

Automated Steering Kit Installation Guide

Kit: EDX-AC1064, P/N 911-2038-000


Fits Ag-Chem RoGator Models*:

864	874
1064	1074

* Hydraulic track adjust only



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 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.

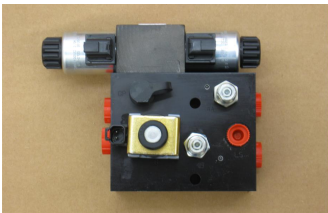



Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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	760-2060-000	2	Adapter, hyd - #6maleJIC x #8maleORB (P and T ports on HA)	
HC	760-2061-000	2	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB (A and B ports on HA)	
HD	760-2045-000	1	Adapter, hyd plug - #6maleORB (LS port on HA)	

Kit Contents - Steering Hydraulics *(continued)*

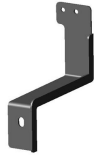

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HE	640-0030	1	Hydraulic steering block mounting bracket	
Bag H2 contains HF				
HF	675-2060-000	2	Bolt - 3/8-16, 4.0, Gr5, ZP	
	678-1054-000	2	Washer, flat - 3/8 ZP	
	676-1035-000	2	Nut, nylock - 3/8NC ZP	
(Mount HA onto HE)				
Bag H4 contains HJ and HK				
HJ	760-2054	1	Adapter, hyd run-tee - #6JIC (Pressure line)	
HK	760-2077	3	Adapter, hyd run-tee - #8JIC (Tank and steering lines)	
HL	760-1100	1	Hose, hyd - 3/8" x 40", #6femJIC swivel both ends (Pressure hose)	
HM	760-1125	1	Hose, hyd - 3/8" x 36", #6femJIC swivel x #8femJIC 90 swivel (Tank hose)	
HN	760-1098	2	Hose, hyd - 3/8" x 21", #6femJIC swivel x #8femJIC swivel (Steering hoses)	
HO	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	2	Bolt, 5/16NC x 3/4" Gr5 ZP	  (Attach WAS assembly to WK)
	678-1077-000	2	Washer, lock 5/16, ZP	

Kit Contents - Wheel Angle Sensor *(continued)*

WK	640-0119-000	1	WAS assembly mounting bracket	
WL	640-0118-000	1	WAS link rod 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 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 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

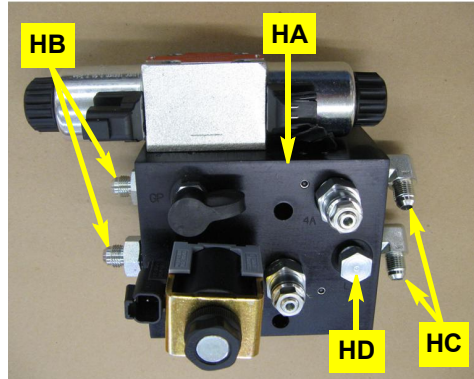


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

Locate the three bolts that fasten the sheet metal panel to the frame in front of the cab on the lower left side (Figure 2). Remove the two rearmost bolts and use them to install the hydraulic steering block mounting bracket **HE** (Figure 2, inset).



Figure 2 with inset: Installed steering block mounting bracket

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

Using hardware **HF**, attach hydraulic steering block **HA** and steering controller bracket **HG** to bracket **HE** (Figure 3 with inset):

- Mount **HG** under **HA** with its short side upward and outward to the full extent of its slots (Figure 3 with inset)
- Mount **HA** with its solenoids inward (so with the **P** and **T** ports forward)

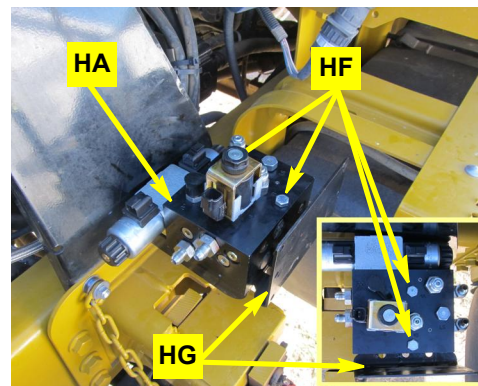


Figure 3 with inset: Installed steering block and steering controller mounting bracket

