

Automated Steering Kit Installation Guide

Kit: EDX-MF9000, P/N 911-2035-000

Fits Massey Ferguson and Challenger Models:

MF9690	Challenger 660
MF9790	Challenger 670
MF9795	Challenger 680B
MF9895	



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 electronic control unit (ECU)

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.

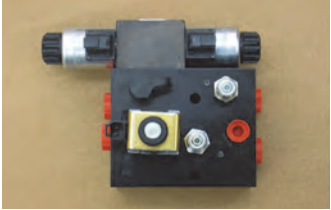
Before attempting to install any of the components, park the machine on a clean level floor with adequate clearance to work all around.

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 of 6 contains HB and HC				
HB	760-2060-000	4	Adapter, hyd - #6maleJIC x #8maleORB (P [pressure], T [tank] and A and B ports on hydraulic steering block)	
HC	760-2058-000	1	Adapter, hyd 90 elbow - #6maleJIC x #6maleORB (LS port on hydraulic steering block)	

Kit Contents - Steering Hydraulics (*continued*)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HD	640-0122-000	1	Hydraulic steering block mounting bracket	
Bag H2 of 6 contains HE				
HE	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 HA onto HD)	
HF	750-5003-000	1	Steering controller	
Bag H3 of 6 contains HG				
HG	675-2010-000	2	Bolt, 5/16NC x 3/4" Gr5 ZP	
	678-1055-000	2	Washer, flat - 5/16" ZP	
	676-1036-000	2	Nut, lock - 5/16NC ZP	
			(Attach HD to machine)	
Bag H4 of 6 contains HH				
HH	675-2020	4	Bolt, 1/4NC x 2" Gr5 ZP	
	678-1053	4	Washer, flat - 1/4" ZP	
	676-1034	4	Nut, lock - 1/4NC ZP	
			(Attach HF and HK to machine)	
Bag H5 of 6 contains HI and HJ				
HI	760-2077	3	Adapter, hyd run-tee - #8JIC (Tank and steering lines)	
HJ	760-2054	1	Adapter, hyd run-tee - #6JIC (Pressure line)	

Kit Contents - Steering Hydraulics (*continued*)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
HK	760-0009	1	Assembly, hyd dynamic load sense valve	
Bag H6 of 6 contains HL, HM and HN				
HL	760-2037	1	Adapter, hyd 90 elbow - #4maleJIC x #6maleORB (Source port in HK - connect machine's load sense hose)	
HM	760-2056	1	Adapter, hyd - #6maleJIC x #6maleORB (Function port in HK)	
HN	760-2082	1	Adapter, hyd 90 elbow - #6maleJIC x #4maleORB (LS port in HK)	
HO	760-1239	1	Hose, hyd - 3/8" x 20", #6fJIC x #6fJIC90 (Pressure hose)	
HP	760-1240	1	Hose, hyd - 3/8" x 21", #6fJIC x #8fJIC90 (Tank hose)	
HQ	760-1166	1	Hose, hyd - 1/4" x 22", #6fJIC90 x #6fJIC (From HN to LS port on HA)	
HR	760-1242	1	Hose, hyd - 1/4" x 30", #6fJIC90 x #4fJIC (From HM to load sense port on orbital)	
HS	760-1238	2	Hose, hyd - 3/8" x 42", #6fJIC x #8fJIC (Steering hoses)	
HT	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 (W1 of 3) contains WA to WF				
WA	720-0045-000#	1	WAS assembly	
WB	750-5002-000	1	Sensor, dual output, BEI (‘WAS 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	3	Nut, nylock 8-32NC, ZP	
WF	675-1150-000	1	Screw, 8-32 x 1", Allen socket cap, ZP	
WG	675-2031-000	1	Threaded rod, 5/16-24 x 12"	
Bag W2 of 3 contains WH, WI and WJ				
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)	

Kit Contents - Wheel Angle Sensor (continued).

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
WK	640-0136-000	1	WAS assembly mounting bracket	
WL	640-0141-000	1	WAS link rod bracket	
Bag W3 of 3 contains WM, WN and WO				
WM	675-2019-000	2	Bolt - 1/4NC x 1/2" Gr5 ZP	
	676-1040	2	Nut, 1/4NC Gr5 ZP (Connect WL to WN or WO)	
WN	675-0156-000#	1	Clamp, 2.19" - 2.50" TBOLT, SS (Connect WL to tie rod - depending on tie rod diameter. See WO)	
WO	675-0132-000	1	Clamp, 1.62" - 1.87" TBOLT, SS (Connect WL to tie rod - depending on tie rod diameter. See WN)	

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	1	Assembly, steering wheel switch/cable	
SE	677-2002	4	Tie strap, 7" releasable	

Kit Contents - Electronic Control Unit

Unpack the electronic control unit kit and identify the required parts as shown. Kit items are A, B, C etc. with an E (Electronic) prefix.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EA	051-0226-000#	1	Main cable	
EB	054-0115-000#	1	Extension cable	

Kit Contents - Electronic Control Unit (continued).

