Installation Instructions

Autopilot™ Automated Steering System

John Deere CAN

- **9360R, 9410R, 9460R, 9560R**
- **9460RT, 9510RT, 9560RT**
- **8235R, 8260R, 8285R,8310R, 8335R, 8360R**
- **8310RT, 8335RT, 8360RT**
- **7200R, 7215R 7230R, 7260R, 7280R**
- **6105R, 6115R, 6125R 6130R, 6140R, 6150R, 6170R, 6190R, 6210R**

Version 5.00
Revision C
July 2012
Part Number 54035-42-E05

Trimble

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Notices

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.

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For product recycling instructions and more information, please go to:
www.trimble.com/ev.shtml

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.

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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 Global Navigation Satellite System (GNSS), such as the United States' Global Positioning System (GPS) products before, 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.

Note – *This manual describes Autopilot installation on the FmX® integrated display and the CFX-750™ display: Instructions for "the display" refer to either one of them. Where instructions apply to only one display, this is clearly identified.*

Technical assistance

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

1. Go to the Trimble website (www.trimble.com).
2. Click the **Support & Training** link at the top of the screen, select *Support* and then select *Support A–Z list of products*.
3. Scroll to the bottom of the list.
4. Click the *submit an inquiry* link. A form appears.
5. Complete the form and then click **Send**.

Manual system upgrade to Autopilot

EZ-Guide 500

Retain	Remove
EZ-Guide® 500 lightbar P/N 6610-xx Antenna for EZ-Guide 500 lightbar: P/N 60600-xx (DGPS) or P/N 57200-00 (OmniStar™/RTK) Antenna to receiver cable: P/N 50449 Power cable: P/N 62817 *Optional.* Remote keypad	Power connection cable: P/N 62818

FmX integrated display and CFX-750 display

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

Required components

Kit required	Special tools
Platform kit: P/N 54035-42	

Antenna mounting kits

Antenna options
Antenna spar mount: P/N 53676
Antenna V plate mount and AgGPS 262/AG-372 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the AgGPS 262/AG-372 receiver – see Chapter 3, Antenna/Receiver Installation)

Accessory kits

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

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit: P/N 54035-42	John Deere CAN connection cable	Chapter 2
	Controller mounting plate	Chapter 2
	Power switch	Chapter 5
	Bolt kit controller	Chapter 6
Common parts	Controller	Chapter 6
	Controller mounting bracket	
	Cable kit: • Main wiring harness • Power bus auxiliary wiring harness • Sonalert alarm	
GNSS receiver	GNSS receiver	Chapter 3
	GNSS antenna	
	GNSS receiver power/data cable	
	RTK radio, cable, and radio antenna	
Display	EZ-Guide 500 lightbar	Chapter 4
	FmX integrated display	
	CFX-750 display	
	Display cable	
	Mounting bracket	
Roof bracket kit (P/N 53676)	Roof brackets	Chapter 2
	Bolt kit, roof bracket	

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.*

CHAPTER

2

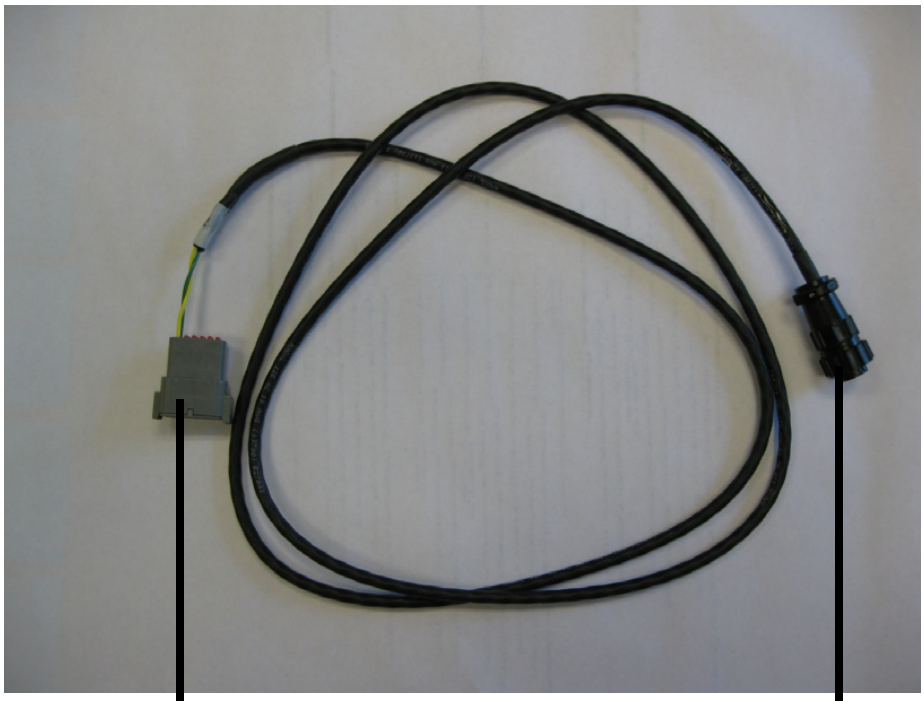
CAN Cable Installation

In this chapter:

- John Deere CAN interface cable (P/N 85037)
- Connecting the cable
- CAN cable connections

This chapter describes how to install the John Deere CAN cable.

