INSTALLATION INSTRUCTIONS

Trimble® Autopilot™ Automated Steering System

Versatile

- **350-550 4WD AGR**
- **450-550 DeltaTrack AGR**
- **260-310 MFWD AGR**
- **SX240 Self-propelled sprayer**
- **SX280 Self-propelled sprayer**

Note - *This manual applies to both the 54035-72 and 54035-73 kits.*

Version 5.00
Revision B
September 2015
Part number 54035-72-E05-B

Trimble

Legal Notices

Agriculture Business Area

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

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Safety Information

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

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

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

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

Warnings

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

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

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

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

Cautions

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

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

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

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

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

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



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

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

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CHAPTER 1

Introduction

In this chapter:

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

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

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

Technical assistance

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

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

Manual system upgrade to Autopilot

CFX-750 display and FmX integrated display

Retain
CFX-750™ display: P/N 94000-xx
Power cable CFX-750 display: P/N 77282
FmX® integrated display: P/N 93700-xx
Power cable FmX display: P/N 66694
Antenna for display: P/N 60600-02 (DGPS) or 77038-00 (OmniSTAR®/RTK)
Antenna to receiver cable: P/N 50449
Basic cable (both displays): P/N 67258

Required components

Kits required
Platform kits: P/N 54035-72 or 54035-73

Antenna mounting kits

Kits required
Antenna V plate mount and AG-372 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the AG-372 receiver – see Chapter 5, Display Installation). Roof spars: • MFWD: P/N 55349 • 4WD: P/N 53676 • Self-propelled sprayers: None

Accessory kits

Accessory options
Remote engage cable: P/N 91949 (included in kit)

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit: P/N 54035-72 or P/N 54035-73	Hydraulic steering cable	Chapter 2
	Manual override cable	
	AutoSense™ steering device and cabling	Chapter 3
	AutoSense mounting bracket and hardware	
	Power switch	Chapter 6
	Bolt kit controller	Chapter 7
Roof bracket kit: • P/N 62388-02 - use only with a VHB plate • P/N 62388-01 - use with magnets for removable mounting of the AG-372 antenna Roof spars: • P/N 55349 for the MFWD • P/N 53676 for the 4WD	Roof brackets	Chapter 4
	Bolt kit, roof bracket	
GNSS receiver	GNSS receiver	Chapter 4
	GNSS antenna	
	GNSS receiver power/data cable	
	RTK radio, cable, and radio antenna	
Display	CFX-750 display	Chapter 5
	FmX integrated display	
	Display cable	
	Mounting bracket	
Common parts	Controller	Chapter 7
	Controller mounting bracket	
	Cable kit: Main wiring harness Power bus auxiliary wiring harness Sonalert alarm	

Notice to the installer

This kit supports both articulated 4WD and standard MFWD AutoGuidance Ready (AGR) platforms. Factory standard AGR machines ***do not*** include the Pilot Head valve controller that is mounted to the top of the steering valve unless the machine was ordered with the full guidance system installed.

To determine if the Pilot Head is present, see Step 2 on page 14:

- Machines that have the Pilot Head should use kit P/N 54035-72.
- Machines without the Pilot Head should use P/N 54035-73.

The installation process for 4WD and MFWD machines are the same unless specifically noted.

Preparing the vehicle for installation

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

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

CHAPTER 2

Cable Installation

In this chapter:

- Valve cable installation
- Manual override connection

This chapter describes how to install the valve interface cable, and make the connections to the manual override cable and remote engage switch.

Valve cable installation

Step 1

Locate the existing Danfoss steering valve.

4WD: Valve location is under the cab just in front of the back edge of the fuel tank.



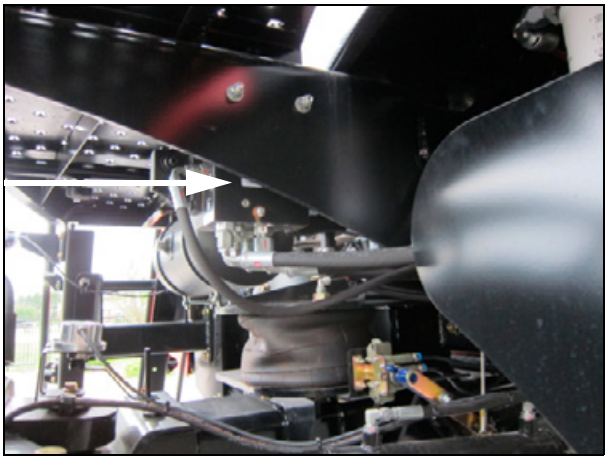
4WD

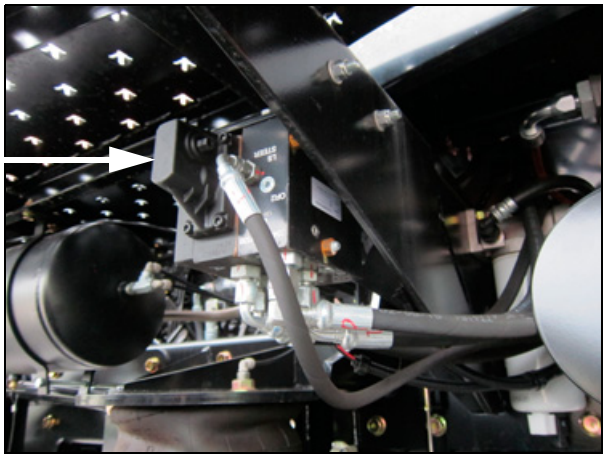
MFWD: Valve is located under the cab behind the right rear tire at about the 1:00 O'clock position.



MFWD

Self propelled sprayer: Valve is located under the stairs of the machine, just behind the left front wheel.





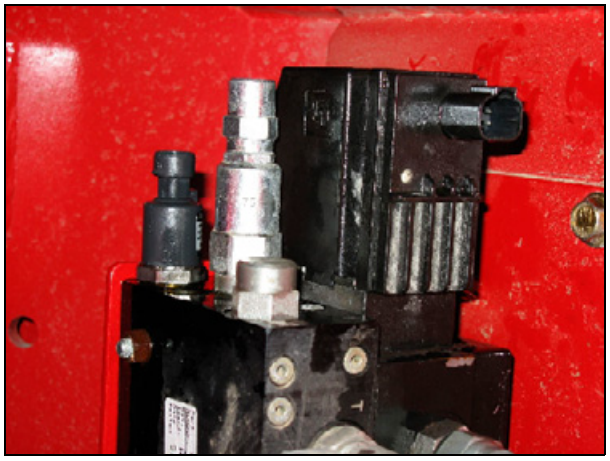
Self-propelled sprayer

Step 2

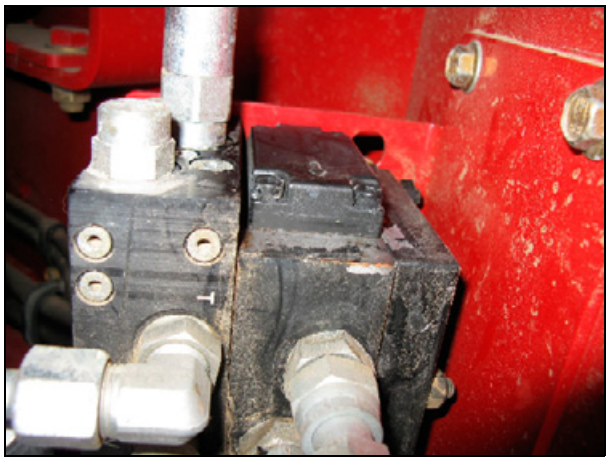
To determine if the machine has a Pilot head is installed, see the photos on the right.

On machines with the **Pilot Head attached to the valve**, remove the existing valve cable And tie it securely out of the way

If the **Pilot Head is omitted**, remove the "Blank Off" plate and install the Pilot Head. Make sure that contaminants do not get into the hydraulic system, and do not lose any O-ring seals.



Pilot Head installed showing existing cable removed

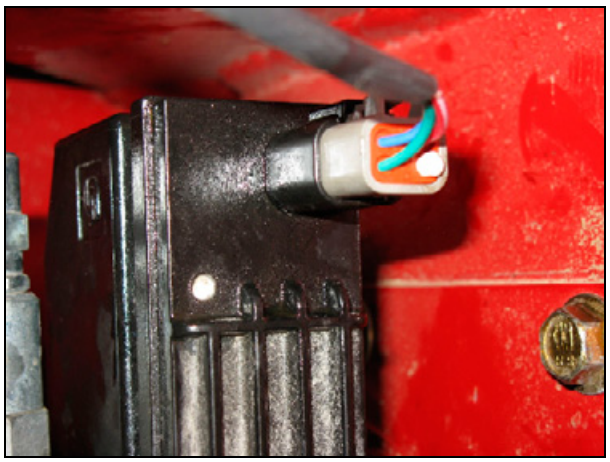


Valve with Pilot Head omitted, showing blank-off plate

Step 3

Connect the Autopilot valve cable (P/N 59870) to the machines steering valve and then route the wire to the NavController II harness through the port at the right rear of the cab.

Note – *There are more photos for this step on the next two pages.*





Cable pass-thru location



On the self-propelled sprayers, the cables can be brought into the cab through the pass-through location near the batteries



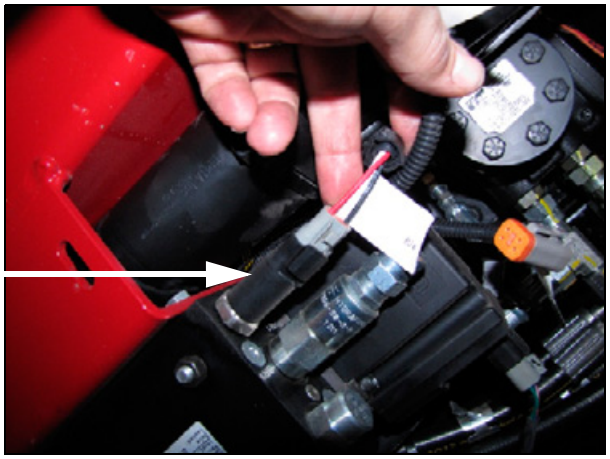
Self-propelled sprayer pass-through location

Manual override connection

Step 1

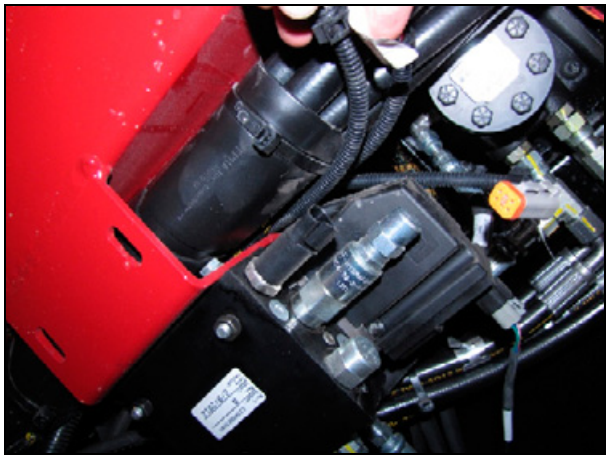
On machines with the pressure transducer installed, locate the transducer in the machines steering valve.

If a pressure transducer is not installed, go to Step 6 .



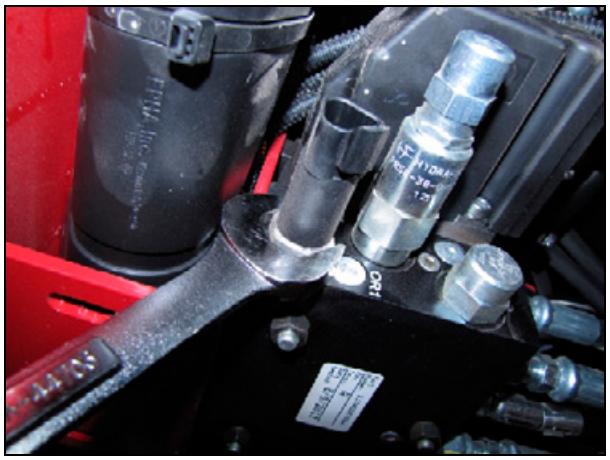
Step 2

Disconnect the existing cabling from the pressure transducer and secure it safely out of the way.



Step 3

Clean the area of any dirt or debris and then remove the pressure transducer from the machines steering valve.



Step 4

Install the Autopilot manual override pressure transducer into the location where the sensor was removed in Step 3.



Step 5

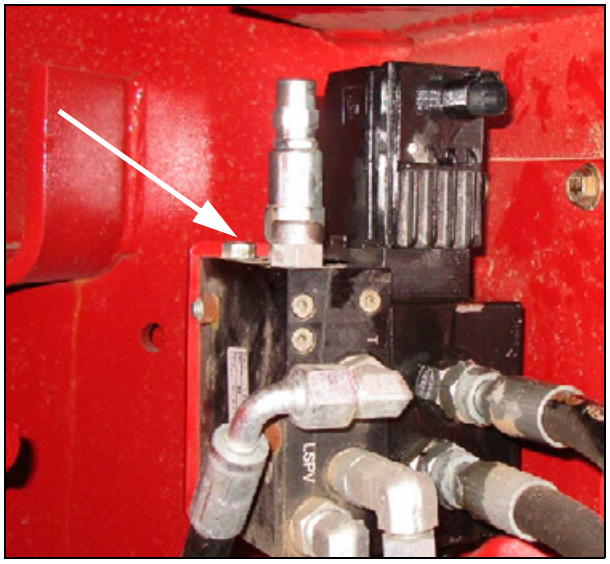
Connect the provided cabling to the manual override sensor and route the cabling to the NavController II harness through the port at the right rear of the cab.



Step 6

Machines without transducer installed only

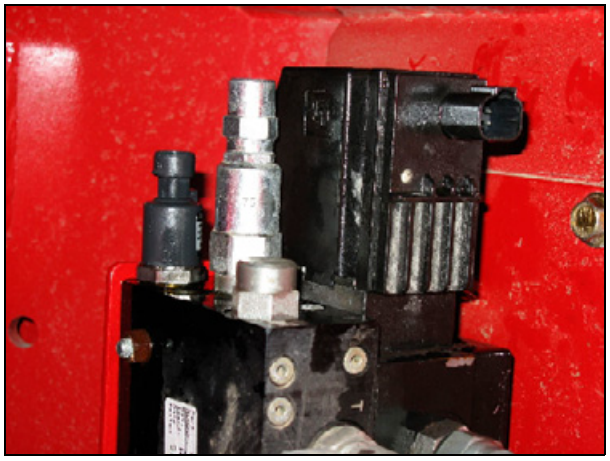
Remove the port plug shown.



