Automated Steering Kit Installation Guide

Kit: EDX-L700, P/N 911-2056-000

Fits Lexion Combine Models*:

670	**730**
	740
	750
	760
	770

Notes:

1. This kit is only for combines with serial numbers beginning **C4 and **C5**.*

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 the safety information.
  - Read and understand your automated steering system documentation.
- 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 specified 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 starting below. After the kit tables, there are four step-by-step installation sections, one for each of the kits.

Please read this manual thoroughly before beginning the installation.

⚠WARNING:

To avoid serious injury or death during machine operation, install the appropriate kits for your machine make and model.

Machine Preparation

⚠WARNING:

Inspect the machine and perform any needed maintenance (for example, contaminated hydraulic fluid) before installing the automated steering kit. This kit cannot perform as intended on a machine that is not maintained properly. Errors in performance increase the risk of operator and bystander injury or death.

Failure to maintain clean hydraulic fluid and operational hydraulic components can cause loss of directional control resulting in serious injury or death.

To avoid serious injury, wear hand and eye protection and use wood or cardboard when checking for leaks.

Turn off the machine and power off the automated steering controller when installing or performing maintenance.

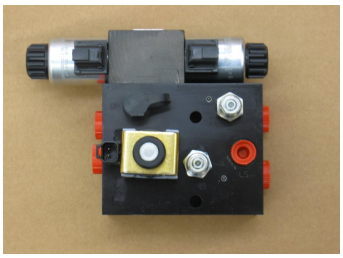
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as hydraulic hoses or electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

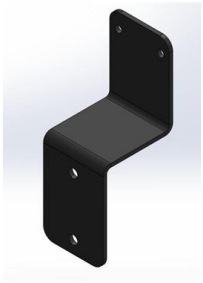
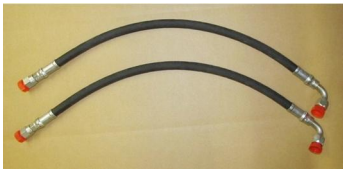
To prevent hydraulic system contamination, it is essential to thoroughly clean hydraulic system fittings and hose connections prior to disconnecting or removing. Use a degreasing solvent spray cleaner such as a brake cleaner to prevent hydraulic system contamination. Note that o-rings used on ORB and ORFF type fittings, referred to in the Kit Contents section, may be damaged by degreasing solvent cleaners. If a fitting is to be cleaned internally, you should first remove and clean the o-ring with a fiberless cloth.

Kit Contents - Steering Hydraulics

Unpack the hydraulics installation kit and identify the required parts as shown. Kit items are A, B, C etc. with an H (Hydraulic) prefix.

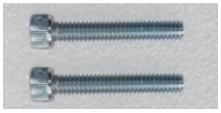
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HA	760-0020-000	1	Assembly, hyd valve block - 15L\proportional (Hydraulic steering block)	
Bag H1 contains HB, HC and HD				
HB	760-2080	2	Adapter, hyd 90 elbow - #8maleJIC x #8maleORB (HA's P [pressure] and T [tank] port)	
HC	760-2061	2	Adapter, hyd 90 elbow - #6maleJIC x #8maleORB (HA's A and B [steering] ports)	
HD	760-2045	1	Adapter, hyd plug - #6ORB (HA's LS [load sense] port)	

Kit Contents - Steering Hydraulics *(continued)*

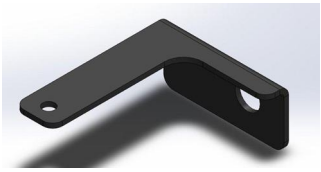
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HE	640-0169-000	1	Hydraulic steering block mounting bracket (Mount HA)	
Bag H2 contains HF and HG				
HF	675-2010 678-1055 676-1036	2 2 2	Bolt - 5/16NC x 3/4" Gr5, ZP Washer, flat - 5/16 ZP Nut, lock - 5/16NC ZP (Mount HE on machine)	
HG	675-2006-000 678-1054 676-1035	2 2 2	Bolt - 3/8NC x 3-3/4" Gr5, ZP Washer, flat - 3/8 ZP Nut, nylock - 3/8NC ZP (Mount HA on HE)	
Bag H4 contains HK and HL				
HK	760-2117-000	2	Adapter, hyd - #8maleJIC x M16maleORB (Pressure and tank ports in machine's valve stack)	
HL	760-2013-000	2	Adapter, hyd - run-tee #12LEO (Steering lines)	
HM	760-1175	2	Hose, hyd - 3/8" x 30", #8femJIC x #8femJIC 90 (Pressure and tank hoses)	
HN	760-1351	2	Hose, hyd - 3/8" x 144", #6femJIC swivel x #12femMLE 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.