John Deere CAN interface cable (P/N 85037)



Connecting the cable

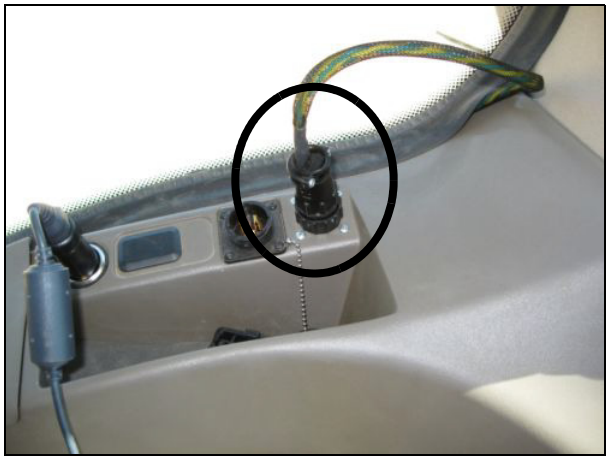
Step 1

Find the John Deere CAN connection on the right fender.



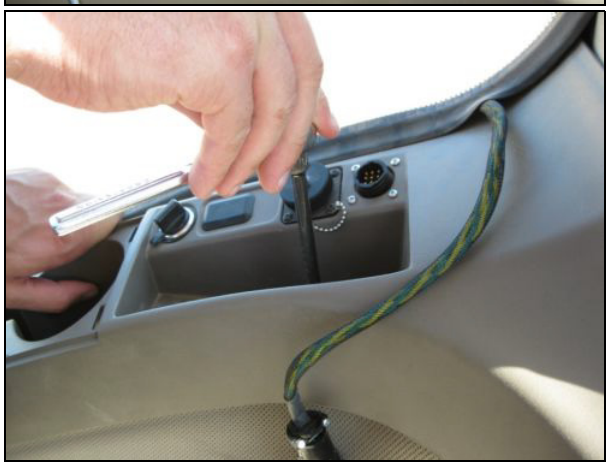
Step 2

Once you finish routing the John Deere connection cable, as described below, plug it into the rear connection.



Step 3

Remove the screws that hold the wall panel in place and then route the cable under the panel.



Step 4

Remove the plastic molding from the corner.



Step 5

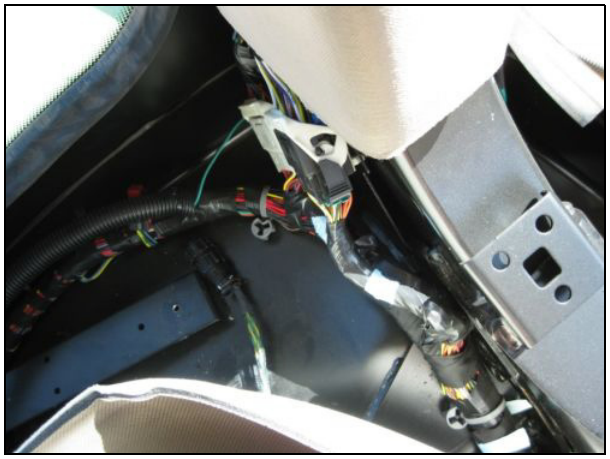
Pull up the floor molding.



Step 6

Route the cable under the side panel and up to the top.

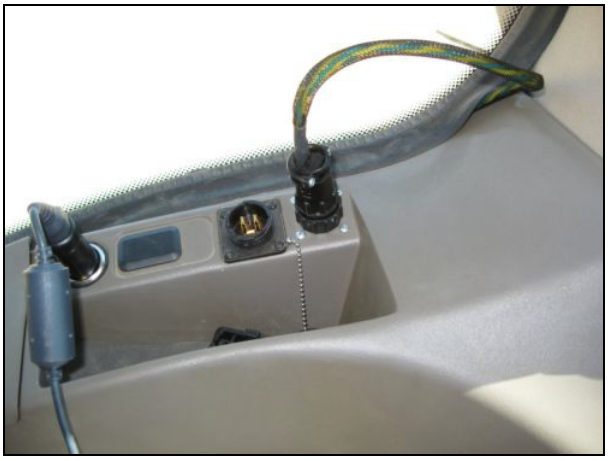




Step 7

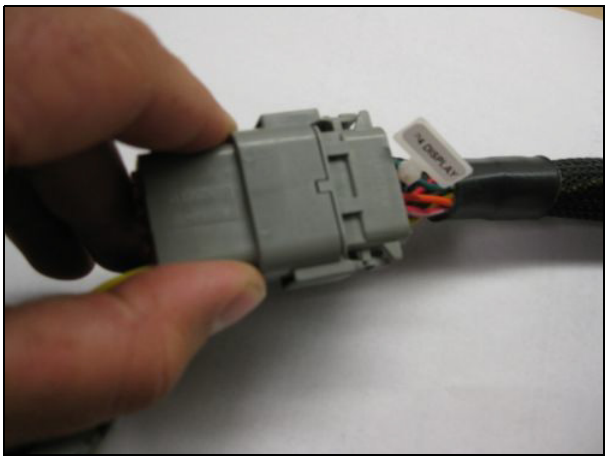
Replace the corner molding.

Plug the John Deere connection cable into the connector and then tighten the locking collar.



