

Automated Steering Kit Installation Guide

Kit: EDX-AC1254, P/N 911-2023-000

Fits Ag-Chem RoGator Sprayer Models:


1254*	SS874
1264	SS1074
1274	SSC1074

Note 1: There are two possible front axle arrangements and two possible steering column types for the listed models. To accommodate the variations, this guide provides instructions for two wheel angle sensor (WAS) installations (WAS 1 and WAS 2) and two steering wheel switch (SWS) installations (SWS 1 and SWS 2). The guide makes it clear which installation instructions apply to each variation.



Note 2*: There are some variations between the hydraulic fittings used for 1254 models and the other models listed above. The instructions make it clear what to install where variations occur.

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.

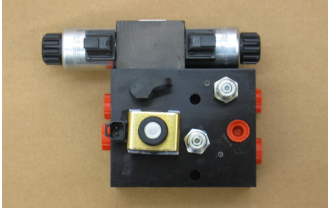



Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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.

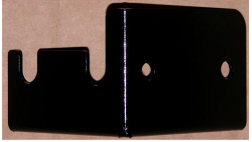




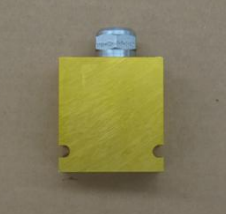


To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and 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, HC and HD				
HB	760-2061-000	2	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB (A and B ports on hydraulic steering block)	
HC	760-2060-000	2	Adapter, hyd - #6maleJIC x #8maleORB (P and T ports on hydraulic steering block)	
HD	760-2058	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	640-0013	1	Hydraulic steering block mounting bracket	
Bag H2 contains HF				
HF	675-2006-000	2	Bolt - 3/8NC x 3-3/4" Gr5, ZP	
	678-1054-000	2	Washer, flat - 3/8 ZP	
	676-1035-000	2	Nut, nylock - 3/8NC ZP	
(Mount hydraulic steering block onto HE)				
Bag H4 contains HJ, HK and HL				
HJ	760-2054	2	Adapter, hyd run-tee - #6JIC (Steering ports at orbital - 1254 models only)	
HK	760-2077	4	Adapter, hyd run-tee - #8JIC (Pressure and tank ports at orbital [all models] and steering ports at orbital non-1254 models [with HL])	
HL	760-2065	2	Adapter, hyd - #8femJIC x #6maleJIC (Use with HK in steering ports at orbital - non-1254 models)	
HM	760-0009	1	Assembly, hyd dynamic load sense valve	
Bag H5 contains HN, HO and HP				
HN	760-2036	1	Adapter, hyd - #6maleORB x #4maleJIC (Source port in HM, 1254 models only - see HQ)	
HO	760-2082	1	Adapter, hyd - #4maleORB x #6maleJIC 90 elbow (LS port in HM)	

Kit Contents - Steering Hydraulics *(continued)*


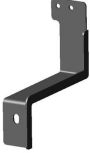






REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HP	760-2056	1	Adapter, hyd - #6maleORB x #6maleJIC (Function port in HM)	
Bag H6 contains HQ and HR				
HQ	760-2111-000	1	Adapter, hyd - #6maleORB x #5maleJIC (Source port in HM, non-1254 models - see HN)	
HR	760-2112-000	1	Adapter, hyd - M12x1.5maleORB x #4maleJIC (LS port in steering orbital - non-1254 models)	
HS	760-1317	1	Hose, hyd - 1/4" x 15", #6femJIC swivel x #4femJIC 90 swivel (Jumper hose for load sense line)	
HT	760-1071	2	Hose, hyd - 3/8" x 70", #6femJIC swivel x #8femJIC 90 swivel (Pressure and tank hoses)	
HU	760-1053	2	Hose, hyd - 3/8" x 50", #6femJIC swivel x #6femJIC 90 swivel (A and B steering hoses)	
HV	760-1036	1	Hose, hyd - 1/4" x 33", #6femJIC swivel x #6femJIC 90 swivel (Load sense hose)	
HW	677-2001	20	Tie strap, 11" heavy duty	

Kit Contents - Wheel Angle Sensor

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

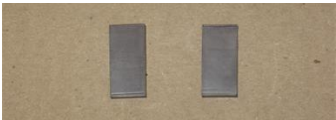



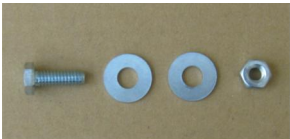

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI	
WC	602-1087-000	1	Connector arm, steering	
WD	675-1191-000	2	Screw, mach, 8-32 x 3", PPH ZP	
WE	676-1054-000	4	Nut, nylock 8-32NC, ZP	
WF	675-1150-000	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	
	678-1077-000	2	Washer, lock 5/16, ZP (Attach WAS assembly to WK)	

Kit Contents - Wheel Angle Sensor *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WK	640-0113-000	1	WAS assembly mounting bracket (WAS 1 installation)	
WK2	640-0153-000	1	WAS assembly mounting bracket - 2 (WAS 2 installation)	
WL	640-0114-000	1	WAS link rod bracket (WAS 1 installations - see WP in Bag W3)	
WL2	640-0118-000	1	WAS link rod bracket (WAS 2 installations)	
WM	640-0115-000	1	Hose support bracket (WAS 1 installation)	
Bag W3 contains WN, WO and WP				
WN	675-2049-000	2	Bolt - 1/4"-20 x 1" Gr5, ZP	
	678-1059-000	2	Washer, lock - 1/4" ZP	
	676-1040-000	2	Nut, 1/4NC Gr5 ZP (Mount WK to axle frame - WAS 1 installation)	
WO	675-2009-000	1	Bolt - 5/16NC x 1-1/4" Gr5, ZP	
	678-1055-000	1	Washer, flat - 5/16" ZP	
	676-1036-000	1	Nut, lock - 5/16NC ZP (Secure steering hoses against WM - WAS 1 installation)	
WP	678-1054-000	2	Washer, flat - 3/8 ZP (WAS 1 installation. Use with machine's bolts when installing WL.)	

