Automated Steering Kit Installation Guide

Kit: EDX-L400, P/N 911-2042-000

Fits Lexion Combine Models:

560R / 565R	**460 / 465 / 460R / 465R**
570R / 575R	**470 / 475 / 470R / 475R**
580R / 585R	**480 / 485 / 480R / 485R**

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.

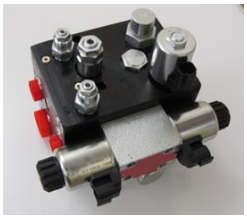
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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.

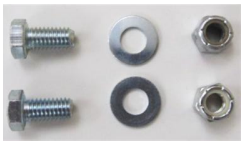
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and 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	760-0023-000	1	Assembly, hyd valve block - O.C. 15L\proportional (Hydraulic steering block)	
Bag H1 contains HB, HC, HD, HE, HF and HG				
HB	760-2009-000	1	Adapter, hyd 90 elbow - #10maleJIC x #12maleORB (P [pressure] port in HA)	
HC	760-2061-000	3	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB (T [tank] and A and B [steering ports] in HA)	
HD	760-2054-000	1	Adapter, hyd run-tee - #6JIC (Use with the HC in HA's T port)	

Kit Contents - Steering Hydraulics *(continued)*

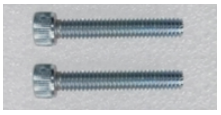
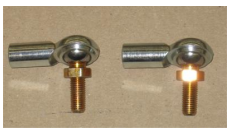
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HE	760-2008-000	1	Adapter, hyd - #10maleJIC x #12maleORB (EF [excess flow] port in HA)	
HF	760-2056-000	1	Adapter, hyd - #6maleJIC x #6maleORB (PP [pilot port] in HA)	
HG	760-2045-000	1	Adapter, hyd plug - #6maleORB (PPG port in HA)	
HH	640-0022	1	Hydraulic steering block mounting bracket	
Bag H2 contains HI				
HI	675-2007-000 678-1054 676-1035	2 2 2	Bolt, 3/8NC x 3/4" Gr5 ZP Washer, narrow flat, 3/8" Nut, nylock - 3/8NC ZP (Mount HH on machine)	
Bag H3 contains HJ				
HJ	675-2067 678-1054 676-1035	2 2 2	Bolt, 3/8NC x 6" Gr5 ZP Washer, narrow flat, 3/8" Nut, nylock - 3/8NC ZP (Mount HA and HK on HH)	
Bag H5 contains HN and HO				
HN	760-2025	1	Adapter, hyd run-tee - #15LEO (Tank return line)	
HO	760-2003	2	Adapter, hyd run-tee - #10LEO (Steering lines, 400 series - see HP and HQ)	

Kit Contents - Steering Hydraulics *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag H6 contains HP and HQ				
HP	760-2013	2	Adapter, hyd run-tee - #12LEO (Steering lines, 500 series - use with HQ)	
HQ	760-2100	2	Adapter, hyd - #12femLEO x #10maleLEO (Steering lines, 500 series - use with HP)	
HR	760-1329	1	Hose, hyd - 1/2" x 112", #10fJICSW x #15fMLESW (Pressure hose)	
HS	760-1330	1	Hose, hyd - 1/2" x 102", #6fJICSW x #15fMLESW90EL (Tank hose)	
HT	760-1331	2	Hose, hyd - 3/8" x 144", #6fJICSW x #10fMLESW (Steering hoses)	
HU	760-1332	1	Hose, hyd - 1/2" x 118", #10fJICSW90EL x #15mMLE (Excess flow hose)	
HV	760-1033	1	Hose, hyd - 3/8" x 14", #6fJIC x #6fJIC (Jumper hose - PP port to tank line at HA)	
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.