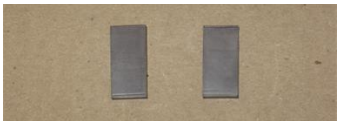
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag 710-0099-000 contains WA to WJ				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI (‘Wire connector’)	
WC	602-1087-000	1	Connector arm, steering	
WD	675-1191-000	2	Screw, mach, 8-32 x 3", PPH ZP	
WE	676-1054-000#	4	Nut, nylock 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 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	640-0170-000	1	WAS assembly mounting bracket (Mount WAS assembly using WJ; mount on WM using WN)	
WL	640-0171-000	1	WAS link rod bracket (Mount on back face of right side [rear, steering] stub axle using WO)	
Bag W3 contains WM, WN, and WO				
WM	675-0150-000	2	Clamp, 2.66"-2.97" TBOLT, SS (Mount WK on steering cylinder using WN)	
WN	675-2019 678-1053 676-1034	4 4 4	Bolt - 1/4NC x 1/2" Gr5, ZP Washer, flat - 1/4, ZP Nut, lock - 1/4NC, ZP (Mount WM on WK)	
WO	675-2073-000 676-1087-000	1 1	Bolt - 5/8"-11x2" Gr5, ZP Nut, lock - 5/8NC ZP (Mount WL on stub axle face)	

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 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 (Figure 1):

- **HB** in the **P** (pressure) and **T** (tank) ports
- **HC** in the **A** and **B** (steering) ports
- **HD** in the **LS** port

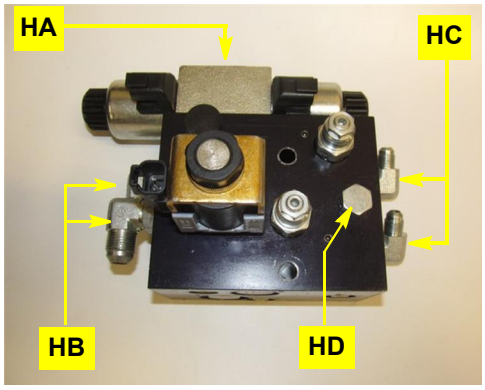


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

On the left side of the machine, remove the trough (triangular 'bin' forward of the battery compartment - Figures 2-i and 2-ii). Using hardware **HF**, mount bracket **HE** immediately below the machine's valve stack (Figure 3 and inset).

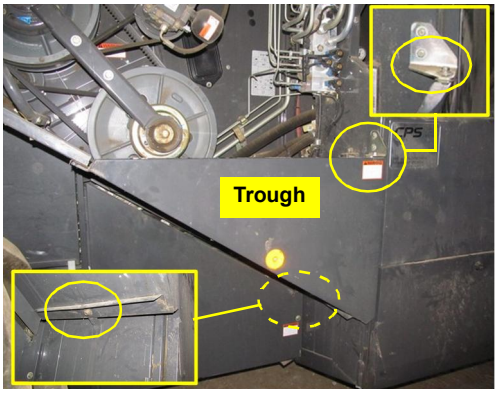


Figure 2-i: Steering block mounting bracket installation - preparation

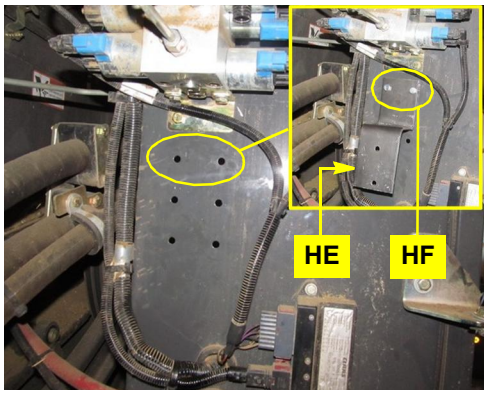


Figure 2-ii with inset: Steering block mounting bracket location and installation

3. Install pressure and tank fittings, connect hoses.

Locate the pressure port **P** and tank port **T** in the underside of the machine's valve stack above the steering block bracket you installed at step 2 (Figure 3-a and inset). Remove the plug from the P port and install adapter **HK** (3-b, use caps as required 3-b inset). Connect the elbow end of hose **HM** to **HK** (3-c).