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	
Bag S1 contains SE				
SE	675-2017	1	Bolt - 1/4NC x 3/4" Gr5, ZP	
	678-1053	2	Washer, flat - 1/4 ZP	
	676-1034	1	Nut, locking - 1/4NC ZP (SWS 1 installation)	
SF	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.

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

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

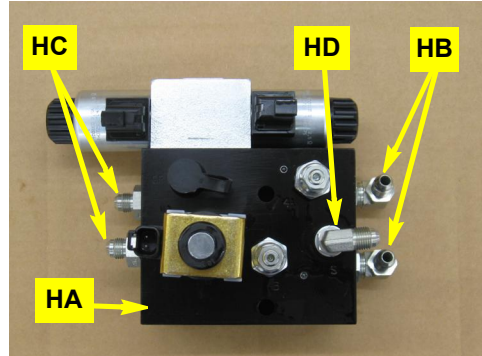


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

Locate the three bolts on the left side of the machine frame to the rear of the front axle (Figure 2-i).

Loosen the top two bolts and slide hydraulic steering block bracket **HE**, its two-hole block mounting face upward, behind the loosened bolts (Figure 2-ii). Retighten the bolts.

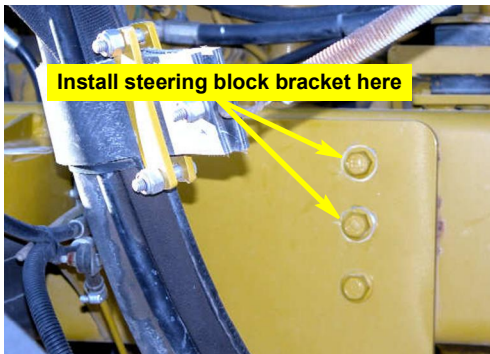


Figure 2-i: Steering block mounting bracket location

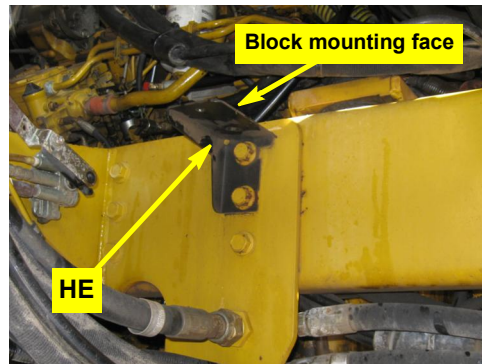


Figure 2-ii: Installed steering block mounting bracket

3. Install the hydraulic steering block

Using hardware **HF**, attach hydraulic steering block **HA** to bracket **HE** (Figure 3).

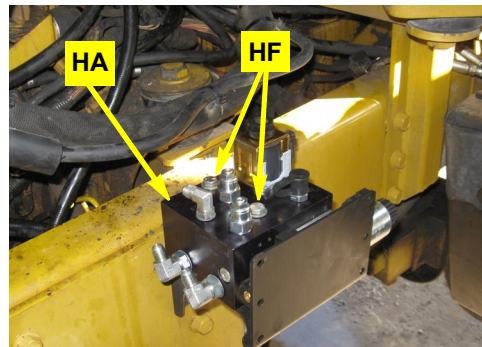


Figure 3: Installed steering block

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

Locate the pressure and tank hoses at the right side of the steering orbital (Figure 4-i inset, the top hose is the tank line). Disconnect the two hoses and install run-tees **HK** in the pressure and tank ports (Figure 4-i).

NOTE: Leave run-tees loose to allow for alignment when attaching hoses.

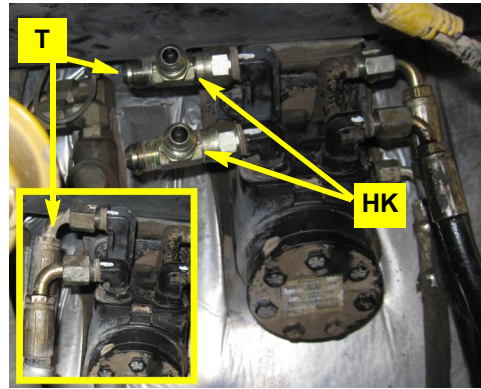


Figure 4-i with inset: Pressure and tank lines at orbital

Reconnect the machine's pressure and tank hoses to the open 'T' ends of their respective run-tees (Figure 4-ii).

