Autopilot

AUTOMATED STEERING SYSTEM

INSTALLATION INSTRUCTIONS

Case IH Puma CVX	▶ 125 / 130 / 140 / 145 / 155 / 160 / 165 ▶ 170 / 180 / 185 / 195 ▶ 200 / 210 / 215 / 225 / 230
Case IH Puma	▶ 115 / 125 / 140 / 155
Case IH Maxxum (with CC remotes)	▶ Value Limited: MXM 110 / 120 / 125 / 130 / 140 / 155 / 175 / 190 ▶ Pro: MXU 100 / 110 / 115 / 120 / 125 / 130 / 135 / 140
New Holland (with CC remotes)	▶ Plus: T6020 / T6030 / T6050 / T6070 / TS100A / TS110A / TS115A / TS125A / TS135A ▶ Elite Autoshift: T6020 / T6030 / T6040 / T6050 / T6060 / T6070 ▶ Elite Power Command: T6030 / T6050 / T6070 / T6080 / T6090
New Holland	▶ TM 120 / 130 / 140 / 155 / 175 / 190 ▶ T6.120 / T6.140 / T6.150 / T6.160 / T6.155 / T6.165 / T6.175 ▶ T7.170 / T7.185 / T7.200 / T7.210 / T7.220 / T7.235 / T7.250 / T7.260 / T7.270 ▶ T7030 / T7040 / T7050 / T7060 / T7070
Steyr CVT (long wheelbase)	▶ 6165 / 6170 / 6180 / 6185 / 6200 / 6205 / 6210 / 6215 / 6225 / 6230
Steyr CVT (short wheelbase)	▶ 6130 / 6145 / 6160

Version 8.00
Revision A
March 2019
P/N 54035-1052-E08

Trimble

Legal Notices

Agriculture Business Area

Trimble Agriculture Division
10368 Westmoor Drive
Westminster, CO 80021-2712
USA
www.trimble.com

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This is the March 2019 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-1052-E08. It applies to version 8.00 of the Autopilot automated steering system.

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Class B Statement – Notice to Users. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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: http://www.trimble.com/Corporate/Environmental_Compliance.aspx

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:

Trimble Europe BV
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.

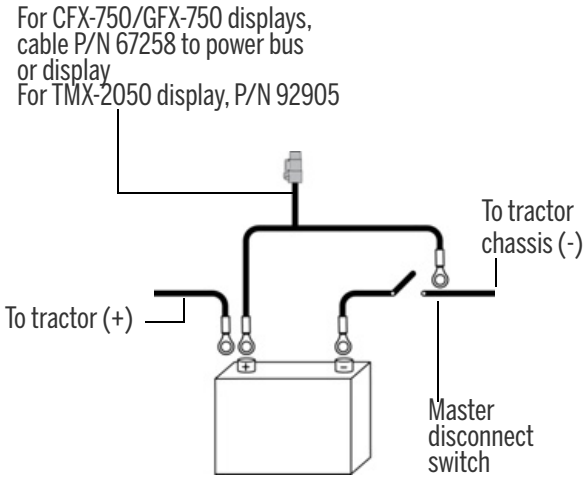
⚠ **CAUTION –** Do not direct pressurized water at:
- Electronic or electrical components or connectors
- Bearings
- Hydraulic seals
- Fuel injection pumps
- Any other sensitive parts or components



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.

⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) 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.



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1

Introduction

- 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 other Global Navigation Satellite System (GNSS) such as the United States', Trimble recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GNSS, visit 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

Trimble displays

Retain
CFX-750™ display: P/N 94110-xx
Power cable CFX-750 display: P/N 77282
Antenna for display: P/N 60600-02 (DGPS) or 77038-00 (OmniSTAR®/RTK)
Antenna to receiver cable: P/N 50449
Basic cable (CFX-750 display): P/N 67258
TMX-2050™ display: P/N 96700-00
TM-200 Module: P/N 95060-00
TM-200 Module to display cable: P/N 93843
TM-200 Module power I/O cable: P/N 92676
TM-200 Module battery cable: P/N 92905
GFX-750™/XCN-1050: P/N 121000-XX
Power cable GFX-750/XCN-1050: P/N 110551
Base power cable: P/N 67258
NAV-900 guidance controller: P/N 108993-05
GFX-750 to NAV-900 Comms cable: P/N 110540

Required components

Kits required	Special tools
Platform kit: P/N 54035-1052	10.5 mm drill bit
Hydraulic hose kit for all machines: P/N 109532-2000	Allen wrench set (metric and imperial)

Antenna mounting kits

Kits required
Ag15 antenna mounting plate: P/N 62034
Bracket, GPS - V base plate indexing: P/N 62388-02
Optional spar mounts (must measure application for proper part number):
P/N 64898: Bracket, GPS Spar 16.5"– 28.5"
P/N 55349: Bracket, GPS Spar 27.5"– 37.5"
P/N 53676: Bracket, GPS Spar 36.5"– 46.5"
P/N 55348: Bracket, GPS Spar 45"– 55"
P/N 66774: Bracket, GPS Spar 54"– 64"
NOTE – For quick release mounting of the NAV-900 to a Spar mount, use P/N 110308: Bracket, NAV-900, Spar Quick Release Adapter

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
Remote engage push button: P/N 101250

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit: P/N 54035-1052	Hydraulic valve	Chapter 2
	Hydraulic manifold	
	Transducer flow switch	
	Manual override cable	
	Hydraulic brackets and bolt kits	
	Hydraulic valve cable	
	IMD-900 steering device and cabling	Chapter 3
	IMD-900 mounting bracket and hardware	
	Power switch	Chapter 6
	Bolt kit controller	Chapter 8
Common parts	Controller	Chapter 8
	Controller mounting bracket	Chapter 1
	Cable kit: • Main wiring harness • Power bus auxiliary wiring harness • Sonalert alarm	Chapter 8
GNSS receiver	GNSS receiver	Chapter 4
	GNSS antenna	
	GNSS receiver power/data cable	
	RTK radio, cable, and radio antenna	
Display	CFX-750 display, GFX-750 display	Chapter 5
	TMX-2050 display	
	Display cable	
	Mounting bracket	
Hydraulic hose kit for all machines: P/N 109532-2000	Hydraulic hoses	Chapter 2
	Hydraulic adaptors	

Hardware	Component	See...
Roof bracket kit: P/N 62388-02	Roof brackets	Chapter 4
Bracket, GPS spar 36.5" - 46.5": P/N 53676	Bolt kit, roof bracket	
Bracket, GPS spar 54" - 64": P/N 66774		

Preparing the vehicle for installation

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.

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

2

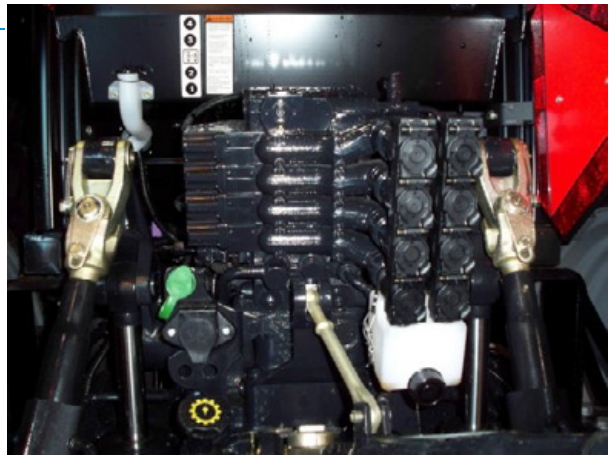
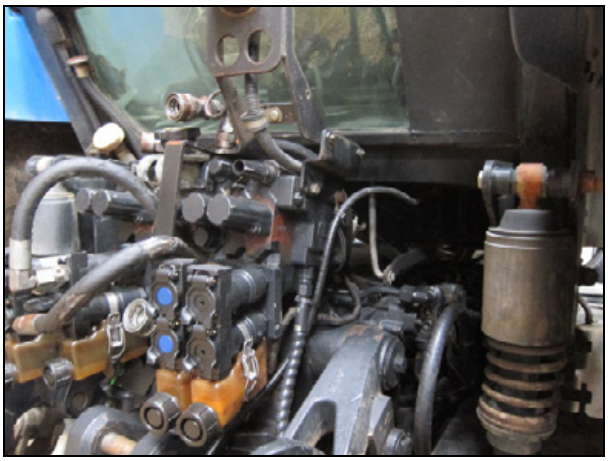
Hydraulic Control Valve Installation

- Vehicle types
- Hydraulic system components
- Assembling the hydraulic control valve
- Installing the LS check valve: Machine type 1 only
- Installing the manual override pressure transducer: All machines
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- Mounting the hydraulic manifold to the mounting bracket
- Mounting the manifold to the machine with the mounting bracket
- Connecting the hydraulic lines
- Pressure, Tank, and LS connections
- Connecting hoses to the Autopilot manifold: Upright in front of stack (option 1) and above stack (option 2) mounting methods
- Connecting hoses to the Autopilot manifold: Lay flat onto stack mounting method (option 3)
- Connecting hoses to the Autopilot manifold: Lay flat mounting (option 4)
- Connecting hoses to the Autopilot manifold: Lay flat mounting method (option 5)
- Connecting the cables to the manifold

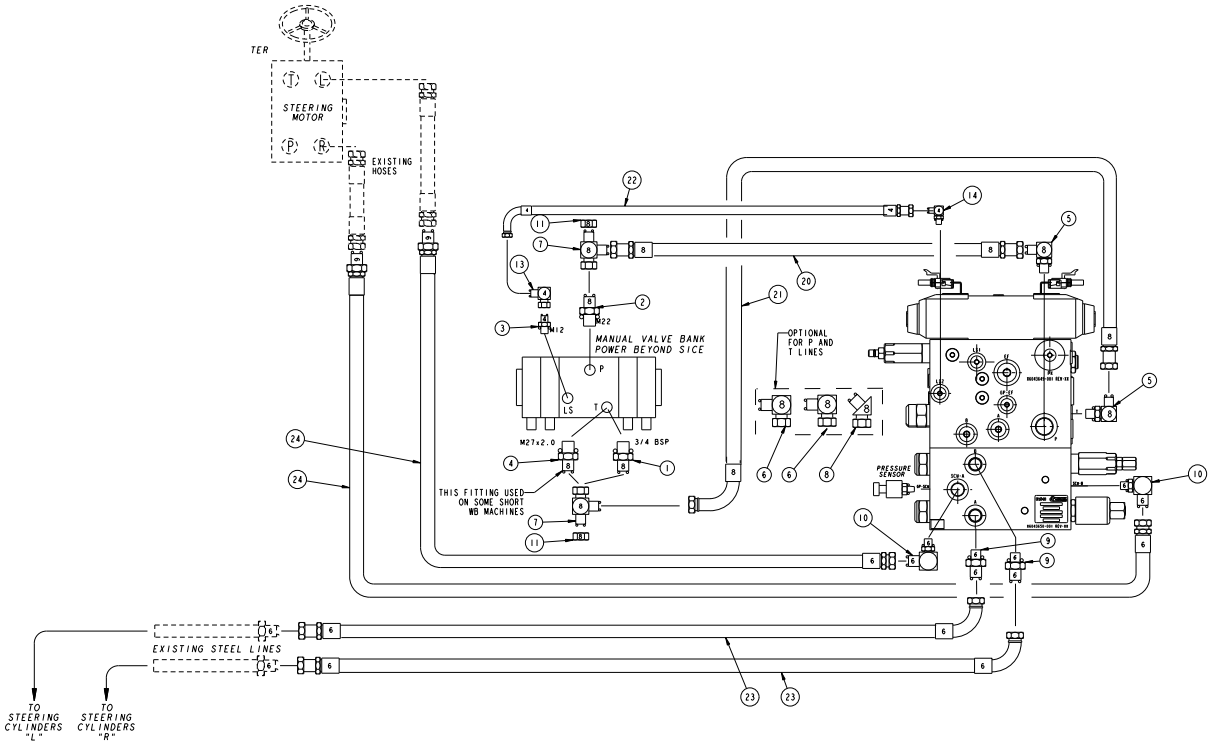
Vehicle types

Depending on the type of machine that you use, select the appropriate installation option to configure the Autopilot valve.

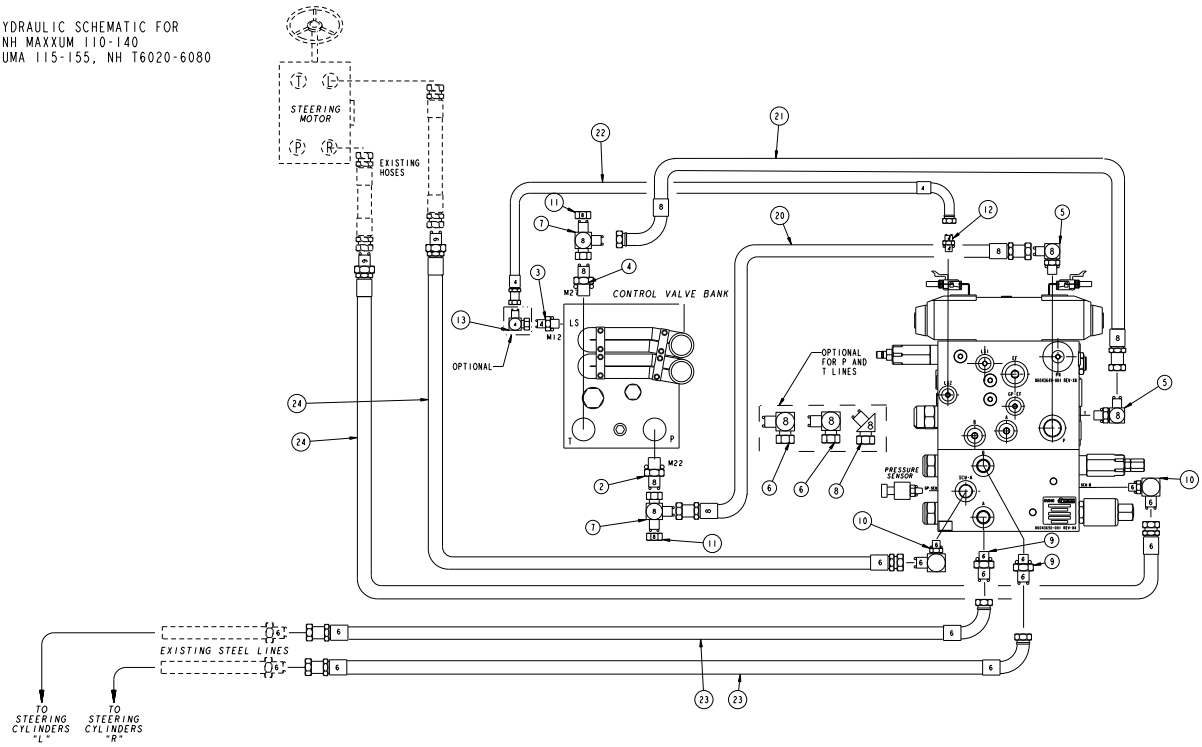
Machine type	Valve configuration	Valve stack description
1	1. The LS check valve is inserted in the **LS-CV** port in the H4 valve. 2. The 110 PSI PFRD cartridge is inserted into the PFRD cavity on the manifold. The cartridge P/N is 66113.	Vehicle remotes are split into two columns; one on each side of the upper three-point link. 

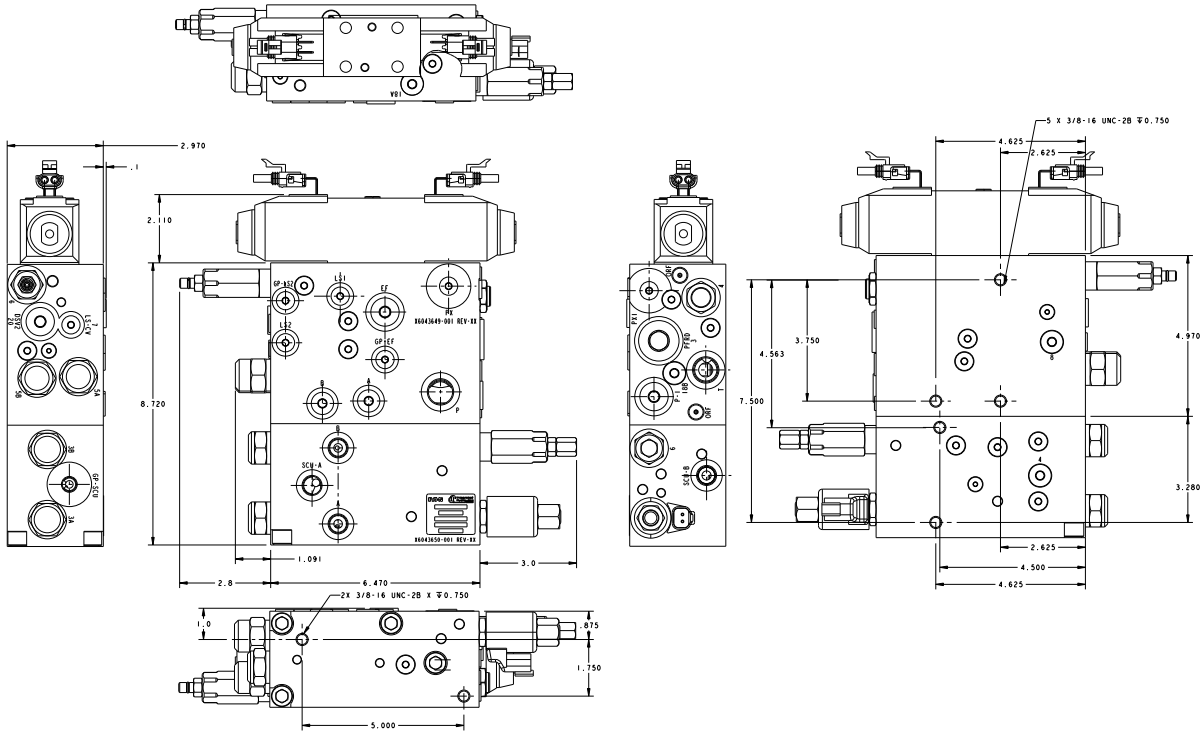
Machine type	Valve configuration	Valve stack description
2	1. The LS Check valve is removed from the **LS-CV** port in the H4 valve and replaced with a -4ORB plug 2. The 110 PSI PFRD cartridge is inserted into the PFRD cavity on the manifold. The cartridge P/N is 66113.	Vehicle remotes are in one column on the right side of the tractor.  *MXU, TM, MXM, TS1xxA machine types:*  

Hydraulic system components



HYDRAULIC SCHEMATIC FOR
CNH MAXXUM 110-140
PUMA 115-155, NH T6020-6080





Fittings

Item	Description	Part number	Item	Description	Part number
1	Fitting	8·12F42EMDMLO	**9**	Fitting (x2)	6 F50LO
2	Fitting	8 M22F870MLO	**10**	Fitting (x2)	6 C50LO
3	Fitting	4 M12F870MLO	**11**	Fitting	8 FNL
4	Fitting	8 M27F870MLO	**12**	Fitting	4 F50LO
5	Fitting (x2)	8 C50LO	**13**	Fitting	4 C6LO
6	Fitting (x2)	8 C6LO	**14**	Fitting	4 C50LO
7	Fitting (x2)	8 R6LO	**15**	Fitting	HP·B-13-RFL
8	Fitting	8 V6LO			

Hoses

Item	Description	Part number	Line
20	40" (102 cm) hose	F451TCJSJS·08·08·08·40"	P
21	40" (102 cm) hose	F451TCJSJ9·08·08·08·40"	T
22	42" (107 cm) hose	F451TCJSJ9·04·04·04·42"	LS2
23	112" (284 cm) hose (x2)	F451TCJSJ9·06·06·06·112"	CYL - A CYL - B
24	82" (208 cm) hose (x2)	F451TCJSJ0·06·06·06·82"	SCU - A SCU - B

NOTE – Part numbers are Parker numbers and are for reference only.

Assembling the hydraulic 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 chapter.

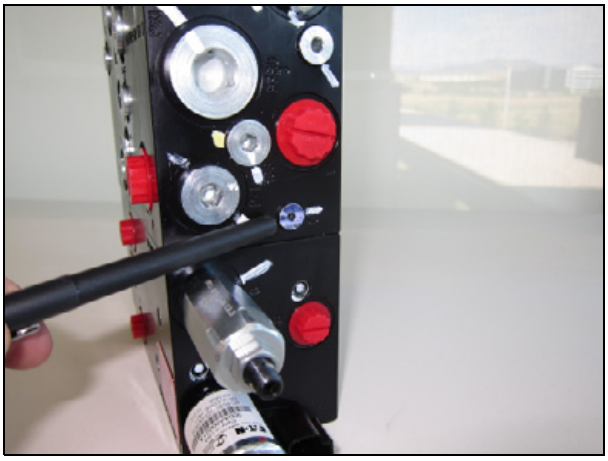
Gather the manifold, fittings and cartridges for preparing the manifold on a clean work surface.

Installing the PFRD cartridge for pressure compensation - All machines

Step 1

Configure the manifold for pressure compensation.

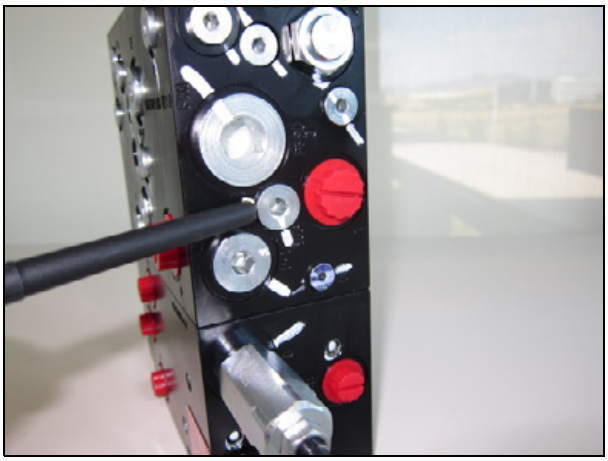
Locate and remove the orifice plug from its storage location shown here.

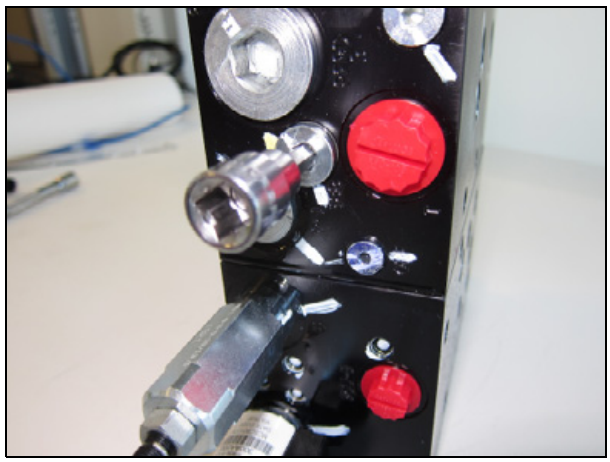


Step 2

Remove the plug from the 18B location (shown).

The orifice plug should be installed behind this plug.





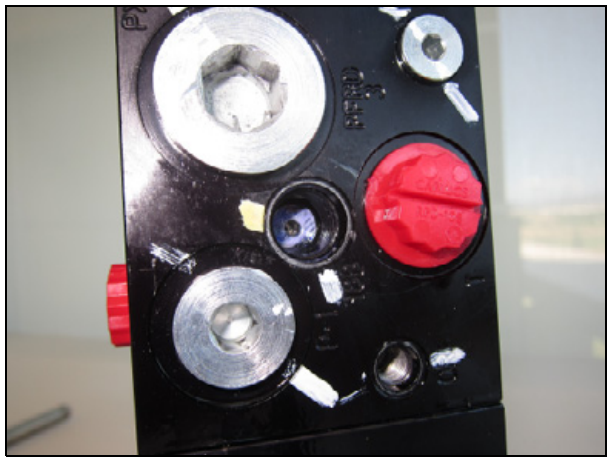
Step 3

Remove the solid plug located behind the 18B plug previously removed.



Step 4

Install the orifice plug in the location behind the 18B plug.



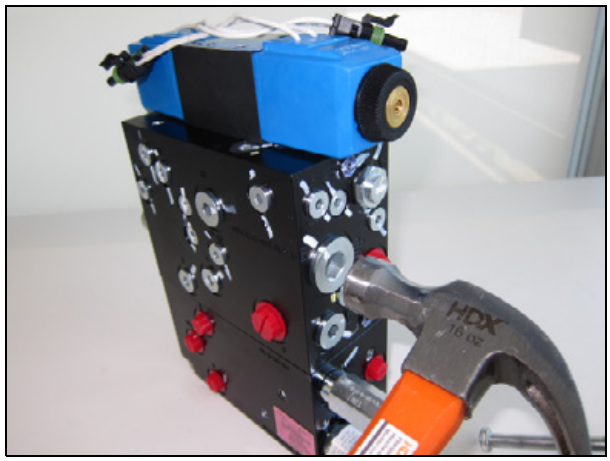
The solid plug may be replaced in the storage location.



Step 5

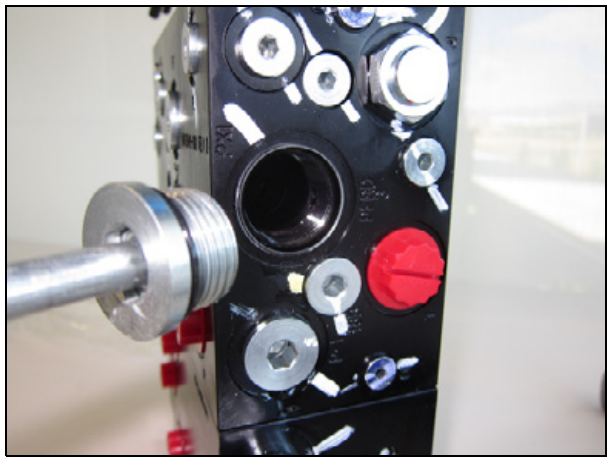
The PFRD cartridge is used as a pressure compensation cartridge in closed center machines.

TIP – Tapping on the plug with a hammer can make the plug easier to loosen.



Step 6

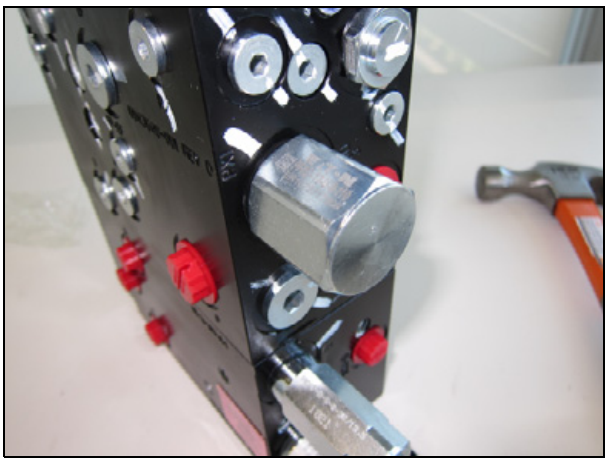
Remove the plug from the PFRD port.



Step 7

Install the PFRD cartridge as shown here.

- 110 PSI PFRD, Trimble P/N 66113

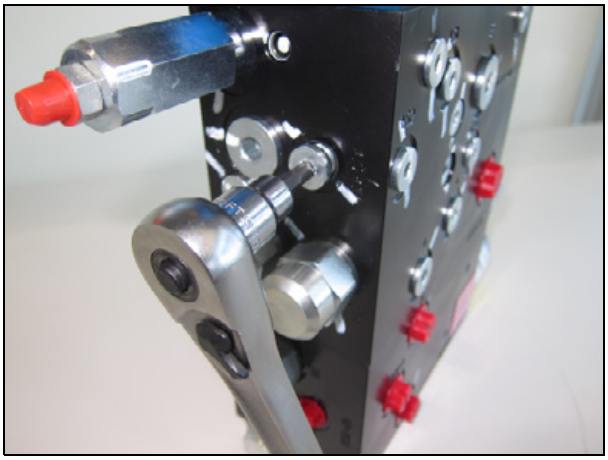


Installing the LS check valve: Machine type 1 only

Step 1

Find and remove the plug from the **LS-CV** port on the manifold, as shown.

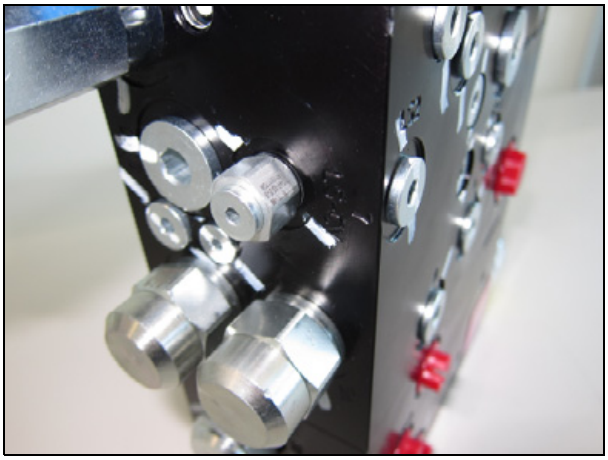
TIP – If the plug is tight, tapping on the plug with a hammer before attempting to loosen may help.



Step 2

Install the load sense check valve as shown.

The LS check valve is Trimble P/N 67113.



Installing the manual override pressure transducer: All machines

Connecting the manual override pressure transducer to the H4 manifold

The GP-SCU port should be used for the manual override pressure transducer.



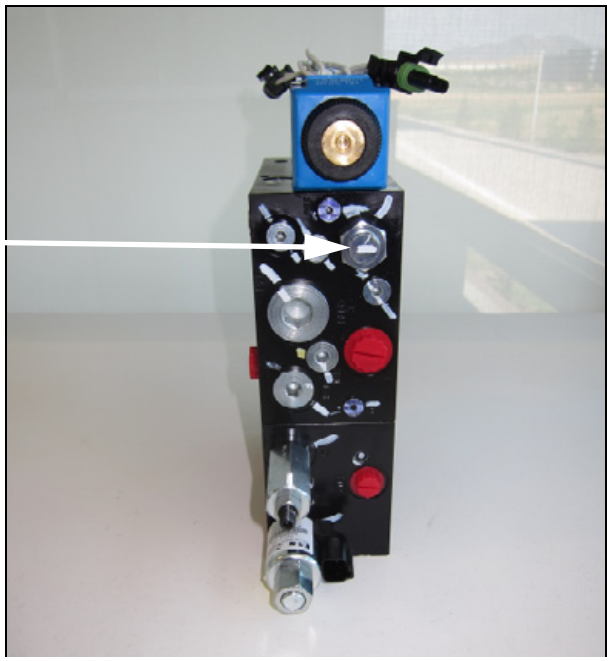
With the isolation block present, the manual override pressure transducer is installed into the GP-SCU port as shown.



Installing the tank check valve: All machines

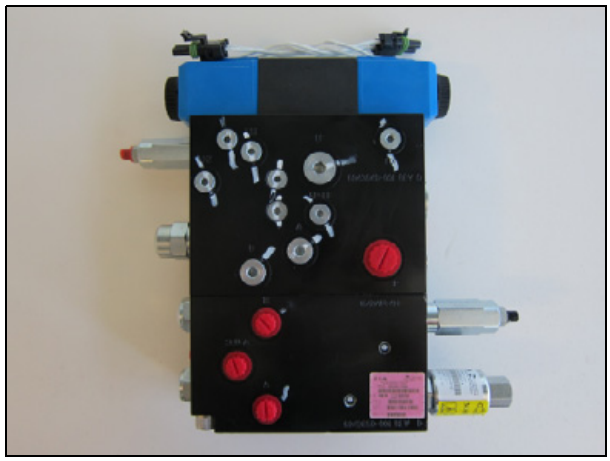
Step 1

Remove the check valve in the manifold and replace with the P/N 114166 check valve provided with the platform kit.



Step 2

Remove the red plugs from the Autopilot manifold.

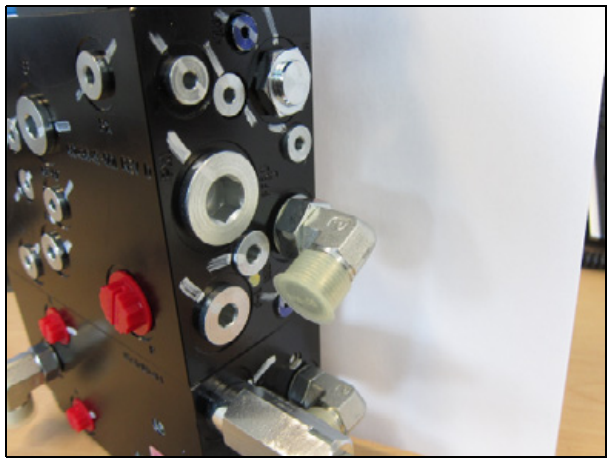




Step 3

Assemble the 90° -8 ORS fitting into the T port of the manifold,

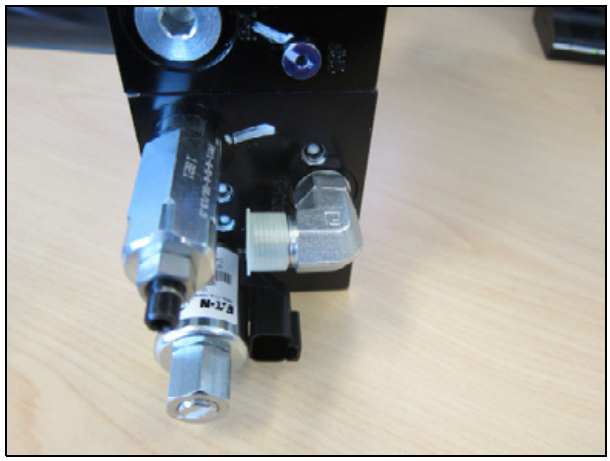
Depending on mounting orientation, adjust the fitting to best fit the hose routing and machine.



Step 4

Install a 90° -6 ors fitting in the SCU-B port.

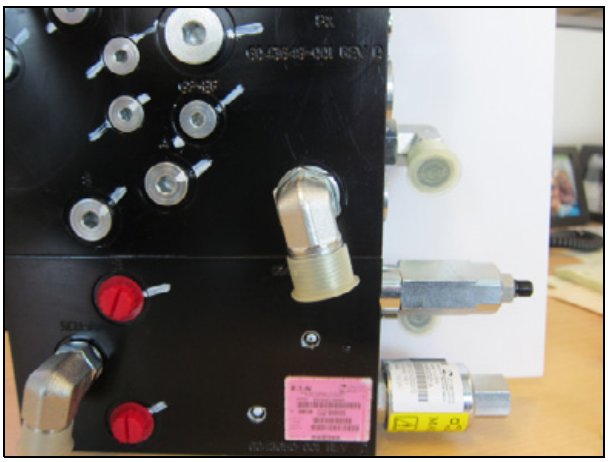
Depending on mounting orientation, adjust the fitting to best fit the hose routing and machine.



Step 5

Assemble the 90° -8 ORS fitting into the P port of the manifold.

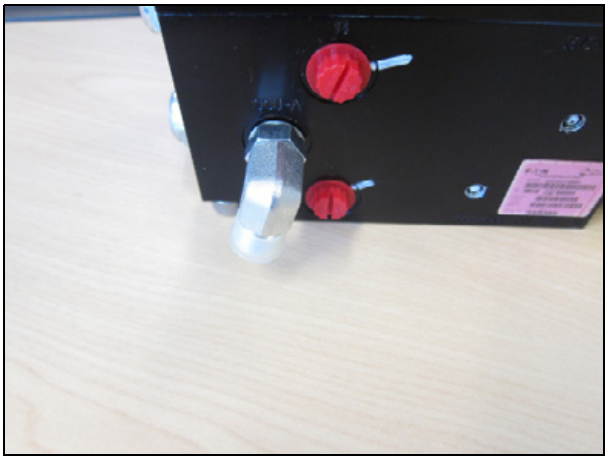
Depending on the mounting orientation, adjust the fitting to best fit the hose routing and machine.



Step 6

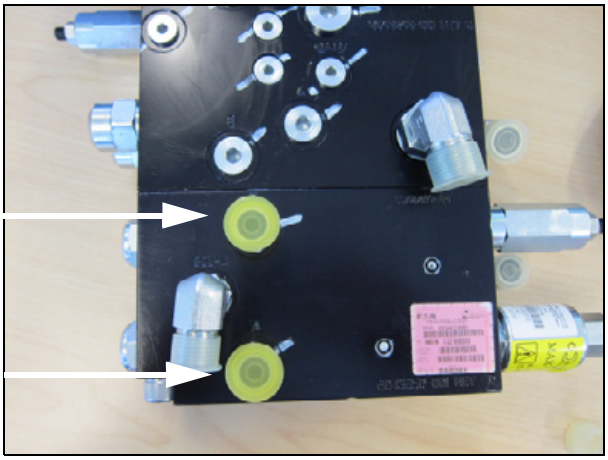
Install a 90° -6 ORS fitting in the SCU-A port.

Depending on mounting orientation, adjust the fitting to best fit the hose routing and machine.



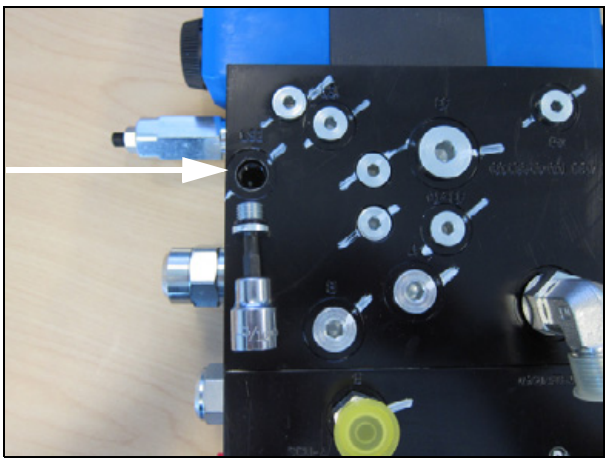
Step 7

Install the straight -6 ORS fittings in the A and B ports of the manifold as shown.



