Automated Steering Kit Installation Guide

Kit: EDX-C8120, P/N 911-2032-000

Fits CaseIH Combine Models:

7120 8120 9120

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 beginning 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.

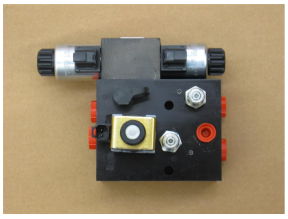
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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.

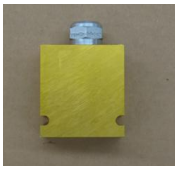
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and 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	Assembly, hyd valve block - 15L\proportional (Hydraulic steering block)	
Bag H1 contains HB, HC and HD				
HB	760-2080-000	2	Adapter, hyd 90 elbow - #8maleJIC x #8maleORB (P [pressure], T [tank] on hydraulic steering block)	
HC	760-2061-000	2	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB A and B [steering] ports on hydraulic steering block)	
HD	760-2058-000	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (LS port on hydraulic steering block)	

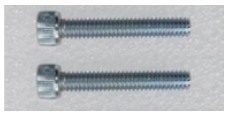
Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HE	640-0092	1	Hydraulic steering block mounting bracket	
Bag H2 contains HF				
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 HE)	
Bag H4 contains HJ and HK				
HJ	760-2069	3	Adapter, hyd run-tee - #8ORFF	
			(Pressure line and steering lines)	
HK	760-2004	1	Adapter, hyd run-tee - #10ORFF	
			(Tank line)	
HL	760-0009	1	Assembly, hyd dynamic load sense valve	
Bag H5 contains HM, HN and HO				
HM	760-2040	1	Adapter, hyd 90 elbow - #6maleORB x #6femORFFswiv	
			(Use in HL - LS function port)	
HN	760-2048	1	Adapter, hyd - #6maleORFF x #6maleORB	
			(Use in HL - source port)	

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HO	760-2082	1	Adapter, hyd 90 elbow - #6maleJIC x #4maleORB (Use in HL - to steering block LS port)	
HP	760-1327-000	1	Hose, hyd - 1/2" x 35", #8femJIC swivel x #8femORFF 90 swivel (Pressure hose)	
HQ	760-1328-000	1	Hose, hyd - 1/2" x 25", #8femJIC swivel x #10femORFF 90 swivel (Tank hose)	
HR	760-1019	1	Hose, hyd - 1/4" x 42", #6femJIC swivel #6femJIC swivel (Load sense hose)	
HS	760-1326-000	2	Hose, hyd - 3/8" x 64", #6femJIC swivel x #8femORFF 90 swivel (Steering hoses)	
HT	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.

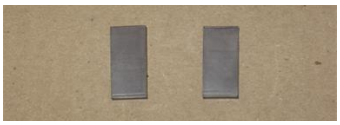
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI	
WC	602-1087-000	1	Connector arm, steering	
WD	675-1191-000	2	Screw, mach, 8-32 x 3", PPH ZP	
WE	676-1054-000	4	Nut, nylock 8-32NC, ZP	
WF	675-1150-000	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	640-0140-000	1	WAS assembly mounting bracket	
WL	640-0128-000	1	WAS link rod	
Bag W3 contains WM				
WM	675-2061-000	2	U-bolt, 3/8"-16 x 2-3/4" x 4-5/16", ZP (Attach WK and WL to steering cylinder and tie rod respectively)	

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	
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 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.*

Remove the plastic plugs from hydraulic steering block **HA** and install adapter fittings as follows (Figure 1):

- **HB** in the **P** and **T** ports
- **HC** in the **A** and **B** ports
- **HD** in the **LS** port