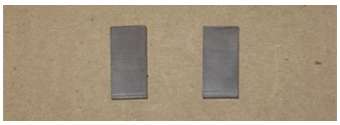
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI ('Wire connector')	
WC	602-1087-000	1	Connector arm, steering	
WD	675-1191-000	2	Screw, mach, 8-32 x 3", PPH ZP	
WE	676-1054-000	4	Nut, nylock 8-32NC, ZP	
WF	675-1150-000	2	Screw, 8-32 x 1", Allen socket cap, ZP	
WG	675-2031-000	1	Threaded rod, 5/16-24 x 12"	
WH	676-1053-000	4	Nut, 5/16-24 standard ZP	
WI	760-0018-000	2	Rod end swivel with stud, 5/16-24	
WJ	675-2010-000 678-1077-000	2 2	Bolt, 5/16NC x 3/4" Gr5 ZP Washer, lock 5/16, ZP (Attach WAS assembly to WK)	

Kit Contents - Wheel Angle Sensor *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WK	640-0149-000	1	WAS assembly mounting bracket	
Bag W3 contains WL				
WL	675-0156-000	1	Clamp, 2.19" - 2.50" TBOLT, SS (For link rod assembly)	

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 with insets):

- **HB** in the **P** port
- **HC** in the **A** and **B** ports and the **T** port
- **HE** in the **EF** port
- **HF** in the **PP** port
- **HG** in the **PPG** port
- **HD** on **HC** in the tank port (not shown but see Figure 4b)

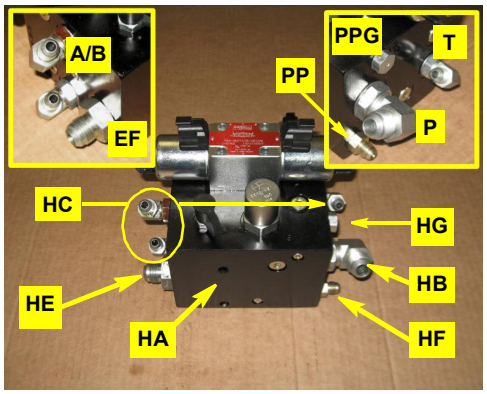


Figure 1 with insets: Prepared hydraulic block

2. Install the steering block mounting bracket.

NOTE: *The hydraulic block is mounted on the front face of the center brace/panel on the left side of the machine. It is mounted slightly differently on 400 and 500 series machines. Using the bracket HH as a template, follow steps a and b or steps c and d.*

400 series

a. Set bracket **HH** so that (Figure 2a):

- The block mounting holes are horizontal
- Its centerline is 4″ from the upper inside edge of the brace
- Its top edge is 8″ up from the lower, inside corner (45° approx) in the brace

b. Mark and drill two 3/8″ holes.

500 series

c. Mount bracket **HH** by its top hole (its block mounting holes horizontal) in the lower, outer hole of the four holes near the top of the center brace/panel.

d. Mark and drill a second 3/8″ hole (Figure 2b).

400 and 500 series

e. Using hardware **HI,** install bracket **HH** (Figures 2a and 2b).

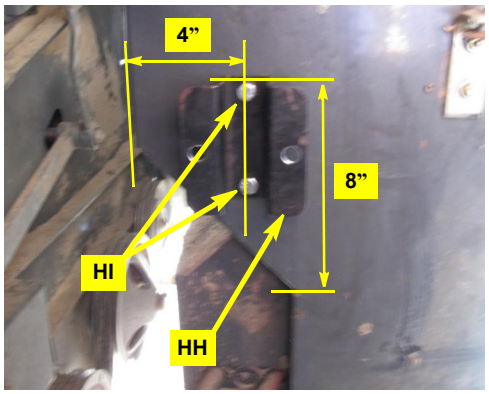


Figure 2a: Installed steering block mounting bracket - 400 series

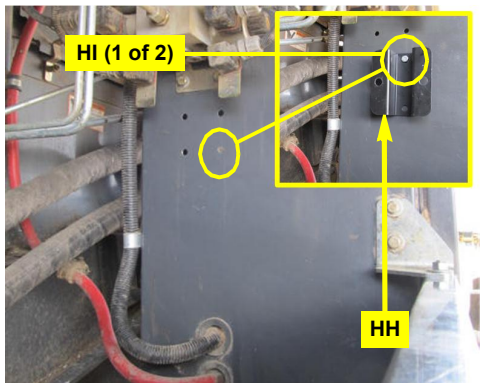


Figure 2b: Installed steering block mounting bracket - 500 series

3. Install the hydraulic steering block.

Using hardware **HJ**, mount hydraulic steering block **HA** on bracket **HH** as follows (Figure 3):.