Step 7

Machines without transducer installed only

Install the Autopilot manual override pressure transducer into the location where the plug was removed in Step 6.



Step 8

Connect the provided cabling to the manual override sensor and route the cabling to the NavController II harness via the port at the right rear of the cab.



CHAPTER 3

AutoSense Steering Device Installation

In this chapter:

- AutoSense steering device components
- Installing the AutoSense device: 4WD
- Installing the AutoSense device: MFWD
- Installing the AutoSense device: Self-propelled sprayers
- Preparing the harness: P/N 54602 Rev C

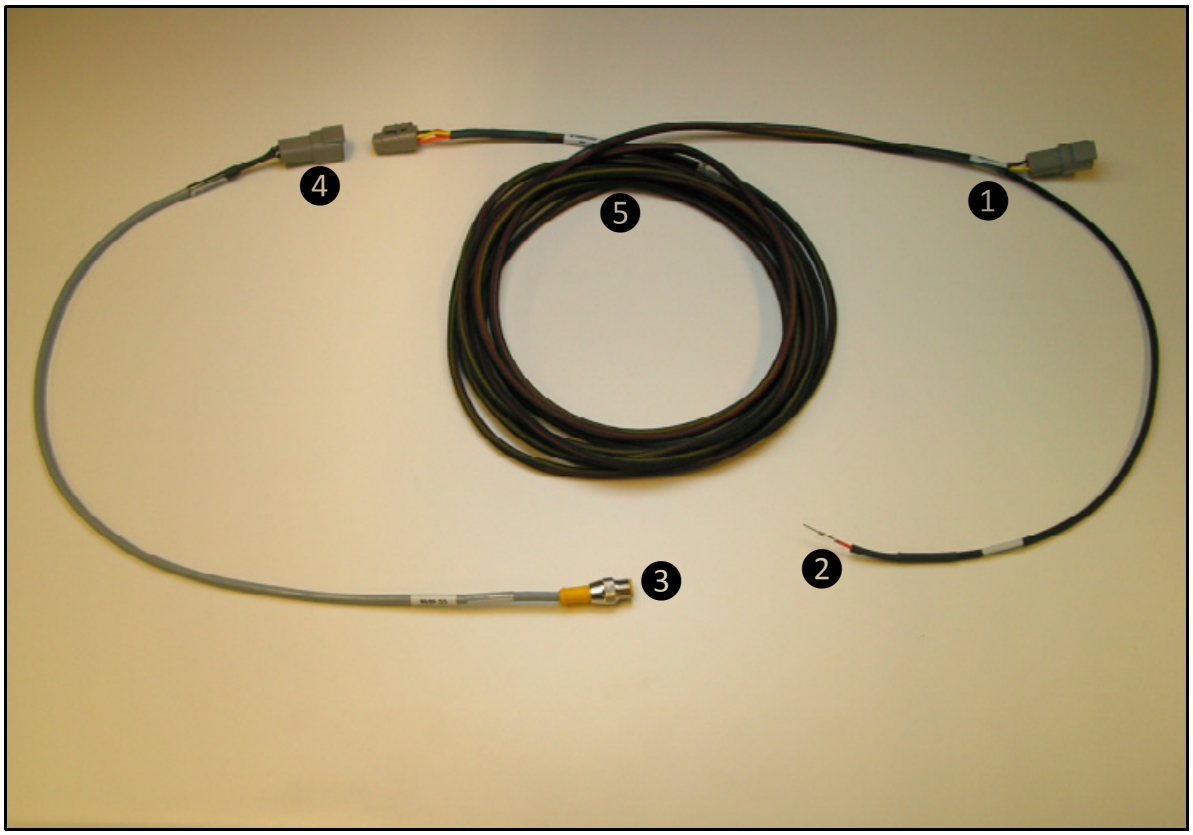
This chapter describes how to install the AutoSense™ steering device. If the required mounting location is not accessible, chose a different place. To ensure proper function, the AutoSense device must be located where it is free of obstructions and can rotate with the wheels when they turn.

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

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

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

AutoSense steering device components



Item	Description	Part number
❶	P-6 connector	
❷	Power connector	
❸	AutoSense connector	
❹	Jumper cable	57560
❺	AutoSense steering cable	57885

Installing the AutoSense device: 4WD

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

Step 1

Locate the mounting position on the rear articulating structure. On the crossbar in front of the brake is a good location.



Step 2

Use the alcohol swab (provided) or another equally aggressive cleanser to remove all dust and oil from the mounting surface.

Use the VHB (Very High Bond) adhesive foam tape to secure the AutoSense mount plate to the crossbar.

Use the included #6-32 socket head cap screws to attach the AutoSense unit to the mount.



Step 3

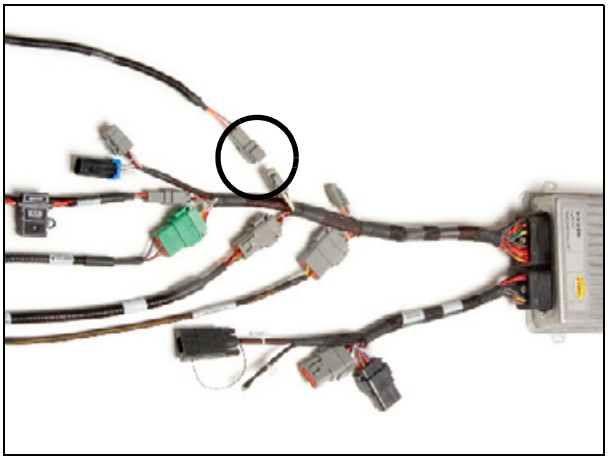
Route the steering sensor cable inside the canvas cover housing the hydraulic hoses and cables with the connector exiting the bundle at the top of the steel brake line. Connect the jumper cable to the steering device and to the sensor cable connector. Secure the jumper to the steel bake line with ty-wraps.



Step 4

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

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



Installing the AutoSense device: MFWD

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

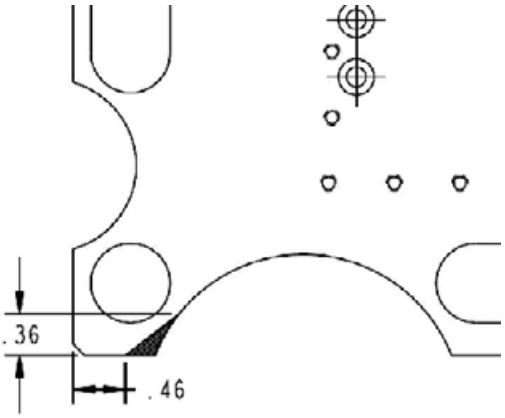
Step 1

Locate the M16X2.0 threaded holes in the top of the steering knuckle.



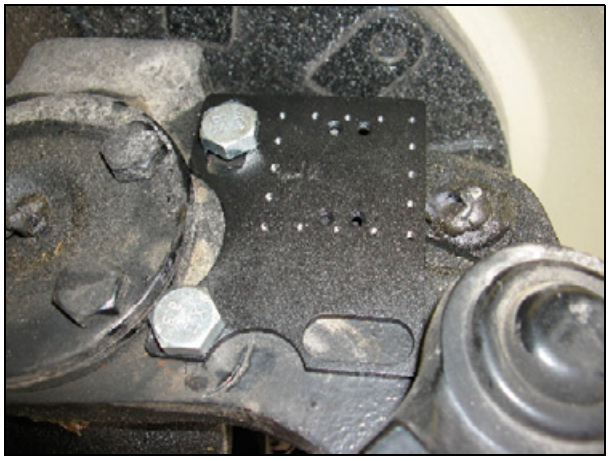
Step 2

To clear the king pin cap on the steering knuckle, trim the corner of the AutoSense device bracket P/N 58043 as shown. To prevent rust apply a dab of paint to the trimmed edge



Step 3

Use the supplied M16X2.0X25MM bolts to attach the mount plate to the steering knuckle.



Step 4

Use the supplied #6-32 socket head cap screws to attach the AutoSense unit to the mount.



Step 5

Attach the AutoSense cable to the sensor and route it along the tie rod. Use zip-ties to secure the AutoSense cable, while making sure that there is an adequate service loop that allows the cable to be free throughout the full range of steering motion.

Connect the AutoSense cable to the P/N 57885 cable and route it into the cab through the passthrough. See the image on page 15.

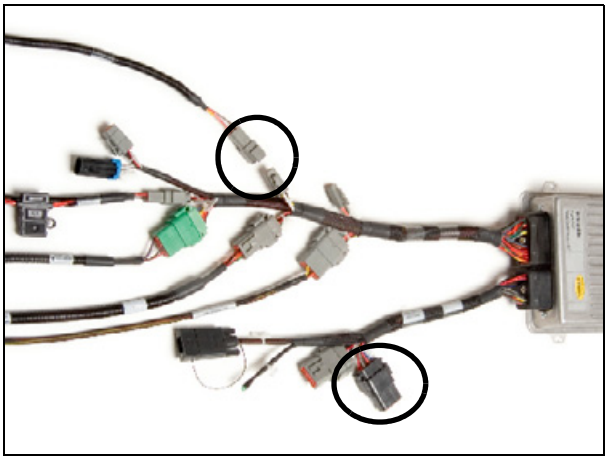


Step 6

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

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

Connect the extra pin on the P/N 54602 cable to the P-13 connector as shown in the next section, on page 29.

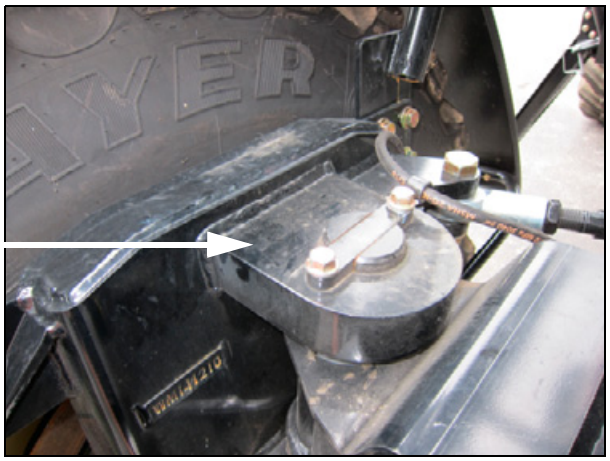


Installing the AutoSense device: Self-propelled sprayers

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

Step 1

Locate the mounting position near the right front wheel of the machine.

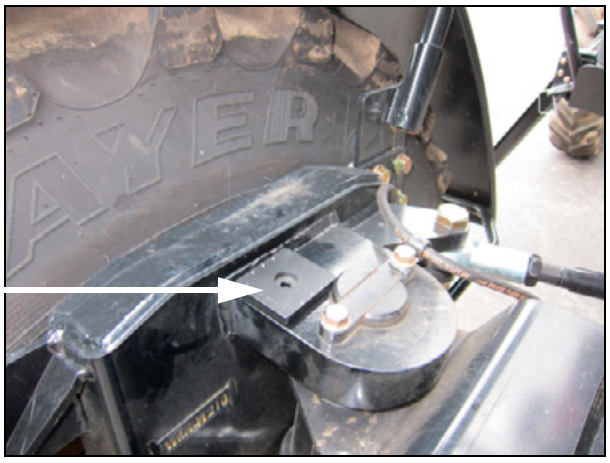


Step 2

Use the alcohol swab (provided) or another equally aggressive cleanser to remove all dust and oil from the mounting surface.

Use the VHB (Very High Bond) adhesive foam tape to secure the AutoSense mount plate.





Step 3

Use the provided #6-32 socket head cap screws to attach the AutoSense unit to the mount.

Route the steering sensor cable to the NavController.

Make sure that there is adequate slack in the cable for changing the track width of the vehicle.



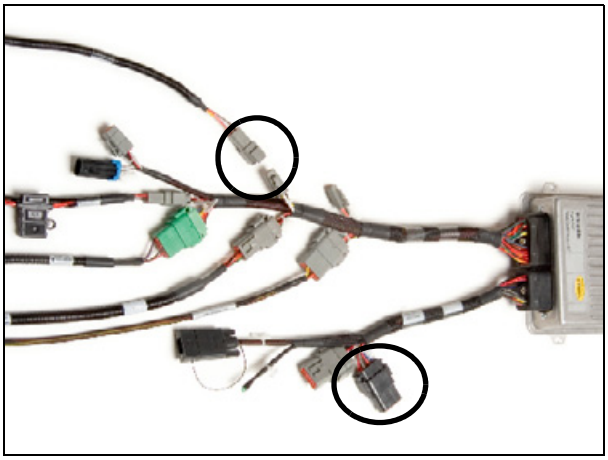
⚠ **CAUTION –** Make sure that the cable does not contact any hot or moving components and is protected from field debris.

Step 4

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

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

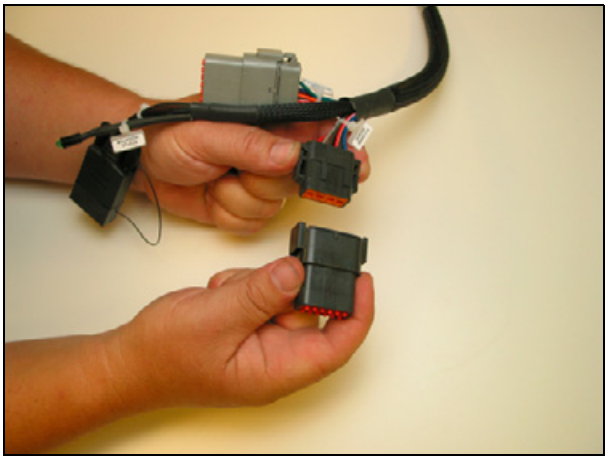
Connect the extra pin on the P/N 54602 cable to the P-13 connector as shown in the next section, on page 29.



