INSTALLATION INSTRUCTIONS

Trimble® Autopilot™ Automated Steering System

Claas Lexion combines

2011-2012	▪ 670/ 730 / 740 / 750 / 760 / 770 / 780
2013+	▪ 620 / 630 / 650 / 660 / 670 / 740 / 750 / 760 / 770 / 780

Version 5.00
Revision C
September 2014
Part number 54038-41-E05-C

Trimble

Legal Notices

Agriculture Business Area

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USA
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This is the September 2014 release (Revision C) of the Autopilot Automated Steering System Installation Instructions, part number 54038-41-E05-C. It applies to version 5.00 of the Autopilot automated steering system.

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Product Limited Warranty

Trimble warrants that this Trimble product and its internal components (the "Product") shall be free from defects in materials and workmanship and will substantially conform to Trimble's applicable published specifications for the Product for a period of one (1) year, starting from the earlier of (i) the date of installation, or (ii) six (6) months from the date of product shipment from Trimble. This warranty applies only to the Product if installed by Trimble or a distributor authorized by Trimble to perform Product installation services.

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Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and the receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.
Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to:
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Recycling in Europe: To recycle Trimble WEEE, Call +31 497 53 2430, and ask for the "WEEE Associate"
Or
Mail a request for recycling instructions to:
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c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL

Safety Information

Always follow the instructions that accompany a Warning or Caution. The information they provide is intended to minimize the risk of personal injury and/or damage to property. In particular, observe safety instructions that are presented in the following format:

WARNING – This alert warns of a potential hazard, which, if not avoided, can cause severe injury.

CAUTION – This alert warns of a hazard or unsafe practice which, if not avoided, can cause injury or damage.

Note – *An absence of specific alerts does not mean that there are no safety risks involved.*

Warnings

WARNING – When you are working on the vehicle's hydraulic systems, vehicle attachments that are suspended can drop. If you are working around the vehicle, you could suffer serious injury if an attachment dropped on you. To avoid this risk, lower all vehicle attachments to the ground before you begin work.

WARNING – If someone else attempts to drive the vehicle while you are working on or under it, you can suffer serious or fatal injuries. To avoid this possibility, install a lockout box on the battery terminal to prevent the battery from being reconnected, remove the key from the vehicle's ignition switch, and attach a "Do not operate" tag in the cab.

WARNING – Agricultural chemicals can pose serious health risks. If the vehicle has been used to apply agricultural chemicals, steam clean the vehicle to remove any chemical residue from the areas of the vehicle where you will be working.

WARNING – Vehicle cabs can be quite high in the air. To avoid potentially serious injury through falling from this height, always use the steps and handrails, and face the vehicle, when you enter or exit it.

Cautions

CAUTION – When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot and can cause serious burns. To avoid burns, allow hot machine parts to cool before you begin working on them.

CAUTION – The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

CAUTION – Battery posts, terminals, and related accessories contain lead and lead compounds, which can cause serious illness. To avoid ingesting lead, wash your hands thoroughly after touching the battery.

CAUTION – Always wear protective equipment appropriate to the job conditions and the nature of the vehicle. This includes wearing protective glasses when you use pressurized air or water, and correct protective welder's clothing when welding. Avoid wearing loose clothing or jewelry that can catch on machine parts or tools.

CAUTION – Parts of the vehicle may be under pressure. To avoid injury from pressurized parts, relieve all pressure in oil, air, and water systems before you disconnect any lines, fittings, or related items. To avoid being sprayed by pressurized liquids, hold a rag over fill caps, breathers, or hose connections when you remove them. Do not use your bare hands to check for hydraulic leaks. Use a board or cardboard instead.

CAUTION – Do not direct pressurized water at:
- electronic or electrical components or connectors
- bearings
- hydraulic seals
- fuel injection pumps
- any other sensitive parts or components



Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

CAUTION – To prevent damage to the system, make sure that no wires or hoses interfere with or catch on any mechanical linkages, or contact any machine parts that get hot.

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CHAPTER 1

Introduction

In this chapter:

- Technical assistance
- Manual system upgrade to Autopilot
- Required components
- Autopilot hardware organization: As shipped
- Preparing the vehicle for installation

This manual describes how to install the Trimble® Autopilot™ automated steering system.

Even if you have used another GNSS (Global Navigation Satellite System), such as the United States' GPS (Global Positioning System), before, spend some time reading this manual to learn about the special features of this product. If you are not familiar with GNSS, go to the Trimble website (www.trimble.com) for an interactive look at Trimble and GNSS.

Technical assistance

If you have a problem and cannot find the information you need in the product documentation, contact Trimble technical support:

1. Log into http://agpartners.trimble.com.
2. Click the *Feedback* link at the right of the screen. A form appears.
3. Complete the form and then click **Submit Feedback**.

Manual system upgrade to Autopilot

CFX-750 display and FmX integrated display

Retain	Remove
CFX-750™ display: P/N 94000-xx Power cable CFX-750 display: P/N 77282 **FmX® integrated display: P/N 93100-xx** Power cable FmX display: P/N 66694 Antenna for display: P/N 60600-02 (DGPS) or 77038-00 (OmniStar/RTK) Antenna to receiver cable: P/N 50449 Basic cable (both displays): P/N 67258	

Controller

Kits required
Autopilot NavController II: P/N 54425-xx

Required components

Kits required	Special tools
Platform kit: P/N 54038-41 Hydraulic hose kit: P/N 84635 Hydraulic hose kit for machines 2013+: P/N 91572	$^{7}/_{16}$" drill bit SAE hex bit set

Accessory kits

Accessory options
Remote engage switch assembly – standard Euro: P/N 57227-10 Remote engage switch assembly – full Euro: P/N 57227-20 Remote engage foot pedal: P/N 57259

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit: P/N 54038-41	Hydraulic valve	Chapter 2
	Hydraulic manifold	
	Transducer flow switch	
	Manual override cable	
	Hydraulic brackets and bolt kits	
	Hydraulic valve cable	
	AutoSense™ steering device and cabling	Chapter 3
	AutoSense mounting bracket and hardware	
	Power switch	Chapter 5
	Bolt kit controller	Chapter 7
Hydraulic hose kit: P/N 84635 (2011-2012 machines) Hydraulic hose kit for machines 2013+: P/N 91572	Hydraulic hoses	Chapter 2
	Hydraulic adaptors	
GNSS receiver	GNSS receiver	Chapter 4
	GNSS antenna	
	GNSS receiver power/data cable	
	RTK radio, cable, and radio antenna	
Display	CFX-750 display	Chapter 4
	FmX integrated display	
	Display cable	
	Mounting bracket	
Common parts	Controller	Chapter 7
	Controller mounting bracket	
	Cable kit: Main wiring harness Power bus auxiliary wiring harness Sonalert alarm	

Preparing the vehicle for installation

Note – *The left and right sides of the vehicle are referenced while standing behind the unit, facing the normal direction of travel.*

1. Park the vehicle on a hard, level surface. Block the front and rear wheels.
2. Align the steering straight ahead. On an articulated vehicle, install the articulation locks.
3. Remove all dirt and debris from the areas of the vehicle where the Autopilot system will be installed.
4. Open all kit boxes and check the contents of the box against the packing list/s. Lay all of the parts out on a clean workbench.

CHAPTER 2

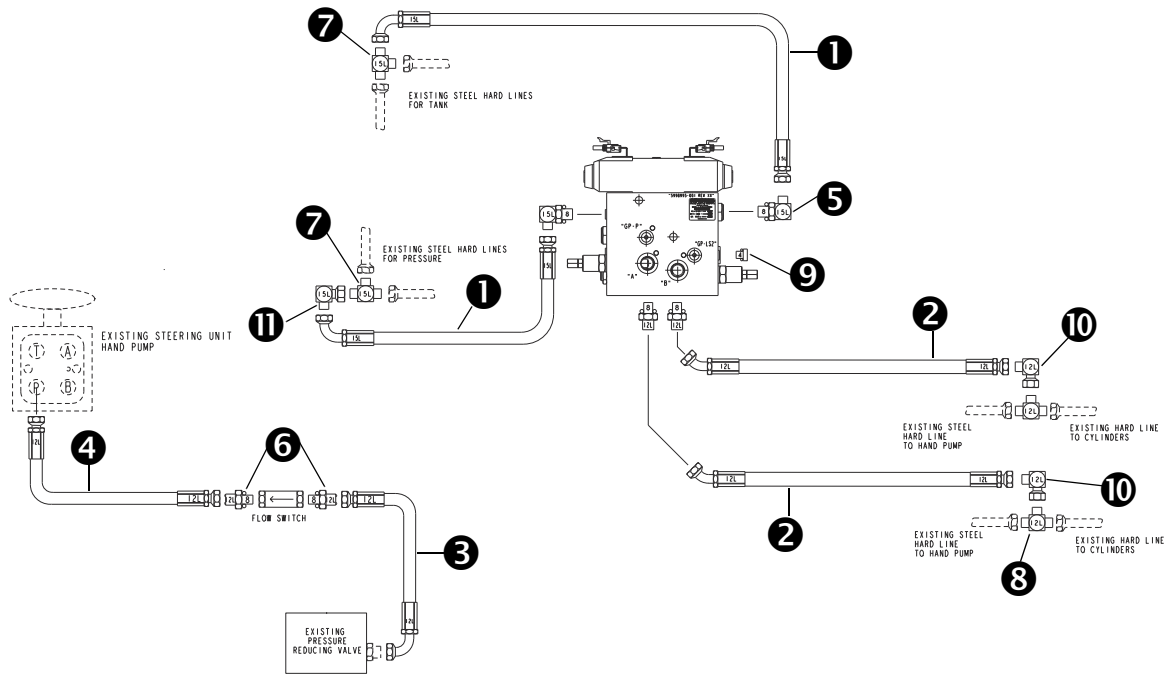
Hydraulic Control Valve Installation

In this chapter:

- Hydraulic control valve components: 2012 machines or older
- Hydraulic control valve components: 2013 machines or newer
- Prepare the Autopilot manifold and control valve
- Hydraulic manifold installation process: Machines 2012 and older
- Hydraulic manifold installation process: Machines 2013 and newer
- Hydraulic hoses installation process: Machines 2012 and older
- Hydraulic hoses installation process: Machines 2013 and newer
- Steering cylinder connections: Machines 2013 and newer
- All machines: Flow switch installation
- Checking the hydraulics

This chapter describes how to install the hydraulic control valve and hoses.

Hydraulic control valve components: 2012 machines or older

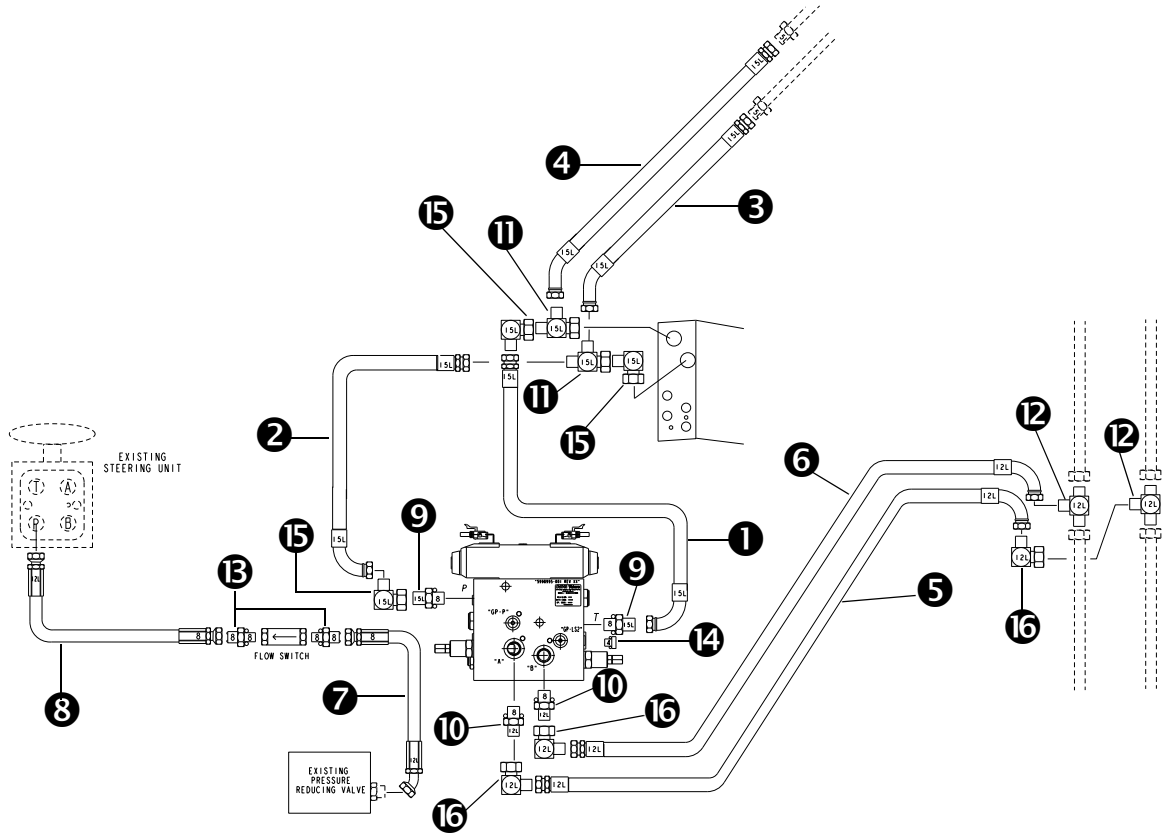


Item	Description	Part number
❶	50 inch hose(x2)	F451TCC3C5-15L-15L-08-50
❷	43 inch hose(x2)	F451TCC3C4-12L-12L-06-43
❸	10 inch hose	F451TCC3C5-12L-12L-06-10
❹	10 inch hose	F451TCC3C3-12L-12L-06-10
❺	Fitting (x2)	WEE15L3 / 4UNFA3C
❻	Fitting (x4)	GE12L3 / 4UNFOMDA3C

Item	Description	Part number
❼	Fitting (x2)	T15LOMDA3C
❽	Fitting (x2)	T12LOMDA3C
❾	Fitting	4 HP50N-S
❿	Fitting (x2)	EW12LA3C
⓫	Fitting	EW15LA3C

Note – *Part numbers are Parker numbers and are for reference only.*

Hydraulic control valve components: 2013 machines or newer



Item	Description	Part number
❶	22 inch hose	F451TCC3C5-15L-15L-08-22”
❷	30 inch hose	F451TCC3C5-15L-15L-08-30”
❸	60 inch hose	F451TCC3C4-15L-15L-08-60”
❹	60 inch hose	F451TCC3C4-15L-15L-08-60”
❺	85 inch hose	F451TCC3C5-12L-12L-06-85”
❻	85 inch hose	F451TCC3C5-12L-12L-06-85”
❼	12 inch hose	F451TCJSC4-08-12L-06-12”
❽	12 inch hose	F451TCJSC3-08-12L-06-12”

Item	Description	Part number
❾	Fitting (x2)	GE15L3/4UNFOMDA3C
❿	Fitting (x2)	GE12L3/4UNFOMDA3C
⓫	Fitting (x2)	EL15LOMDA3C
⓬	Fitting (x2)	T12LOMDA3C
⓭	Fitting (x2)	8 F5OLO-S
⓮	Fitting	4 HP5ON-S
⓯	Fitting (x3)	EW15L
⓰	Fitting (x3)	EW12L

Prepare the Autopilot manifold and control valve

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Note – *Place the hydraulic control valve and manifold on a clean work surface. Ensure the cartridges remain very clean. Any small particles introduced into the system can cause obstruction.*

Step 1

Locate the Autopilot manifold/valve assembly and place them on a clean work surface.



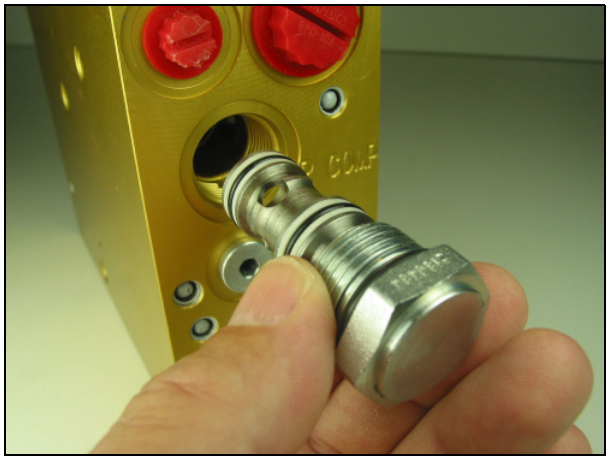
Step 2

Locate the cavity plug stamped “2186484”.



Step 3

Insert the cavity plug into the pressure compensation port labeled “P COMP”.



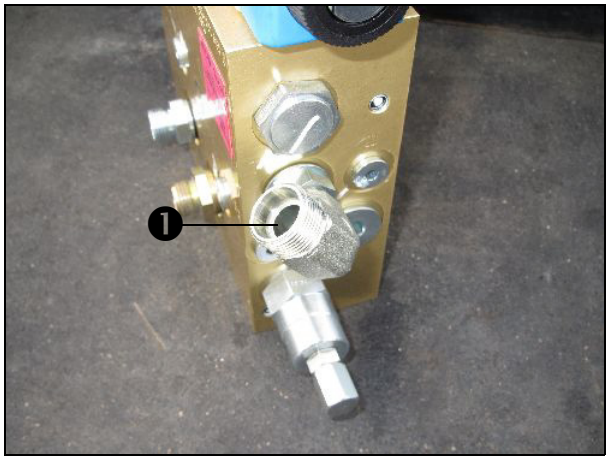
Step 4

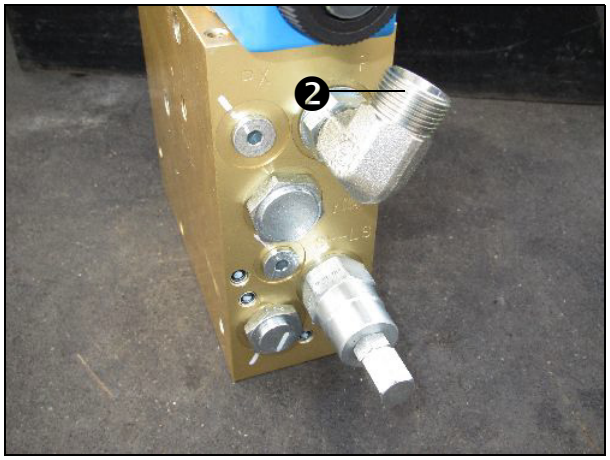
Install a 15L metric E/O elbow fitting into the T port ❶ and P port ❷.

Machines 2013+:

Install the 15L straight fitting into the T and P port of the manifold.

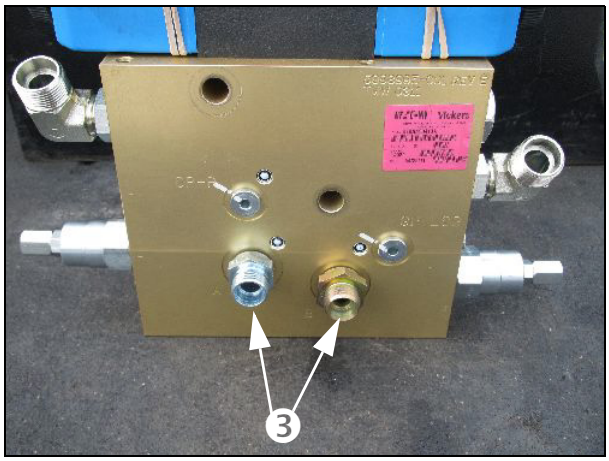
Assemble the provided swivel 90 fitting to the P port





Step 5

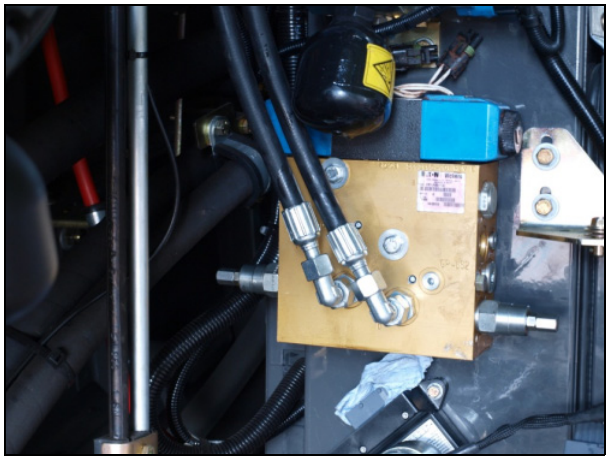
Install 12L metric E/O straight into the A and B ports ❸ .



Step 6

Machines 2013+:

Install the provided swivel 90° fittings onto the A and B ports of the manifold.

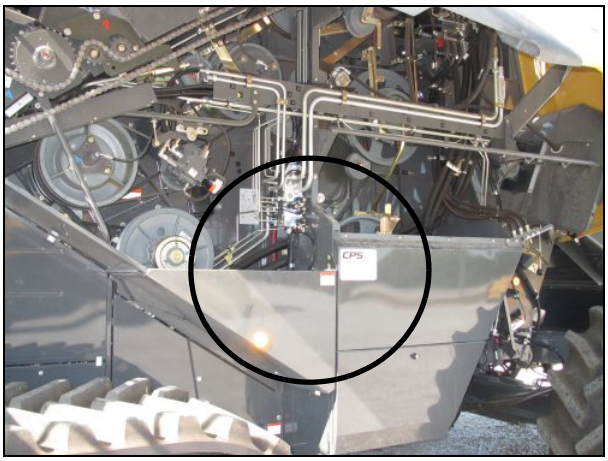


Hydraulic manifold installation process: Machines 2012 and older

Step 1

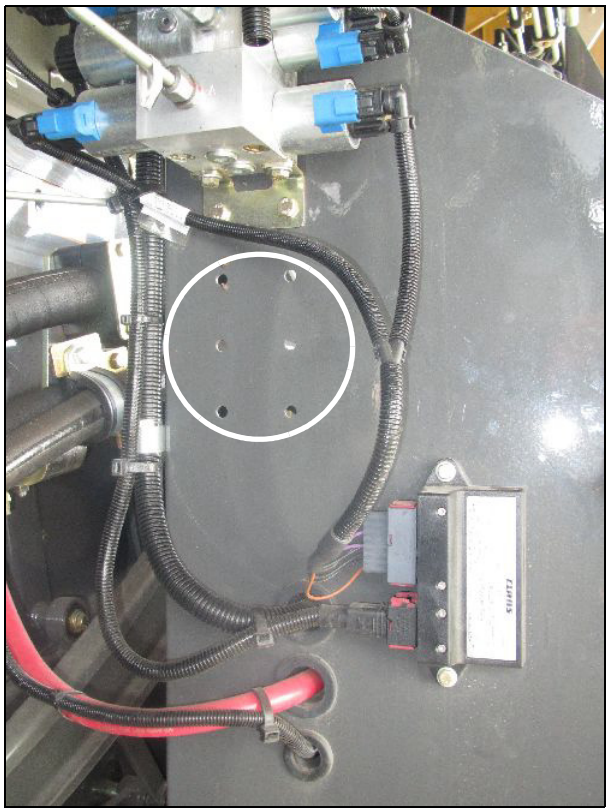
Locate the hydraulic manifold mounting area.