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

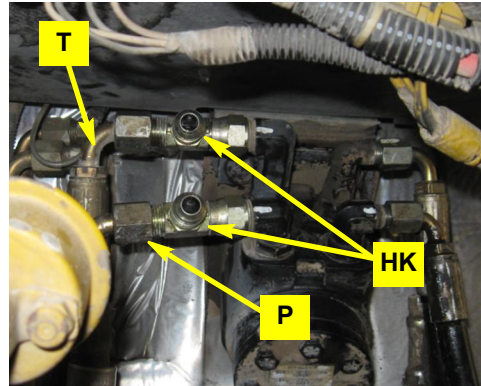


Figure 4-ii: Reconnected machine's tank and pressure hoses

5. **Prepare and install the load sense shuttle valve.**

a. Assemble the load sense shuttle valve **HM** as follows (Figure 5a):

- fitting **HQ** (or **HN** - 1254 models) in the source port
- fitting **HO** in the LS port
- fitting **HP** in the function port

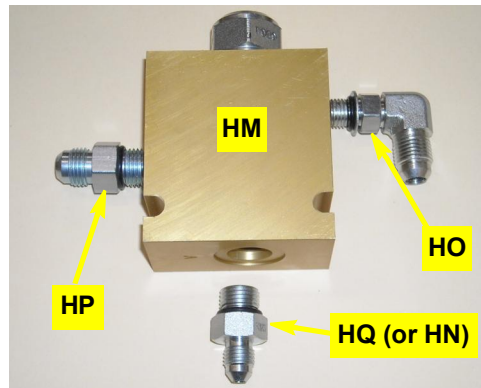


Figure 5a: Preparing the load sense shuttle valve

b. Disconnect the steering hoses at the orbital to improve access to the load sense connection (Figure 5b).

c. Locate the machine's load sense line at the orbital and disconnect it (Figure 5b and inset). For non-1254 models only, remove the fitting in the load sense port and replace it with **HR** (not shown).

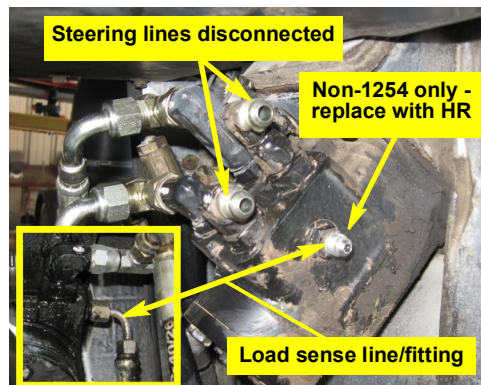


Figure 5b: Steering lines and load sense line disconnected from orbital

5. **Prepare and install the load sense shuttle valve (continued).**
 - d. Install jumper hose **HS** between the orbital (original fitting or **HR**) and adapter **HP** in the function port in the load sense shuttle valve (Figure 5c).
 - e. Connect the hose you disconnected from the orbital at step c to fitting **HN** (1254 models) or fitting **HQ** (not shown) in the source port in the load sense shuttle valve (Figure 5c and inset).

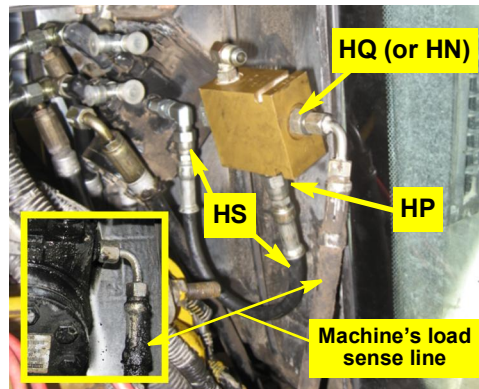


Figure 5c with inset: Installing the load sense shuttle valve

6. **Install the pressure, tank and load sense hoses.**
 - a. Connect load sense hose **HV** to fitting **HO** in the load sense shuttle valve (Figure 6a inset).
Connect pressure and tank hoses **HT** to the stems of run-tees **HK** (Figure 6a).

NOTE: Figure 6a inset shows a straight hose end using an elbow fitting to connect to **HO**. Connect the elbow end of your **HV** directly onto **HO**.

- b. Route the three hoses down to the hydraulic steering block installed at step 3. Route the hoses, with other plumbing and clear of moving parts, along the firewall and down to the hydraulic steering block.
 - c. Connect load sense hose **HV** to adapter fitting **HD** in the hydraulic steering block and the pressure and tank hoses **HT** to adapter fittings **HC** in the **P** and **T** ports on the hydraulic steering block (Figure 6b).

NOTE: Secure routed hoses in place with the provided heavy tie straps **HW**. Securely tighten all hose fittings and connections.

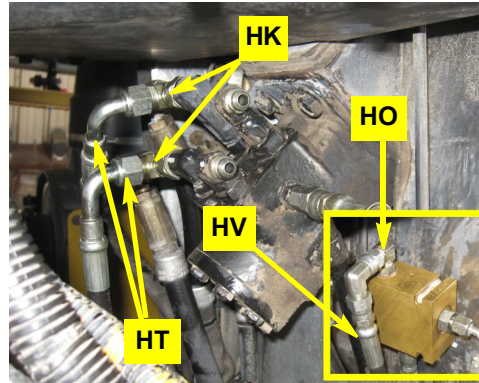


Figure 6a with inset: Pressure, tank and (inset) load sense hose connected at orbital/LS valve

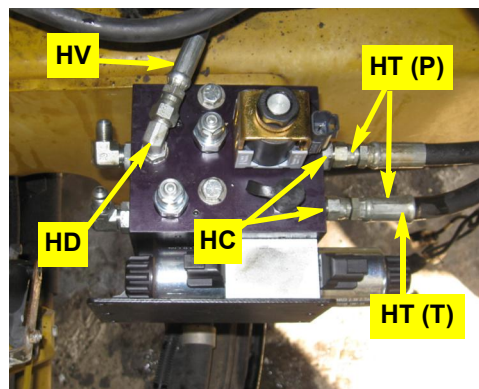


Figure 6b: Pressure, tank and load sense hoses installed at steering block

7. **Install the steering output fittings.**
If not disconnected at step 5b, disconnect the two steering hoses from the left side of the orbital and install run-tees **HK** (or **HJ** - 1254 models) in the steering ports (Figure 7).
Reconnect the machine's steering hoses to the open 'T' ends of run-tees **HJ** or **HK** (Figure 7 inset).
For non-1254 models, install reducer fittings **HL** (not shown) on the open stems of run-tees **HK**.