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EC	051-0228-000#	1	Steering controller main cable	
ED	051-0231-000#	1	Valve cable	
EE	051-0230-000#	1	WAS cable (Use with EN)	
EF	051-0229-000#	1	SWS cable	
EG	054-0117-000#	1	Power switch	
EH	051-0166-000#	1	CAN-PWR cable	

Kit Contents - Electronic Control Unit *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EI	806-1031-000#	1	Controller (ECU)	
EJ	640-0091-000	1	ECU mounting bracket	
EK	726-1093-000	1	Switch bracket	
Bag E1 of 1 contains EL and EM				
EL	675-1228-000#	4	Screw, self-drilling, #10-16 x 2", Hex, ZP (Attach EJ to cab floor)	
EM	675-1188-000	4	Screw, mach, M6 x 12mm, PPH, ZP (Attach EI to EJ)	
EN	051-0294-000#	1	WAS extension cable (combines only) (Use with EE)	
EO	051-0304-000#	1	Power cable - long (combines only) (Replaces EA's power cable)	

Installation - Automated Hydraulic Steering Kit

⚠ WARNING:

Before installing, disconnecting or repairing the hydraulic hoses and components, turn off the machine and relieve all pressure from the hydraulic system by turning the steering wheel left and right. Failure to remove the pressure can result in serious injury or death from unexpected machine movement.

To avoid burn injury when installing, disconnecting or repairing the hydraulic hoses and components, turn off the machine and allow the system to cool down prior to touching the parts of the machine that are heated.

See Appendix B for a schematic of the hydraulic circuits.

1. Prepare the hydraulic steering block.

NOTE: Make sure the hydraulic steering block **HA** is clean and dust free.

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

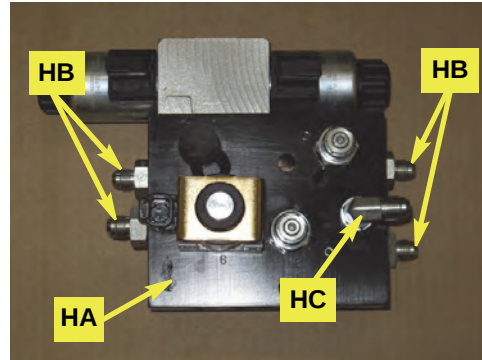


Figure 1: Prepared hydraulic block

2. Install the steering block mounting bracket.

Locate the two leftmost holes in the brace under the cab—inboard of the blower ducting (Figure 2).

Using hardware **HG**, install hydraulic steering block mounting bracket **HD** in the two holes. Mount the block with (Figure 2 inset):

- Its block mounting flanges forward
- Its long end inward

NOTE: If required, temporarily remove the blower ducting to reach behind the brace to secure the bracket.

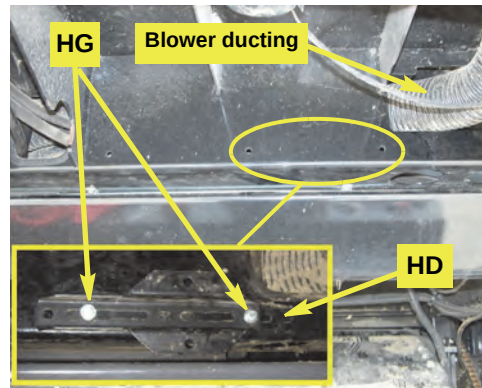


Figure 2 with inset: Installed steering block mounting bracket

3. Install the hydraulic steering block.

Using hardware **HE**, attach hydraulic steering block **HA** to bracket **HD**. Mount **HA** with its solenoids on top, the pressure and tank ports inward (Figure 3).

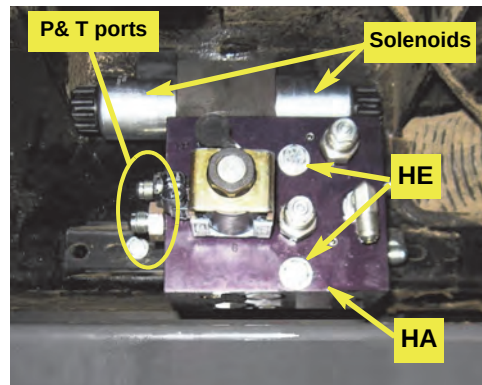


Figure 3: Installed steering block

4. **Prepare, install and connect the load sense shuttle valve.**
 - a. Assemble load sense shuttle valve **HK** as follows (Figure 4a):
 - Adapter fitting **HM** in the function port
 - Adapter fitting **HL** in the source port
 - Adapter fitting **HN** in the **LS** ('Pilot') port (to hydraulic block).

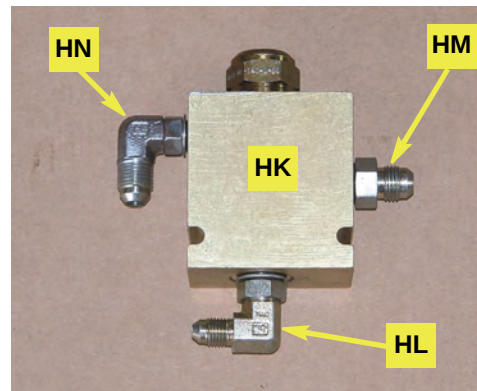


Figure 4a: Prepared load sense valve

- b. Locate the existing hole in the front cab brace, inboard of the installed hydraulic steering block. Using load sense valve **HK** as a template, drill a new 1/4" hole to the right (as viewed - Figure 4b and right inset). Using half of hardware **HH**, install the load sense valve (Figure 4b left inset).

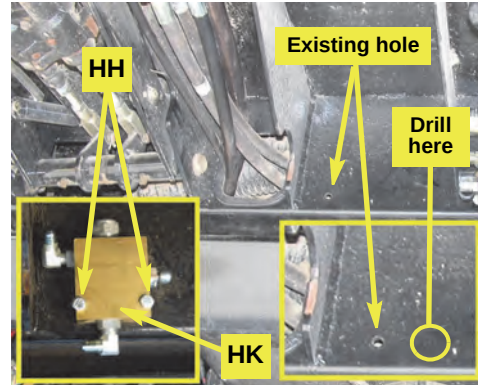


Figure 4b with insets: Load sense valve location and installed

- c. Locate the machine's load sense line on the right side of the orbital (Figure 4c), disconnect it and reconnect it to fitting **HL** in the load sense valve's source port (Figure 4c inset).