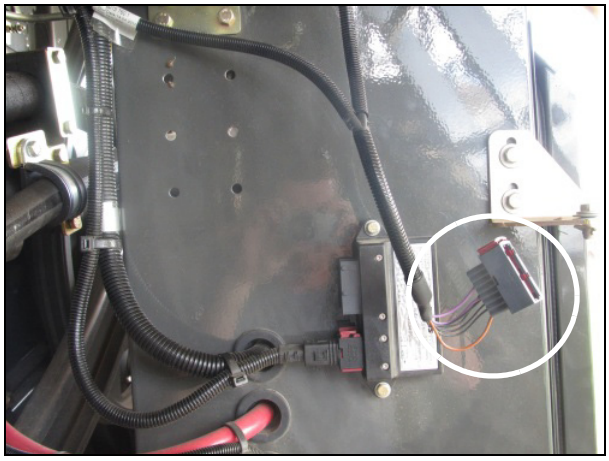
Step 2

Mount the manifold to the steel panel below the existing hydraulic distribution manifold.



Step 3

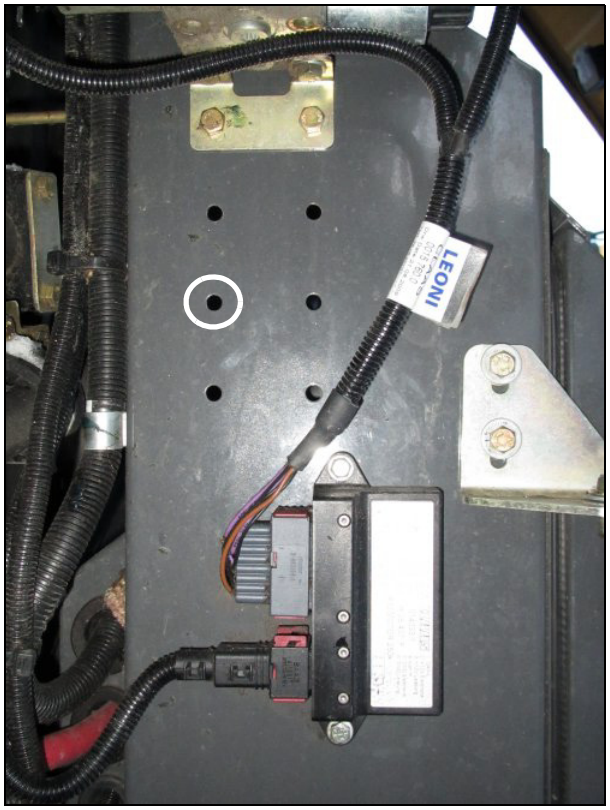
Disconnect the upper electrical connector from the variable speed CANbus module.



Step 4

Use step drill bit to enlarge the existing thru hole to $^{3}/_{8}$”, as shown.

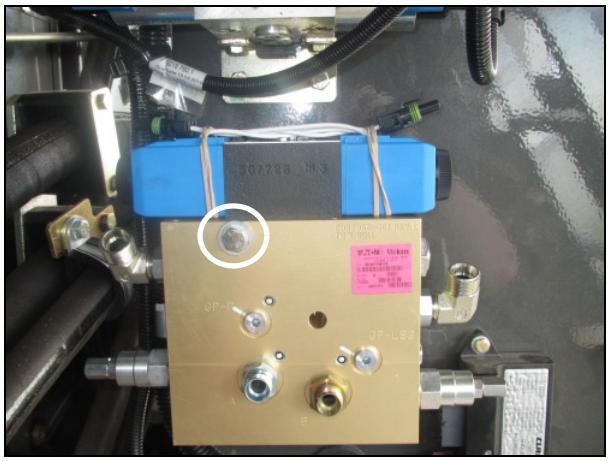
Note – *Check for cables behind the panel before drilling.*





Step 5

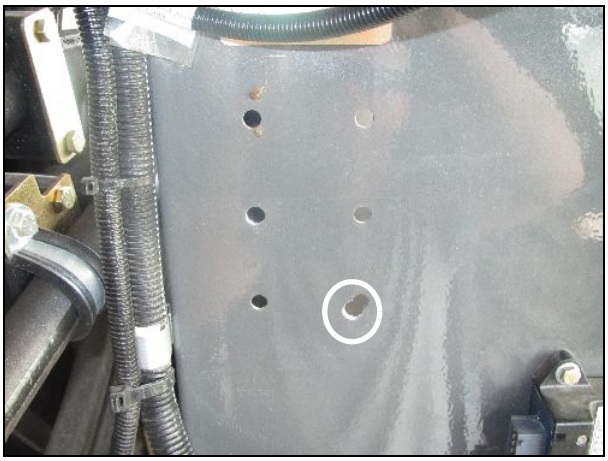
Use the a supplied $^{3}/_{8}$" x 3" bolt and flat washer to mount the manifold, as shown.



Step 6

Drill a $^{7}/_{16}$" hole thru the steel panel using the lower hole in the manifold as a guide.

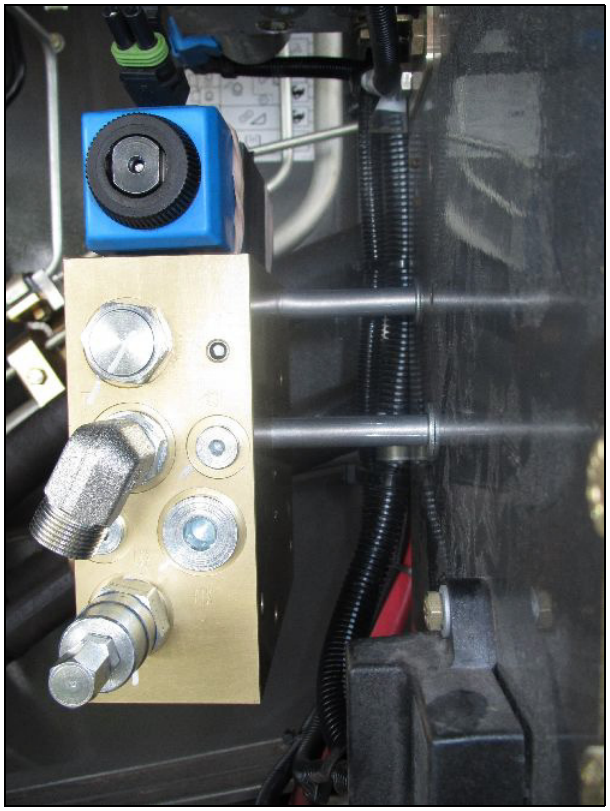


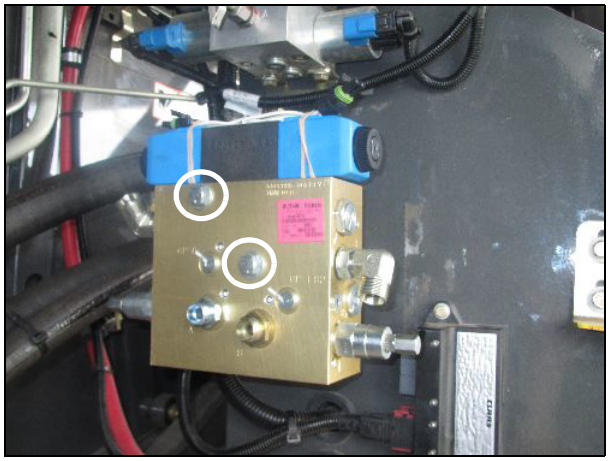


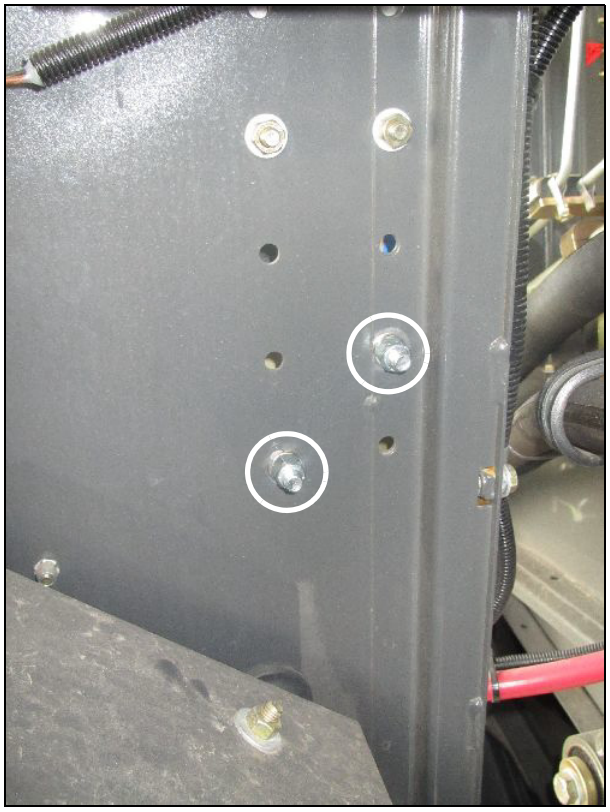
Step 7

Use the supplied $^{3}/_{8}$" x 6" hex bolts, 2.5" long round spacers, flat washers and nylock nuts to mount the manifold.

Note – *There is another image relating to this step on the next page.*

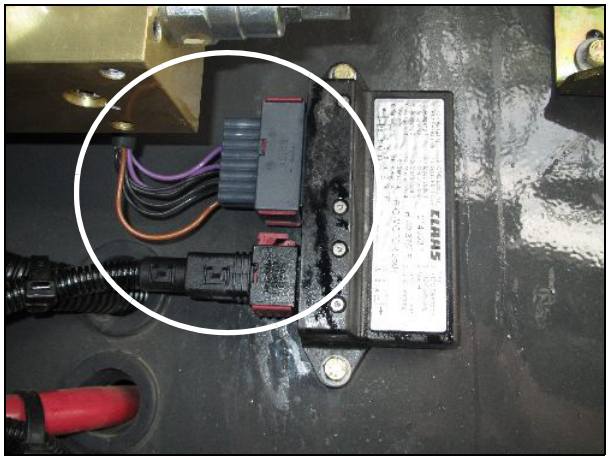






Step 8

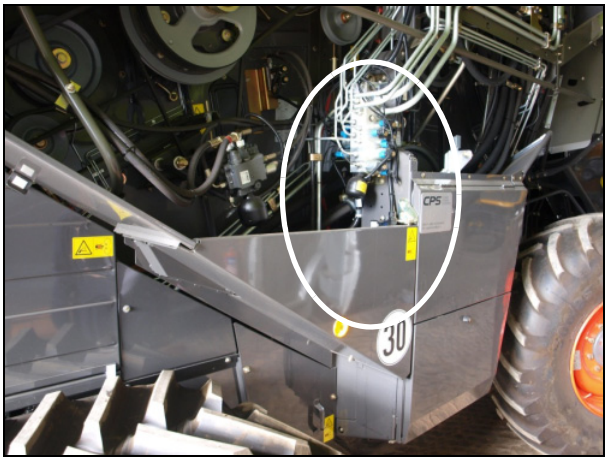
Reconnect the variable speed CANbus module.

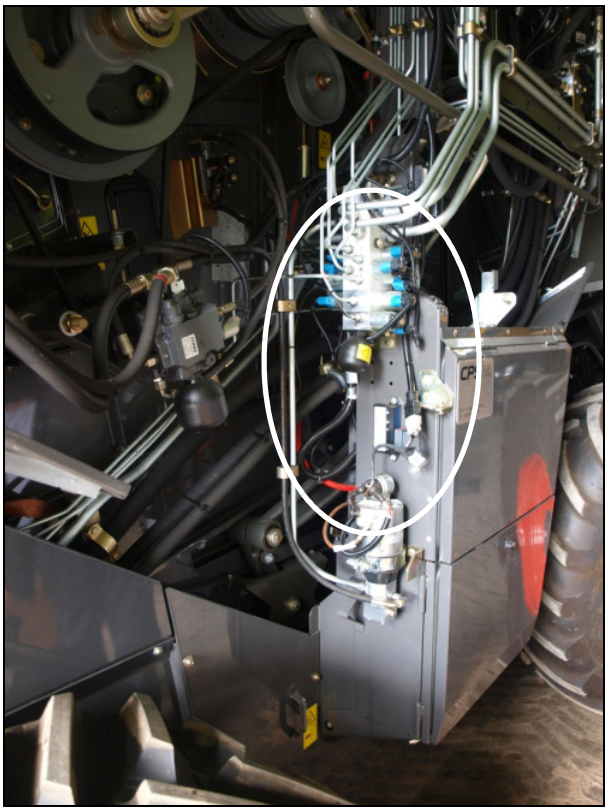


Hydraulic manifold installation process: Machines 2013 and newer

Step 1

Locate the hydraulic manifold mounting area.

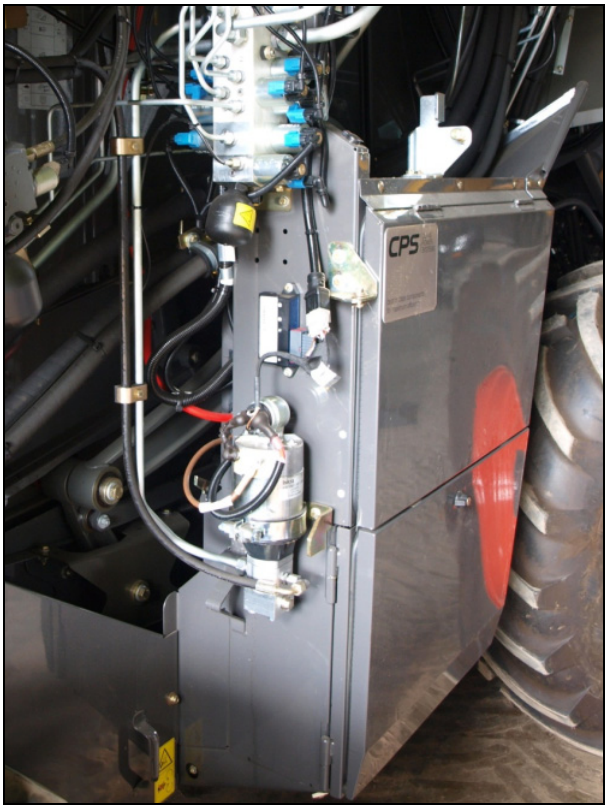




Step 2

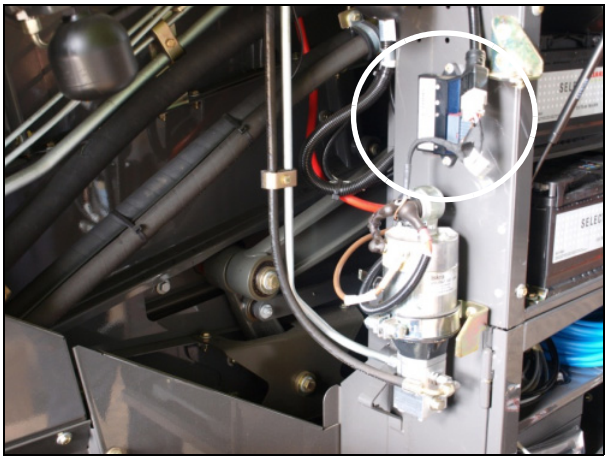
Mount the manifold to the steel panel below the existing hydraulic distribution manifold.

Note – *There are now two extra slices and an accumulator added to the distribution manifold, and a backup electric pump below.*



Step 3

Remove the two bolts that attach the motor control module to the panel.

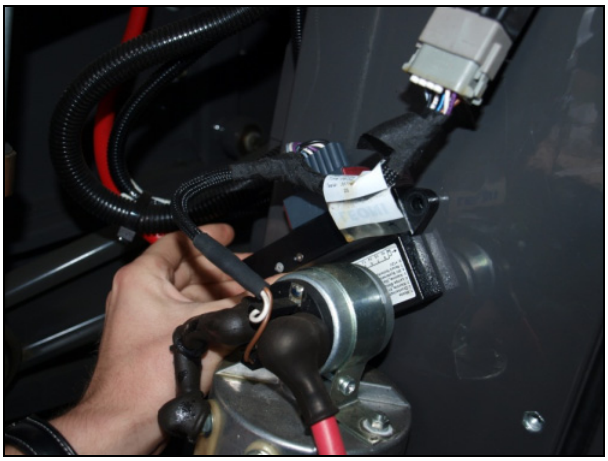


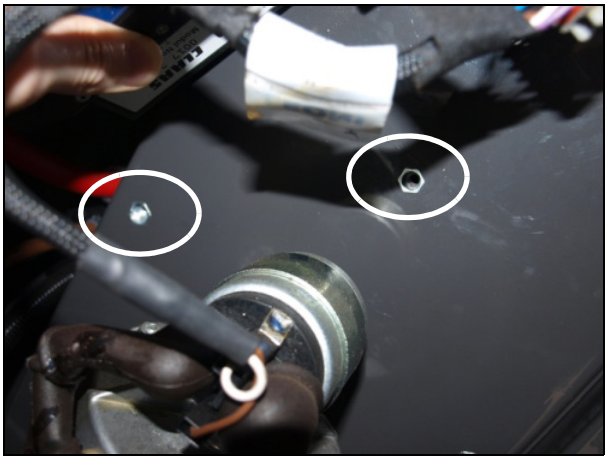
Step 4

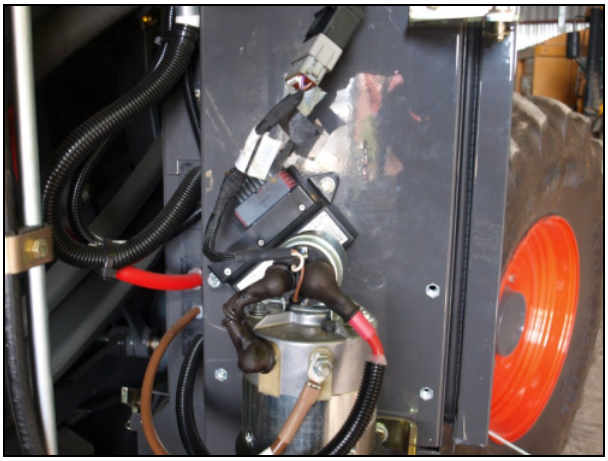
Enlarge the mounting holes that are on the module to 10 mm.

Step 5

To remount the controller lower down on the panel, use the existing threaded holes that are just above the motor, one of the existing M6 bolts, and an M8 40 mm bolt.



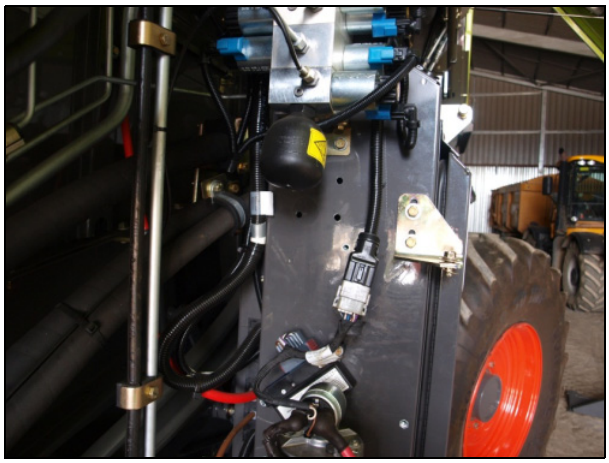




Step 6

Mount the manifold on the panel using the existing hole marked in Step 7.

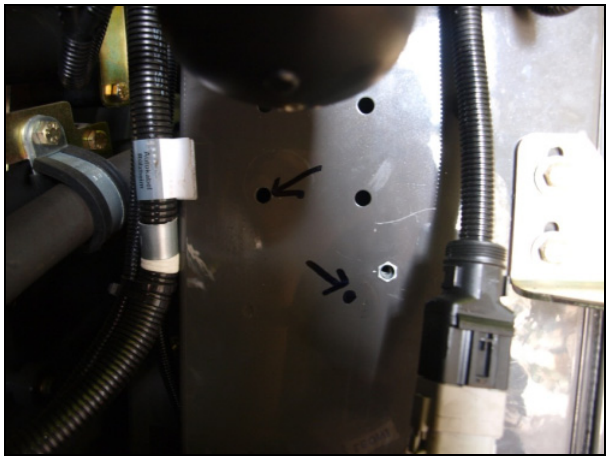
To keep the manifold away from the panel, use a M8 100 mm bolt, and the supplied 12 mm aluminium spacer. Use washers and nyloc nuts as appropriate.





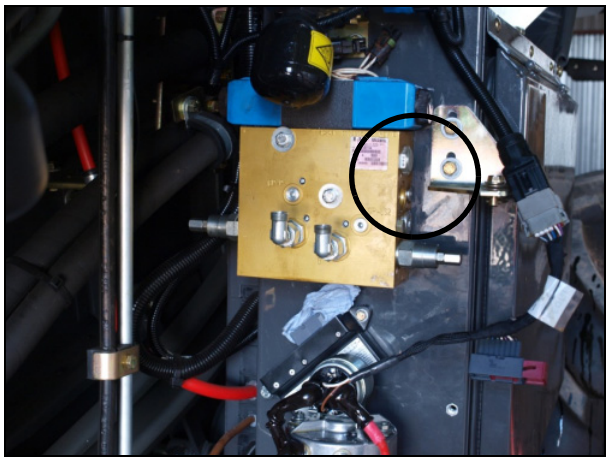
Step 7

Mark and then drill a second 8.5 mm hole through the manifold and into the panel behind.



Step 8

To mount the manifold, use another M8 100 mm bolt, washers, aluminium spacer and a nyloc nut.



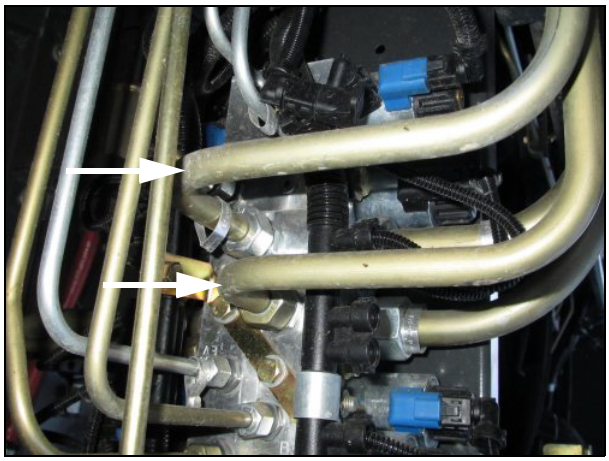
Hydraulic hoses installation process: Machines 2012 and older

Pressure and Tank hoses

Step 1

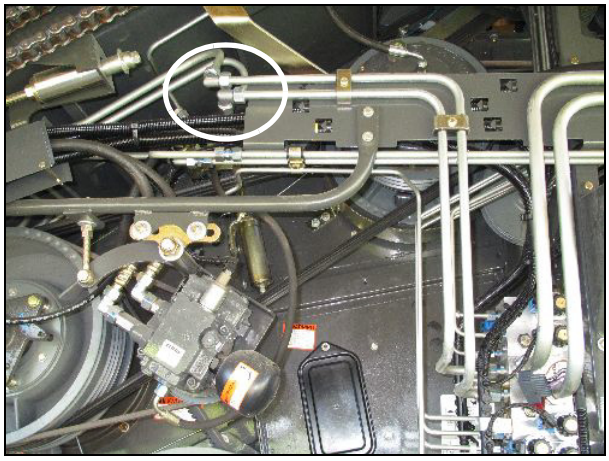
Locate the P1 and T1 ports at the distribution manifold.