- Mount the flat side of **HA** against **HK** with its solenoids inward and vertical (so with the **A**, **B** and **EF** ports on top).

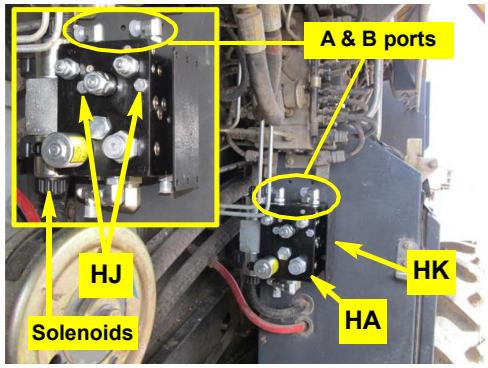


Figure 3: Installed steering block (500 series)

4. Install tank, pressure and excess flow fittings and hoses.

NOTE: *Leave run-tee 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.*

NOTE: *Route hoses with other machine plumbing and clear of moving parts* ***(see step 5 'Routing hoses', page 10).*** *Secure hoses with heavy duty tie straps* ***HW.*** *Tighten all hoses, run-tees and steering block fittings when installation is complete.*

a. Locate the connections at the junction of the machine's working hydraulic pump steel lines and rubber hoses on the left side of the machine. Identify the tank and pressure lines (Figure 4a). Note that the pressure line is in a different position on the 500 series machines (Figure 4a inset).

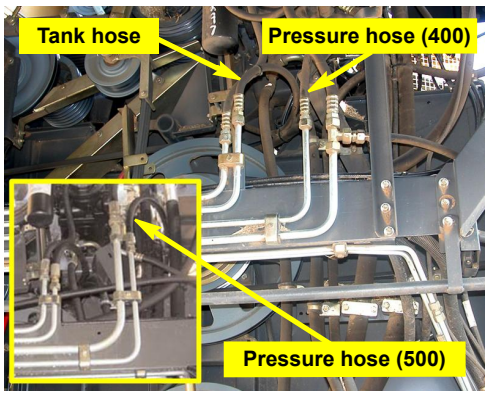


Figure 4a with inset: Tank and pressure hose locations

b. Install run-tee **HN** in the tank line between the steel line and the rubber hose (Figure 4b). Connect the elbow end of tank hose **HS** to the stem of run-tee **HN** (Figure 4b, right inset). Connect the straight end of **HS** to the open 'T' end of run-tee **HD** connected to adapter **HC** in the **T** port of the hydraulic steering block (Figure 4b, left inset).

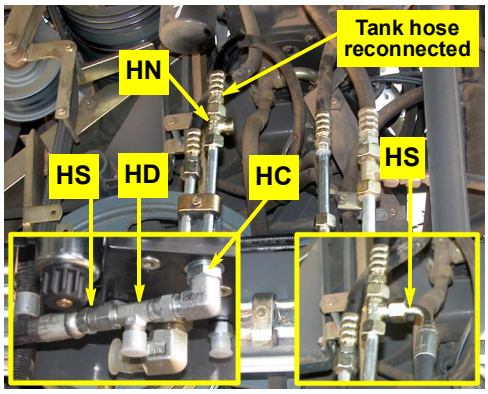


Figure 4b with insets: Run-tee at tank port, machine's tank hose reconnected, tank hose installed

c. Disconnect the machine's pressure line/hose (see pressure hose connections, Figure 4a) then:

- Install pressure hose **HR** between the machine's rubber pressure hose (Figure 4c and top inset) and adapter **HB** in the **P** port of the hydraulic steering block (Figure 4c bottom left inset)
- Install excess flow hose **HU** between the machine's steel pressure line (Figure 4c and top inset) and adapter **HE** in the **EF** port of the hydraulic steering block (Figure 4c bottom right inset)