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

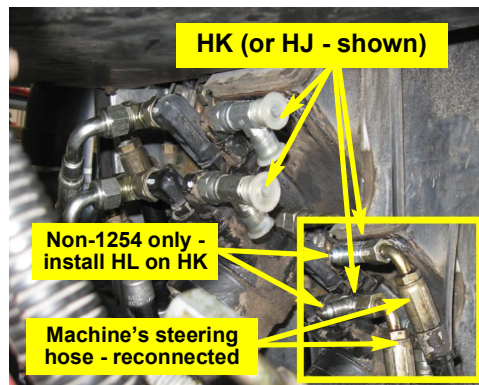


Figure 7 with inset: Run-tees connected at orbital and (inset) machine's hoses reconnected

8. Install the steering output hoses.

- a. Connect steering hoses **HU** to either the fittings **HL** (not shown) on run-tees **HK** or the open stems of run-tees **HJ** (1254 models) (Figure 8a). Route the hoses, with other plumbing and clear of moving parts, along the firewall and down to the hydraulic steering block.

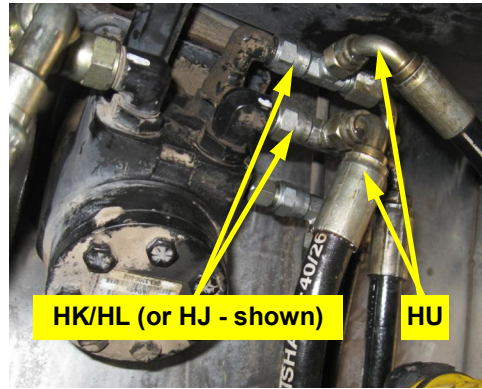


Figure 8a: Steering hoses connected at orbital

- b. Connect the steering hoses **HU** to adapter fittings **HB** in the **A** and **B** ports of the hydraulic steering block (Figure 8b).

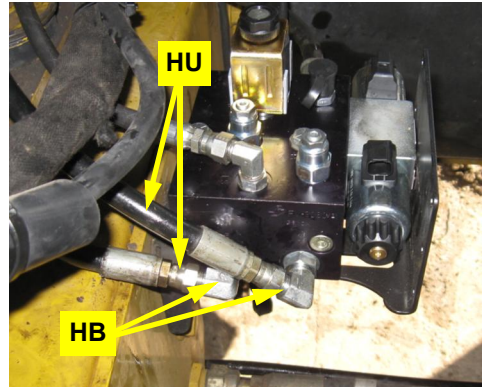


Figure 8b: Steering hoses connected at steering block

9. Verify operation.

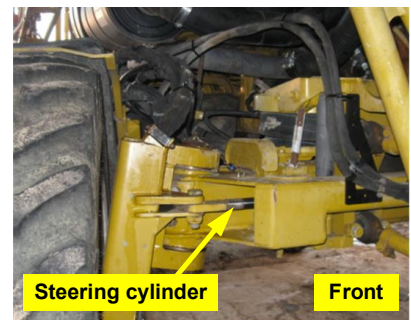
⚠ WARNING: *During tests of the hydraulic system, the machine may move unexpectedly. Be prepared for machine movement to avoid injury.*

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.

Installation - Wheel Angle Sensor 1 (WAS 1)

This WAS installation section—WAS 1—is applicable to machines on which the steering cylinders are in front of the front axle (see photo at right). For machines with the steering cylinders behind the front axle, see WAS 2 on page 15.



⚠ 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).

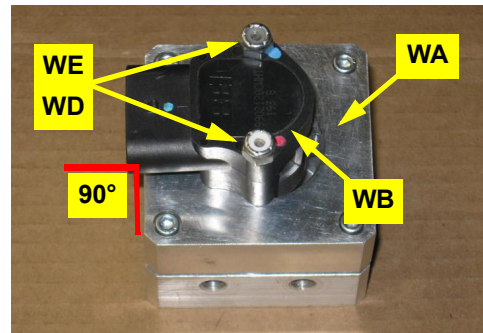


Figure 1a: Prepared WAS housing\connector

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

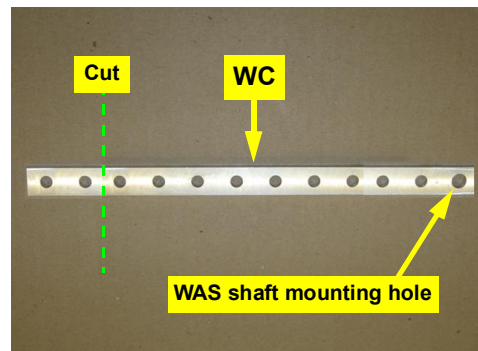


Figure 1b: WAS arm preparation

- 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).

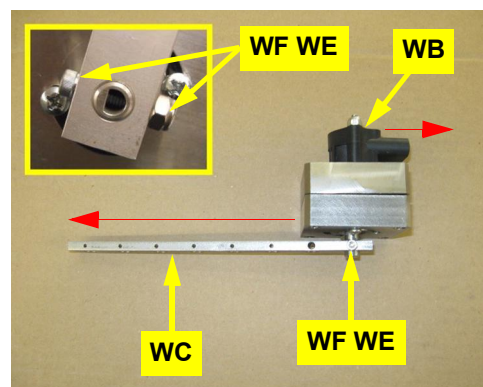


Figure 1c with inset: WAS arm installed

1. Prepare the wheel angle sensor (continued).

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

- d. Cut threaded rod **WG** to 9" (Figure 1d-i) then screw the swivel rod ends **WI** onto the cut rod to achieve a center-to-center stud measurement of 10¼" (Figure 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2.