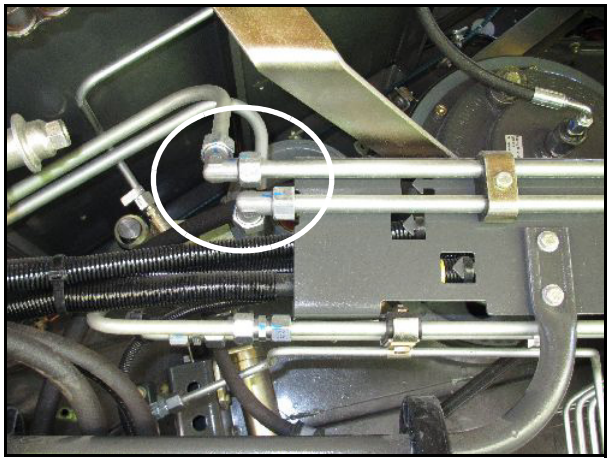
Verify the pressure line by following the hard line to the hand pump “P” port.

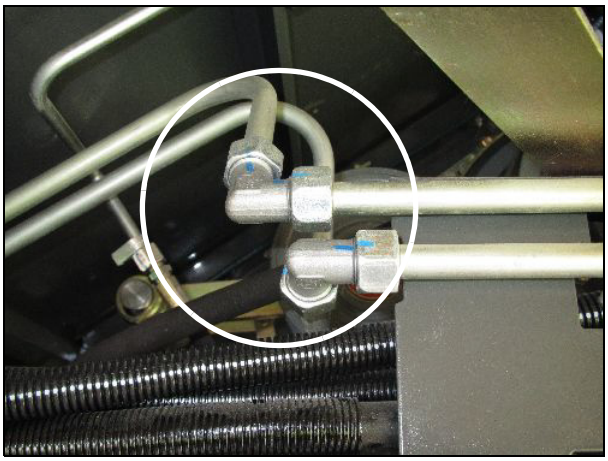


Step 2

Follow the steel hard lines forward and find the 15L elbows, as shown.

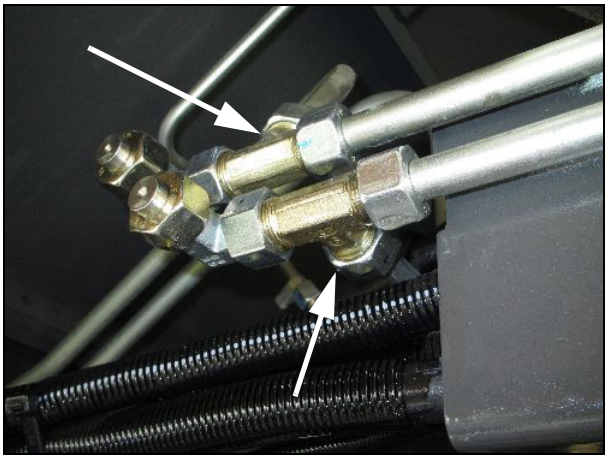






Step 3

Remove both existing elbows and then attach the supplied 15L-15L-15L male tees.



Step 4

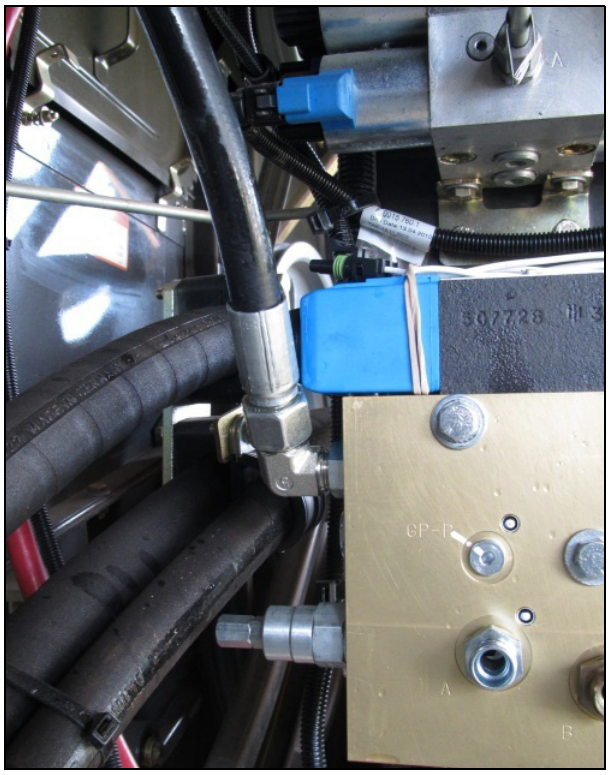
Connect the supplied 15L elbows to the 15L male tees installed in Step 3.



Step 5

Connect the straight end of the supplied 50" hoses to the P and T ports of the manifold.

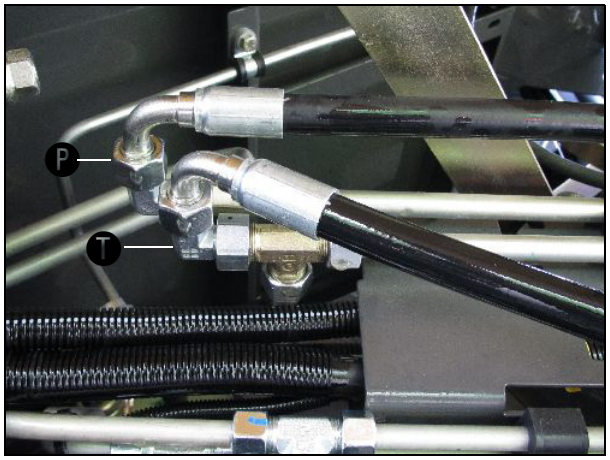




Step 6

Connect the 90° ends of both 50" hoses to newly installed elbows as shown.

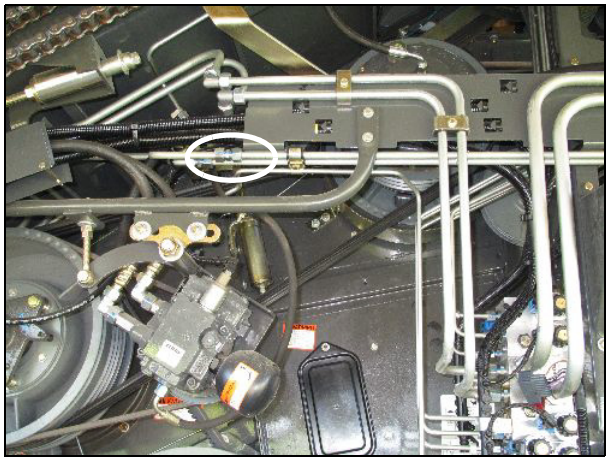
The top steel line is P. The bottom steel line is T.

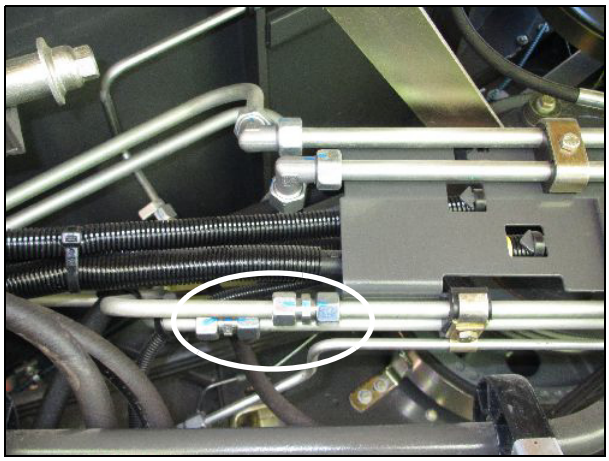


Steering cylinder connections for the model 700 series

Step 1

Locate the steel left and right steering line connections above the left side front drive tire.



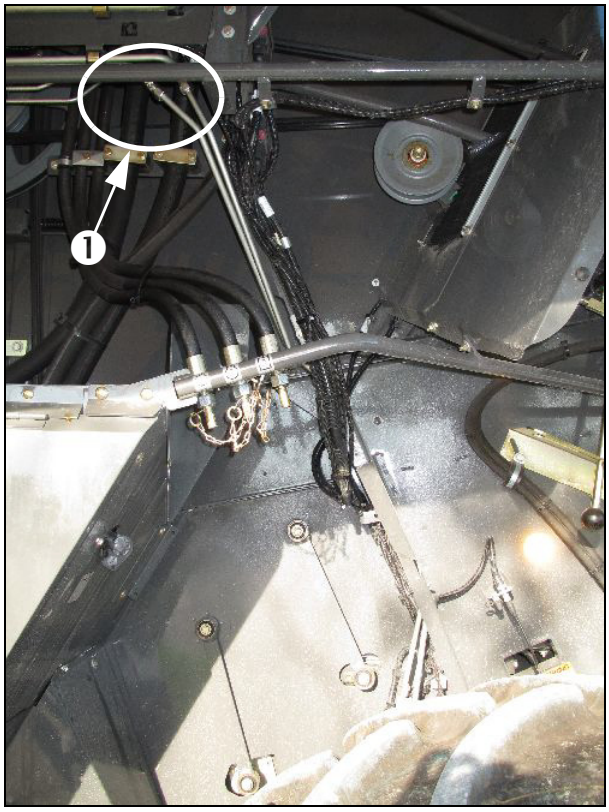


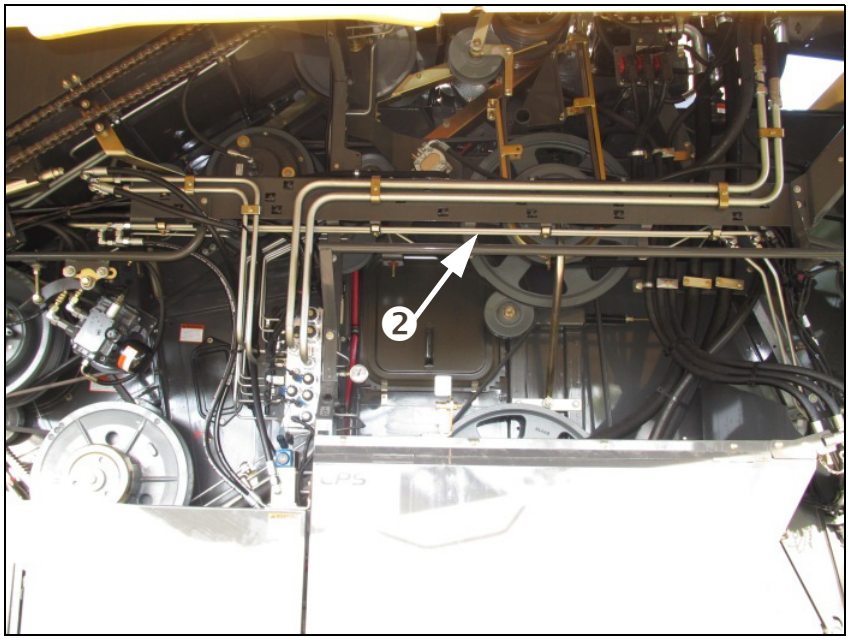
Step 2

Cut all of the zip ties that are attached to the steel L and R steering hard lines.

Remove or loosen the clamps ❷ that support the steel hard lines.

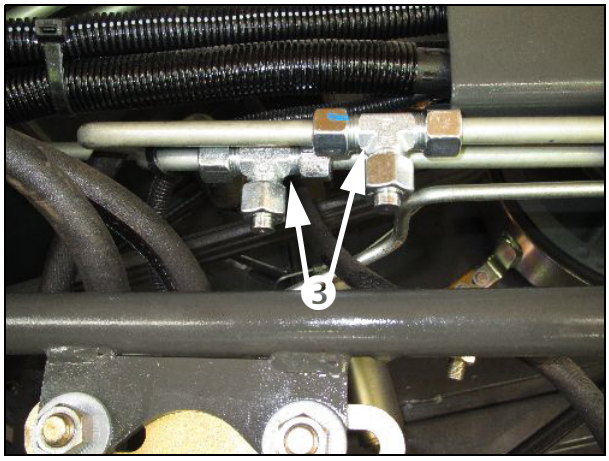
Disconnect the opposite end of the steel hard lines above the left side rear tire ❶. Side the tubes 3" (7.6cm) rearward to prepare for Step 3.





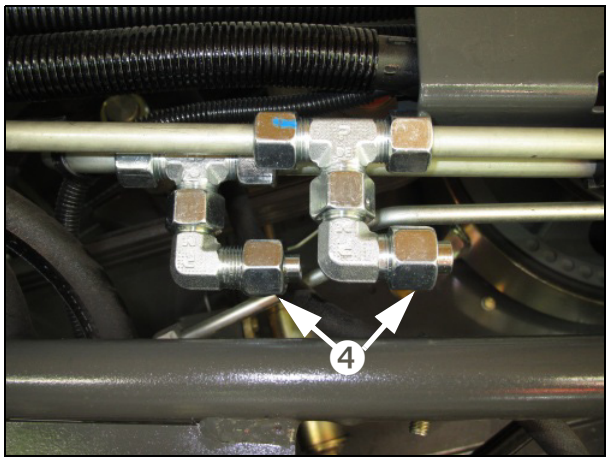
Step 3

Remove the existing 12L-12L metric E/O union fittings and replace with the supplied 12L-12L-12L male tees ❸.



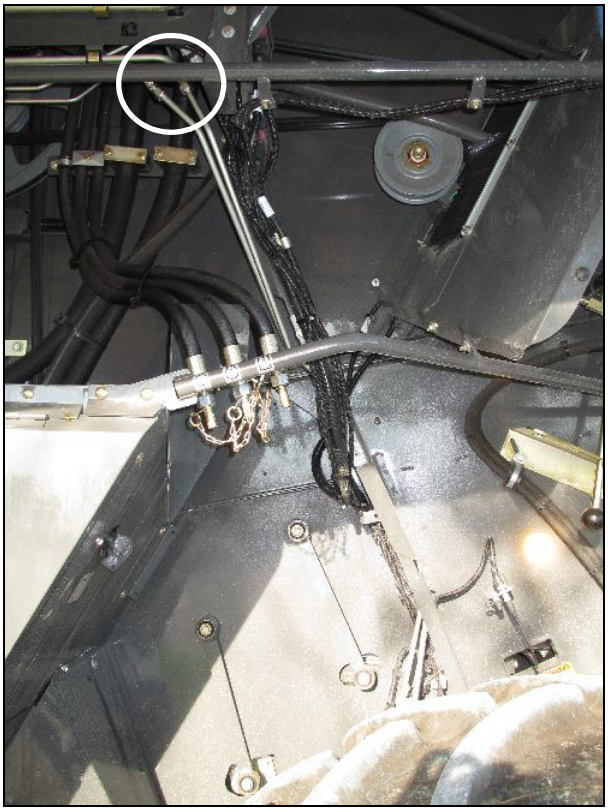
Step 4

Attach 12L–12L elbows ❹ to the 12L–12L–12L metric E/O male tees, as shown.



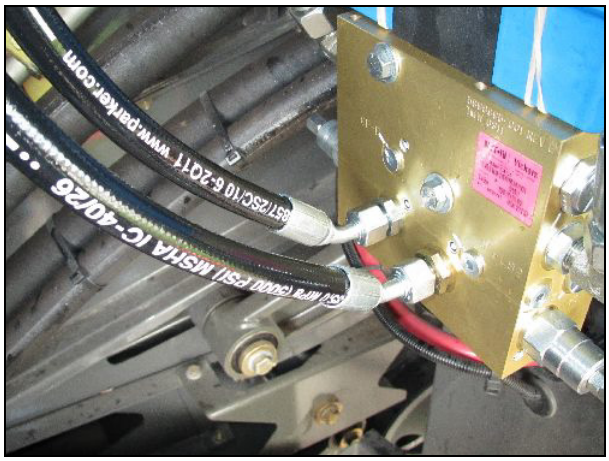
Step 5

Reconnect the both steel lines above the left side rear tire. Reinstall the clamps for the steel lines.



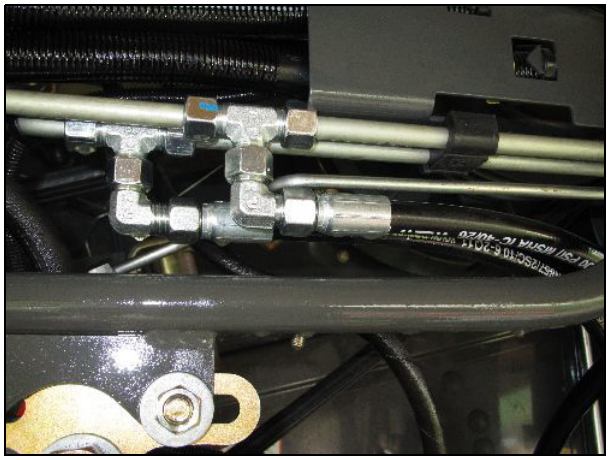
Step 6

Connect the 45° elbow end of the supplied 43" hoses to the A and B ports of the manifold.



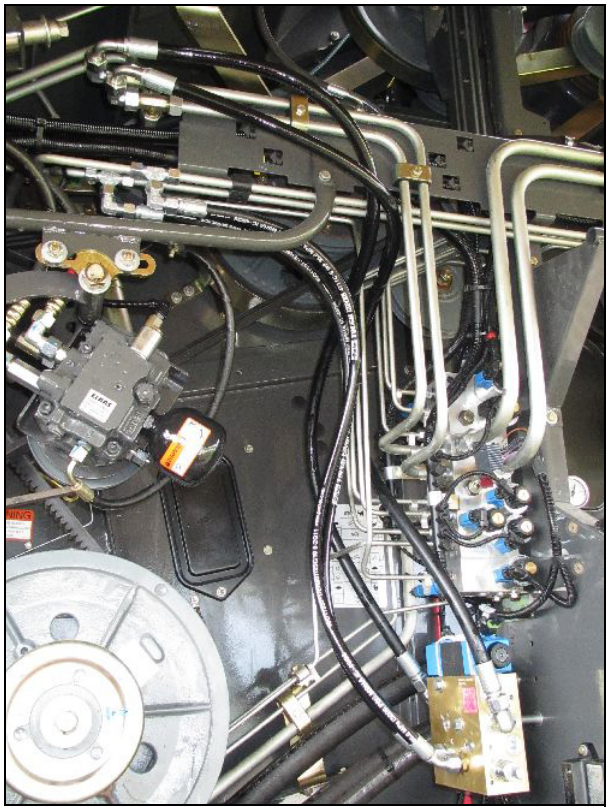
Step 7

Connect the straight ends of both 43" hoses to newly installed elbows, as shown.



Step 8

The image to the right shows the installed P, T, A, B hoses.

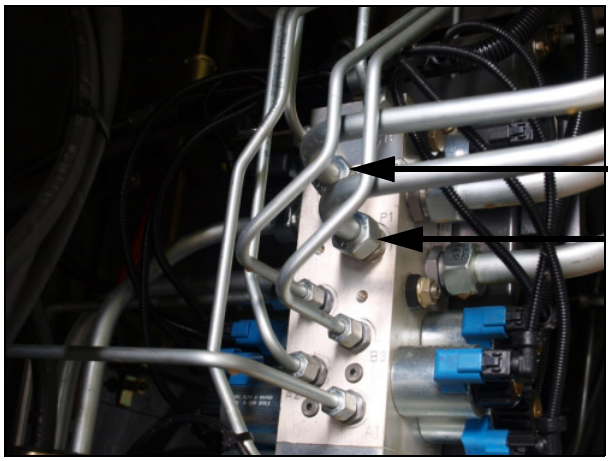


Hydraulic hoses installation process: Machines 2013 and newer

Pressure and Tank hoses

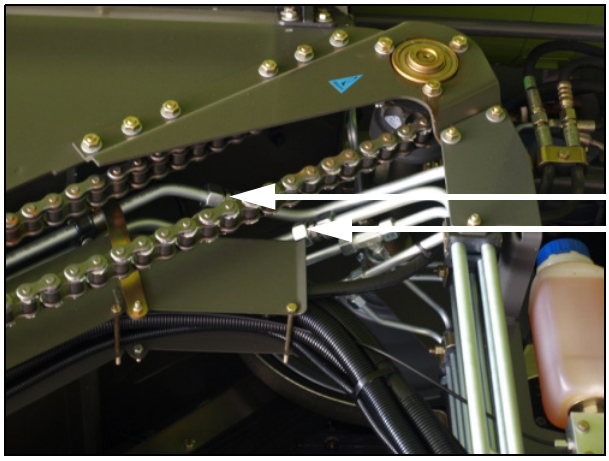
Step 1

Locate the P1 and T1 ports at the distribution manifold.



Step 2

Follow the steel hard lines upwards to find the 15L-15L straight fittings as shown.



Step 3

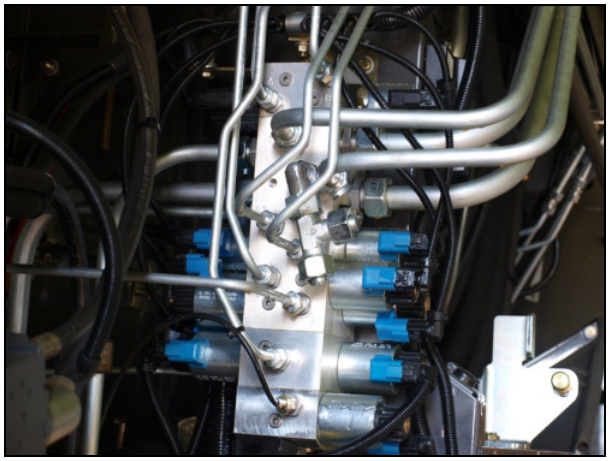
Loosen the clamps that hold the Pressure and Tank steel lines in place, remove the 15L-15L straight fittings, and then remove the two steel lines. (There isn't enough movement in these lines to replace the straight unions with tees.)

Notes:

- *Some 15L F end caps are very helpful for this step.*
- *The unions at the top can be left open, however the ports on the manifold leak a lot and will drain the tank.*

Step 4

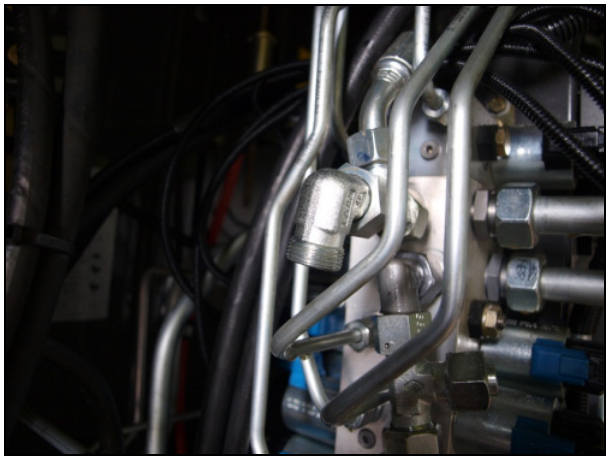
Fit the supplied 15L M-F 90° elbow to the P1 port on the manifold and then attach the 15L-15L-15L M-F with M on the branch tee.



Step 5

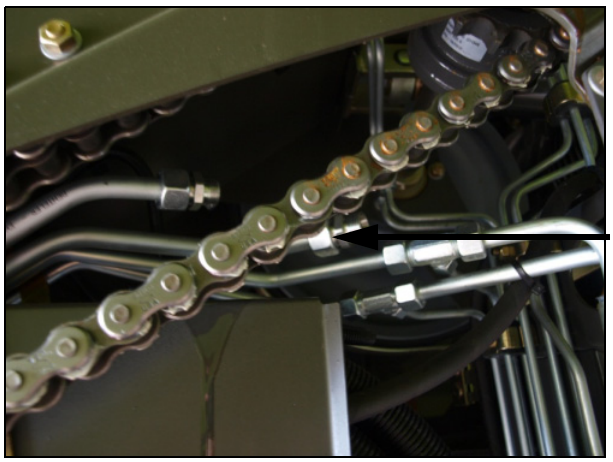
Fit the supplied 15L-15L-15L M-F with M on the branch tee to the T1 port on the manifold and then attach the 15L M-F 90° elbow.