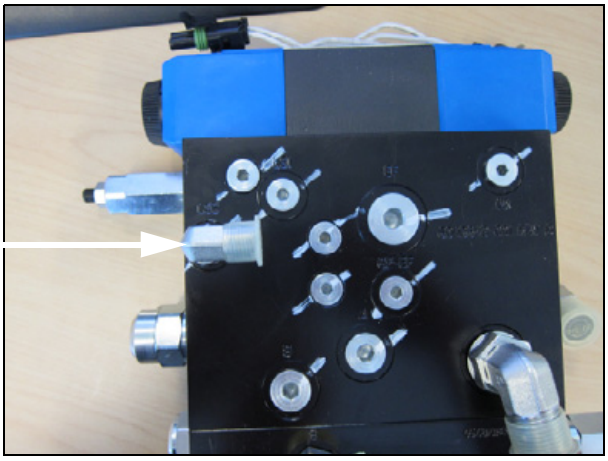
Step 8

Remove the plug from the LS2 port of the Autopilot manifold as shown.



Step 9

Install either the -4 ORS straight fitting or the -4 ORS 90° fitting (shown) into the LS2 port of the Autopilot manifold.



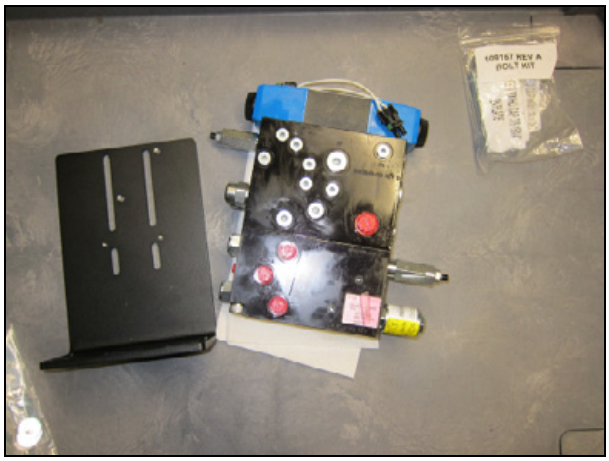
Mounting the hydraulic manifold to the mounting bracket

The manifold should be mounted onto the manifold mounting bracket in one of the ways shown, depending on the actual mounting configuration on the machine.

Options 1-3 are compatible with PUMA, MAXXUM, NHT6xxx, NH T7xxx. NH T6.xxx, NH T7.xxx.

Step 1

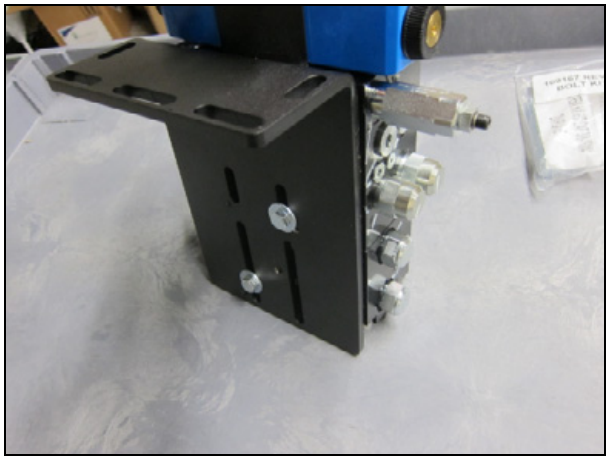
Gather the manifold, bracket and bolt kit.



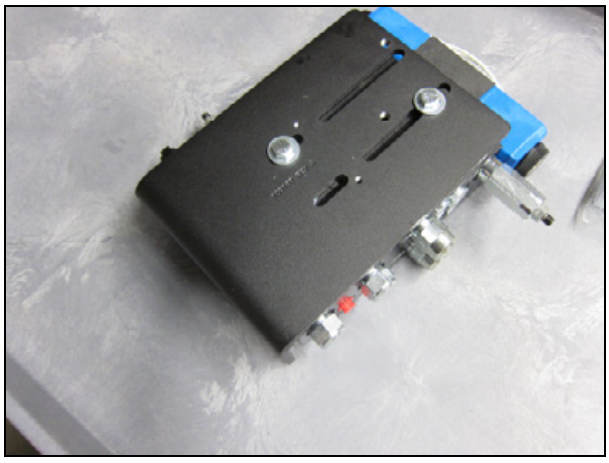
Step 2

- To mount the manifold in front of the valve stack: Use the provided 3/8" mounting hardware to attach the manifold to the bracket as shown.

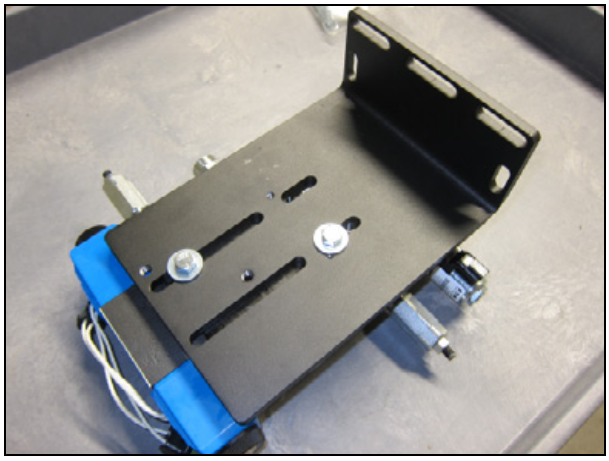
  TIP – For this mounting method, it is better to attach the manifold to the mounting bracket **before** assembling it to the machine.

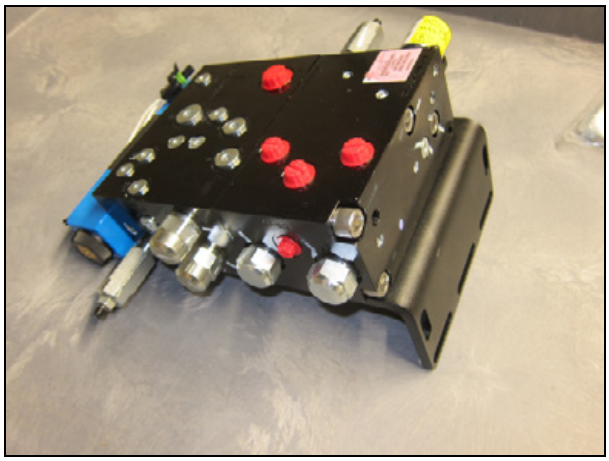


- To install the manifold on top of the valve stack in the upright position: Bolt the manifold to the bracket as shown.



- To mount the manifold on top of the remote stack in the lay flat position: Use the provided 3/8" mounting hardware to install the manifold to the manifold mounting bracket as shown.



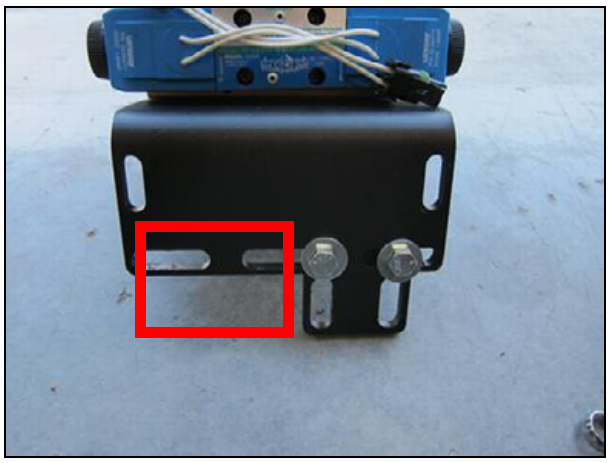


Step 3

For the lying flat on top of the stack position, attach an extra adapter bracket to the manifold mounting bracket.

In this image it is shown in the left side of stack configuration; for the right side of the stack, install it in the area circled in red.

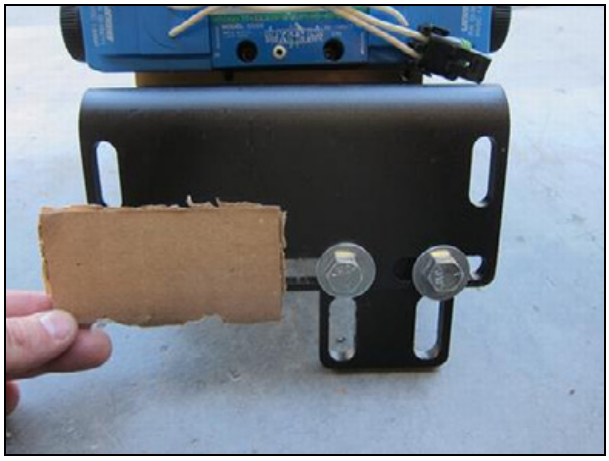
If the mounting bracket is installed on the right side of the stack, no additional cutting is required (shown in the next step).



Step 4

On some machines with power beyond, or if routing is easier that installing the manifold to the left side of the remote stack, trimming is required to clear the existing machine hard lines on the machine.

Mark and cut approximately as shown here for the manifold mounting bracket to clear the existing machine line.

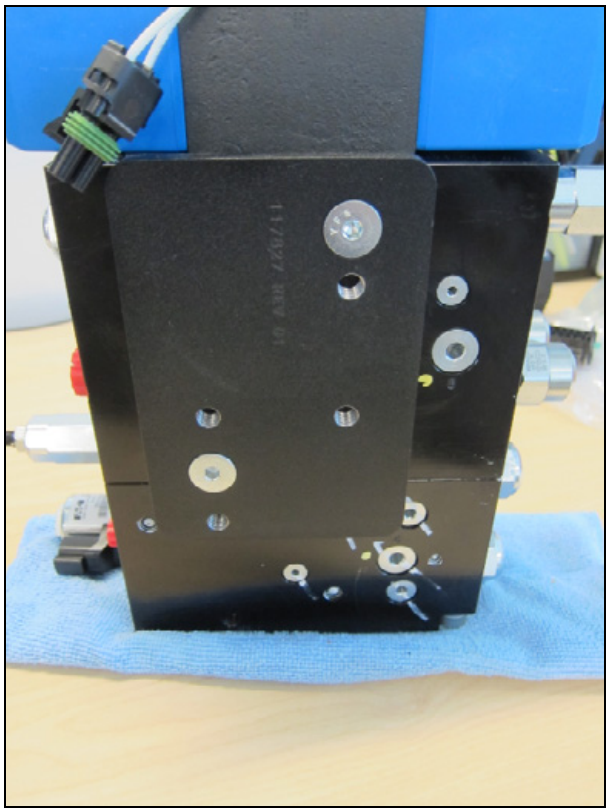


Option 4: Mounting the manifold to the manifold mounting bracket

(For CASE MXU and NH TS1xxA machines and as an alternative to Option 1, page 33*)*

Step 1

Attach the P/N 117827 bracket to the manifold as shown, using the provided hardware.

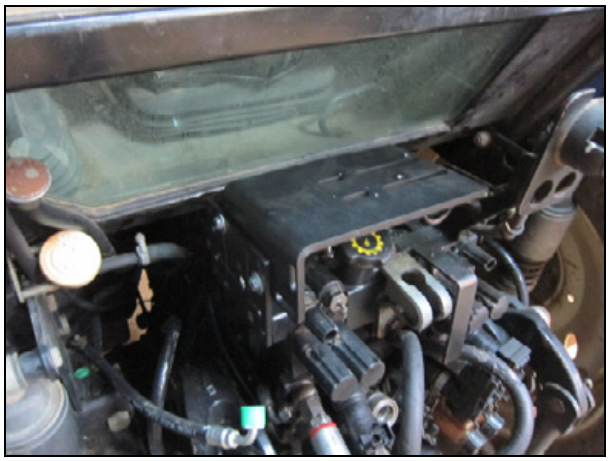


Option 5: Mounting the manifold to the manifold mounting bracket

(For CASE IH MXM and New Holland TM machines)

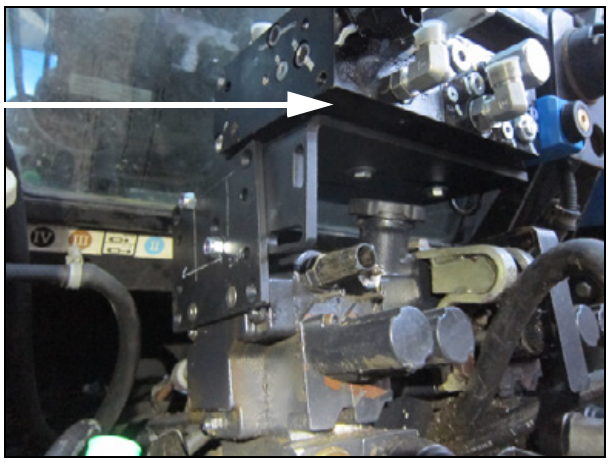
Step 1

Mount the manifold to the P/N 109167 mounting bracket (shown).



Step 2

Attach the manifold to the P/N 109167 bracket with the provided 3/8" hardware as shown with the manifold sitting slightly off the side of the bracket.





Mounting the manifold to the machine with the mounting bracket

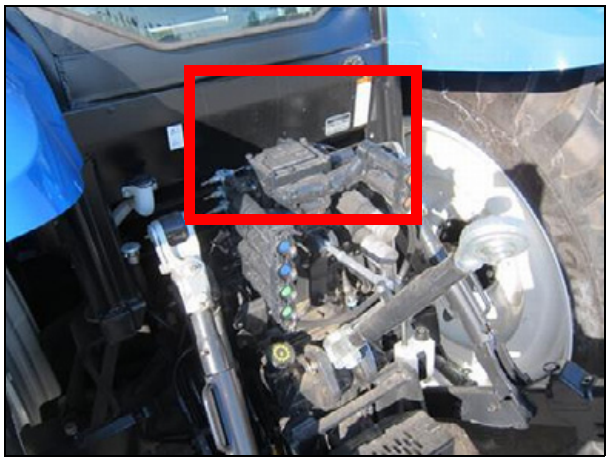
Option 1: Upright on top of stack Autopilot manifold mounting

(For machine with remotes horizontally stacked remotes and cab close to the remote stack)

NOTE – If the manifold is too high to clear the window opening, use Option 4: Mounting the manifold to the manifold mounting bracket, page 31.

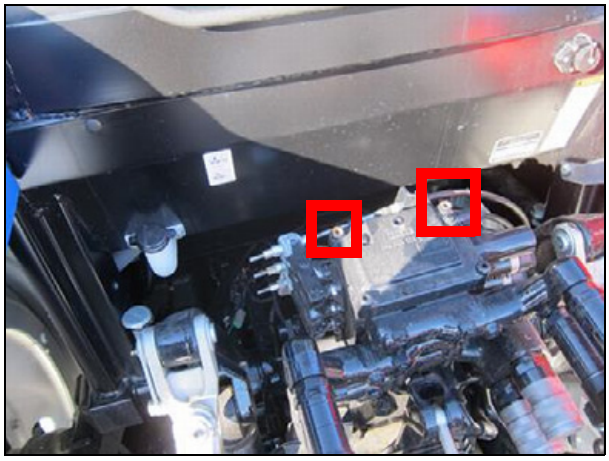
Step 1

The Autopilot manifold will be installed on the machine in the location shown here.



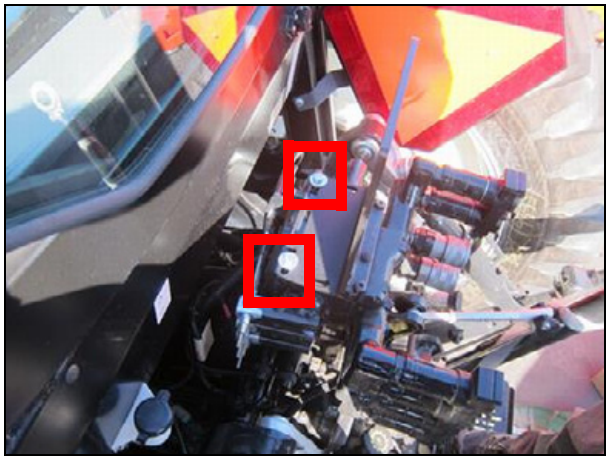
Step 2

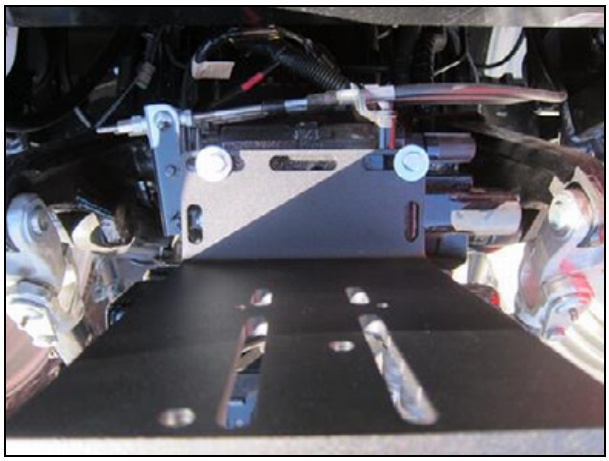
Remove the plastic plugs covering the Autopilot manifold mounting holes.



Step 3

Use the provided M8 hardware to assemble the manifold mounting bracket to the machine.





Step 4

Use the provided 3/8" long bolts and hardware to assemble the Autopilot manifold to the machine.

NOTE – The photos show a previous generation of the manifold but the new manifold will install in this location the same.





Option 2: Upright and forward of stack Autopilot manifold mounting

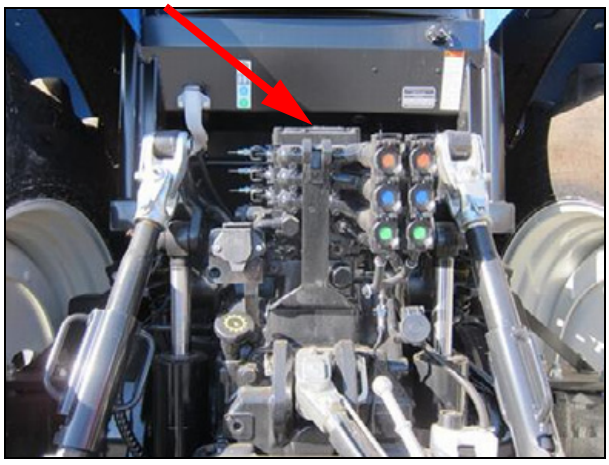
(For machines with remotes horizontally stacked remotes)

Step 1

Larger machines with vertically stacked remote stacks have enough space to install the manifold in front of the stack.

Install the Autopilot manifold in the location shown here.





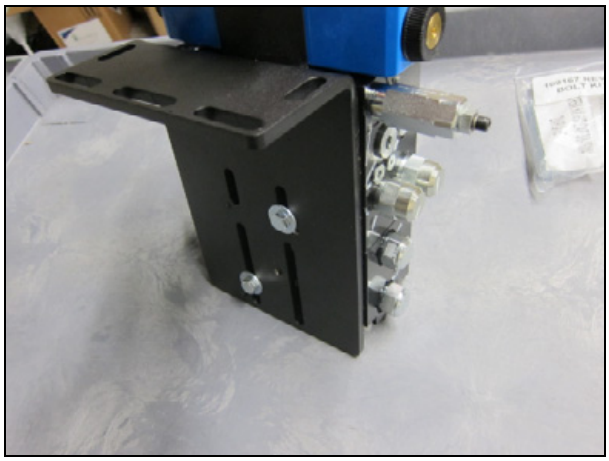
Step 2

Remove the plastic plugs covering the Autopilot manifold mounting holes.



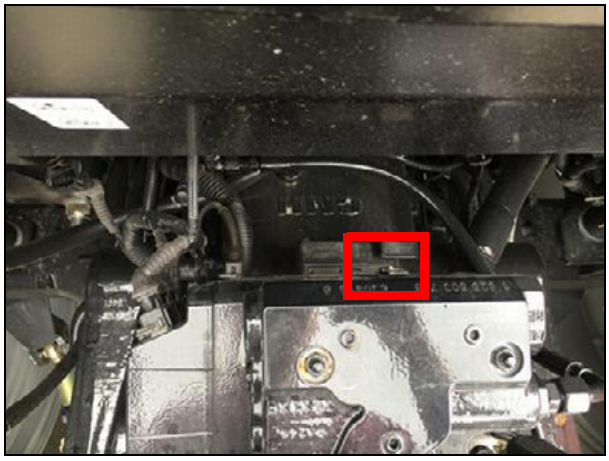
Step 3

Before assembling the manifold mounting bracket to the machine, use the provided 3/8" bolts to assemble the Autopilot manifold to the manifold mounting bracket.



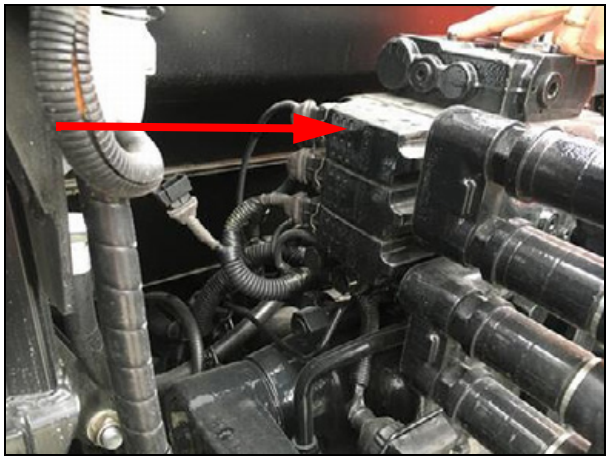
Step 4

On machines with electronic remotes, you must install the LS line to the machine before attaching the manifold mounting plate to the machine.



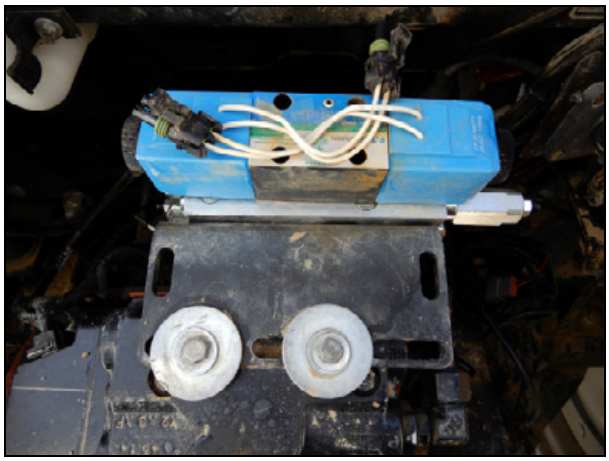
The LS line connection point on the machine will sit behind the manifold mounting plate once the plate is installed.

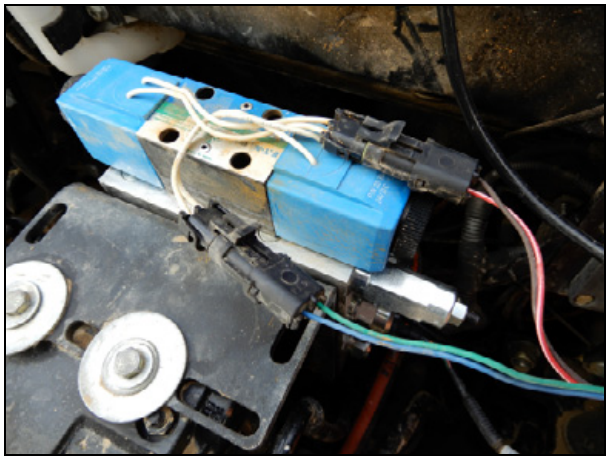
See also Connections for Type 2 machines: Compatible with PUMA, MAXXUM, NH T6xxx, NH T7xxx. NH T6.xxx, NH T7.xxx, MXU and NH TSA, page 49, Step 1 through Step 6.



Step 5

Use the provided M8 bolts to attach the Autopilot manifold DCBV assembly to the machine.





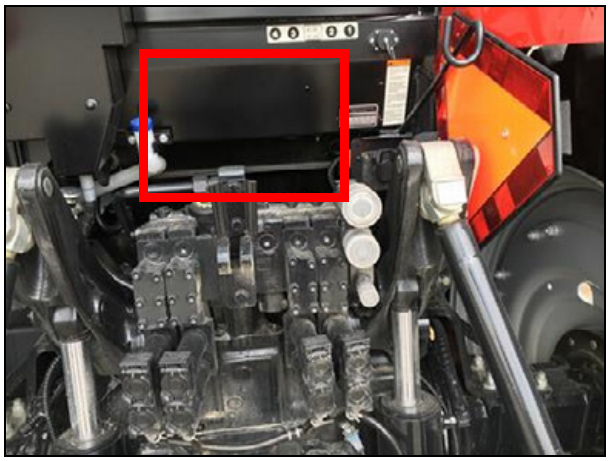
Option 3: Lying flat on top of stack Autopilot manifold mounting

(For machines with horizontally stacked remotes)

Step 1

On machines with horizontally stacked remotes, the Autopilot manifold is installed on top of the valve stack as shown here.

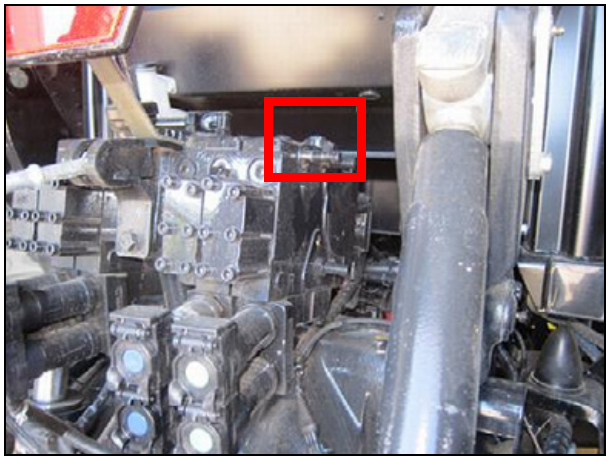
The manifold mounting bracket may be assembled to either side of the valve stack but may require modification on the left side to clear the hard line.



Step 2

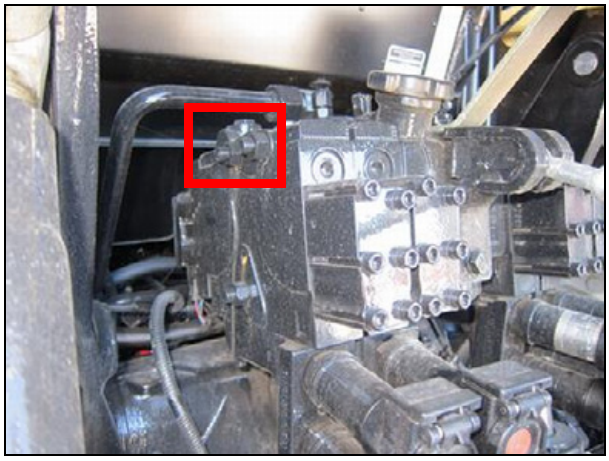
Determine which side the Autopilot manifold mounting bracket will mount to and then remove the two nuts.

See also Connections for Type 1 machines, page 45, Step 1 through Step 4.



Before installing the plate to the machine complete the Pressure and LS line connection to the machine. You may use the optional swivel 90° fittings to install the lines so that they are low enough to clear the manifold mounting.

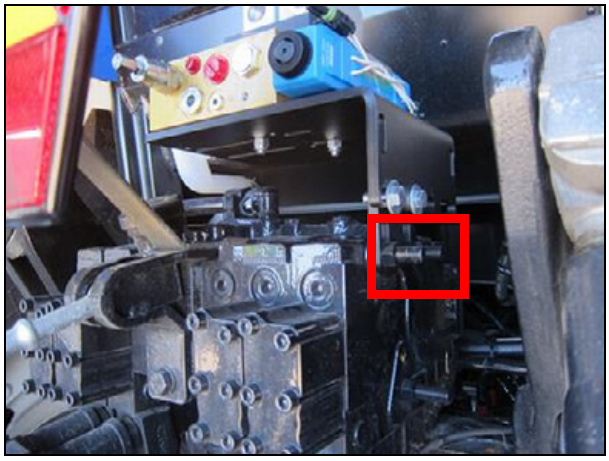
NOTE – On some machines the studs may need to be replaced with longer studs (not provided) to accommodate mounting of the Autopilot manifold mounting bracket.

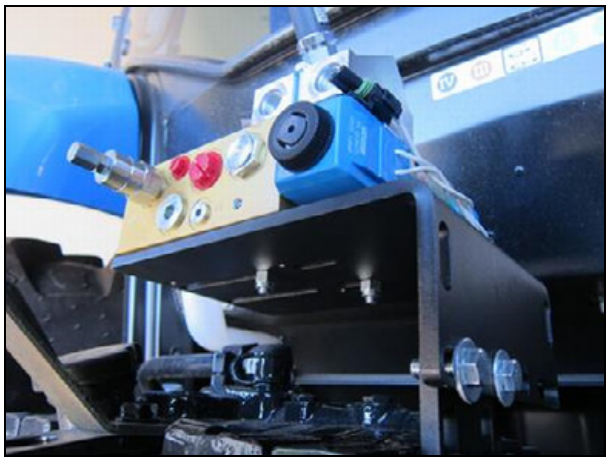


Step 3

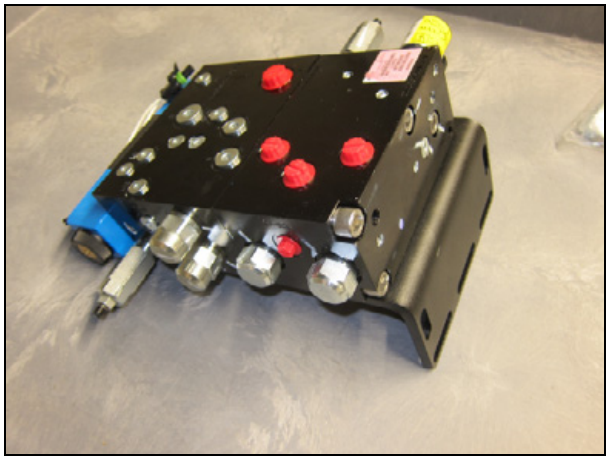
For installations on the right side of the valve stack, install the Autopilot manifold to the machine as shown.

If you are installing the Autopilot manifold on the left side, you must install the small plate on the other side of the manifold mounting plate (as shown previously in the instructions).





NOTE – The photos show a previous generation of the manifold; the new manifold will install in this location, but with the orientation on the mounting plate reversed.

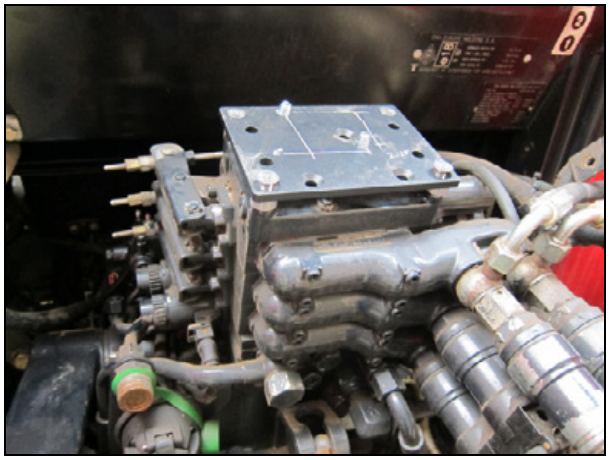


Option 4: Attaching the manifold to the machine

Step 1

Place the short 3/8" bolts (provided with the P/N 117412 bracket) through the 59168 plate.

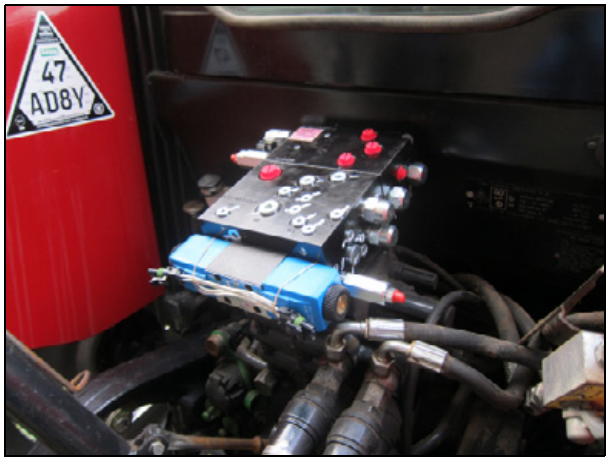
Attach the P/N 59168 plate to the machine using the provided m8 screws, with the aluminum spacers between the plate and the mounting hole to provide clearance for the bolt heads.



Step 2

Position the manifold on the machine as shown and then attach the manifold to the machine with the 3/8" bolts that protrude through the 59168 plate.

Using a wrench tighten the bolts securing the manifold to the machine.



Option 5: Attaching the manifold to the machine

NOTE – This option requires 2 remotes to the left of center. If only one exists, one remote can be moved from the right side to the left side to accommodate; if three remotes are present, check clearance to the 3PT hitch lift arm before mounting the manifold.

Step 1

On the left side of the remote stack, remove the plug and clean the two holes shown.

The manifold mounting bracket will attach to these holes.



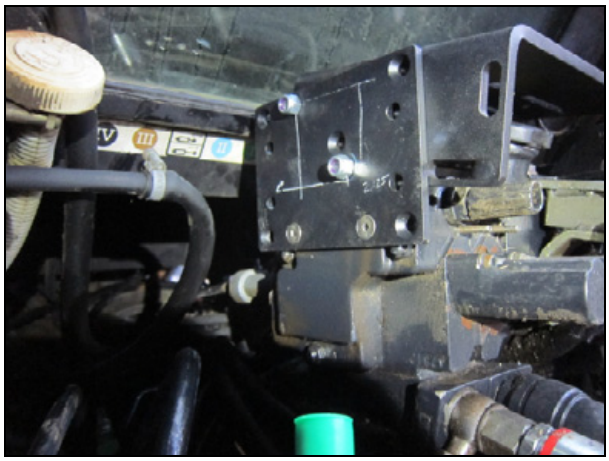
Step 2

Attach the 59168 bracket to the machine as shown, with the M8 hardware provided with the bracket.



Step 3

Attach the manifold on the P/N 109167 bracket to the previously installed plate using the 3/8" hardware included with the 109167 bracket kit.





Connecting the hydraulic lines

Steering line connections

Step 1

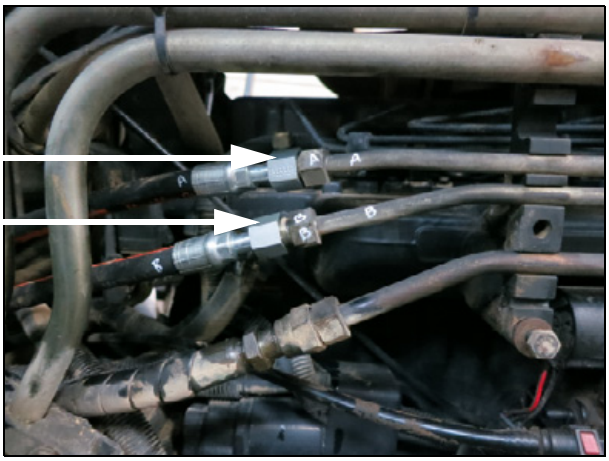
Locate the clamped steel lines on the left side of the engine. Label both sides of the lines **A** and **B** / **L** and **R**.



NOTE – On the MXM and New Holland TM machines the steering line connection point is on the right side of the engine as shown.

Apart from this change, the proceeding steps for the steering connections stay the same.





Step 2

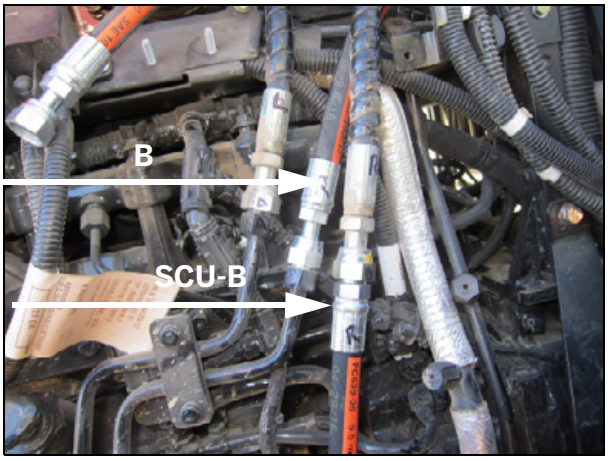
Disconnect the B / R hose as shown.



Step 3

Connect the B hose to the hard line as shown.

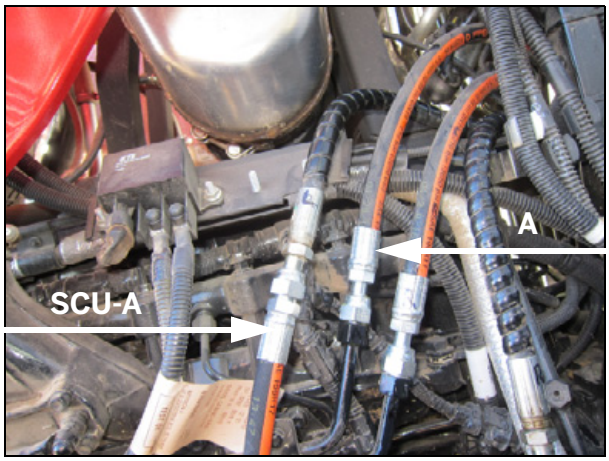
Connect the SCU-B hose to the line hose removed from the hard line.



Step 4

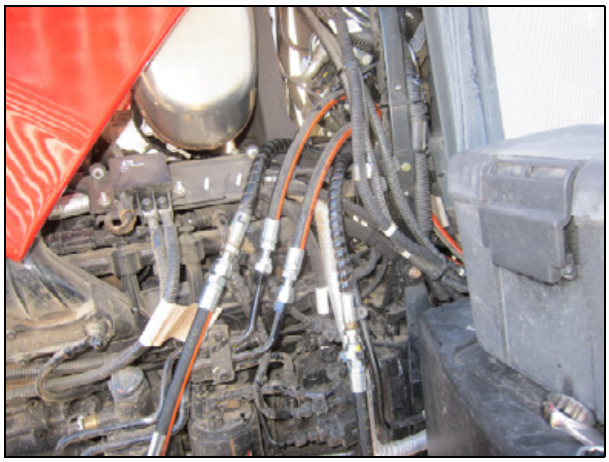
Disconnect the machine A line from the hard line and then connect the A hose to the hard line as shown.

Connect the SCU-A hose to the line hose removed from the hard line.



Step 5

Route the other ends of the A,B and SCU-A, SCU-B lines under the cab to the Autopilot manifold connection points.