Preparing the harness: P/N 54602 Rev C

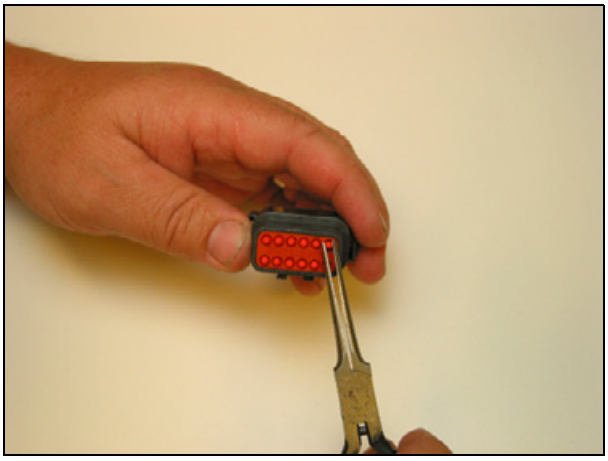
Step 1

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



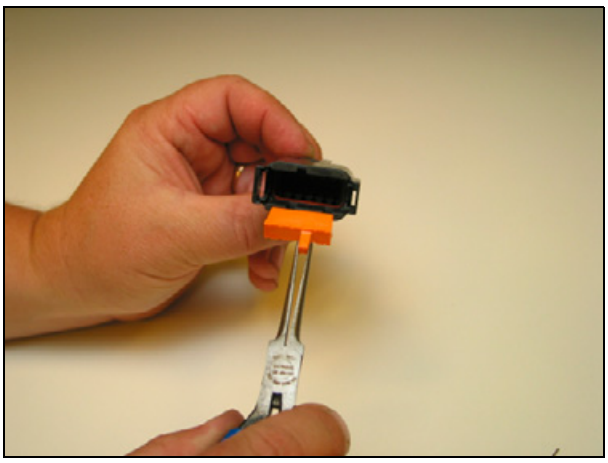
Step 2

Remove the plug from cavity number 1.



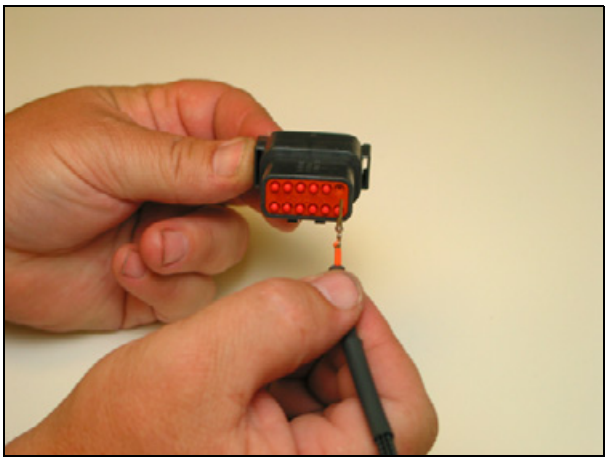
Step 3

Remove the wedge from the connector.



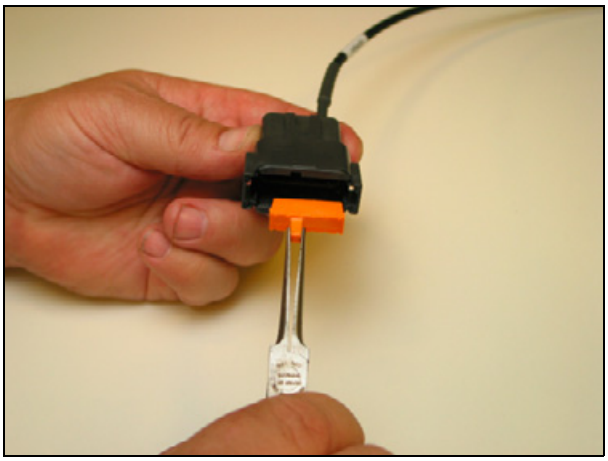
Step 4

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



Step 5

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



Step 6

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

CHAPTER 4

Antenna/External Receiver (If Used) Installation

In this chapter:

- Antenna and receiver installation options
- AG-372 receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AG-372 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AG-372 receiver with magnetic feet
- AG-542 receiver components
- Installing the AG-542 receiver

This chapter describes how to install the required receiver and antenna, and radio module (if used).

To install the antenna for the CFX-750 or FmX 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:

- **Bolting to the OEM mount**: Trimble recommends bolting the antenna or V-plate to the existing OEM mount for high-accuracy applications.
- **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 36.
- **Magnetic mounting:** Magnetic mounting for quick release is available for both VHB and spar type mounting.

Possible mounting methods

GNSS receiver	Magnetically attached to a plate on the roof	VHB V plate on the roof	Bolted to an existing OEM mount	Bolted to a spar mount
CFX-750 display; FmX integrated display	✓	✓	✓	✓
AG-372 receiver	✘	✓	✓	✓
Trimble® AG-542 receiver	✓	✓	✓	✓

Notes:

- *For quick release magnetic mounting with an AG-372 receiver, order the kit listed in Antenna mounting kits, page 8 and bolt the V plate to the spar.*
- *With all other antennas, bolt the V plate to the spar for high accuracy and repeatability.*
- *For WAAS, EGNOS, OmniSTAR VBS, Beacon, and DGPS applications, place either of the plates in a firm location using the VHB.*

Mounting an adjustable spar to roof bolts

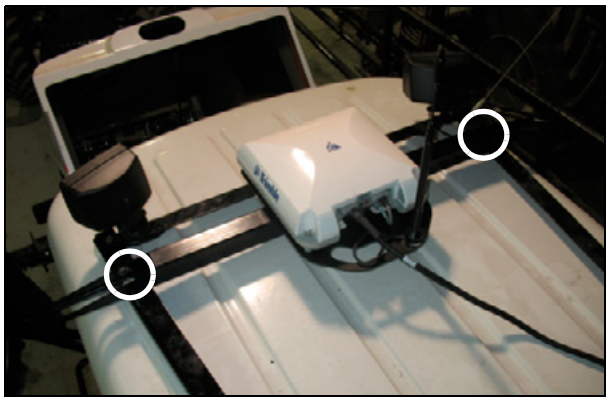
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Position the cab bolts on the roof of the vehicle.



If a light bracket already occupies the roof studs, mount the spar directly onto the light bracket.

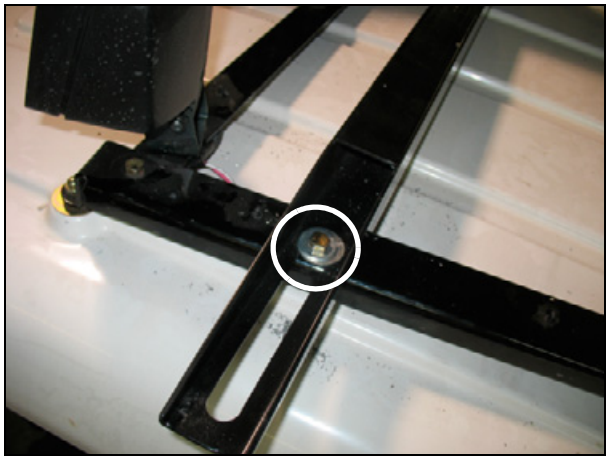


Step 2

If required, replace the existing bolts with longer bolts.



If you use the light bracket, drill two holes to match the spar width.



Step 3

Use the slotted holes to center the spar and then tighten the bolts. If required, use the spacers and flat washers provided to secure the spar.

Note – *If the receiver is offset to the left or the right of the vehicle, Autopilot system performance may be affected. Before you tighten the cab bolts, make sure that the GNSS antenna is aligned with the center of the vehicle.*



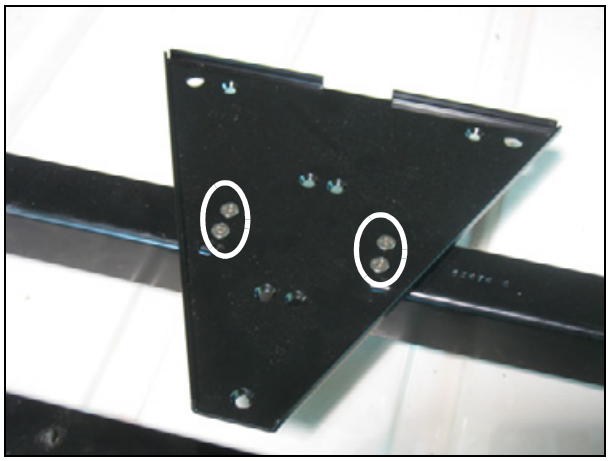
Step 4

For either of the following applications:

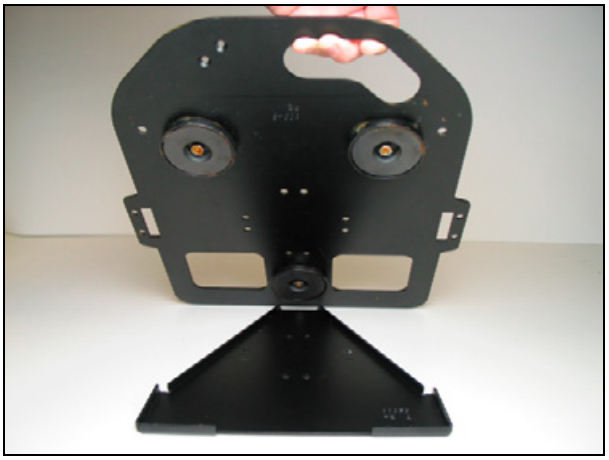
- A single magnet antenna mount
- An AG-372 receiver with magnetic option for quick removal

Attach a V plate with four ¼" flathead screws.

The narrow end points to the front of the vehicle.



V plate on the spar



Magnetic mount on the V plate

If you use a standard AG-372 plate for permanent mounting, install the radio antenna first. Use four ¼" flathead screws to attach the plate, with the handle toward the back of the vehicle.

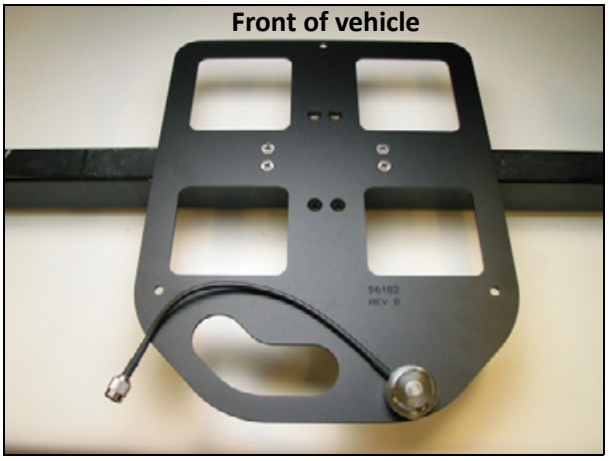


Plate on the spar

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 display 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.

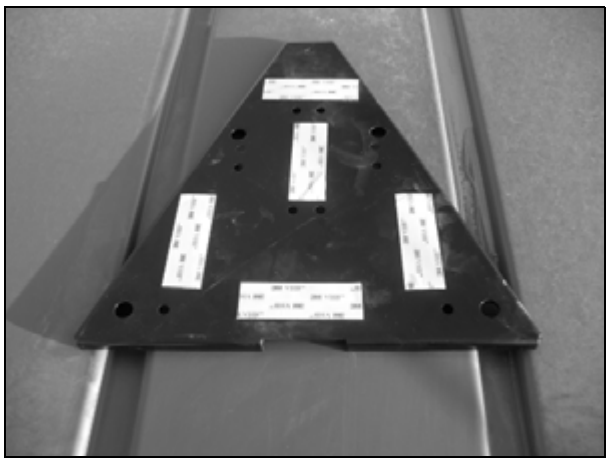


Step 2

V plate only

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

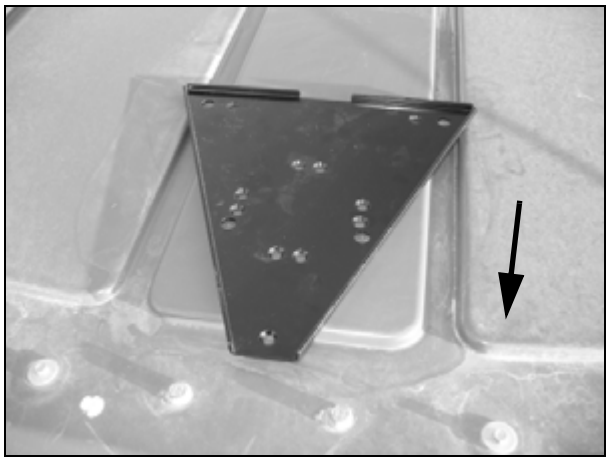
Note – *The VHB strips are pre-applied to the P/N 62034 plate.*



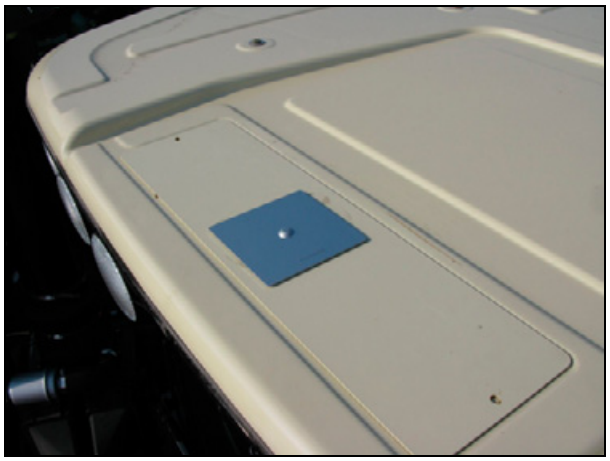
Step 3

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.*

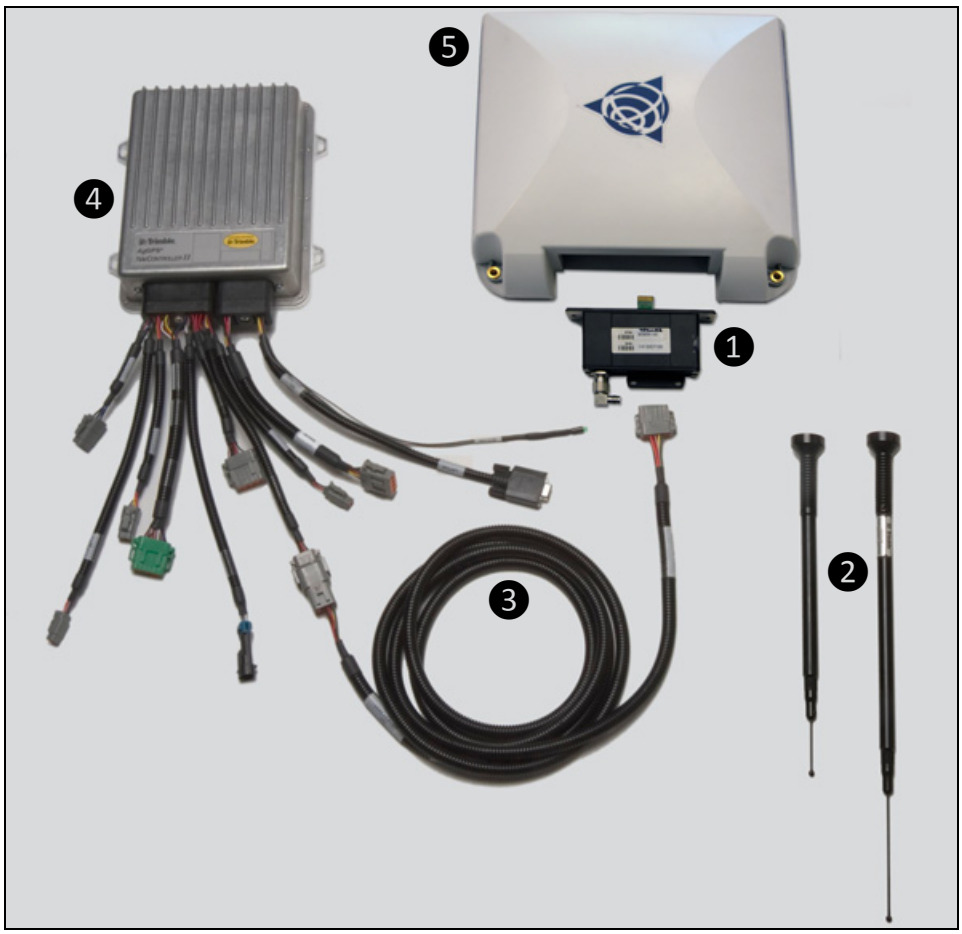


V plate



P/N 62034 plate

AG-372 receiver with *Ag*GPS 450/900 radio module (if equipped) components



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

Installing the AG-372 GPS receiver with *Ag*GPS 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.