Note – *Trimble recommends that you get the tee* ***ready to connect*** *to the manifold in this step (rather than connecting the tee) and then splitting the connection only once so less oil is spilled.*



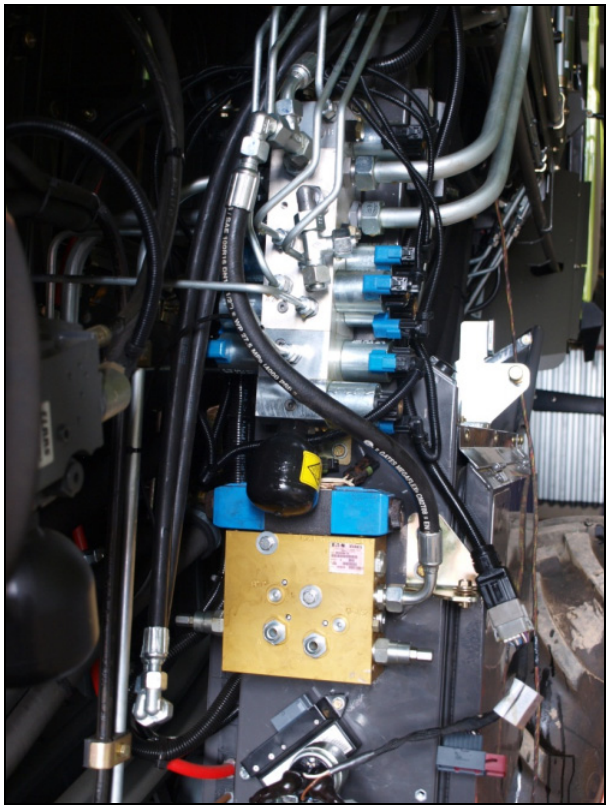
Step 6

Connect the 15L 45° elbow pipe end of the 60" hose to the top of the tee in the T1 port of the distribution manifold, and route it upwards towards the unions at the top. Connect the straight end to where the steel Tank line was removed from.



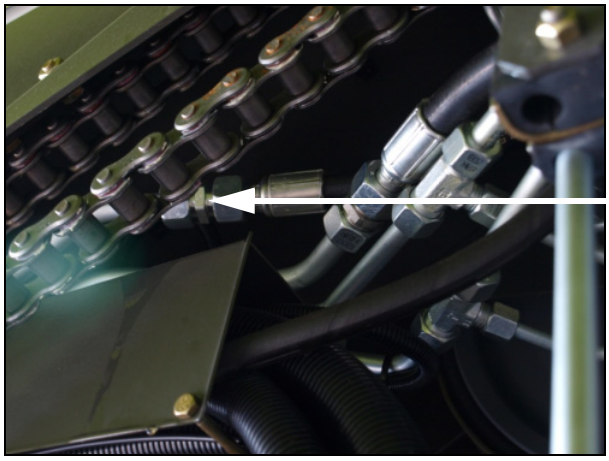
Step 7

Connect the 15L 90° elbow pipe end of the 22" tank hose to the 15L straight union in the T port of the Trimble valve manifold, and route it upwards. Connect the straight end of the pipe to the 15L 90° elbow in the T1 port of the Claas manifold.



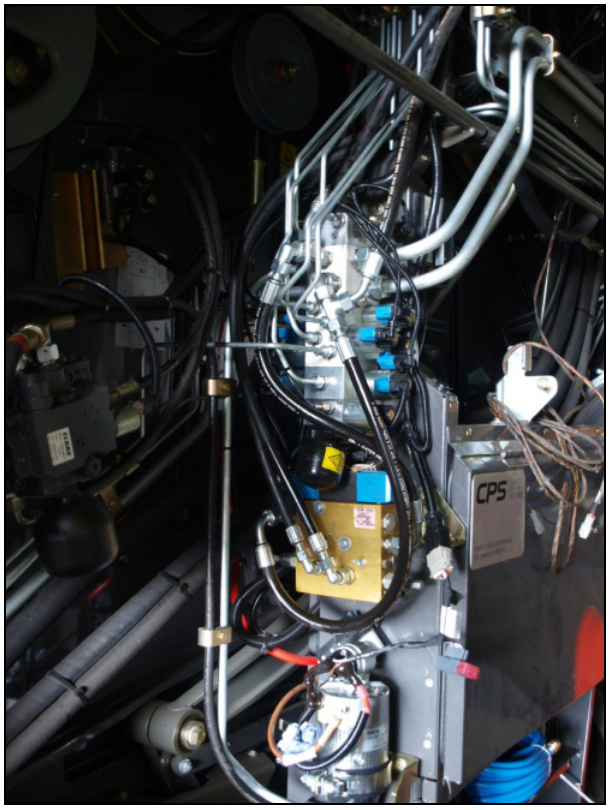
Step 8

Connect the 15L 45° elbow pipe end of the 60" hose to the top of the tee in the P1 port of the distribution manifold, and route it upwards towards the unions at the top. Connect the straight end to where the steel Pressure line was removed from.



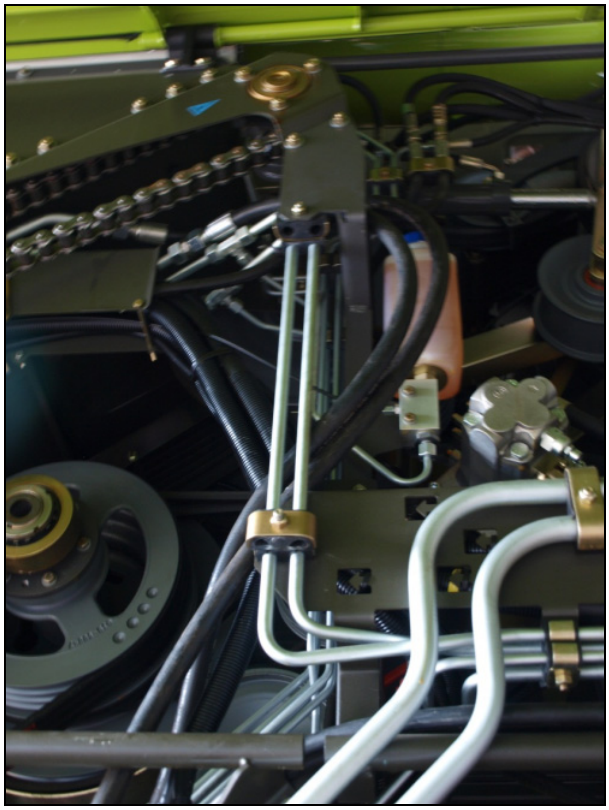
Step 9

Connect the 15L 90° elbow pipe end of the 30" P hose to the 15L 90° elbow fitting in the P port of the Autopilot manifold, and route it as shown. Connect the straight end of the pipe to the 15L tee in the P1 port of the Claas manifold.



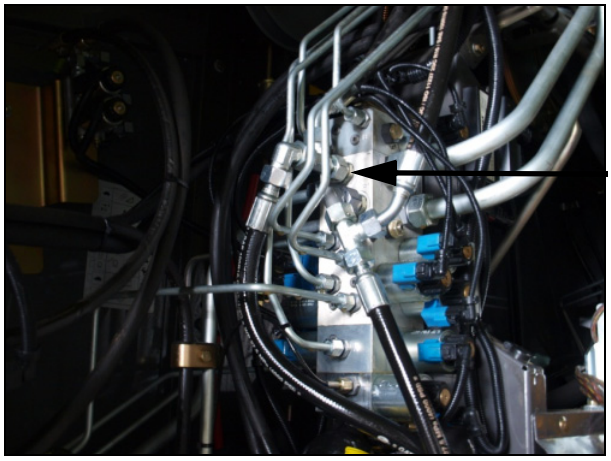
Step 10

Make sure that the hoses are correctly routed and do not rub on any moving parts including the side panel when closed. Secure with zip ties.



Step 11

Remember to connect the 15L tee into the T1 port of the Claas manifold if not already done.



Step 12

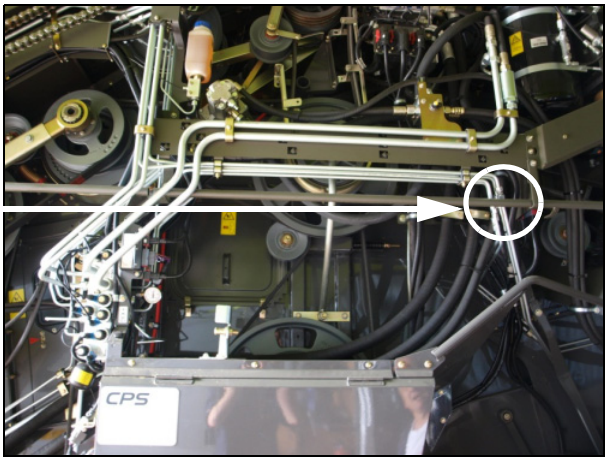
Reattach any electrical connectors removed, secure all hoses with zip ties, and reassemble the side of the machine. Pay attention to the rear mounting bracket for the side panel.



Steering cylinder connections: Machines 2013 and newer

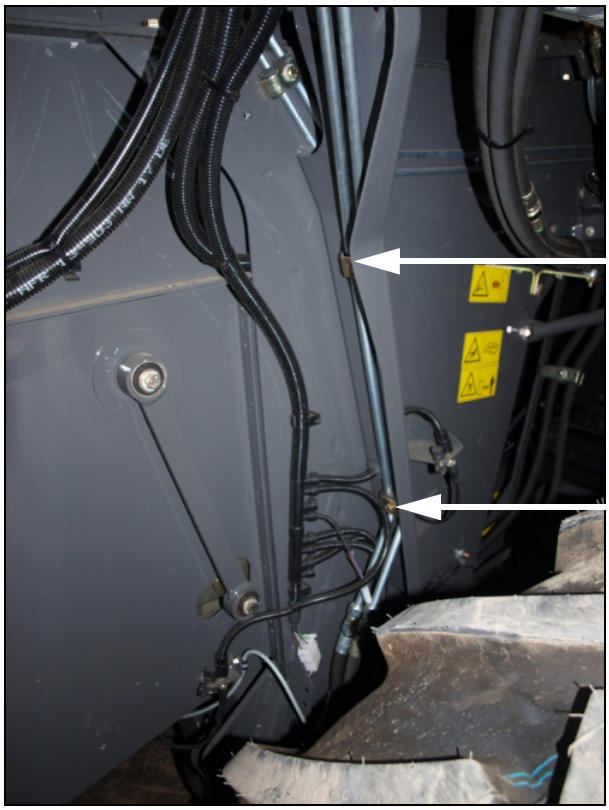
Step 1

Locate the steel left and right steering line connections above the left side rear tyre. There are four pipes, and left and right are the two closest to the rear of the machine.



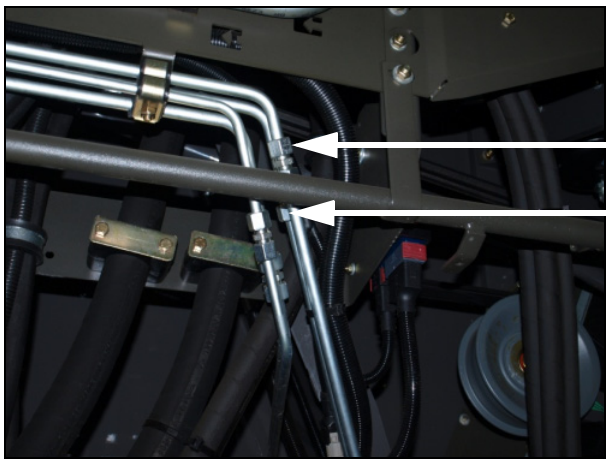
Step 2

Loosen the clamps that support the steel hard lines down to the rear axle.



Step 3

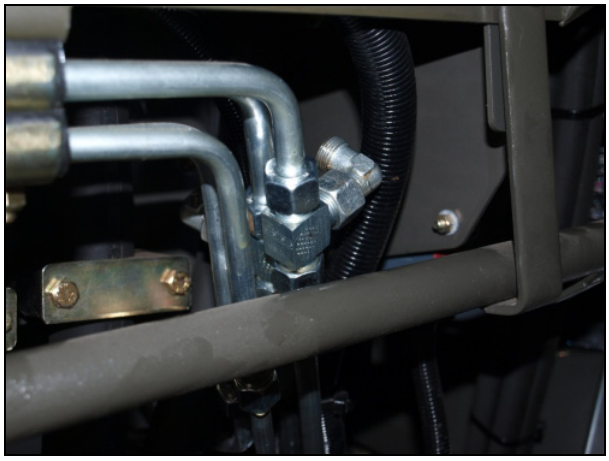
Disconnect the fittings at the top of the lines. Slide the pipes 3" downwards.



Step 4

Remove the existing 12L-12L metric straight fitting and replace with the supplied 12L-12L-12L all male tees supplied.

Attach a 12L M-F 90° elbow fitting to the tee closest to the outside of the combine.

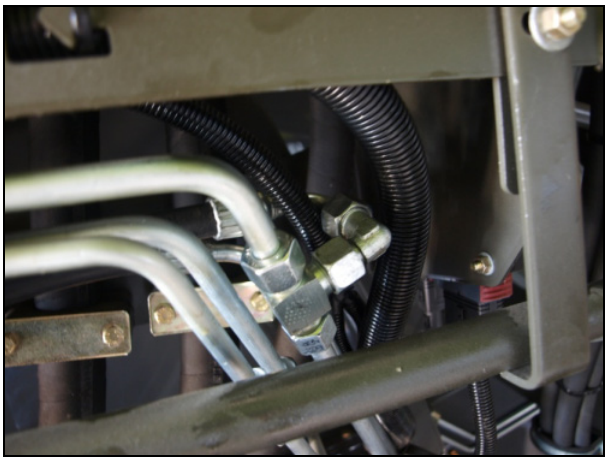


Step 5

Reconnect the steel lines above the tyre and reinstall or tighten the clamps that hold the steel lines in place.

Step 6

Connect the 90° pipe end of the supplied 85" hoses to the newly installed tee and elbow above the rear tyre.





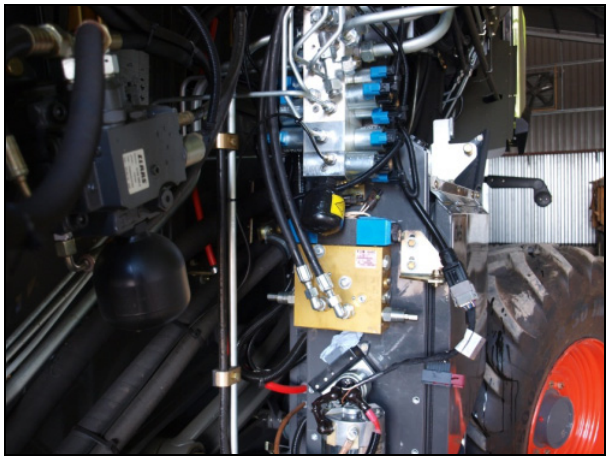
Step 7

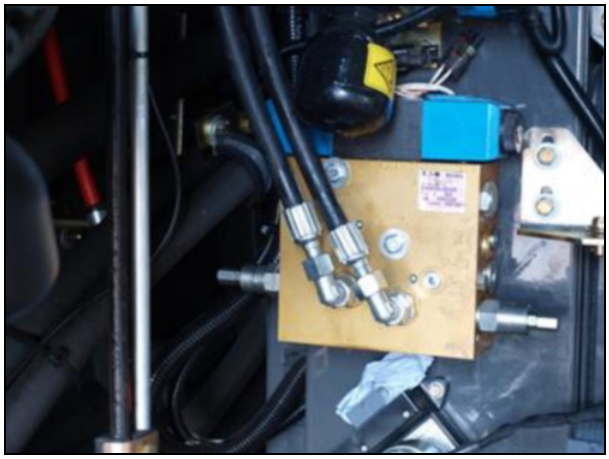
Route the hoses along the existing steel lines towards the front of the machine.



Step 8

Bring the hoses down over the Claas manifold and connect the straight end of the hoses to the A and B port of the manifold.

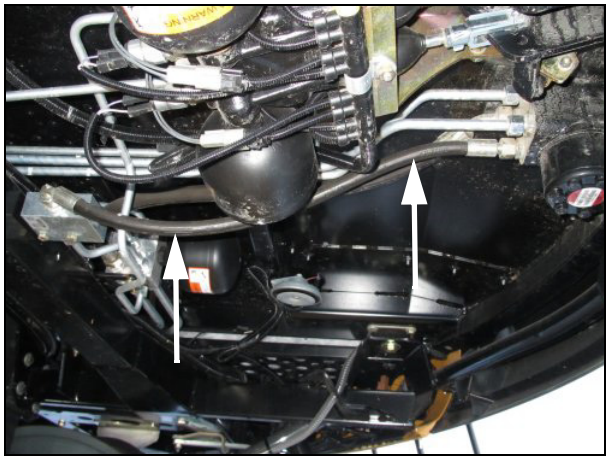




All machines: Flow switch installation

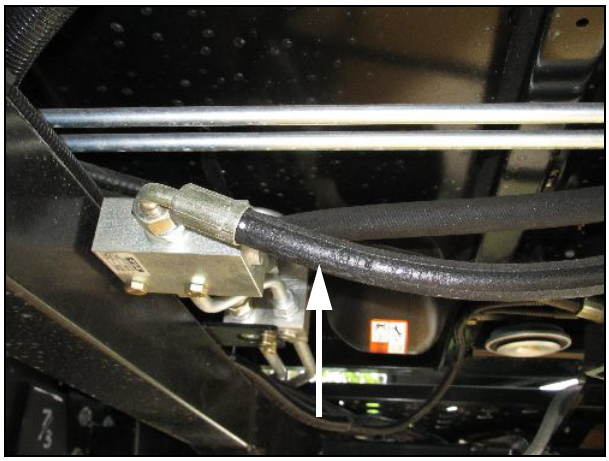
Step 1

Remove the existing hose between the pressure reducing valve and hand pump.



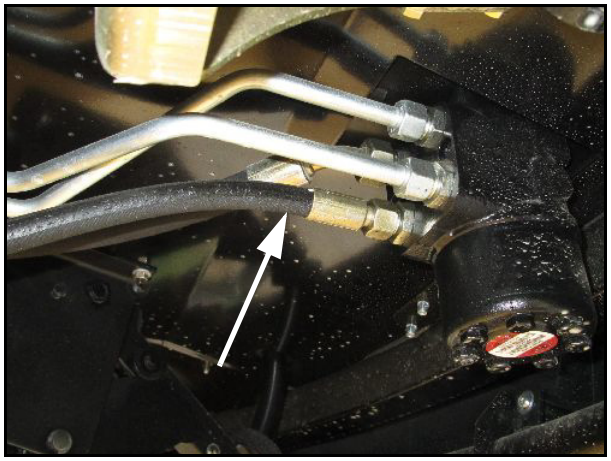
Step 2

Attach the 90° end on 2012 and older machines, 45° on 2012+ machines, of the supplied 12" hose to the pressure reducing valve.



Step 3

Attach the straight end of the second 12" hose to the hand pump.



Step 4

Thread the supplied -8 ORFS adapters into the flow switch.



Step 5

Assemble the flow switch and both to 12" hoses as shown. The arrow on the flow switch point towards the 12" hose with straight hose fittings.



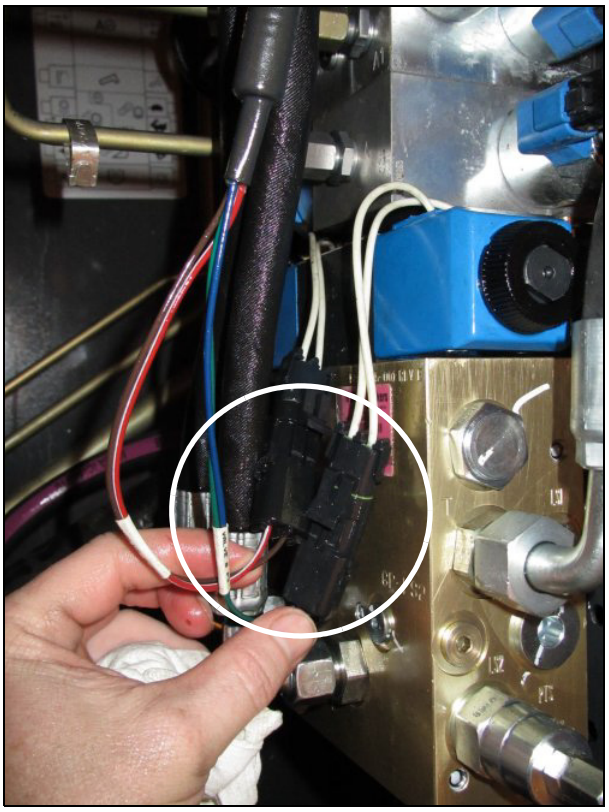
Tip – The arrow on the flow switch points towards the hand pump.



Securing the electrical connections

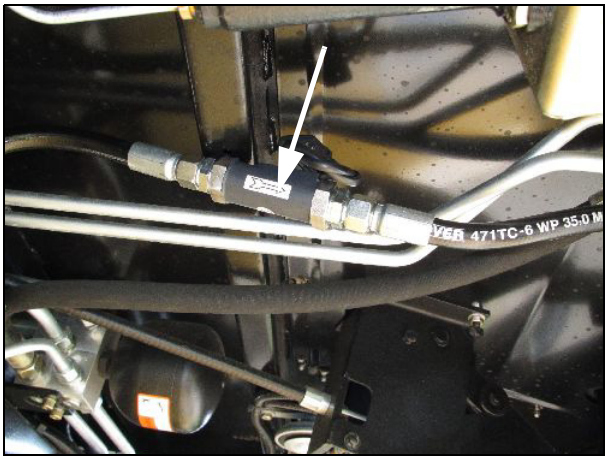
Step 1

Connect the P/N 55657 cable to the hydraulic valve. Route the cable towards the cab, following the machine's existing electrical harness.



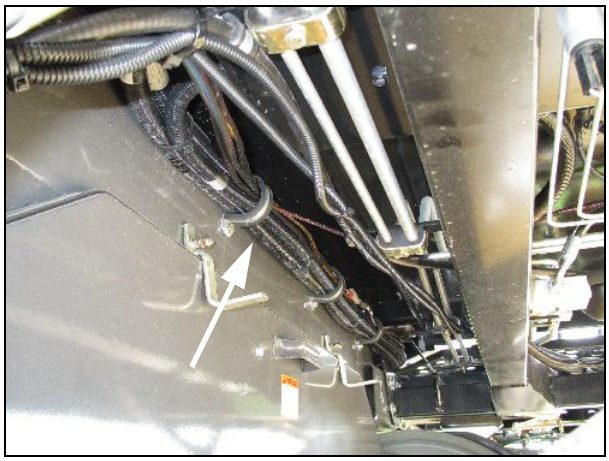
Step 2

Connect the P/N 66034 cable to the flow switch.



Step 3

Route the hydraulic valve, steering sensor and flow switch cables to the right rear corner of the operator's cab. Follow the machine's existing electrical harness.

