Automated Steering Kit Installation Guide

Kit: EDX-C6088, P/N 911-2031-000

Fits CaseIH Combine Models*:

C5088
C6088
C7088

* Excludes the Sidehill option for the models listed.

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.

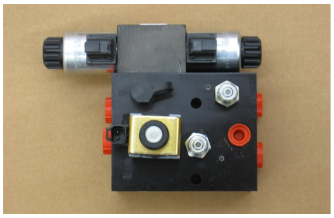
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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.

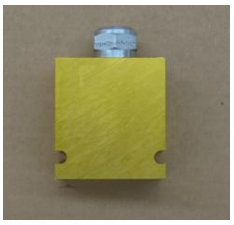
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and 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 [steering] ports on hydraulic steering block)	
HC	760-2058-000	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (LS port on hydraulic steering block)	

Kit Contents - Steering Hydraulics *(continued)*

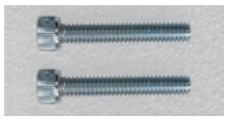
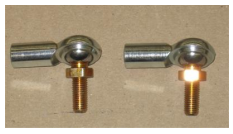
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HD	640-0027	1	Hydraulic steering block mounting bracket	
Bag H2 contains HE				
HE	675-2006 678-1054 676-1035	2 2 2	Bolt, 3/8NC x 3 3/4" Gr5, ZP Washer, narrow flat, 3/4"OD x 13/32"ID x 1/16" thk ZP Nut, nylock - 3/8NC ZP (Mount hydraulic steering block HA on HD)	
Bag H4 contains HI				
HI	760-2069	4	Adapter, hyd run-tee - #8ORFF (Pressure, tank and steering lines)	
HJ	760-0009	1	Assembly, hyd dynamic load sense valve	
Bag H5 contains HK, HL, HM and HN				
HK	760-2034	1	Adapter, hyd 90 elbow - #4maleORFF x #6maleORB (Use in HJ - LS function port)	
HL	760-2082	1	Adapter, hyd 90 elbow - #6maleJIC x #4maleORB (Use in HJ - to steering block LS port using hose HQ)	
HM	760-2090	1	Adapter, hyd - #6maleORB x #4femORB (Use in HJ - source port)	
HN	760-2089	1	Adapter, hyd 90 elbow - #4maleORB x #4femORFF (Use with HM in HJ)	

Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HO	760-1017	1	Hose, hyd - 3/8" x 52", #6femJIC swivel x #8femORFF 90 swivel (Pressure hose)	
HP	760-1325-000	1	Hose, hyd - 3/8" x 32", #6femJIC swivel x #8femORFF swivel (Tank hose)	
HQ	760-1142	1	Hose, hyd - 1/4" x 56", #6femJIC swivel both ends (Load sense hose)	
HR	760-1023	2	Hose, hyd - 3/8" x 58", #6femJIC swivel x #8femORFF 90 swivel (Steering hoses)	
HS	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.

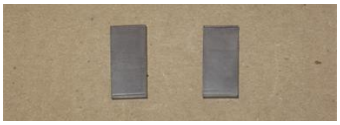
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI	
WC	602-1087-000	1	Connector arm, steering	
WD	675-1191-000	2	Screw, mach, 8-32 x 3", PPH ZP	
WE	676-1054-000	4	Nut, nylock 8-32NC, ZP	
WF	675-1150-000	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	640-0130-000	1	WAS assembly mounting bracket	
WL	640-0131-000	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	
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	
Bag S1 contains SF				
SF	676-1059-000	1	Nut, nylock - 3/8NF ZP (Mount SC)	

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.*

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

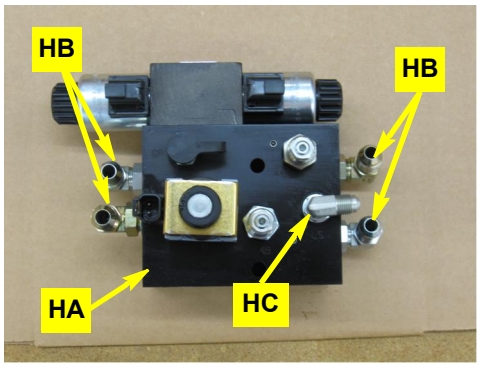


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

Install the steering block mounting bracket **HD** on the second and third bolts (from the left, or outside) in the box member flanges below the cab access foot plate on the left of the machine (Figure 2 with inset).