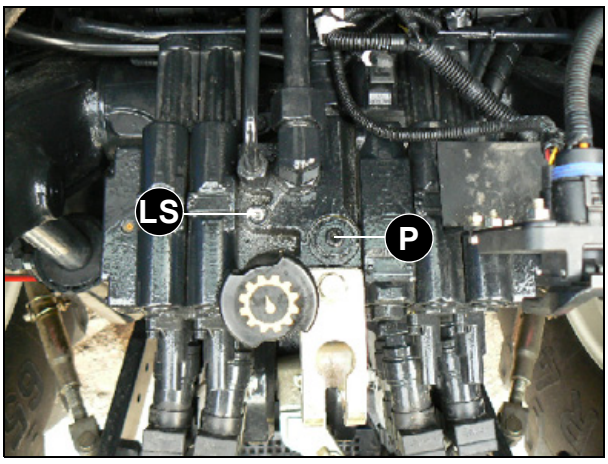
Pressure, Tank, and LS connections

Depending on the type of machine that you have, use one of the following options. To determine the correct option to use, see Vehicle types, page 16.

Connections for Type 1 machines

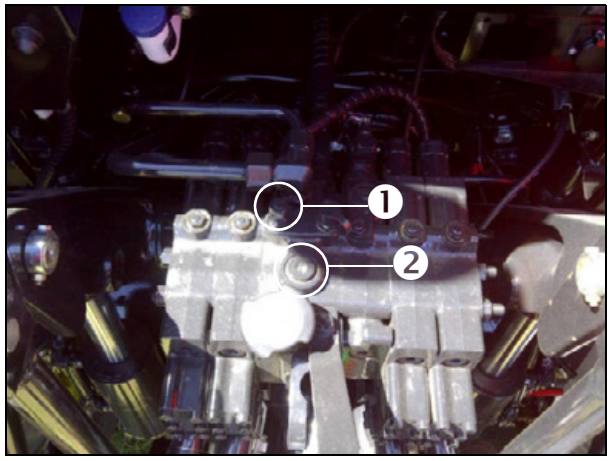
Step 1

Locate the Power Beyond P and LS ports on the valve stack at the rear of the tractor.



For machines with electronic remotes:

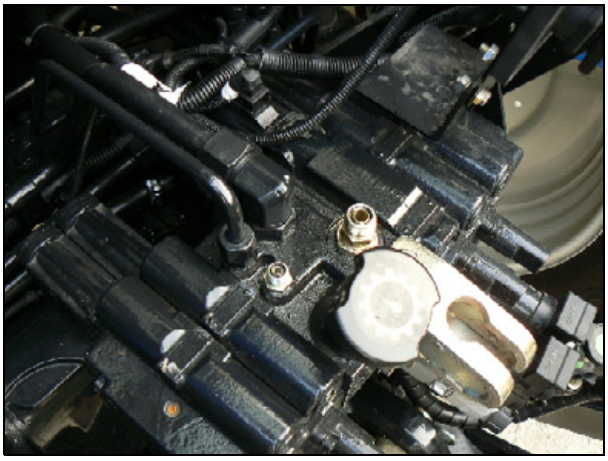
- ❶ Load sense
- ❷ Pressure



Step 2

Remove the plug from the P port and install a -8 ORFS straight fitting.

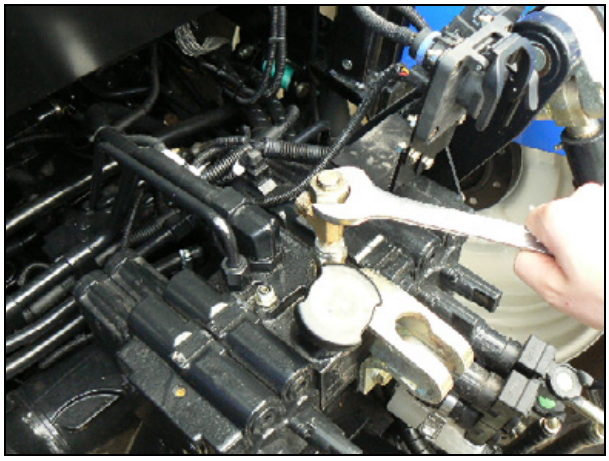
Remove the plug from the LS port and install a -4 ORFS straight fitting.



Step 3

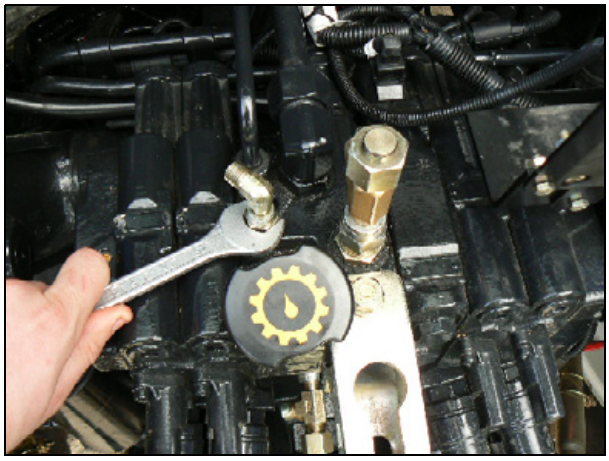
Install a -8 swivel tee on the P port and a -8 ORFS plug to the run side of the tee.

On machines with the P/N 109532 it may be needed to install a swivel 90° fitting here before installing the run tee fitting.



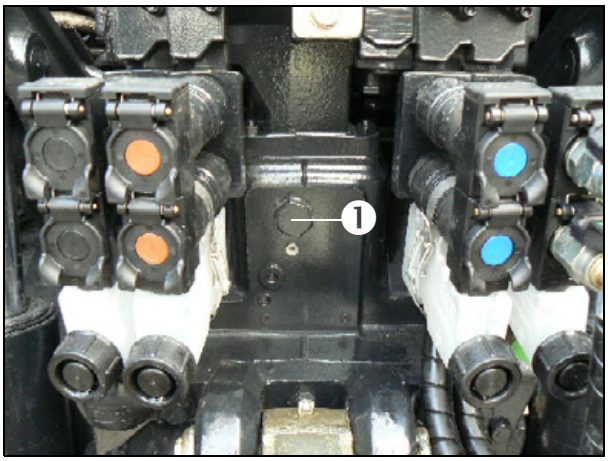
Step 4

Install a -4 ORFS 90° elbow in the LS port.



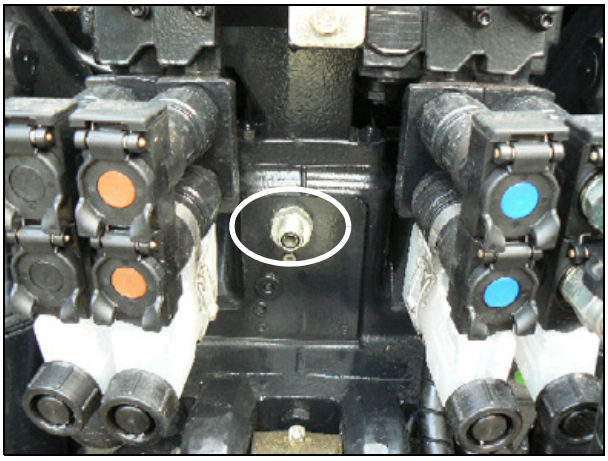
Step 5

Locate the T port ❶ at the back of the tractor, underneath the valve stack.



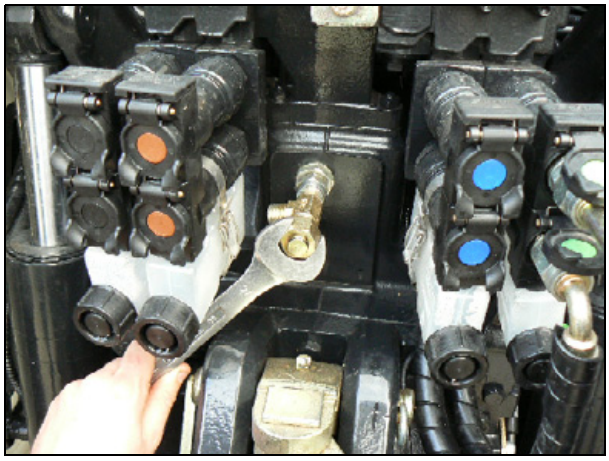
Step 6

Install a -8 straight fitting into the T port.



Step 7

Install a -8 swivel tee on the T port and a -8 ORFS plug to the run side of the tee.



Step 8

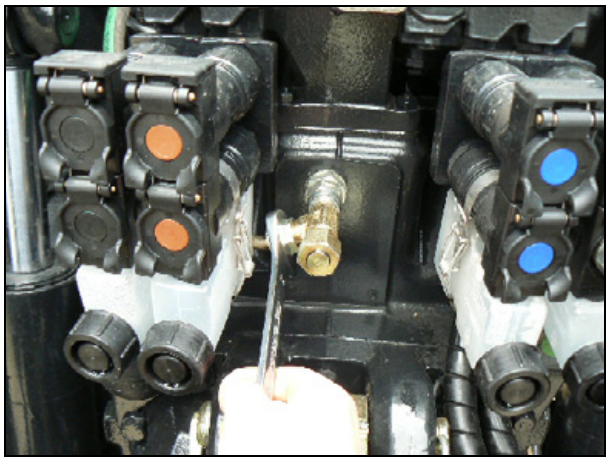
Locate the provided 113" P hose, the 113" T hose, and the 113" LS2 hose.

Route them underneath the cab from the back of the tractor toward the Autopilot manifold.



Step 9

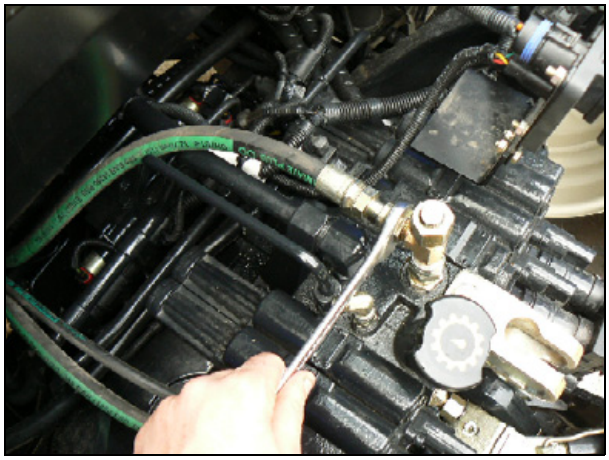
Connect the 45° end of the T hose to the branch of the tee on the T port.



Step 10

Connect the straight end of the P hose to the branch of the tee on the P port.

Keep the connection loose at this stage.



Step 11

Connect the straight end of the LS hose to the 90° elbow on the LS port.

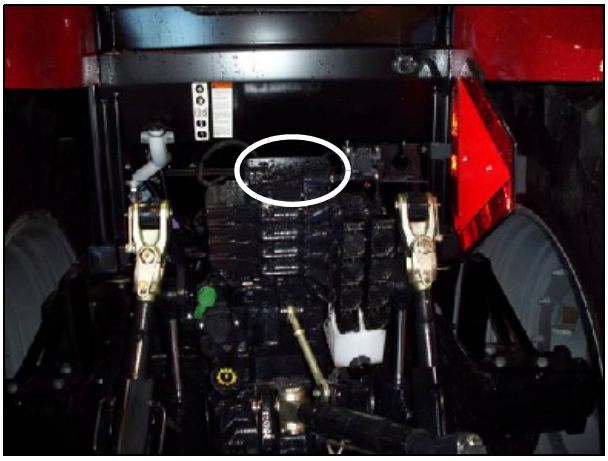
NOTE – This tractor is fitted with a soft cab suspension that can cause large cab movements in rough terrain conditions. Therefore, attach the hoses to the chassis rather than the cab to prevent the hoses from being damaged.



Connections for Type 2 machines: Compatible with PUMA, MAXXUM, NH T6xxx, NH T7xxx. NH T6.xxx, NH T7.xxx, MXU and NH TSA

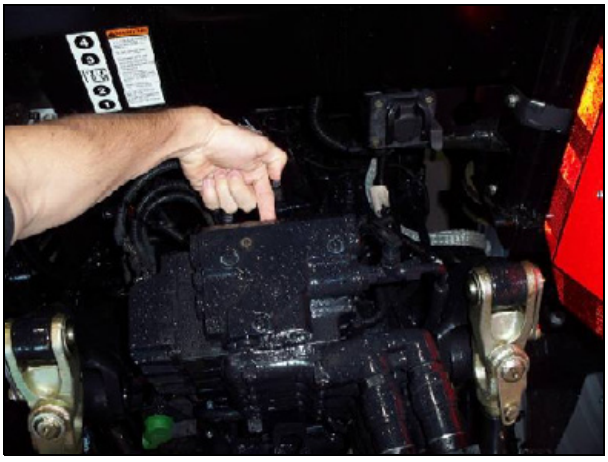
Step 1

At the rear of the machine locate the remote valve stack; this is where you will make the pressure, tank, and load sense connections.



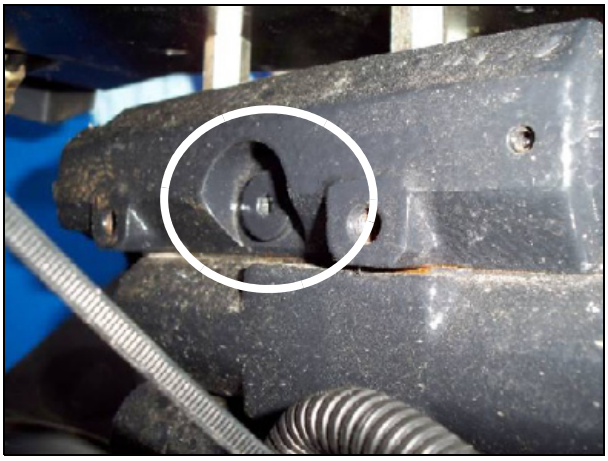
Step 2

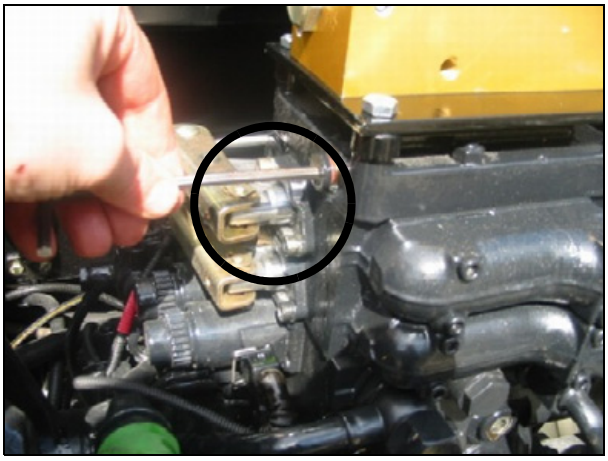
The LS connection point is on the back of the valve stack, between the cab and the valve stack, as shown.



Step 3

Locate and remove the plug in the LS connection port.





Mechanical remote valve stack LS port

Step 4

Install the supplied fitting into the LS connection port.

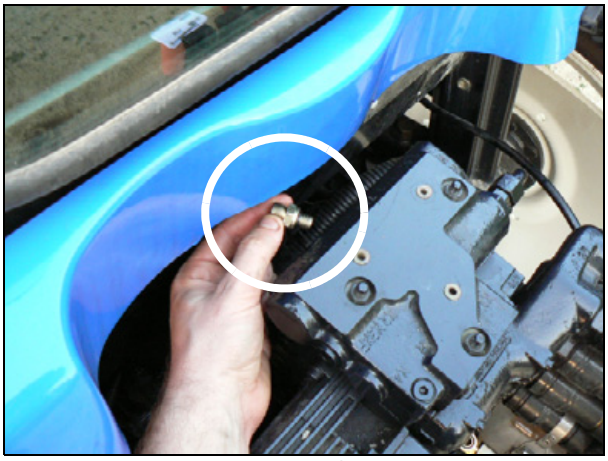


Step 5

Insert an M12 ORB to -4 ORFS straight adaptor.



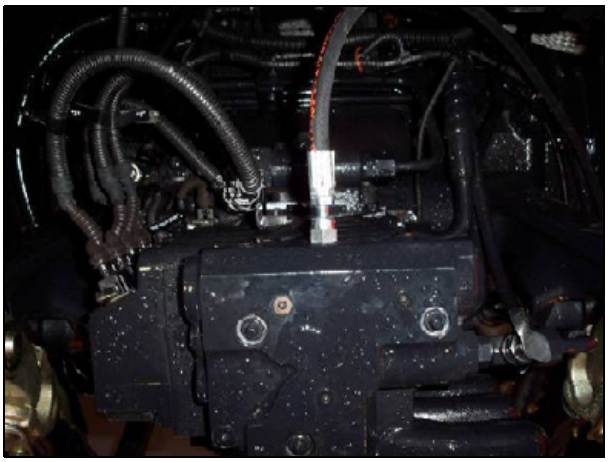
Adaptor in LS port:
Mechanical remote vave stack



Adaptor in LS port:
Electro-hydraulic valve stack

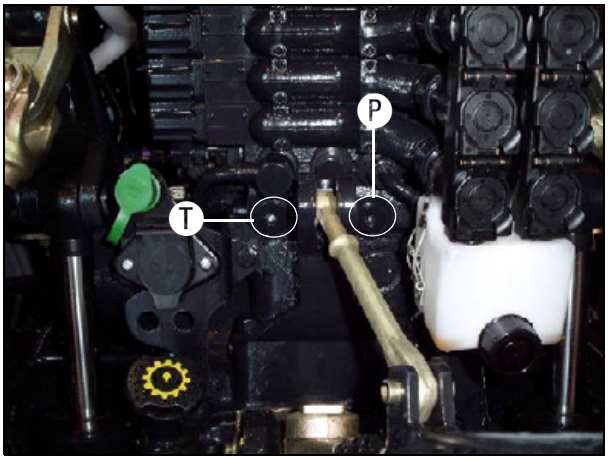
Step 6

Attach the straight end of the LS hose to the fitting installed in Step 4 above, in the LS connection port.



Step 7

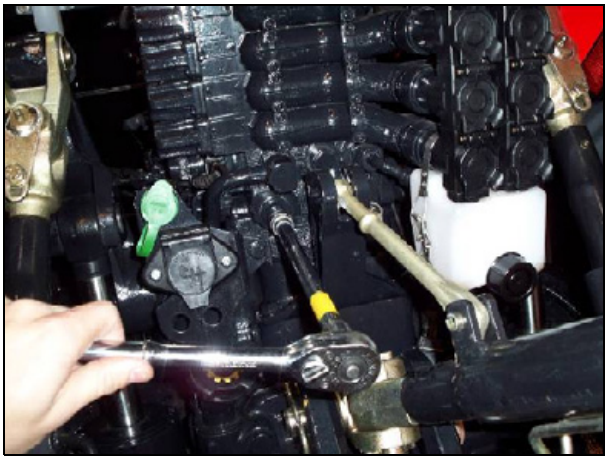
The pressure and tank connection points are located in the area just below the valve stack, as shown.



Step 8

Remove the plugs in the P and T ports.

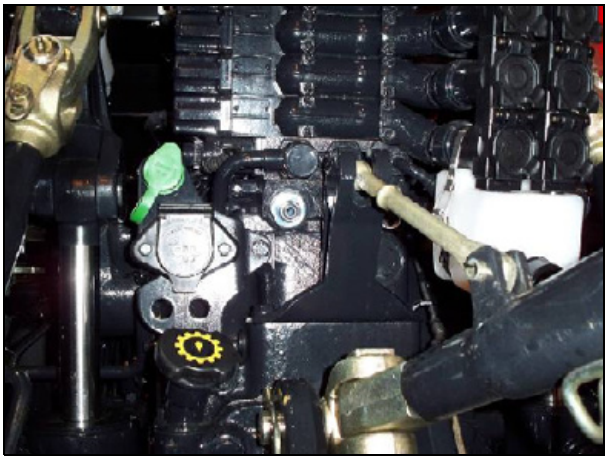
Tapping on the plug with a mallet may help to loosen them.





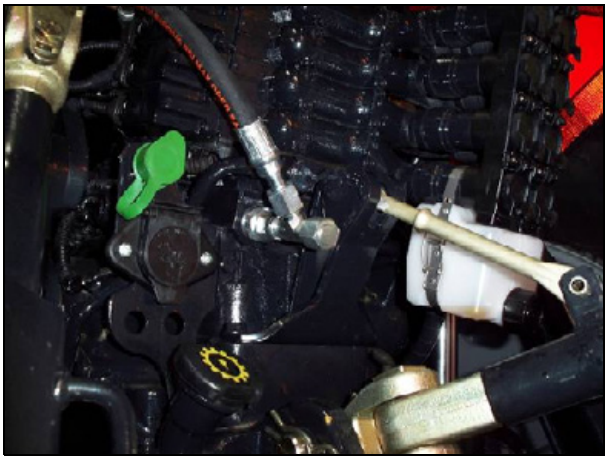
Step 9

Assemble the supplied M27 x 2.0 -8 ORS fitting into the tank port, as shown.



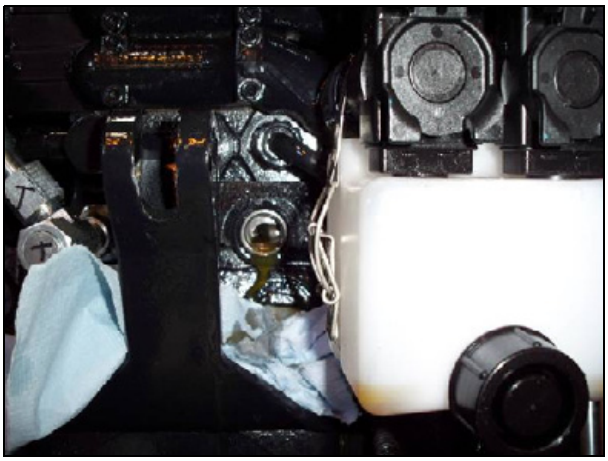
Step 10

Attach the straight end of the T hose to the branch of the run tee fitting.



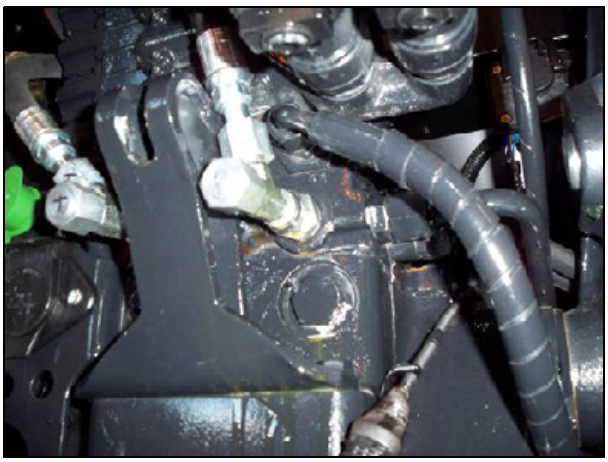
Step 11

Remove the plug in the P port of the machine.



Step 12

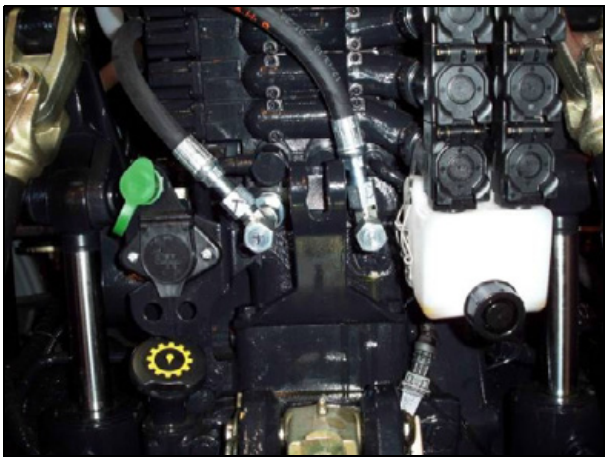
Assemble the provided M22 fitting, then assemble the run tee fitting (with the cap on the end of the run tee fitting).



Step 13

Assemble the straight end of the P hose to the branch of the run tee fitting on the P port.

Route all of the hoses under the cab to the Autopilot manifold.



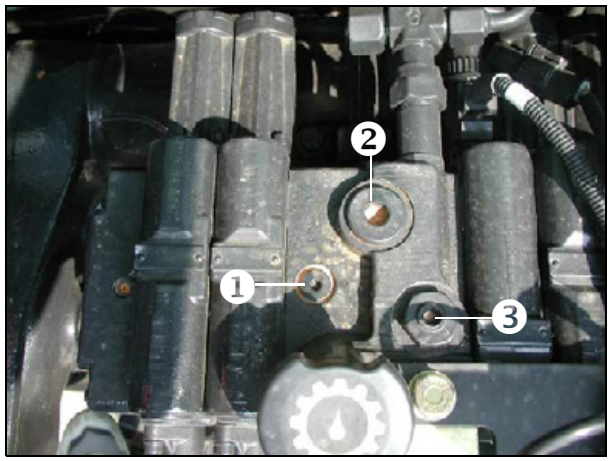
Connections for Type 2 machines: Compatible with Case IH MXM and New Holland TM series of machines

Step 1

Locate the plugged ports on the power beyond slice at the rear of the cab next to the oil fill cap.

Remove the existing plugs from the:

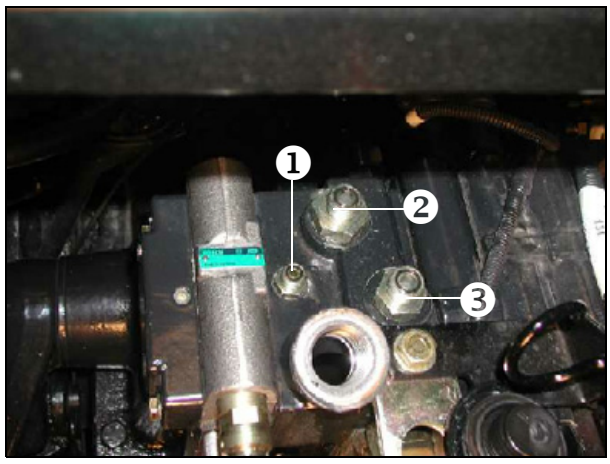
- LS port (❶)
- T port (❷)
- P port (❸)



Step 2

Install the following:

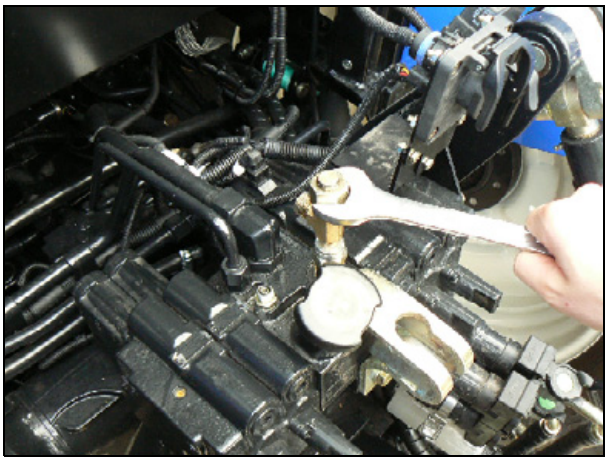
- M12 x -4 ORS straight adaptor in the LS port (❶).
- M27 x -8 ORS straight adaptor in the T port (❷).
- M22 x -8 ORS straight adaptor in the P port (❸).



Step 3

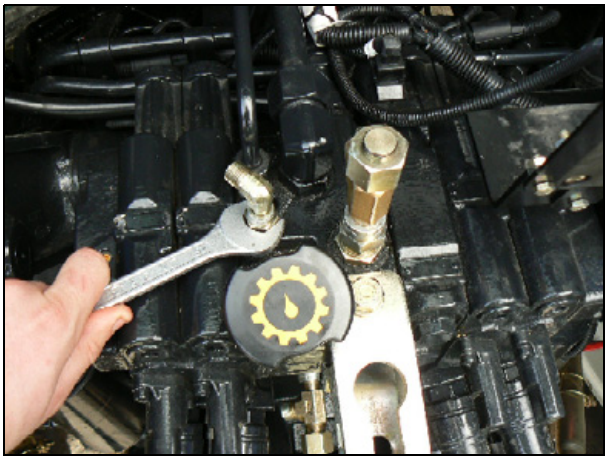
Install a -8 swivel tee to the P and T ports and a -8 ORFS plug to the run side of the two tees.

NOTE – You can use a swivel 90° fitting to clear the manifold mounting.



Step 4

Install a -4 ORFS 90° elbow to the LS port.

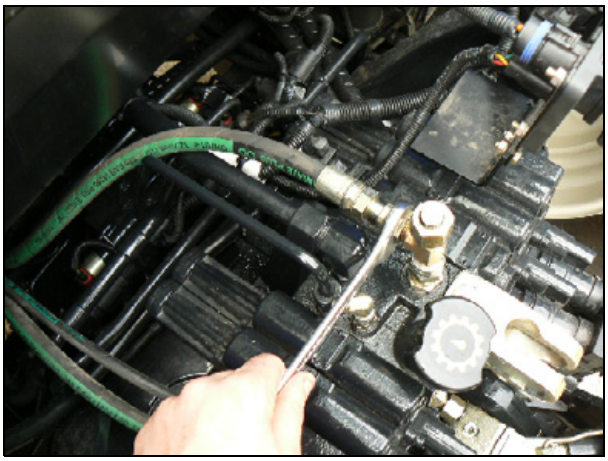


Step 5

Connect the straight end of the P and T hoses to the branch of the tees on the P and T ports.

NOTE – Keep the connection loose at this stage.

NOTE – You can use a swivel 90° fitting to clear the manifold mounting.



Step 6

Connect the straight end of the LS hose to the 90° elbow on the LS port.



Alternate LS connection when the LS port on the valve stack will not operate

Step 1

Locate the Shuttle Tee on the pump compensator and remove the plug.

NOTE – If all the branches of the Shuttle Tee are populated, remove one of the hoses which is connected to the tee and add an extra shuttle tee (not provided in the kit).



Step 2

Install a -4 ORFS 90° elbow in the LS port.



Step 3

Route the LS hose from the LS2 port on the Autopilot manifold to the pump compensator and connect it to the elbow fitting as shown

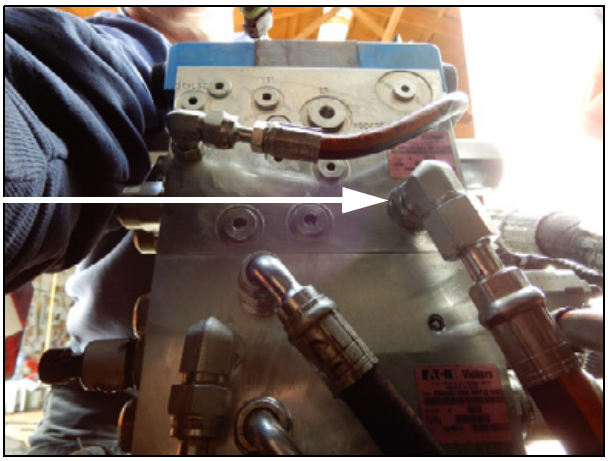
NOTE – The LS hose from the kit may be too short to reach the pump compensator and an extra male-to-female ORFS 4 hose will be needed to extend the original LS hose (this extra hose is not provided in the kit).



Connecting hoses to the Autopilot manifold: Upright in front of stack (option 1) and above stack (option 2) mounting methods

Step 1

Connect the straight end of the P line to the 90° fitting on the P port of the Autopilot manifold as shown.





Step 2

Connect the straight end of the LS line to the 90° fitting on the LS2 port as shown.



Step 3

Connect the straight end of the T line to the 90° fitting on the T port as shown.



Step 4 .

Connect the straight end of the SCU-B line to the 90° fitting on the SCU-B port as shown.



Step 5 .

Connect the straight end of the SCU-A hose to the 90° fitting on the SCU-A port as shown.

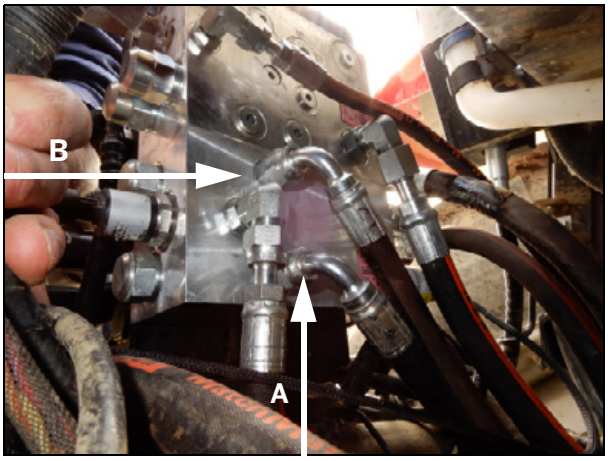
The other ends of these hoses are routed to the connections going to the machine steering orbitrol hand pump.



Step 6 .

Connect the 90° ends of the A and B hoses to the straight fittings on the A and B ports of the Autopilot manifold as shown.

The other ends of these hoses are routed to the connections going to the machine steering cylinder.



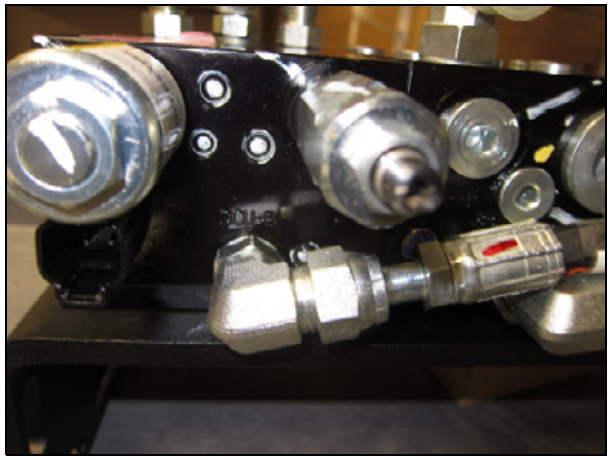
Connecting hoses to the Autopilot manifold: Lay flat onto stack mounting method (option 3)

The manifold is transverse mounted.

Step 1

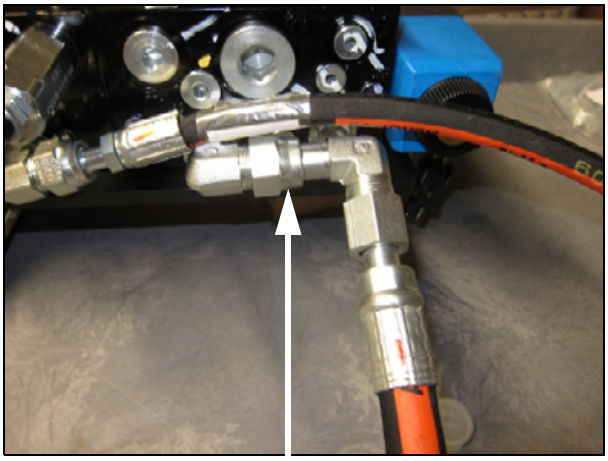
Connect the straight end of the SCU-B line to the 90° fitting on the SCU-B port as shown.

Route the other ends of this hose to the connections going to the machine steering orbitrol hand pump.



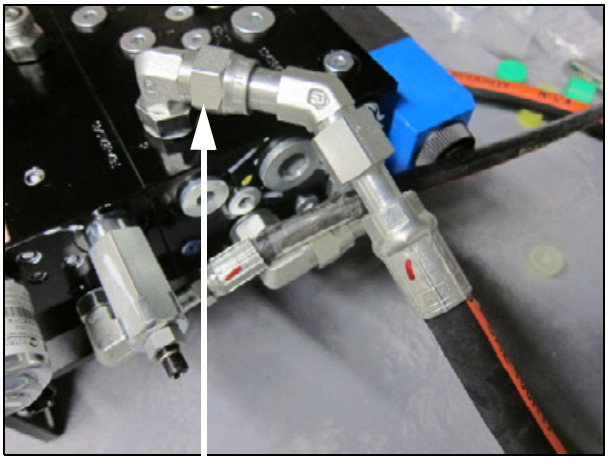
Step 2

Connect the provided swivel 90° fitting to the 90° fitting on the T port of the Autopilot manifold. Then connect the straight end of the T hose as shown.



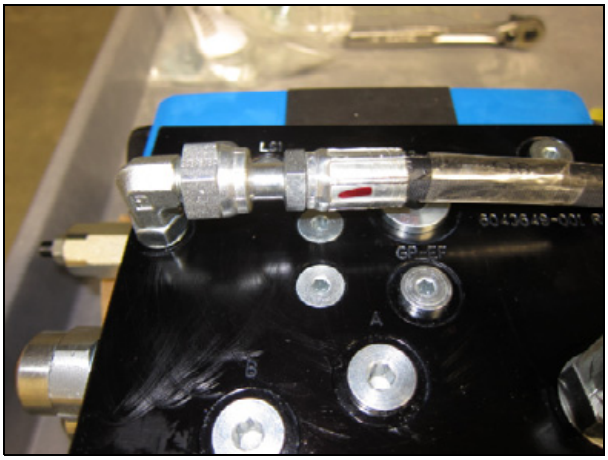
Step 3

Connect the provided swivel 45° fitting to the 90° fitting on the P port of the Autopilot manifold. Then connect the straight end of the P hose as shown.



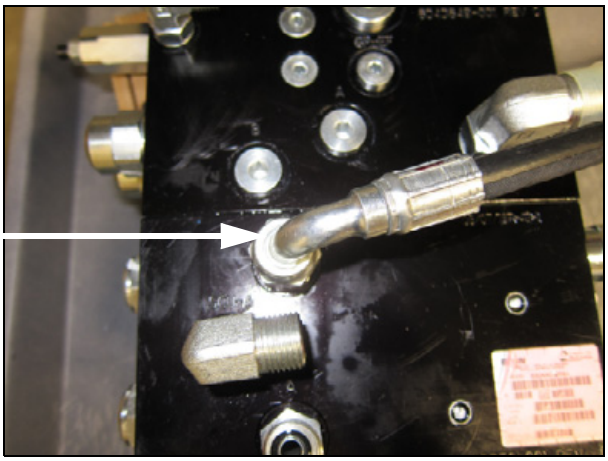
Step 4 .

Connect the straight end of the LS line to the 90° fitting on the LS2 port as shown.

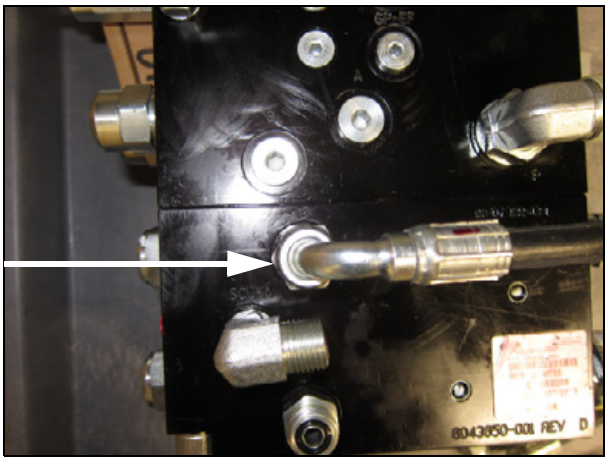


Step 5 .