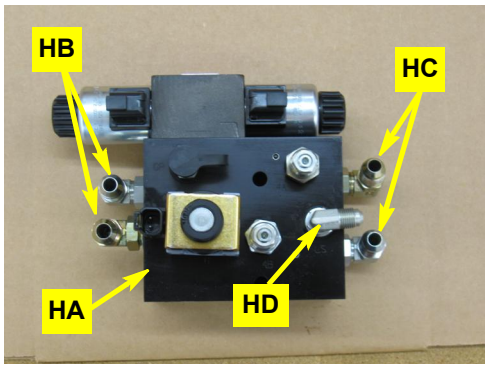


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

NOTE: *The Figure 2 left inset shows an earlier HE mounting bracket. The right inset shows the later, extended bracket supplied with this installation kit.*

Insert the hardware bolts **HF**, from the 'step' side of the bracket, through the inner two vertical holes in the hydraulic steering block mounting bracket **HE**. On the left of the machine, locate the lower bolt of the pair rearward of the ladder assembly support bracket. The bolts are the third pair in (Figure 2 with insets). Install the bracket with its slot horizontal.

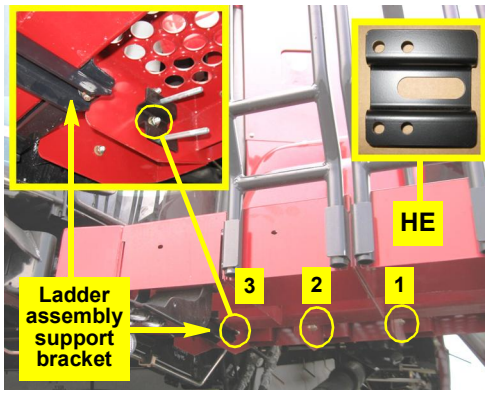


Figure 2 with insets: Installed steering block mounting bracket

3. Install the hydraulic steering block

Mount hydraulic steering block **HA** on bracket **HE** as follows (Figure 3):

- Mount **HA** with its solenoids downward (with the **A** and **B** ports toward the front of the machine).

Secure the block and bracket with hardware nuts **HF**.

NOTE: *In the following steps, 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.*

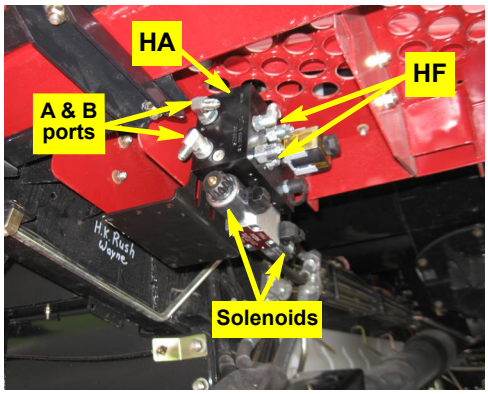


Figure 3: Installed steering block

4. Install the pressure fitting.

Locate the junction of the machine's rubber pressure hose and steel line to the rear of the hydraulic block you installed (Figure 4 with inset). Install run-tee **HJ** at the junction. Reconnect the machine's pressure hose to the open 'T' end of **HJ** (Figure 4 inset).

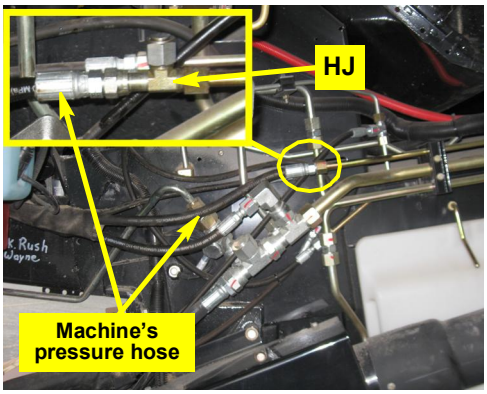


Figure 4 with inset: Run-tee at pressure port, machine's pressure hose reconnected

5. Install the tank fitting.

Locate the junction of the machine's rubber tank hose and the elbow fitting in the stem of the run-tee connected to the steel tank line (outward of the pressure run-tee you installed - Figure 5 with inset). Install run-tee **HK** at the junction. Reconnect the machine's tank hose to the open 'T' end of **HK** (Figure 5 inset).