Repeat the procedure for the tank hose (3-d).

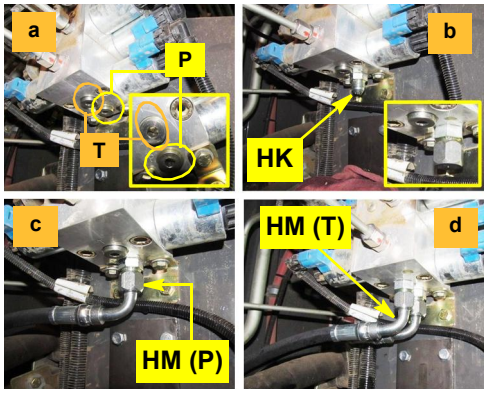


Figure 3-a to 3-d: Installed pressure fitting (b); connected pressure (c) and tank (d) hoses

4. Install the hydraulic steering block.

Using hardware **HG**, attach hydraulic steering block **HA** to bracket **HE** as follows (Figure 4):

- Mount **HA** on **HE** with its left and right solenoids upward (so with its **A** and **B** steering ports outward)

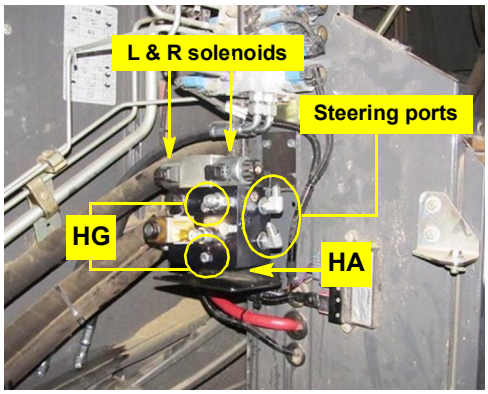


Figure 4: Steering block installed

5. Install steering fittings and hoses.

a. Locate the elbow joints in the steering lines forward of the rear axle on the left side (Figure 5a, circled).

NOTE: *Leave run-tees and hoses 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.*

b. Disconnect the machine's steering hoses, connect the fixed swivels of LEO run-tees **HL** to the machine's steel lines and reconnect the machine's hoses to the uncapped open 'T' ends of **HL**. Connect the #12 end of each steering hose **HN** to the uncapped stem of **HL** (Figure 5a inset).

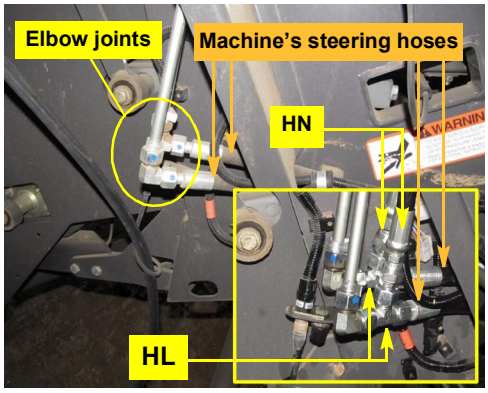


Figure 5a: LEO run-tees installed, steering hoses reconnected/connected

c. Route steering hoses **HN** forward, up and along the horizontal frame, then down to the steering block. Use tie straps **HO** to secure the hoses with existing machine plumbing (Figure 5b).

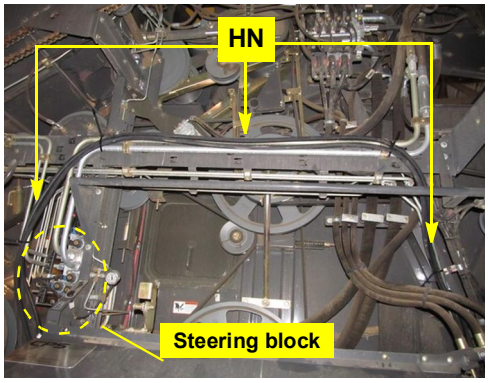


Figure 5b: Steering hoses routed to block

6. Connect the pressure, tank and steering hoses to the hydraulic steering block.

At the hydraulic steering block (Figure 6) connect:

- Pressure and tank hoses **HM** to adapters **HB** in the steering block (Figure 6, left)
- Steering hoses **HN** to adapters **HC** in the steering block (Figure 6, right).