NOTE: *Some figures show some temporary, un-crimped hose fittings.*

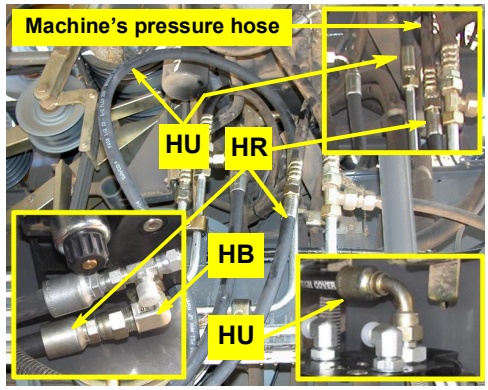


Figure 4c with insets: Pressure and excess flow hoses installed

5. Route the hoses.

Route the tank (**HS**), pressure (**HR**) and excess flow (**HU**) hoses to/from the hydraulic steering block separately along the machine's steel lines (Figure 5), passing them together between the machine and the inside edge of the brace/panel the steering block is mounted on (Figure 5 inset).

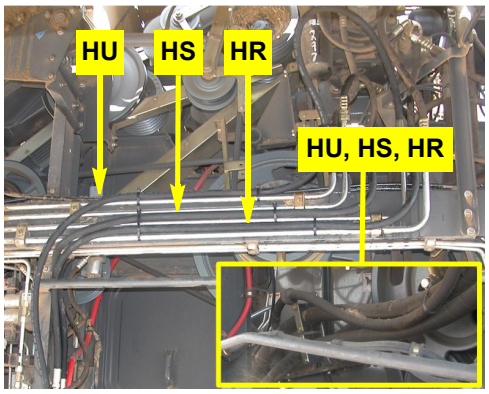


Figure 5 with inset: Tank, pressure and excess flow hoses routed to/from steering block

6. Install the tank to pilot port hose.

Install jumper hose **HV** between adapter **HF** in the **PP** port of the hydraulic steering block and the stem of run-tee **HD** on adapter **HC** in the **T** port of the hydraulics steering block (Figure 6).

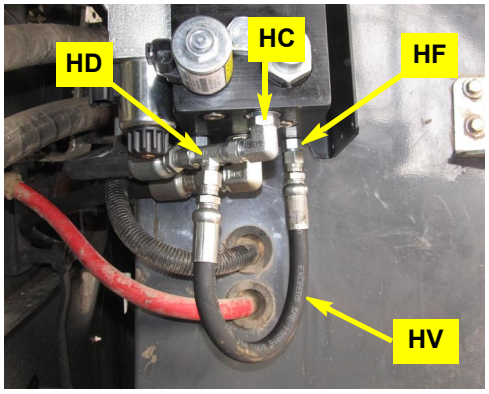


Figure 6: Jumper hose installed

7. Install the steering output fittings.

Locate the combine steering lines on the left side of the machine above the rear axle where the rubber hoses are connected to the steel lines (Figure 7).

Install run-tees **HO** (400 series) or run-tees **HP** with adaptors **HQ** (500 series - see note following) in the steering lines (Figure 7 inset). Reconnect the machine's steering hoses to the open 'T' end of the run-tees.

NOTE: *On 500 series machines, you need to use the larger run-tees HP with reducer fittings HQ - see Figure 8a.*

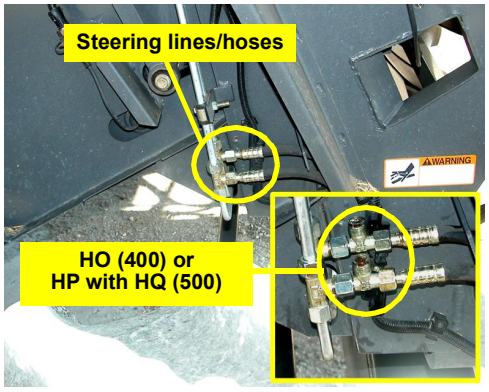


Figure 7 with inset: Run-tees (and adapters) installed at steering line/hose connections (500 series installation shown - see Figure 8a)

8. Install the steering hoses.

Connect steering hoses **HT** between the stem ends of run-tees **HO** (400 series) or adapters **HQ** on the stems of **HP** (500 series) (Figure 8a - 500 series shown) and adapters **HC** in the steering ports of the hydraulic steering block (Figure 8c). Note the slightly different hose routing for 400 and 500 series machines (Figure 8b).