4. **Install the pressure and tank fittings.**

NOTE: *Plastic caps placed on the open ends of the fittings will prevent excessive leakage prior to hose installation. Leave run-tees loose to allow for alignment when attaching hoses*

- a. Locate the pressure and tank hoses at the valve block behind the front axle (it actuates the front track width cylinders - Figure 4a with insets). Note that the **T** and **P** hoses and connections are not visible in the main picture - see the 4a insets and Figure 4b). The ports are marked **T** (left side - Figure 4a, left inset) and **P** (right side - Figure 4a, right inset). Disconnect the hoses.
- b. Install run-tees **HJ** and **HK** in the **P** and **T** ports respectively and reconnect the machine's hoses to the open 'T' ends of their respective run-tees (Figure 4b). Reconnect the machine's pressure and tank hoses to the open 'T' ends of their respective run-tees (not visible - but see Figure 5a-i).

5. **Install the pressure and tank hoses.**

- a. Connect pressure hose **HL** and tank hose **HM** to the stems of run-tees **HJ** and **HK** respectively (Figure 5a-i). Route the hoses across to the outside of the machine frame and back to the hydraulic steering block installed at step 3. Route the hoses with other plumbing and clear of moving parts. Secure routed hoses with tie straps **HO** (Figure 5a-ii).

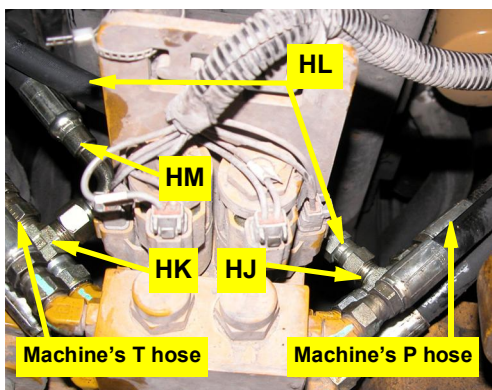


Figure 5a-i: Pressure and tank hoses connected at front axle valve block

- b. Connect the pressure and tank hoses **HL** and **HM** to adapter fittings **HB** in the **P** and **T** ports on the hydraulic steering block (Figure 5b).
- c. Securely tighten all hose fittings and connections.

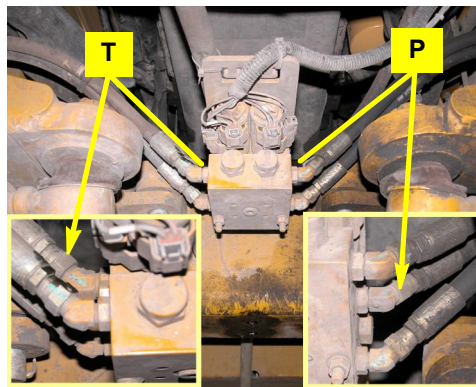


Figure 4a with insets: Pressure and tank lines at front axle valve block

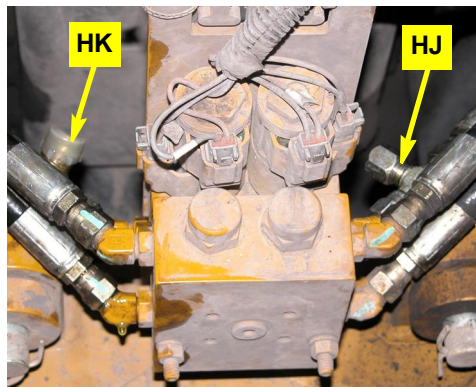


Figure 4b: Pressure and tank run-tees installed. machine's hoses reconnected (not visible)