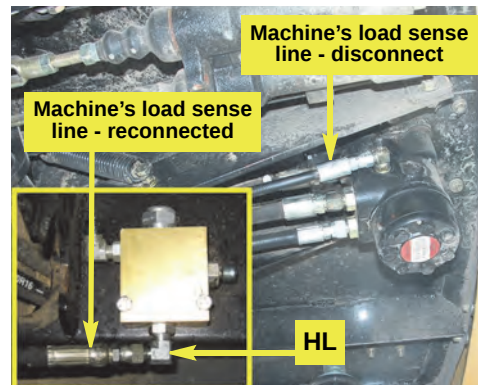


Figure 4c with inset: Load sense source hose installed

- d. Install load sense hose **HR** between the load sense port on the orbital (Figure 4d inset) and fitting **HM** in the function port of the load sense valve (Figure 4d).

Install load sense hose **HQ** between fitting **HN** in the load sense ('Pilot') port of the load sense valve and fitting **HC** in the **LS** port on the hydraulic steering block (Figure 4d).

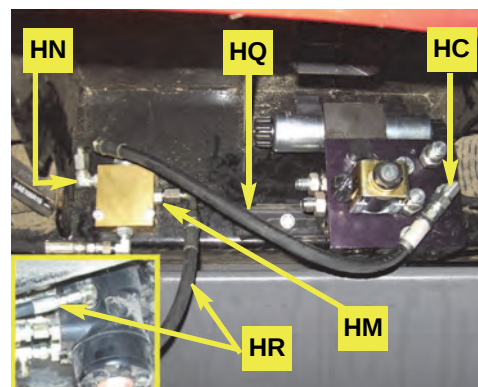


Figure 4d with inset: Load sense hoses installed

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

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

Locate and disconnect the machine's pressure hose (bottom left) and tank hose (top left) at the orbital (Figure 5).

Install run-tees **HI** and **HJ** in the tank and pressure ports of the orbital respectively. Reconnect the machine's hoses to the open 'T' ends of the run-tees (Figure 5 inset).

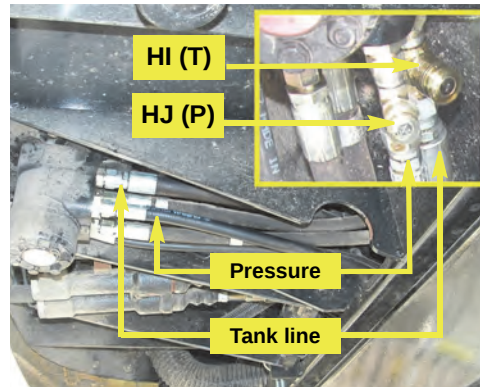


Figure 5 with inset: Pressure and tank run-tees and hoses at orbital. Existing hoses reconnected.

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

Install the pressure hose **HO** between the stem of run-tee **HJ** (Figure 6 inset) and fitting **HB** in the **P** port of the hydraulic steering block (Figure 6).

Install the tank hose **HP** between the stem of run-tee **HI** (Figure 6 inset) and fitting **HB** in the **T** port of the hydraulic steering block (Figure 6).

NOTE: Route hoses with other machine plumbing free from entanglement and secured with heavy tie straps **HT**. Securely tighten all hose fittings and connections when hose installation is complete.

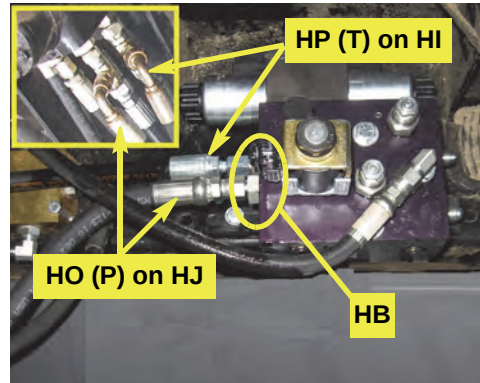


Figure 6 with inset: Pressure and tank hoses installed

7. **Install the steering output fittings.**

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

Locate the steering lines under the entry platform on the left side of the machine and disconnect the rubber hoses from the steel lines (Figure 7 and left inset).

Install run-tees **HI** and reconnect the machine's steering hoses to the open 'T' ends of the run-tees (Figure 7, right inset).

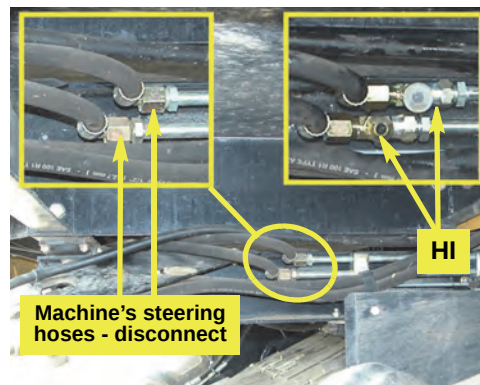


Figure 7 with insets: Steering run-tees installed

8. **Install the steering hoses.**

Install steering hoses **HS** between the stems of run-tees **HI** (Figure 8 and right inset) and the fittings **HB** in the **A** and **B** ports on the hydraulic steering block (Figure 8 and left inset).

NOTE: Route hoses with other machine plumbing free from entanglement and secured with heavy tie straps **HT**. Securely tighten all hose fittings and connections when hose installation is complete.