NOTE: *Securely tighten all hose fittings and connections when hose installation is complete.*

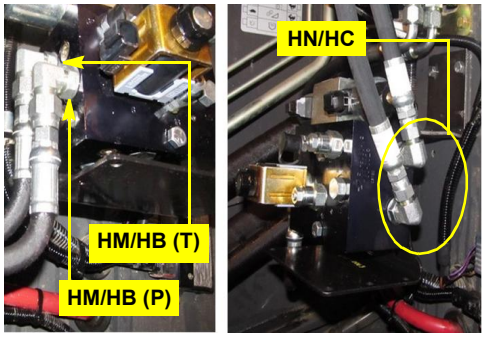


Figure 6: Pressure and tank hoses at steering block (left); steering hoses at steering block (right)

7. 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.

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.

NOTE: *This WAS installation is currently applicable to only axle types 0768740.5 and 0769150.3*

1. Prepare the wheel angle sensor.

a. Using 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. Set **WB** at 90° to any side of **WA** (Figure 1a).

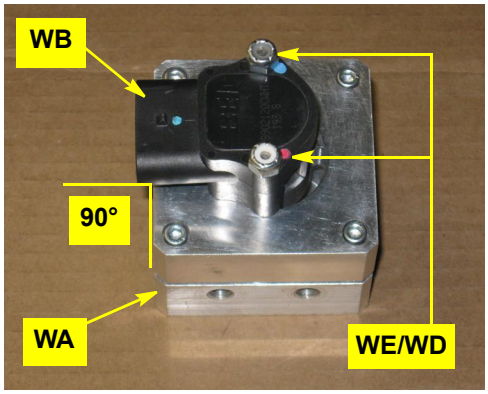


Figure 1a: Prepared WAS housing\connector

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

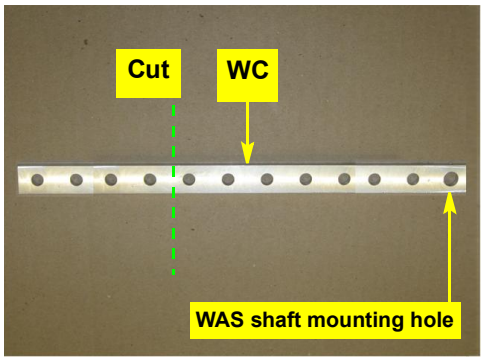


Figure 1b: WAS arm preparation

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

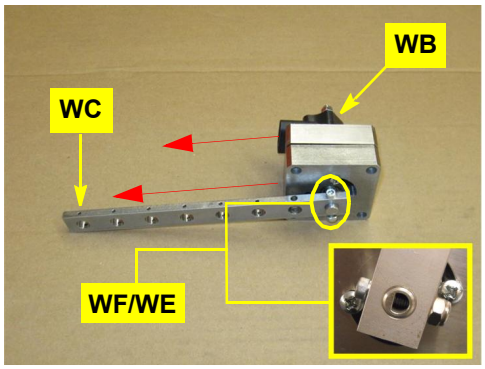


Figure 1c with inset: WAS arm installed

d. Screw two nuts **WH** then swivel rod ends **WI** onto **WG** to achieve a center-to-center stud measurement of 13-1/2″ (Figure 1d - not to scale). Leave **WH** loose until you complete linkage adjustment at step 2f.