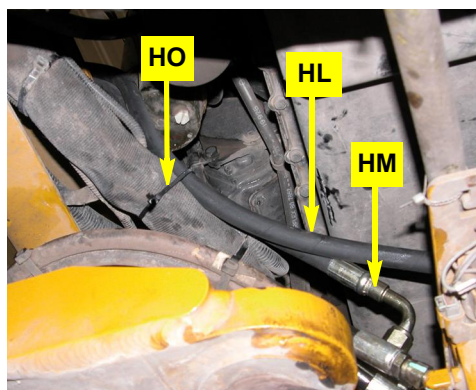


Figure 5a-ii: Pressure and tank hoses routed toward left frame and tied

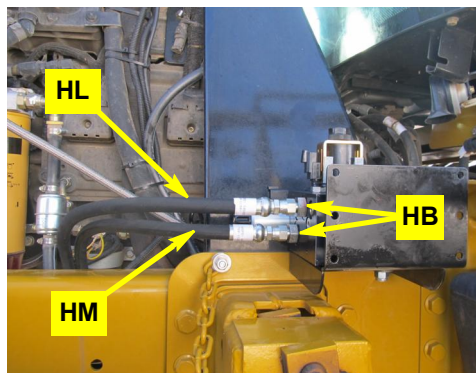


Figure 5b: Pressure and tank hoses installed at steering block

6. **Install the steering output fittings.**

NOTE: Plastic caps placed on the open ends of the fittings will prevent excessive leakage prior to hose installation.

Locate the steering lines on the left side of the steering orbital under the front of the cab (Figure 6). Disconnect the steering lines, install run-tees **HK** and reconnect the lines to the open 'T' ends of the run-tees (Figure 6 inset).

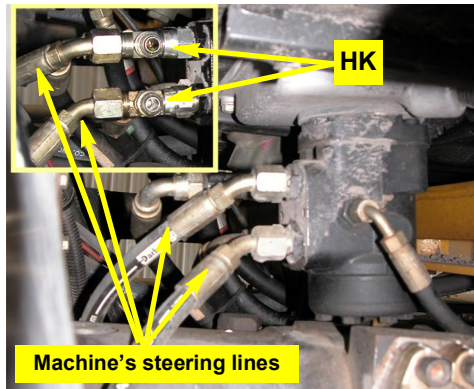


Figure 6 with inset: Run-tee connected at orbital, machine's hoses reconnected

7. **Install the steering output hoses.**

- a. Connect steering hoses **HN** to the open stems of run-tees **HK** (Figure 7 inset). Route the hoses, with other plumbing and clear of moving parts to the hydraulic steering block. Use ties **HO** as necessary.
- b. Connect the steering hoses **HN** to adapter fittings **HC** in the **A** and **B** ports of the hydraulic steering block (Figure 7).

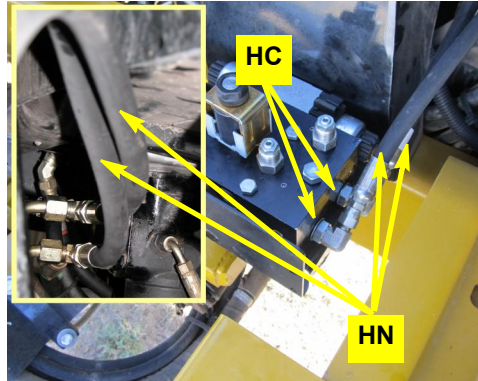


Figure 7 with inset: Steering hoses connected at steering block and (inset) connected to run-tees at orbital

8. **Install the steering controller.**

Using hardware **HI**, install steering controller **HH** on its mounting bracket **HG**. Mount **HH** in the middle holes of bracket **HG** and with its wire connectors downward (Figure 8).

9. **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.

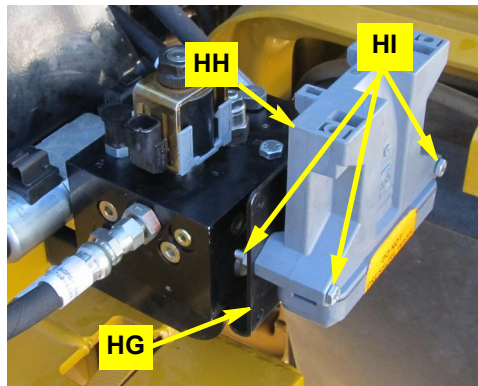


Figure 8: Steering controller attached to steering block

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).