Removable installation

To attach the AG-372 receiver to the cab roof:

Step 1

Use VHB to install a V plate onto the roof (see Attaching the plate with VHB adhesive, page 36).

Step 2

Use the provided hardware to attach the three magnets that are in the P/N 62388-01 kit to the AG-372 receiver.

Step 3

Use the magnets to attach the AG-372 receiver onto the V-plate.

Installing the optional RTK radio in the AG-372 receiver

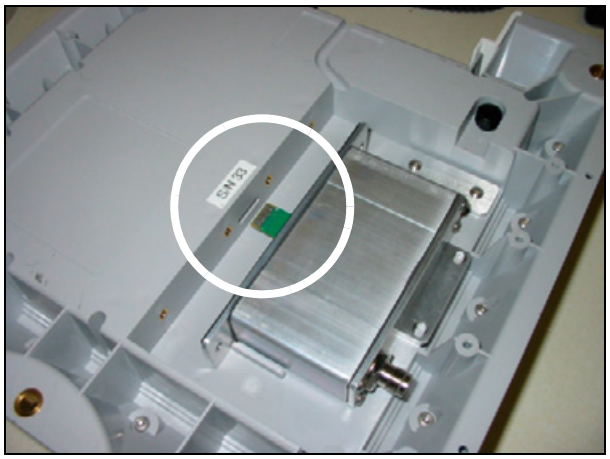
Step 1

Remove the blanking plate and set it aside.



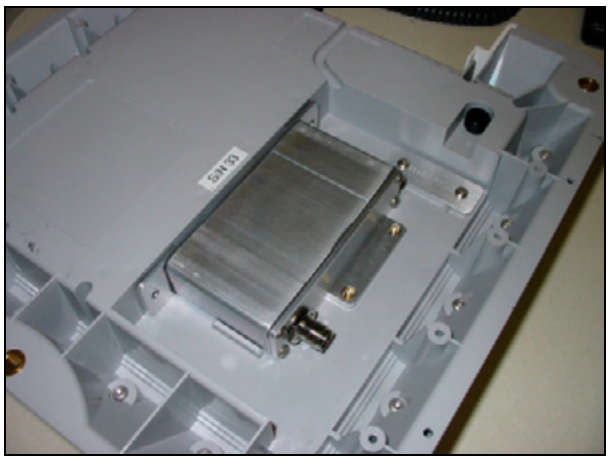
Step 2

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.



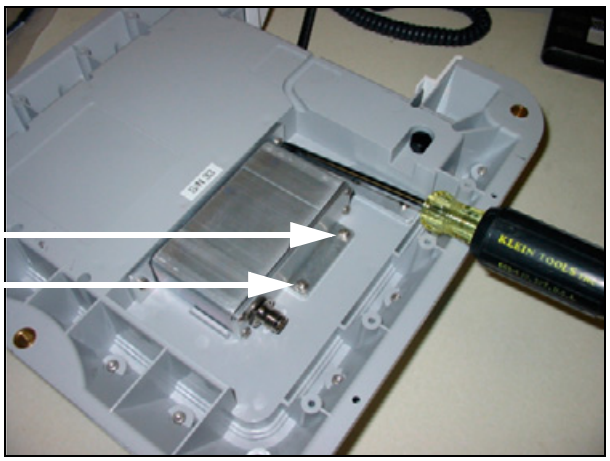
Step 3

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



Step 4

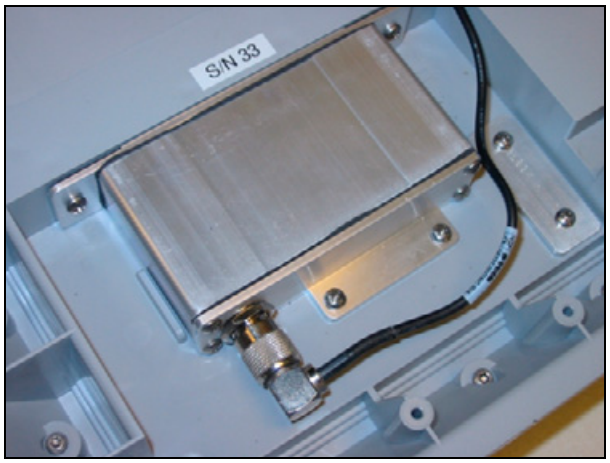
Use a #1 or #2 Phillips screwdriver and the supplied screws to install the integrated radio. First insert and tighten the two screws on the horizontal wall (arrowed), and then insert the remaining screws.



Step 5

Install the supplied antenna cable.

Notes: *The housing can accommodate a cable diameter of up to ¼".*

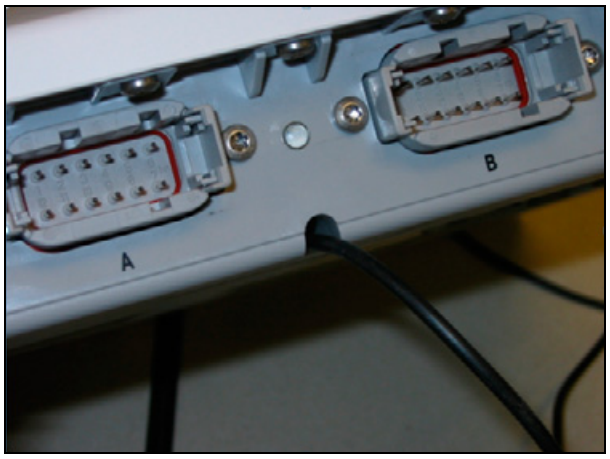


Step 6

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

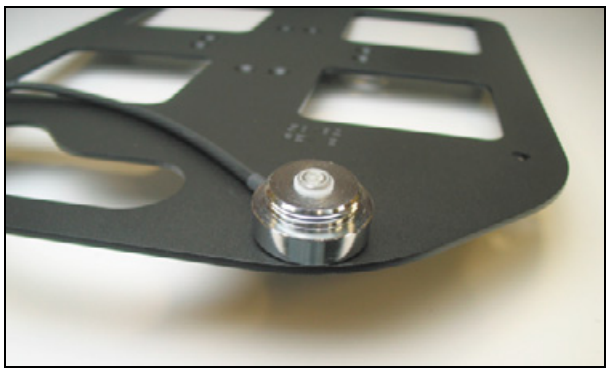


This image shows the unit with the cable routed through the channel.



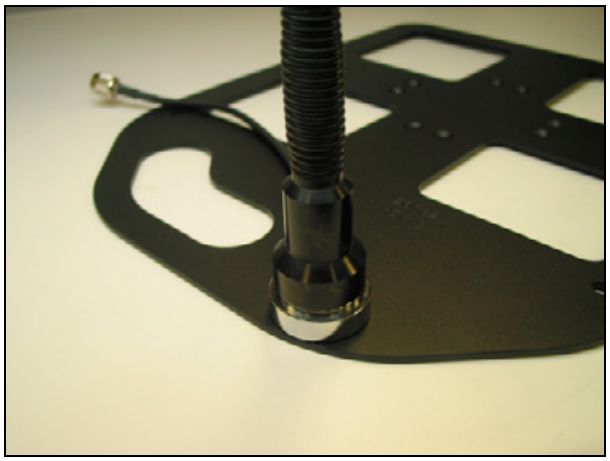
Step 7

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.



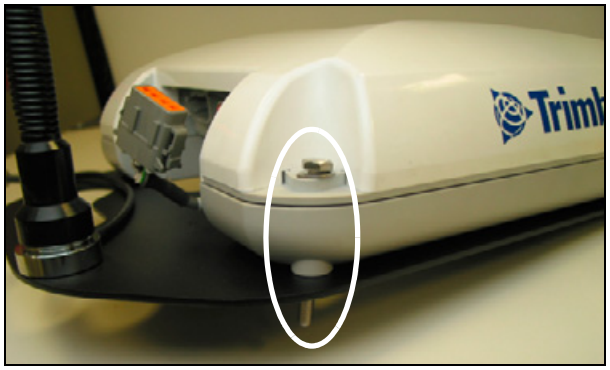
Step 10

Insert the nylon bushings provided.



Step 11

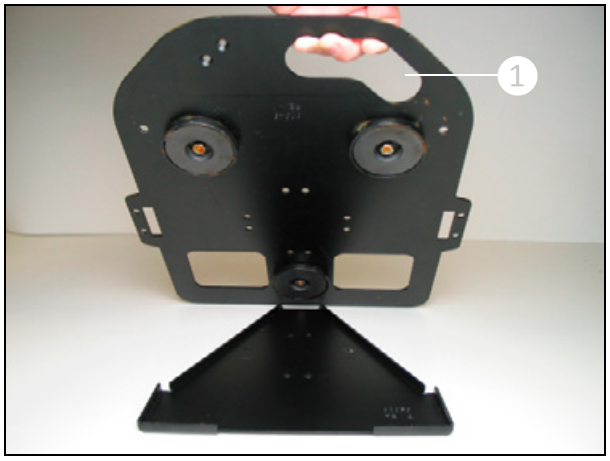
Insert the bolts through the receiver, radio, and mounting bracket. Place nuts on the bolt ends and then tighten them.



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.

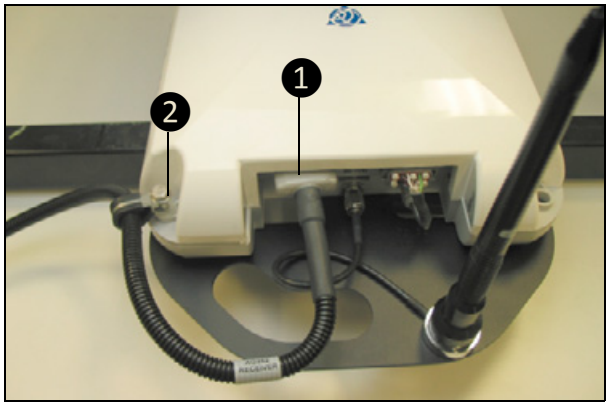


Step 13

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

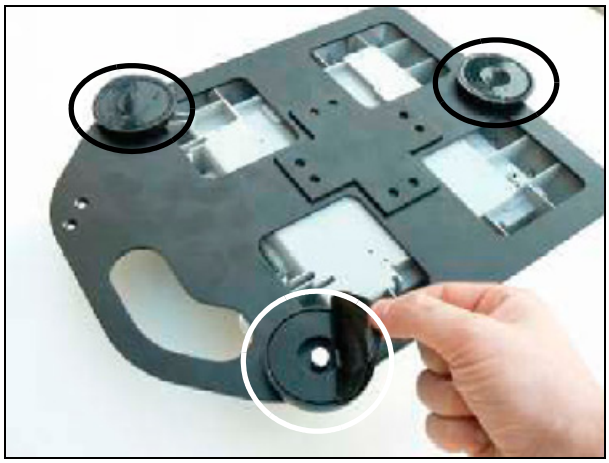
Attach the magnets to the receiver mounting plate. Use the three ¼" bolts to mount the AG-372 receiver.

Place the nuts on the receiver side.



Step 2

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

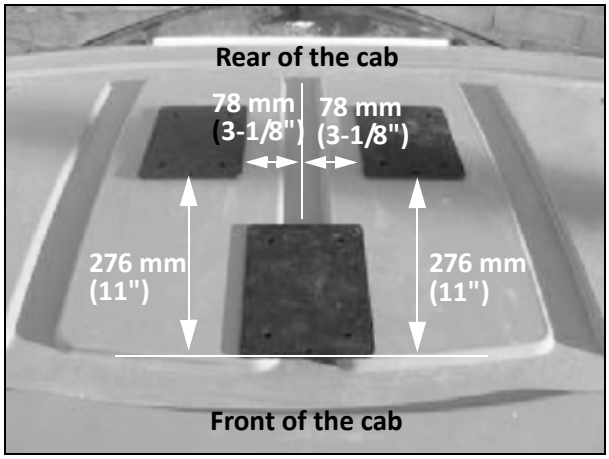


Step 3

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

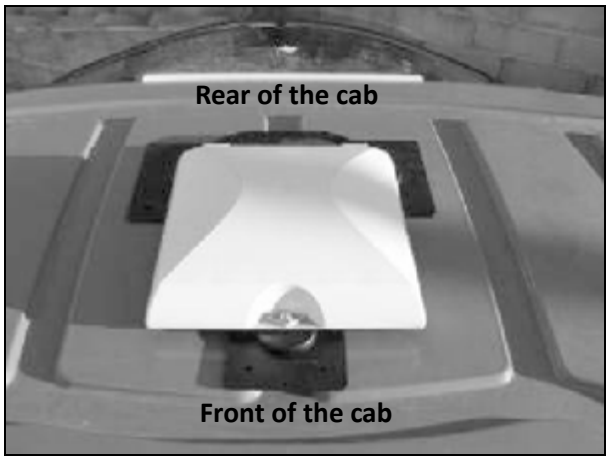
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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.