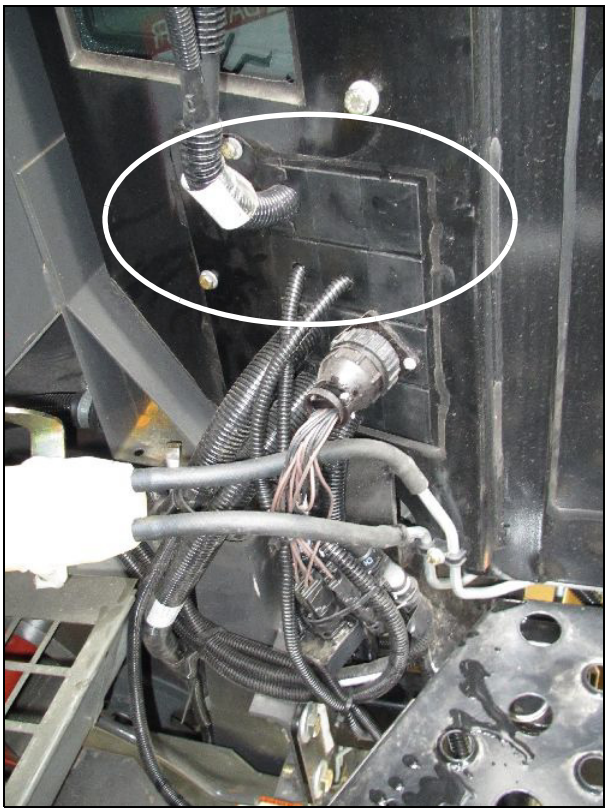


Step 4

Open the right side access panel outside the operator's cab.

Route the cables into the cab through the access port, as shown.





Step 5

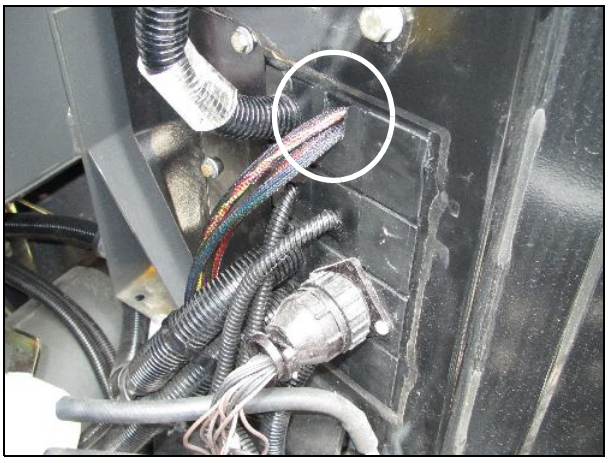
Move the access port's metal side panel and slide out two plastic blocks, as shown.



Step 6

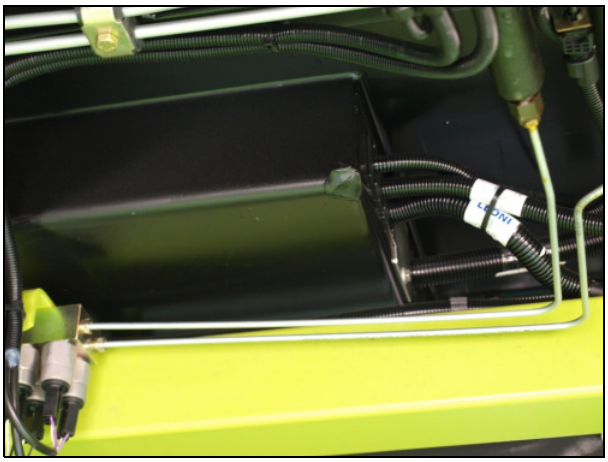
Use a Dremel rotary tool and #561 bit to create a slot in a plastic block.

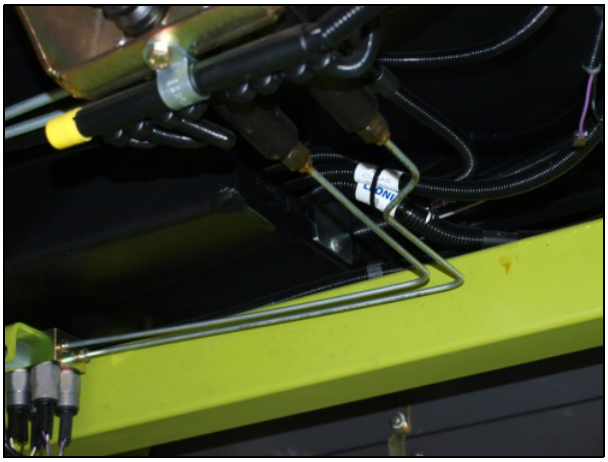
Route all three cables through the newly created slot and into the cab. Reinstall the plastic blocks and metal access panel.



Securing the electrical connections: 2013 machines or newer

Machines models 2013 or newer are similar to Claas Lexion 670-770 but the box where cables enter the cab has been redesigned. See the images below.





Checking the hydraulics

1. Make sure that all the hydraulic connections are tight.
2. Check the oil level in the hydraulic tank. If necessary, top it up.
3. Check for hydraulic leaks. Connect the battery and then start the machine. Once you complete the leak check, disconnect the battery.

CHAPTER 3

AutoSense Steering Device Installation

In this chapter:

- AutoSense steering device components
- Installing the AutoSense device on wheeled machines: 2012 and older
- Installing the AutoSense device on wheeled machines: 2013 and newer; Option A
- Installing the AutoSense device on wheeled machines: 2013 and newer; Option B
- Connecting the AutoSense device to the main harness, for wheeled machines 2013 and newer: Options A and B
- Installing the AutoSense steering device on tracked machines
- Preparing the harness: P/N 54602 Rev C

This chapter describes how to install the AutoSense™ steering device. If the required mounting location is not accessible, chose a different place. To ensure proper function, the AutoSense device must be located where it is free of obstructions and can rotate with the wheels when they turn.

On articulated vehicles, mount the AutoSense device on the opposite side of the pivot point to the Autopilot controller.

Mount the device base down or base up so that it maintains a level orientation. Do not mount it on its side. An angle of up to 10° in any direction is acceptable.

To avoid stretching the cable, leave adequate length on the service loop.

AutoSense steering device components



Item	Description	P/N
❶	P-6 connector	
❷	Power connector	
❸	AutoSense connector	
❹	Jumper cable	57560
❺	AutoSense steering cable	57885
❻	AutoSense extension cable	55656

Installing the AutoSense device on wheeled machines: 2012 and older

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

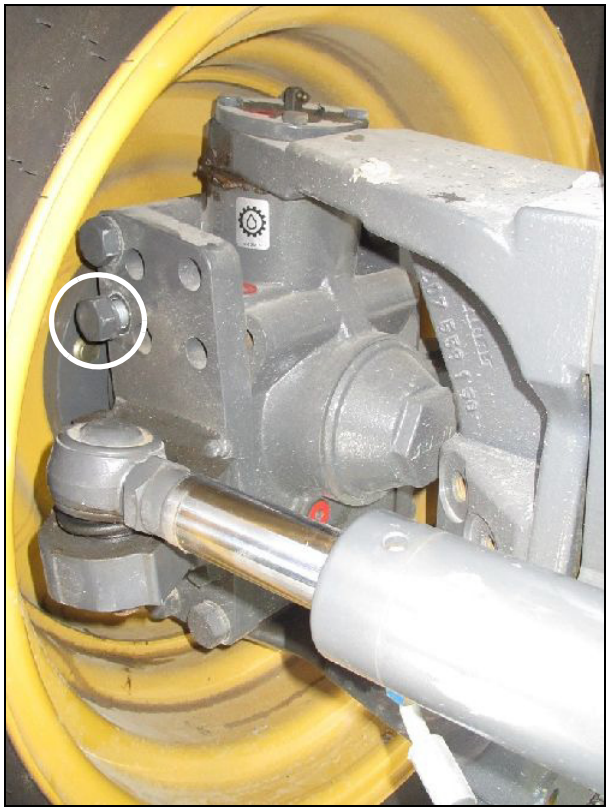
Step 1

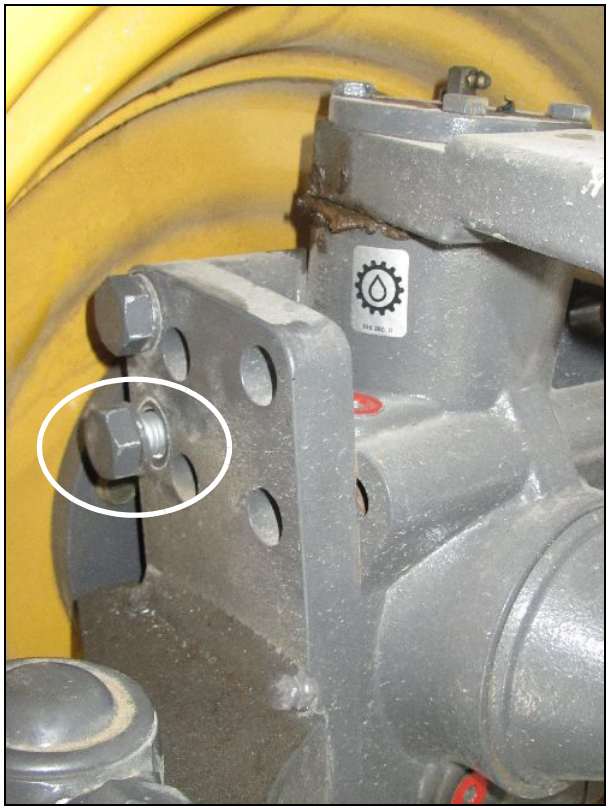
Locate the mounting location on the left side rear axle.



Step 2

Loosen the lower bolt, as shown.





Step 3

Use the supplied #6-32 screws to attach the AutoSense device to the mounting bracket, as shown.



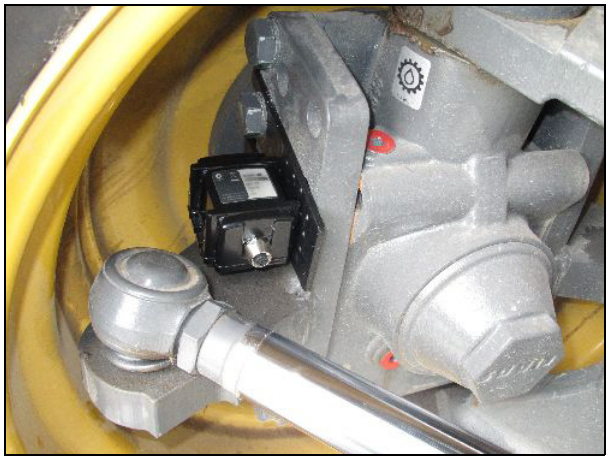






Step 4

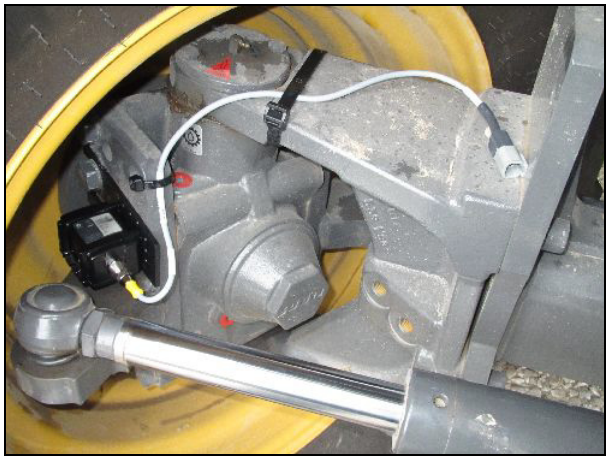
Attach the mounting plate to the rear axle. Slide the plate under the existing bolt. Mount the AutoSense device level. Retighten the bolt.





Step 5

Connect the P/N 57560 jumper cable to the steering device. Leave adequate length on the service loop to avoid stretching the jumper cable.



Step 6

Connect the P/N 55656 extension cable to the jumper cable. Route the extension cable behind the rear of the axle to avoid damage from plant stalks. Route the extension cable forward towards the cab along existing hose and steel lines.

Connect a second extension cable P/N 57885 to reach the operator’s cab.



Following the machine's existing electrical harness, route the steering sensor cable to the right rear corner of the operator's cab.



Installing the AutoSense device on wheeled machines: 2013 and newer; Option A

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

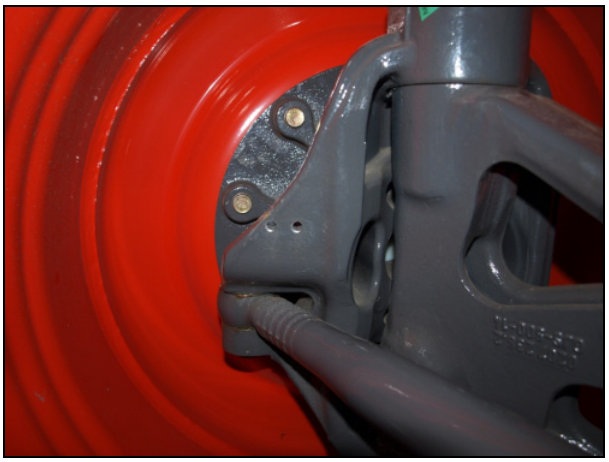
Locate the casting shown at the rear steering wheels.

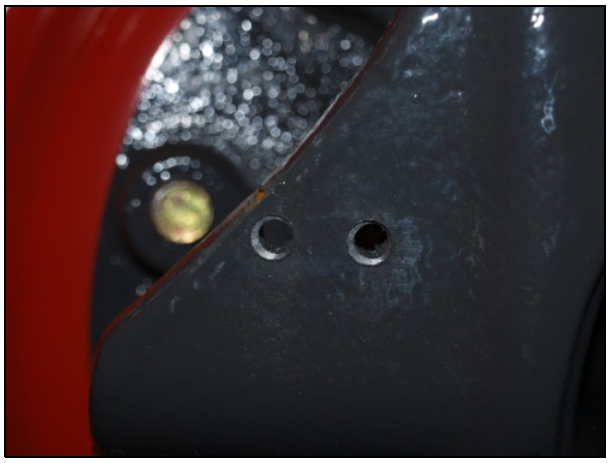


Step 2

Take care when doing the following. Drilling holes in the casting could potentially break the casting, and is done at your own risk.

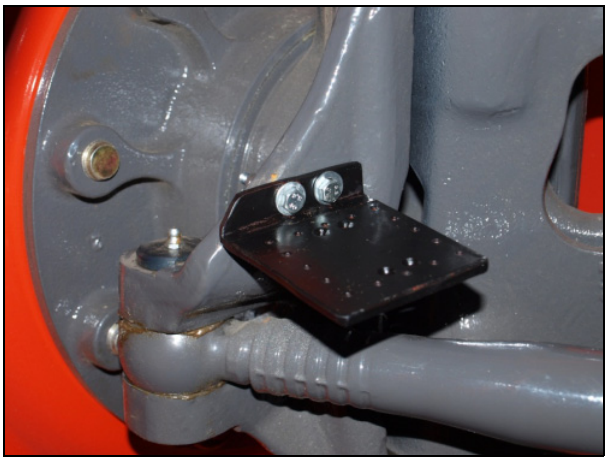
Use the AutoSense mounting plate (P/N 91912) as a template to mark and then drill two holes for mounting the plate. $^{5}/_{16}$" or 7mm holes may be drilled for ¼ or M6 hardware.

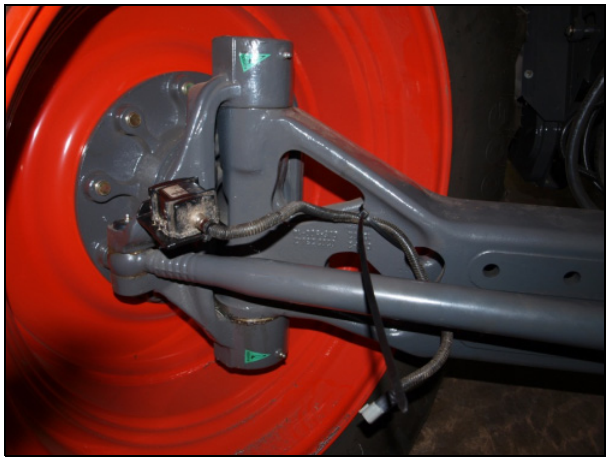




Step 3

Use two bolts to attach the mounting plate to the casting.







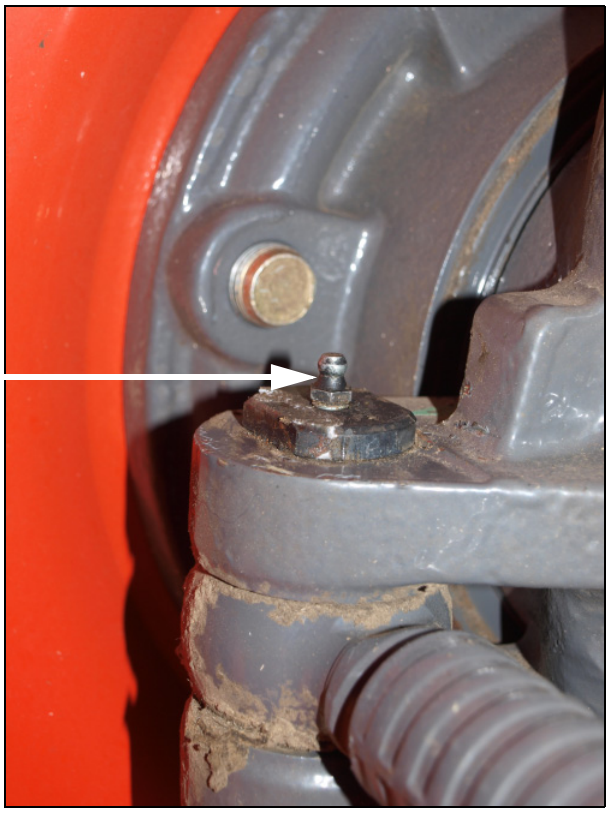
Step 4

Connect the jumper cable (P/N 57560) to the steering device. Leave adequate length on the service loop to avoid stretching the jumper cable.

Installing the AutoSense device on wheeled machines: 2013 and newer; Option B

Step 1

Remove this grease fitting.





Step 2

Locate P/N 100513 and the grease fitting from the Autopilot kit. Attach the grease fitting to P/N 100513.



Step 3

Install P/N 100513 where the grease fitting was removed from in Step 1.



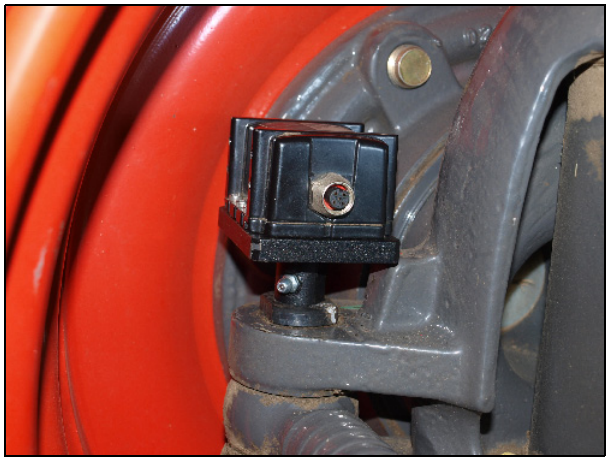
Step 4

Use the supplied 3/8" bolt and loctite to attach the AutoSense mounting plate to P/N 100513.



Step 5

Use the supplied socket head screws to attach the AutoSense device to mounting plate.



Step 6

Attach the AutoSense jumper cable and secure it in a fashion that allows full movement of the steering wheels without possibility of damage to the cables.



Connecting the AutoSense device to the main harness, for wheeled machines 2013 and newer: Options A and B

Step 1

Connect the extension cable (P/N 55656) to the jumper cable. Route the extension cable behind the rear of the axle to avoid damage from plant stalks. Route the extension cable forward towards the cab along existing hose and steel lines.

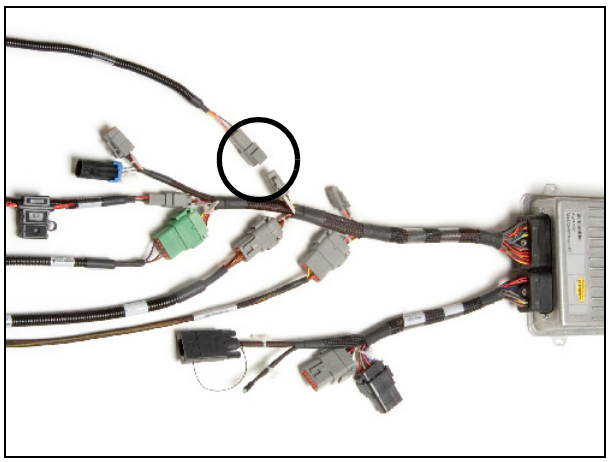
Step 2

To reach the operator's cab, connect a second extension cable (P/N 57885) to P/N 55656. Route the extension cable forward towards the cab along existing hose and steel lines. Route the cable inside the cab.

Step 3

Plug the steering sensor cable to P-6 on the Autopilot controller main wiring harness.

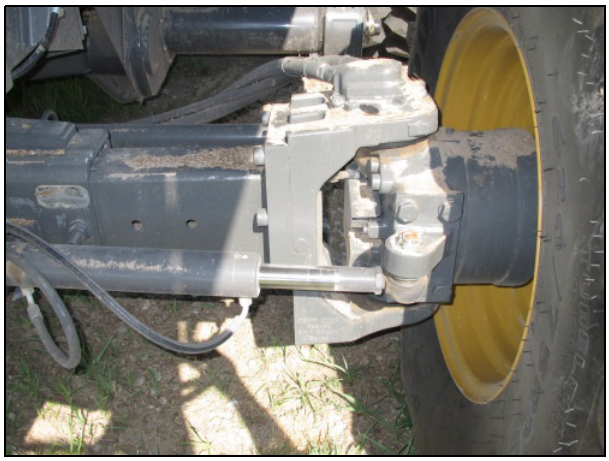
The P6 connector is labeled **Steering Sensor**.



Installing the AutoSense steering device on tracked machines

Step 1

Locate the mounting location on the right rear cylinder rod end.





Step 2

Remove the cotter pin and castle nut from the tie rod.



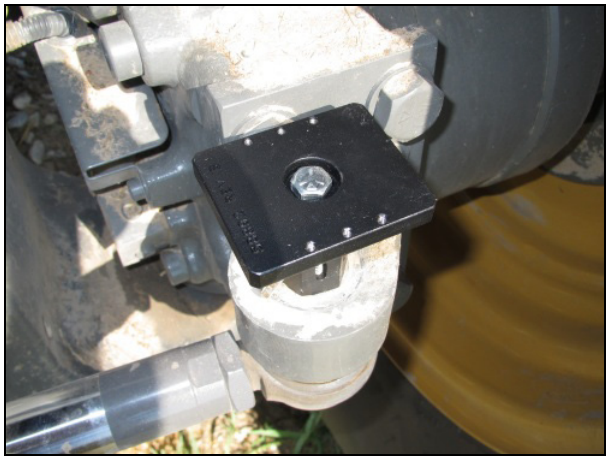
Step 3

Install the M24 adaptor nut and then reinstall the cotter pin.