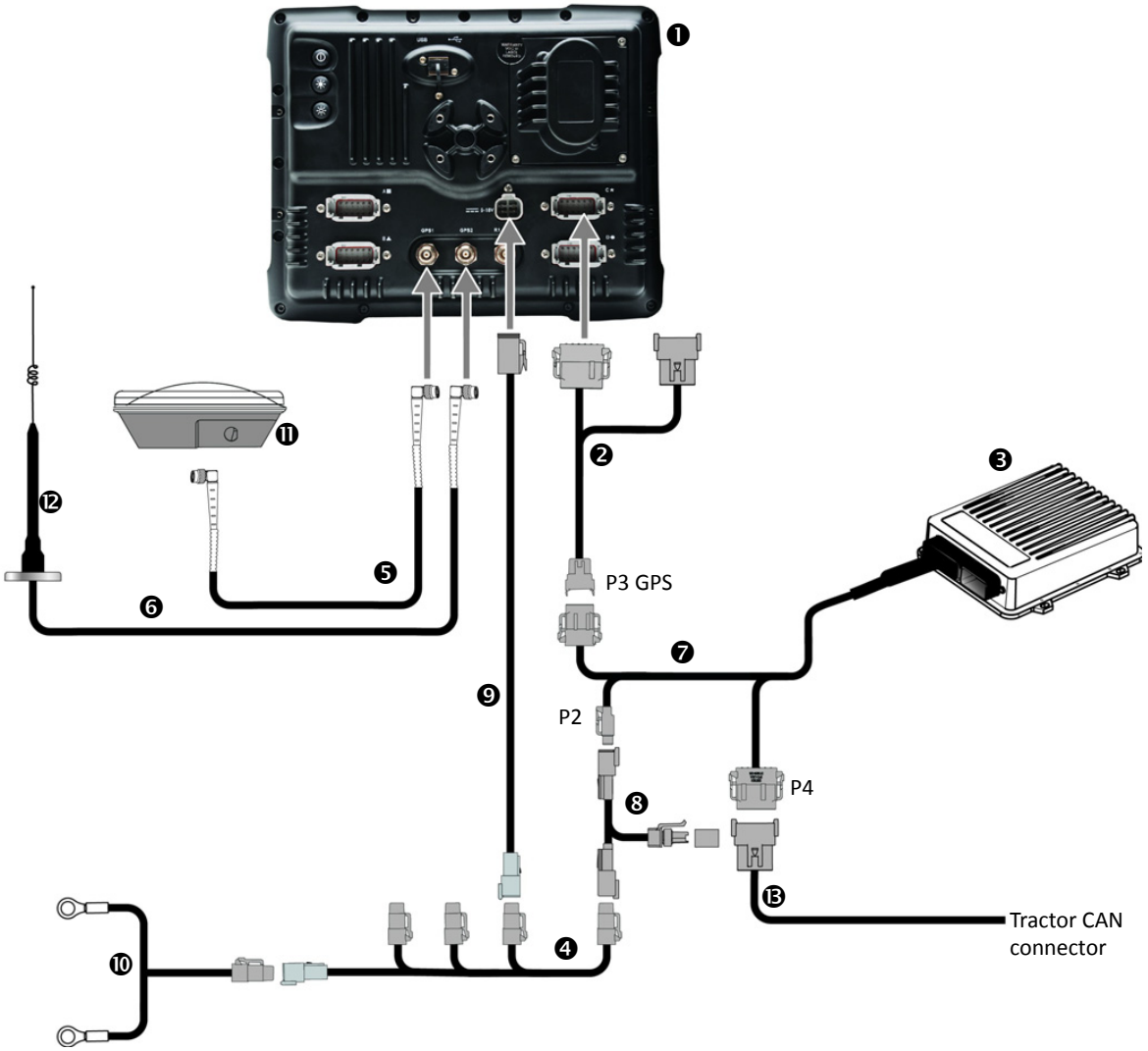
Step 8

Plug the R4 connection into the P4 connector on the NavController II harness.