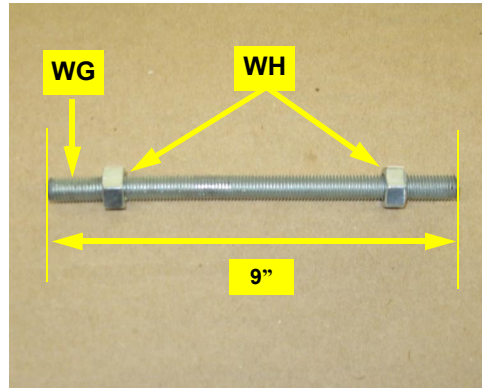


Figure 1d-i: Cut threaded rod

2. Mount the wheel angle sensor.

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

Before you can mount the wheel angle sensor, you need to reposition (raise) the right side steering cylinder hoses at step a.

- a. Locate and remove the two P clamps retaining the steering cylinder hoses on the right side front of the axle frame (Figure 2a inset).

Using the bolt you removed, install hose support bracket **WM** in place of the two P clamps (resting the small lug on **WM** on top of the axle casing) (Figure 2a).

Using hardware **WO**, install the P clamps on bracket **WM**. Use a tie (**HW**) to further secure the motor hoses at the top of **WM** (Figure 2a).

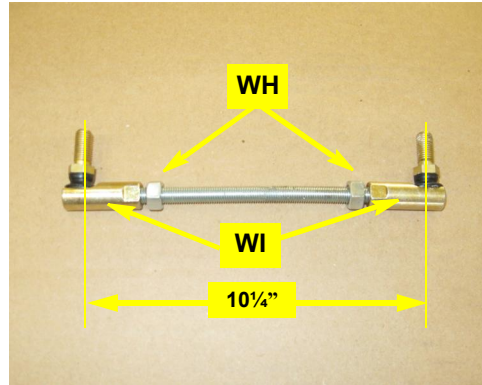


Figure 1d-ii: Assembled threaded link rod

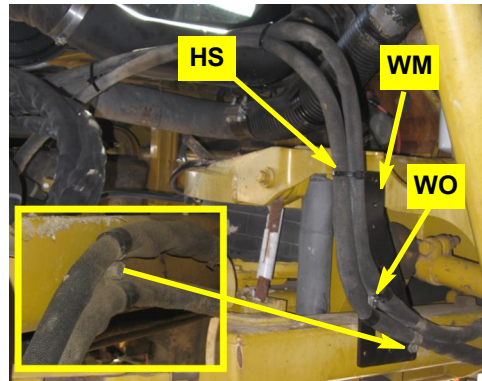


Figure 2a with inset: Repositioned wheel motor hoses

- b. Locate the two unused holes in the top of the right side axle frame (Figure 2b top right inset). Using hardware **WN** install WAS mounting bracket **WK** on the axle frame (Figure 2b). Mount **WK** with its long side to the rear and have **WN**'s bolts come up from inside the axle box section (so washers and nuts showing - Figure 2b lower left inset).

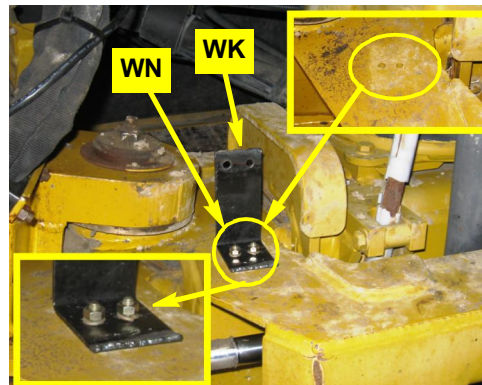


Figure 2b with insets: Installed WAS mounting bracket

2. **Mount the wheel angle sensor (continued).**
- c. Locate and loosen (but see note following) the two outer bolts of the wheel motor hoses clamp at the top of the wheel motor housing (Figure 2c inset). Slide bracket **WL**, with its twist toward the front, between the bolts and the steel plate. Retighten the bolts (Figure 2c).

NOTE: *Alternatively, remove the bolts and add hardware **WP** (flat washers, not shown) before securing bracket **WL**.*

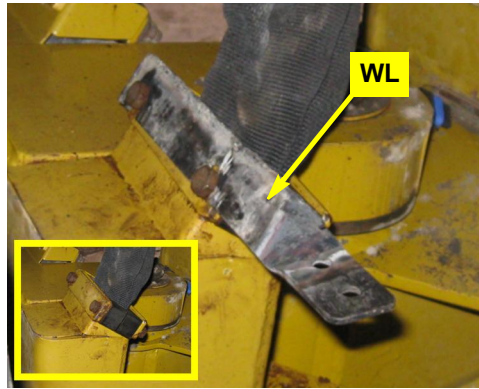


Figure 2c with inset: WAS link rod bracket installed

- d. Using hardware **WJ** (not visible), mount the WAS assembly from step 1 on the front of bracket **WK**. Mount the WAS assembly with the wire connector of **WB** pointing outward (you will connect the WAS cable later) and the WAS arm **WC** toward the center of the machine (Figure 2d).