Step 4

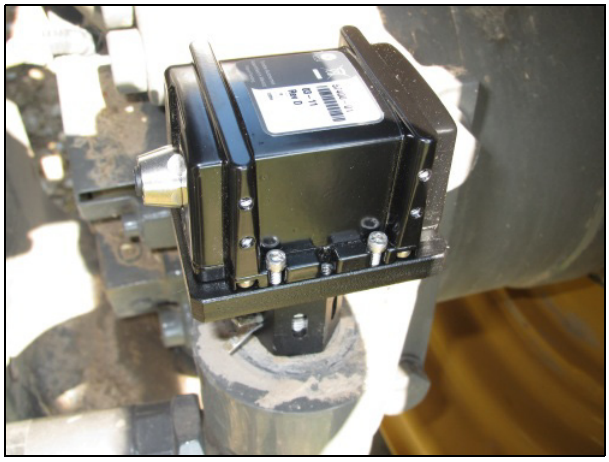
Attach the mounting plate to the adaptor nut. Use the $^{3}/_{8}$" bolt and thread locker provided.



Step 5

Mount the AutoSense device using the included #6-32 screws with the connector pointing to the wheel.

Note – *The connector can point in any direction, as long as the cable routing permits.*



Step 6

Connect the P/N 57560 jumper cable to the steering device. Leave adequate length on the service loop to avoid stretching the jumper cable.



Step 7

Connect the P/N 55656 extension cable to the jumper cable. Route the extension cable behind the rear of the axle to avoid damage from plant stalks. Route the extension cable forward towards the cab along existing hose and steel lines.



Step 8

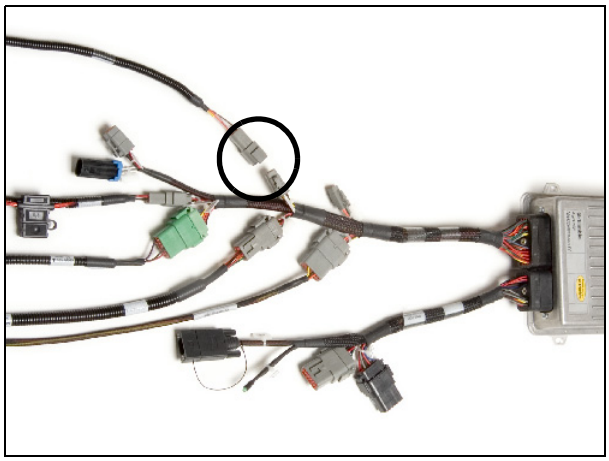
Connect a second extension cable P/N 57885 to reach the operator's cab. Route the extension cable forward towards the cab along existing hose and steel lines. Route the cable inside the cab.



Step 9

Plug the steering sensor cable to P-6 on the Autopilot controller main wiring harness.

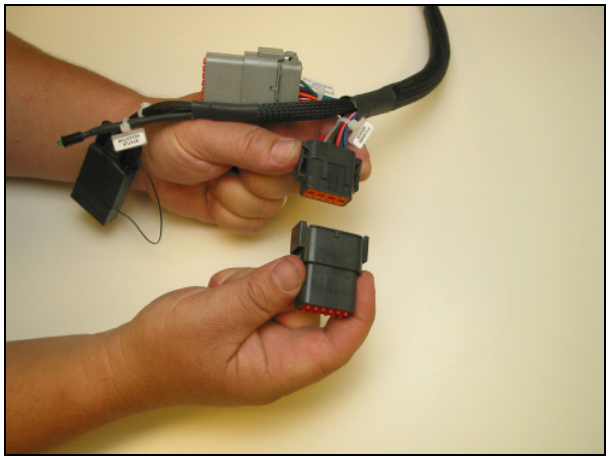
The P6 connector is labeled **Steering Sensor**.



Preparing the harness: P/N 54602 Rev C

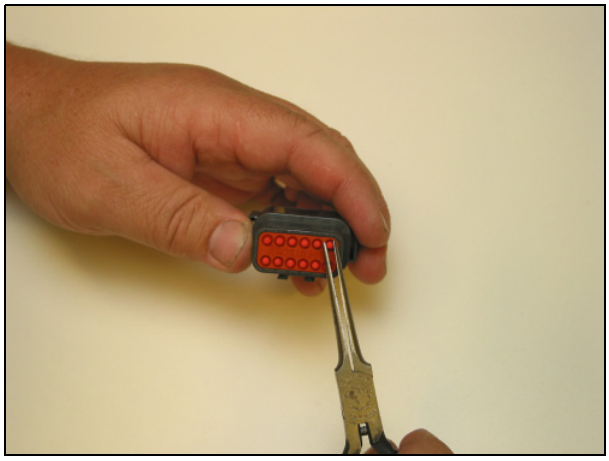
Step 1

Remove the black Deutsch DTM receptacle from the P-13 sensors leg of the auxiliary harness. See Chapter 7, Controller Installation.



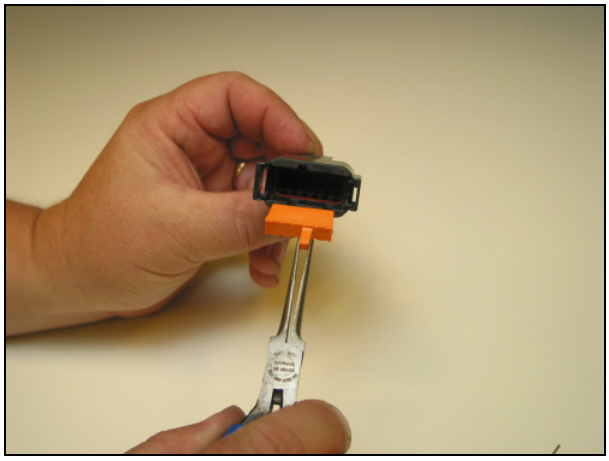
Step 2

Remove the plug from cavity number 1.



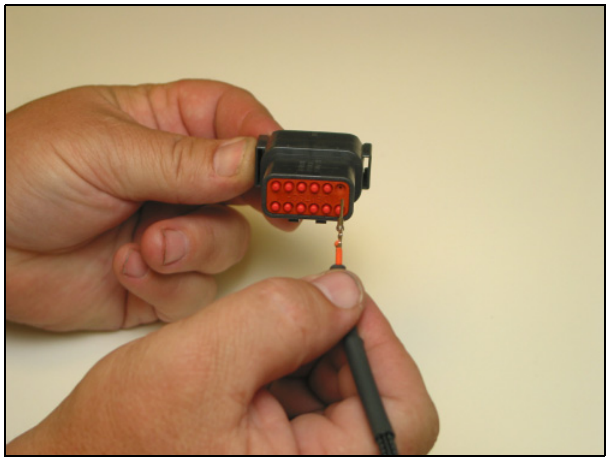
Step 3

Remove the wedge from the connector.



Step 4

Insert the DTM pin labeled “Cavity 1” into the connector.

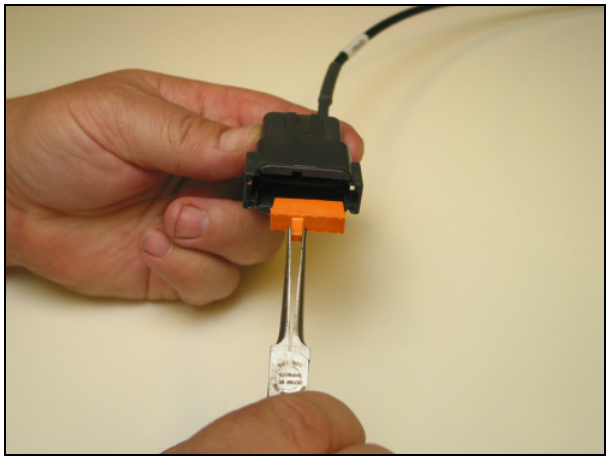


Step 5

Pull back on the wire to seat the pin. Replace the wedge in the connector.

Step 6

Plug the assembled Deutsch receptacle into the P-13 sensors leg of the Autopilot controller auxiliary harness. See Chapter 7, Controller Installation.



CHAPTER 4

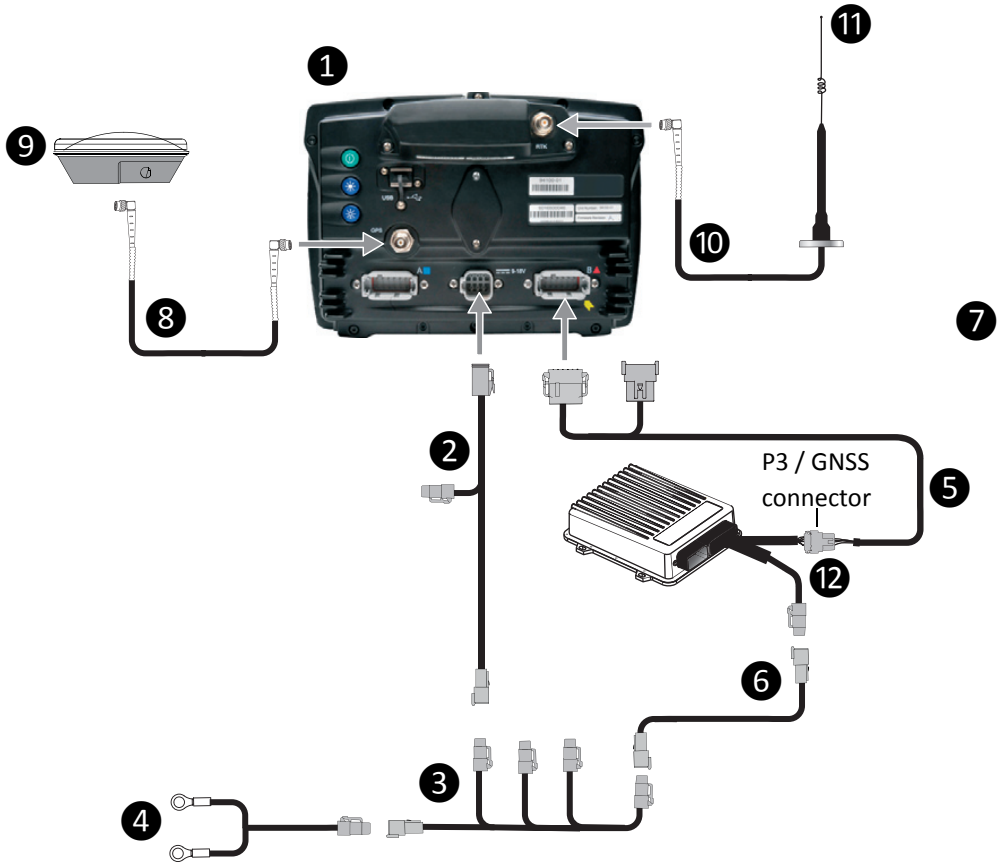
Display Installation

In this chapter:

- CFX-750 display components
- FmX integrated display components
- Preparing the CFX-750 display
- Installing the CFX-750 display
- CFX-750 display: Installing the wiring harness
- Preparing the FmX integrated display
- Installing the FmX integrated display
- FmX integrated display: Installing the wiring harness
- CFX-750 display and FmX integrated display: Connecting accessory options
- CFX-750 and FmX displays: Installing the GNSS antenna and plate
- CFX-750 and FmX displays: Installing the RTK radio antenna

This chapter describes how to install and connect the FmX integrated display or the CFX-750 display in the vehicle.

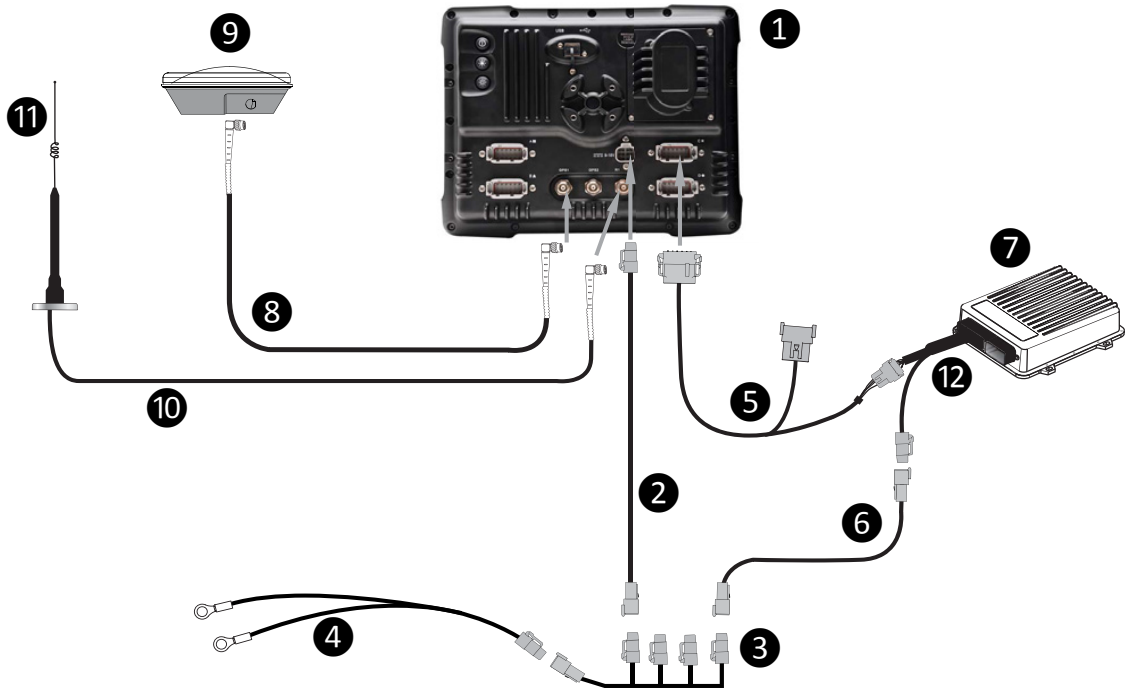
CFX-750 display components



CAUTION – Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
❶	CFX-750 display ***Note –*** *RTK password required.*	93100-02
❷	CFX-750 power cable	66694
❸	CFX-750 power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GNSS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	72122
⓫	900 MHz radio antenna kit	22882-10
⓬	Main NavController II cable	54601

FmX integrated display components



CAUTION – Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
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❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GNSS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	72122
⓫	900 MHz radio antenna kit	22882-10
⓬	Main NavController II cable	54601

Preparing the CFX-750 display

Step 1

Locate the CFX-750 display, the RAM mount, and the RAM mount clamp.



Step 2

Use the provided metric hardware to attach the RAM mount to the rear of the display.



Step 3

Attach the RAM mount to the rear of the display.



Installing the CFX-750 display

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the bar mount to the rail.

Attach the free end of the RAM mount to the bar mount and then tighten the clamp on the RAM mount so that the display is secure.





Note: Custom display mounting bracket shown

Step 2

Connect the cable to the B port of the CFX-750 display.

To connect power to the CFX-750 display, see Chapter 7, Controller Installation.



CFX-750 display: Installing the wiring harness

Step 1

Locate the cable that connects the CFX-750 display to the NavController II.

Step 2

Connect the cable to the P3 connector on the NavController II main harness and then route the cable from the NavController II to the mounting location on the CFX-750 display.



Preparing the FmX integrated display

Step 1

Locate the FmX integrated display, the RAM mount, and the RAM mount clamp.



Step 2

Use the provided metric hardware to attach the RAM mount to the rear of the display.



Step 3

Attach the RAM mount to the rear of the display.



Installing the FmX integrated display

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the bar mount to the rail. Attach the free end of the RAM mount to the bar mount and then tighten the clamp on the RAM mount so that the display is secure.

Note – *Some machines may have a RAM mount bracket already installed.*





Note: Factory display mounting bracket shown

Optionally, you can make custom brackets to mount the display on the right rear of the cab.

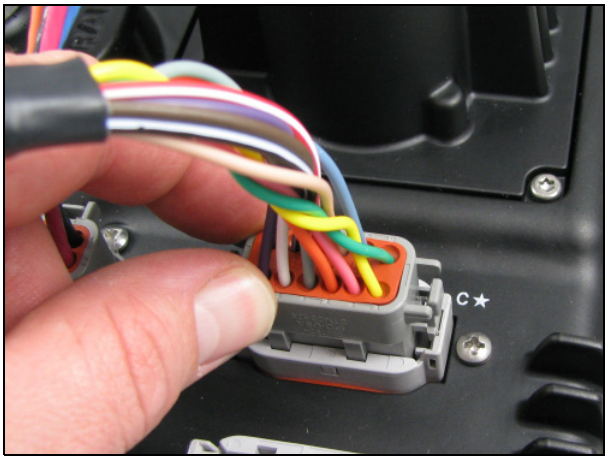


Note: Custom display mounting bracket shown

Step 2

Connect the cable to the C port of the FmX integrated display.

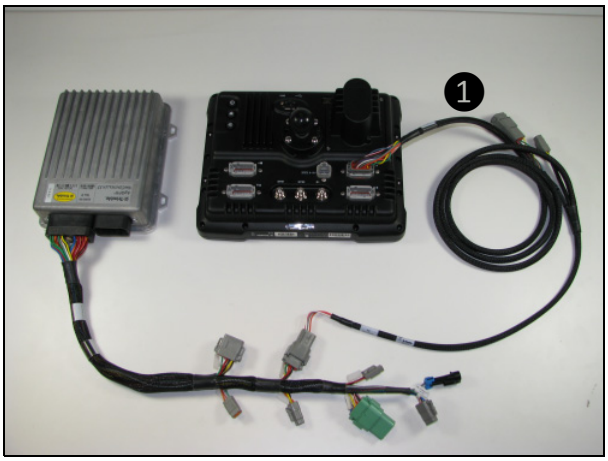
To connect power to the FmX integrated display, see Chapter 7, Controller Installation.



FmX integrated display: Installing the wiring harness

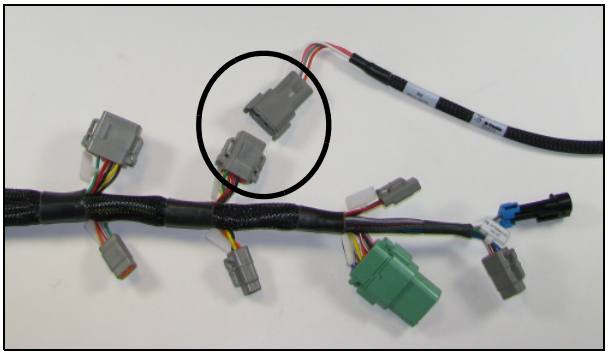
Step 1

Locate the cable that connects the FmX integrated display to the NavController II ❶.



Step 2

Connect the cable to the P3 connector on the NavController II main harness, and then route the cable from the NavController II to the mounting location on the FmX integrated display.



CFX-750 display and FmX integrated display: Connecting accessory options

Note – *Unless otherwise stated, "the display" applies to the CFX-750 display or the FmX integrated display.*

AgCam

The AgCam and AgCam cable are accessory items that you can purchase separately from the display. The CFX-750 display allows up to two video inputs; the FmX integrated display allows up to four.

Step 1

Locate the AgCam and AgCam cable.

Step 2

Mount the AgCam in a secure location and then route the cable towards the display.



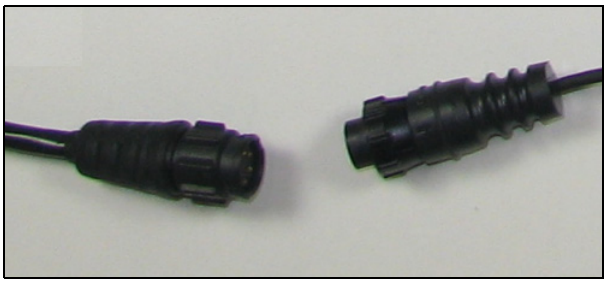
CFX-750 display



FmX display

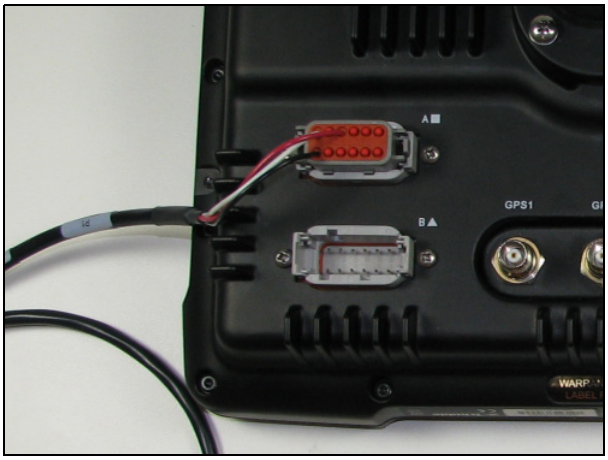
Step 3

Connect the AgCam cable to the display adaptor cable.



Step 4

Connect the display to AgCam adaptor cable to one of the open 12 pin connectors on the back of the display.



CFX-750 and FmX displays: Installing the GNSS antenna and plate

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Note – *The V plate antenna bracket is available on the Autopilot price list.*

To install the antenna and plate, use the VHB adhesive method outlined below.

Note – *Standard P/N 62034 plates are provided in display kits. You can use Very High Bond (VHB) to attach either a P/N 62034 plate or a V plate.*

Step 1

Clean the antenna location on the roof of the cab with a light solvent to remove oil and dust.



Step 2

Attach the antenna/receiver cable to the antenna and then route the cable into the cab through the rubber grommet at the base of the rear window. Secure the cable along the way.

Note – *Place antenna as far forward on top of cab as possible. The grain bin extensions (when extended) will block the GPS antenna's view of the sky.*



Step 3

Attach the antenna to the center of the P/N 62034 plate.



***Ag*GPS 25 antenna on Lexion combine with a P/N 62034 plate**



***Ag*GPS 25 antenna on Lexion combine**

CFX-750 and FmX displays: Installing the RTK radio antenna

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Connect the radio antenna to the magnetic antenna base



Step 2

Attach the magnetic radio antenna base to the supplied 5” x 5” plate.

Step 3

Route cable from the vehicle roof into the cab, and connect the radio cable to the display.



Example installation

CHAPTER 5

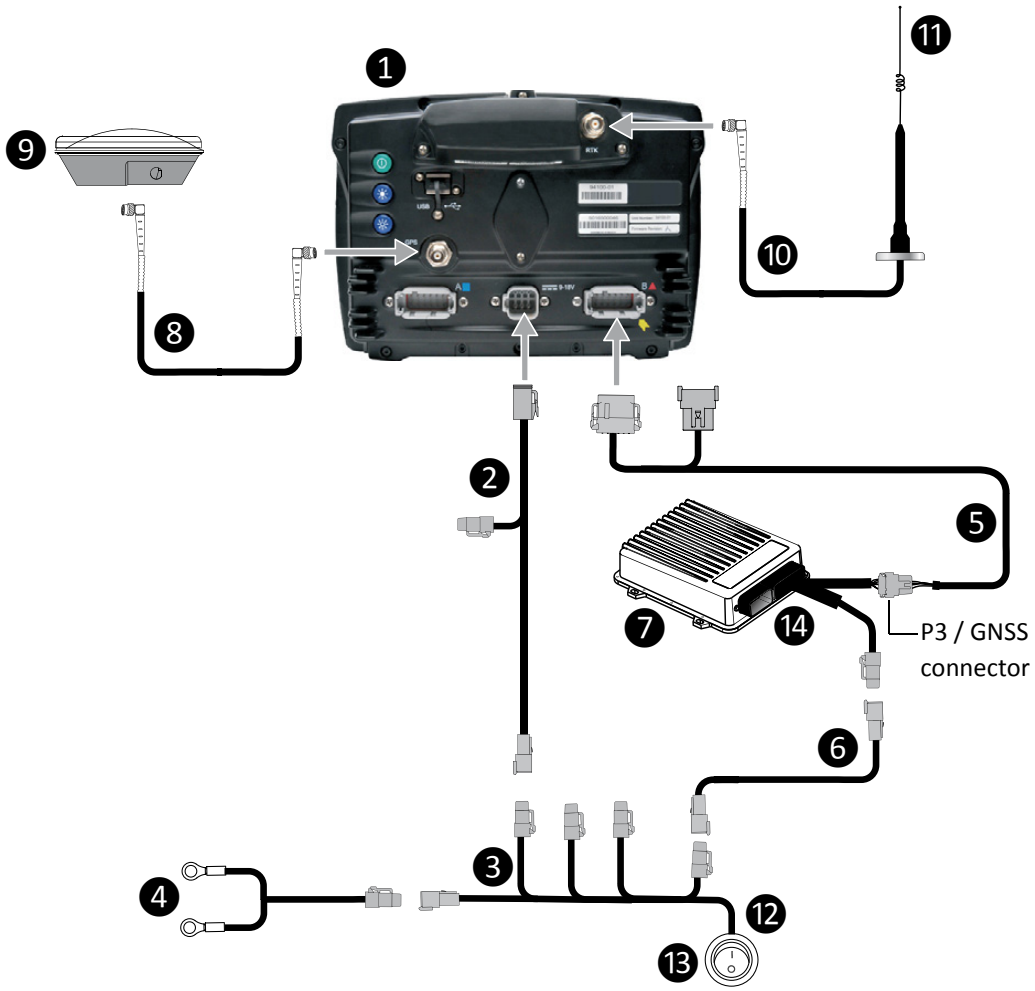
Power Harness Installation

In this chapter:

- CFX-750 display components
- FmX integrated display components
- Installing the power harness for the display
- Configuring the power bus options for the display

This chapter describes how to install the power harness in the vehicle.