Mount **HD** with its bend rearward so its long side is not against the box member (Figure 2, bottom right inset).

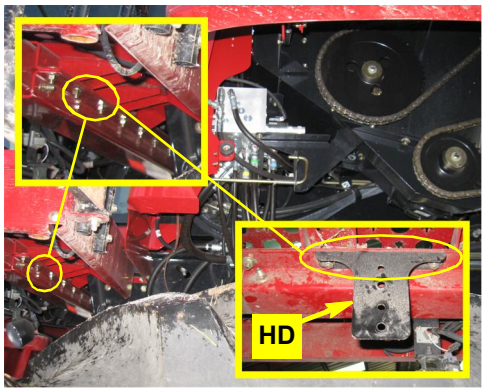


Figure 2 with insets: Installed steering block mounting bracket

3. Install the hydraulic steering block.

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

- Mount **HA** against the front face of **HD** with its solenoids downward (so with the **P** and **T** ports to the left).
- Figure 3 shows bracket **HF** that may or may not be used in your installation. If bracket **HF** is not included in your install kit then disregard

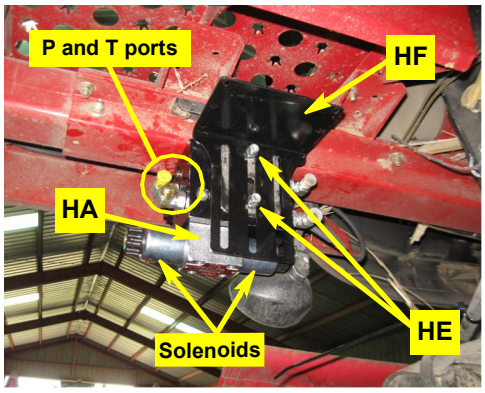


Figure 3: Installed steering block

4. Install the pressure fitting.

Locate the hydraulic valve on the left side of the compartment behind the cab (Figure 4). Locate the pressure port on the lower right side of the rear face of the valve (Figure 4 - upper inset). Disconnect the machine's pressure hose and install run-tee **HI** on the elbow adapter in the block. Reconnect the machine's pressure hose to the open 'T' end of the run-tee (Figure 4 - lower inset).

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.*

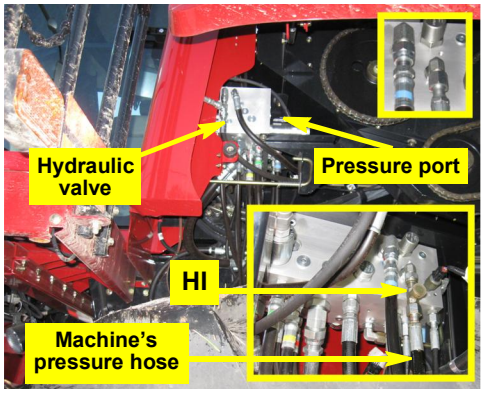


Figure 4 with insets: Run-tee at pressure port, machine's pressure hose reconnected

5. Install the tank fitting.

Locate the return oil manifold at the forward end of the horizontal steel lines below the hydraulic valve (Figure 5). Locate the machine's tank hose in the bottom of the manifold (it's the foremost hose going into the bottom of the manifold - Figure 5 left inset). Disconnect the machine's tank hose and install run-tee **HI** on the manifold. Reconnect the machine's tank hose to the open 'T' end of the run-tee (Figure 5 right inset).

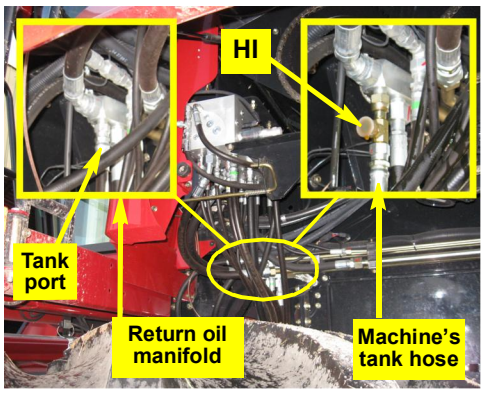


Figure 5 with insets: Run-tee at tank port, machine's tank hose reconnected

6. Prepare and install the load sense valve.

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

- Install adapter **HK** in the valve's function port
- Install adapter **HL** in the valve's **LS** port (to hydraulic steering block)
- Install adapter **HM** in the valve's source port and then adapter **HN** in **HM**.