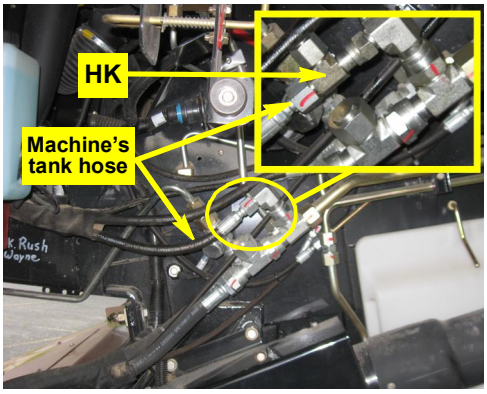


Figure 5 with inset: Run-tee at tank port, machine's tank hose reconnected

6. Prepare and install the load sense valve.

a. Prepare dynamic load sense valve **HL** as follows (Figure 6a):

- Install adapter **HM** in the valve's function port
- Install adapter **HN** in the valve's source port
- Install adapter **HO** in the valve's **LS** port (to hydraulic steering block)

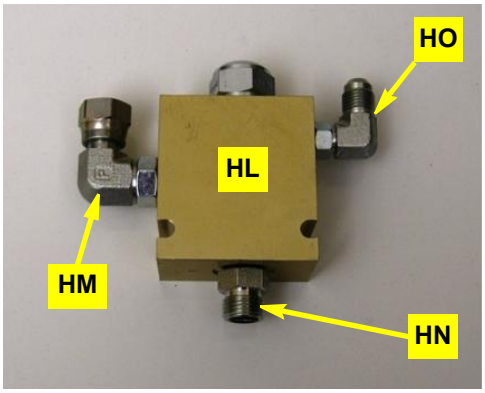


Figure 6a: Prepared load sense valve

b. Locate the junction of the machine's load sense hose and steel line inward of the pressure line you fitted the run-tee **HJ** to (Figure 6b with inset). Disconnect the hose and connect load sense valve's fitting **HN** to the steel line (Figure 6b inset). Reconnect the machine's load sense hose to load sense valve fitting **HM**.

NOTE: *In the following hose installation steps, route hoses with other machine plumbing and clear of moving parts. Secure hoses with heavy duty tie straps **HT.** Tighten all hoses, run-tees and steering block fittings when installation is complete.*

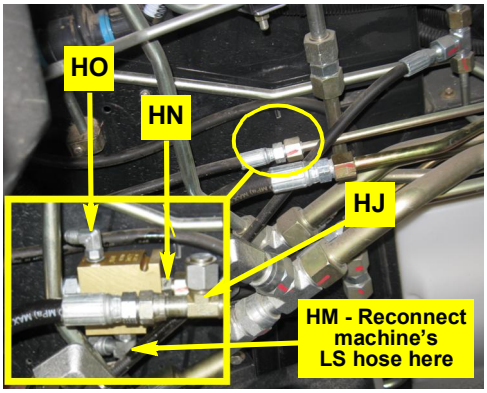


Figure 6b with inset: Load sense valve installed, machine's load sense hose reconnected

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

a. Install pressure and tank hoses **HP** and **HQ** between their respective run-tees **HJ** and **HK** installed at steps 4 and 5 (Figure 7a) and fittings **HB** in the **P** and **T** ports of the hydraulic steering block (Figure 7b). Connect the elbow ends of the hoses to their run-tees.

NOTE: *Figure 7b shows a straight fitting in the **T** port. You will use elbow fittings **HB** in both the **P** and **T** ports.*

b. Install load sense hose **HR** between fitting **HO** in the load sense valve (Figure 7a) and fitting **HD** in the **LS** port of the hydraulic steering block (Figure 7b).