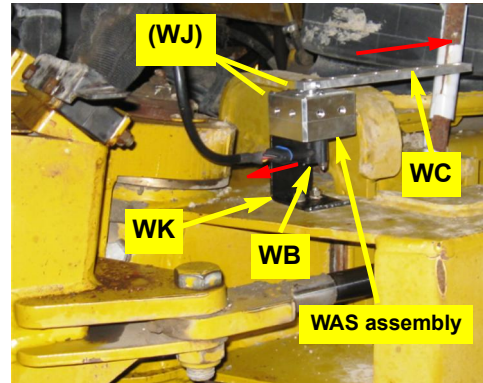


Figure 2d: Installed WAS assembly

- e. 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 2e). Leave swivel nuts **WH** loose.

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

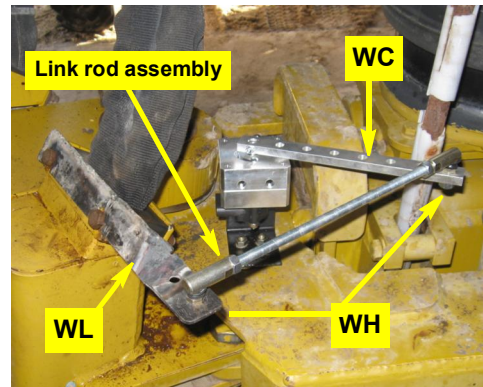


Figure 2e: Installed WAS link rod assembly

- f. 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 2f-i and 2f-ii).



Figure 2f-i: Full left lock

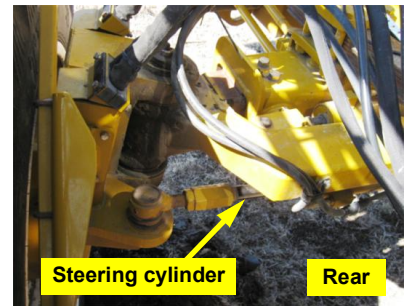
- g. When the linkage does move freely and without binding, tighten hardware **WH** on the rod and the swivels (Figure 2f-i).



Figure 2f-ii: Full right lock

Installation - Wheel Angle Sensor 2 (WAS 2)

This WAS installation section—WAS 2—is applicable to machines on which the steering cylinders are behind the front axle (see photo at right). For machines with the steering cylinders in front of the front axle, see WAS 1 on page 12.



⚠ 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).
- b. Cut one hole off WAS arm **WC** at the opposite end from the WAS shaft mounting hole (Figure 1b).
- 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:** the full (cut) length of **WC** is not showing.

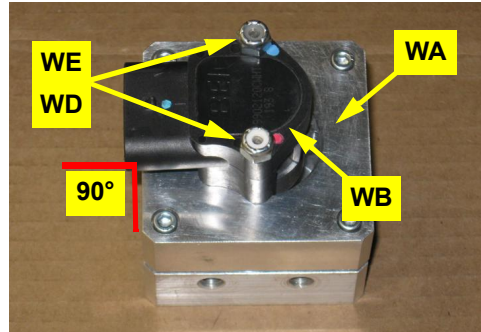


Figure 1a: Prepared WAS housing/connector

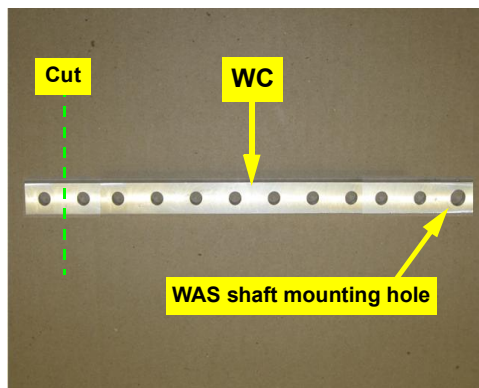


Figure 1b: WAS arm preparation

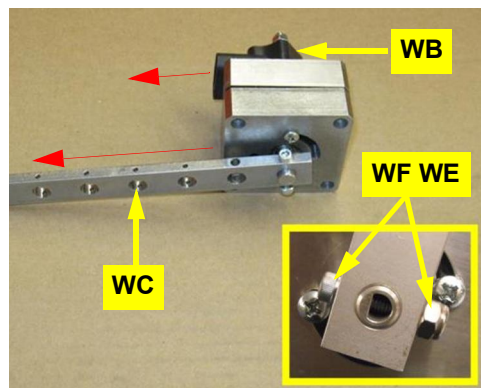


Figure 1c with inset: WAS arm installed

NOTE:

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

- d. Cut threaded rod **WG** to 11³/₄" (Figure 1d - top) then screw the swivel rod ends **WI** onto the cut rod to achieve a center-to-center stud measurement of 13" (Figure 1d - bottom). Leave **WH** loose until you complete linkage adjustment at step 2.

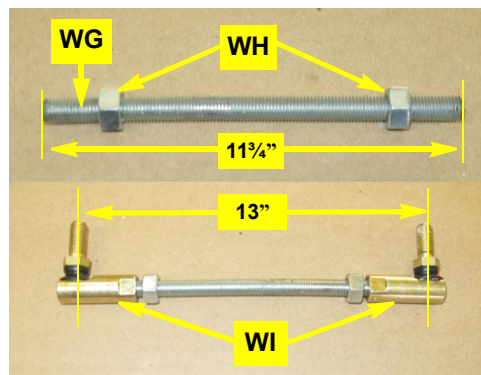


Figure 1d (not to scale): Cut rod (top) and assembled link rod (bottom)

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

NOTE: *The figures in this section show prototype brackets and fittings. Install your supplied fittings and 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 **WK2**