CAN cable connections

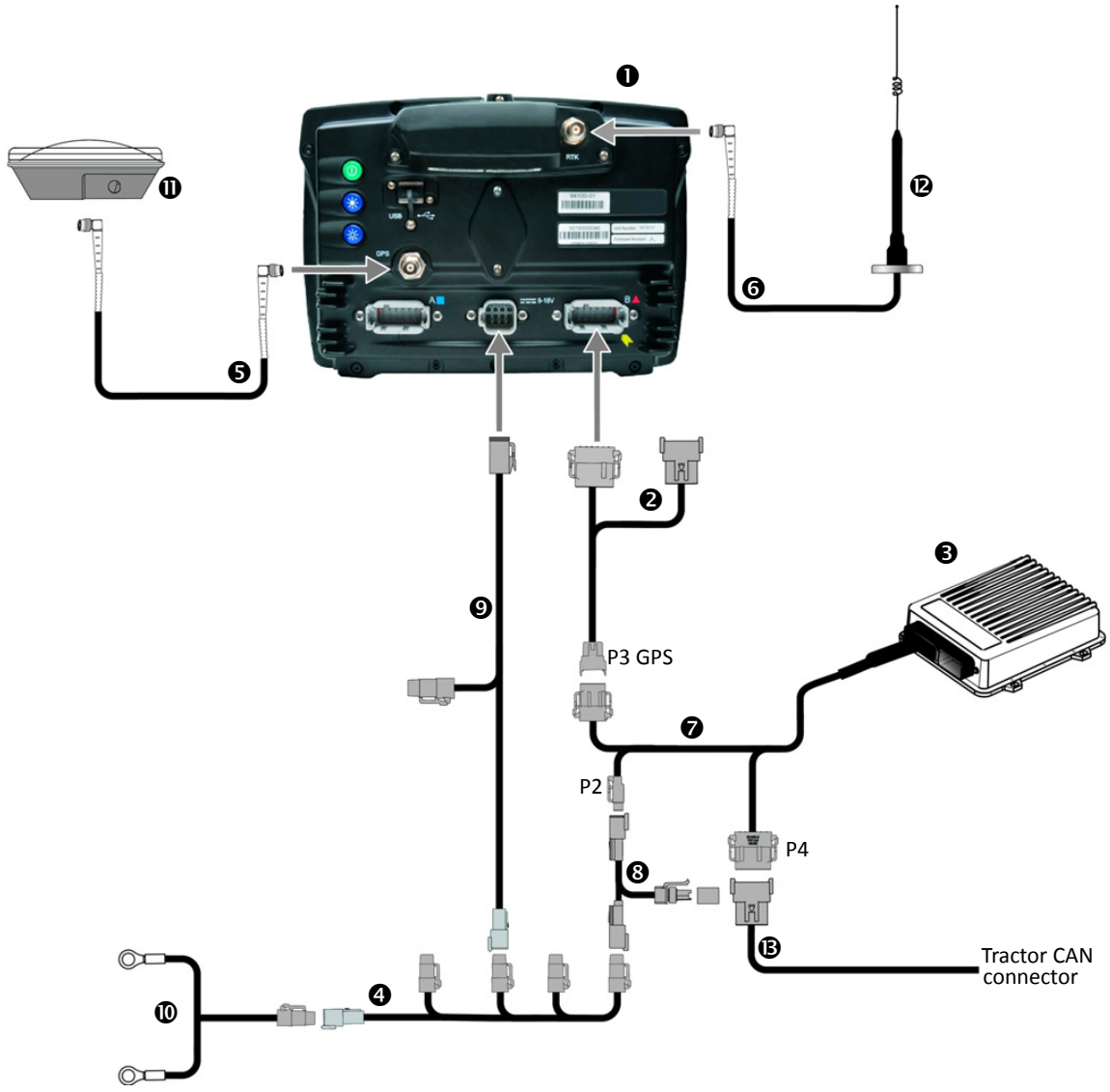
FmX integrated display



Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	Display to NavController II w/ Port replicator	75471
❸	NavController II	55563-00
❹	Power bus w/ Relay	67259
❺	Antenna cable	50449
❻	Antenna cable	72122
❼	NavController II main cable	54601

Item	Description	Trimble part number
❽	Power adapter	67095
❾	Display power cable	66694
❿	Basic power cable	67258
⓫	AG25 GNSS antenna	77038-00
⓬	RTK antenna	
⓭	JD CAN cable	85037

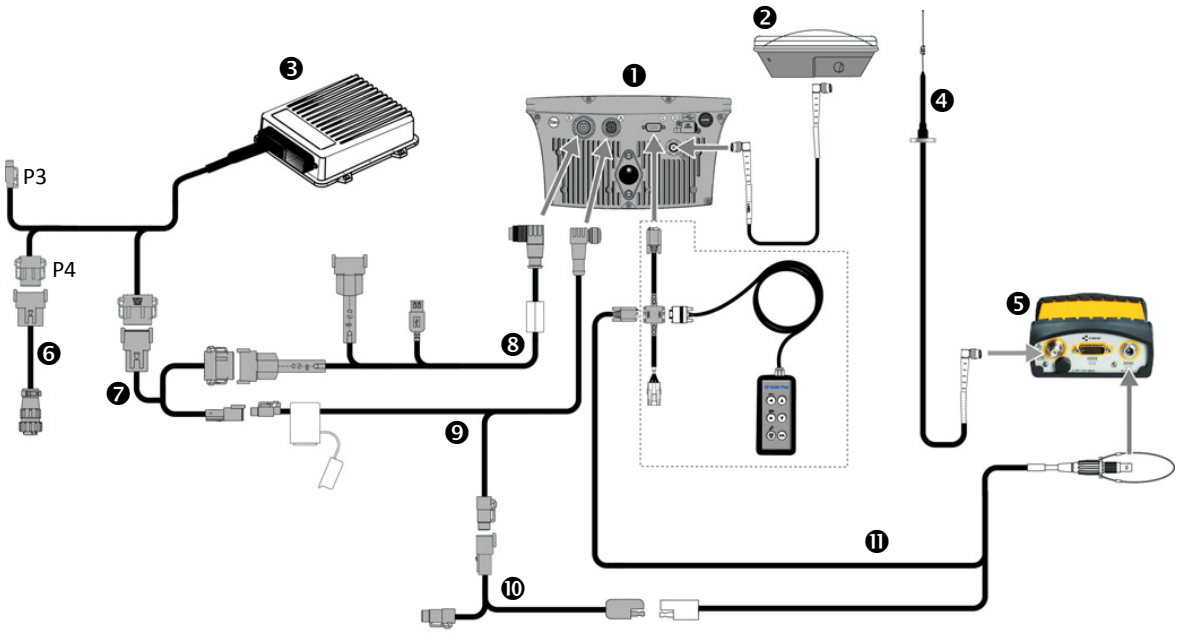
CFX-750 display



Item	Description	Trimble part number
❶	CFX-750 display	94100-01
❷	Display to NavController II w/ Port replicator	75471
❸	NavController II	55563-00
❹	Power bus w/ Relay	67259
❺	Antenna cable	50449
❻	Antenna cable	72122
❼	NavController II main cable	54601
❽	Power adapter	67095
❾	Display power cable	66694