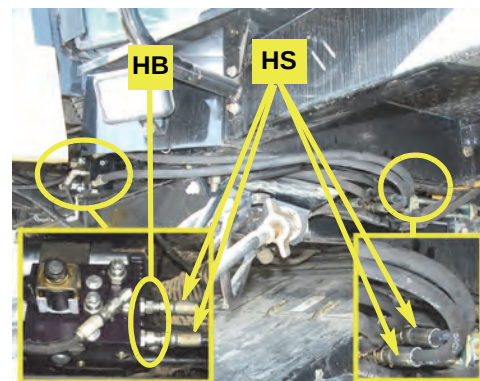


Figure 8 with insets: Steering hoses installed

9. **Install the steering controller.**

Check the angled frame brace next to the orbital for two $\frac{1}{4}$ " holes near and parallel to the bottom edge of the brace and $4\frac{1}{2}$ " apart. If they are not there, or there is only one, drill the frame brace as required (Figure 9).

Using the remaining hardware **HH** (not visible), install steering controller **HF** on the frame brace. Mount the controller with the pressure wash warning on top and the connector sockets toward the left of the machine (so black connector socket toward the front - Figure 9 inset).

10. **Verify operation.**

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

Keep others away and stay clear of mechanical steering linkages to prevent serious injury or death from pinch point hazards while manually operating the hydraulic steering circuit.

- a. Tighten all connections and clean up the installation area around the machine and make certain that it is safe to operate.
- b. Start the machine and check hydraulic connections for any leaks.

Rotate the steering wheel from one extreme to the other and back.

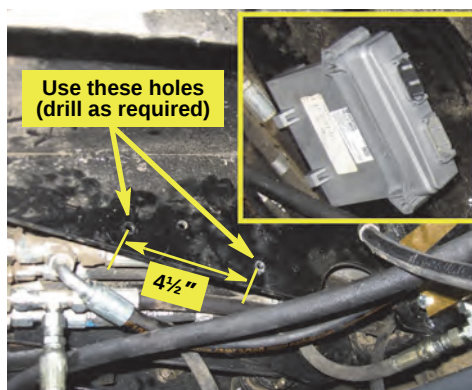


Figure 9 with inset: Steering controller mounting location and (inset) installed

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).

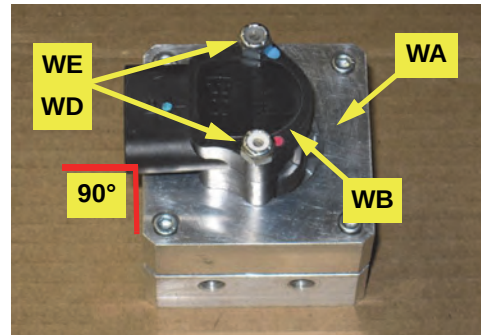


Figure 1a: Prepared WAS housing/connector

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

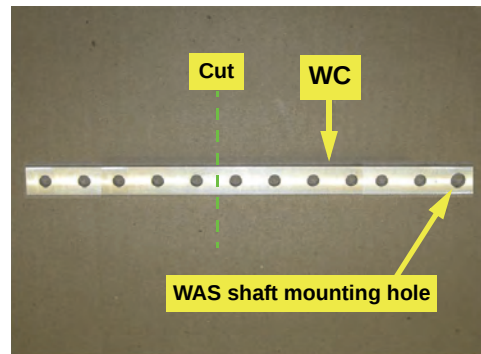


Figure 1b: WAS arm preparation

- 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.

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

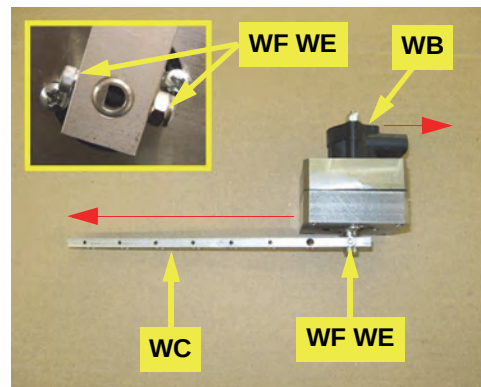


Figure 1c with inset: WAS arm installed

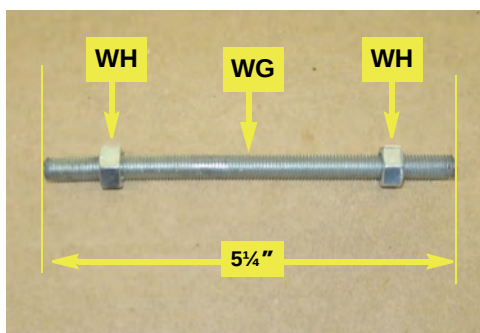


Figure 1d-i: Threaded link rod preparation

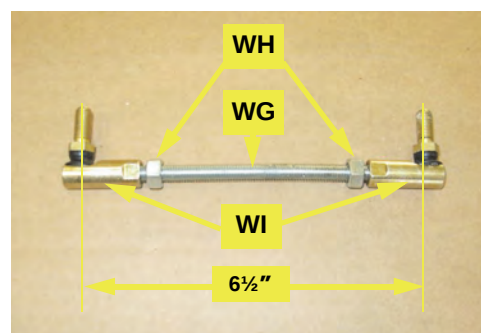


Figure 1d-ii: Assembled threaded link rod

2. Mount the wheel angle sensor.

- a. Using hardware **WJ** (Figure 2a inset), install the WAS assembly from step 1 on bracket **WK**. Have the wire connector **WB** at the bottom and mount the assembly so that the bends in **WK** will hold the assembly away from the axle when installed at step b (Figure 2a with inset).