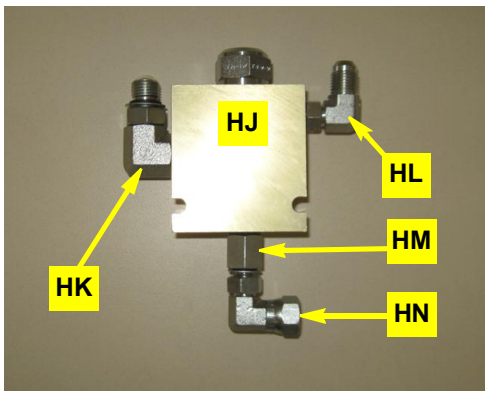


Figure 6a: Prepared load sense valve

b. Locate the load sense line on the right side of the bottom of the hydraulic valve (Figure 6b - viewed from rear). Disconnect the machine's load sense line and connect load sense valve adapter **HM** to the load sense port. Reconnect the machine's load sense line to load sense valve adapter **HK** (Figure 6b inset - viewed toward rear).

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 **HS**. Tighten all hoses, run-tees and steering block fittings when installation is complete.*

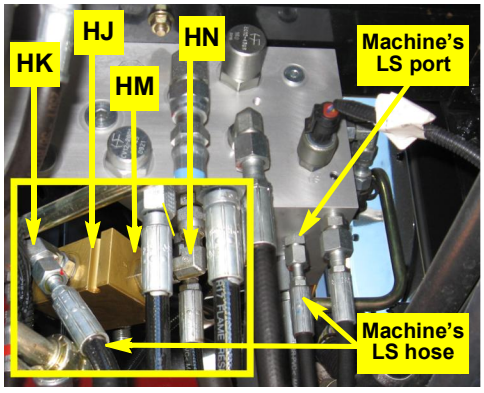


Figure 6b with inset: Load sense valve installed, machine's load sense hose reconnected

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

a. Install pressure hose **HO** between adapter **HB** in the **P** port of the hydraulic steering block (Figure 7a) and the open stem of run-tee **HI** installed at step 4 (Figure 7a inset).

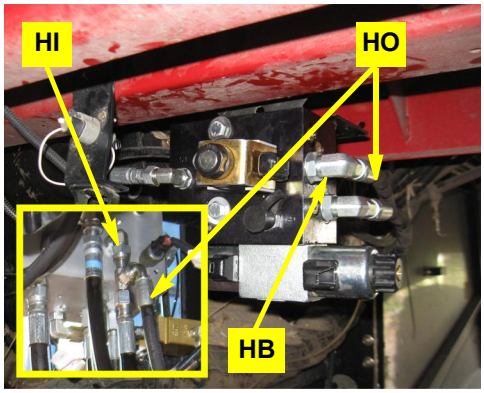


Figure 7a with inset: Pressure hose installed at steering block and (inset) at hydraulic valve

b. Install tank hose **HP** between adapter **HB** in the **T** port of the hydraulic steering block (Figure 7b) and the open stem of run-tee **HI** installed at step 5 (Figure 7b inset)

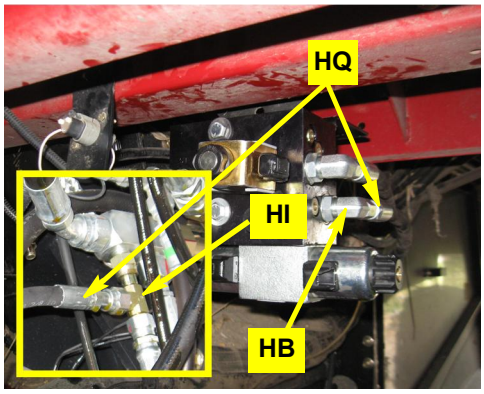


Figure 7b with inset: Tank hose installed at steering block and (inset) at return oil manifold

c. Install load sense hose **HQ** between adapter **HC** in the LS port of the hydraulic steering block (Figure 7c) and adapter **HL** in the load sense valve installed in step 6 (Figure 7c inset).