Item	Description	Trimble part number
⑩	Basic power cable	67258
⑪	AG25 GNSS antenna	77038-00
⑫	RTK antenna	
⑬	JD CAN cable	85037

EZ-Guide 500 system



Item	Description	Trimble part number
❶	EZ-Guide 500 lightbar	66100-XX
❷	GPS Antenna	57200-00
❸	NavContoller II	55563-00
❹	SNB900 radio antenna magnetic mount	62109
❺	SNB900 radio	22882-00
❻	JD CAN cable	85037
❼	EZ-Guide 500 Port A to NavController II	62754
❽	EZ Guide 500 port expander	62609
❾	EZ-Guide 500 power/CAN	62817
❿	Power for RTK radio	63185
⓫	RTK radio to EZ-Guide 500 cable	61158

CHAPTER

3

Antenna/Receiver Installation

In this chapter:

- Antenna and receiver installation options
- AgGPS 262 GPS receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AgGPS 262/AG-372 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AgGPS 262/AG-372 receiver with magnetic feet
- AgGPS 432/442/542 receiver components
- Installing the AgGPS 432/442/542 receiver

This chapter describes how to install an *Ag*GPS 262/AG-372 receiver and *Ag*GPS radio module, an *Ag*GPS 332 receiver and antenna, an *Ag*GPS 442 receiver and antenna, an AgGPS 542 receiver and antenna, or an FmX/CFX-750/EZ-Guide 500 antenna.

Note – *To install the antenna for an EZ-Guide 500 system, see Chapter 4, Display Installation.*

Antenna and receiver installation options

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

- **Spar mount** – This bracket mounts directly to the roof bolts and is required for all high accuracy applications such as RTK and OmniSTAR. Trimble recommends this method for mounting an AgGPS 262/AG-372 receiver. Bolt a metal spar to the roof or to a light bracket and then attach either a V plate for magnetic mounting or an AgGPS 262/AG-372 receiver plate for permanent mounting.
- **VHB mount** – Attach a 4" x 6" plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 29.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting:

Possible mounting methods

GNSS receiver	V plate on spar (removable)	VHB plate on roof (removable)	Standard *Ag*GPS 262/AG-372 plate bolted to spar (permanent)	Ag15/Ag25/Zephyr bolted to Spar mount
*Ag*GPS 262/AG-372 receiver	✓	x	✓	x
*Ag*GPS 432/442/542 receiver	✓	x	x	✓
FmX integrated display CFX-750 display EZ-Guide 500 system	✓	✓	✓	✓

Notes:

– *For quick release magnetic mounting with an AgGPS 262/AG-372 receiver, order the kit listed in Antenna mounting kits, page 11 and bolt the V plate to the spar. When spar mounting is not available and high accuracy is required, see Installing an AgGPS 262/AG-372 receiver with magnetic feet, page 42.*

– *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

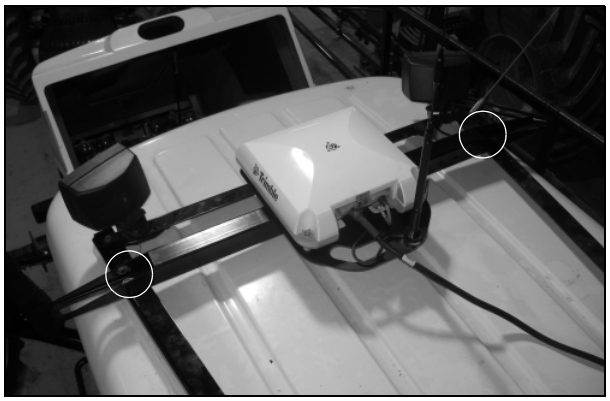
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

Position the cab bolts on the roof of the vehicle.

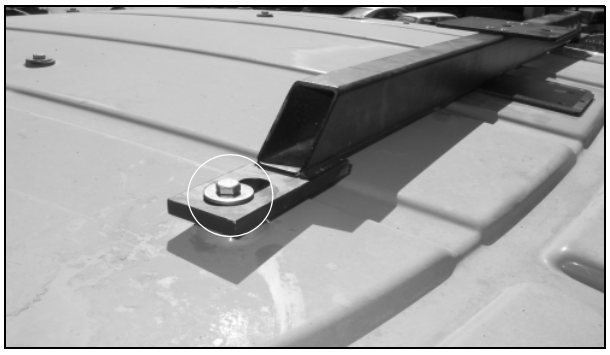


If a light bracket already occupies the roof studs, mount the spar directly onto the light bracket.



Step 2

If required, replace the existing bolts with longer bolts.