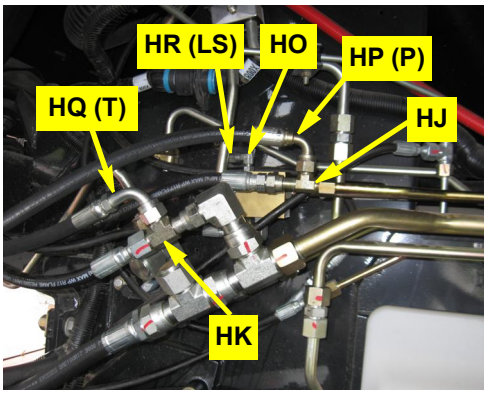


Figure 7a: Pressure, tank and load sense hoses installed at run-tees and load sense valve

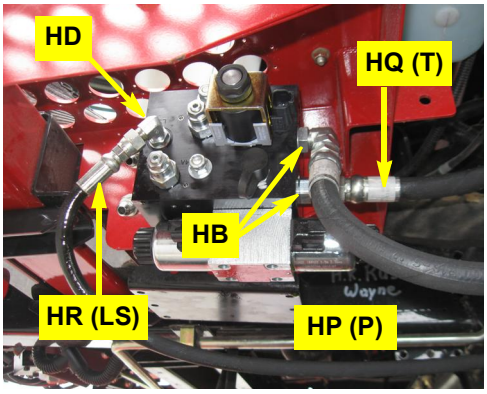


Figure 7b: Pressure, tank and load sense hoses installed at the steering block

8. Install the steering fittings.

Remove the cab front panel below the windscreen and locate the junction of the steering hoses and steel lines inward from the steering orbital. Install run-tees **HJ** at the junctions (Figure 8 with insets).

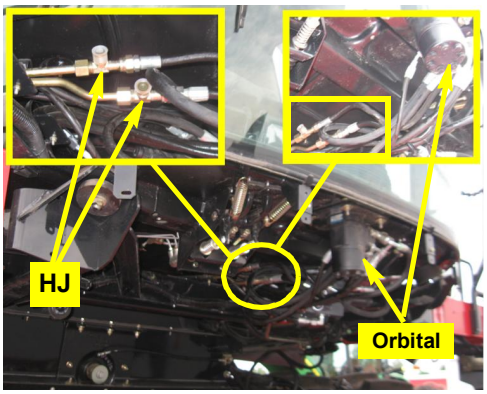


Figure 8 with insets: Run-tees installed in steering lines

9. Install the steering hoses.

Install steering hoses **HS** between the stems of run-tees **HJ** (Figure 9-i) and adapters **HC** in the **A** and **B** ports of the hydraulic steering block (Figure 9-ii). Connect the elbow ends of the hoses to the run-tees. Route the hoses from the run-tees along the cross-member to the steering block on the left side of the machine.

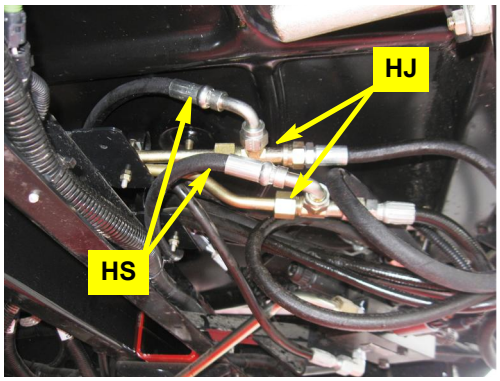


Figure 9-i: Steering hoses installed at run-tees in the steering lines

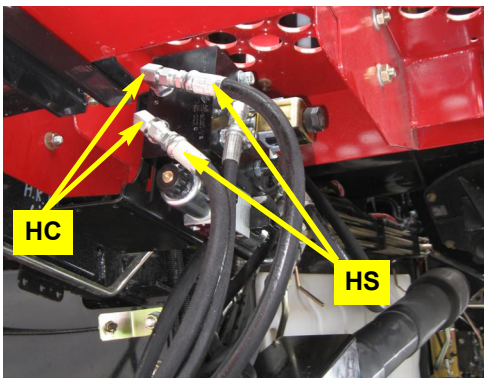


Figure 9-ii: Steering hoses installed at steering block

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 machine and make certain that it is safe to operate.