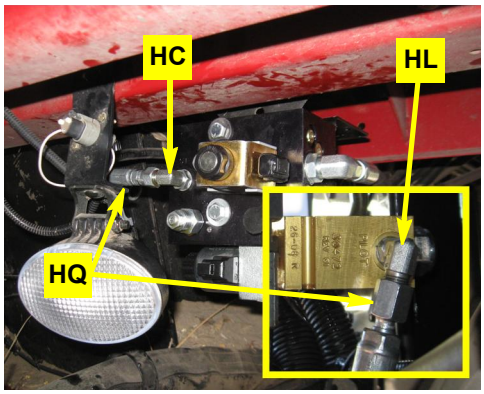


Figure 7c with inset: Load sense hose installed at steering block and (inset) at load sense valve

8. Install the steering fittings.

Locate the steering hose to (steel) steering line connections inside the body panel inside the left front wheel (Figure 8). Install run-tees **HI** between the hose and the steel lines (Figure 8 - inset).

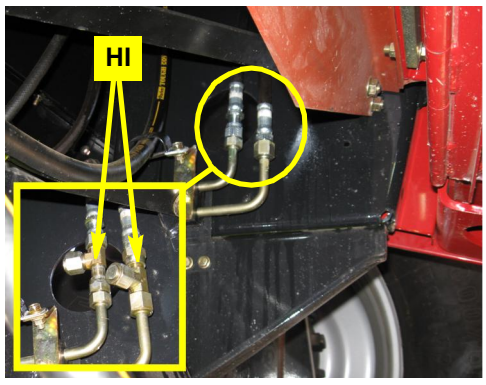


Figure 8 with inset: Run-tees installed at steering hose/steering line connections

9. Install the steering hoses.

Install steering hoses **HR** between the run-tees **HI** installed in step 8 (Figure 9) and adapters **HB** in the **A** and **B** ports of the hydraulic steering block (Figure 9 inset).

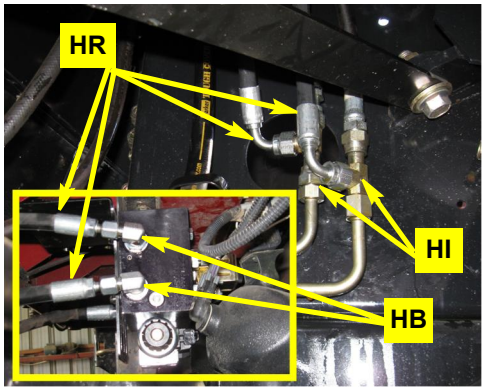


Figure 9 with inset: Steering hoses installed

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 (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).

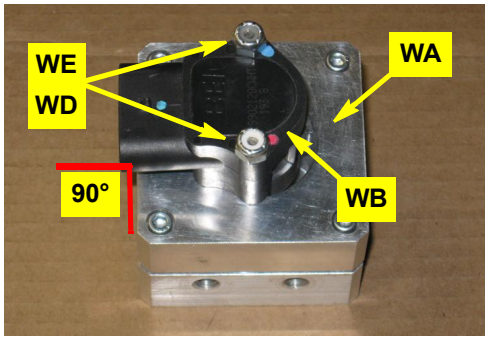


Figure 1a: Prepared WAS housing\connector

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

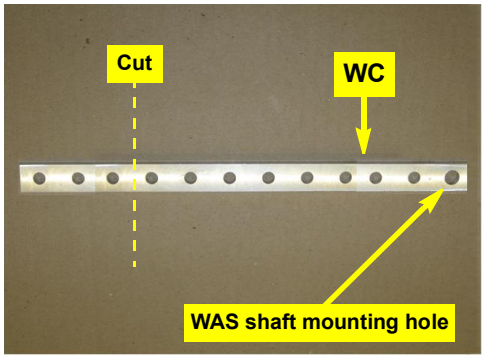


Figure 1b: WAS arm preparation

c. Using hardware **WF** (screw) and **WE** (nut), attach the WAS arm **WC** to the WAS assembly. Mount the arm in the same 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.*

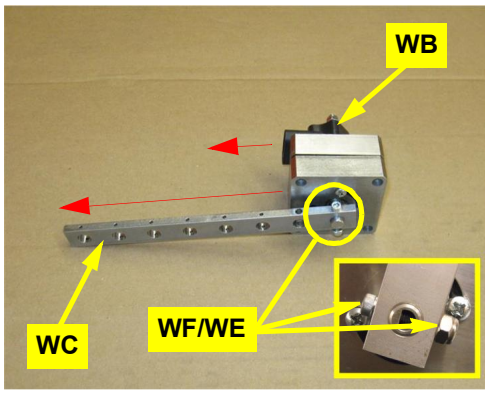


Figure 1c with inset: WAS arm installed

d. Cut threaded rod **WG** to 5¼" long (Figure 1d-i) then screw swivel rod ends **WI** onto the cut rod to achieve a center-to-center stud measurement of 6½" (Figure 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2f.

