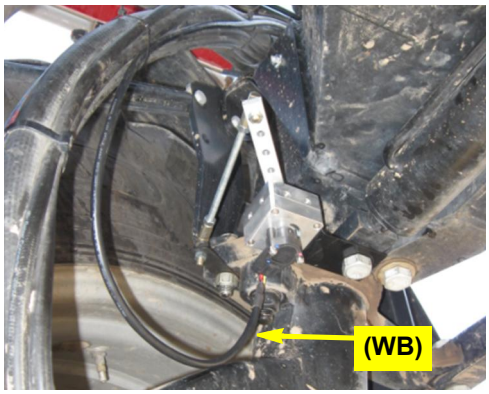


Figure 2e-i: Full left lock

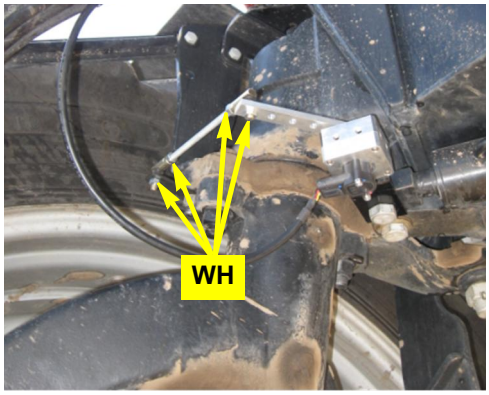


Figure 2e-ii: Full right lock

Installation - Steering Wheel Switch (SWS)

1. Prepare the switch bracket.

Prepare switch bracket **SC** as follows (Figure 1 - not to scale):

- Mark a bend line 1-3/4” from the pre-drilled end
- Cut 1-3/8” from the other end
- Drill a 3/8” hole halfway between the bend line and the cut end
- Put a 90° bend at the bend line

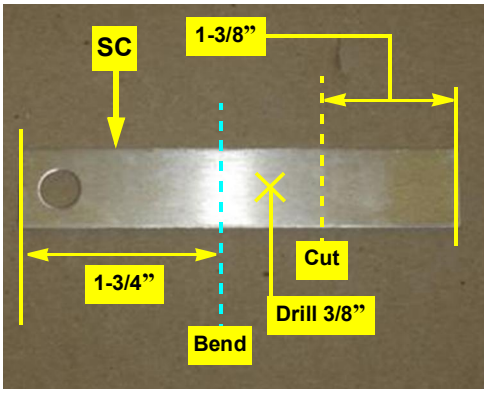


Figure 1: Switch bracket preparation (not to scale)

2. Install the magnets.

a. Locate the four nut/studs at the base of the steering column behind the pedals shaft and remove the right rear nut (nearest the driver). Using the prepared switch bracket as a template on the stud (using the new hole), mark the steering column in the center of the pre-drilled hole. Remove the bracket and drill a 1/2” hole in the steering column (Figure 2a).

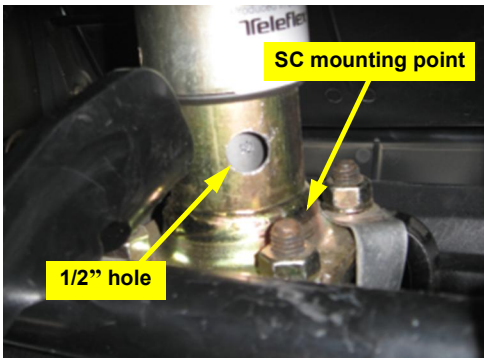


Figure 2a: Drilled steering column

b. Cut one magnet **SA** in half then trim each half into shape to pass through the 1/2” hole (keep the magnet as big as possible, round for example). 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 (Figure 2b).

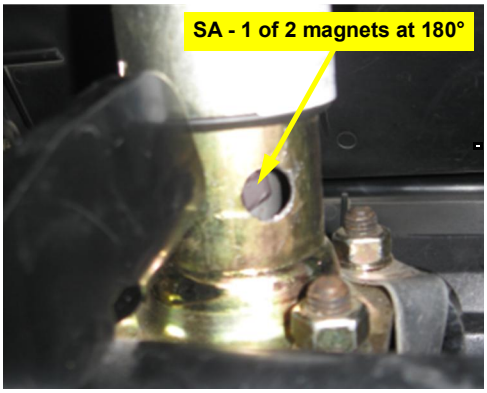


Figure 2b: Installed magnet(s)

3. Install the switch.

Install switch **SD** in its bracket **SC**. Mount the switch/bracket assembly on the right rear stud at the base of the steering column. Adjust the bend in bracket **SC** and the switch nuts to set the sensor face to 1/8” to 1/4” from the magnets (Figure 3).

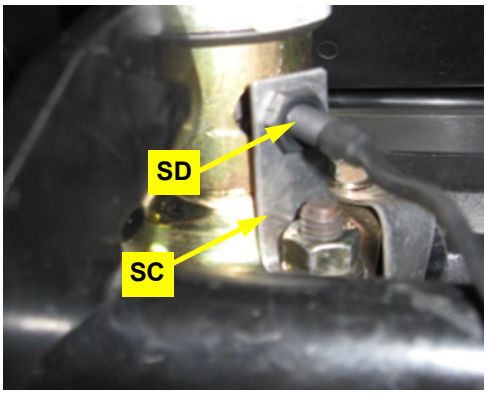


Figure 3: Installed switch bracket and switch

Appendix - Hydraulic Circuits