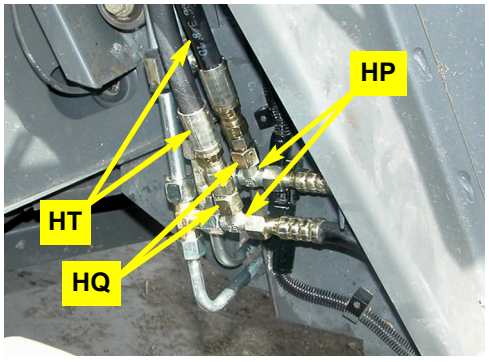


Figure 8a: Steering hoses at run-tees (500 series installation shown - hoses onto reducer adapters on run-tees)

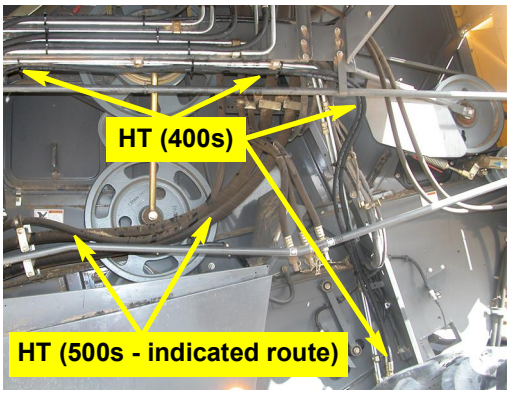


Figure 8b: Routing steering hoses to/from hydraulic steering block

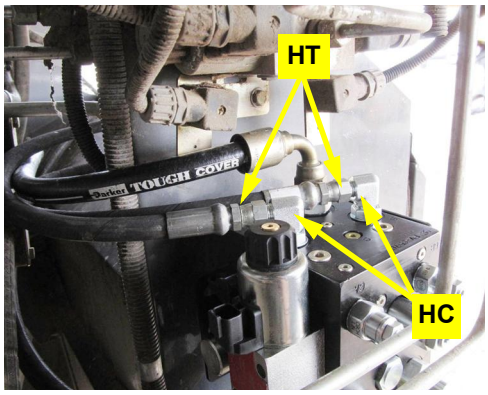


Figure 8c: Steering hoses at steering block

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 (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).