Connect the 90° ends of the A and B hoses to the straight fittings on the A and B ports of the Autopilot manifold as shown.



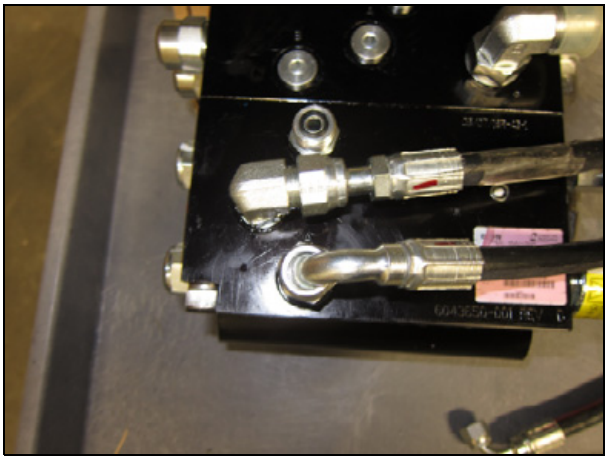
The other ends of these hoses are routed to the connections going to the machine steering cylinder.



Step 6 .

Connect the straight end of the SCU-A line to the 90° fitting on the SCU-A port as shown.

The other ends of this hose is routed to the connections going to the machine steering orbitrol hand pump.



⚠ **CAUTION –** Make sure all the lines are routed so they are not pinched or pulled and do not contact any moving parts on the machine.

Connecting hoses to the Autopilot manifold: Lay flat mounting (option 4)

In this option the manifold is rotated backwards from the upright position.

Photos for this connection type are not shown in the manual.

NOTE – Attach the hose to the machine in a similar manner to that of option 1 and option 2 (page 58).

Connecting hoses to the Autopilot manifold: Lay flat mounting method (option 5)

The manifold is transverse mounted.

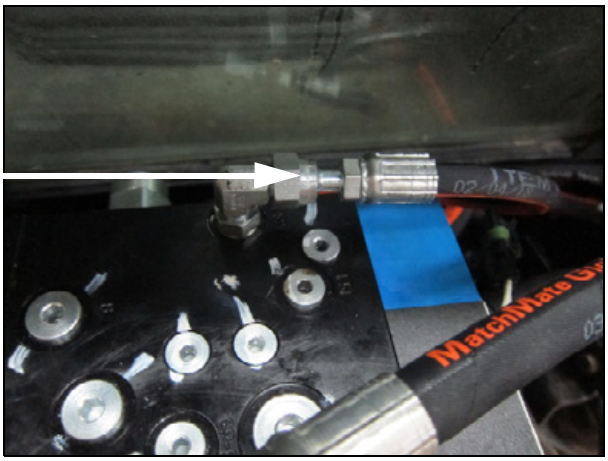
Step 1

Route the P hose from the P connection at the machine and connect the other end of the P line to the P port on the Autopilot manifold.



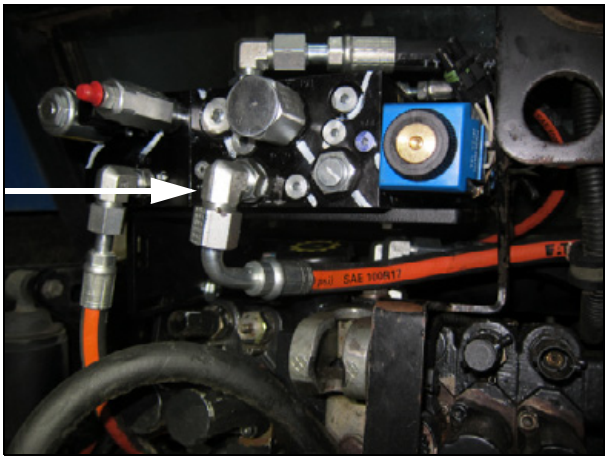
Step 2

Route the LS hose from the LS connection at the machine and connect the other end of the LS line to the LS2 port on the Autopilot manifold.



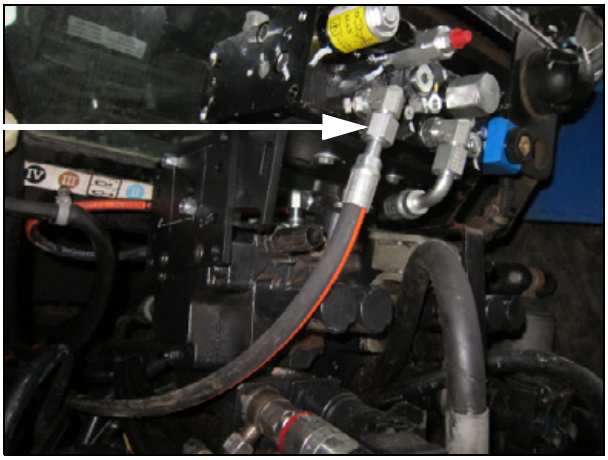
Step 3

Route the T hose from the T connection at the machine and connect the other end of the T line to the T port on the Autopilot manifold.



Step 4

Route the SCU-B hose from the SCU-B connection at the machine and connect the other end of the SCU-B line to the SCU-B port on the Autopilot manifold.



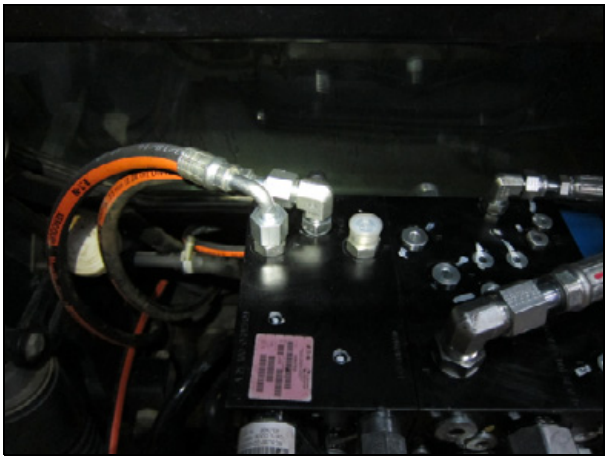
Step 5

Route the SCU-A hose from the SCU-A connection at the machine and connect the other end of the SCU-A line to the SCU-A port on the Autopilot manifold.



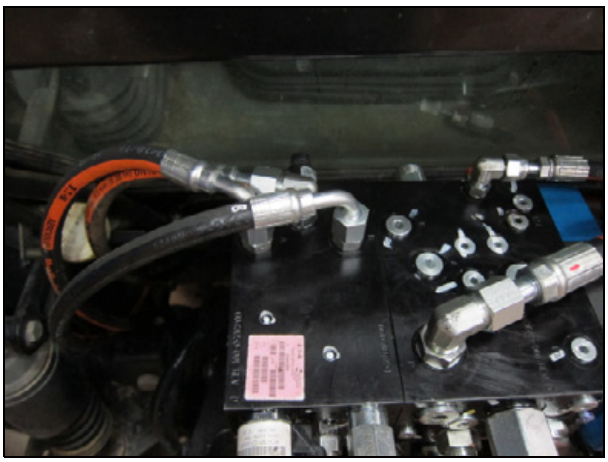
Step 6

Route the A hose from the A connection at the machine and connect the 90° end of the A line to the A port on the Autopilot manifold.



Step 7

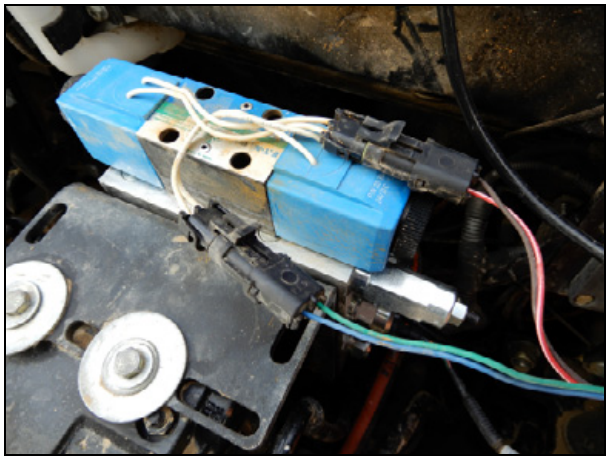
Route the B hose from the B connection at the machine and connect the 90° end of the B line to the B port on the Autopilot manifold.



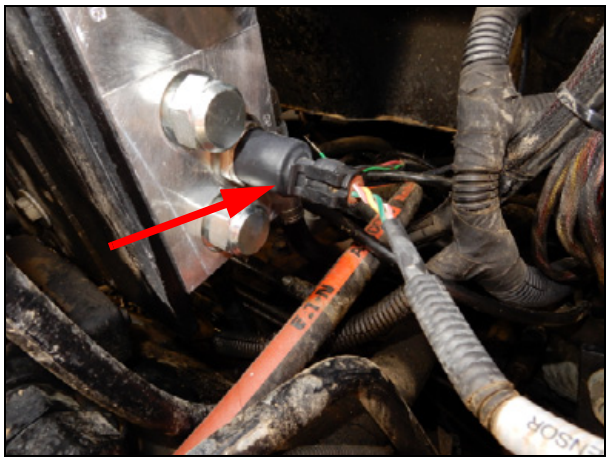
Connecting the cables to the manifold

Connect the valve cable, the manual override pressure transducer cabling, and the isolation solenoid cabling to the connections on the Autopilot manifold and then route the lines to the controller harness.

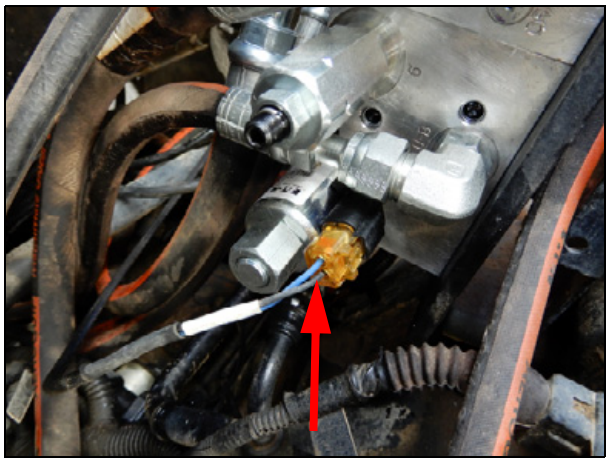
⚠ **CAUTION –** Make sure the cables are routed there in a way that they do not contact any moving parts and are not pinched or pulled as the machine is steered left or right.



Valve cable



Manual override pressure transducer cabling



Isolation solenoid cabling

3

AutoSense Steering Device Installation

- IMD-900 steering device components
- Installing the IMD-900 steering device
- Connecting the IMD-900 harness to the 54602 harness

This chapter describes how to install the IMD-900 module steering device.

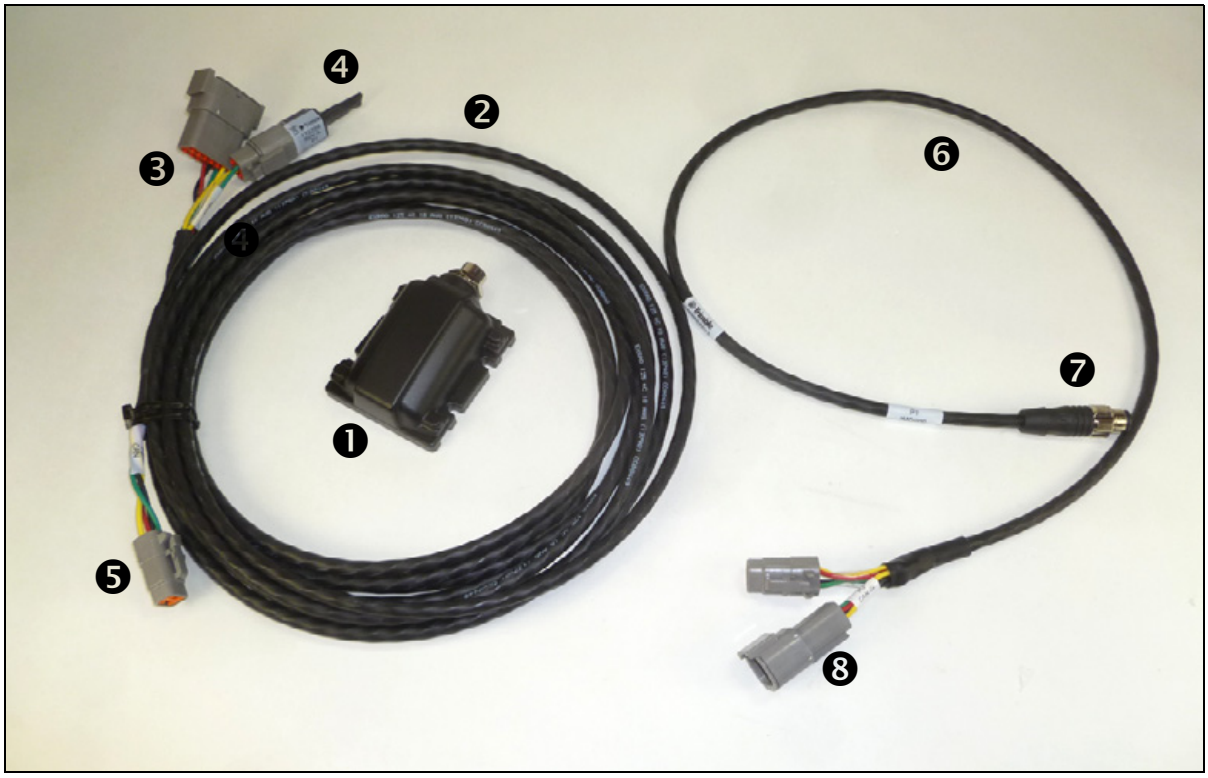
If the described mounting location is not accessible, chose a different place. To ensure proper function, the IMD-900 device must be located where it is free of obstructions and can rotate with the wheels when they turn.

On articulated vehicles, mount the IMD-900 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, but as flat as possible is recommended.

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

IMD-900 steering device components



Item	Description
❶	IMD-900 steering sensor (P/N 109256-00)
❷	Cable (P/N 114675)
❸	R1-CAN connector
❹	CAN terminal (× 2)
❺	P3 CAN connector
❻	Cable (P/N 112759)
❼	P1-IMD-900
❽	P3/R3 CAN out/CAN in

Installing the IMD-900 steering device

⚠ **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 chapter.

The new IMD-900 steering device is shown on the right. Install it using the following steps.



NOTE – The photos show the AutoSense™ mounting but the new IMD-900 steering sensor will mount in the same manner.

Step 1

Locate the mounting location at the left kingpin.

Remove the two bolts shown.



Step 2

Use the existing hardware to mount the AutoSense bracket as shown.



Step 3

Mount the AutoSense device on the bracket with the connector pointing toward the center of the vehicle. Use the six provided #6 x ½" socket head screws.



Step 4

Turn the vehicle steering as far to the right as possible (the mechanical lock) to ensure that there is no risk of damage to the AutoSense connector from the bolt that reduces the rotation of the fender.



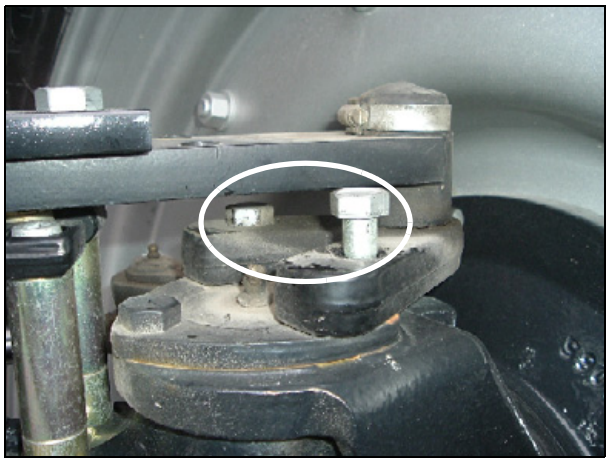
Step 5

Locate the mounting location under the fender, above the left kingpin.



Step 6

Remove the fender bolts shown.



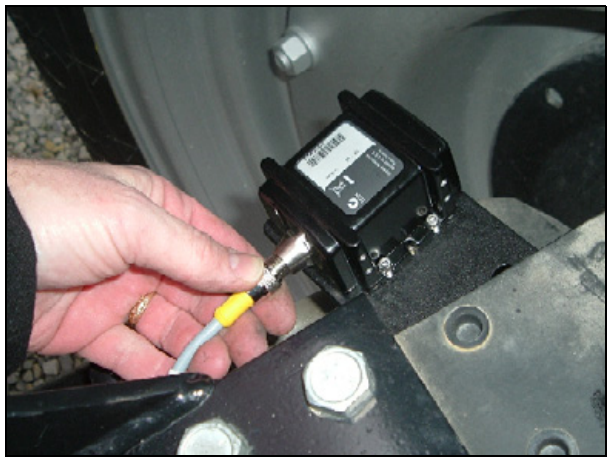
Step 7

Use the existing hardware to mount the bracket.



Step 8

Mount the AutoSense sensor with the connector pointing toward the center of the vehicle.

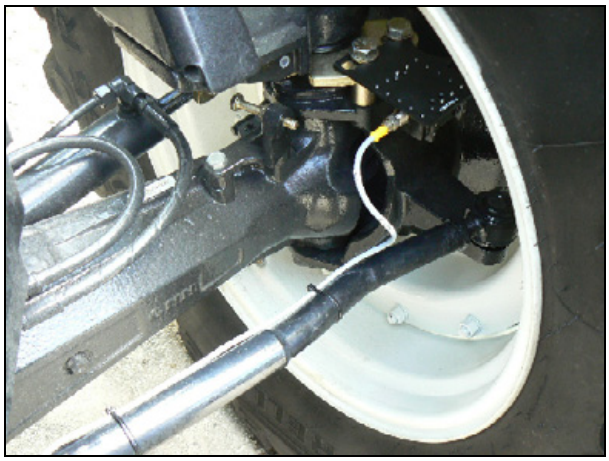


Routing the AutoSense cable

Step 1

Standard axle

If the tractor is fitted with a standard axle, route the steering cable to the steering device along the tie-rod and then connect it to the steering device.



STANDARD AXLE

Supersteer axle

If the tractor is fitted with a SuperSteer axle, route the steering cable along the main axle and then connect it to the steering device.

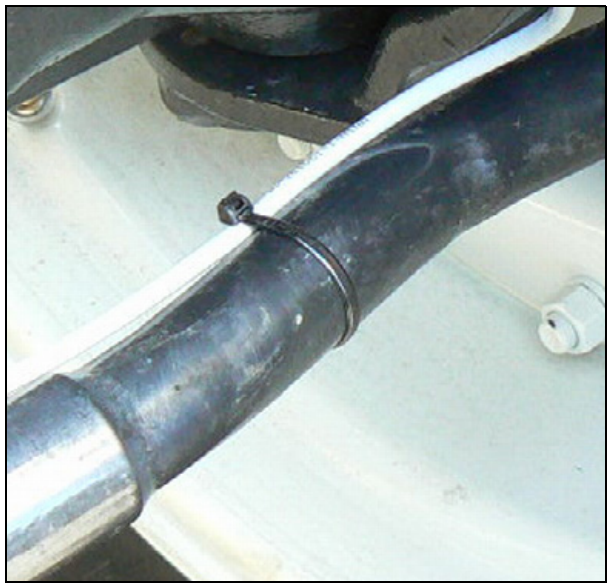


SUPERSTEER AXLE

Step 2

Secure the cable with cable ties or adhesive plastic consoles (not supplied).

Leave adequate length on the service loop to avoid stretching the cable.



CABLE TIES



ADHESIVE PLASTIC CONSOLES

Step 3

MXM and TM series machines

Route the steering cable to the steering sensor along the tie-rod and then connect it to the steering sensor. Leave adequate length on the service loop to avoid stretching the cable.

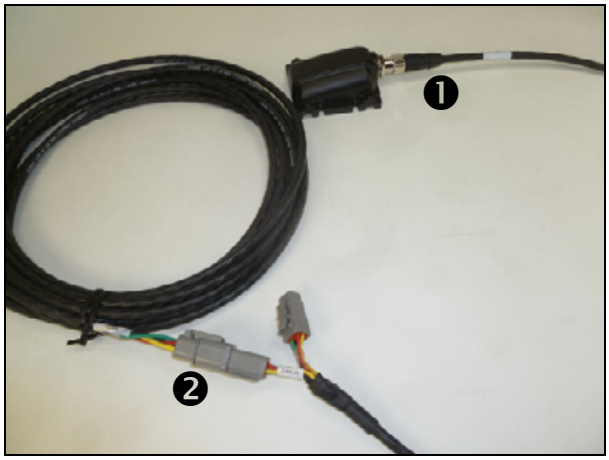


Connecting the IMD-900 harness to the 54602 harness

Step 1

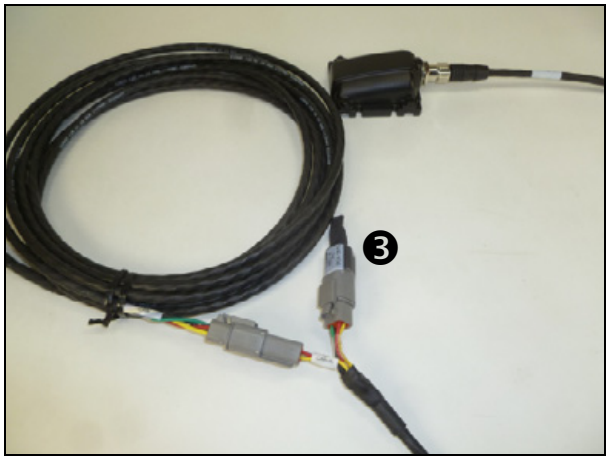
Connect the P1 connector of the 112759 cable to the IMD-900 ❶.

Connect the R3 connector to the 114675 cable ❷.



Step 2

Connect the CAN terminal to the P3 connector of the 112759 cable ❸.



Step 3

With the cable routed to the NavController, connect the R1 connector to the P12 connector on the 54602 harness on the NavController as shown.

Attach a terminator next to the P12 connection.



4

Antenna/Receiver Installation

- Antenna and receiver installation options
- Attaching the plate with VHB adhesive
- AG-372 receiver with AgGPS 450/900 radio module components (if equipped)
- Installing the AG-372 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AG-372 receiver with magnetic feet
- AgGPS 542 receiver components
- Installing the AgGPS 542 receiver
- Installing the NAV-900 guidance receiver using a spar mount
- Optional: Using the P/N 110308 for quick release mounting of the NAV-900 from the spar
- NAV-900 guidance receiver: Connecting the cables - both methods
- NAV-900 guidance receiver: Connecting an external radio (as required)

This chapter describes how to install the required receiver and antenna, and radio module (if used). To install the antenna for the display, see Chapter 5, Display Installation.

Antenna and receiver installation options

There are several options for mounting components (the antenna, radio module, or GNSS receiver) on the cab roof depending on the accuracy required and the antenna type:

- **VHB mount** – Attach a P/N 62034 plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 77.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting.

Possible mounting methods

GNSS receiver	VHB mounted plate	VHB V mounted plate
CFX-750 display TM-200 module	✓	✓
AG-372 receiver	✘	✓
*Ag*GPS® 542 receiver	✓	✓

NOTE – For quick release magnetic mounting with an AG-372 receiver, order the kit listed in Antenna mounting kits, page 10 and use VHB to attach the V plate to the roof.

NOTE – For WAAS, EGNOS, OmniSTAR VBS, Beacon, and DGPS applications, place either of the plates in a firm location using the VHB.

Attaching the plate with VHB adhesive

⚠ **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.

Standard P/N 62034 plates are provided in most kits. You can use the VHB mounting method to attach either a P/N 62034 plate or a V plate.

- **RTK, OmniSTAR, DGPS, GLONASS applications** – To use this method for high accuracy, the surface must be rigid and free of "oil panning". For RTK or OmniSTAR HP corrections, the spar method is recommended. The V plate provides repeatable positioning of the antenna.
- **WAAS, EGNOS, OmniSTAR VBS, Beacon applications** – Use a P/N 62034 plate for simplified installation in applications where high accuracy is not critical.

Step 1

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

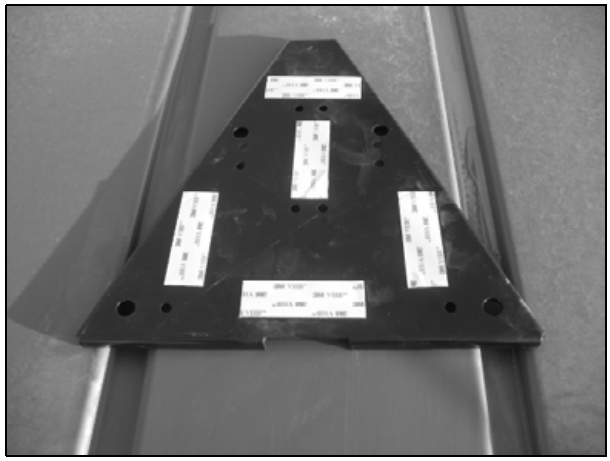


Step 2

V plate only

Remove the backing from one side of the VHB strips provided and then apply the strips to the plate.

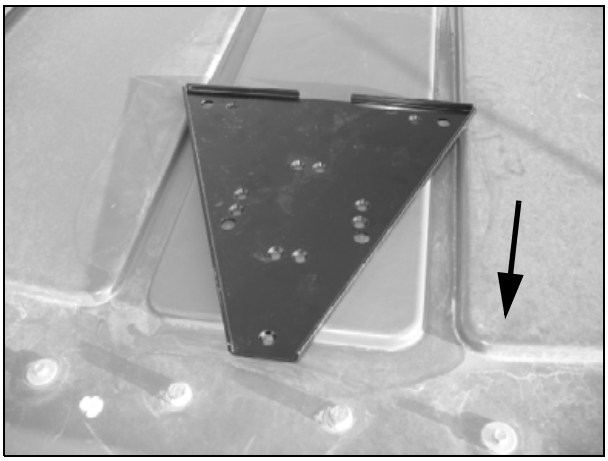
NOTE – The VHB strips are pre-applied to the P/N 62034 plate.



Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end of the plate points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure and then leave for approximately 30 minutes to adhere.

NOTE – The arrow points to the front of the vehicle.

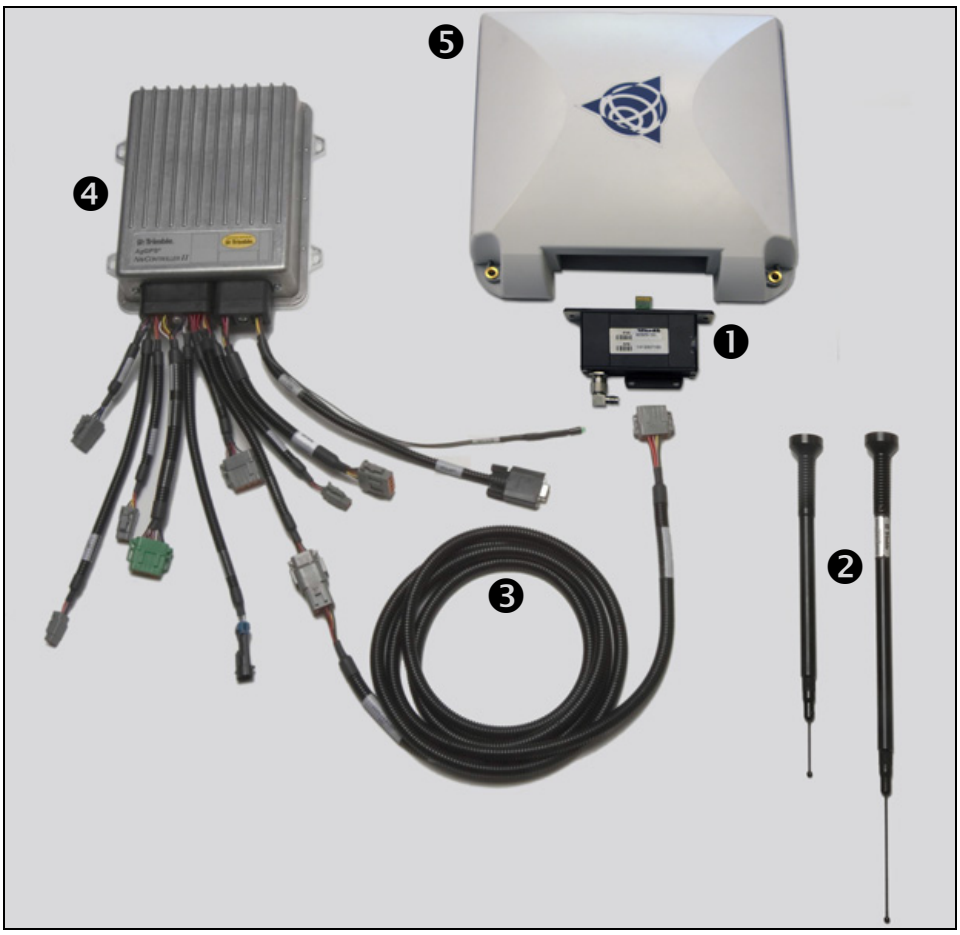


V plate



P/N 62034

AG-372 receiver with AgGPS 450/900 radio module components (if equipped)



Item	Description	Trimble part number
❶	*Ag*GPS 450 or 900 radio (if equipped)	
❷	Radio antenna cable and magnetic mount	
❸	*Ag*GPS 450 or 900 radio antenna	
❹	Antenna/receiver cable	54608
❺	Autopilot controller	

Installing the AG-372 GPS receiver with AgGPS 450/900 radio module (if equipped)

⚠ **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.

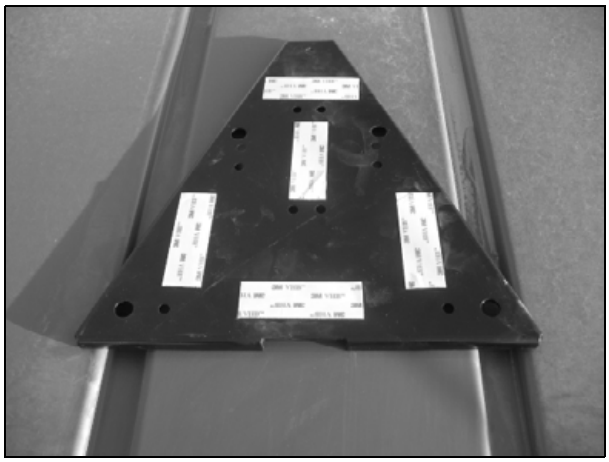
To attach the AG-372 receiver plate to the cab roof so that it can be removed if required, attach a V plate to the roof with VHB and then stick the receiver plate to the V plate with magnets.

Removable installation

Step 1

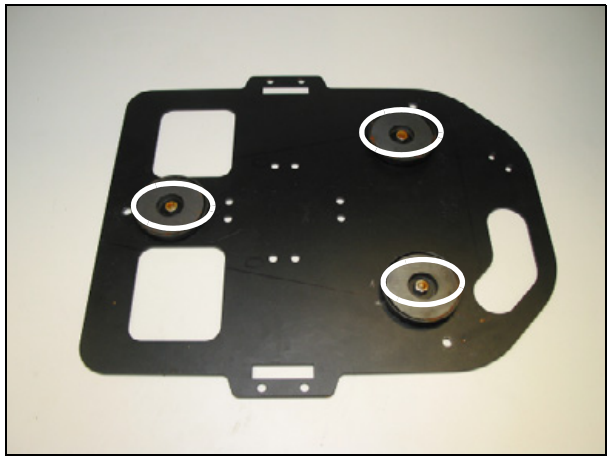
V plate

Attach the V plate roof using the supplied VHB. Ensure that the narrow end points forward.



Mounting plate

Attach the three provided magnets to the plate with the ¼" flathead screws and hardware provided.



Underside of plate

Installing the RTK radio (if required)

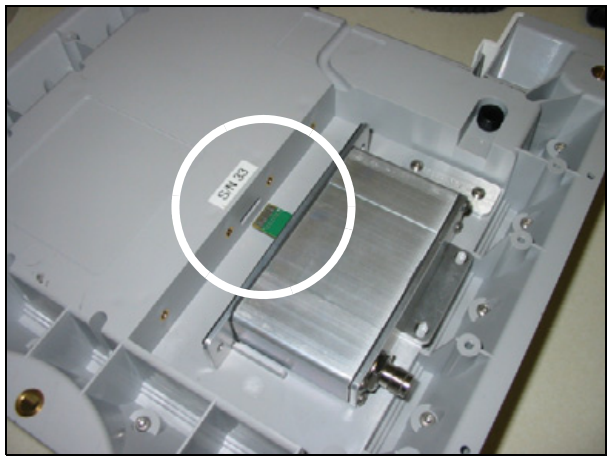
Step 1

Remove the blanking plate and set it aside.



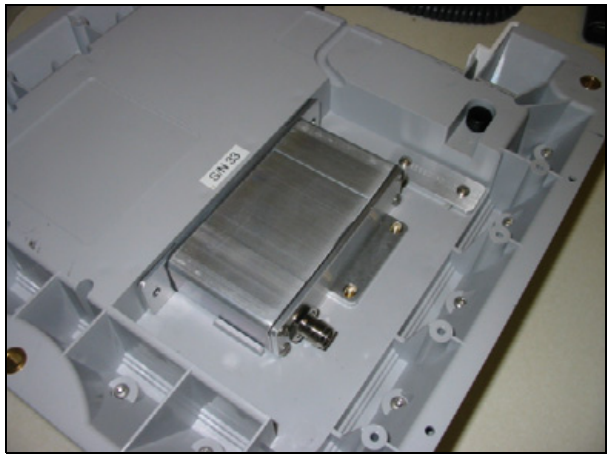
Step 2

Place the integrated radio inside the AG-372 receiver. Ensure that the circuit board is aligned with the slot in the vertical wall of the receiver.



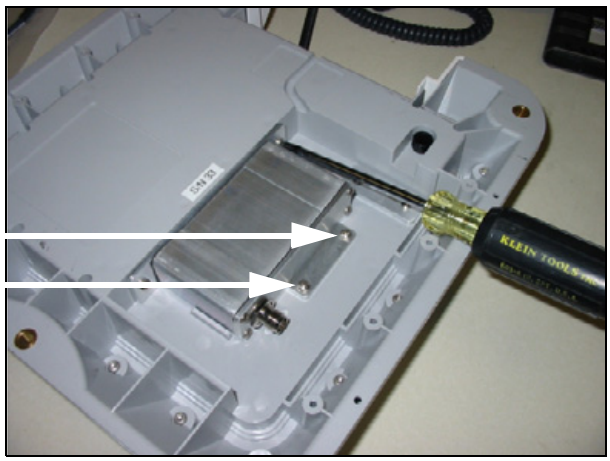
Step 3

Slide the integrated radio back so that it is flush with the vertical wall of the receiver.



Step 4

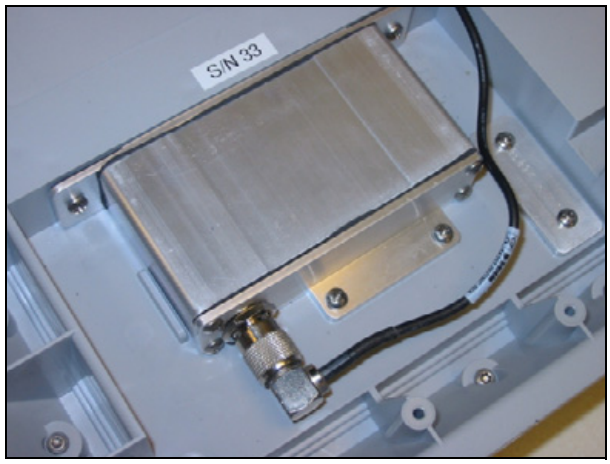
Use a #1 or #2 Phillips screwdriver and the supplied screws to install the integrated radio. First insert and tighten the two screws on the horizontal wall (arrowed), and then insert the remaining screws.



Step 5

Install the supplied antenna cable.

NOTE – The housing can accommodate a cable diameter of up to ¼".

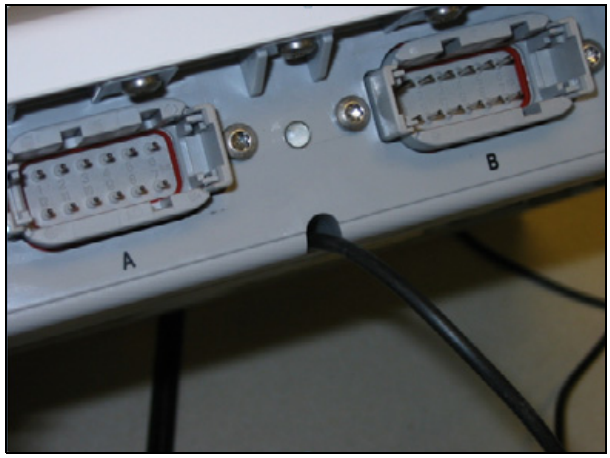


Step 6

Route the cable through the cable channel and then insert the cable cover.

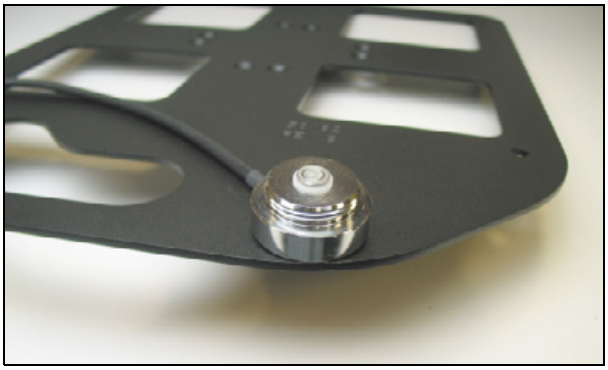


This image shows the unit with the cable routed through the channel.