CFX-750 display components

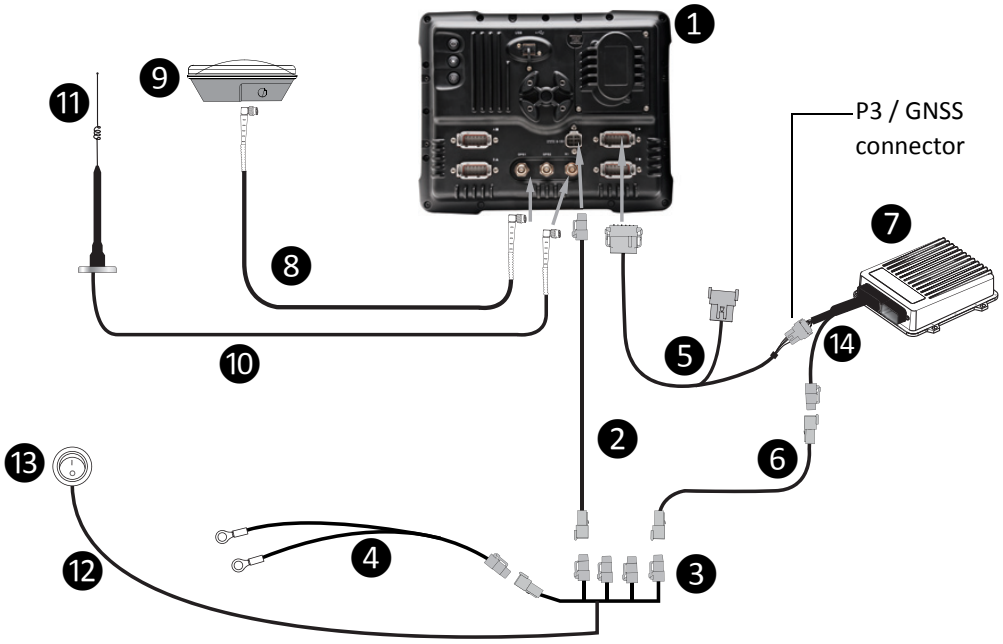


⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
❶	CFX-750 display ***Note –*** *RTK password required.*	93100-02
❷	CFX-750 power cable	66694
❸	CFX-750 power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GNSS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00

Item	Description	Trimble part number
⑩	NMO to TNC 20ft antenna cable and base	72122
⑪	900 MHz radio antenna kit	22882-10
⑫	External switch cable included with kit	Part of P/N 67259
⑬	External switch included with kit	Part of P/N 67259
⑭	Main NavController II cable	54601

FmX integrated display components



⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	FmX power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GNSS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	72122
⓫	900 MHz radio antenna kit	22882-10
⓬	External switch cable included with kit	Part of P/N 67259
⓭	Switch	67095
⓮	NavController II harness	54601

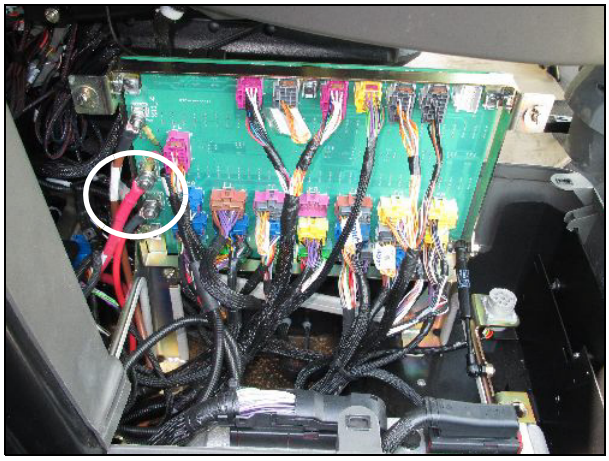
Installing the power harness for the display

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

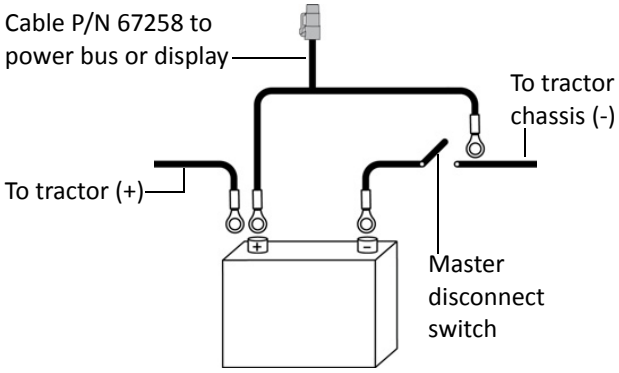
Step 1

Connect the basic power cable to the vehicle battery and then route the cable into the cab.

Note – *The power lugs are located the bottom side of the fuse panel circuit board, behind the operator's seat.*

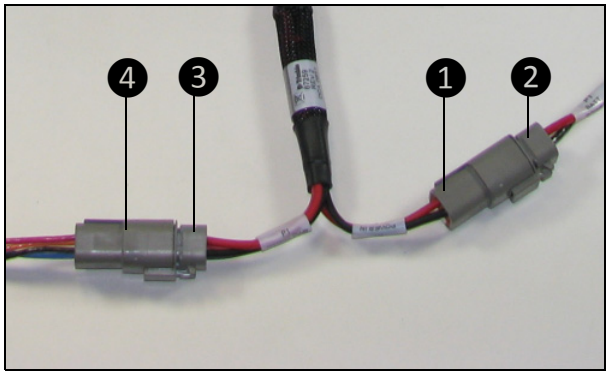


CAUTION – If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258) is ***not*** directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example.
Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



Step 2

Locate and connect the 4-pin Deutsch DTP receptacle on the power bus ❶ to the 4-pin Deutsch DTP plug ❷ on the basic power cable and then remove the protective cap from the 4-pin Deutsch DTP plug ❸ on the power bus and connect the plug to the 4-pin Deutsch DTP receptacle ❹ on the display power adaptor.

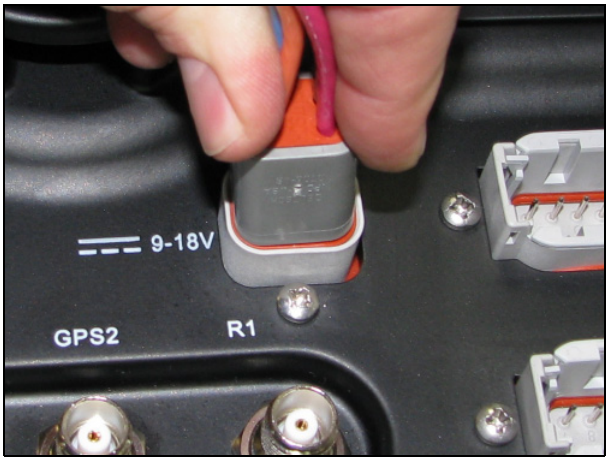


Step 3

Route the display power adaptor to the display mounting location and then connect it to the display.



CFX-750 display



FmX display

Configuring the power bus options for the display

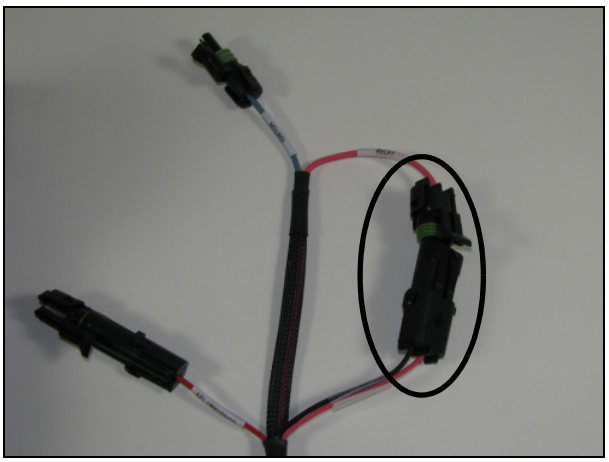
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

When you use the power bus cable, use one of the following configuration methods to turn on the Autopilot system:

- Display power button is used to turn on the Autopilot system
- External switch is used to turn on the Autopilot system
- Ignition is used to turn on the Autopilot system

Display power button is used to turn on the Autopilot system

Connect the 2 pin connectors labeled R2 and P2 on the power bus.

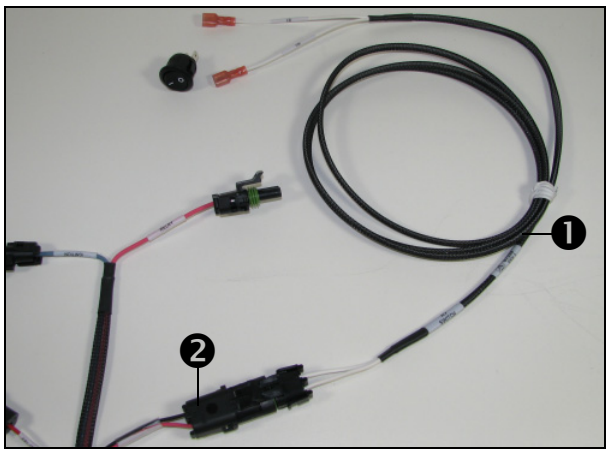


External switch is used to turn on the Autopilot system

Step 1

Connect the cable labeled R7 switch ❶ (included with the power bus) to connector labeled P2 on the power bus ❷ and then route the cable labeled R7 to a switch location.

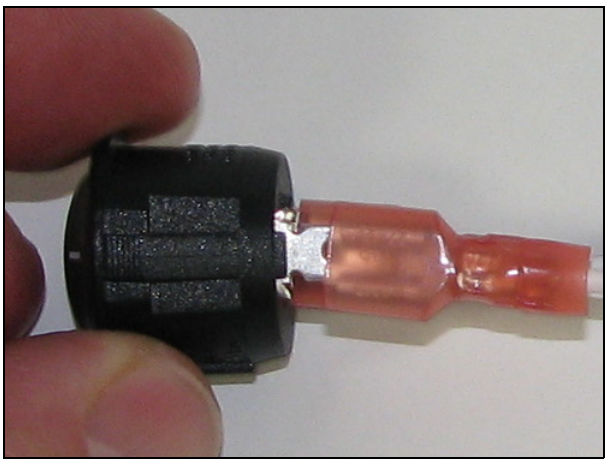
Note – *To install the switch provided, drill a ¾" hole.*



Step 2

Connect the cable labeled R7 to the switch pins.

Note – *Polarity is not important.*

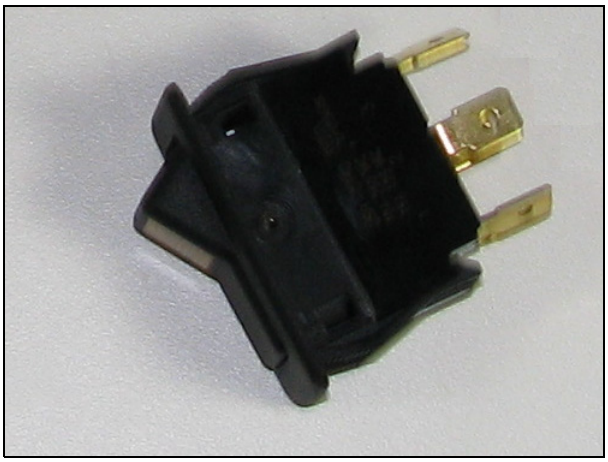


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

Note – *An alternative location is required for the switch provided.*

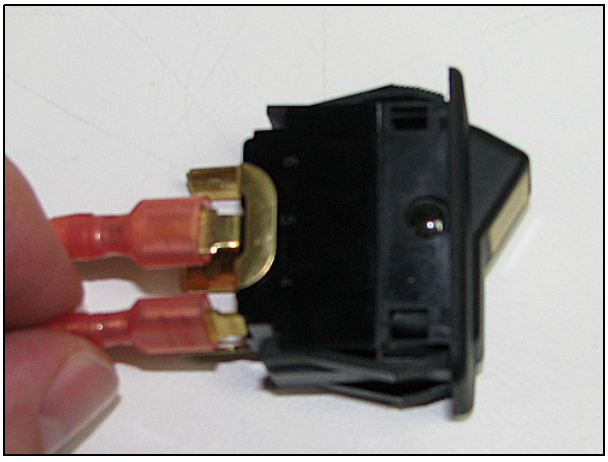


Step 2

Route the cable labeled R7 to the switch location and then connect the cable to the illuminated switch.

Connect the wire labelled S1 to pin 5 on the switch and then connect the wire labelled S2 to pin 4 on the switch.

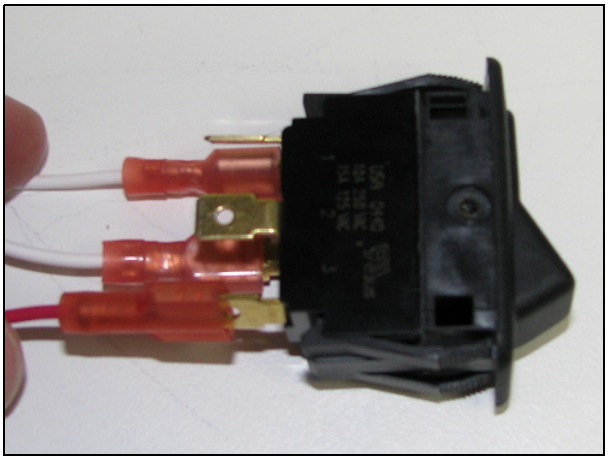
Note – *Polarity **is** important.*



Step 3

Connect a separate wire to pin 3 on the switch using a spade connector. Route the wire and then connect it to the vehicle switched power.

Note – *This additional wire is required to allow the switch to illuminate.*

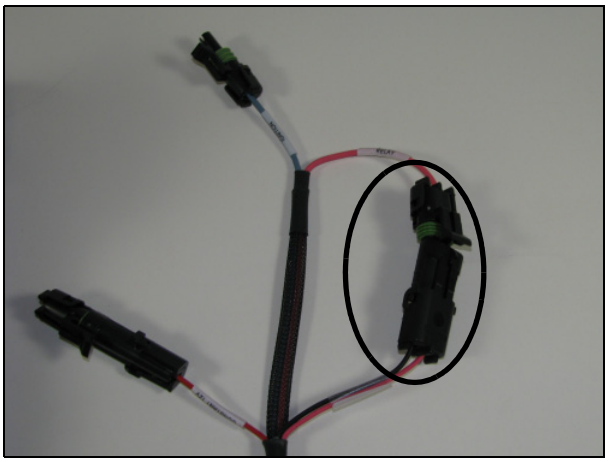


Ignition is used to turn on the Autopilot system

Note – *For more information on how to use the ignition sensing option, see the FmX Integrated Display User Guide.*

Step 1

Connect the 2-pin connectors labeled R2 and P2 on the power bus.

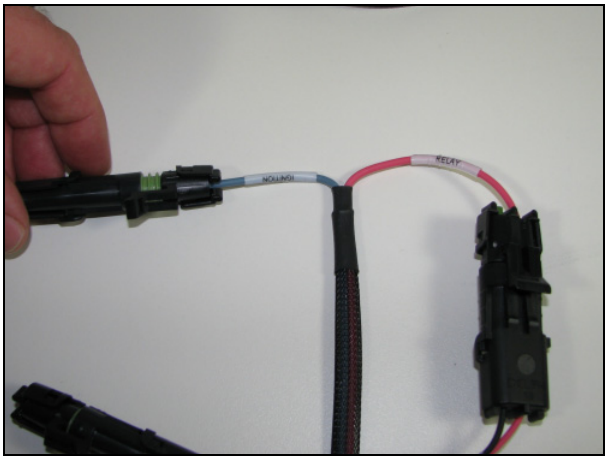


Step 2

Connect the cable labeled R8 Ignition (included with the power bus) to connector P3 Ignition on the power bus.

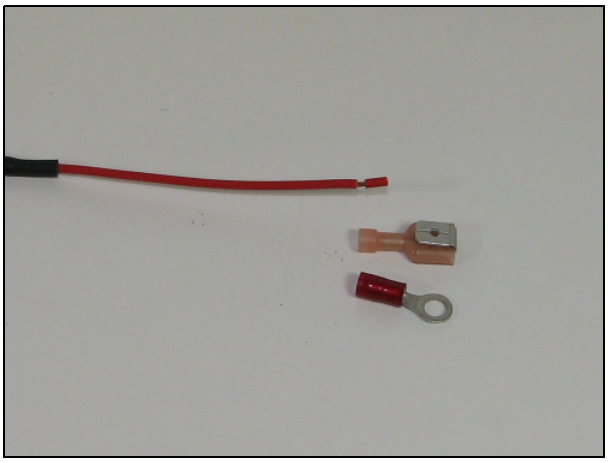
Step 3

Route the cable to the vehicles ignition.



Step 4

Connect the red ignition sense wire to the vehicle ignition using the spade or ring terminal provided.



CHAPTER 6

Remote Engage Switch Installation

In this chapter:

- Remote engage switch components: Rocker switch
- Remote engage switch components: Foot switch
- Preparing the remote engage cable
- Using the remote engage switch

This chapter describes how to install the remote engage switch.

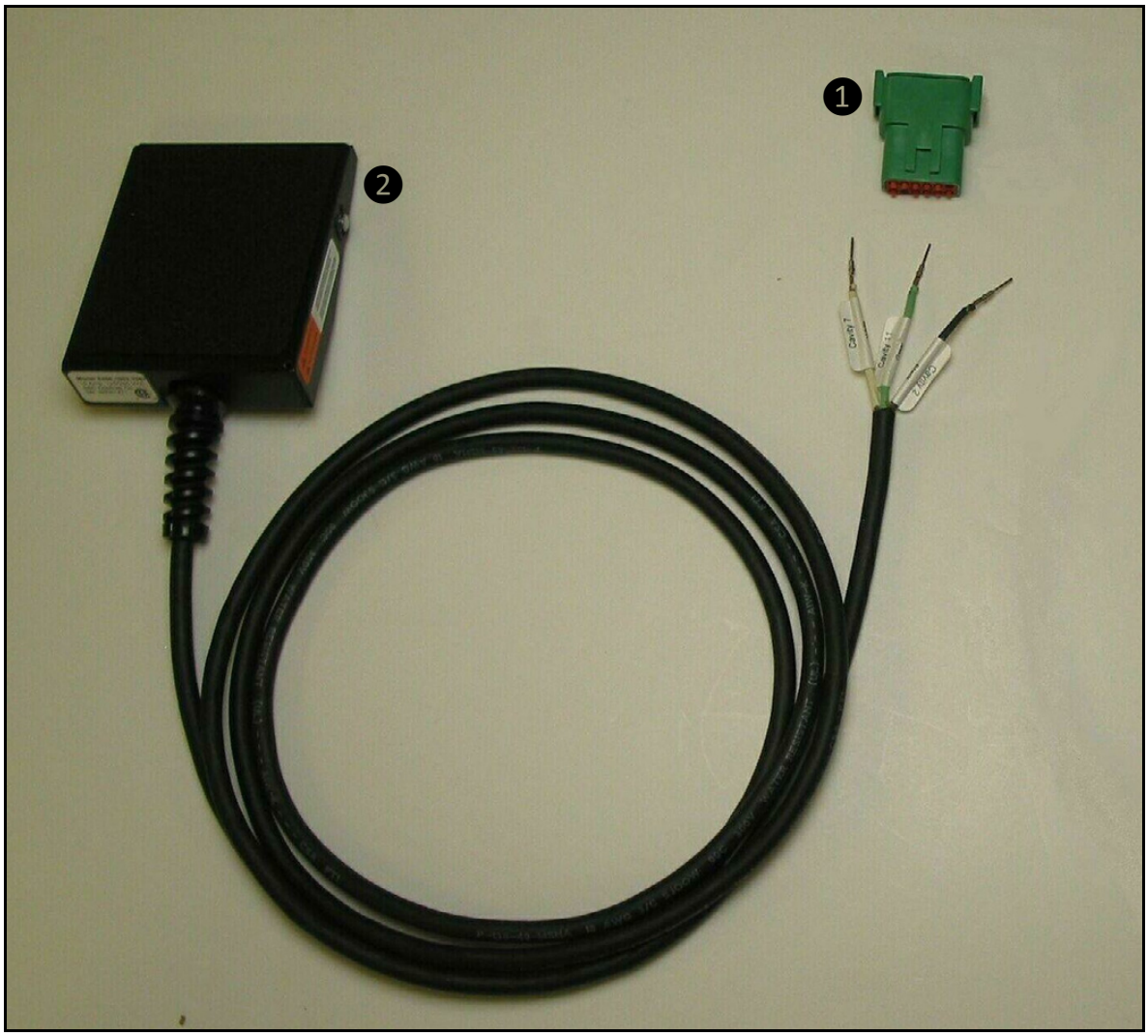
Remote engage switch components: Rocker switch



Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

Note – *This is a Full or Standard Euro switch, depending on the kit ordered.*

Remote engage switch components: Foot switch

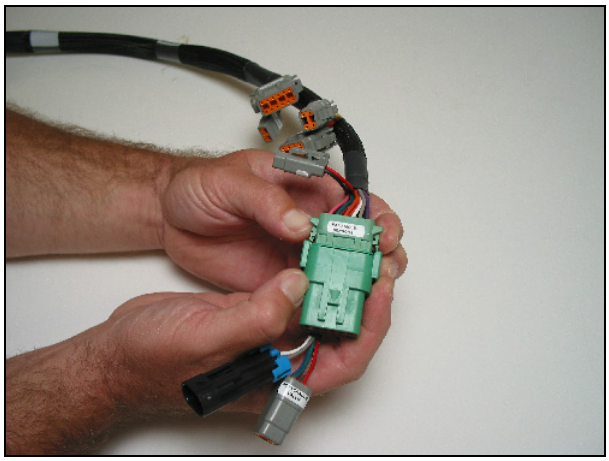


Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

Preparing the remote engage cable

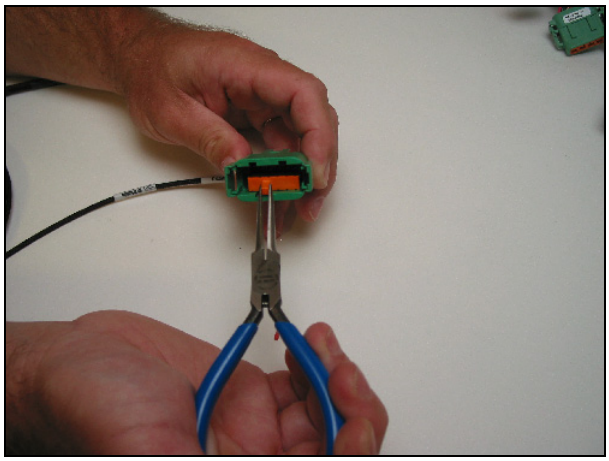
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. For more information, see Chapter 7, Controller Installation.