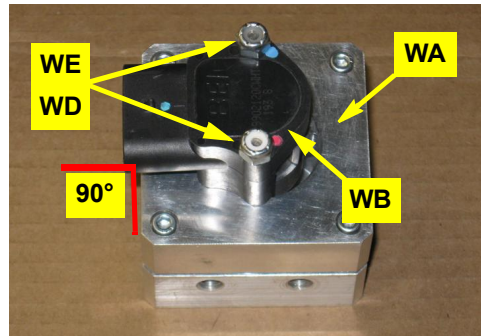


Figure 1a: Prepared WAS housing/connector

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

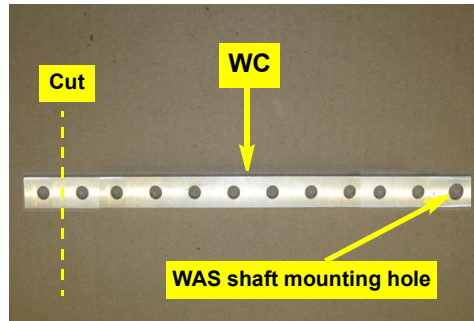


Figure 1b: WAS arm preparation

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

- d. Cut threaded rod **WG** to 11¼" long (Figure 1d-i) then screw swivel rod ends **WI** onto the cut rod to achieve a center-to-center stud measurement of 13" (Figure 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2f.

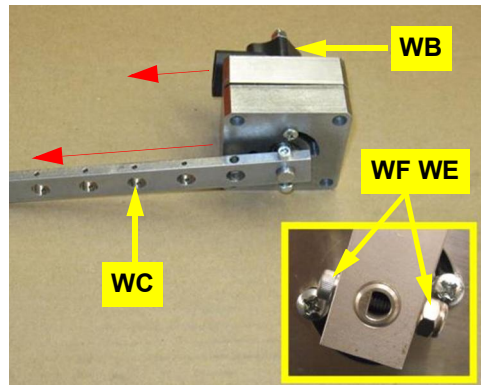


Figure 1c with inset: WAS arm installed

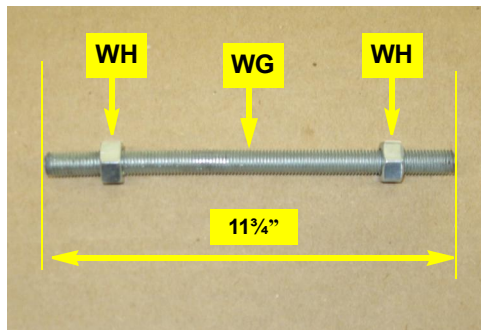


Figure 1d-i: Threaded link rod preparation

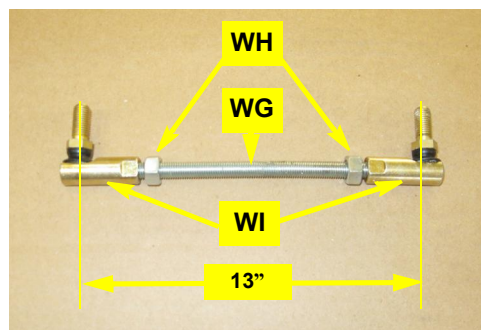


Figure 1d-ii: Assembled threaded link rod

2. **Mount the wheel angle sensor.**

NOTE: *The figures in this section show prototype brackets. Install your supplied brackets as described.*

a. Locate the steering hose clamp on the left rear face of the front axle (Figure 2a inset). Remove the clamp bolt and use it to install WAS bracket **WK** (and the clamp - Figure 2a).

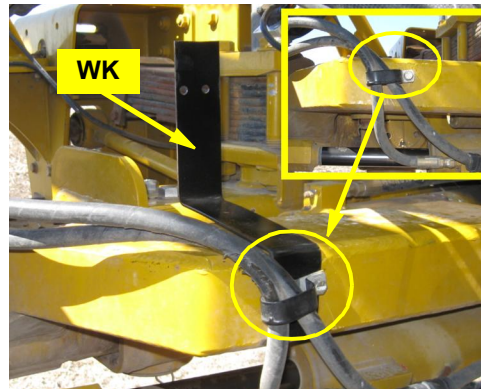


Figure 2a with inset: Installed WAS mounting bracket

b. Locate and remove the lower nut on the uppermost U-bolt of the left fender attachment. Install link rod bracket **WL** with its long side down and toward the center of the machine. Retighten the nut (Figure 2b).