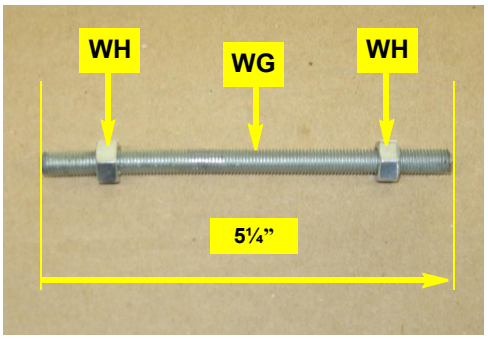


Figure 1d-i: Threaded link rod preparation

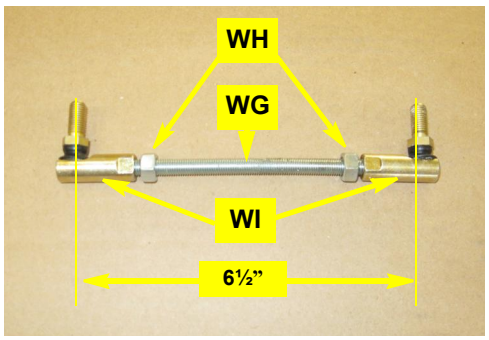


Figure 1d-ii: Assembled threaded link rod

2. Mount the wheel angle sensor.

NOTE: *Figures in this section show prototype brackets. Install your brackets as described.*

a. On the left side of the rear axle, locate and remove the top, inner (of six) axle track adjustment bolts (Figure 2a inset) and install WAS mounting bracket **WK** (Figure 2a).

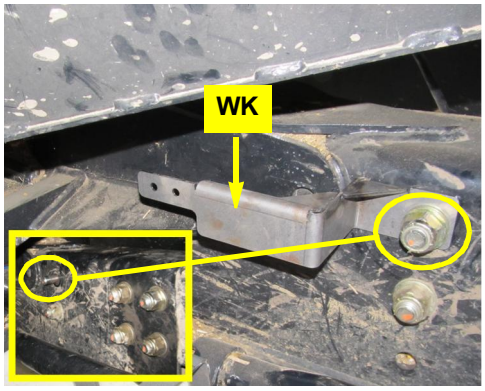


Figure 2a with inset: WAS assembly mounting bracket installed

b. Using hardware **WJ**, install the WAS assembly from step 1 on the axle side of bracket **WK**. Have the wire connector **WB** on top, pointing toward the center of the machine. Connector arm **WC**'s working arc will be toward the front of the machine (Figure 2b).

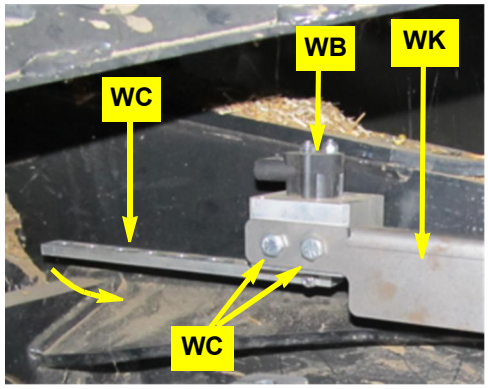


Figure 2b: WAS assembly installed

c. Mount rod link bracket **WL** on the tie rod's adjustment clamp bolt. Mount the bracket so that it bends away from the axle and is vertical (Figure 2c with inset and Figure 2d).

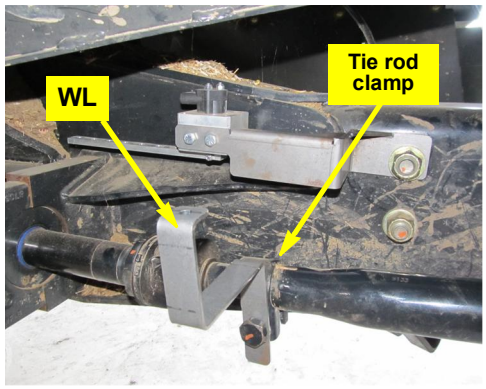


Figure 2c with inset: WAS rod link installed

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

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.