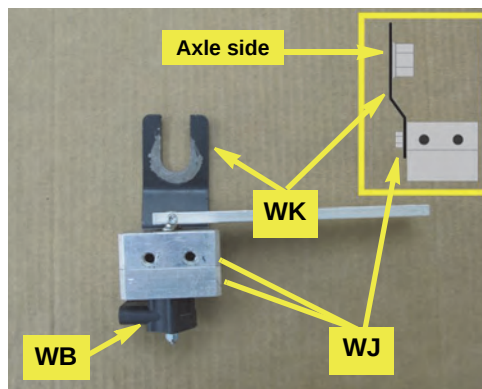


Figure 2a with inset: WAS assembly on mounting bracket

- b. Locate the axle adjustment nuts on the front side of the left rear axle. Loosen the second or third nut in on the solid axle frame (Figure 2b).

Slide the bracket **WK** and WAS assembly up under the loosened nut so that the assembly is held away from the axle and the wire connector **WB** is pointing inward (Figure 2b inset).

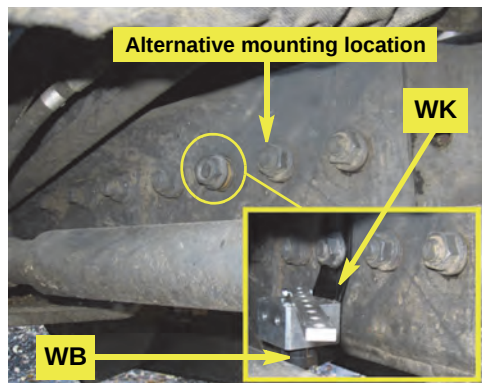


Figure 2b with inset: WAS assembly mounting location and (inset) installed

- c. Using hardware **WM** and, depending on the diameter of your tie rod, either clamp **WN** or **WO**, attach link rod bracket **WL** to the tie rod. Mount **WL** with its short side up and pointing forward (Figure 2c).

With the machine's wheels as straight ahead as possible, position the clamp/bracket assembly with its centerline $6\frac{1}{2}$ " from the centerline of the housing mounting (Figure 2c inset).

NOTE:

The position of the clamp determines the operating arc of the WAS arm so it is important to get the steering wheels as close as possible to straight ahead before positioning and securing the clamp/bracket assembly.

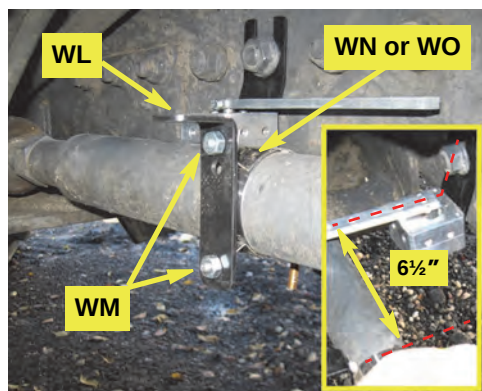


Figure 2c with inset: Link rod bracket installed

- d. Using hardware **WH** (not shown), 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.

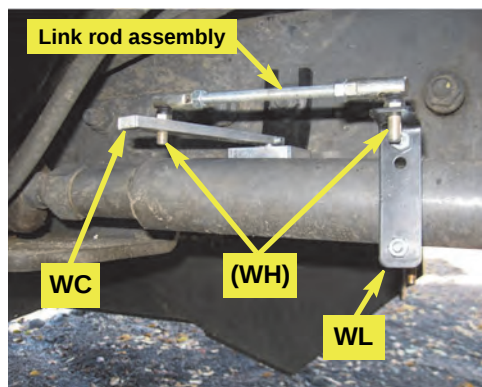


Figure 2d: WAS link rod assembly installed

2. **Mount the wheel angle sensor (continued).**
- e. With all hardware **WH** loose, slowly turn the wheels full left lock then full right lock (Figures 2e-i and 2e-ii). 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 (Figure 2e-i) and the swivels (not visible).

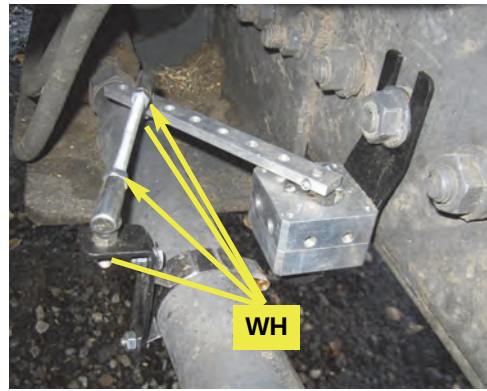


Figure 2e-i: Full left lock



Figure 2e-ii: Full right lock

Installation - Steering Wheel Switch (SWS)

1. Prepare the switch bracket.

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

- Cut 1/4" from the end opposite the pre-drilled end
- Cut a 7/16" wide, 1/2" deep slot in the center of the cut end
- Put a 90°, upward bend in the bracket 1-7/8" from the pre-drilled end
- Put a slight twist in the pre-drilled end 3/4" from the end

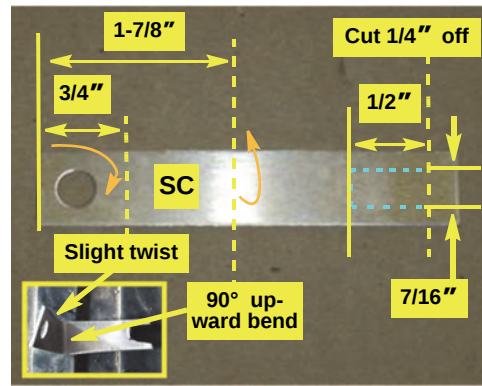


Figure 1 with inset: Prepared steering wheel switch bracket (not to scale)

2. Install the switch bracket, switch and magnets.

- a. Remove the five screws on the left side of the steering column (Figure 2a) and remove the two left-side column cover sections (Figure 2a inset).