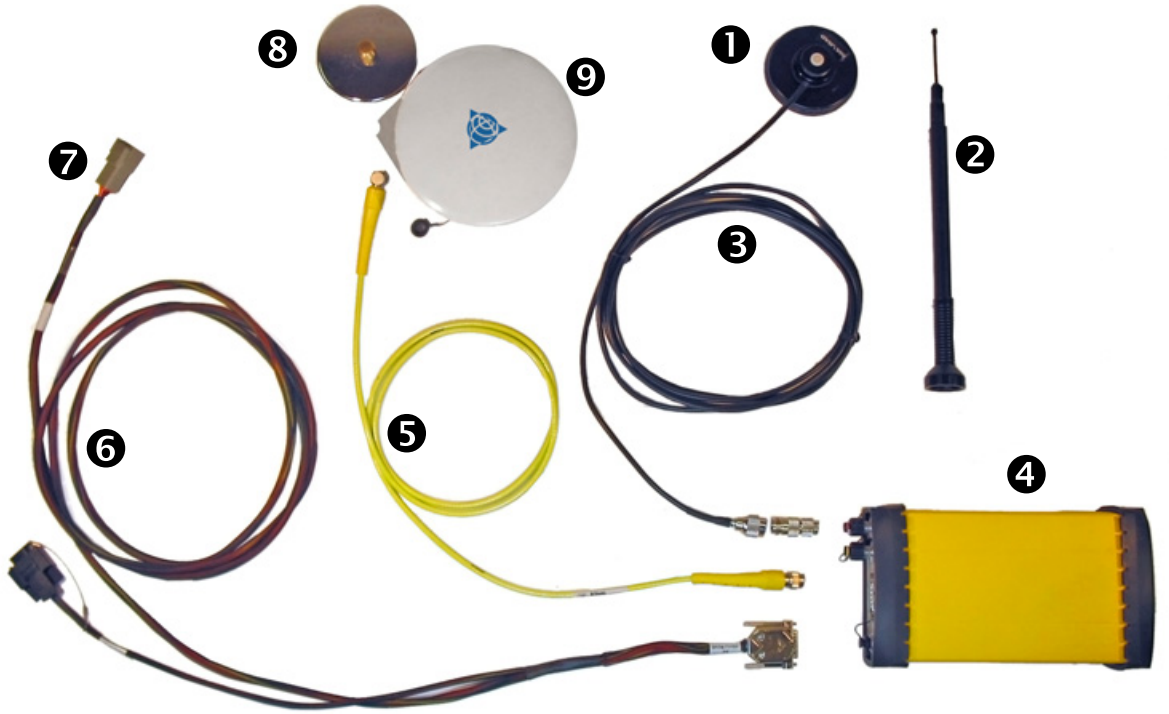


Step 5

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



AG-542 receiver components



Item	Description	Trimble part number
❶	Radio antenna magnetic base	62109
❷	Radio antenna	22882-10
❸	Radio antenna cable	62109
❹	AG-542 GPS receiver	93605-90-10
❺	Antenna cable	58957-05
❻	Receiver cable	62037
❼	To controller “P3 GPS”	
❽	Antenna magnetic mount	12920-00
❾	AG_542 GPS receiver	57970-10

Installing the AG-542 receiver

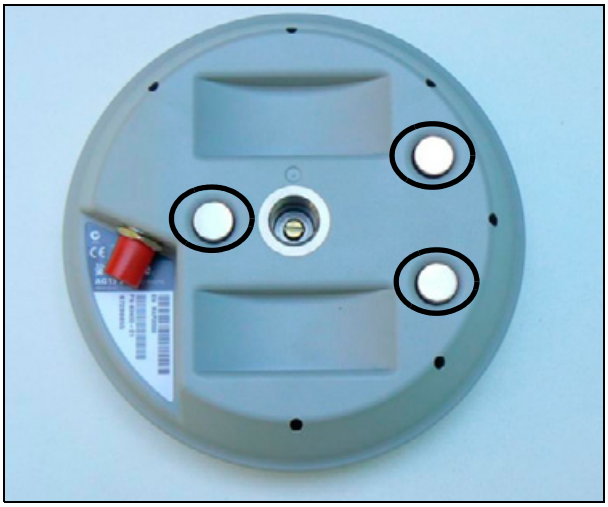
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

Attach the large magnet with a ⅝" 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

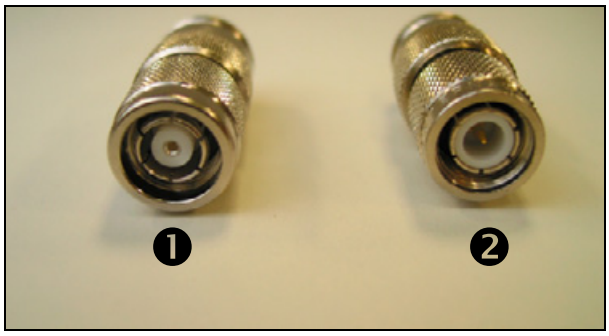
Mount the receiver in a convenient location in the cab. Route the antenna cable to the receiver and then connect it.



Step 5

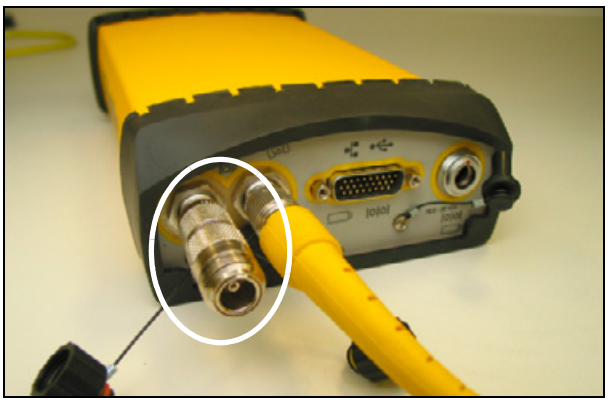
Identify the correct adaptor for the radio connection:

- 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.



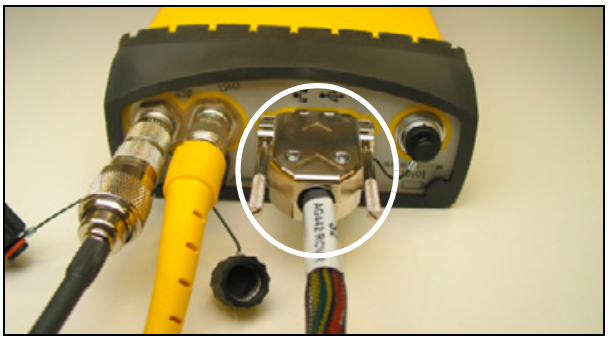
Step 7

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 7, 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 P/N 62034 plate with the VHB provided to relocate the antenna.





CHAPTER 5

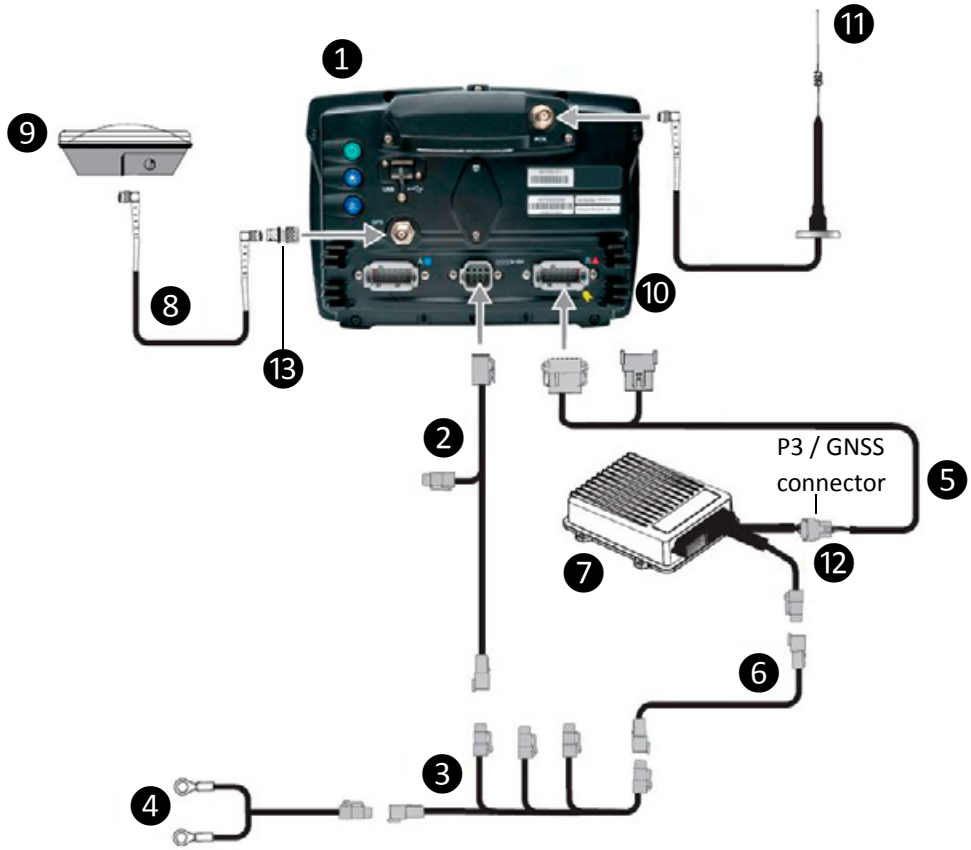
Display Installation

In this chapter:

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

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

CFX-750 display components

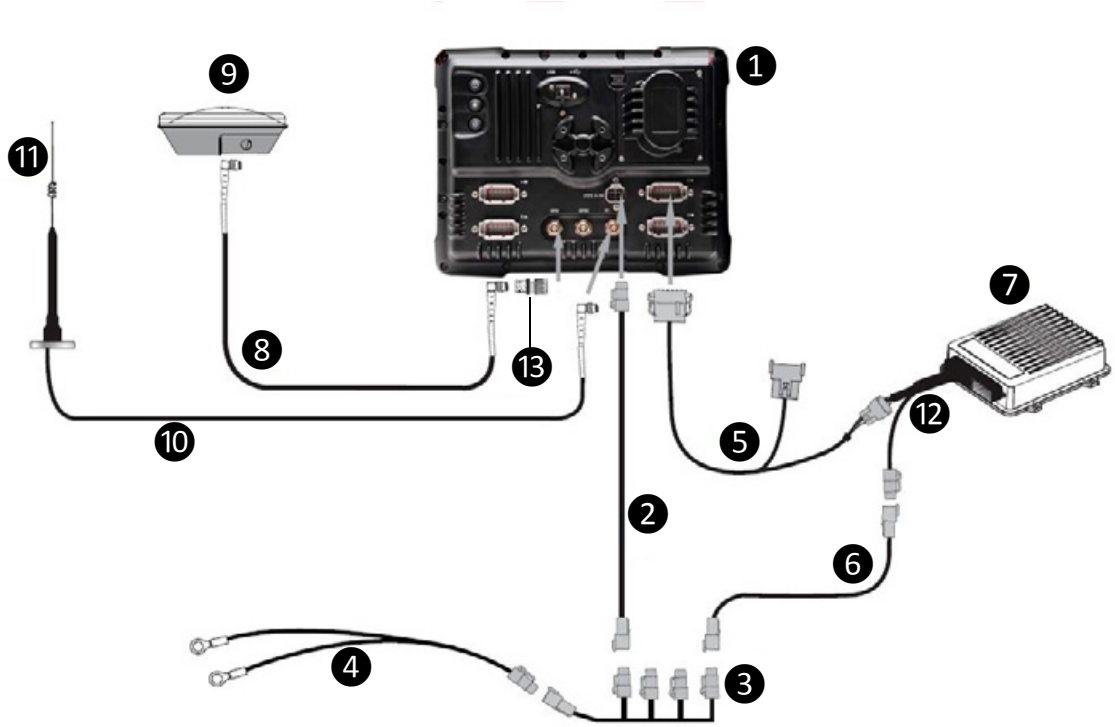


⚠ **CAUTION –** Connecting the Port Replicator on the Display to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the display, and will void the warranty.

Item	Description	Trimble part number
❶	CFX-750 display ***Note –*** *RTK password required.*	94110-xx
❷	CFX-750 power cable	66694
❸	CFX-750 power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	Display to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	OEM installed GNSS TNC/BNC antenna cable	
❾	AG-25 GNSS antenna	77038-00
❿	NMO to TNC 20 ft antenna cable and base	72122
⓫	900 MHz radio antenna kit	22882-10

Item	Description	Trimble part number
⓬	Main NavController II cable	54601
⓭	BNC to TNC antenna adapter	83666

FmX integrated display components



CAUTION – Connecting the Port Replicator on the Display 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
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	FmX power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	Display to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	OEM installed GNSS TNC/BNC antenna cable	
❾	AG-25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	72122
⓫	900 MHz radio antenna kit	22882-10
⓬	Main NavController II cable	54601
⓭	BNC to TNC antenna adapter	83666

Preparing the CFX-750 display

Step 1

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



Step 2

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



Step 3

Attach the RAM mount to the rear of the display.



Installing the CFX-750 display

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

Step 1

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

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

Step 2

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

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



Step 3

The machine's existing antenna cable is under a cover on the right side of the cab. To find the panel locate electronics bay cover that is behind the seat, and then remove it. Then, look under the inner fender cover that is below the control switch panel.

The cable is terminated with a BNC style connector. The kit supplies a BNC-to-TNC adapter that must be used to connect the antenna cable to the display.

Note – *There are more images for this step on the next page.*




9-16V 7A
GPS2


RTK
GPS2

CFX-750 display: Installing the wiring harness

Step 1

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

Step 2

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



Preparing the FmX integrated display

Step 1

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



Step 2

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



Step 3

Attach the RAM mount to the rear of the display.