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

c. Rotate the steering wheel from one extreme to the other and back.

Installation - Wheel Angle Sensor

⚠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).

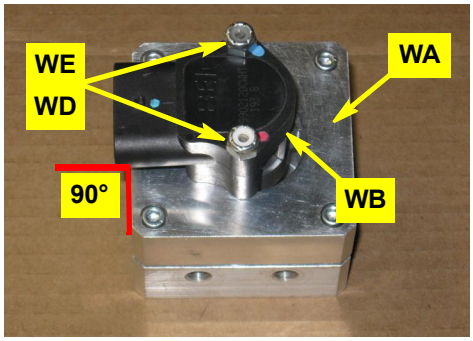


Figure 1a: Prepared WAS housing\connector

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

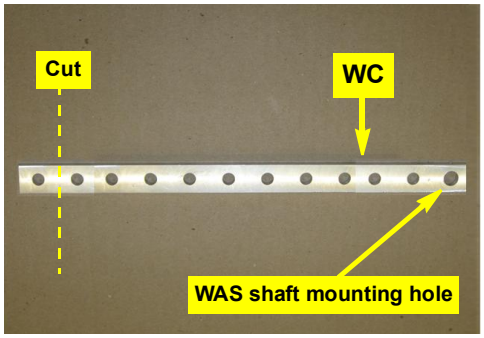


Figure 1b: WAS arm preparation

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).

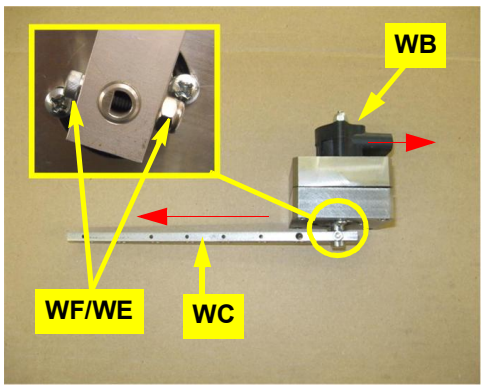


Figure 1c with inset: WAS arm installed

d. Screw nuts **WH** and swivel rod ends **WI** onto rod **WG** to achieve a center-to-center stud measurement of 13½″ (Figure 1d). Leave **WH** loose until you complete linkage adjustment at step 2f.

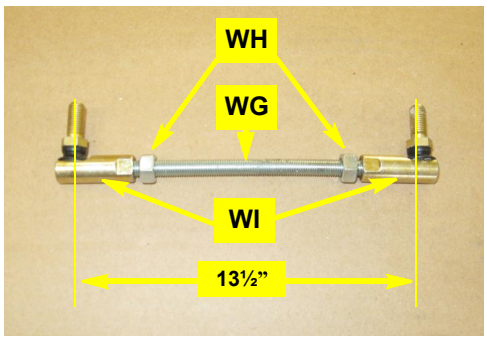


Figure 1d: Assembled threaded link rod

2. Mount the wheel angle sensor.

a. Using hardware **WJ** (Figure 2a inset), mount the WAS assembly from steps 1a to 1c on bracket **WK**. Mount the assembly with its wire connector **WB** pointing away from **WK**'s U-bolt holes (Figure 2a).

b. Using one U-bolt **WM**, mount the WAS assembly and bracket on the left steering cylinder. Mount the assembly on the front of the cylinder with **WB** on top pointing outward and bracket **WK** vertical (Figure 2b, inset). Set the assembly with the center of U-bolt **WM** 12½″ from the piston rod end of the cylinder (Figure 2b).

c. Using the remaining U-bolt **WM**, mount the link rod bracket **WL** on the tie rod. Mount the bracket vertically on the front of the tie rod with its short side upward and pointing forward. Set the bracket with the center of U-bolt **WM** 4¾″ from the inner edge of the tie rod end lock nut. (Figure 2c).

d. Using hardware **WH** (not visible), install the link rod assembly from step 1 between the last hole in connector arm **WC** and bracket **WL**. Set the swivel studs downward at both ends (Figures 2d-i and 2d-ii - see **Note** following). Leave swivel nuts **WH** loose.