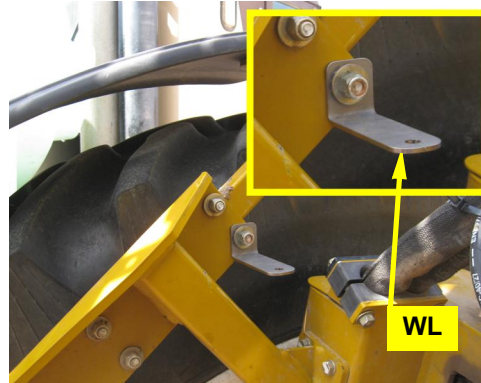


Figure 2b with inset: WAS link rod bracket installed

c. Using hardware **WJ** (not visible), mount the WAS assembly from step 1 on the rear face of bracket **WK**. Mount the WAS assembly with its arm **WC** on top and **WB**'s wire connector pointing inward (Figure 2c - you will install the WAS cable later).

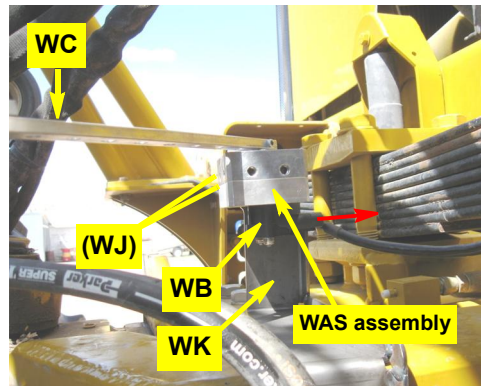


Figure 2c: Installed WAS assembly

d. Using hardware **WH** (not visible), 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).

NOTE: *Use tie straps **HO** to keep the cylinder hoses clear of the moving WAS linkage.*

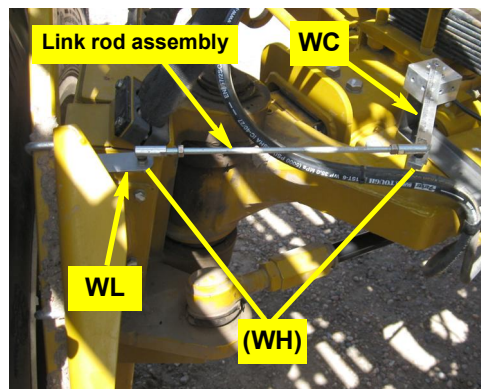


Figure 2d: Installed WAS link rod assembly

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).



Figure 2e-i: Full left lock (viewed from above)

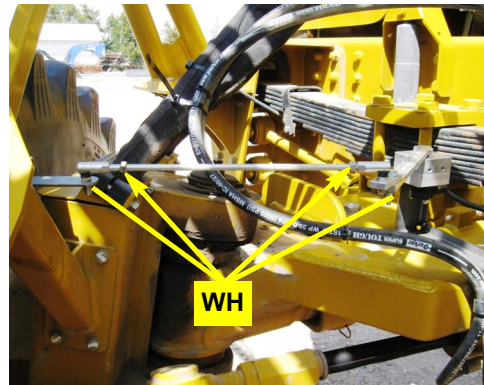


Figure 2e-ii: Full right lock (viewed from rear)

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

Installation - Steering Wheel Switch

1. Install the steering wheel switch.

- a. Remove the top, then bottom front steering column panels (nearest the windscreen) to expose the steering shaft (Figure 1a).