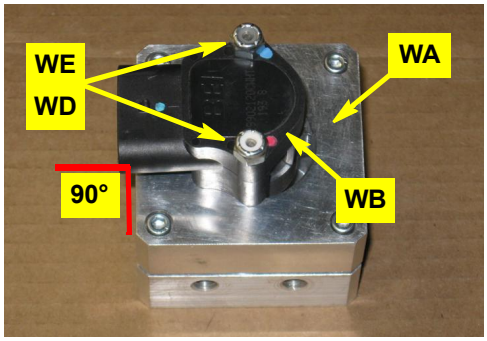


Figure 1a: Prepared WAS housing\connector

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

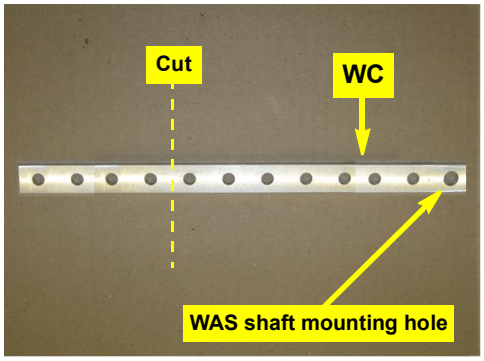


Figure 1b: WAS arm preparation

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

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

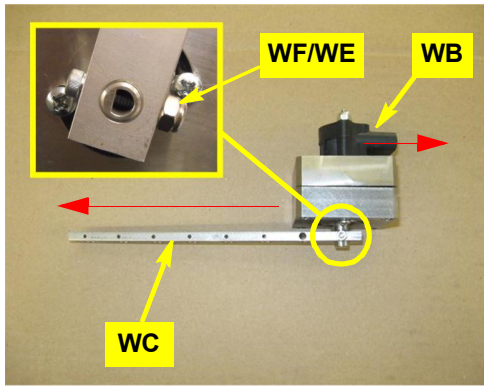


Figure 1c with inset: WAS arm installed

d. Cut threaded rod **WG** to 8½" long (Figure 1d-i) then screw swivel rod ends **WI** onto the cut rod to achieve a center-to-center stud measurement of 9¾" (Figure 1d-ii). Leave **WH** loose until you complete linkage adjustment at step 2f.

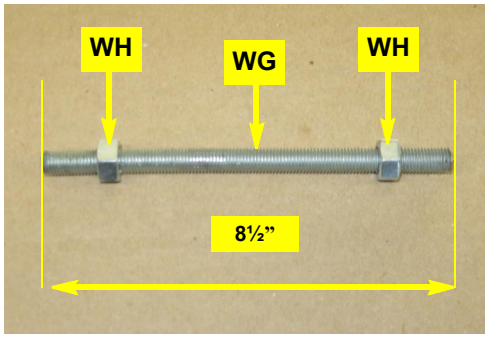


Figure 1d-i: Threaded link rod preparation

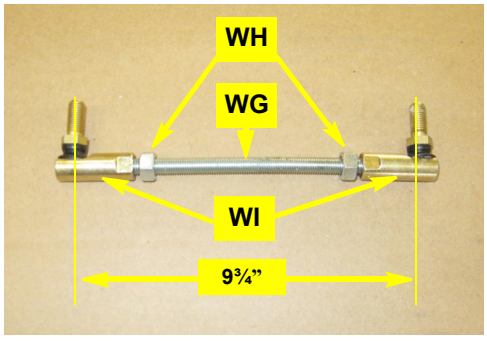


Figure 1d-ii: Assembled threaded link rod

2. Mount the wheel angle sensor.

a. Using hardware **WJ** attach the WAS assembly from step 1 to bracket **WK**. Mount the assembly (Figure 2a with inset):

- Using the top two holes in **WK**
- With the connector end of **WB** pointing away from the slotted end of the bracket
- So that the bend in **WK** will hold the assembly away from the axle casing when installed

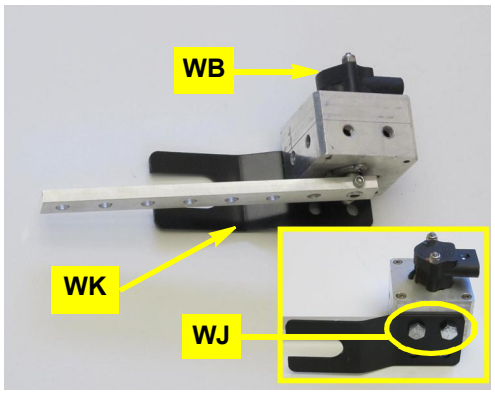


Figure 2a with inset: WAS assembly mounted on bracket

b. Mount the bracket and WAS assembly on the front face of the right side rear axle using the innermost axle width adjustment bolt. Face wire connector **WB** in toward the machine (so the WAS arm outward - Figure 2b with inset).

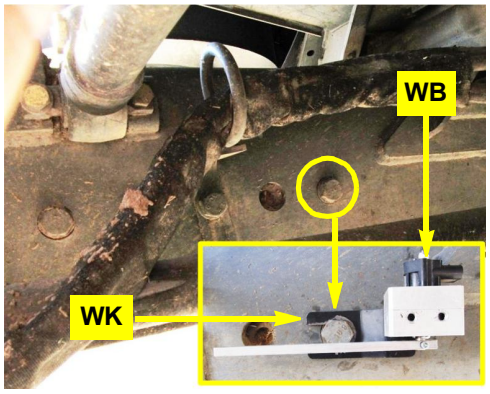


Figure 2b with inset: WAS assembly installed

c. Mount rod link clamp **WL** on the tie rod. Set the outer edge of the clamp 12½" from the center of the mounting bolt used and have the clamp flanges uppermost and parallel to the ground (Figure 2c).