Figure 2a with inset: Installed WAS mounting bracket

- (and the clamp - Figure 2a).
b. Locate and remove the lower nut on the uppermost U-bolt of the left fender attachment. Install link rod bracket **WL2** with its long side down and toward

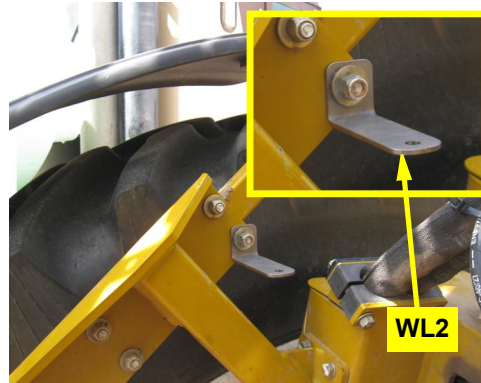


Figure 2b: WAS link rod bracket installed

- the center of the machine. Retighten the nut (Figure 2b).
c. Using hardware **WJ** (not visible), mount the WAS assembly from step 1 on the rear face of bracket **WK2**. Mount the WAS assembly with its arm **WC**

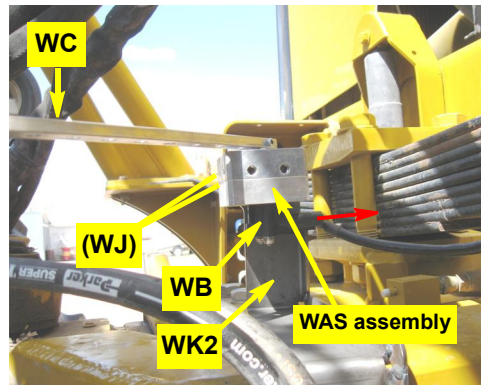


Figure 2c: Installed WAS assembly

- uppermost and **WB**'s wire connector pointing inward (Figure 2c - you will install the WAS cable later).

- d. Using hardware **WH** (not visible), install the link rod assembly from step 1 between the last hole in WAS arm **WC** and bracket **WL2**. Set the swivel studs downward at both ends (Figure 2d - leave swivel nuts **WH** loose).

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

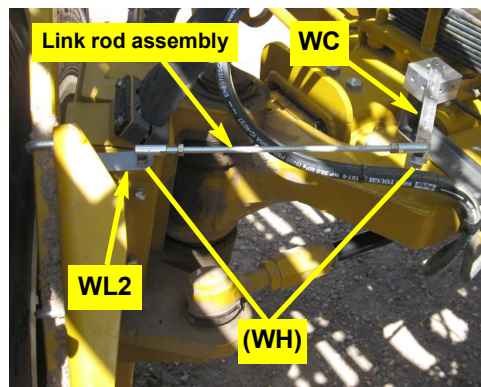


Figure 2d: Installed WAS link rod assembly

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)

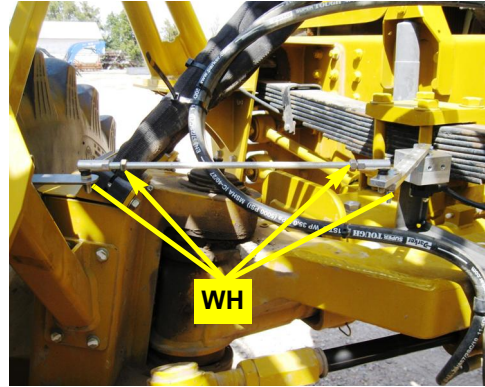
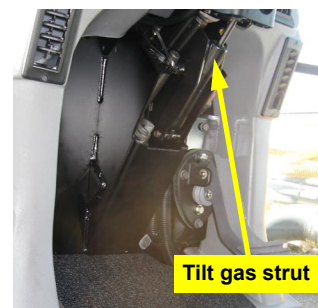


Figure 2e-ii: Full right lock (viewed from rear)

- 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 (SWS 1)

This SWS installation section—SWS 1—is applicable to machines that have the large, open steering column with the tilt gas strut clearly visible on the driver's side (see photo at right). For machines with the compact, enclosed steering column, see SWS 2 on page 20.



1. Install the steering wheel switch.

- a. Drill a 1/4" hole in the left side of the steering column 2" up from the bottom edge of the opening in the column and 3/4" in from the edge of the opening (Figure 1a).

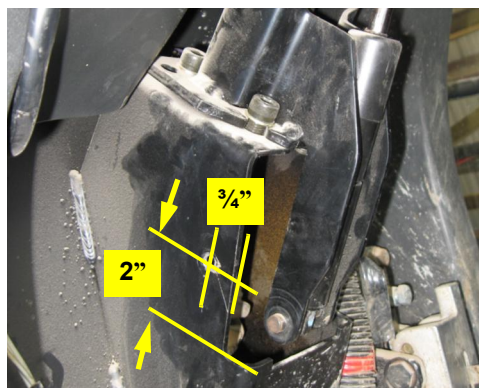


Figure 1a: Drilled steering column

- b. Drill a 3/8" 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 then a curving bend in the bracket to pass by the steering shaft (so that the switch will mount on the right of the steering shaft) (Figure 1b).