Installing the FmX integrated display

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

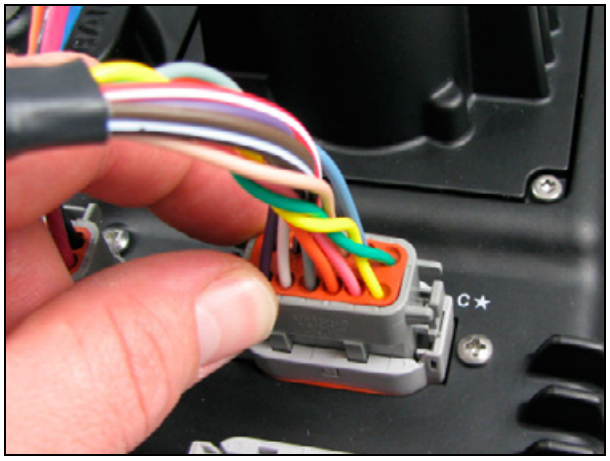
Step 1

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

Step 2

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

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



Step 3

The machine's existing antenna cable is under a cover on the right side of the cab. To find the panel locate electronics bay cover that is behind the seat, and then remove it. Then, look under the inner fender cover that is below the control switch panel.

The cable is terminated with a BNC style connector. The kit supplies a BNC-to-TNC adapter that must be used to connect the antenna cable to the display.

Note – *There are more images for this step on the next page.*



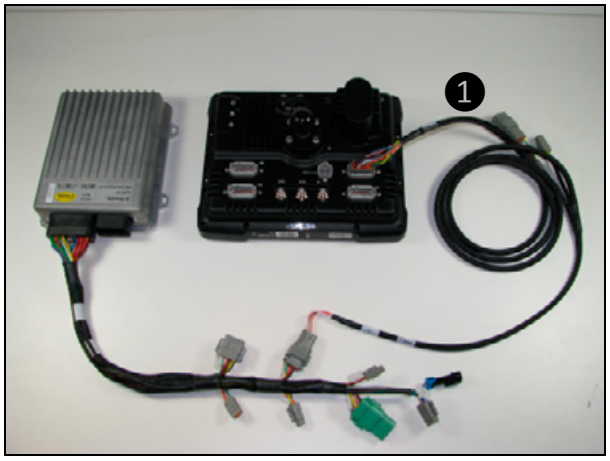

9-16V 7A
GPS2


RTK
GPS2

FmX integrated display: Installing the wiring harness

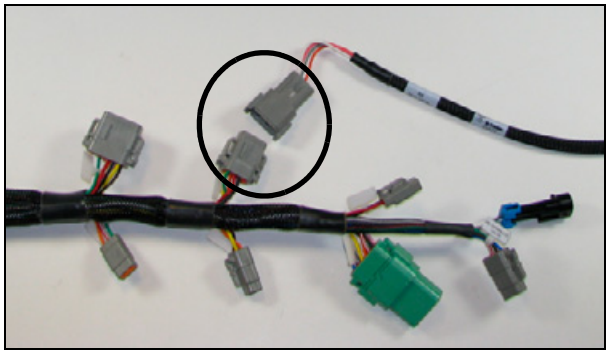
Step 1

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



Step 2

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



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

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

AgCam

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

Step 1

Locate the AgCam and AgCam cable.

Step 2

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



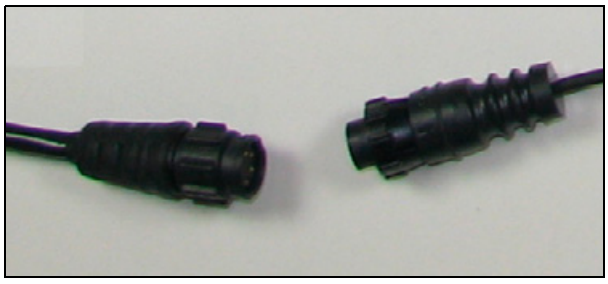
CFX-750 display



FmX display

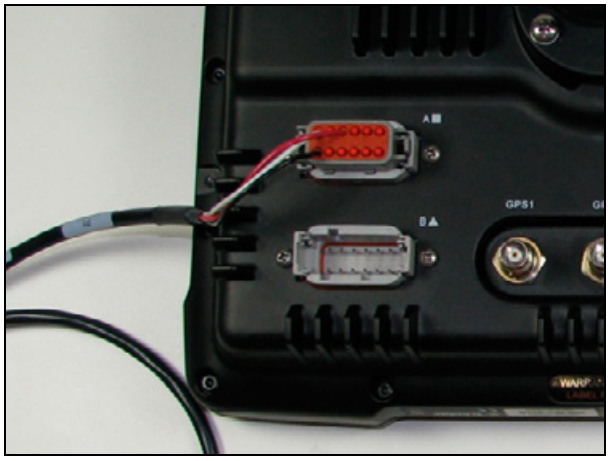
Step 3

Connect the AgCam cable to the display adaptor cable.



Step 4

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



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

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

Note – *The V plate antenna bracket is available on the Autopilot price list. See Antenna mounting kits, page 8.*

Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK, RTX™ and OmniSTAR HP/XP/G2 operations. For more information, see Antenna and receiver installation options, page 32.

Optional, use a ⅝" bolt to attach the AG-25 antenna to the spar, as shown.



VHB adhesive method

Standard P/N 62034 plates are provided in most display kits. You can use Very High Bond (VHB) to attach either a P/N 62034 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 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.

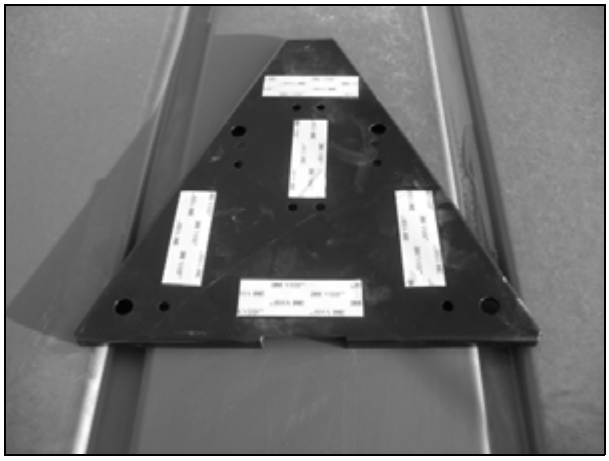


Step 2

V plate only

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

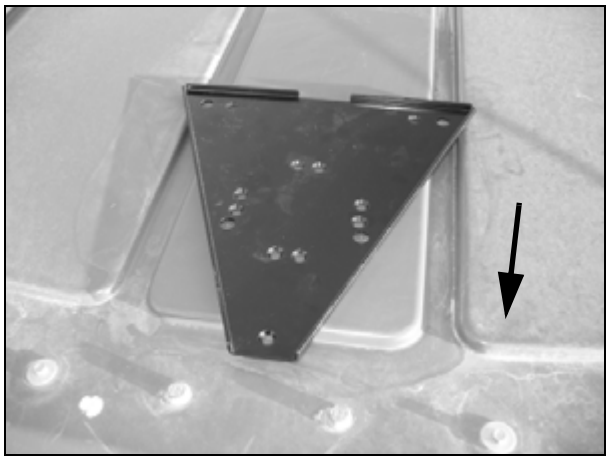
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



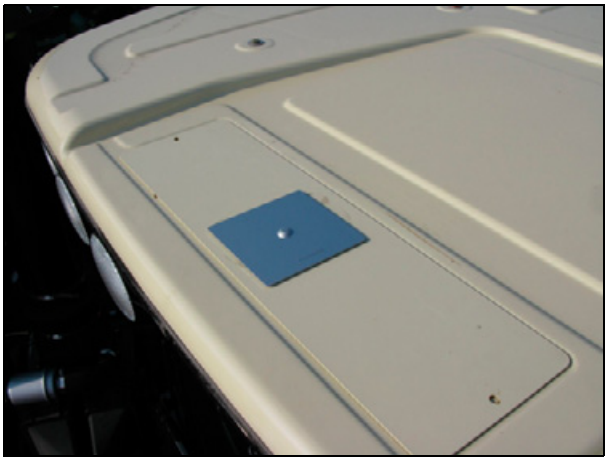
Step 3

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.*



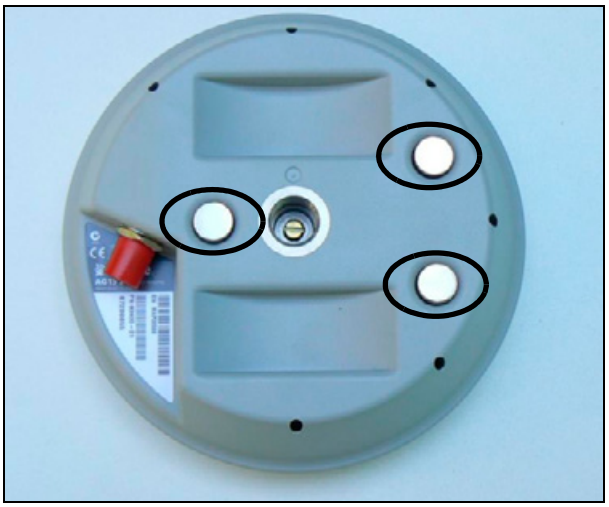
V plate



P/N 62034 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 existing steel plate or P/N 62034 plate.



Step 6

Both models

AGR models are equipped with a GPS antenna cable already installed. If available it will be at the center of the cab under the edge of the roof just above the windshield. Attach the TNC connector to the antenna.

If the antenna cable is not present, attach the Trimble antenna cable P/N 50449 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 FmX displays: Installing the RTK radio antenna

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

Step 1

Connect the radio antenna to the magnetic antenna base



Step 2

Attach the magnetic radio antenna base to the 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 3

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

CHAPTER 6

Power Harness Installation

In this chapter:

- Installing the power harness for the display
- Configuring the power bus options for the display

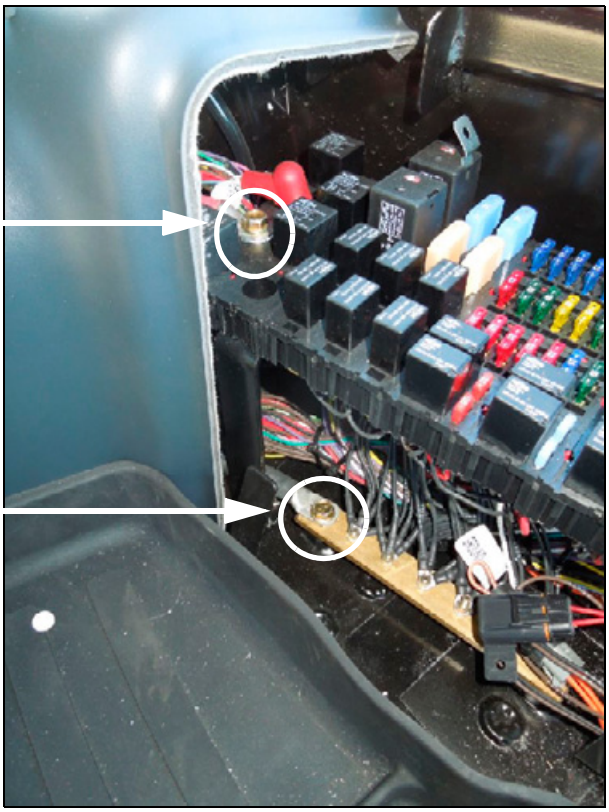
This chapter describes how to install the power harness in the vehicle.

Installing the power harness for the display

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

Step 1

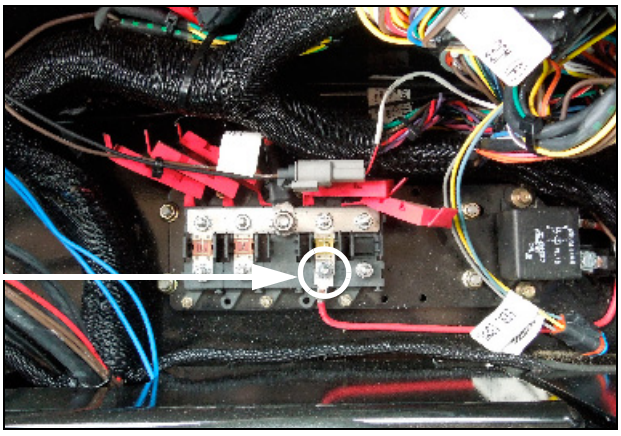
The power for the display is best routed to the vehicle power bus, shown in the picture on the right. This compartment is located behind the seat.