Step 2

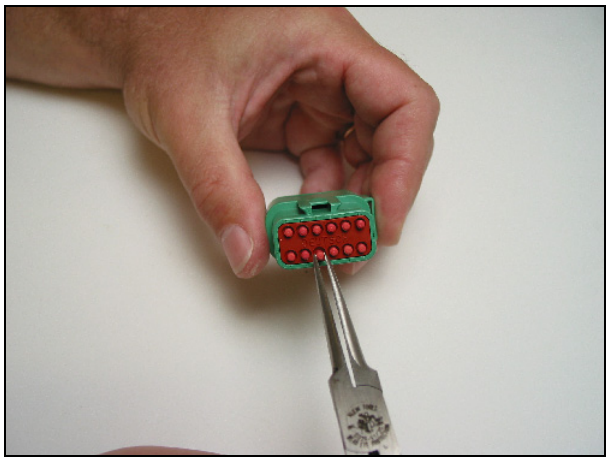
Remove the wedge from the connector.



Step 3

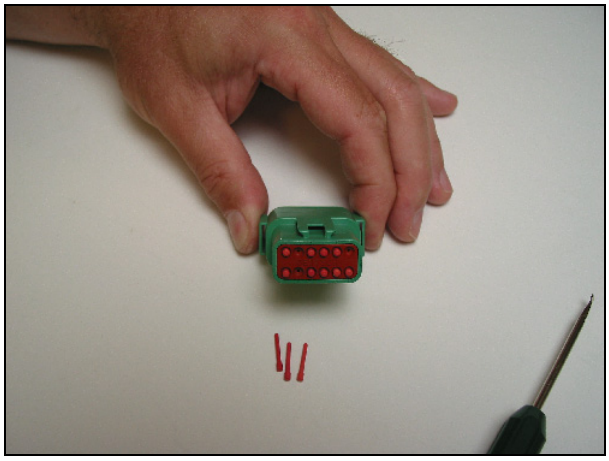
Rocker switch only

Remove the plugs from cavity 2 and cavity 7.



Foot Switch Only

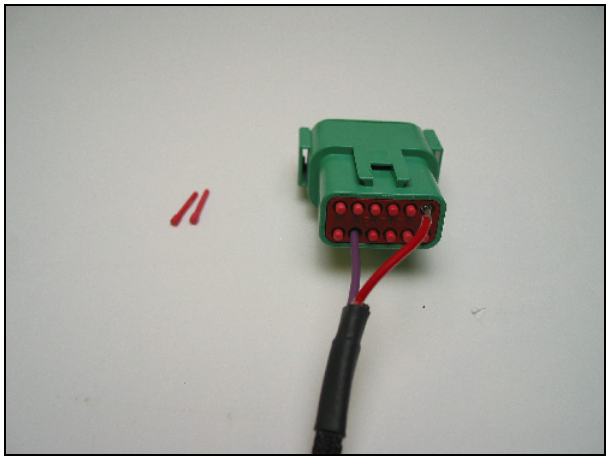
Remove the plugs from cavity 2, cavity 7, and cavity 11.



Step 4

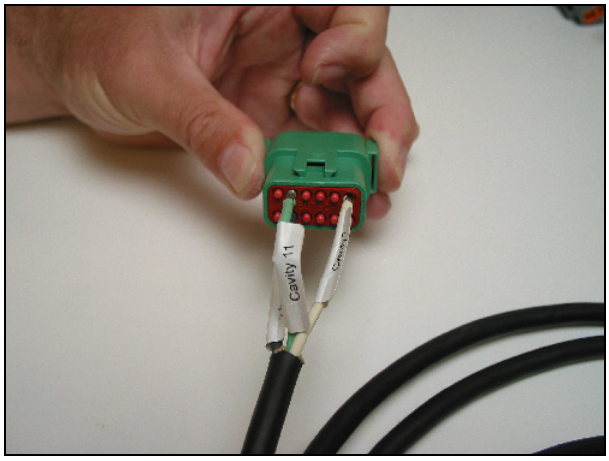
Rocker switch only

Insert the DTM pins into cavity 2 and cavity 7, according to the labels on the wires.



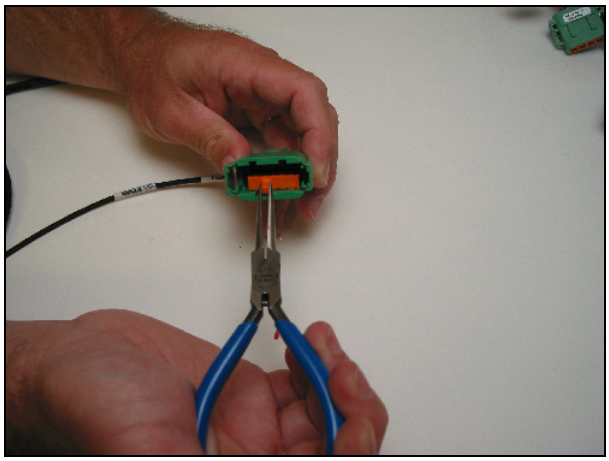
Foot switch only

Insert the DTM pins into cavity 2, cavity 7, and cavity 11, according to the labels on the wires.



Step 5

Pull on the wires to seat them in place and then replace the wedge in the connector.



Step 6

Replace the receptacle on the P5 plug of the NavController II harness.

Step 7

Rocker switch only

Run the spade ends of the cable to a knockout location in the operator console.



Foot switch only

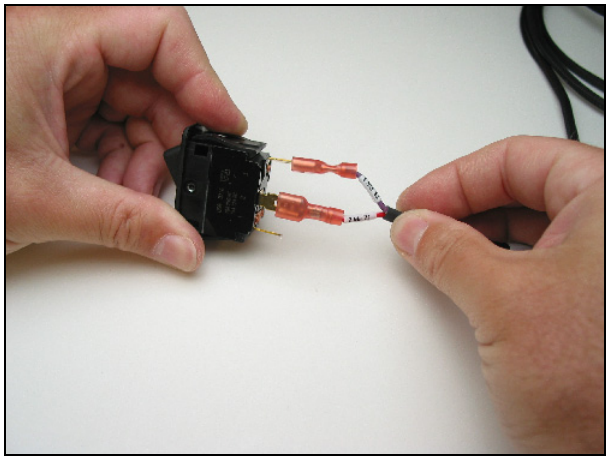
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 8

Rocker Switch Only

Connect the wires to the switch. Match the print on the switch body with the labels on the wires.



Step 9

Rocker Switch Only

Place the switch in the console.





Rocker switch in Lexion combine console

Using the remote engage switch

To use NavController II to engage the system:

- For firmware versions 5.20 and earlier: Hold down the remote engage switch for longer than **0.5** seconds and less than **4** seconds.
- For firmware 5.21 and later: Hold the switch down for longer than **0.15** seconds and less than **4** seconds.

The system engages when you release the switch.

CHAPTER 7

Controller Installation

In this chapter:

- Installing the controller
- Controller connections

This chapter describes how to install the controller unit.

Installing the controller

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Locate the panel behind the operator's seat.



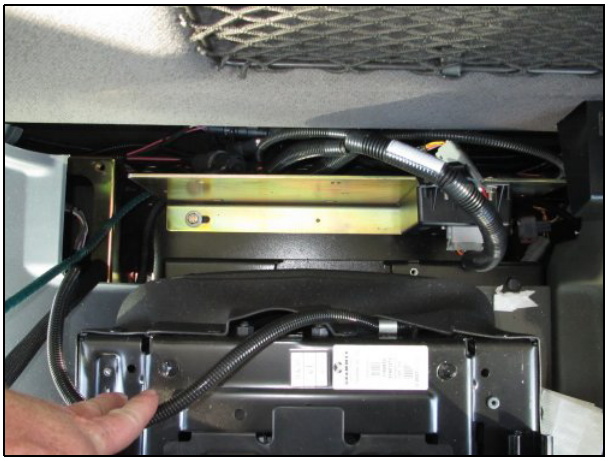
Step 2

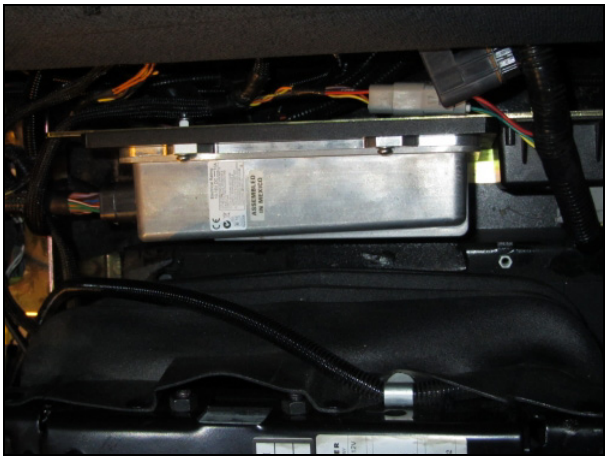
Remove the cover under the right side seat console.



Step 3

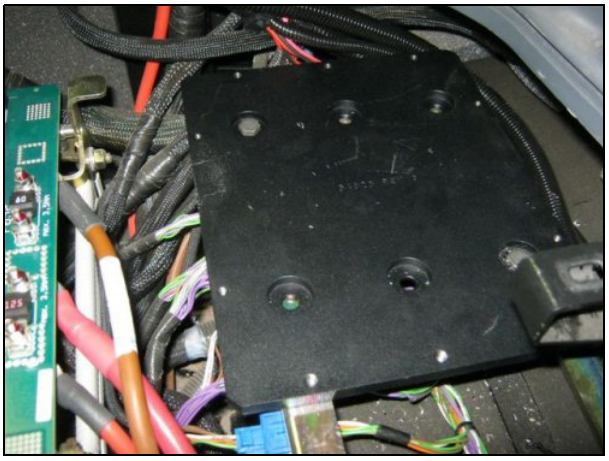
If the combine has a L-bracket behind the seat, attach the controller mounting plate to the bracket and then attach the NavController II. It may be useful to remove the bracket, attach the mounting plate and the NavController II then reattach the L-bracket.





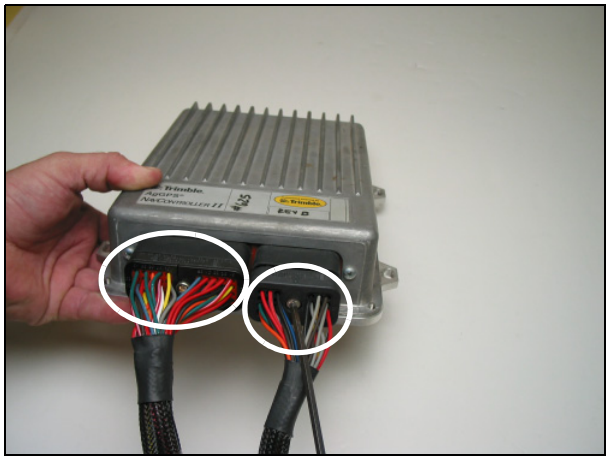
Step 4

If the machine does not have a L-bracket behind the seat, mount the P/N 54828 controller plate to the existing bracket behind the right side console.



Step 5

Before you install the controller, attach the main and auxiliary cable harnesses. Use an allen wrench to secure the connectors to the controller.



Step 6

Use the supplied #10-32 screws to fasten the controller to the plate.



Behind seat



Behind seat

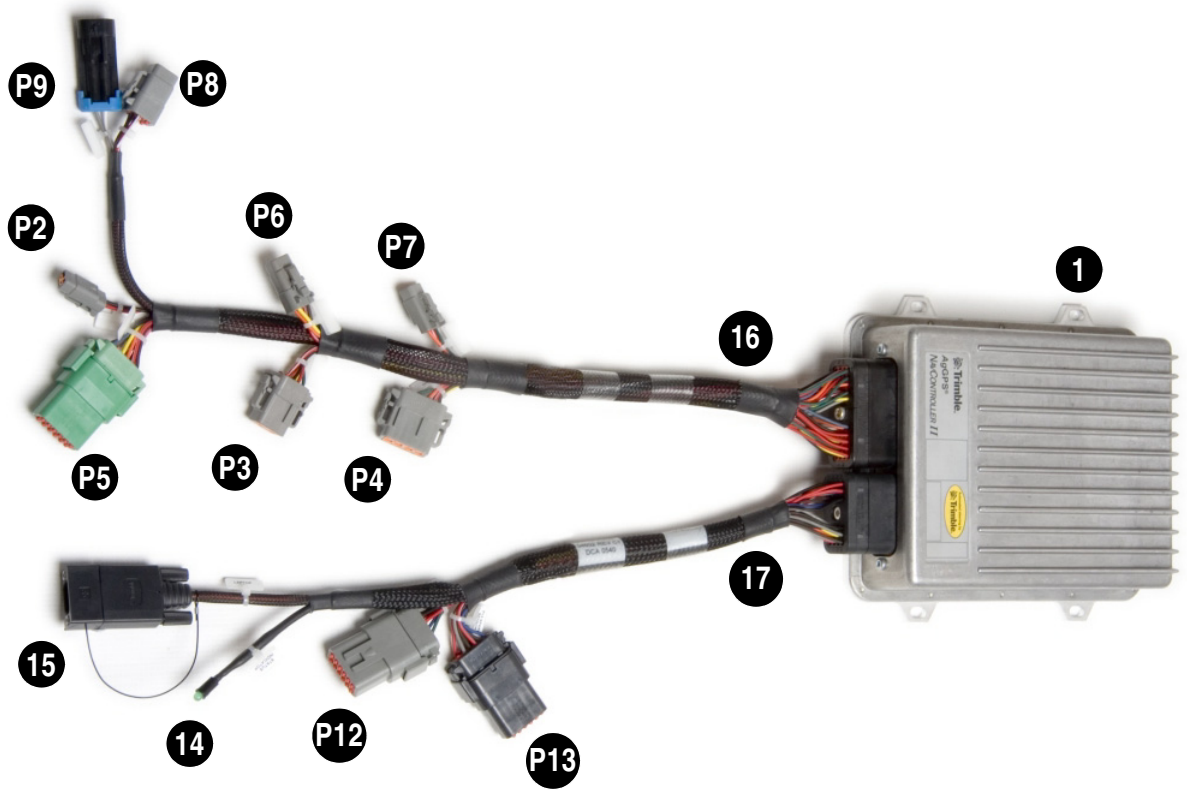


Behind the right side console



Behind the right side console

Controller connections



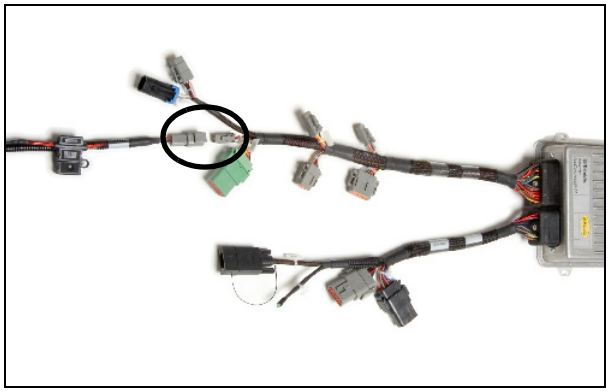
Item	Description
1	NavController II controller
P2	Power connector
P3	GNSS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

Item	Description
P9	Sonalert connector
P12	Lightbar/spare connector
P13	Spare sensors connector
14	Status indicator
15	Laptop connector
16	Main harness
17	Auxiliary harness

Step 1

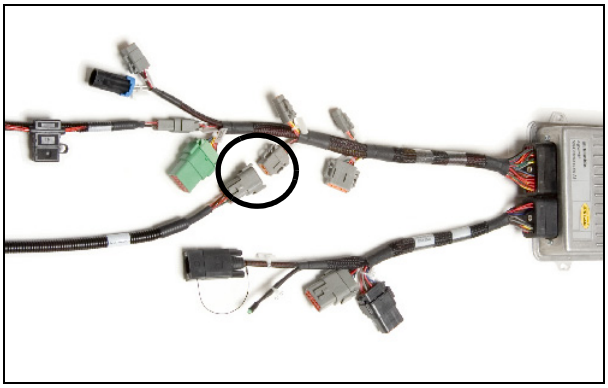
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

Note – *The power connection supplies power through the controller to all connected devices, including GNSS and displays.*



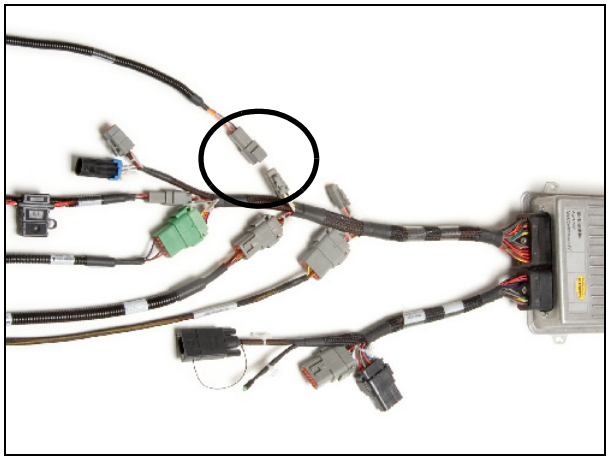
Step 2

Connect the CFX-750 display or FmX integrated display to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

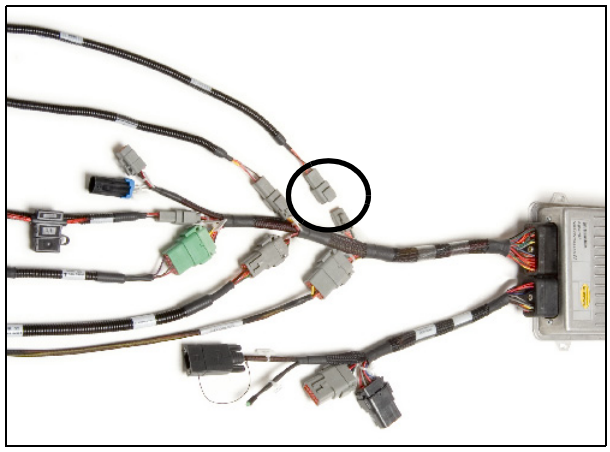
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 4

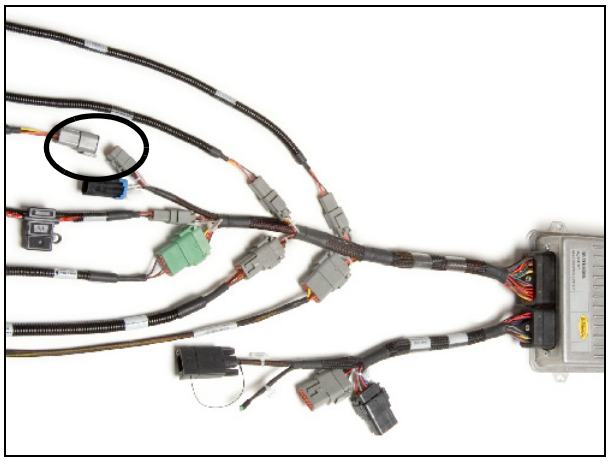
Connect the manual override cable connection to P-7, which is labeled “Manual Override”. P-7 is located on the main wiring harness.

Note – *When you install the remote engage harness, add the pins to the existing connector.*



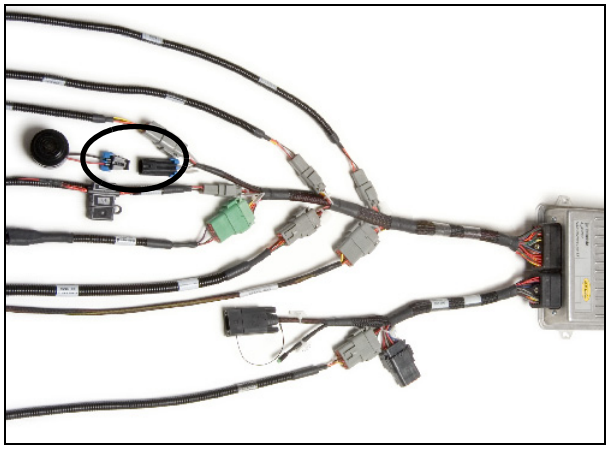
Step 5

Connect the hydraulic steering valve cable connection to P-8, which is labeled “Hydraulic Valve”. P-8 is located on the main wiring harness.



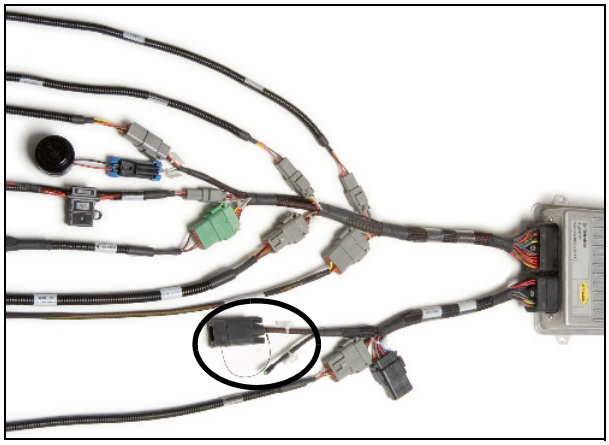
Step 6

Connect the Sonalert P-9 to the two pin Delphi connector on the main wiring harness. Route the cable so the Sonalert warning device is in a position that is audible to the operator.



Step 7

Route the LED and laptop lead, which is located on the auxiliary wiring harness, to a location that allows the operator to determine the controller status. See controller LED status for status determination. Six flashes per second indicates a correctly functioning controller.



Step 8

Use the provided sleeving to secure the harness cables with tie wraps. Cover and route the cable bundle to avoid damage to connectors and strain on wire connections.

CHAPTER 8

Final Machine Check

WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

To perform the final machine check:

1. Connect the battery.
2. Start the machine and check for hydraulic leaks. Correct as needed.
3. Update the Trimble display and the Autopilot NavController II to the latest firmware from http://agpartners.trimble.com.

   You can use FlashLoader 200 software version 3.19 to update the Autopilot controller: Download it from http://agpartners.trimble.com.
4. Load the correct configuration file into the Autopilot NavController II for the vehicle model being used.

   Download the latest set of configuration files from http://agpartners.trimble.com.

   You can use Autopilot Toolbox II software version 2.92 or later to load the configuration file into the Autopilot controller. You can download the Autopilot Toolbox II software from http://agpartners.trimble.com.
5. Calibrate the Autopilot system using the Trimble display or Autopilot Toolbox II software version 2.92 or later. Depending on your machine type, the following items must be calibrated before you can use the Autopilot system:
   - NavController II mounting orientation
   - Manual override
   - AutoSense mounting orientation
   - Valve deadzone
   - Autopilot P-gain
   - Antenna height/Antenna axle offset, and Roll offset