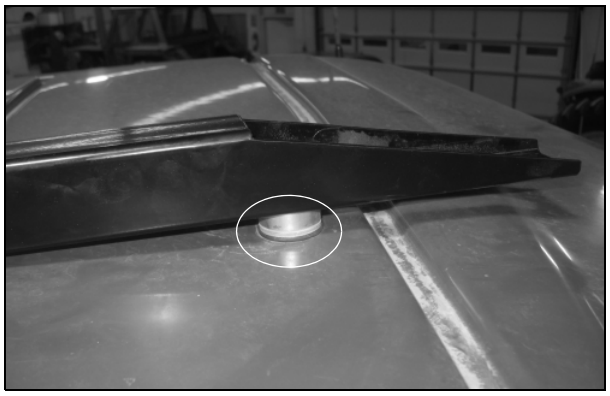


If you use the light bracket, drill two holes to match the spar width.



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 GPS antenna is aligned with the center of the vehicle.*

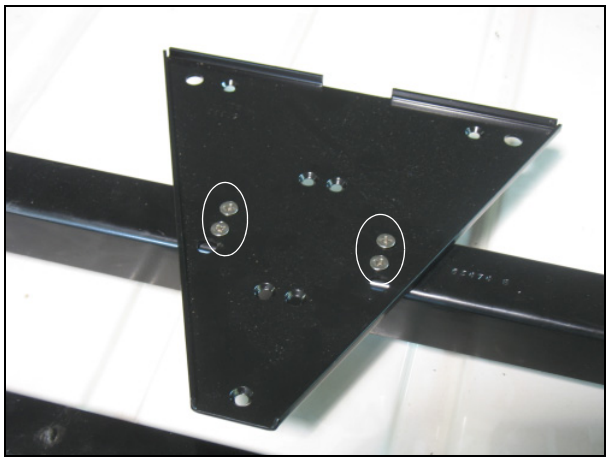
Step 4

For either of the following applications:

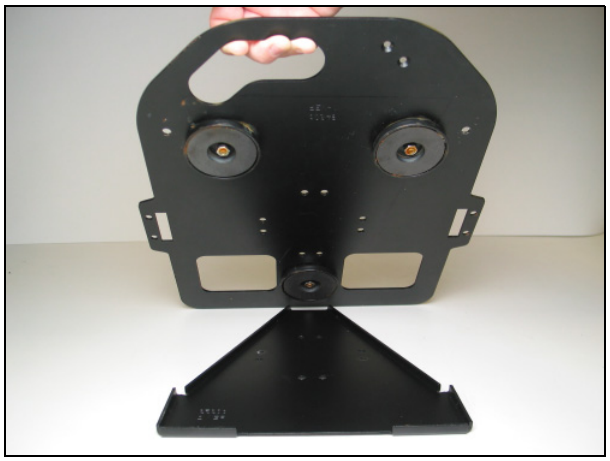
- A single magnet antenna mount
- An *Ag*GPS 262/AG-372 receiver with magnetic option for quick removal

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*GPS 262/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.

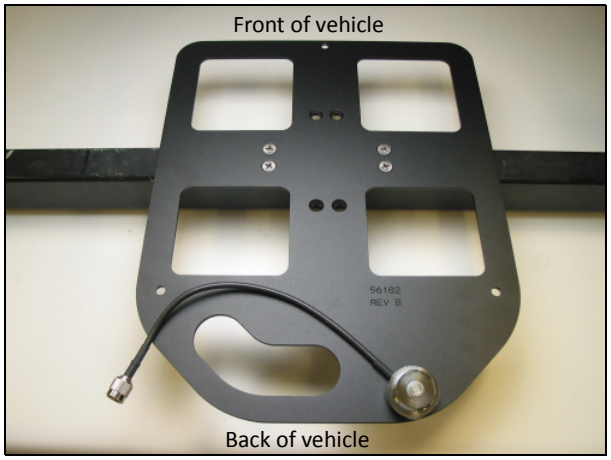


Plate on the spar

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 chapter.

Standard 4" x 6" plates are provided in most kits. You can use the VHB mounting method to attach either a 4" x 6" plate or a V plate.

- **GNSS, RTK, OmniSTAR, DGPS application:** 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. Apply force to the roof to find a firm location.