4WD

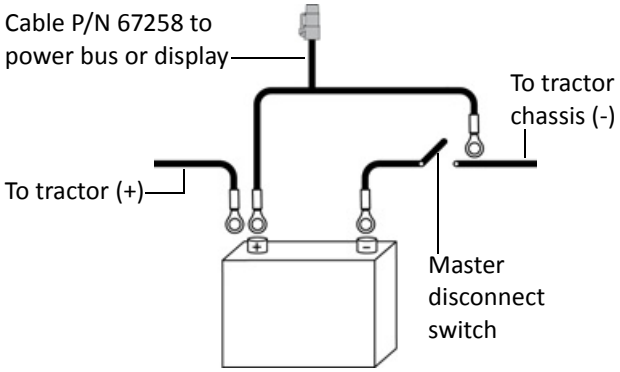


MFWD negative connection



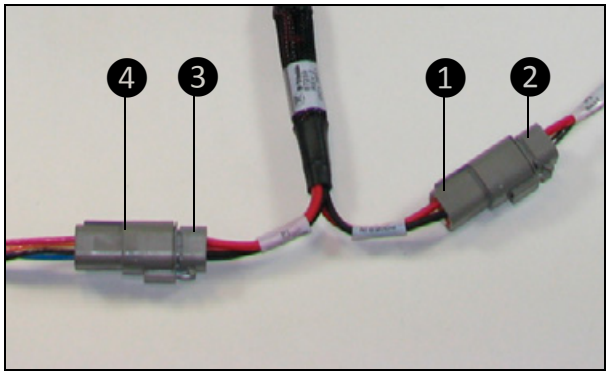
MFWD positive connection

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



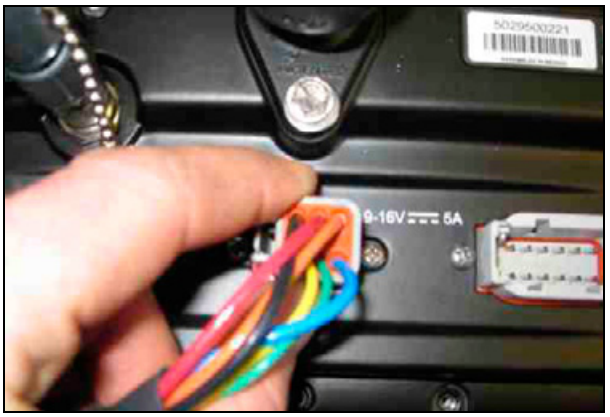
Step 2

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

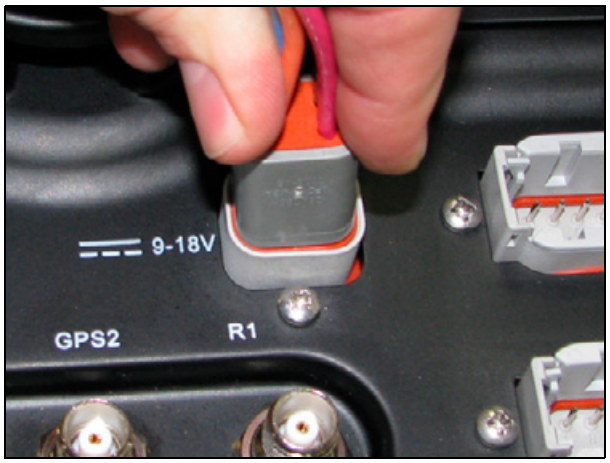


Step 3

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



CFX-750 display



FmX display

Configuring the power bus options for the display

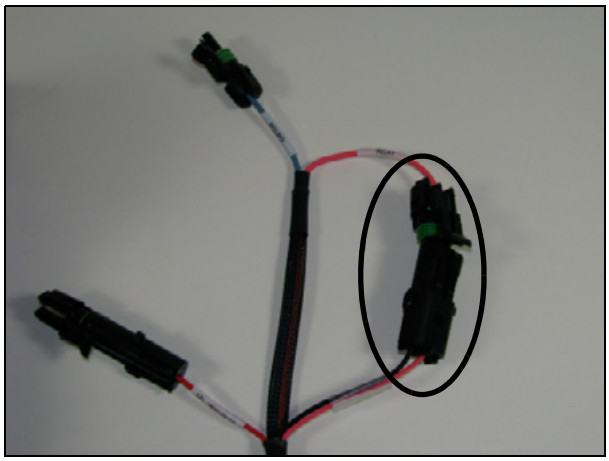
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

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

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

Display power button is used to turn on the Autopilot system

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

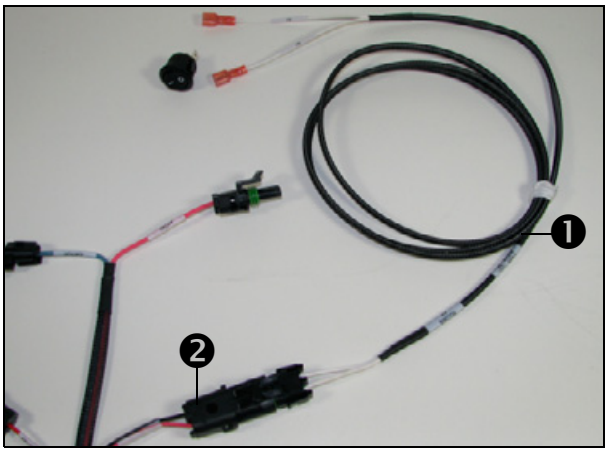


External switch is used to turn on the Autopilot system

Step 1

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

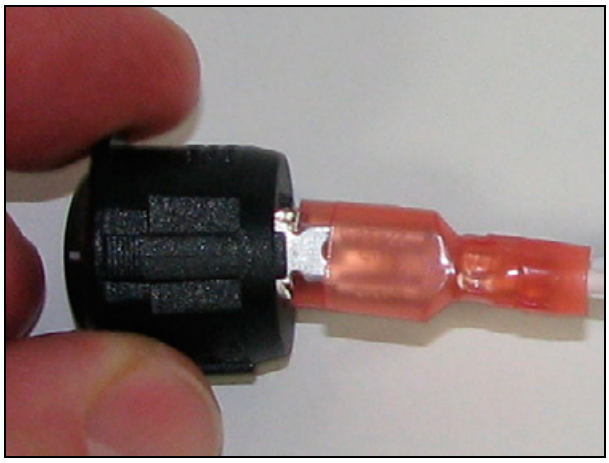
Note – *To install the switch provided, drill a ¾" hole.*



Step 2

Connect the cable labeled R7 to the switch pins.

Note – *Polarity is not important.*

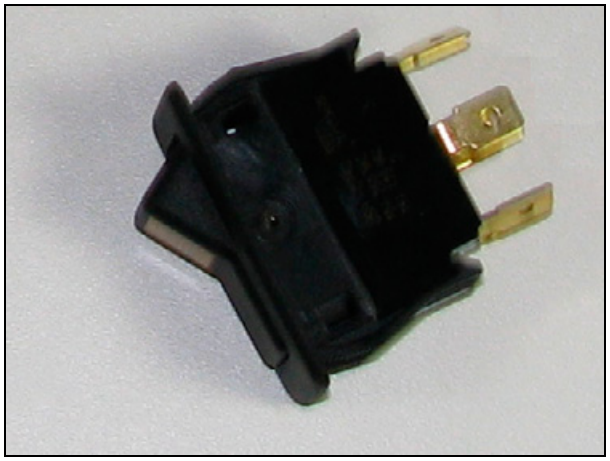


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

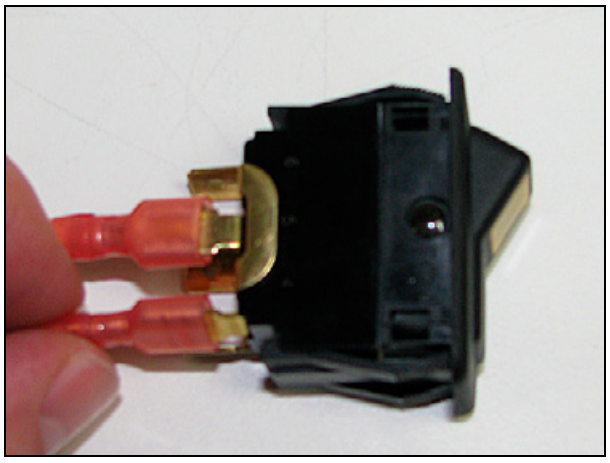


Step 2

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

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

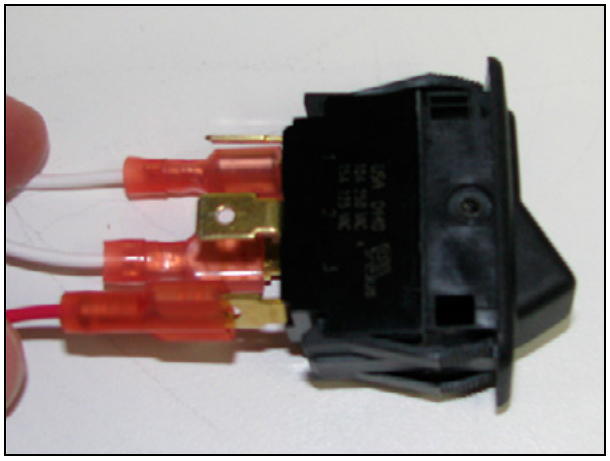
Note – *Polarity **is** important.*



Step 3

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

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

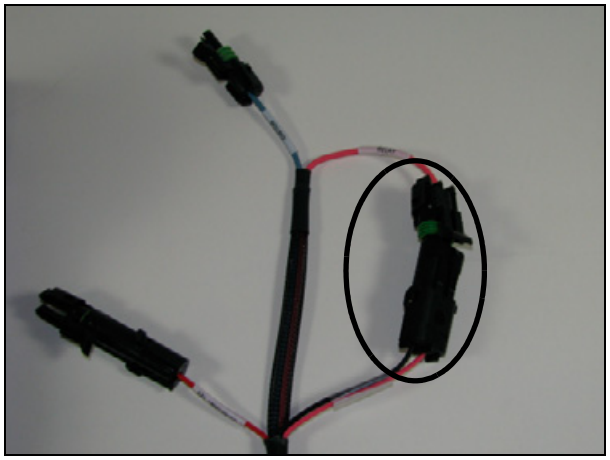


Ignition is used to turn on the Autopilot system

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

Step 1

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

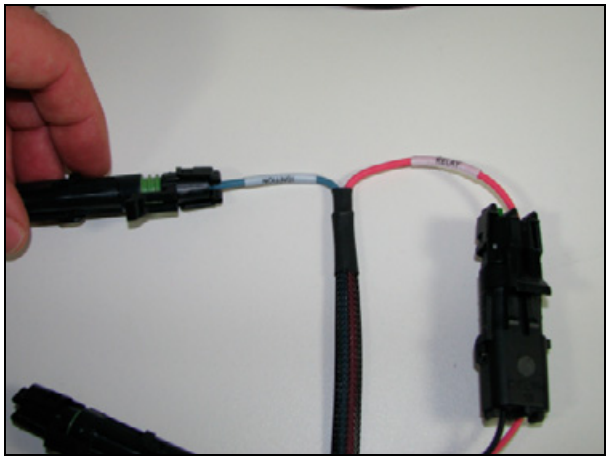


Step 2

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

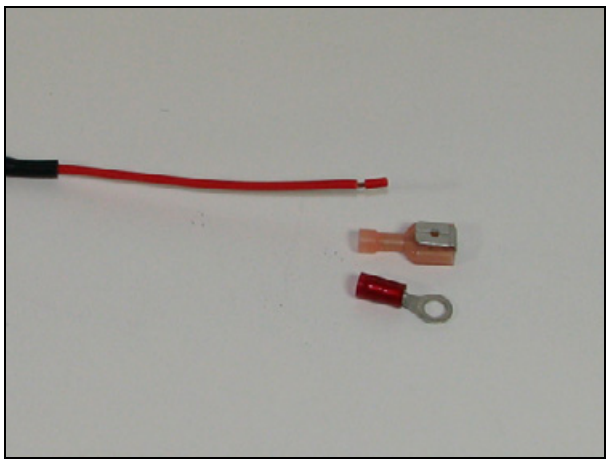
Step 3

Route the cable to the vehicles ignition.



Step 4

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



CHAPTER 7

Controller Installation

In this chapter:

- Installing the controller: 4WD
- Installing the controller: MFWD
- Controller connections

This chapter describes how to install the controller unit.

Installing the controller: 4WD

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

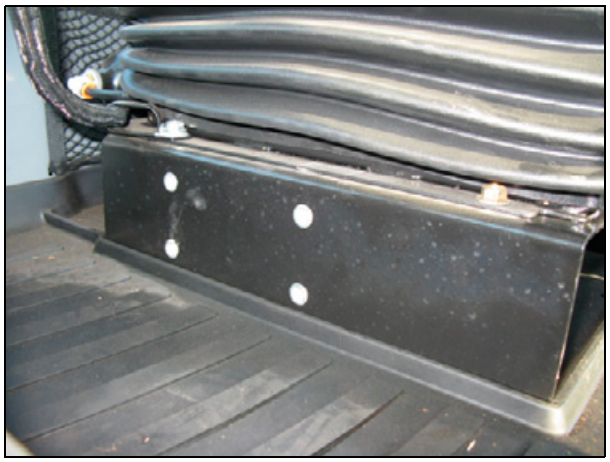
Mount the controller to the right-side of the seat base.



Step 2

Some newer models have mounting holes. If they are present, use the supplied hardware to install the mount plate.

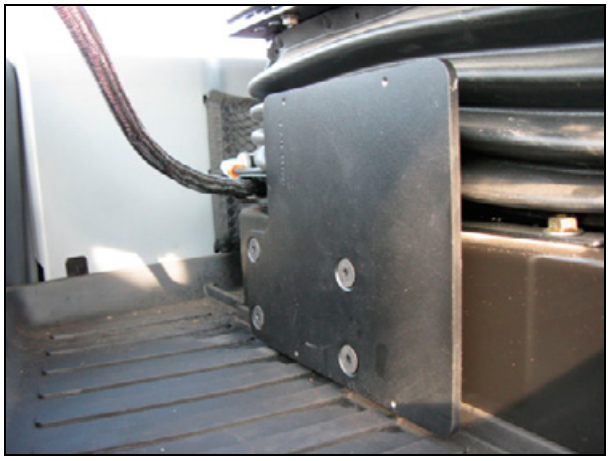
If the mounting holes are not present, use the mount plate as a template and match-drill four 10 mm clearance holes in the seat base.



Step 3

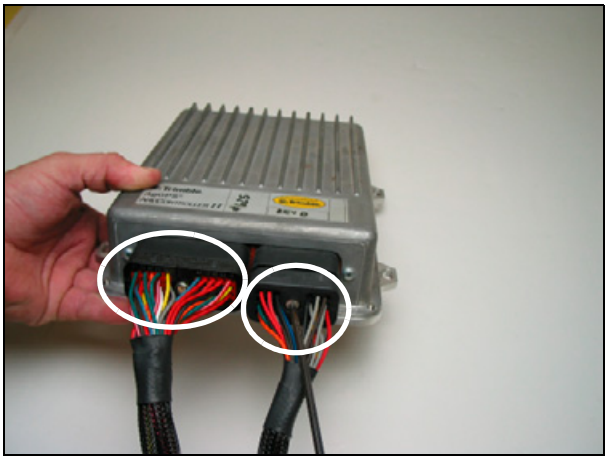
Use the four supplied M10 flat head bolts and four spacers to mount the plate to the seat base. The spacers provide additional clearance for the seat at its lowest adjustment. If the threaded holes are available, tighten the bolts securely. If the holes were drilled, install the supplied M10 Ny-lok nuts to secure the bracket to the seat base.





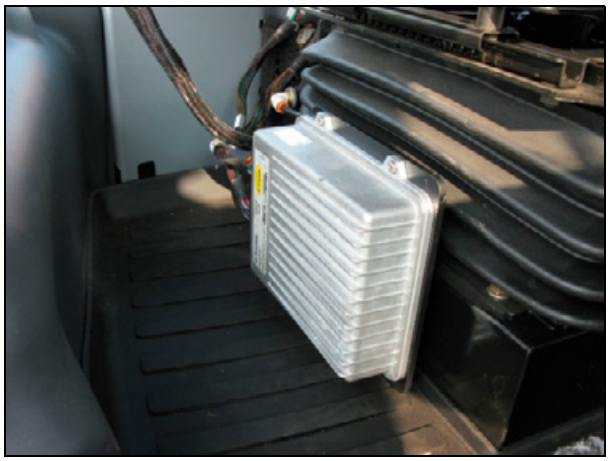
Step 4

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



Step 5

Use the four #10 Phillips screws provided in the bolt kit to mount the controller to the bracket.