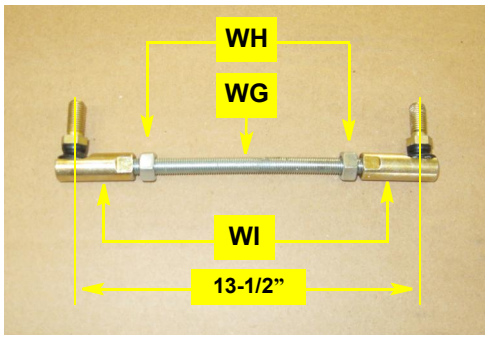


Figure 1d: Assembled threaded link rod

2. Mount the wheel angle sensor assembly.

NOTE: *Figures in this section show prototype brackets. They differ slightly from the brackets in your kit but are installed the same way.*

a. Using hardware **WN**, mount the two clamps **WM** on bracket **WK** (the holes at 2-3/4″ centers). Set the clamps with their nuts toward the remaining two holes (Figure 2a, left).

b. Using hardware **WJ,** mount WAS assembly from step 1 on the clamp side of bracket **WK**. (With the clamps toward you, mount the WAS assembly with its connector and arm to the right—Figure 2a, right)

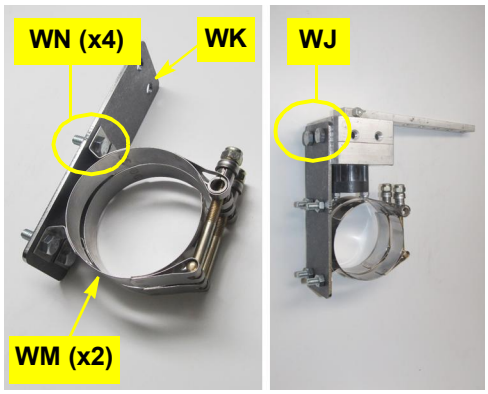


Figure 2a: WAS assembly mounting

c. Mount the WAS/clamp assembly on the right steering cylinder with (Figure 2b):

- The clamp bolts rearward
- Bracket **WK** vertical
- The outer edge of the outer clamp 2″ from the piston rod end of the cylinder

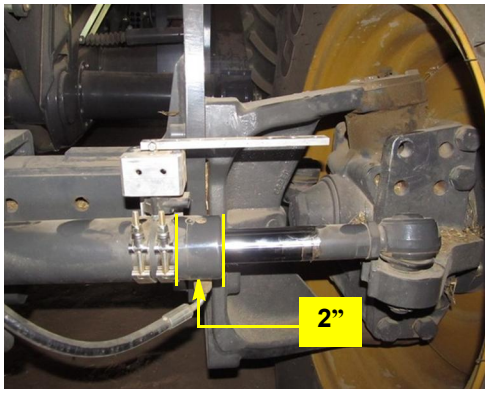


Figure 2b: WAS/clamp assembly installed

d. Using hardware **WO** mount link rod bracket **WL** on the rear face of the stub axle. Install the bracket—pointing rearward and ‘over’ **WO**—in the top left (as viewed) hole in the face (Figure 2c and left inset).

e. Using hardware **WH** install the link rod assembly from step 1—swivel studs downward—between the last hole in WAS arm **WC** and **WL**. Leave **WH** loose (Figure 2c right inset).

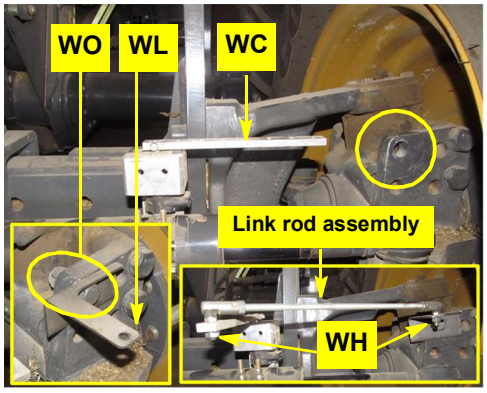


Figure 2c: WAS link rod mounting bracket and link rod installed

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

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


Figure 2d-i: Full left lock

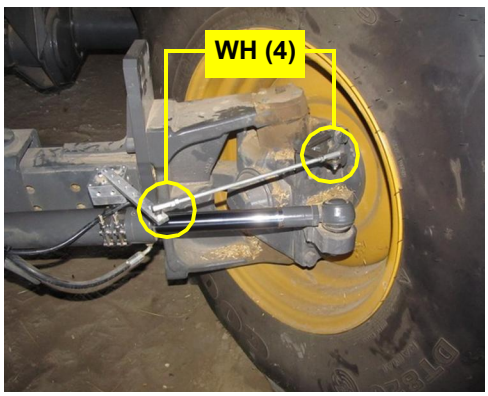


Figure 2d-ii: Full right lock

Installation - Steering Wheel Switch (SWS)