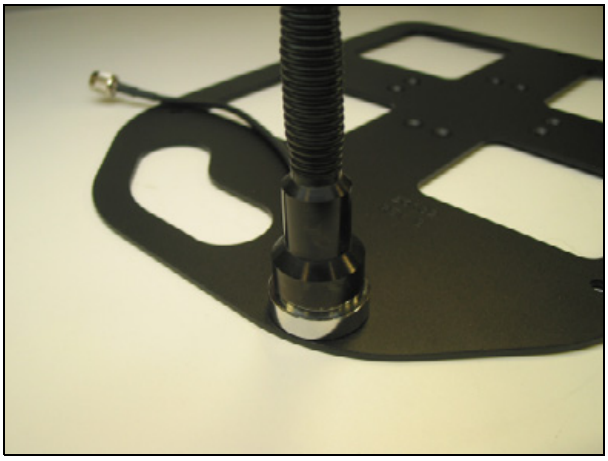
Step 7

Attach the antenna base to the rear of the plate with the two flathead screws provided.



Step 8

Attach the radio antenna to the antenna base.



Step 9

Position the AG-372 receiver and radio on the mounting plate with the connector ports facing the radio antenna. Align the three bolt holes with the receiver, radio, and mounting plate.



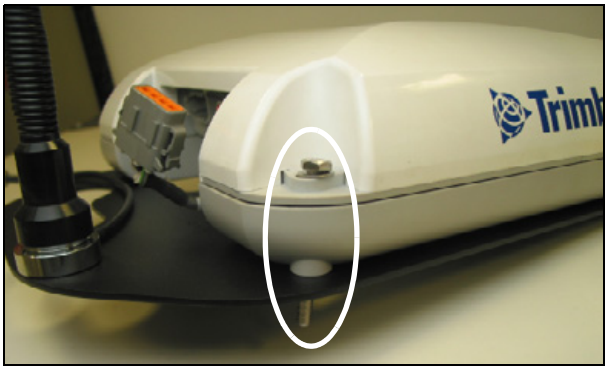
Step 10

Insert the nylon bushings provided.



Step 11

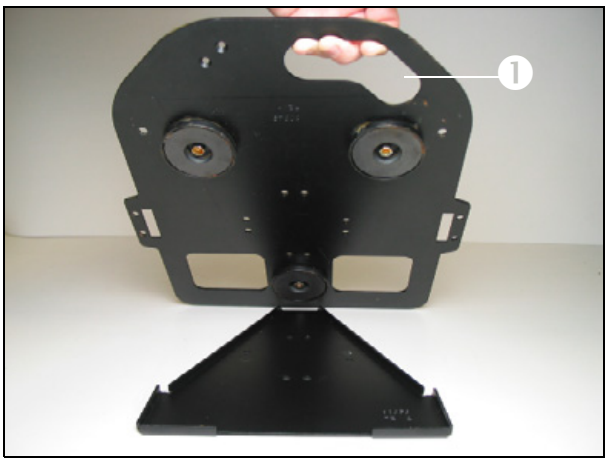
Insert the bolts through the receiver, radio, and mounting bracket. Place nuts on the bolt ends and then tighten them.



Step 12

Magnet method

Place the receiver on the roof by aligning the magnets with the V plate. Ensure that the handle ❶ is toward the back of the vehicle.

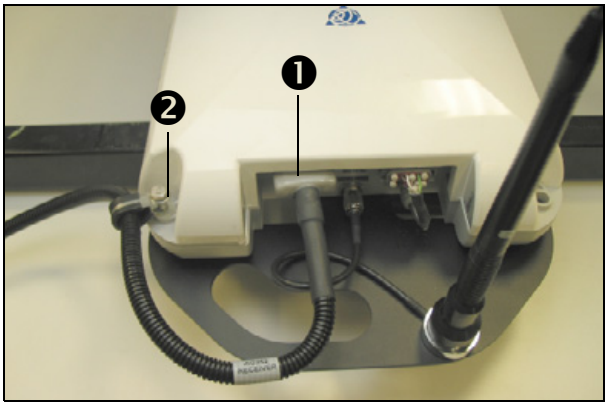


Step 13

Both methods

Connect the cable from the cab controller into port A ❶ of the AG-372 receiver. Bolt the cable clamp ❷ to the left side of the receiver.

Route the cable into the cab and into the controller.



Installing an AG-372 receiver with magnetic feet

⚠ **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.

Use this option only when all other options are unavailable. It requires a firm surface for mounting to avoid vertical vibration and is not an easily repeatable location when moving receivers. Many cabs do not offer roof bolts; you may need to drill or to construct a firm location.

Step 1

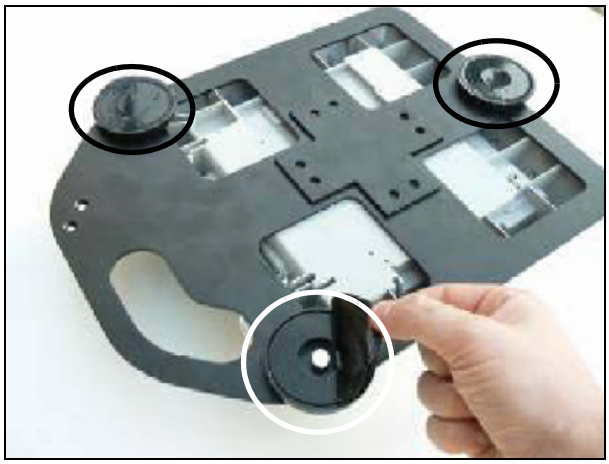
Attach the magnets to the receiver mounting plate. Use the three ¼" bolts to mount the AG-372 receiver.

Place the nuts on the receiver side.



Step 2

Turn the mounting plate upside down. Stick the covers onto the magnets as shown.

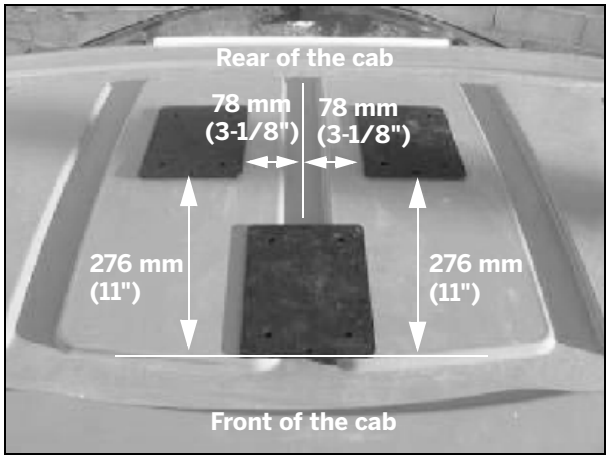


Step 3

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

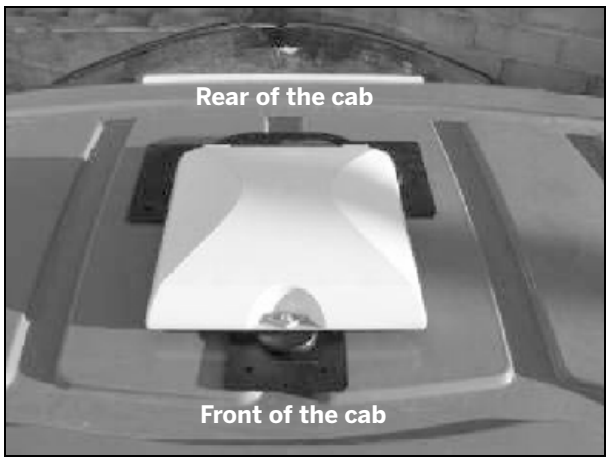
Remove the backing from the VHB strips and then apply the plates to the cab roof.

Attach the three mounting plates so that the receiver is as firm as possible.



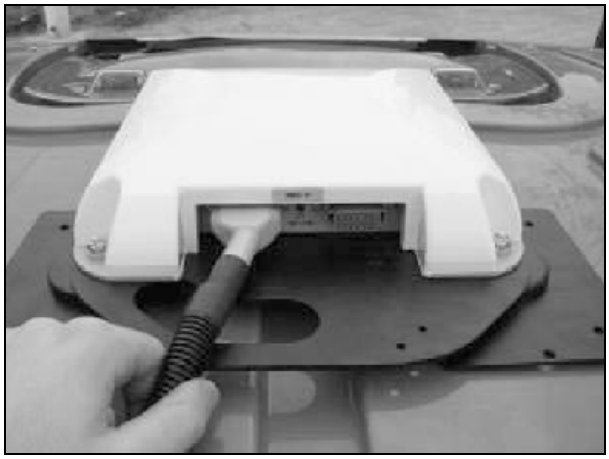
Step 4

Stick the antenna magnetic mounts at the center of the mounting plates.

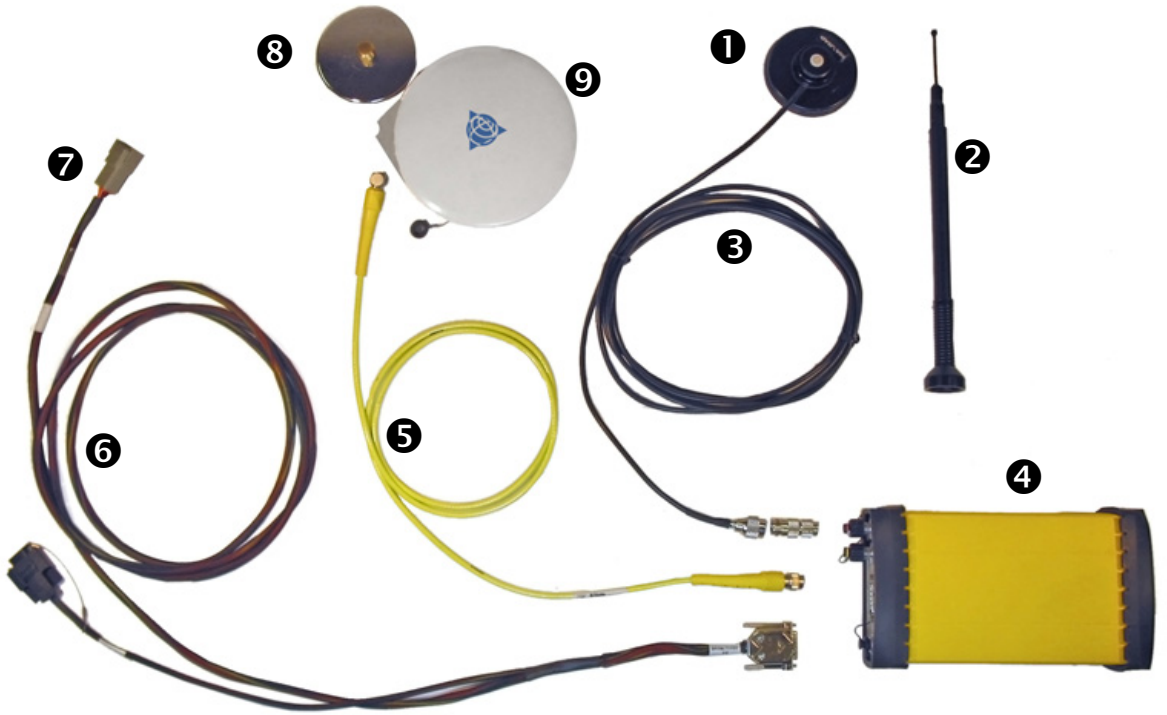


Step 5

Connect the antenna cable to port A of the AG-372 GPS receiver and then route the cable toward the NavController II harness.



*Ag*GPS 542 receiver components



Item	Description	Trimble part number
❶	Radio antenna magnetic base	
❷	Radio antenna	
❸	Radio antenna cable	
❹	*Ag*GPS 542 GPS receiver	
❺	Antenna cable	
❻	Receiver cable	62037
❼	To controller “P3 GPS”	
❽	Antenna magnetic mount	
❾	*Ag*GPS 542 GPS receiver	

Installing the AgGPS 542 receiver

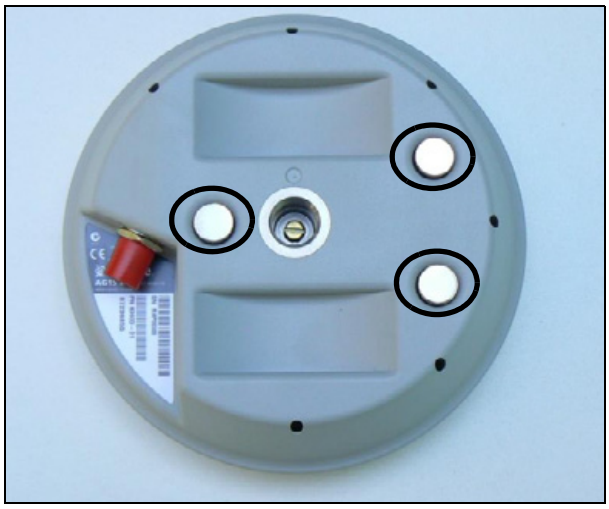
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

Attach the large magnet with a $^{5}/_{8}$" stud to the GPS antenna.



If the antenna has magnets built in, skip this step.



Step 2

GLONASS,RTK, OmniSTAR, DGPS applications

For repeatable positioning, place the antenna against the lip at the narrow end of the V plate.



Step 3

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.



Step 4

Mount the receiver in a convenient location in the cab. Route the antenna cable to the receiver and then connect it.

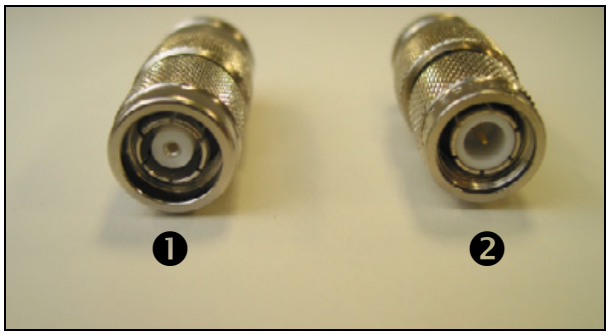


Step 5

Identify the correct adaptor for the radio connection:

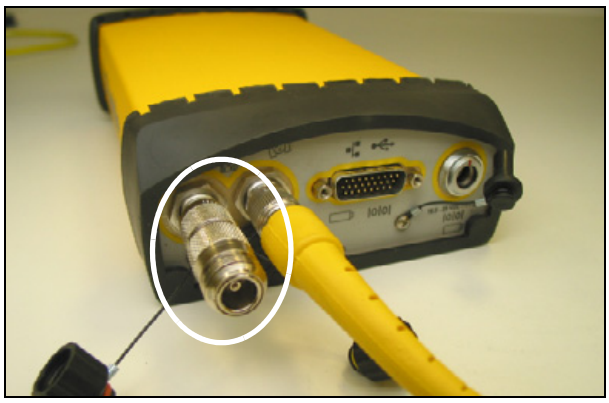
❶ Reverse polarity TNC-to-N for 900 MHz radios

❷ Normal polarity TNC-to-N for 400 MHz radios



Step 6

Attach the adaptor to the radio port.



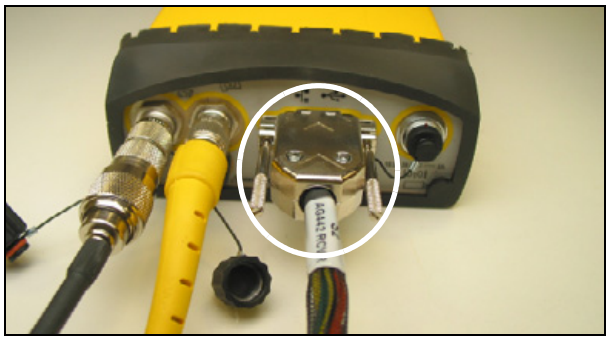
Step 7

Connect the radio antenna cable to the radio port adaptor.



Step 8

Connect the controller cable to the 26-pin connector of the receiver. Controller cable connections will be completed in Chapter 8, Controller Installation.



Step 9

Connect the radio antenna to the magnetic antenna base.



Step 10

Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the 4" x 6" plate with the VHB provided to relocate the antenna.



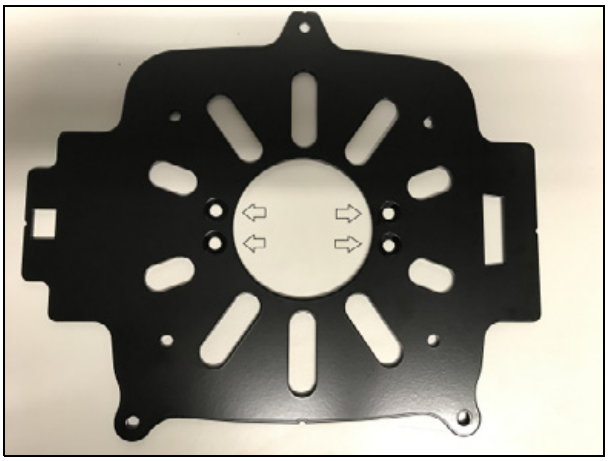
Installing the NAV-900 guidance receiver using a spar mount

For vehicles that do not have factory mounting methods or the factory mounting method is already in use, spar mounts are available to span between rigid bolts on the roof.

Lengths available are:

- P/N 64898: 16.5" – 28.5"
- P/N 55349: 27.5" – 37.5"
- P/N 53676: 36.5" – 46.5"
- P/N 55348: 45" – 55"
- P/N 66774: 54" – 64"

The guidance controller plate has a four-bolt pattern that directly attaches to the spar mounts:



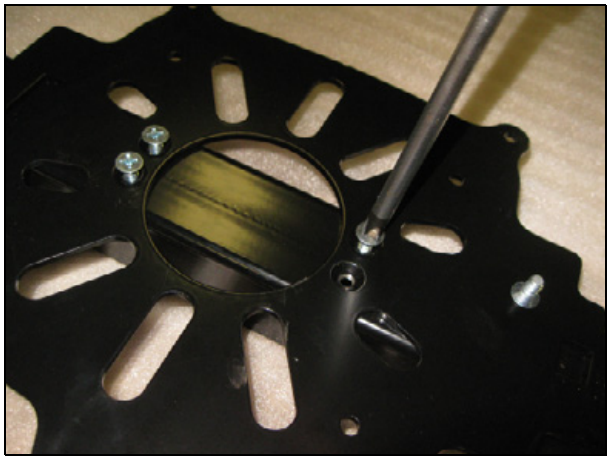
Step 1

Remove the spar from the box and lay out the hardware.



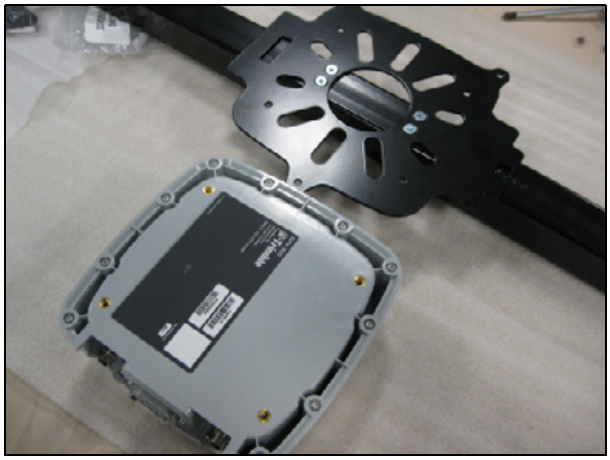
Step 2

Align the four holes on the base mounting plate with the four holes in the spar. Install the supplied ¼-20 × ½" countersunk bolts and tighten appropriately.



Step 3 .

Lay the guidance controller on its top.



Step 4

Lay the mounting plate with spar attached over on top. Attach the plate to the guidance controller with the four 6 mm bolts and lock washers. Tighten the bolts. Take care not to over-tighten the bolts as damage may result.







Step 5

Loosen and remove the large bolts on the cab that are to be used to fasten down the spar.



Step 6

Place the supplied spacer on the cab mounting point. The thickness of the spacer will vary by kit.



Step 7

Locate the provided longer bolts to be use for securing the spar. Put both the original washer and the larger provided washer on the bolt.



Step 8

Place the spar on the space and insert the bolt.



Step 9

Insert the bolt on the other side of the cab. Center the spar on the cab using a measuring tape. Then tighten the bolts.

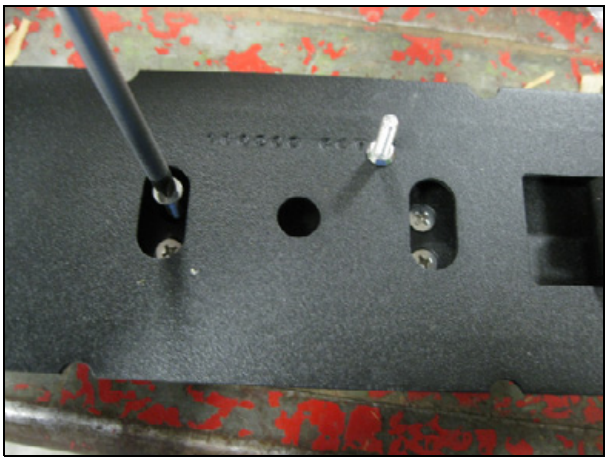




Optional: Using the P/N 110308 for quick release mounting of the NAV-900 from the spar

Step 1

Using the 4 bolts in the GFX-750 display kit, mount the Quick release bracket to the spar.



Step 2

Attach the NAV-900 base plate to the NAV-900 controller.

Step 3

Slip the slot of the base plate over the tang on the bracket and then use the latch to secure the receiver.





NAV-900 guidance receiver: Connecting the cables - both methods

Step 1

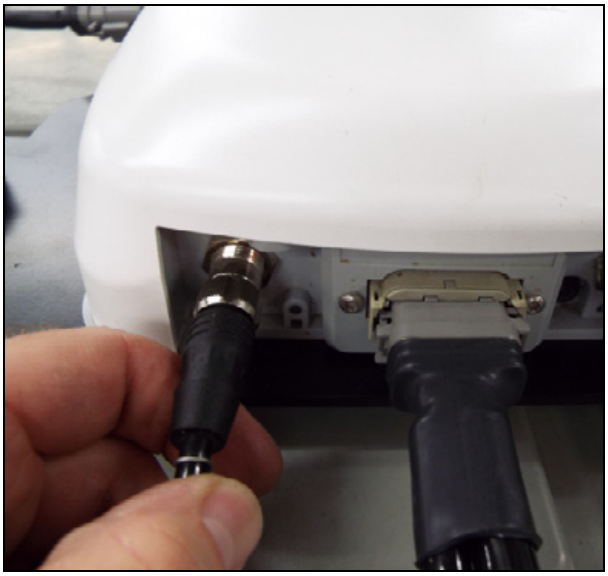
Plug the P1 connector on cable P/N 110550 into the back of the NAV-900 guidance receiver.





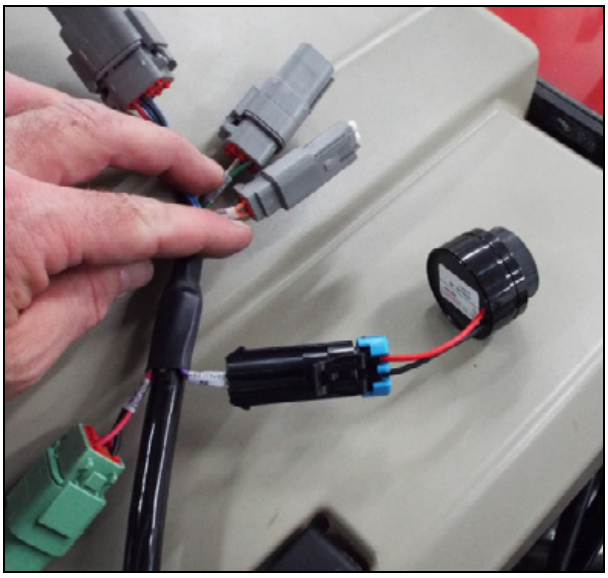
Step 2

Connect P2 of the P/N 110540 cable to the 4-pin M12 connector on the left side of the NAV-900 controller.

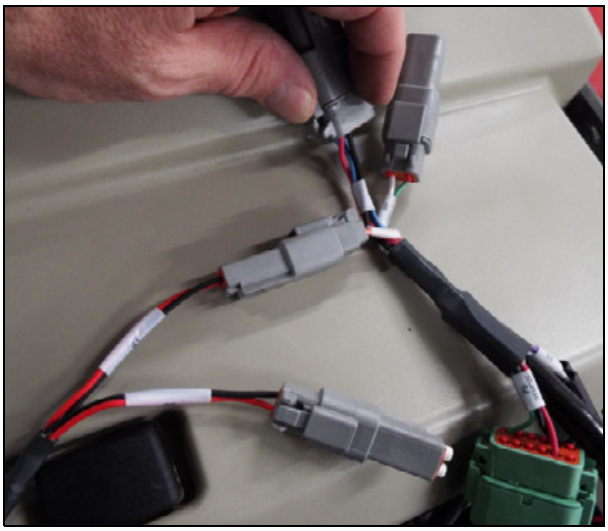


Step 3

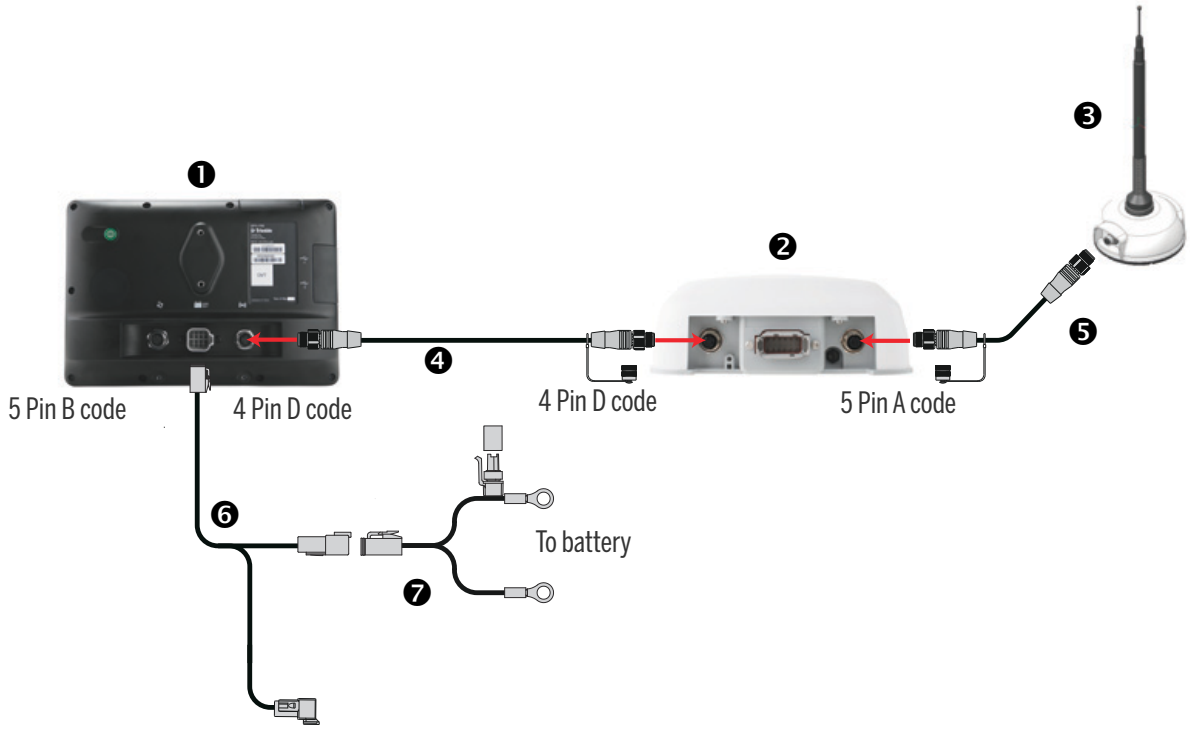
Connect the Sonalert to the cable P/N 110550.



Connect the NMEA output and modem power as needed.



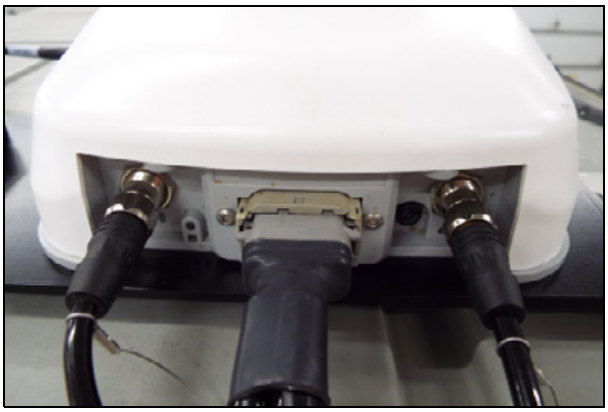
NAV-900 guidance receiver: Connecting an external radio (as required)



Item	Description	Trimble part number
1	GFX-750/XCN-1050 display, with PIQ App	121000-XX
2	NAV-900 Guidance Controller	108993-05
3	Ag-820 radio kit, 430-450 MHz Ag-820 radio kit, 450-470 MHz Ag-820 radio kit, 900 MHz	123500-44 123500-46 123500-90
4	Cable Assy, NAV-900 to in-cab RTK Radio, DTM06, 4.5 m	110540
5	Cable Assy, NAV-900 to Ag-820	113295
6	Cable Assy, GFX-750/XCN-1050, Power to display, CAN, 2.5 m	110551
7	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Basic Power, 4 m	67258

Step 1

Connect the radio interface cable (P/N 113295) to the right 5-pin M12 connector on the NAV-900 controller.



Step 2

Attach the radio to the roof or bracket in a secure fashion.

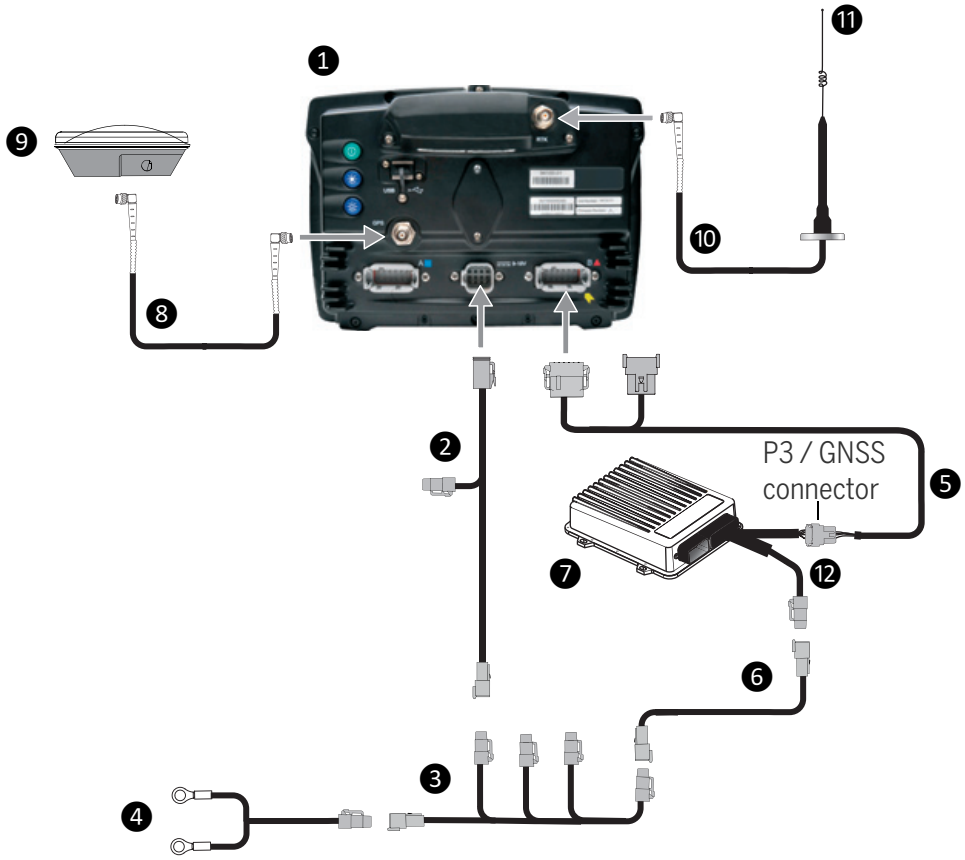


5

Display Installation

- CFX-750 display: Components
- CFX-750 display: Preparation
- CFX-750 display: Installation
- CFX-750 display: Installing the wiring harness
- TMX-2050 display: Components
- TMX-2050 display: Preparation
- TMX-2050 display: Installing the wiring harness
- TMX-2050 display: AG-25 GNSS antenna
- CFX-750 and TMX-2050 displays: Installing the GNSS antenna and plate
- CFX-750 and TMX-2050 displays: Installing the RTK radio antenna
- GFX-750/XCN-1050 display: Components
- GFX-750/XCN-1050 display: Preparation
- GFX-750/XCN-1050 display: Installation
- GFX-750/XCN-1050 display: Installing the wiring harness

CFX-750 display: Components



⚠ **CAUTION –** Connecting the Port Replicator on the CFX-750 to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the display, and will void the warranty.

Item	Description	Trimble part number
1	CFX-750 display **NOTE –** RTK password required.	93100-02
2	CFX-750 power cable	66694
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	CFX-750 to NavController II cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adaptor	67095
7	NavController II	55563-00
8	8 m GNSS TNC/TNC RT angle cable	50449
9	AG25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	72122
11	900 MHz radio antenna kit	22882-10
12	Main NavController II cable	54601

CFX-750 display: Preparation

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.



CFX-750 display: Installation

⚠ **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

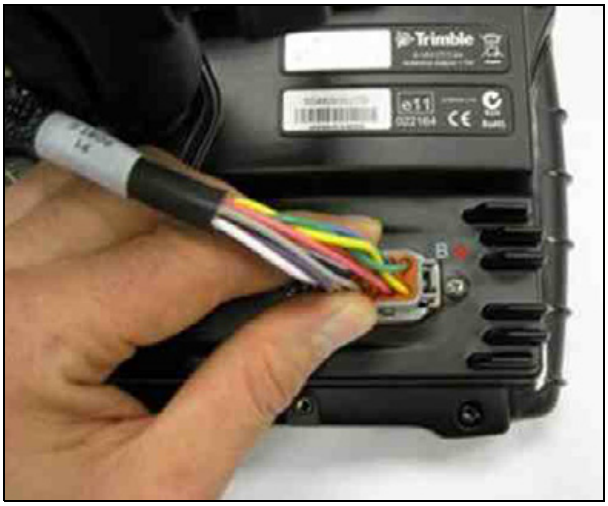
Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the bar mount to the rail.

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.

Step 2

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

To connect power to the CFX-750 display, see Chapter 8, Controller Installation.



CFX-750 display: Installing the wiring harness

Step 1

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

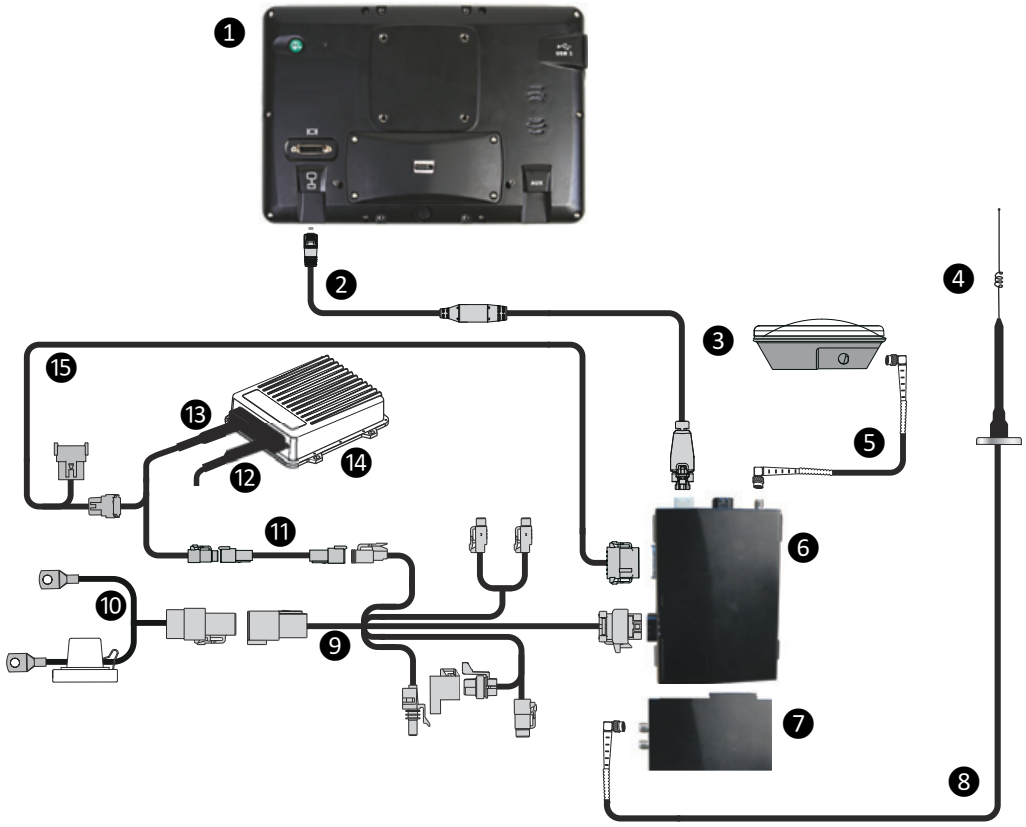
Step 2

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.



TMX-2050 display: Components

This graphic shows how to connect the TM-200 Module and the Autopilot system for after-market installations.



Item	Description	Trimble part number
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10	Cable, battery	92905
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController	55563-00 55566-00
15	TM-200 Module to NavController cable with port replicator	75741

TMX-2050 display: Preparation

The display mount attaches to a rail in the cab of the vehicle. The TMX-2050 display connects to the display mount.

The TM-200 Module connects to the display with a single cable.

Additional components to install depend on your connection and correction services, and the features you are using.

⚠ **CAUTION –** Make sure the vehicle power is off when you are connecting system components.

Installing the display and mount

Use the mounting hardware supplied in the display kit to mount the display in the vehicle cab.

⚠ **CAUTION –** Make sure the vehicle power is off when you are connecting system components.

Before completing installation steps, select a position in the cab where the bar mount (4) can be attached to a rail. Hold the display in the selected location and make sure that it:

- Is easy to see, but does not block the driver's view.
- Is within the driver's reach so that the USB drive is easy to remove and replace.
- Does not interfere with the driver getting in or out of the cab, or any other activities.

.

Item	Description
1	Mounting plate
2	Zirkona mount
3	Tightening arm
4	Bar mount



Step 1

Locate the TMX-2050 display and the Zircona mount and mounting hardware.