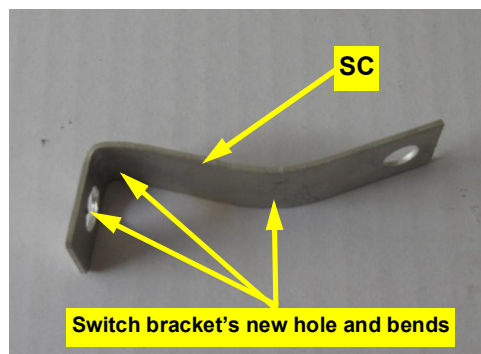


Figure 1b: Drilled and bent switch bracket

- c. Clean a magnet-length area of the steering shaft centered on the hole you drilled in the steering column. Using the two-part epoxy **SB**, attach magnets **SA** 180° apart on the steering shaft. Align the center of the magnets with the center of the hole you drilled in the column (Figure 1c).

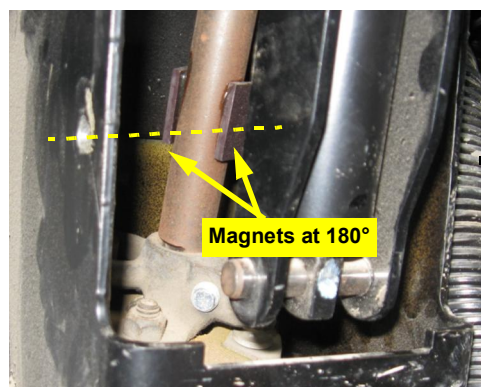


Figure 1c: Installed magnets

1. **Install the steering wheel switch (continued).**
- d. Attach switch **SD** to switch bracket **SC**. Using hardware **SE** install the switch/bracket assembly (Figures 1d and 1e). The bracket will pass between the steering shaft and the steering column tilt gas strut.

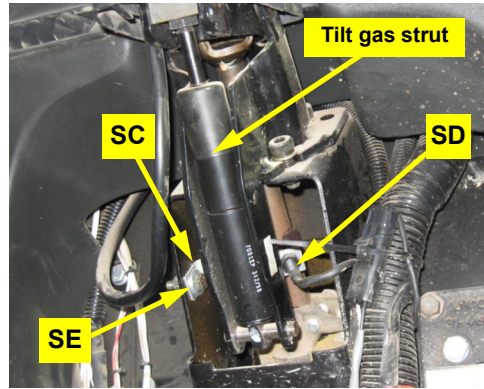


Figure 1d: Installed switch bracket and switch

- e. Align switch **SD** with the magnets **SA** and adjust the sensor face to 1/8" to 1/4" away from the magnets. Route **SD**'s cable forward and between the air ducting and the front of the cab.

Installation - Steering Wheel Switch 2 (SWS 2)

This SWS installation section—SWS 2—is applicable to machines that have the compact, enclosed steering column (see photo at right). For machines with the large, open steering column with the tilt gas strut clearly visible on the driver's side, see SWS 1 on page 18.



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).

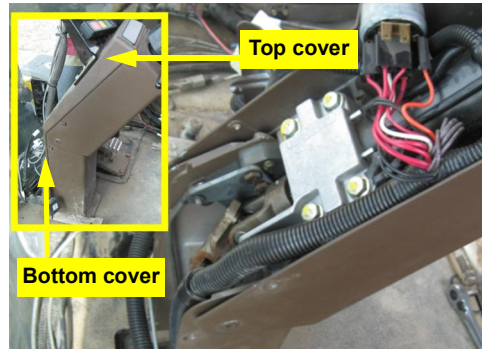


Figure 1a: Steering column covers removed

- b. Drill a 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).

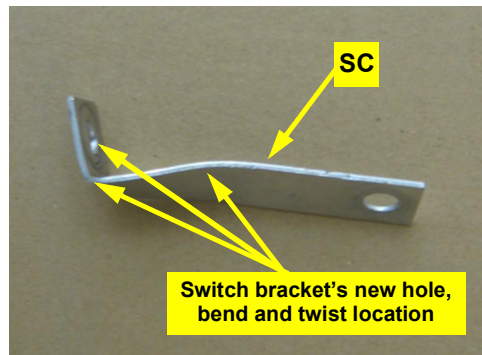


Figure 1b: Drilled, bent and twisted switch bracket

- c. Measure and mark a point 1½" 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 1½" from the clamp coupling (Figure 1c).

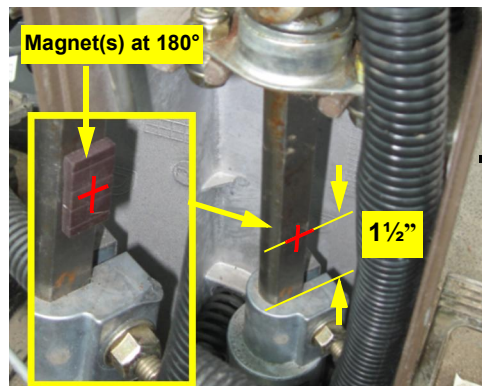


Figure 1c: Installed magnets

1. **Install the steering wheel switch (continued).**
- 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).
- 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.
- f. Refit the two column panels after you route SWS cable **SD** (Figure 1e).

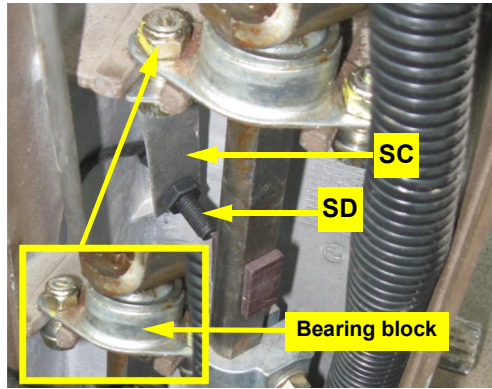


Figure 1d with inset: Installed switch bracket and switch

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Appendix A - Hydraulic Circuits