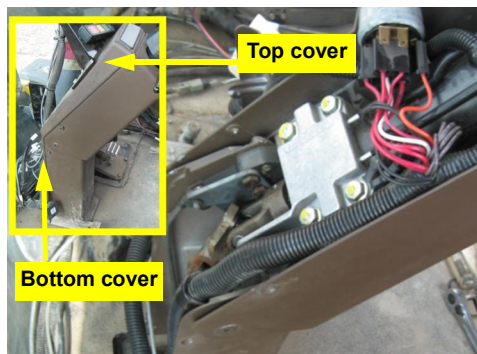


Figure 1a with inset: Steering column covers removed

- b. Drill an 11/32" hole in switch bracket **SC** at the opposite end to the pre-drilled switch hole. Put a 90° bend in the bracket near the new hole and a slight twist approximately half way between the bend and the pre-drilled end (Figure 1b).

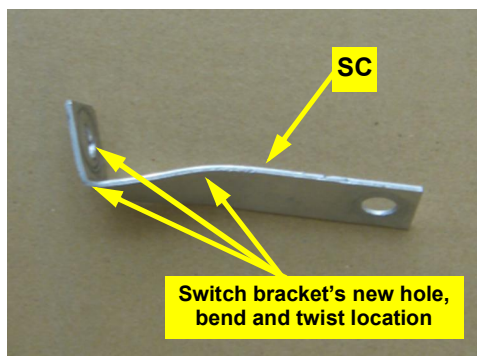


Figure 1b: Drilled, bent and twisted switch bracket

- c. Measure and mark a point 1 1/2" from the top of the alloy clamp coupling at the bottom of the exposed steering shaft. Clean a magnet-length area of the shaft with the cross-marked point as the center.

Using the two-part epoxy **SB**, attach magnets **SA** 180° apart on the steering shaft. Set the center of the magnets 1 1/2" from the clamp coupling (Figure 1c).

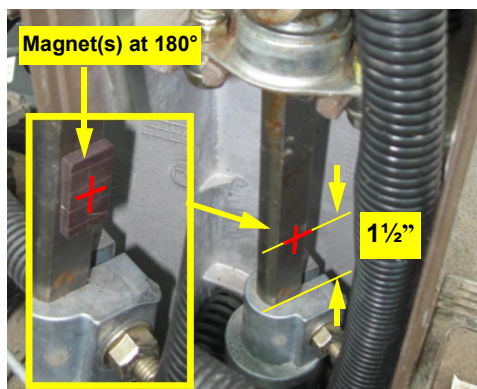


Figure 1c with inset: Installed magnets

- d. Attach switch **SD** to switch bracket **SC** (Figure 1d). Remove the nut and bolt securing the right side of the steering shaft bearing block below the lower universal joint (Figure 1d inset). Using this nut and bolt, install the steering switch bracket under the bearing block mounting (Figure 1d).