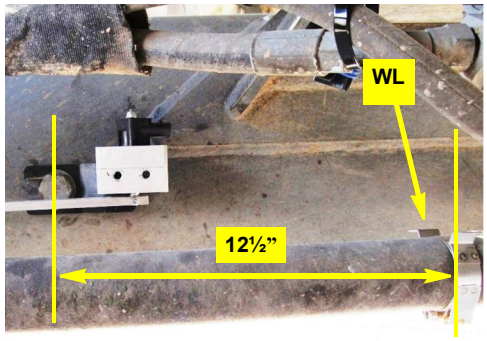


Figure 2c: WAS link rod bracket installed

d. Using hardware **WH** (not visible), install the link rod assembly from step 1 between the last hole in connector arm **WC** and the forward flange of clamp **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).

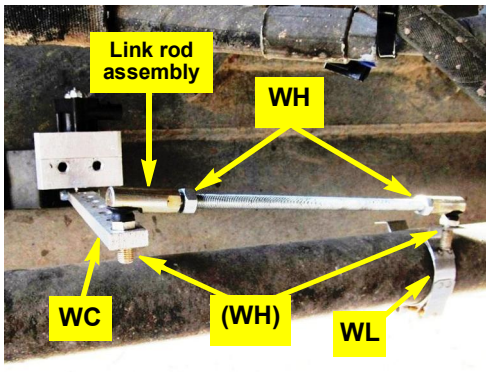


Figure 2d: WAS link rod assembly installed

Installation - Steering Wheel Switch (SWS)

1. Prepare the switch bracket.

Prepare switch bracket **SC** as detailed (Figure 1 with inset). Note that the position of bends and twists are approximate (you can rework them as required once you have installed the bracket):

- Drill a 5/16” hole in the opposite end from the pre-drilled end (the same distance from the end)
- Put an upward bend (approx 110°) 2-3/16” from the newly drilled end
- Put a downward bend (approx 45°) 1” from the first bend
- Put a slight twist (clockwise from pre-drilled end) at the downward bend

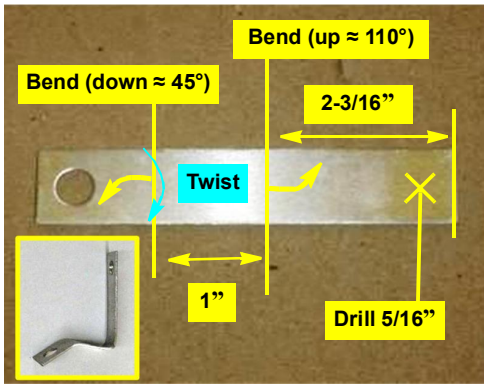


Figure 1 with inset: Switch bracket preparation (not to scale)

2. Access the steering shaft.

a. Remove the screw in the center of the top section of the steering column cover (Figure 2a, top left picture).

b. Remove the tilt lever knob on the left side (Figure 2a, lower left picture) and the four screws from the right side of the upper middle section of the steering column cover (the tilting section). Remove the left side - the right side can stay in place (Figure 2a right picture).


Figure 2a: Dismantling column covers (1)

c. Remove the four screws from the right side of the lower middle sections of the steering column cover (Figure 2b, left picture - tilt the column as necessary to access the two top screws) and remove the left side cover.

d. Remove the two screws holding the right side of the lower middle cover and remove the cover (Figure 2b, right picture and insets). Loosen the fastener holding the upper middle section’s right side (Figure 2b right picture) to facilitate removal of the lower middle section’s right side.