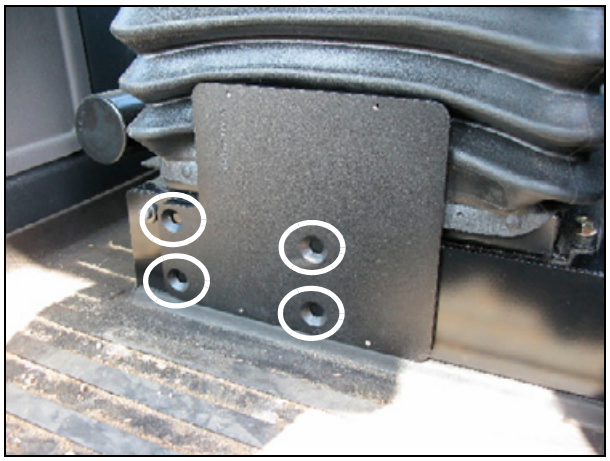


Installing the controller: MFWD

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.

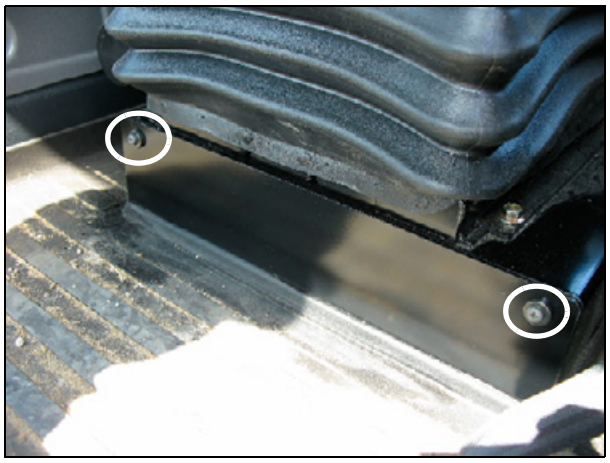
Step 1

Place the mounting plate P/N 00677 against the front of the seat base and using it as a template, mark the centers of the four mounting holes.



Step 2

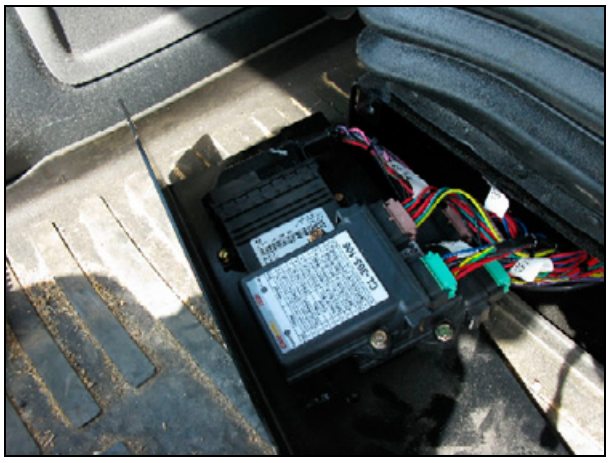
Locate the two Philips-head screws at the front of the seat base and remove them.



Step 3

Carefully lift and pull to remove the electronics tray out of the seat base.

Carefully drill four M10 clearance holes where the marks were made in Step 1. Trimble recommends removing the electronic modules or using a stubby drill bit to prevent damaging the modules.



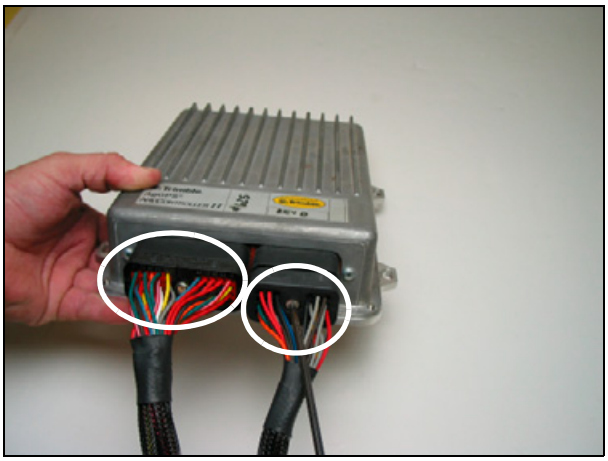
Step 4

Use the included M10 flat head bolts and Nylok nuts to attach the mount plate to the panel. Reinstall the electronics tray.



Step 5

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

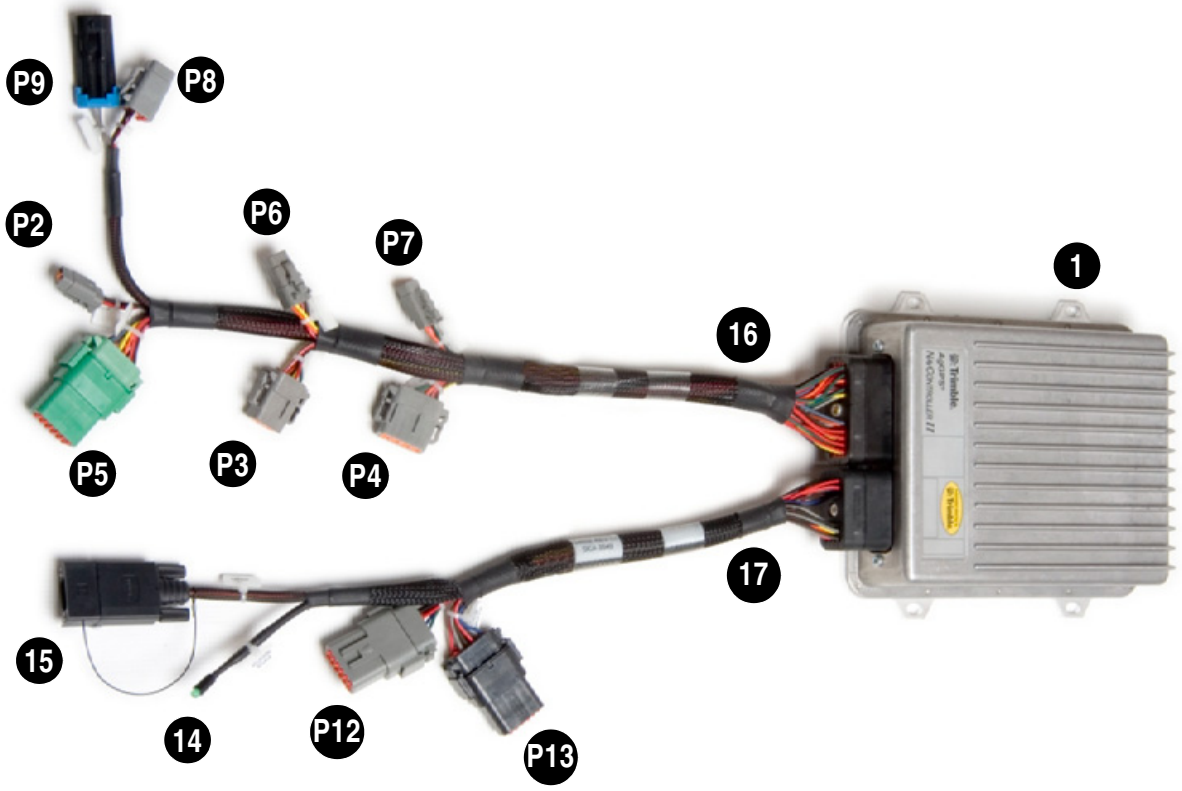


Step 6

Use four of the supplied 6-32 Philips-head screws to attach the NavController II to the mount plate. Route the cables around the base and to the rear.



Controller connections



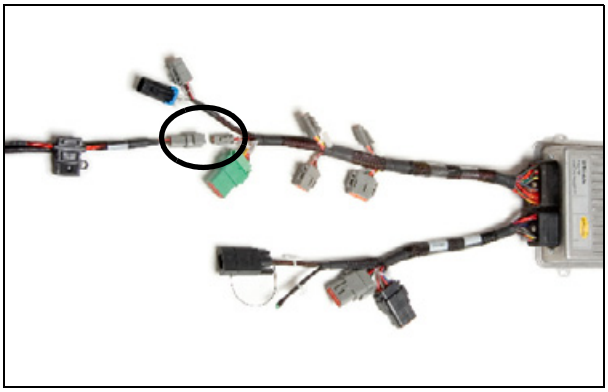
Item	Description
1	NavController II controller
P2	Power connector
P3	GNSS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

Step 1

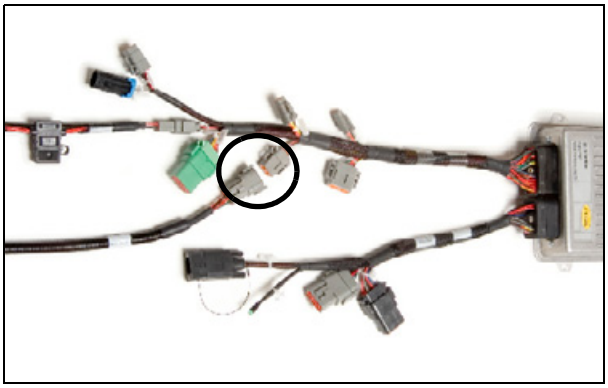
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



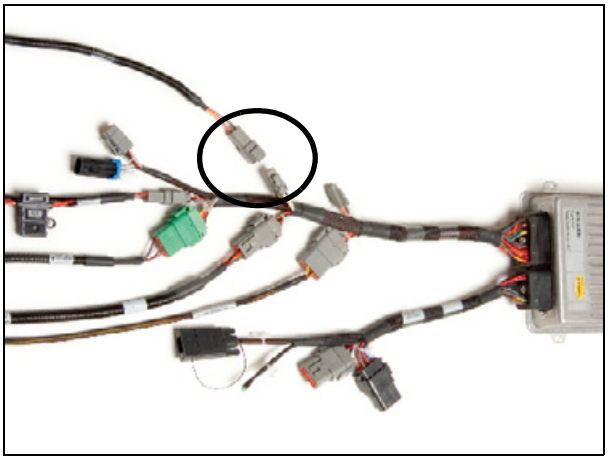
Step 2

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



Step 3

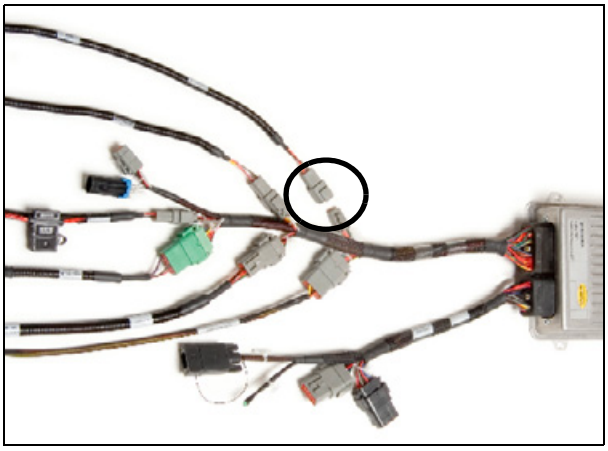
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 4

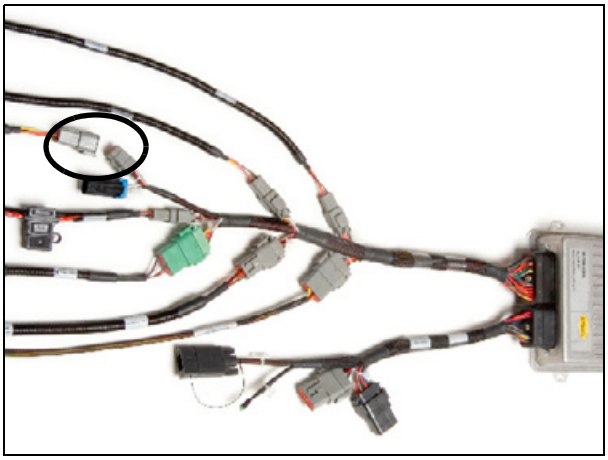
Connect the manual override cable connection to P-7, which is labeled “Manual Override”. P-7 is located on the main wiring harness.

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



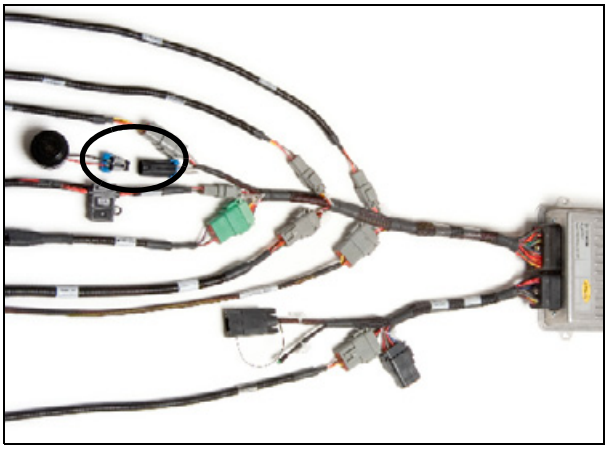
Step 5

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



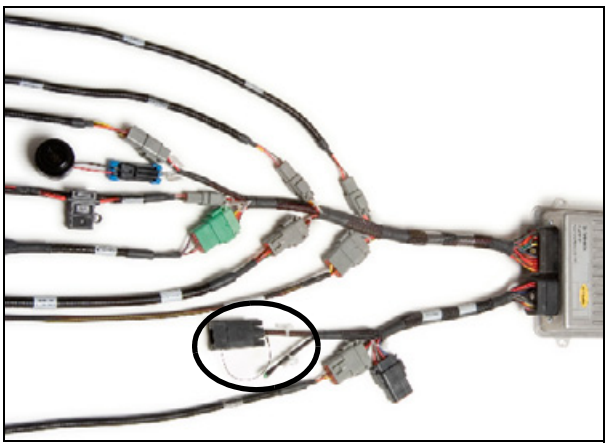
Step 6

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



Step 7

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



Step 8

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

CHAPTER 8

Final Machine Check

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

To perform the final machine check:

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

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

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

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