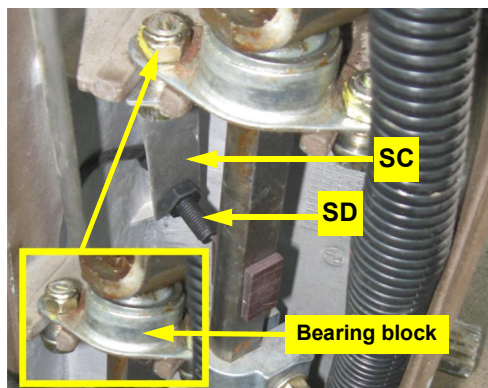


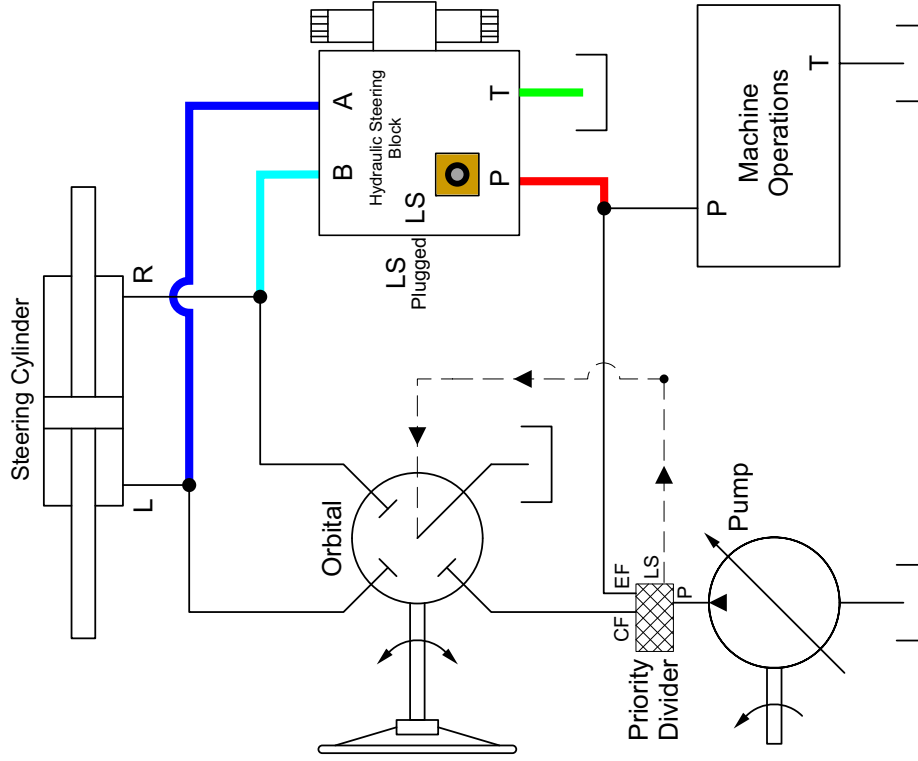
Figure 1d with inset: Installed switch bracket and switch

1. **Install the steering wheel switch** (*continued*).
- e. Twist and bend the switch bracket to align switch **SD** with the magnets and adjust the sensor face to 1/8" to 1/4" away from the magnets.

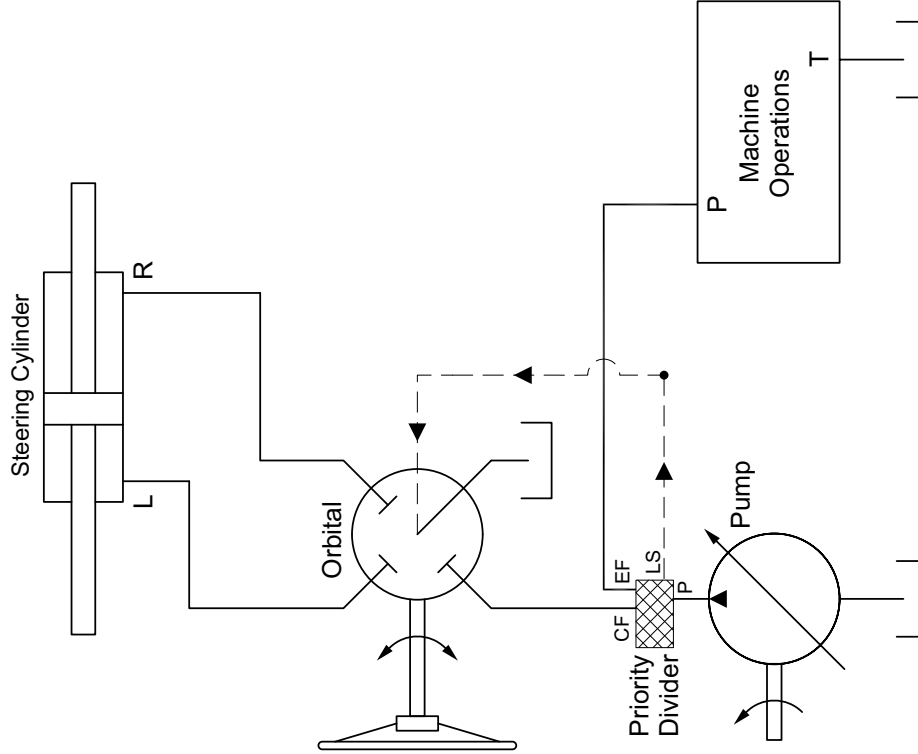
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Appendix - Hydraulic Circuits

With AutoSteer



Without AutoSteer



Legend

- █ Tank
- █ A - Steering Line
- █ B - Steering Line
- █ Pressure