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

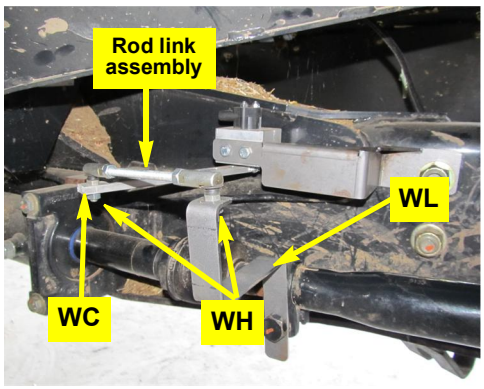


Figure 2d: WAS link rod assembly installed

Installation - Steering Wheel Switch (SWS)

1. Prepare the switch bracket.

Prepare switch bracket **SC** as detailed (Figures 1 and 3a and 3b. Note that the position of bends and twists are approximate - rework them as required once you have installed the bracket):

- Drill a 3/8” hole in the opposite end from the pre-drilled end
- Put an upward bend (about 80°) approximately 2¾” from the newly drilled end
- Put a slight ‘forward’ twist 1” from the newly drilled end
- Put a slight ‘backward’ twist (opposite to the first twist) ½” from the pre-drilled end.

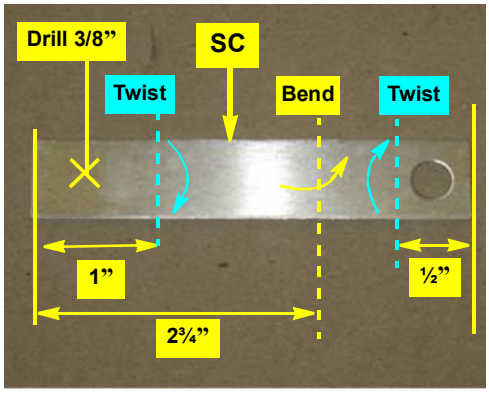


Figure 1: Switch bracket preparation (not to scale). See finished bracket in Figures 3a/b.

2. Install the magnets.

Retracting the floor mat as required, access the bottom of the steering shaft inside the steering column. Using the two-part epoxy **SB**, install magnets **SA**, 180° apart, on the shaft immediately above its narrow section (Figure 2).

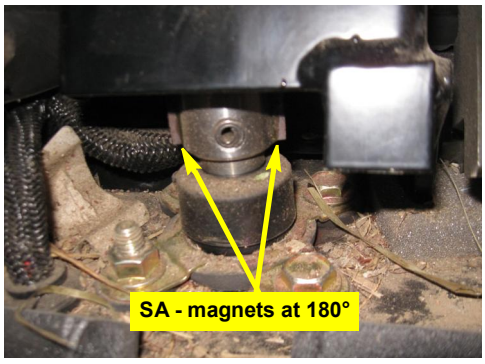


Figure 2: Installed magnets

3. Install the switch bracket and switch.

a. Using hardware **SF** install switch bracket **SC** on the front right stud of the lower steering shaft support. Rework the bend and twists in bracket **SC** as required to align the switch hole with the center of one of the magnets (Figure 3a).

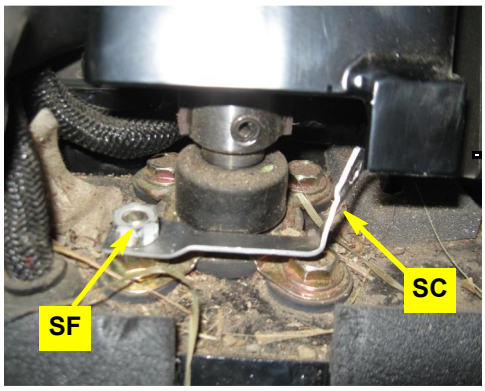


Figure 3a: Installed switch bracket

b. 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 3b). Drop **SD**’s cable down the ledge at the front of the floor and refit the floor mat.

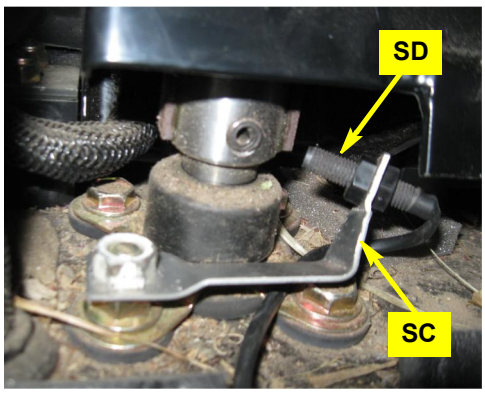


Figure 3b: Installed switch bracket and switch

Appendix - Hydraulic Circuits