NOTE: *Install the link rod with the wheels straight ahead initially, not on a full lock as shown in Figures 2d-i and 2d-ii).*

e. With all hardware **WH** loose, slowly turn the wheels full left lock (Figure 2d-i) then full right lock (Figure 2d-ii). Check that the linkage moves freely without binding and adjust the linkage as necessary. (**Note:** you will connect the 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 2d-ii).

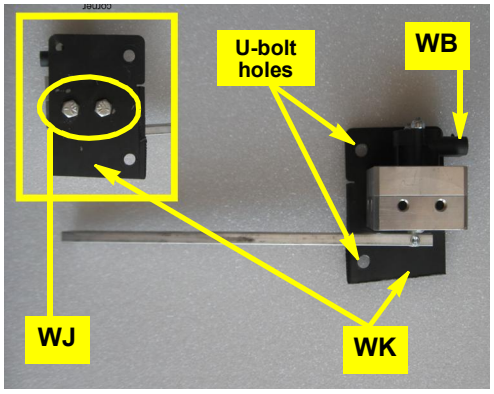


Figure 2a with inset: WAS assembly mounted on its bracket

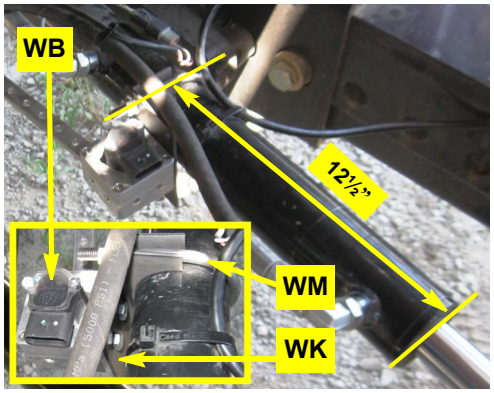


Figure 2b with inset: WAS assembly installed

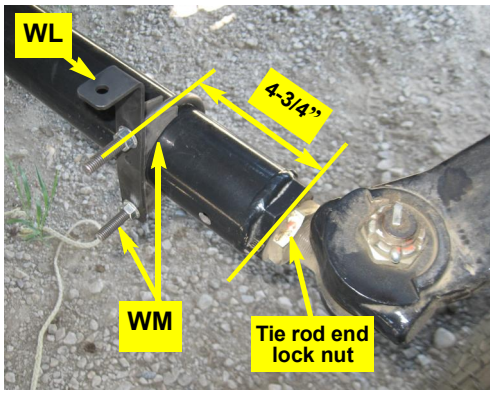


Figure 2c: WAS rod link mounting bracket installed

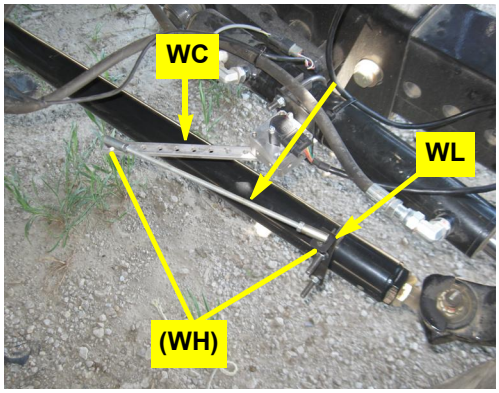


Figure 2d-i: WAS link rod assembly installed - left lock

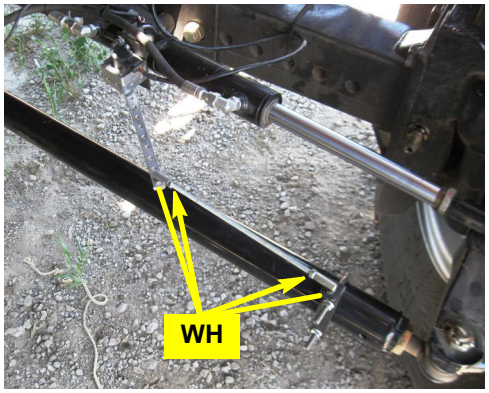


Figure 2d-ii: WAS link rod assembly installed - right lock

Installation - Steering Wheel Switch (SWS)