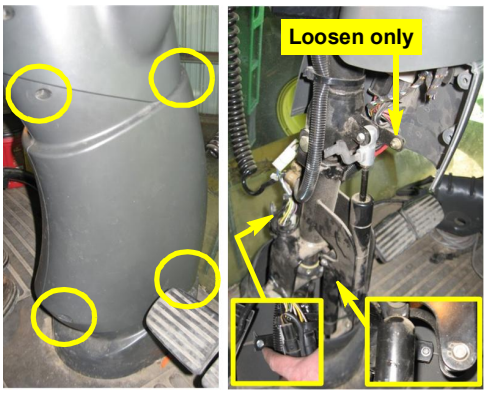


Figure 2b: Dismantling column covers (2)

3. Install the magnets.

Using the two-part epoxy **SB**, install magnets **SA**, vertically and180° apart, on the exposed steering shaft. Align the bottom edge of each magnet about ¼” above the top of the lower shaft bearing (Figure 3).

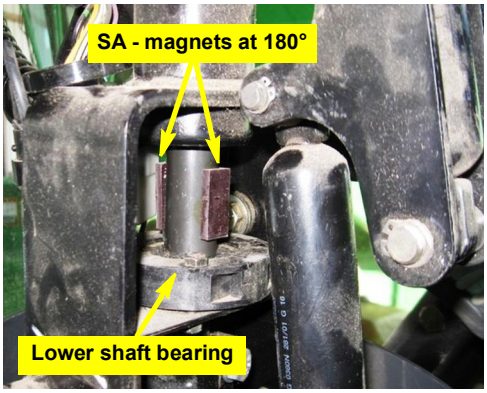


Figure 3: Installed magnets

4. Install the switch bracket and switch.

a. Install switch **SD** in its bracket **SC**. Remove the nut from the bolt/nut holding the wiring conduit clamp to the column support (Figure 4a) and install the **SC/SD** assembly on the bolt (Figure 4a inset).

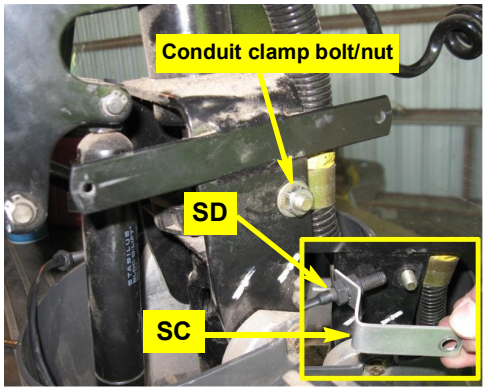


Figure 4a with inset: Switch and switch bracket installation

b. Adjust the bends and twists in **SC** to align **SD** with the magnets and adjust **SD**'s sensor face to 1/8" to 1/4" from the magnets (Figure 4b).

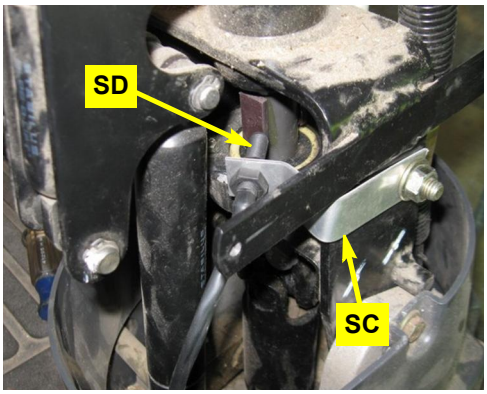


Figure 4b: Switch installed and adjusted

c. Using the light ties **SE** (not shown), route **SD**'s cable down to the aperture near the front right side of the lower column cover.

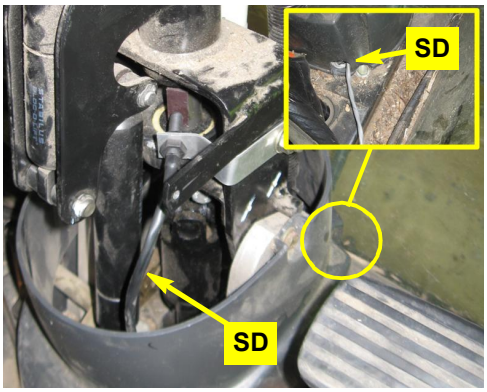


Figure 4c: SWS routed down through the column

Appendix - Hydraulic Circuits