Step 2

Use the provided hardware to attach the Zircona mount to the display as shown





Step 3

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



Step 4

The Zircona mount has a tightening arm 3. Loosen the arm to let the display move on the mount.

Step 5

Adjust the TMX-2050 display until it is positioned where you want it.

Turn the tightening arm clockwise to tighten the Zircona mount and lock the display in the desired position.

Step 6

Connect the display cable to the display.



Step 7

Route the other end of the display cable to the TM-200 Module and then connect it to the TM-200 Module.



TMX-2050 display: Installing the wiring harness

⚠ **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 P5 and P2 connectors on the harness, P/N 106111, to the TM-200 Module.

Step 2

On the TM-200 Module locate the display connection point.



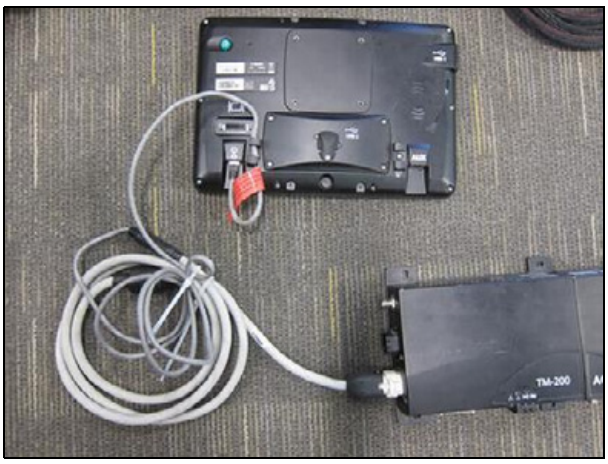
Step 3

Connect the display cable P/N 93843 to the TM-200 Module.



Step 4

Route the cable between the TMX-2050 display and the TM-200 Module.



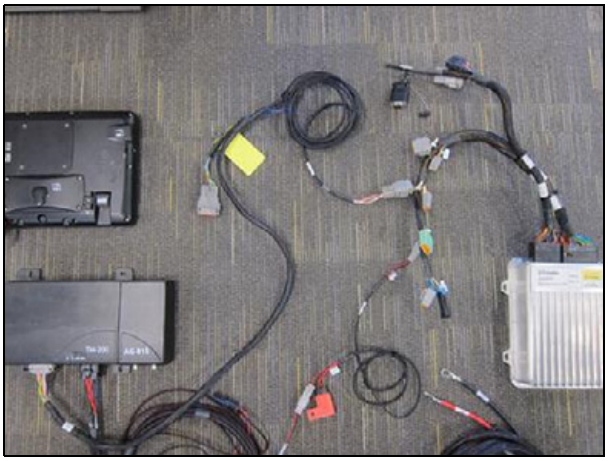
Step 5

Locate the Port labeled **A** on the TM-200 Module and then connect NavController connection cable, P/N 75741.



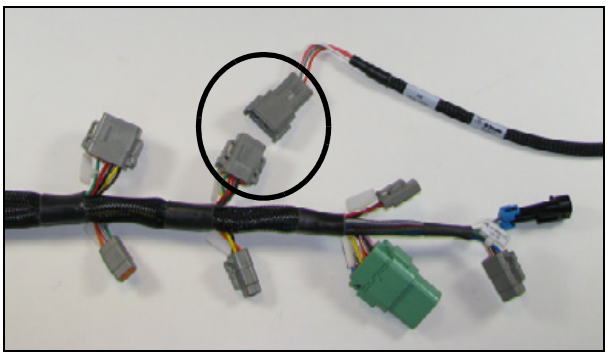
Step 6

Route the other end of the P/N 75741 cable to the plug on the P/N 54601 harness labeled **GPS**.



Step 7

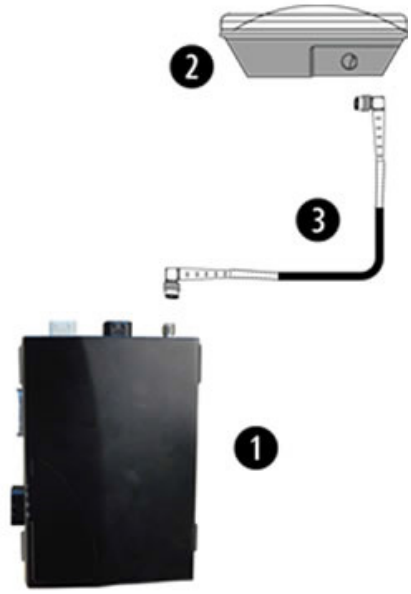
Connect the cable to the P3 connector on the NavController main harness.



TMX-2050 display: AG-25 GNSS antenna

The AG-25 GNSS antenna is required for all correction services. It enables the GNSS receiver in the TM-200 Module to receive GPS / GNSS corrections. The antenna connects to the antenna connector on the TM-200 Module

⚠ **CAUTION –** Wireless cellular radio and GNSS signals can interfere with each other. For best performance, mount antennas at least 1 meter away from each other.



Item	Description
1	TM-200 Module
2	AG-25 GNSS antenna
3	AG-25 antenna to TM-200 Module cable

The AG-25 GNSS antenna has integrated magnets for easy installation. To attach the antenna to a non-metal surface, use the mounting plate.

NOTE – If you are using the AG-25 GNSS antenna with a steering system, refer to the installation instructions for the steering system to determine the correct location for mounting the antenna.

CFX-750 and TMX-2050 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. See Antenna mounting kits, page 11.

Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations. For more information, see Antenna and receiver installation options, page 77.

Use a ⅝" bolt to attach the AG25 antenna to the spar, as shown.

Measure the length between the bolts on the roof of the vehicle and order the appropriate spar:

- Spar 36.5" - 46.5": P/N 53676
- Spar 54" - 64": P/N 66774



VHB adhesive method

Standard 4" x 6" plates are provided in most kits. You can use Very High Bond (VHB) to attach either a 4" x 6" plate or a V plate.

- **GLONASS, RTK, OmniSTAR, DGPS applications** – To use this method for high accuracy, the surface must be rigid and free of "oil panning". For RTK or OmniSTAR HP corrections, the spar method is recommended. The V plate provides repeatable positioning of the antenna.
- **WAAS, EGNOS, OmniSTAR VBS, Beacon applications** – Use a 4" x 6" plate for simplified installation in applications where high accuracy is not critical.

Step 1

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

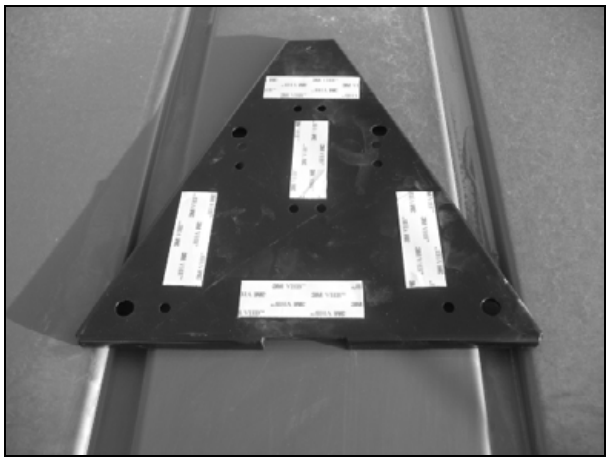


Step 2

V plate only

Remove the backing from one side of the VHB strips provided and then apply the strips to the plate.

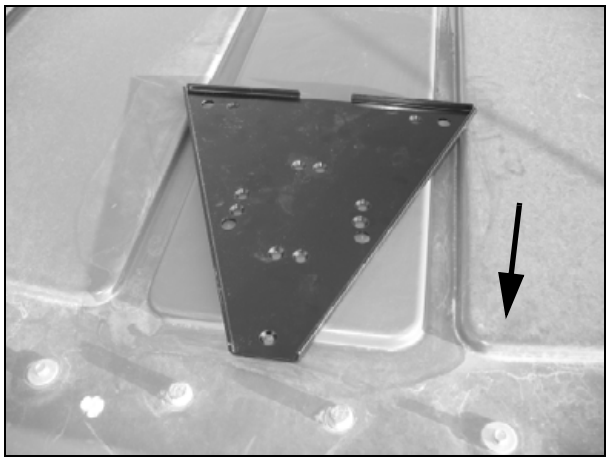
NOTE – The VHB strips are pre-applied to the 4" x 6" plate.



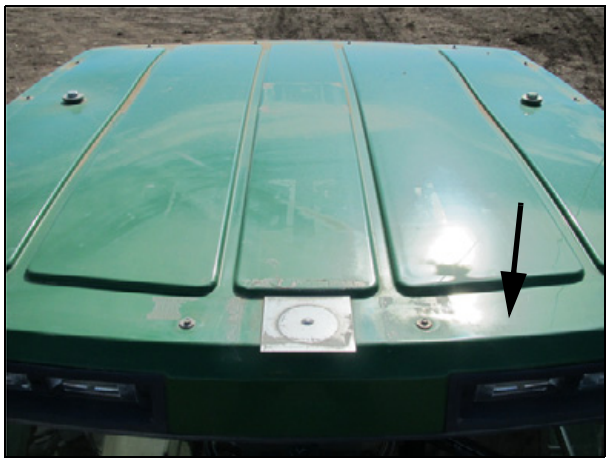
Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure and then leave for approximately 30 minutes to adhere.

NOTE – The arrow in this figure points to the front of the vehicle.



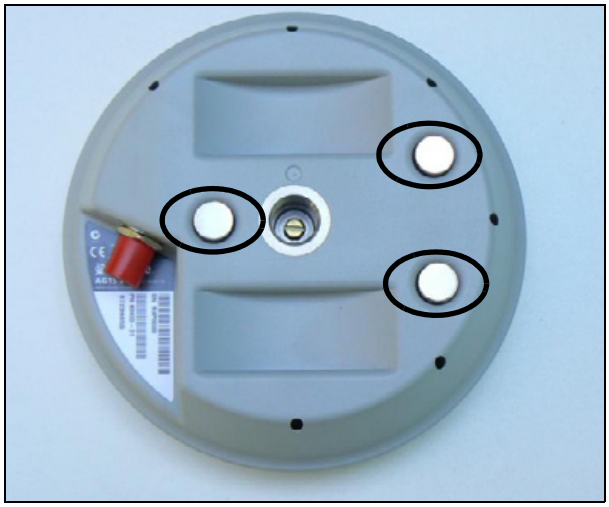
V plate



4" x 6" plate

Step 4

If the antenna has magnets built in, omit this step.



Otherwise, attach the large magnet with a ⅝" stud to the GNSS antenna.



Step 5

GLONASS, RTK, OmniSTAR, DGPS, applications

For repeatable positioning, place the antenna against the lip at the narrow end of the V plate.



WAAS, EGNOS, VBS, Beacon applications

Attach the antenna to the center of the 4" x 6" plate.



Step 6

Both models

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.



CFX-750 and TMX-2050 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 rear of the V plate on the roof. If the cable does not reach the V plate, use the 4" x 6" plate with the VHB provided to relocate the antenna.



Step 3

Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the P/N 62034 plate with the VHB provided to relocate the antenna.

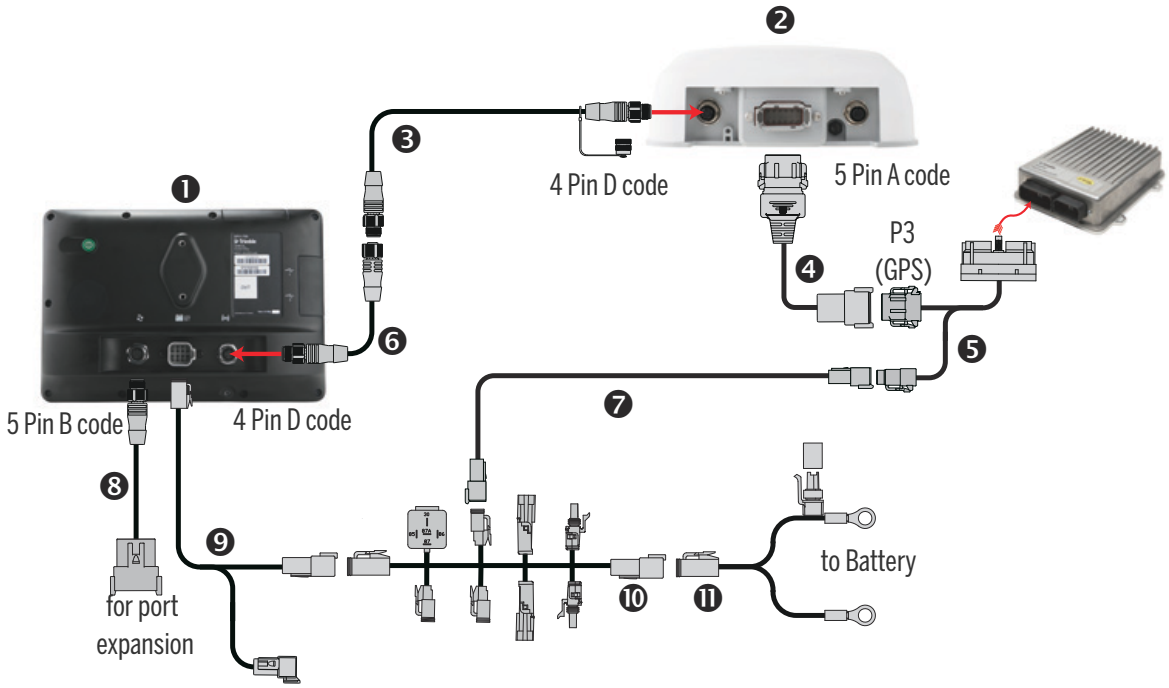
Step 4

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



GFX-750/XCN-1050 display: Components

This graphic shows the Autopilot system using NAV-900 as an external guidance device.



Item	Description	Trimble part number
1	GFX-750/XCN-1050 display, with PIQ App	121000-XX
2	NAV-900 Guidance controller	108993-05
3	Cable Assy, GFX-750/XCN-1050 to NAV-900, Power/Ethernet (BRR), 5 m	110540
4	Cable Assy, NAV-900 to Nav II/III, AutoPilot™	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX-750/XCN-1050 to NAV-900, Power/Ethernet (BRR) Extension, 2.5 m. Optional extension for large vehicles	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX-750/XCN-1050, Expansion Port Basic, RS-232, Dig I/O, 2.5 m	110545
9	Cable Assy, GFX-750/XCN-1050, Power to display, CAN, 2.5 m	110551
10	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Power with Relay and Switch (Acc)	67259
11	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Basic Power, 4 m	67258

GFX-750/XCN-1050 display: Preparation

The GFX-750/XCN-1050 display utilizes the RAM mount system.



Attach the diamond-based ram mount to the back of the display using the provided fasteners.



GFX-750/XCN-1050 display: Installation

Step 1

Use the supplied V bolts or alternate (non-supplied) hardware to affix the RAM base mount to the desired location in the cab. Ideally this position should be readily viewable and within easy reach of the operator.



Step 2

Use the supplied RAM clamp to connect the RAM base mount to the RAM ball attached to the display.



Step 3

Position the display as desired and then tighten the clamp.



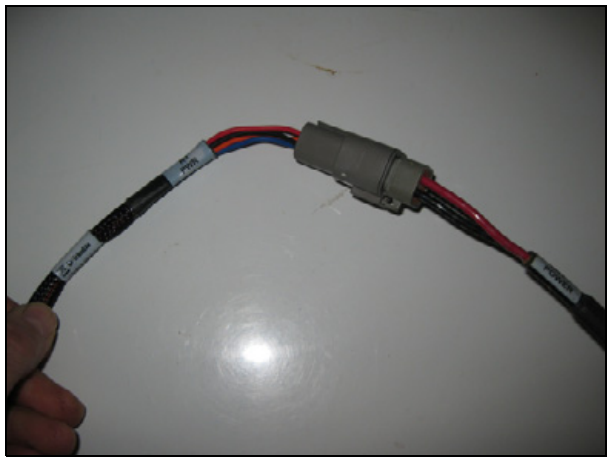
GFX-750/XCN-1050 display: Installing the wiring harness

The GFX-750 display requires a nominal 12 volt power source. The P/N 67258 cable has ring terminal leads for connecting to a battery or other cable mount point.

⚠ **WARNING –** If the machine has a master electrical disconnect, ensure that the display/receiver will be disconnected from the battery when the master disconnect is used. Failure to do so may result in hardware damage and void warranty. Additionally, it is suggested to utilize power terminals located within the cab of the vehicle that ground in the same location as the cab components to avoid ground shifts between the display and any vehicle ECUs.

Step 1

Connect the other 4-pin Deutsch connector of cable P/N 110551 to the P/N 67258 base power cable.



Step 2

Connect the 6-pin DT power/CAN cable P/N 110551 to the middle port of the display.



Step 3

Connect the 4-pin M12 connector to the 4-pin receiver connector. Note the Keying and number of pins.



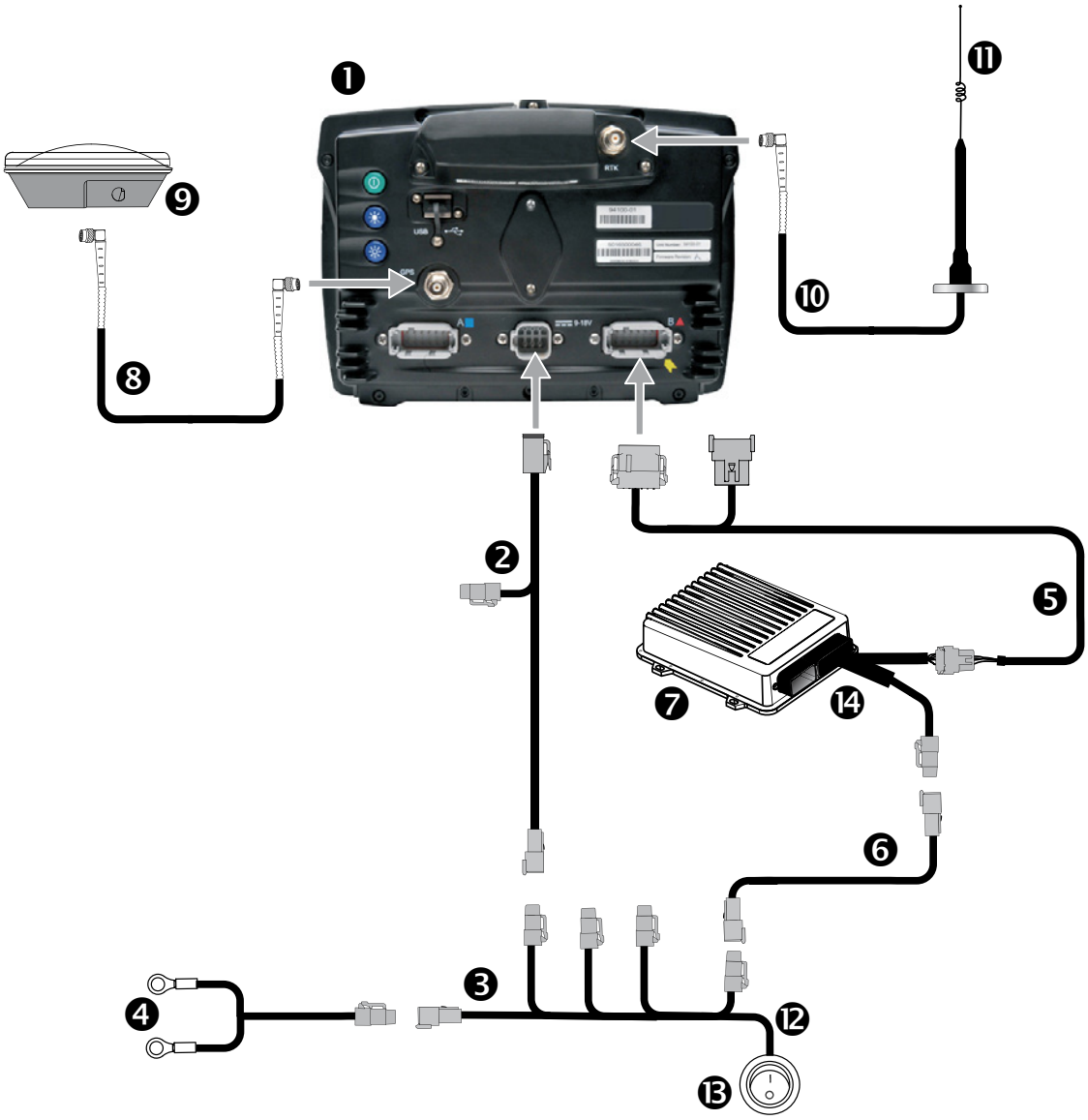


6

Power Harness Installation

- CFX-750 display: Components
- GFX-750/XCN-1050 display: Components
- CFX-750 and GFX-750 displays: Installing the power harness
- CFX-750 and GFX-750 displays: Configuring the power bus options
- TMX-2050 display: Components
- TMX-2050 display: Installing the power harness
- TMX-2050 display: Configuring the power options

CFX-750 display: Components



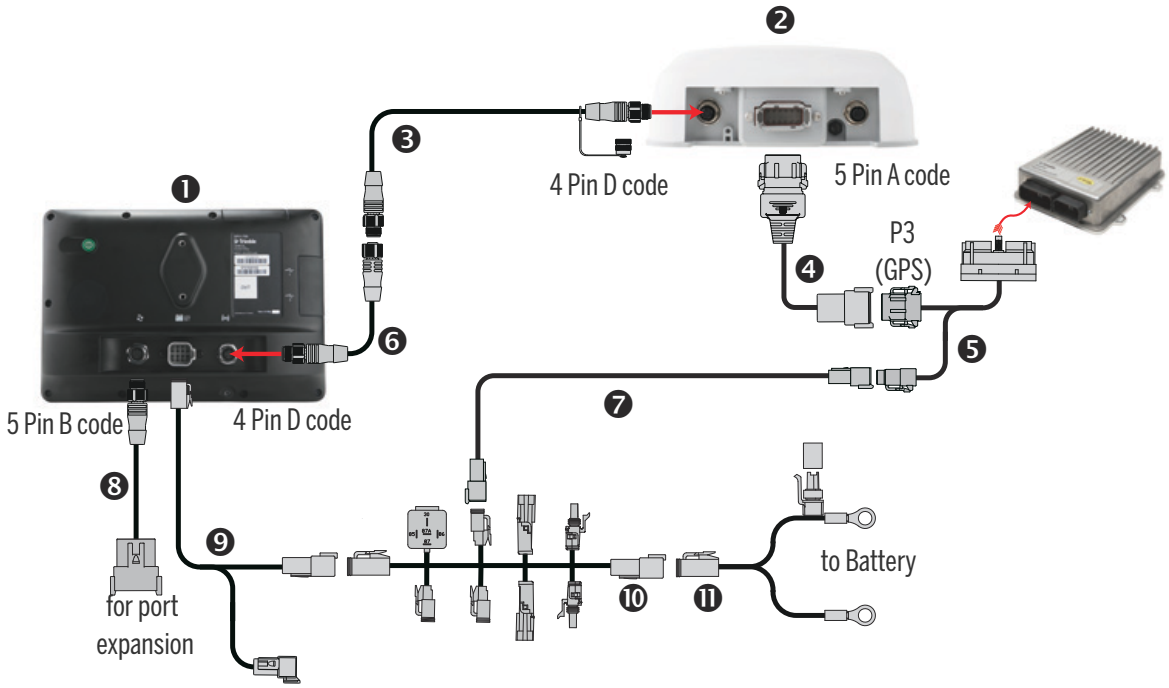
⚠ **CAUTION –** Connecting the Port Replicator on the CFX-750 display to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓮ will result in damage to the CFX-750 display and will void the warranty.

Item	Description	Trimble part number
1	CFX-750 display **NOTE –** RTK password required.	94100-02
2	CFX-750 power cable	77282
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	CFX-750 to NavController II cable with port replicator	75741

Item	Description	Trimble part number
6	2 pin DTM to 2 pin DT power adaptor	67095
7	NavController II	55563-00
8	8 m GPS TNC/TNC RT angle cable	50449
9	AG25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	62120
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

GFX-750/XCN-1050 display: Components

This graphic shows the Autopilot system using NAV-900 as an external guidance device.



Item	Description	Trimble part number
1	GFX-750/XCN-1050 display, with PIQ App	121000-XX
2	NAV-900 Guidance controller	108993-05
3	Cable Assy, GFX-750/XCN-1050 to NAV-900, Power/Ethernet (BRR), 5 m	110540
4	Cable Assy, NAV-900 to Nav II/III, AutoPilot™	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX-750/XCN-1050 to NAV-900, Power/Ethernet (BRR) Extension, 2.5 m. Optional extension for large vehicles	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX-750/XCN-1050, Expansion Port Basic, RS-232, Dig I/O, 2.5 m	110545
9	Cable Assy, GFX-750/XCN-1050, Power to display, CAN, 2.5 m	110551
10	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Power with Relay and Switch (Acc)	67259
11	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Basic Power, 4 m	67258

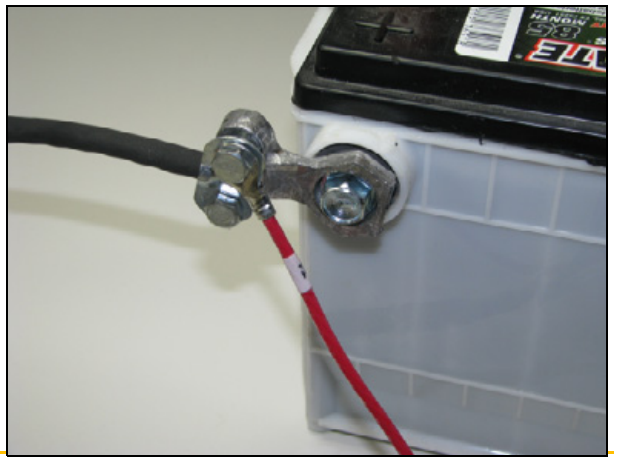
CFX-750 and GFX-750 displays: Installing the power harness

NOTE – Unless otherwise stated, instructions for "the display" refer to the CFX-750 display.

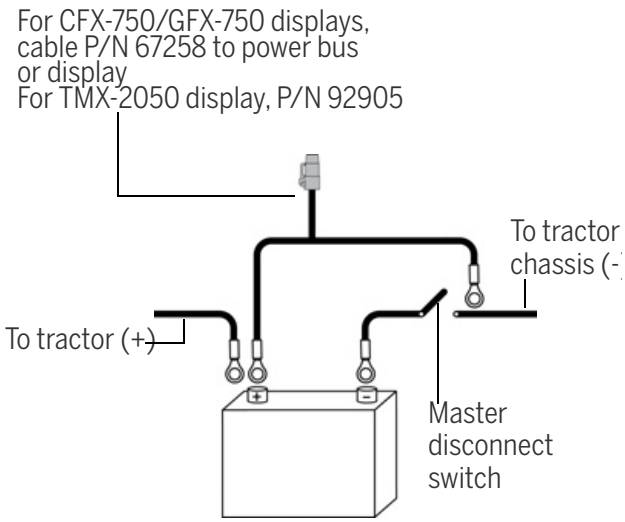
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

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

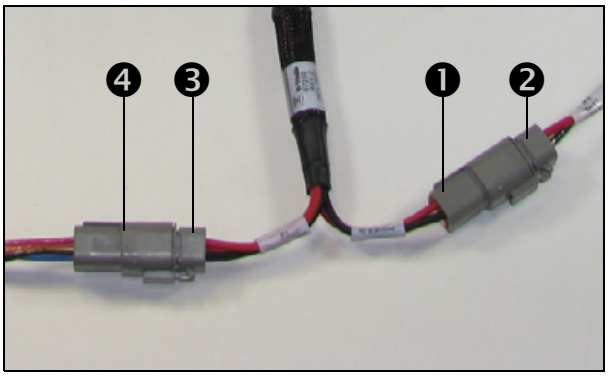


CAUTION – If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is not directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example.
Attach this terminal side just past the main disconnect so that 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

CFX-750 and GFX-750 displays: Configuring the power bus options

NOTE – Unless otherwise stated, instructions for "the display" refer to either the GFX-750 or the CFX-750 display.

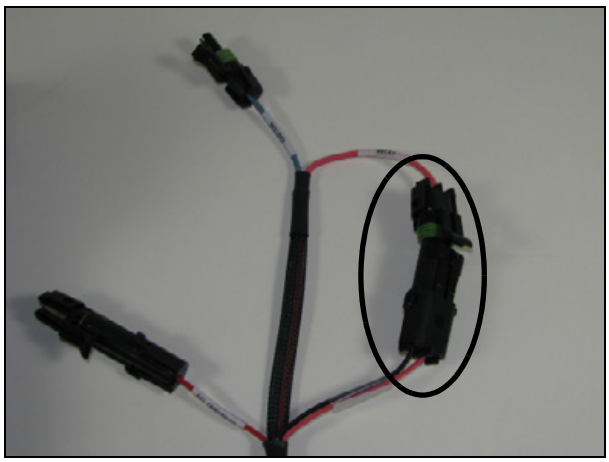
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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.

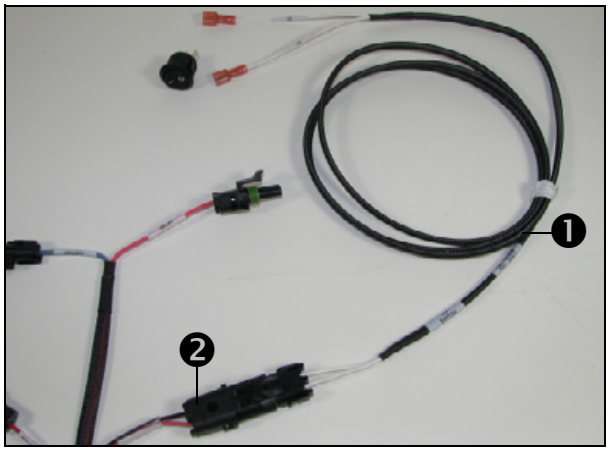


External switch is used to turn on the Autopilot system

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.

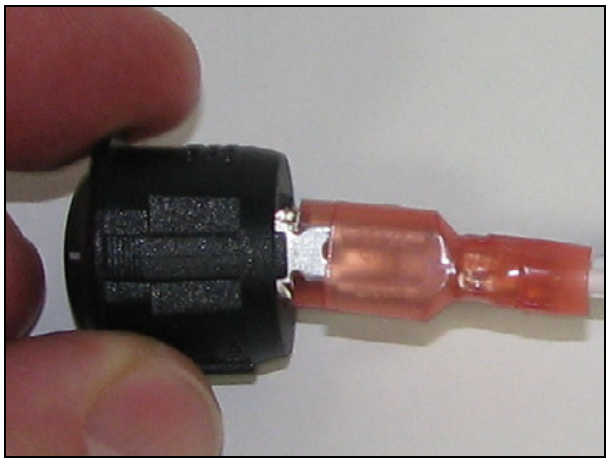
NOTE – To install the switch provided, drill a ¾" hole.



Step 2

Connect the cable labeled **R7** to the switch pins.

NOTE – Polarity is not important.

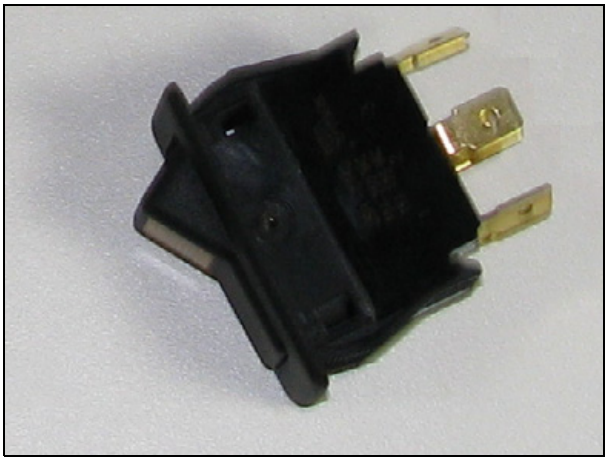


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

NOTE – An alternative location is required for the switch provided.

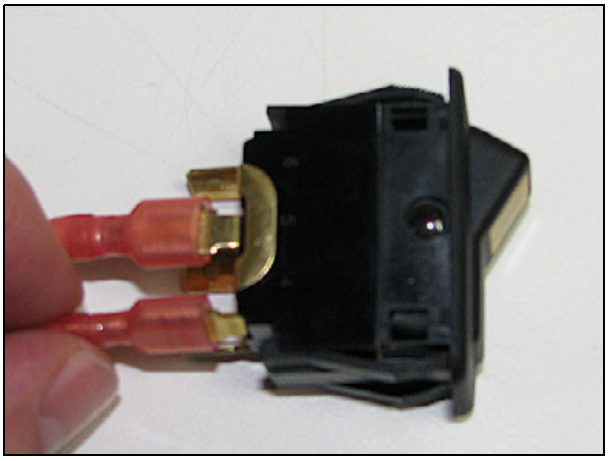


Step 2

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

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

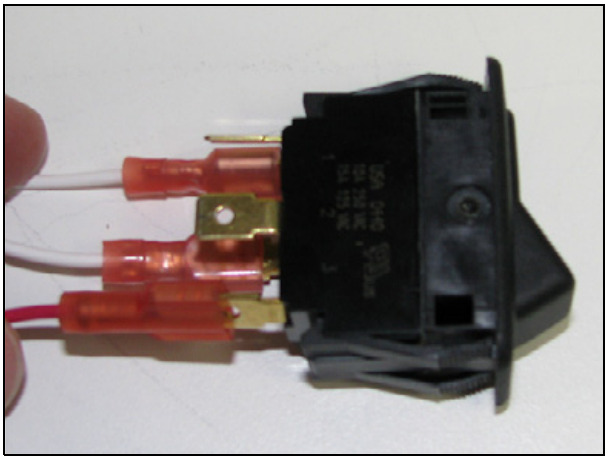
NOTE – Polarity is important.



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.

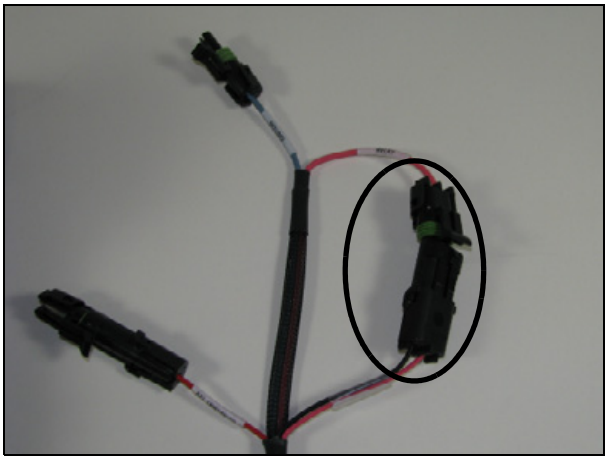
NOTE – This additional wire is required to allow the switch to illuminate.



Ignition is used to turn on the Autopilot system

Step 1

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

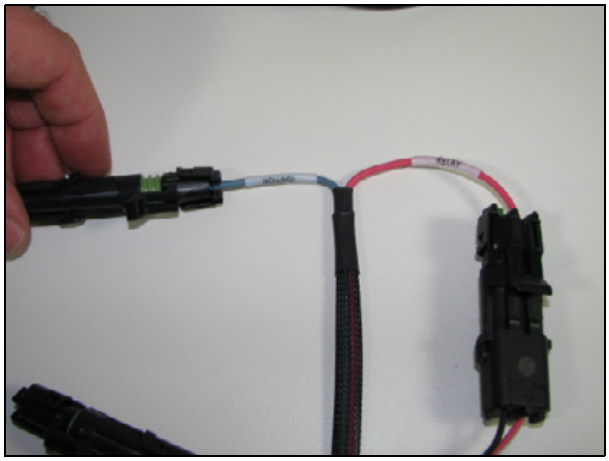


Step 2

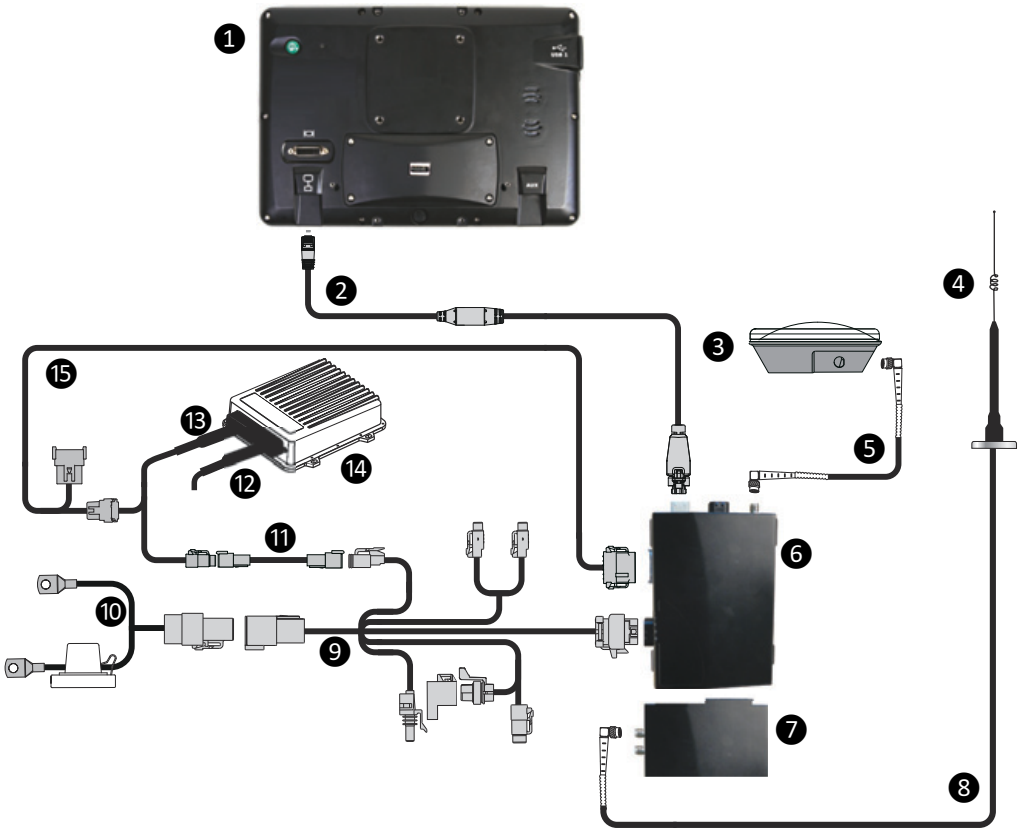
Connect the cable labeled **R8 Ignition** (included with the power bus) to connector **P3 Ignition** on the power bus.