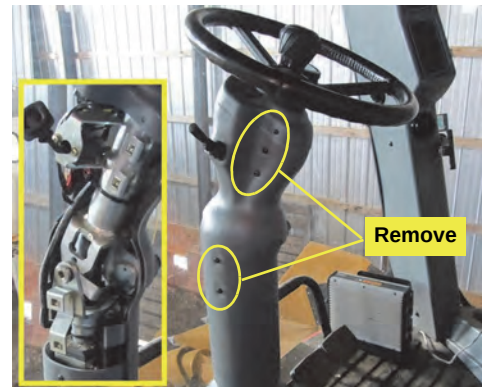


Figure 2a with inset: Partial dismantling of the steering column

- b. Cut one of the magnets **SA** in half and, using the two-part epoxy **SB**, attach the magnet halves 180° apart on the lower yoke of the steering shaft universal joint (Figure 2b).
- c. Loosen the left tilt pivot bolt enough to slide the slotted end of the switch bracket prepared in step 1 onto the bolt. Position the pre-drilled hole in line with one of the magnets and tighten the bolt (Figure 2c).
- d. Install switch **SD** in bracket **SC** and finely adjust the twist and bend in the bracket to align the switch sensor tip with the center of the magnets. Adjust the sensor tip to 1/8" to 1/4" from the magnets (Figure 2d).
- e. Keeping **SD**'s cable connector outside, refit the steering column cover sections.



Figure 2b: Installed magnets

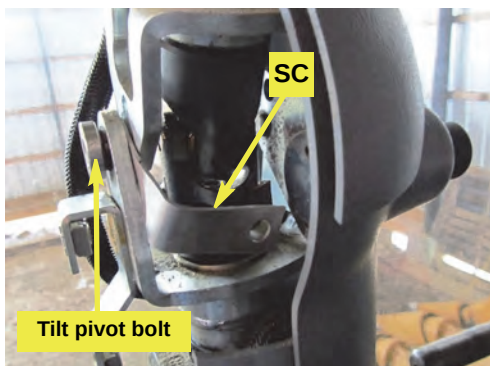


Figure 2c: Installed switch bracket

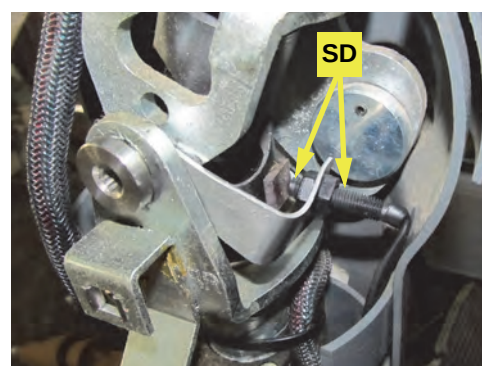


Figure 2d: Installed switch/sensor

Installation - Electronic Control Unit (ECU)

See Appendix A for a schematic of the cable connections.

1. Install the ECU.

- a. Identify the ECU mounting location on the floor at the right front corner of the cab.

Facing the one inch tabs of bracket **EJ** toward the right side of the machine, position the bracket with its front left corner $2\frac{3}{4}$ " from the front window and $1\frac{1}{2}$ " from the outer edge of the footrest (Figure 1a). (This should set the rear edge of the bracket to $14\frac{1}{2}$ " from the front edge of the plastic seat mounting box - Figure 1a and inset).

Using hardware **EL**, fasten the bracket to the cab floor (Figure 1a). Use a small level (not shown) to check the level of the bracket. Adjust accordingly.

NOTE:

Do not overtighten the self drilling screws. Overtightening could cause the fastener to fail.

- b. Using hardware **EM** (not visible) attach the ECU **EI** to bracket **EJ**. Have the wire connections toward the rear and the power and communications indicators at the bottom (Figure 1b).

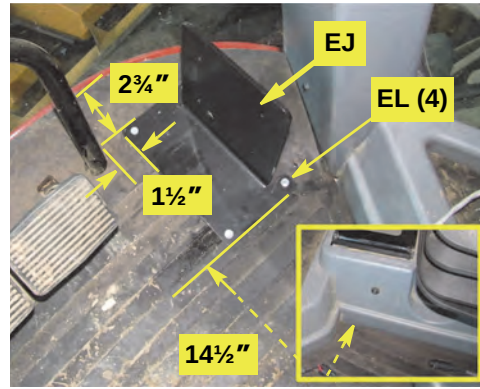


Figure 1a with inset: ECU mounting bracket location/installed

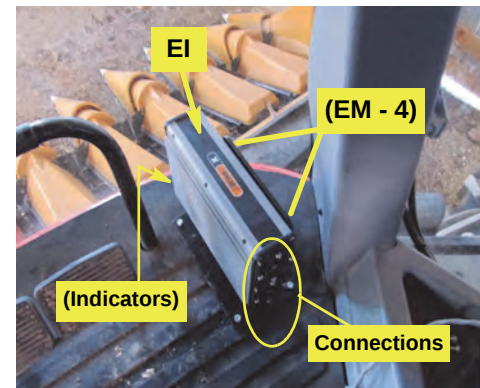


Figure 1b: ECU installed

2. Assemble and install the cables.

On a clean surface, lay out all the cables and become familiar with the connections and where they are to be placed. See Appendix A.