1. Prepare the switch bracket.

NOTE: *The installation of the steering wheel switch requires considerable manipulation (bending and twisting) of the switch's mounting bracket SC. In this installation the bracket and switch are mounted to the right of the steering shaft. If you choose to install the bracket and switch to the left of the shaft, reverse (mirror) the bends and twists detailed in this step.*

Prepare the steering wheel switch bracket **SC** as follows (Figure 1 - not to scale):

- Put an angled 90° bend 2″ and 1-3/4″ from the non-drilled end of bracket SC
- Put a second angled 90° bend (same direction) 2-1/2″ and 2-1/4″ from the non-drilled end
- Put a third angled 90° bend (opposite direction) 1-3/4″ and 1-1/4″ from the drilled end
- Put a clockwise twist (approx 45°) to the drilled end of the bracket at the third bend

NOTE: *You will need to make minor adjustments to the bending and twisting of the bracket once it—and its switch—are in position.*

2. Prepare the steering column.

Dismantle the five-part steering console: top center (Figure 2-a), upper left then upper right half (2-b), lower left half (2-c) then lower right half (2-d).

3. Install the magnets and switch bracket/switch assembly.

a. Cut one magnet **SA** in half horizontally. Using the two-part epoxy **SB** attach the magnet halves 180° apart on the steering shaft. Attach the magnets between the bottom of the upper column tube and the small ledge on the steering shaft above the universal joint (Figure 2b).

b. Install switch **SD** in prepared bracket **SC**. Then, using the two-part epoxy **SB,** attach the **SC/SD** assembly to the right of the steering shaft on the top face of the cast support that 'bridges' the universal joint (Figure 2c - but see note at the start of step 1).

c. Adjust the bracket bends and twist and the sensor itself so that the sensor face is 1/8″ to 1/4″ from the magnets (Figure 2c inset).

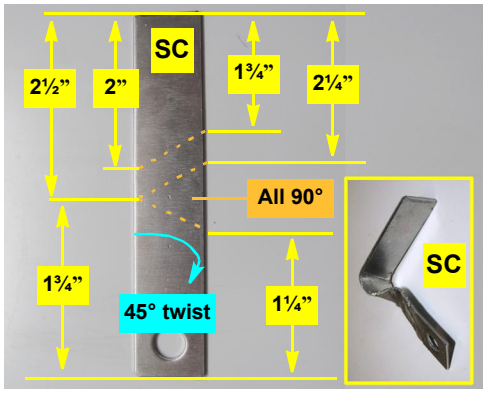


Figure 1 with inset: Prepared steering wheel switch bracket (not to scale)

Figure 2 a-d: Dismantling the console

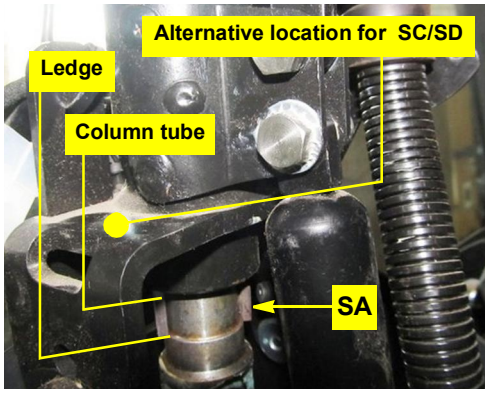


Figure 2b: Installed magnets

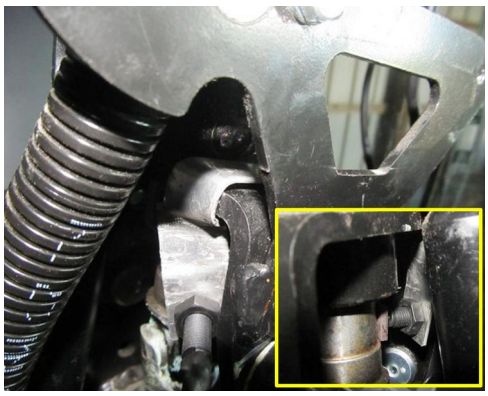


Figure 2c: Installed steering wheel switch

Appendix - Hydraulic Circuits