Step 3

Route the cable to the vehicles ignition.



TMX-2050 display: Components



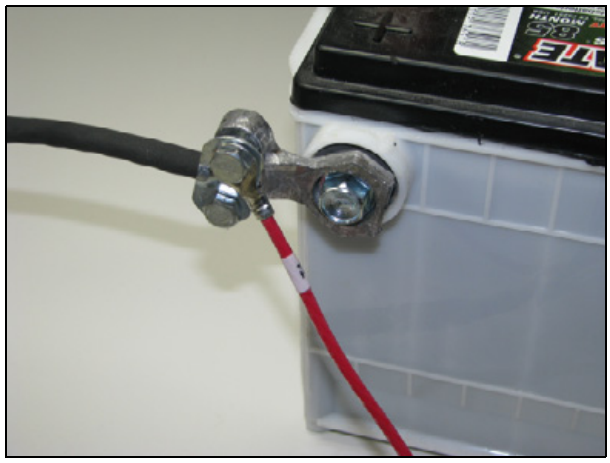
Item	Description	Trimble part number
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10	Cable, battery	92905
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController	55563-00 55566-00
15	TM-200 Module to NavController cable with port replicator	75741

TMX-2050 display: Installing the power harness

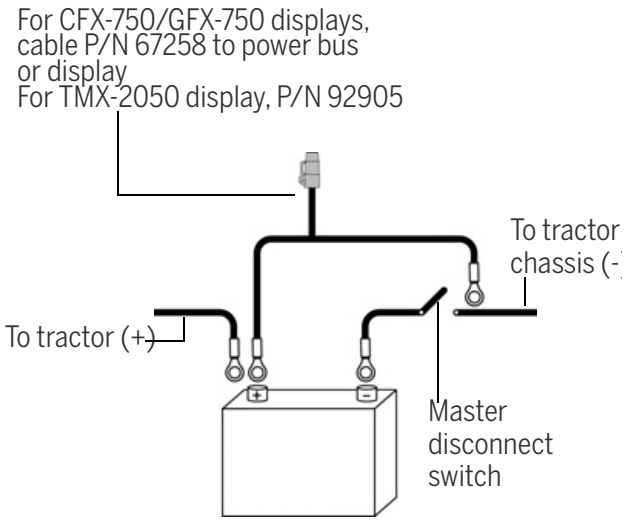
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

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



⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) 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.



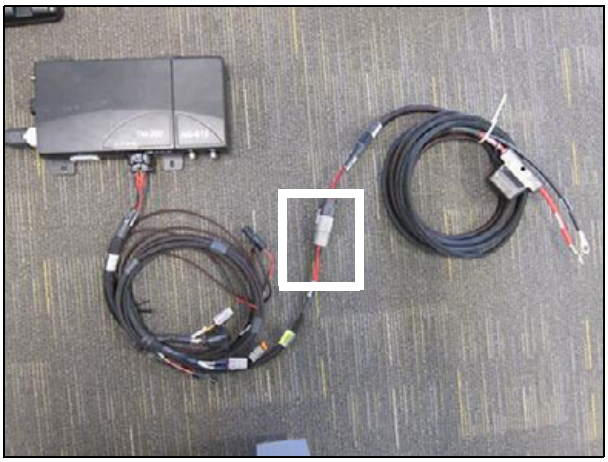
Step 2

Connect the power I/O cable P/N 92676 to the power port on the TM-200 Module.



Step 3

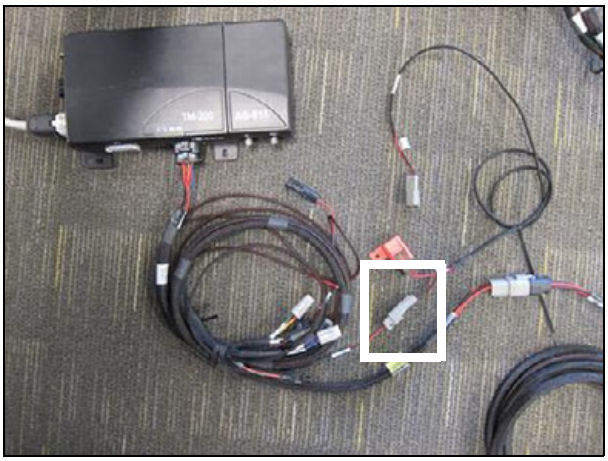
Route the power cable P/N 92905 that you previously connected to the battery and connect it to the R3 power in plug on the P/N 92676 cable.



Step 4

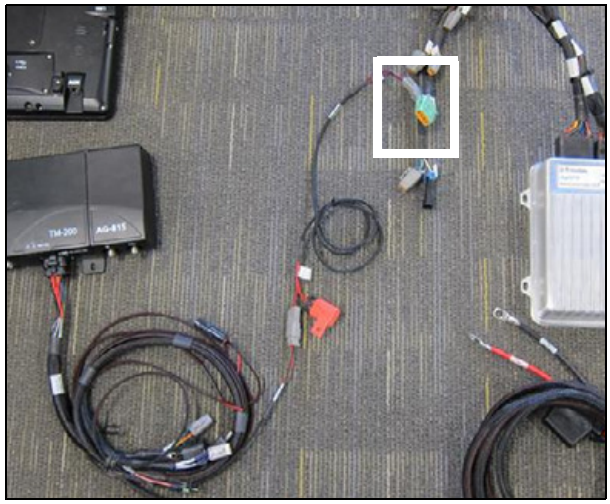
Connect the 2-pin DTM to 2-pin DT power adaptor P/N 67095 to the P2 power out connector on the P/N 92676 cable.

Route the other end to the NavController harness P/N 54601.



Step 5

Connect the other end of the P/N 67095 cable to the P2 power plug on the P/N 54601 cable.



TMX-2050 display: Configuring the power options

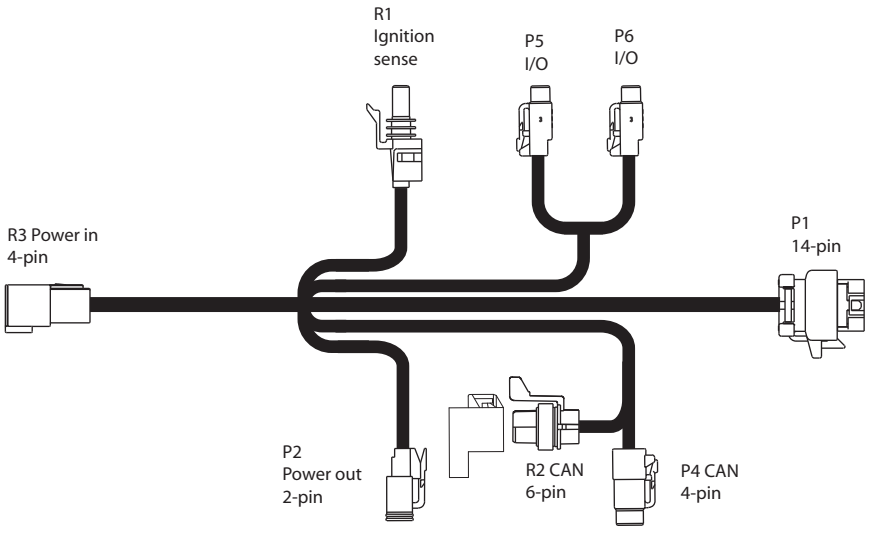
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

When you use the power bus cable, use one of the following methods to turn on the Autopilot system on the Trimble TMX-2050 displays:

- The display power button. No further changes need to be made to the power cables.
- Ignition sensing. See below.

Ignition sensing

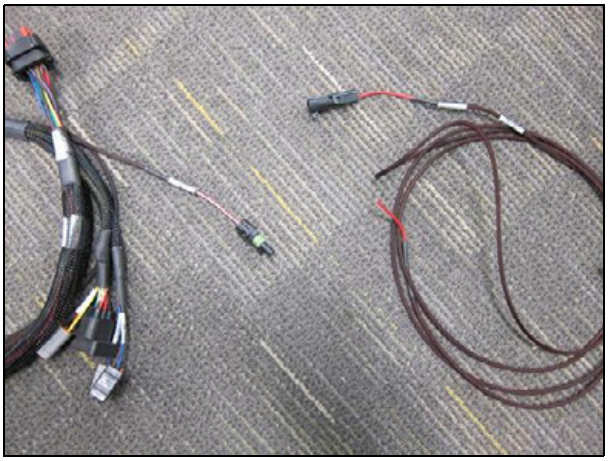
For ignition sensing with the TMX-2050 display, connect the ignition on the power supply to the R1 connector on the harness, P/N 92676.



For more information on how to use the ignition sensing option, refer to the *TMX-2050 Display User Guide*.

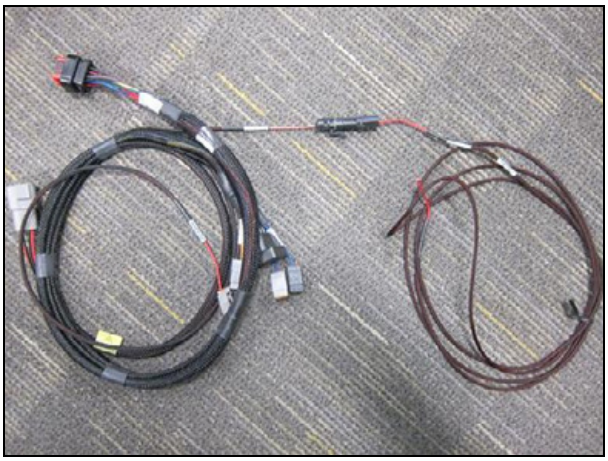
Step 1

Locate the R1 ignition sensing plug on the P/N 92676 cable; also locate the ignition sensing wire provided with the P/N 92676 cable.



Step 2

Connect the red ignition sense wire to the vehicle ignition source then route to the plug on the harness and then connect it.



7

Remote Engage Switch Installation

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

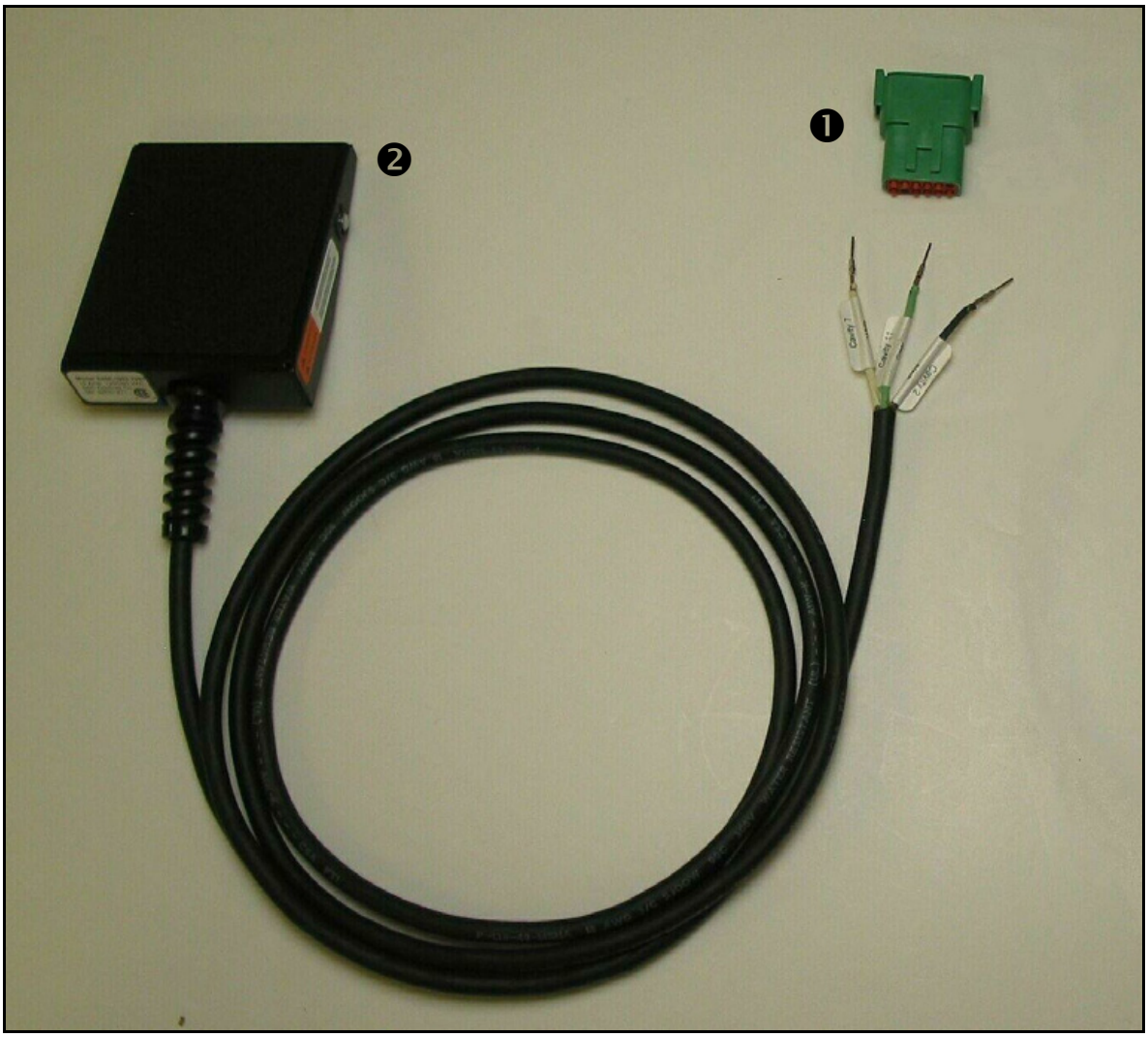
Remote engage switch components: Rocker switch



Item	Description
1	DTM receptacle
2	Remote engage rocker switch

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

Remote engage switch components: Foot switch

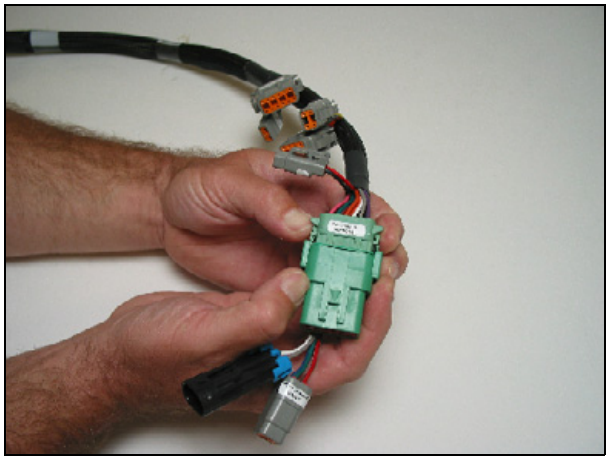


Item	Description
1	DTM receptacle
2	Remote engage foot switch

Preparing the remote engage cable

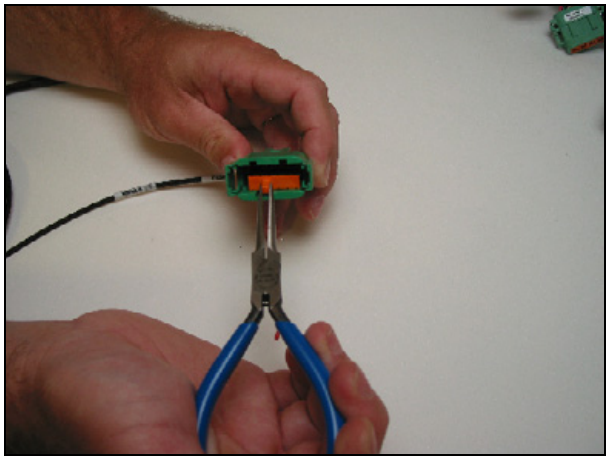
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. For more information, see Controller connections, page 169.



Step 2

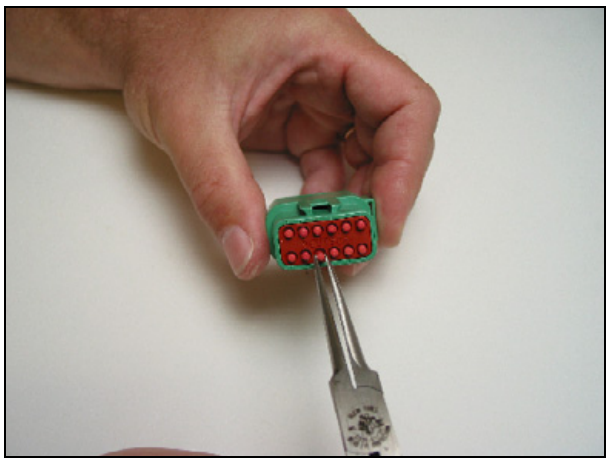
Remove the wedge from the connector.



Step 3

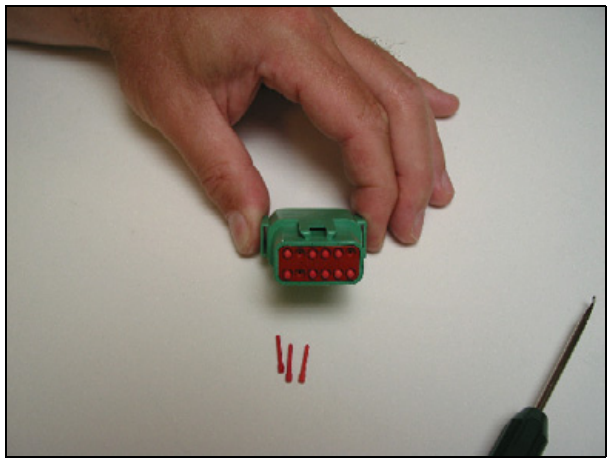
Rocker switch only

Remove the plugs from cavity 2 and cavity 7.



Foot Switch Only

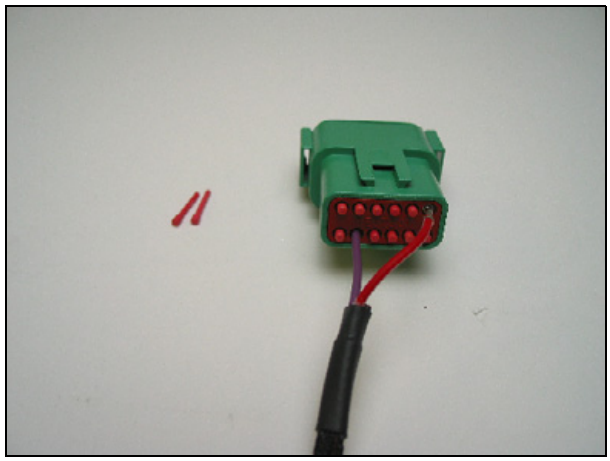
Remove the plugs from cavity 2, cavity 7, and cavity 11.



Step 4

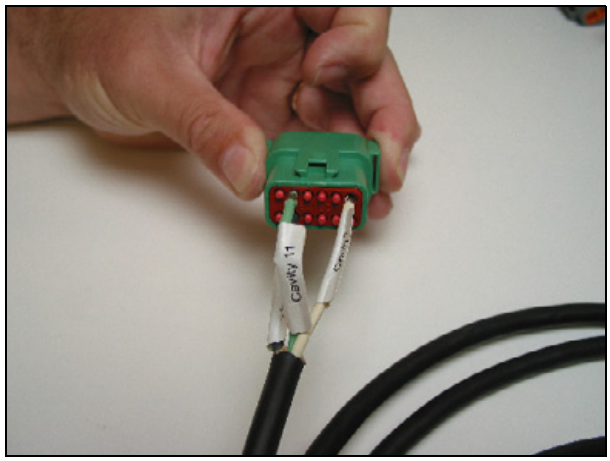
Rocker switch only

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



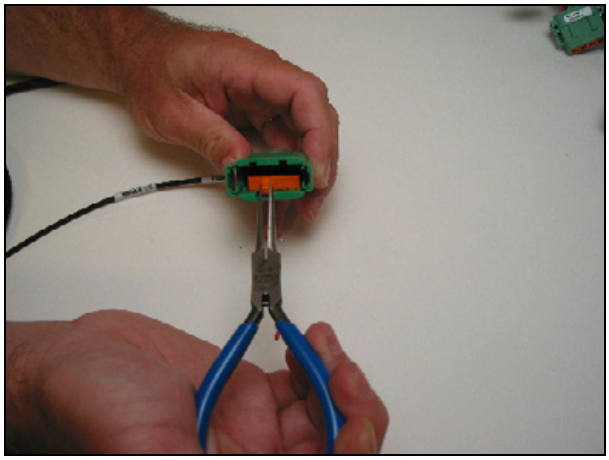
Foot switch only

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

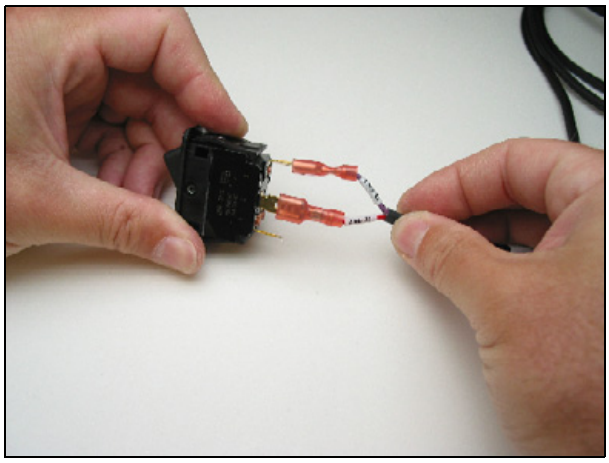
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



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.



Using the remote engage switch

To engage a system using NavController II do one of the following:

- Firmware versions 5.20 and earlier: Hold down the remote engage switch for longer than 0.5 seconds and less than 4 seconds.
- 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.

Controller Installation

- Installing the controller – all models except MXM and TM models
- Installing the controller – MXM and TM models
- Installing the controller cables
- Controller connections

Installing the controller – all models except MXM and TM models

⚠ **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 chapter.

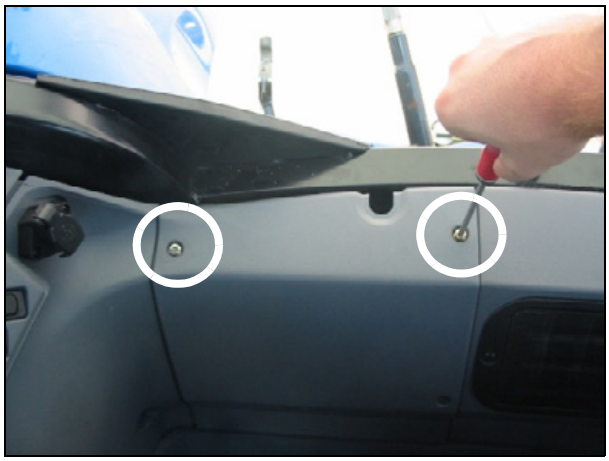
Back method: When the rear ECU slot is free

Controller orientation is straight up and down, and parallel to the axle:

- Roll: 0
- Pitch: -90
- Yaw: 0

Step 1

At the back of the cab, behind the seat, remove the screws that hold the plastic cover on.



Step 2

Remove the plastic cover.



Step 3

Unbolt the ECU from its bracket.



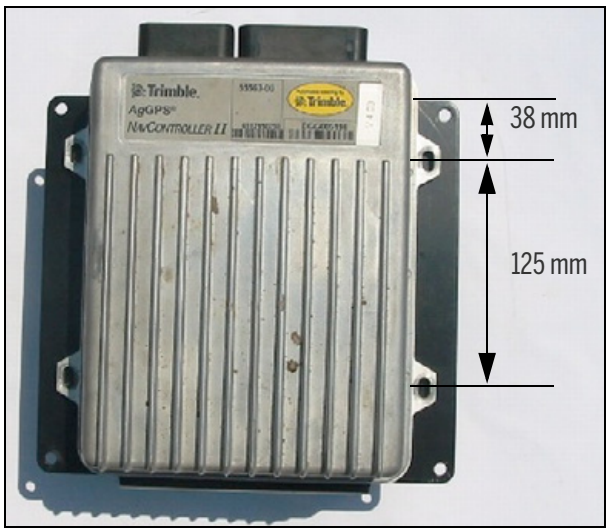
Step 4

Unbolt and remove the existing ECU bracket. Leave the ECU in place.



Step 5

Place the NavController II on the ECU bracket. Make sure that it is centered (25 mm from the left and right sides).



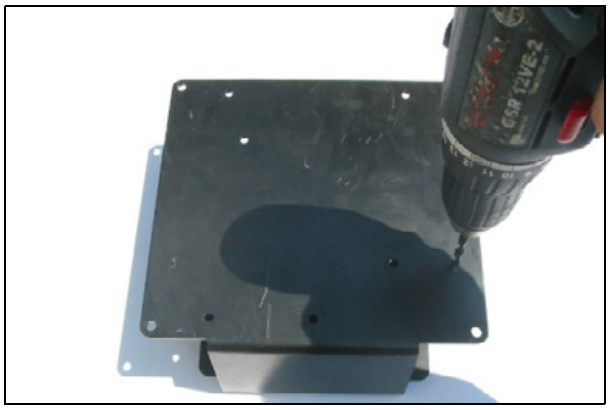
Step 6

Use the controller as a template to mark the positions of the holes.



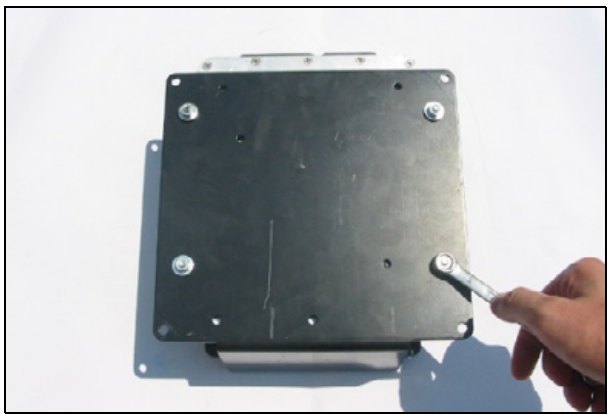
Step 7

At the marked points, drill holes with a 6 mm diameter.



Step 8

Attach the controller to the mounting plate. Use the provided #10 x 5/8 screws, four nuts, and four washers.



Step 9

Place the controller and mounting plate in the gap, with the controller connectors facing upward.



Step 10

Attach the mounting plate to the frame with the existing bolts.



Step 11

Attach the existing ECU (in front of the controller), to the top mounting plate. Use the four existing bolts.



Step 12

Attach the main and auxiliary harnesses using a hex key.



Step 13

Tuck the harnesses behind the plastic housing and feed it down to the floor.



Step 14

Replace the plastic cover panel and then reinstall the screws.



Seat mounting

Controller orientation is straight up and down, and parallel with the axle:

- Roll: 0
- Pitch: 0
- Yaw: 0

Step 1

Locate the controller seat mounting bracket and bolts.



Step 2

Remove the rubber plug from the right rear side of the floor mat. You will route the controller cables through this hole.



Step 3

If the seat suspension air reservoir is present on the right of the seat, cut the cable tie that holds the connector onto the top of the reservoir and then disconnect the plug.

If the air reservoir is not installed, skip to Step 17.



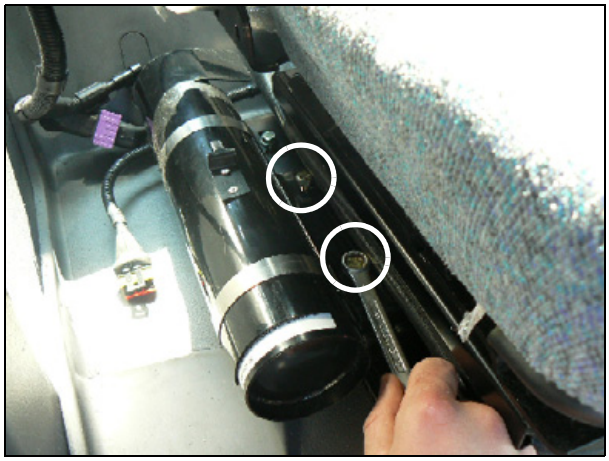
Step 4

Release the pressure in the reservoir using the switch on the left armrest and disconnect the air hose from the accumulator.



Step 5

Unbolt the bracket that holds the accumulator and then take off the accumulator assembly.



Step 6

Reconnect the plug disconnected in Step 3.



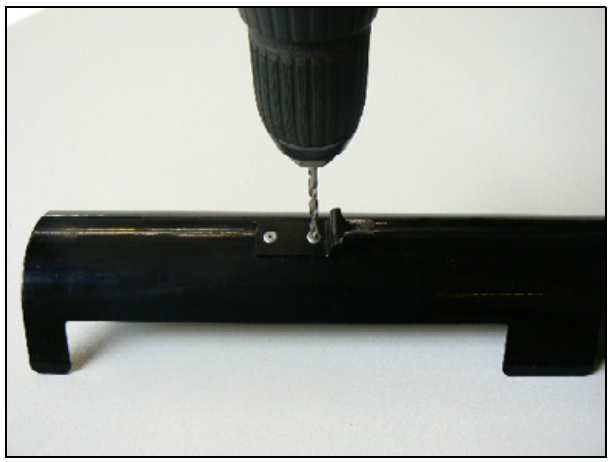
Step 7

Disassemble the air reservoir from its bracket.



Step 8

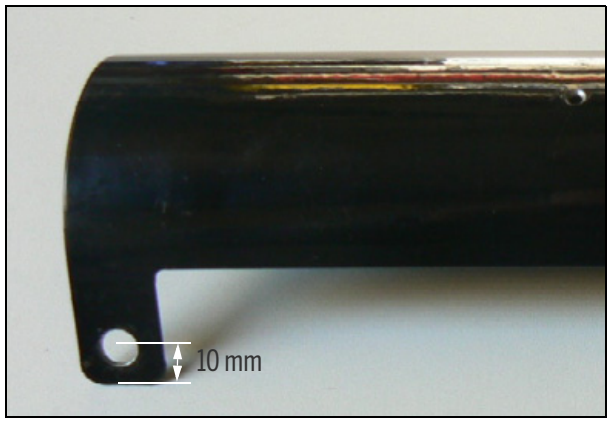
Drill through the rivets to remove the small bracket from the reservoir bracket.

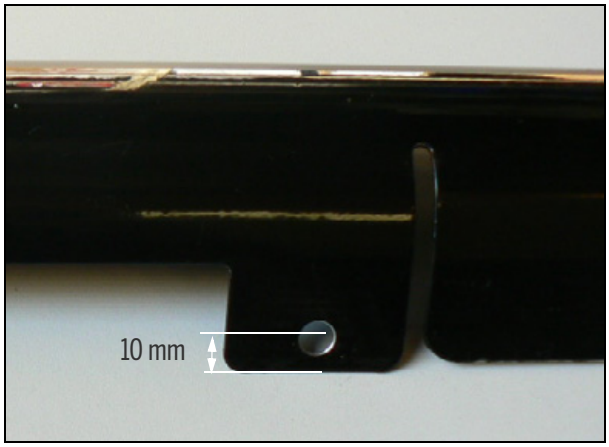


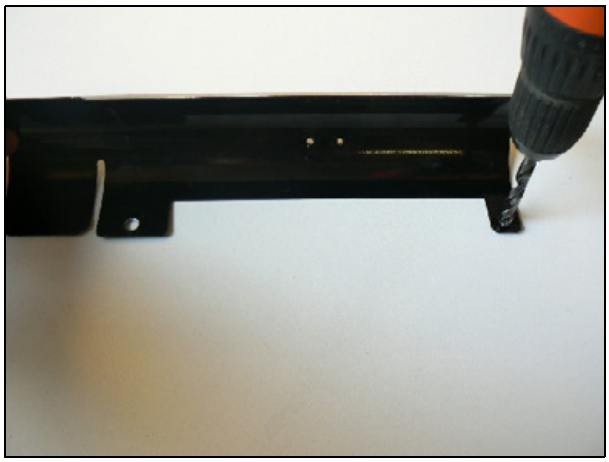
Step 9

Mark the position of the two mounting holes 10 mm from the end of each tab as shown.









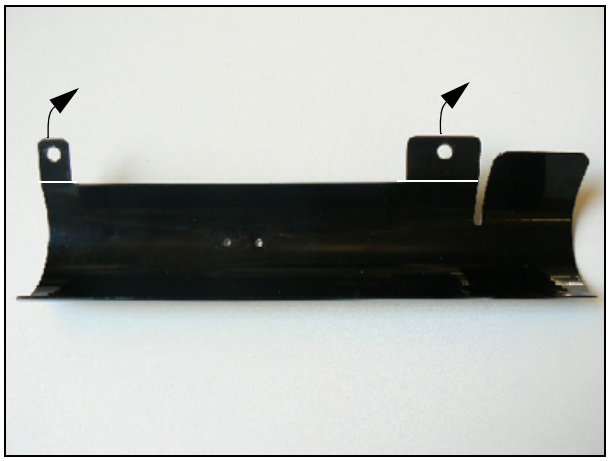
Step 10

Drill a 9 mm hole at each of the two marked locations.

Step 11

Slightly bend the two tabs towards the back. Follow the white line to obtain enough room between the air reservoir and the bracket to mount the M8 nuts.

In this image, the tabs are being bent away from the camera.

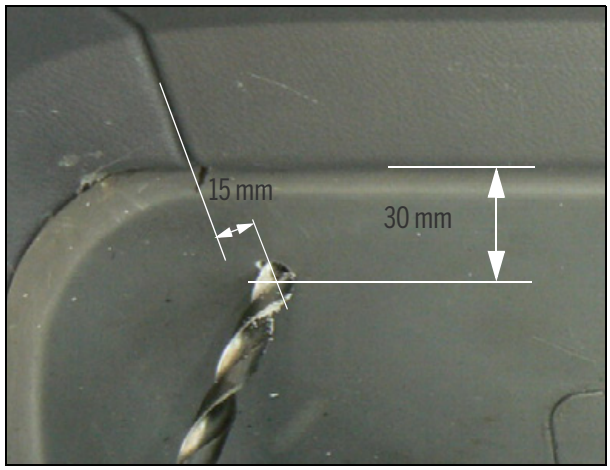


Step 12

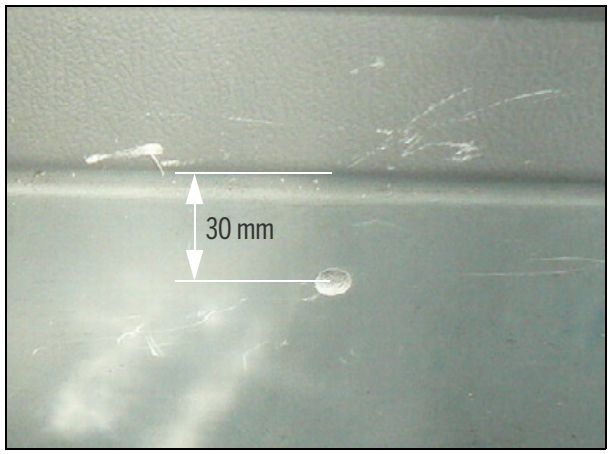
Drill two holes with a diameter of 9 mm through the rubber mat at the rear of the seat as shown.

⚠ **CAUTION –** Ensure that you only drill through the rubber mat. If you drill through the rear wall, you can cause damage to the wires and other devices that are present behind the wall.





LEFT HOLE



RIGHT HOLE

Step 13

Install two flat head M8 x 16 mm screws in place as shown.



Step 14

Place the air reservoir bracket over the M8 screws and then secure them with some M8 nuts.



Step 15

Option 1

Mount the reservoir onto the bracket. Use the two Serflex belts with the air connector pointing to the right fender.

Extend the $^{3}/_{8}$" air hose using a $^{3}/_{8}$" adaptor (not provided) and $^{3}/_{8}$" hose. Connect it to the air reservoir.



Option 2

To avoid extending the $^{3}/_{8}$" hose, do the following:

- Reroute the air hose towards the back of the seat.
- Mount the reservoir with its base facing the right fender.
- Adjust the length of the air hose and then connect it to the air connector.



Step 16

Secure the reservoir with the two Serflex belts as shown.



Step 17

2011 and newer machines are equipped with a bracket for a fire extinguisher. This bracket will be located above the NavController II.



Step 18

To temporarily remove the bracket from the machine, remove the two mounting bolts.



Step 19

Remove the two existing seat retaining screws.



Step 20

Install the 27 mm height spacers over the seat mounting holes.



Step 21

Install the seat bracket over the spacers and then secure it with the provided M8 x 50 mm screws.



Step 22

Use the supplied 10-32 screws to fit the controller bracket to the mounting plate.



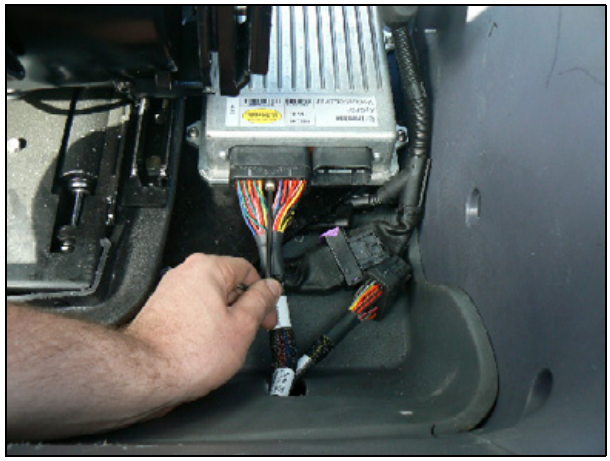
Step 23

To attach the bracket to the machine, first place the supplied spacers under the mounting plate, then place the larger spacer above the plate.Place the original extinguisher plate on top. Use the supplied bolts to install the assembly in place.



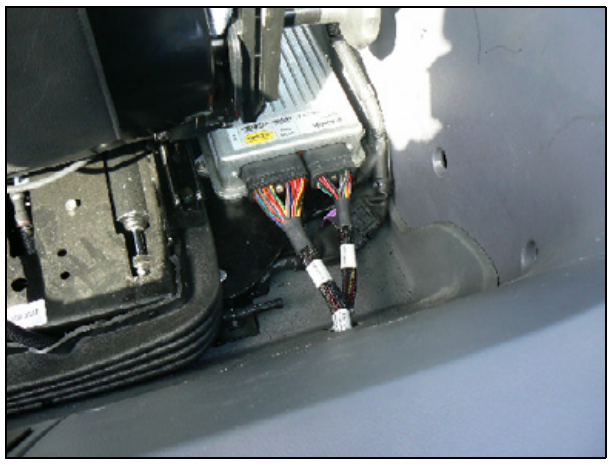
Step 24

Attach the main and auxiliary harnesses to the controller and then use an Allen key to secure them.