1. Prepare the switch bracket.

Prepare switch bracket **SC** as detailed (Figure 1 with inset):

- Cut 1” from the un-drilled end
- Cut a 3/4” long, 1/4” wide slot at the newly cut end
- Put an upward 90° bend 1” from the pre-drilled end and apply a slight clockwise twist (Figure 1 and inset)

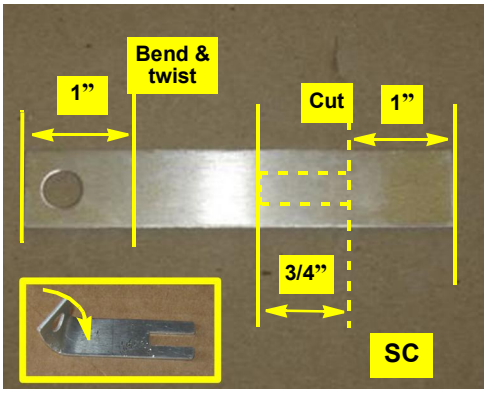


Figure 1 with inset: Switch bracket preparation (not to scale)

2. Install the switch bracket.

a. Retracting the steering column rubber boot surround as required (Figure 2 - top inset), access the bottom of the steering column and shaft. Loosen the locknut on the adjustable stop under the steering column tilt-pedal on the right side of the column (Figure 2 and bottom inset).

b. Slide the slotted end of switch bracket **SC** under the locknut and align **SC**’s switch hole with the vertical centerline of the steering shaft (Figure 3). Tighten the locknut.

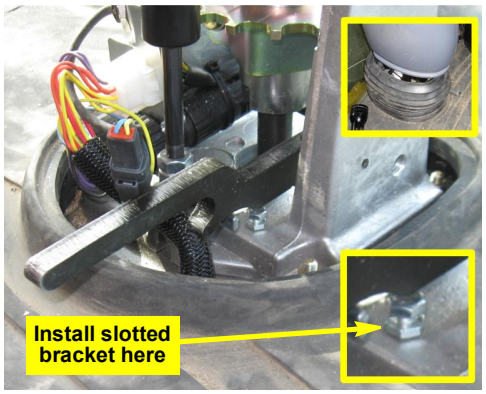


Figure 2 with insets: Switch bracket mounting location

3. Install the magnets and the switch.

Using the two-part epoxy **SB**, install magnets **SA**, 180° apart, on the steering shaft. Install the magnets vertically, centered on the switch hole in the switch bracket (Figure 3).

c. Install switch **SD** in bracket **SC** and use the switch nuts to set the sensor face to 1/8” to 1/4” from the magnets (Figure 3).

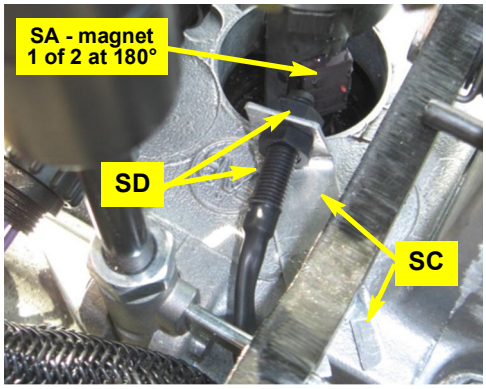


Figure 3: Installed switch bracket, magnets and switch

Appendix - Hydraulic Circuits