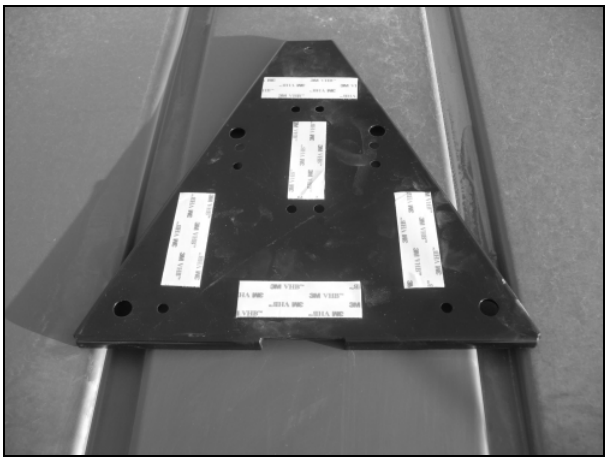


Step 2

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 4" x 6" plate.*



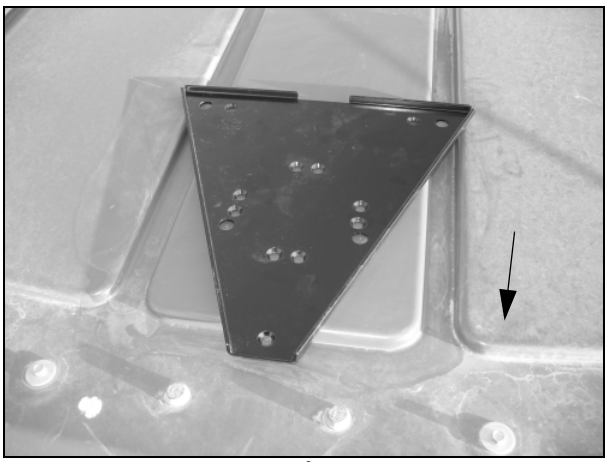
Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end of the plate points forward.

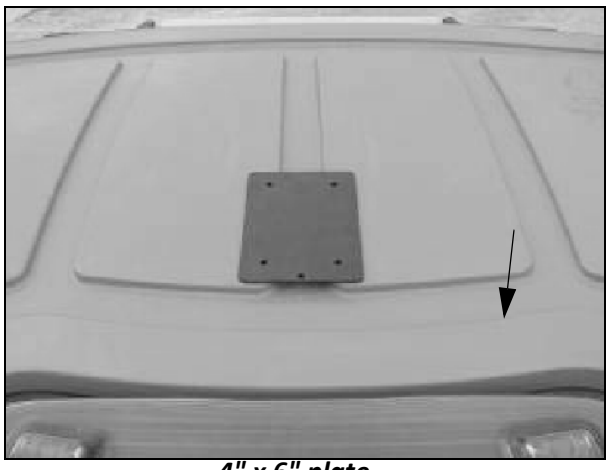
Ensure that the VHB strips make even contact with the surface.

Apply pressure and then leave for approximately 30 minutes to adhere.