NOTE:

*Route cables with other machine cabling or plumbing free from entanglement and secured with heavy tie straps **HT**.*

- a. Connect cable **EA** to the ECU **EI** using an Allen wrench to secure the cable to the ECU. The **EA** connector will fit only the ECU socket that is in line with the power and communications indicators at the opposite end of the ECU. Connect **EA** to the bottom socket on **EI** in this installation (Figure 2a).
- b. Connect steering controller cable **EC**'s two 12-pin connectors (black and gray) to their respective sockets on the steering controller **HF** (Figure 2b).

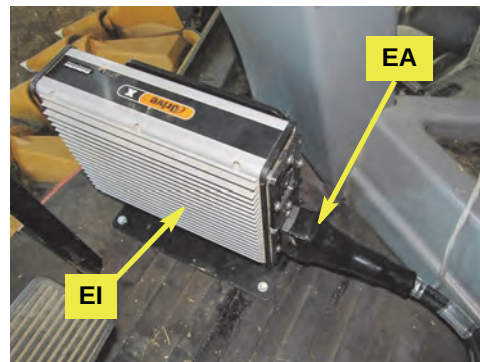


Figure 2a: Installed ECU main cable in bottom socket

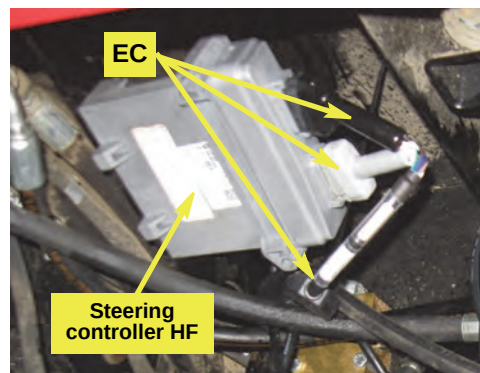


Figure 2b: Steering controller's two 12-pin connections

2. **Assemble and install the cables (continued).**

- c. Connect valve cable **ED** to **EC**'s connector labeled 'VALVE'. Connect **ED**'s three 2-pin connectors (labeled 'LEFT', 'RIGHT' and 'ENABLE') to the enable valve and two solenoid valves on the hydraulic steering block (Figure 2c).

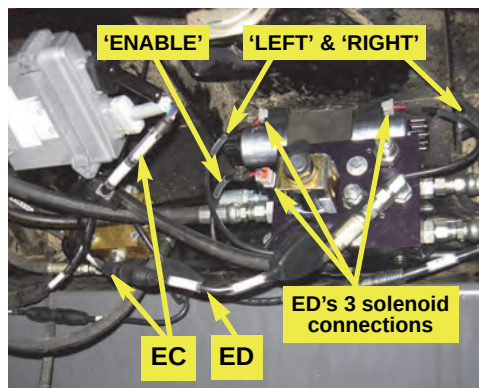


Figure 2c: Valve cable from steering controller to left, right and enable solenoids

- d. Install WAS extension cable **EN** between **EC**'s connector labeled 'WAS' (Figure 2d) and WAS cable **EE**. Route **EN/EE** down and along the side of the machine, secured away from all moving parts, to the WAS assembly on the front of the left side rear axle. Connect **EE** to wire connector **WB** (Figure 2e - example only).

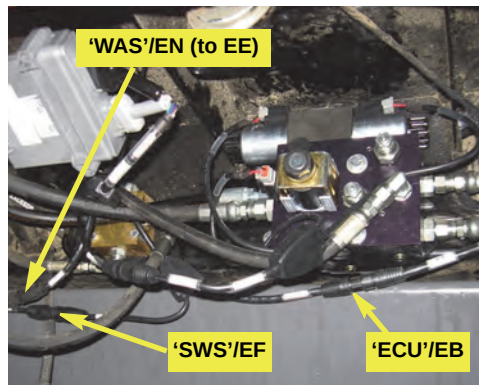


Figure 2d: Controller cable's WAS, SWS and ECU connectors and respective cables

- e. Remove the rubber mat from the raised floor section to the right of the operator's seat to expose the raised floor section screws. Remove the screws (Figure 2f with inset). Move the floor section to the side then remove the cab access hole plug from the machine floor (Figure 2g).
- f. Routing extension cable **EB** through the cab access hole (Figure 2g insets) install the cable between steering controller cable **EC**'s connector labeled 'ECU' (Figure 2d) and, in the cab, **EA**'s connector labeled 'STEERING CONTROLLER'.
- g. Routing SWS cable **EF** through the cab access hole (Figure 2g insets) install the cable between steering controller cable **EC**'s connector labeled 'SWS' (Figure 2d) and, in the cab, steering wheel switch connector **SD**. Within the cab, route cables under the floor mat.