Step 25

Route the wiring harnesses through the hole in the right rubber mat.



Installing the controller – MXM and TM models

Step 1

Clear and clean the floorboard surface to the left of the driver seat in front of the emergency brake.



Step 2

Mark two points 73 mm (2-7/8 inches) from the front edge of the seat base floor mat for controller tab locations. Mark the first drill point ❶ 73 mm (2-7/8 inches) from the front edge of the seat floor board and 44.5 mm (1-3/4 inches) from the seat base. When you measure and drill, ensure that the floor mat is pressed firmly against the steel framework.



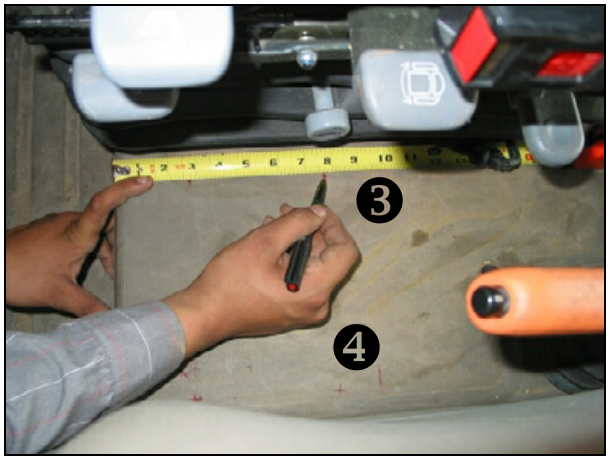
Step 3

Mark the second point ❷ 73 mm (2-7/8 inches) from the front edge of the seat floor board and 241 mm (9-1/2 inches) from the seat base.



Step 4

Mark the third drill point ❸ 200 mm (7-7/8 inches) from the front edge of the seat floor board and 44.5 mm (1-3/4 inches) from the seat base. Mark the fourth point ❹ 200 mm (7-7/8 inches) from the front edge of the seat floor board and 241 mm (9-1/2 inches) from the seat base.



Step 5

Place the controller even with the front edge of the raised floor board, with the connectors facing the back of the cab and the flanges down. Verify that the controller is square with the seat base and clear of obstructions. Verify the drill points match the controller tabs.

NOTE – With deluxe air ride seat models the controller can be located 76 mm (3 inches) to the rear of the described location.



Step 6

The area below the controller is visible from the rear of the tractor.



Step 7

Before you drill a hole, ensure that no wires or hoses are directly below the drilled surface.



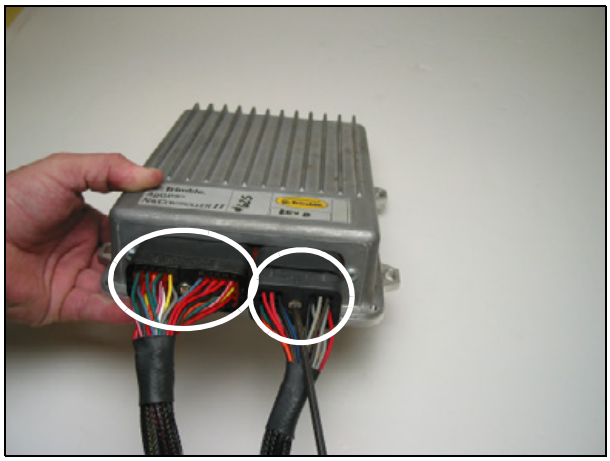
Step 8

Drill four holes at the points marked in Steps 2, 3, and 4. Drill the holes to match the supplied 10-32 x 1 inch fasteners. Use a right angle drill extension to drill next to the seat base.



Step 9

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



Step 10

Insert the four 10-32 x1 1 inch SCH bolts and #10 washers. Attach the #10 nylock nuts from underneath the cab.



Step 11

To firmly secure the controller to the floor, tighten the fasteners in a criss-cross pattern. Once the controller is snug, add 1/8 turn to each fastener. Do not over tighten the fasteners.

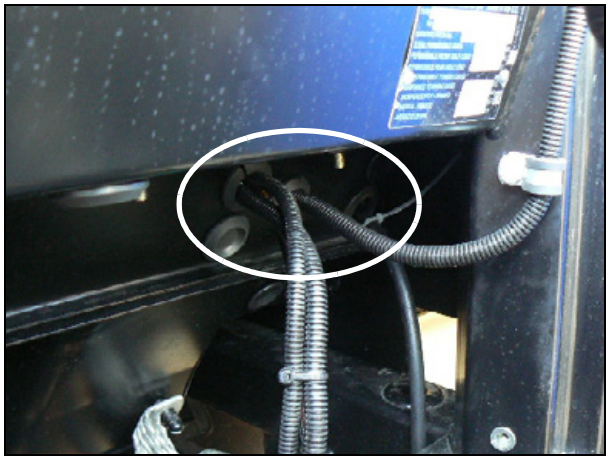
NOTE – The controller must be parallel to the ground and the center line of the vehicle.



Installing the controller cables

Step 1

Locate the existing pass-through at the right corner of the cab and then pass all the Autopilot cables through it.



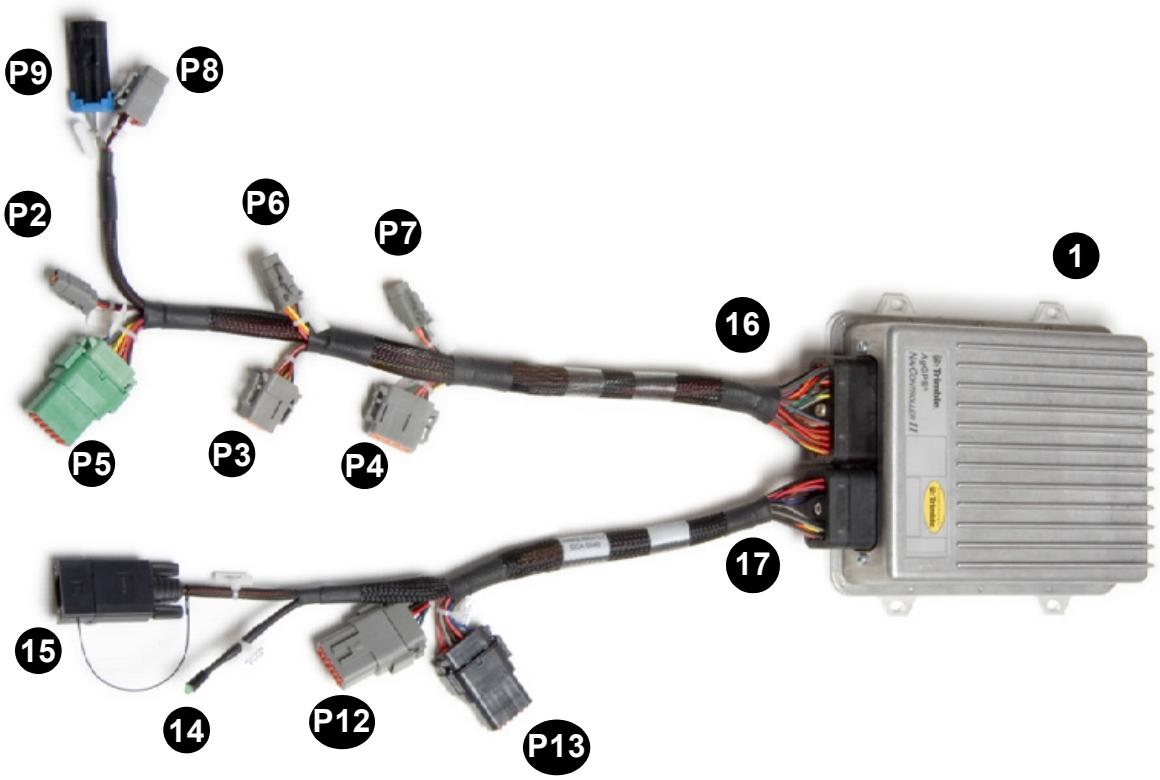
Step 2

Coil the excess cables and then secure them with some cable ties behind the rear panel.

Protect the cables where they are in contact with any cutting edges at the pass-through at the back of the cab.



Controller connections

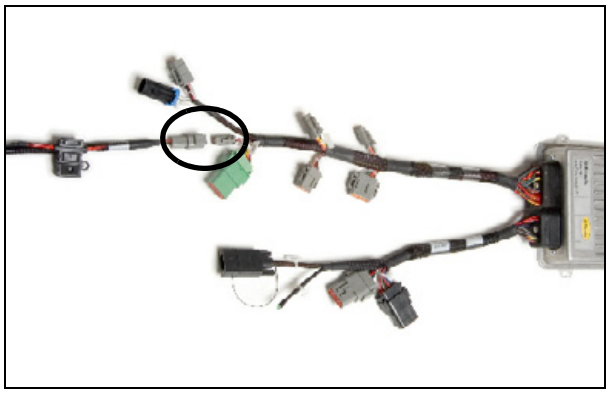


Item	Description	Item	Description
1	NavController II controller	**P9**	Sonalert connector
P2	Power connector	**P12**	Lightbar/spare connector
P3	GPS connector	**P13**	Spare sensors connector
P4	Display connector	**14**	Status indicator
P5	Vehicle sensors connector	**15**	Laptop connector
P6	Steering sensor connector	**16**	Main harness
P7	Manual override connector	**17**	Auxiliary harness
P8	Hydraulic valve connector		

Step 1

Connect the power cable connection to P2, which is labeled **Power**. P-2 is located on the main wiring harness.

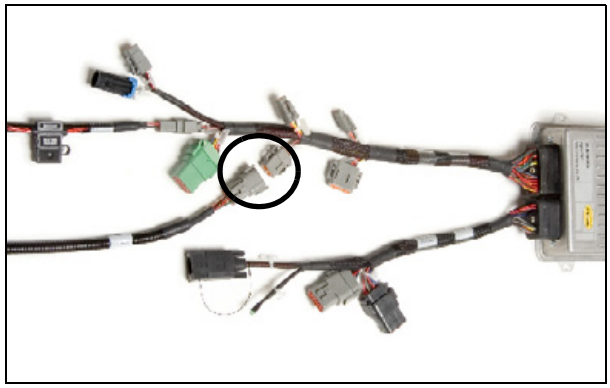
NOTE – The power connection supplies power through the controller to all connected devices, including GNSS and displays.



Step 2

Connect the GPS cable connection to P3, which is labeled **GPS**. P-3 is located on the main wiring harness.

NOTE – If you are using a TMX-2050 or CFX-750 display, attach the main display cable here, P/N 75741.



Step 3

With the cable routed to the NavController, the R1 connector will connect to the P12 connector on the 54602 harness on the NavController as shown.



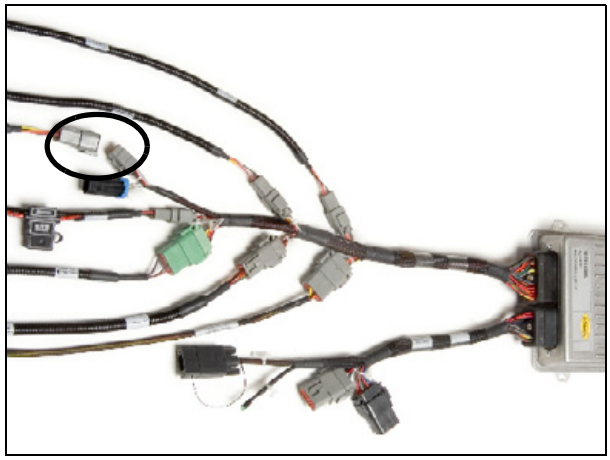
Step 4

Connect the manual override cable connection to P7, which is labeled **Manual Override**. P7 is located on the main wiring harness.

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

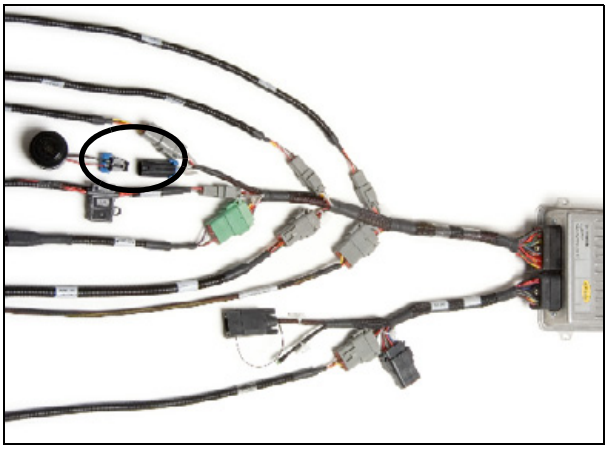
Step 5

Connect the hydraulic steering valve cable connection to P8, which is labeled **Hydraulic Valve**. P8 is located on the main wiring harness.



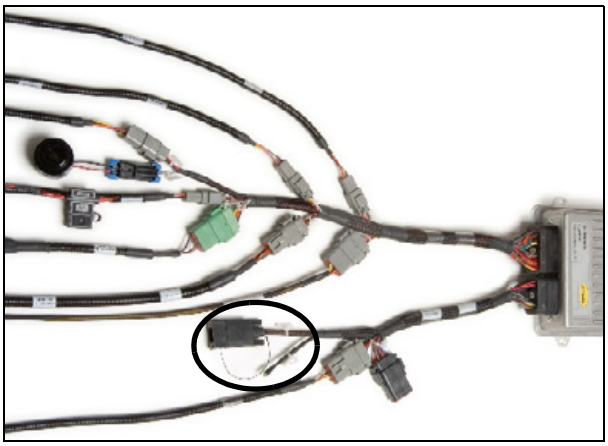
Step 6

Connect the Sonalert P9 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.

9

Isolation Models Setup Instructions

- Connecting the isolation solenoid cable
- Configuring the NavController III to turn on the electronic isolation manifold
- Advanced setup instructions

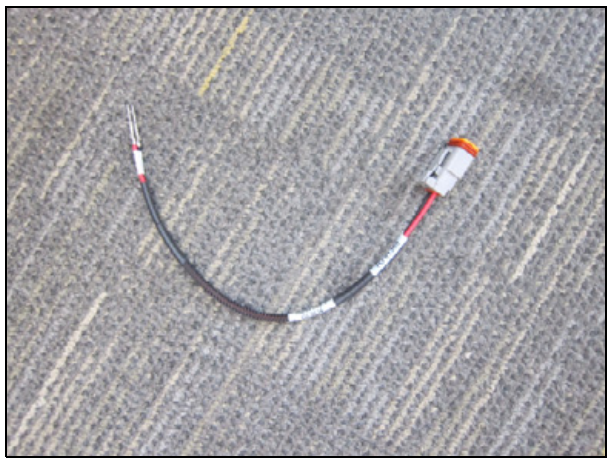
These instructions must only be completed by users familiar with operation of H4 manifold.

Connecting the isolation solenoid cable

Connect the P/N 100199 and 103378 cables to provide power to the Autopilot cut-off coil.

Locate the supplied P/N 103378 and 100799 isolation manifold cable in the isolation manifold kit.





Isolation manifold power connection (available only with NavController III)

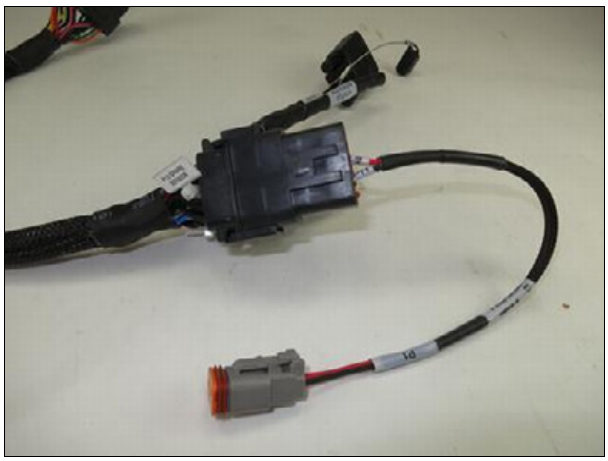
NOTE – This feature is not available with the NavController II.

NOTE – This connection type activates the isolation manifold automatically, using the third solenoid drive function of the NavController III.

Follow this procedure to connect the P/N 100199 cable to the NavController III harness, P/N 54602.

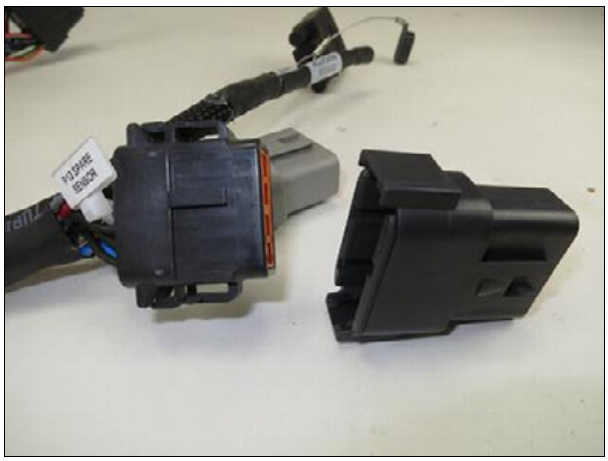
Step 1

Locate the supplied P/N 100199 cable in the isolation manifold kit.



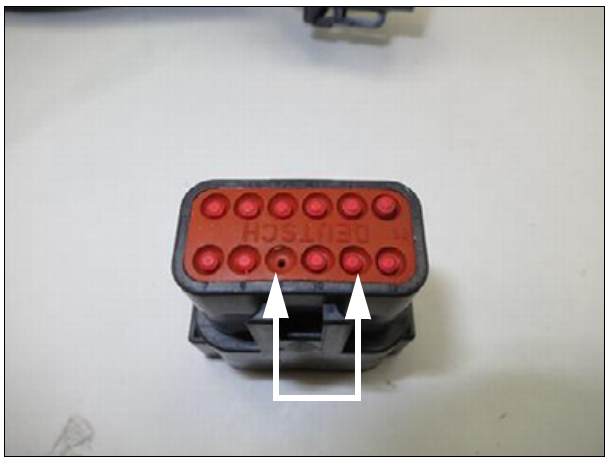
Step 2

Locate and remove the connector plug from the P/N 54602 P13 connector.



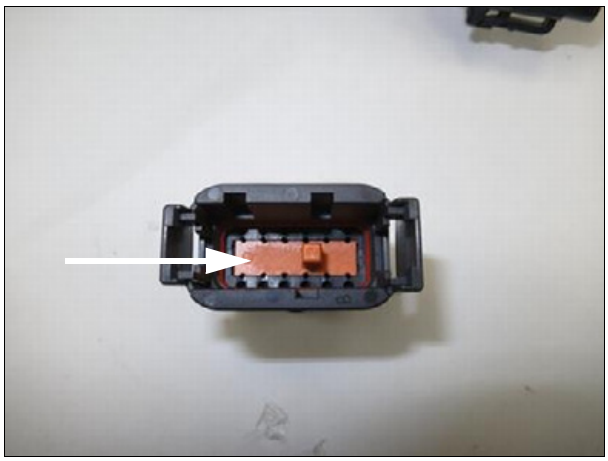
Step 3

On the rear of the plug, remove the sealing pins from the 9 and 11 sockets.



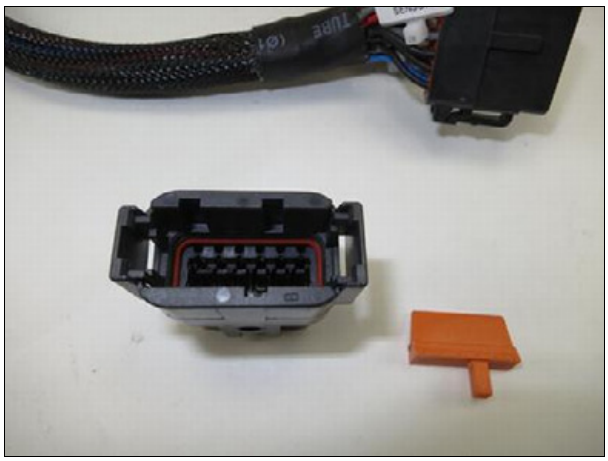
Step 4

On the inside of the connector, locate the orange wedge lock.



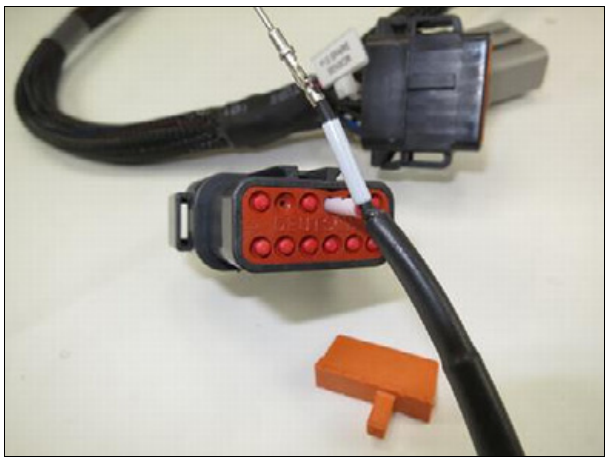
Step 5

Use needle-nose pliers to remove the wedge lock by pulling it straight out of the plug connector.



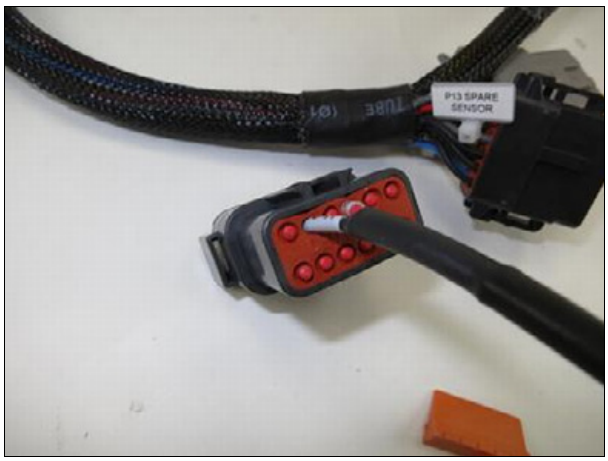
Step 6

Insert the pin labeled **to p13-9** into the 9-pin location on the connector plug.



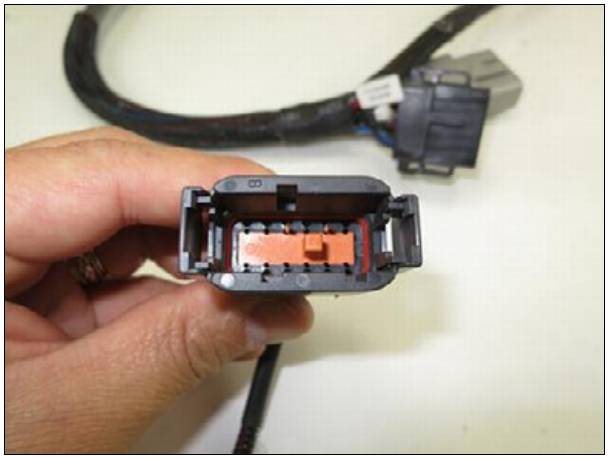
Step 7

Insert the pin labeled **to p13-11** into the 11-pin location on the connector plug.



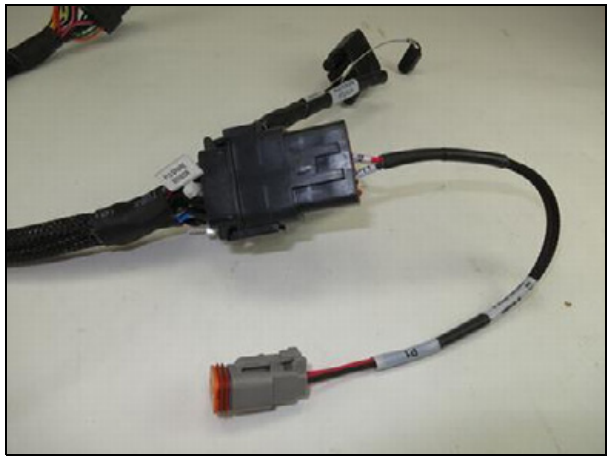
Step 8

Re-install the orange wedge lock into the connector plug.



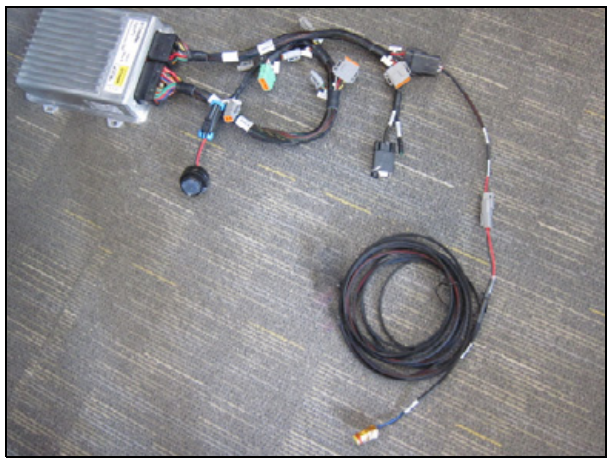
Step 9

Connect the P13 plug to the P/N 54602 harness on the NavController III.



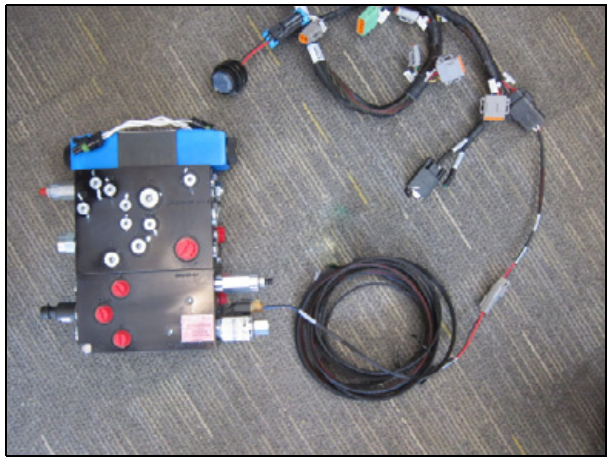
Step 10

Connect the R1 connector on cable P/N 103378 to the P1 connector on cable P/N 100799.



Step 11 - Connecting to the solenoid

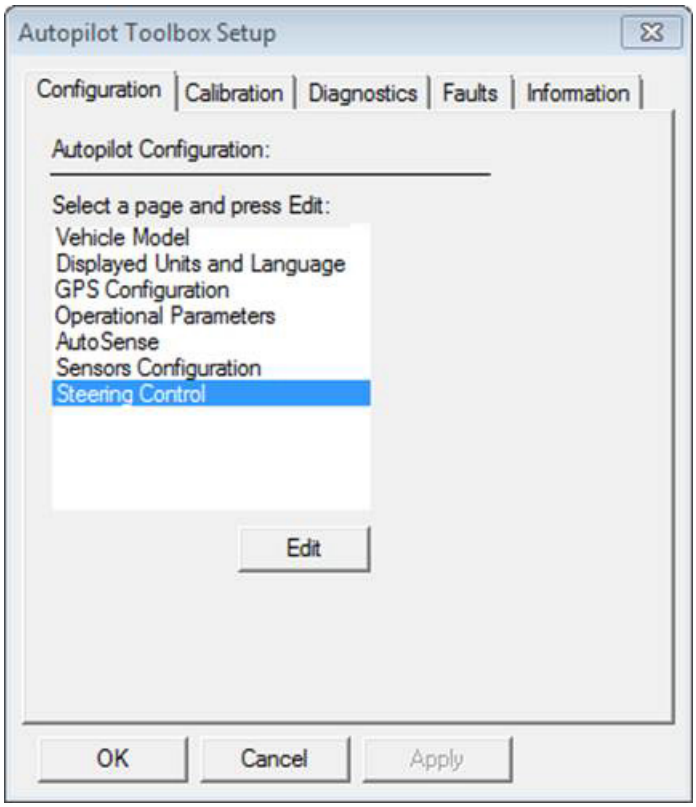
Route the P2 plug of cable P/N 103378 to the Autopilot manifold isolation solenoid and connect it as shown.



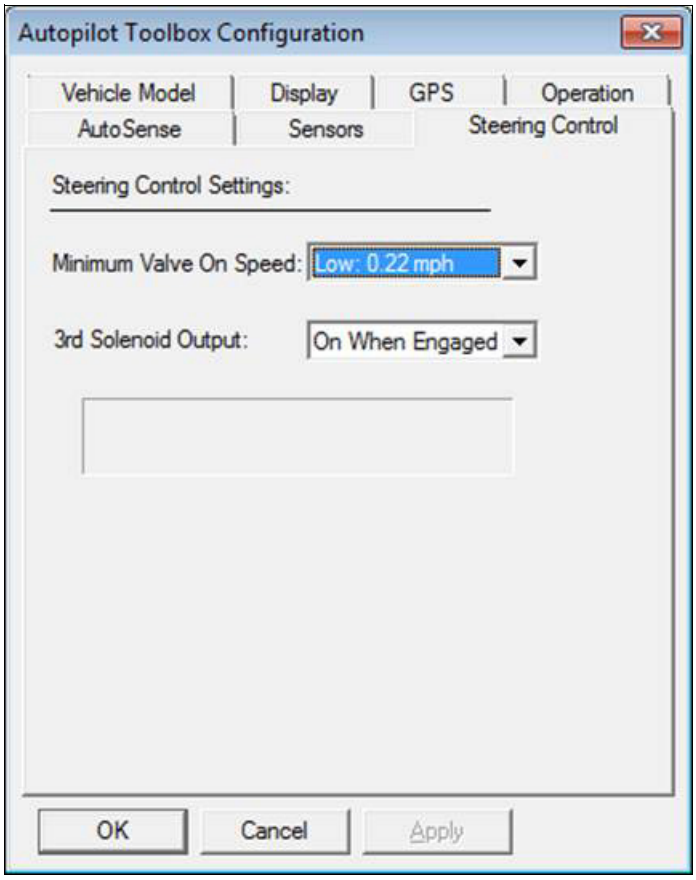


Configuring the NavController III to turn on the electronic isolation manifold

1. In Autopilot Toolbox version 3.3 or later, in the Setup screen, click the **Configuration** tab, select **Steering Control** and then click **Edit**:



2. From the **3rd Solenoid Output** drop-down list, select **On When Engaged** and then click **OK**:



NOTE – The **Minimum Valve On Speed** applies also to the third solenoid valve. The third solenoid will not be active until the set speed is reached. If the vehicle drops below the selected speed, the third solenoid will no longer be active.

In v5.61 of FMX+ or PIQ firmware, UI is available to enable the **3rd Solenoid Output** field. Note that this functionality is not available when using NextSwath Connect.

Advanced setup instructions

Setting the load sense relief pressure

The Load sense relief pressure should be set approximately 100 psi lower than the system relief pressure to allow margin in the adjustment and to fully protect the system. The default setting of the LS relief valve is 2700 psi. If a lower pressure is required, these instructions will provide a procedure for adjusting the LS relief pressure. The relief pressure should not be increased above 2700 psi.

Preparing to set the relief pressure

Step 1

Install a pressure gauge into the LS2 port; if no DSV2 cartridge is present, the PX ports can also be used.

Step 2

Connect the P line of the manifold to a 3000 psi pressure source such as a remote on a tractor.

Step 3

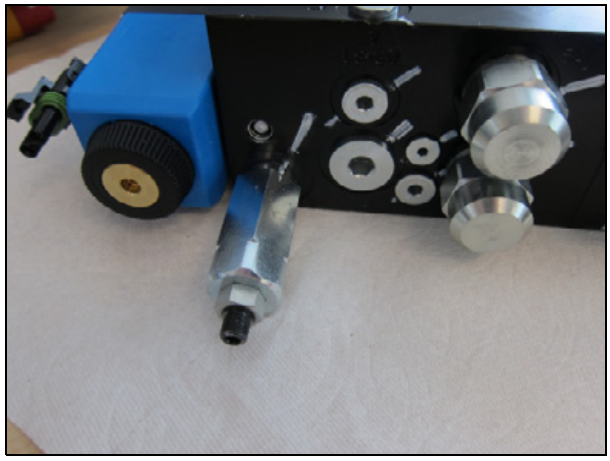
Connect the T line of the manifold to an oil tank or return line on the remote of a tractor.

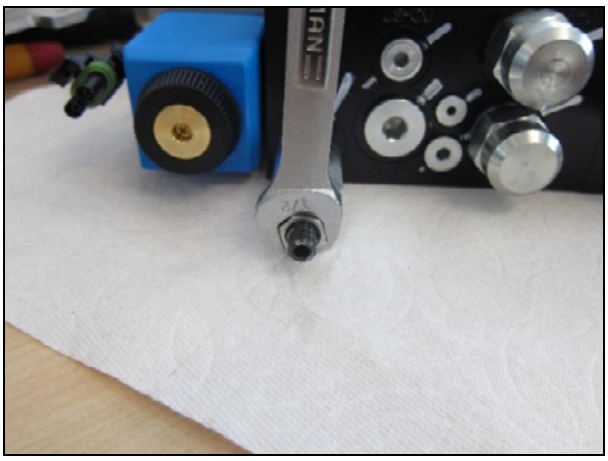
Step 4

The A and B / SCU-A, SCU-B lines: May be either connected to the steering cylinders / orbitrol or capped off for this test.

Step 5

Loosen the jam nut on the LS relief valve'

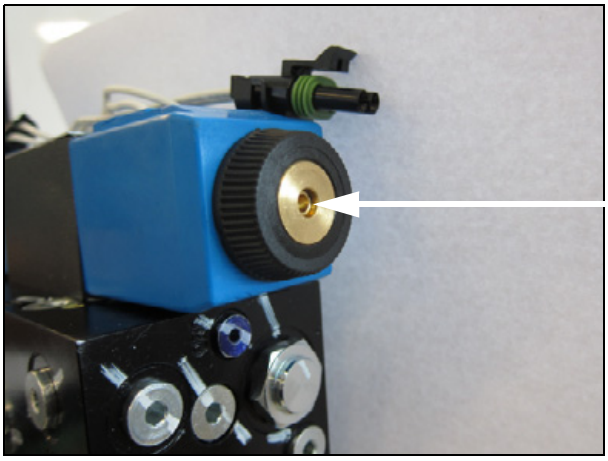




Step 6

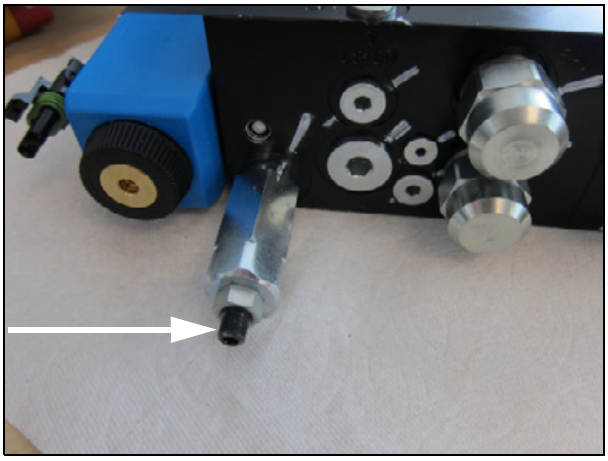
With pressure applied to the P port, press on one of the Detent overrides on the electro hydraulic valve. If the steering cylinders are present in the system, make sure to run the override until you hit and end stop to ensure you are at peak pressure.

NOTE – For systems with the isolation block, the isolation solenoid must be enabled.



Step 7

With the override pressed, turn the relief valve in or out and watch the gauge to set the LS relief pressure.



Adjusting the isolation manifold pressure reducing valve (PRV)

⚠ **CAUTION –** Increasing the pressure setting of the PRV can lead to the loss of ability to mechanically override the autopilot steering.

The isolation sandwich on the H4 manifold uses spring-biased pilot to shift cartridges to toggle between manual steering and Autopilot steering. The manual steering pressure adds to the spring cavity to pilot the cartridges open even in situations where the isolation solenoid were to remain on.

A Pressure reducing valve is present in the system to ensure that the isolation valve pilot pressure can always be overcome by the spring force **+** the manual steering pressure.

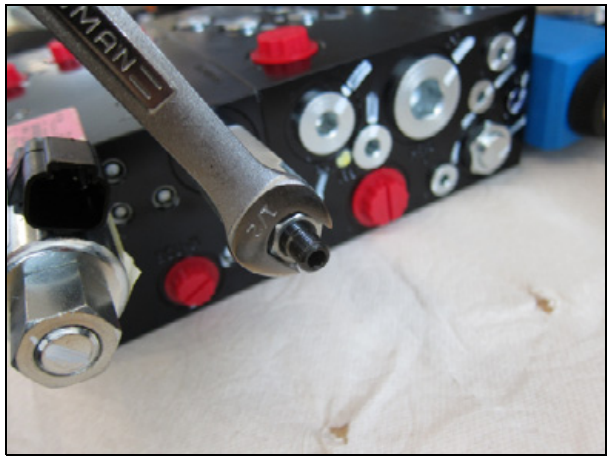
In some machines, it may be necessary to adjust the PRV setting in order to bias the cartridges more towards the manual steering or towards the Autopilot steering.

For the system to function as intended, manual steering should always overcome Autopilot steering. To test this function the P/N 103378 cable can be connected to the power bus or other 12 V source, with the switch on and 12 V being supplied to the cut-off coil. Manually steering the machine should result in movement of the wheels.

In the state where the isolation valve is powered when you are not steering manually, the Autopilot should be able to steer the machine; this means that if you were to press on the detent valve overrides you should be able to actuate wheel movement.

Step 1

Locate and loosen the jam nut on the PRV cartridge.



Step 2

Adjust the PRV valve by turning the screw with a hex wrench.

NOTE – Screwing the screw clockwise / inward will *add* pressure to the PRV setting, resulting in an increased bias towards Autopilot steering. This should be done if the Autopilot is sometimes not steering the machine.

Screwing the screw counterclockwise / outward will *reduce* pressure from the PRV, biasing the system more towards the manual steering side. The PRV setting should be decreased if the isolation solenoid is powered and manual steering is sometimes not possible.

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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 chapter.

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://www.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 NavControllerII for the vehicle model being used.

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

   You can use Autopilot Toolbox II software version 4.02 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 the Autopilot Toolbox II software. 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