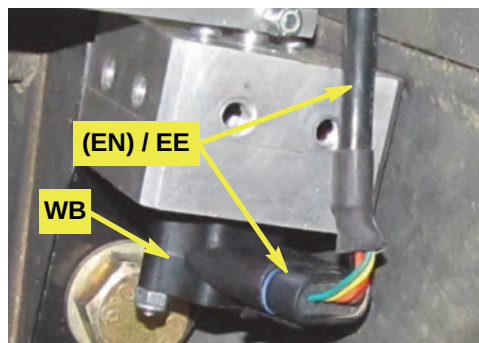


Figure 2e: WAS cable routed and connected to WAS assemblies wire connector (example only, not this installation)



Figure 2f with inset: Accessing the cab access hole

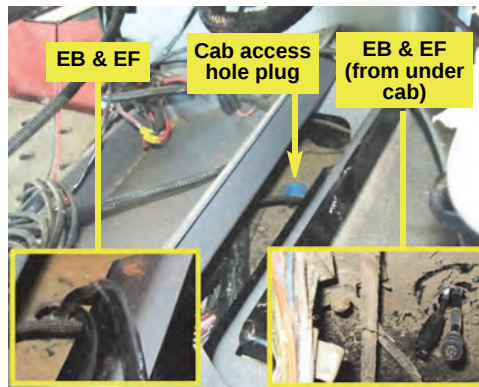


Figure 2g with insets: Using the cab access hole (power cable uses same hole)

2. Assemble and install the cables (*continued*)

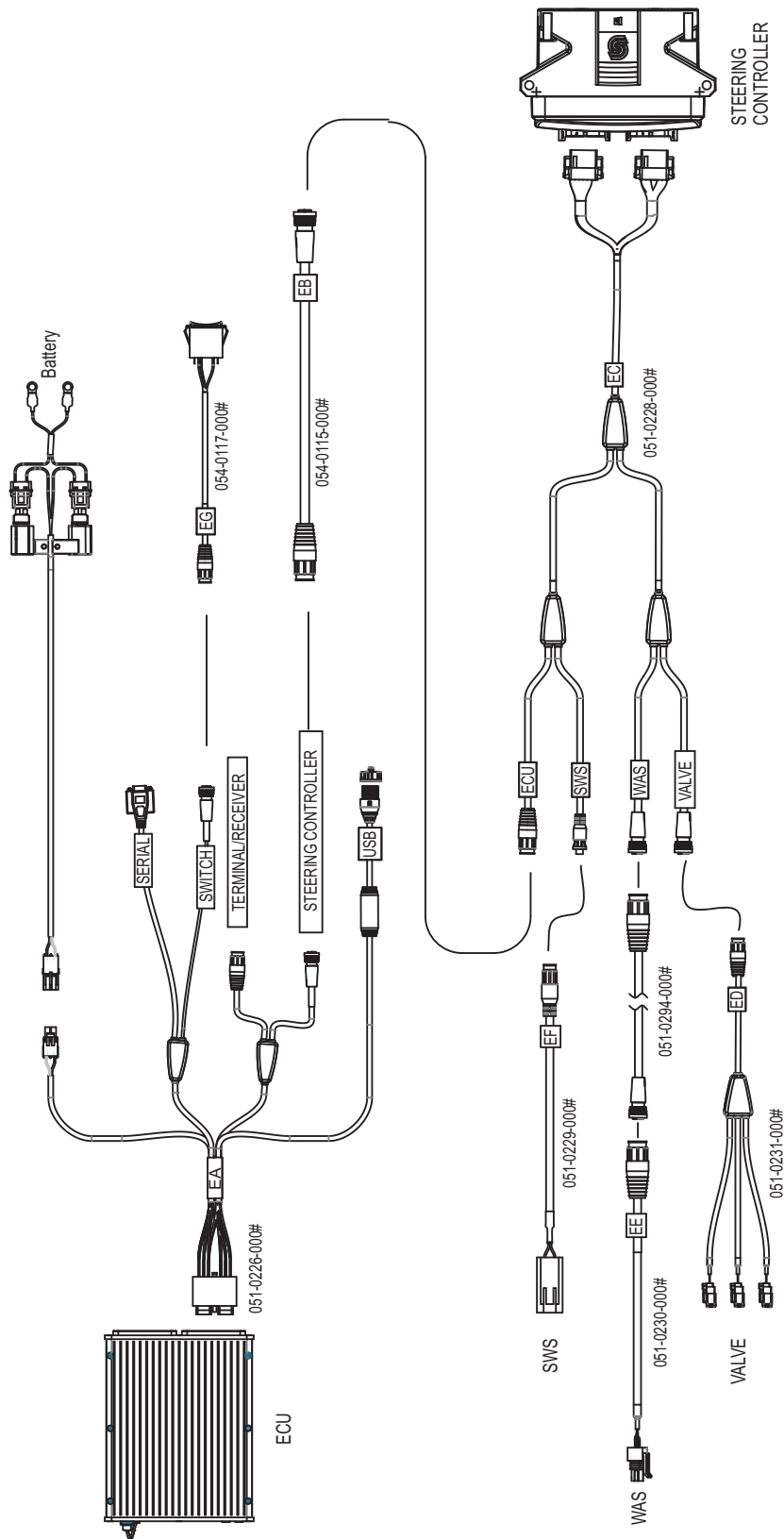
- h. Attach power switch **EG** to cable **EA**'s connector labeled 'SWITCH'. Some machines are equipped with pop out tabs that you can remove and replace with switch **EG**. If no tab is available, you can use bracket **EK** mounting it in the cab at the operator's preferred location.

NOTE: *Set the switch to OFF before connecting **EA** to the battery at step j below.*

- i. Connect CAN-PWR cable **EH** to **EA**'s open connection labeled 'TERMINAL/RECEIVER'. Route the cable in the cab so that it is clear of any machine operation controls. Connect the opposite end of cable **EH** to the guidance terminal.
- j. Disconnect the standard length power cable from ECU main cable **EA**. Route extended power cable **EO** through the cab access hole and connect it to **EA** then the machine's 12V battery.

Appendix A - ECU Cables and Connections

ECU CABLES AND CONNECTIONS - COMBINES



Appendix B - Hydraulic Circuits