Note – *The arrow points to the front of the vehicle.*

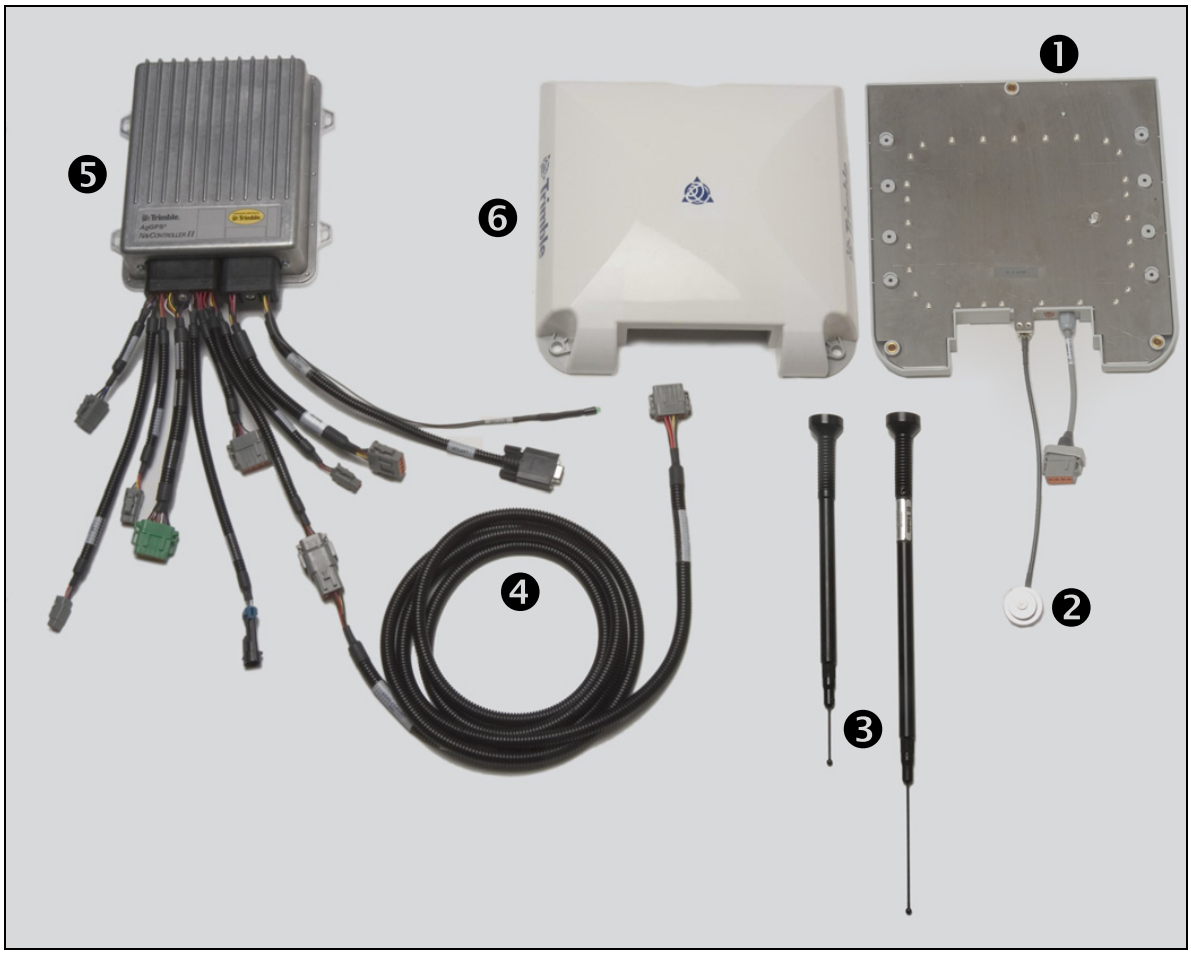


V plate



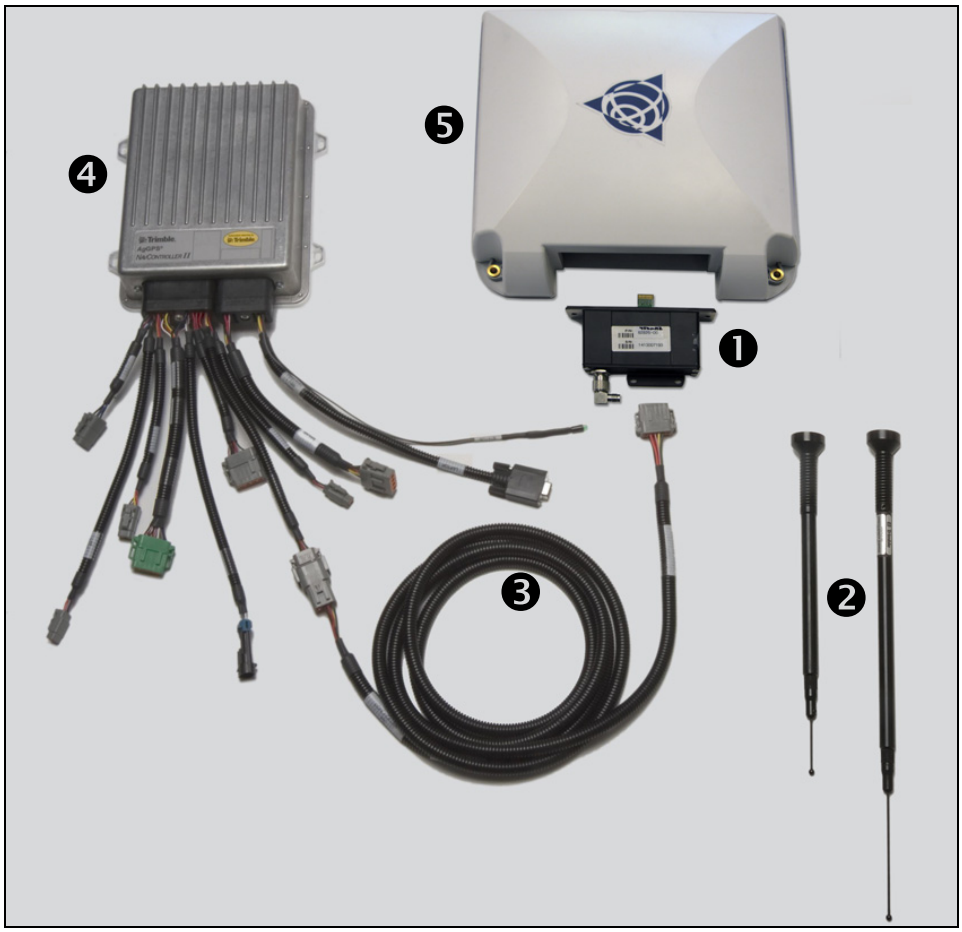
4" x 6" plate

*Ag*GPS 262 GPS 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 cable and magnetic mount	
❸	*Ag*GPS 450 or 900 radio antenna	
❹	Antenna/receiver cable	54608
❺	Autopilot controller	
❻	*Ag*GPS 262 antenna/receiver	

AG-372 GPS 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	*Ag*GPS 450 or 900 radio antenna	
❸	Antenna/receiver cable	54608
❹	Autopilot controller	
❺	AG-372 antenna/receiver	

Installing the *Ag*GPS 262/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 chapter.

To attach the *Ag*GPS 262/AG-372 receiver plate to the cab roof, do one of the following:

- For a removable installation, attach a V plate to a spar and then stick the receiver plate to the V plate with magnets.
- For a permanent installation, bolt the receiver plate to a spar.

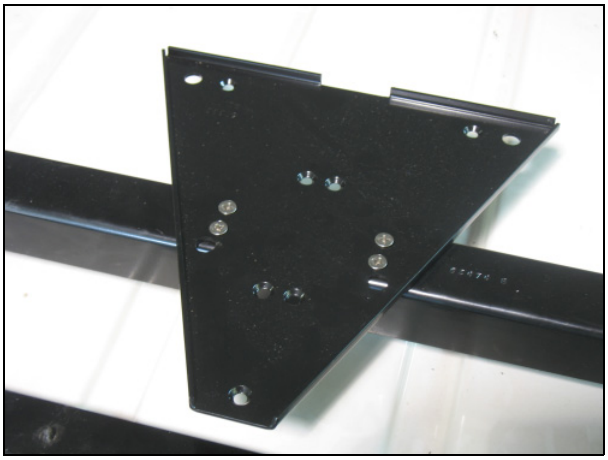
Removable installation

Step 1

V plate

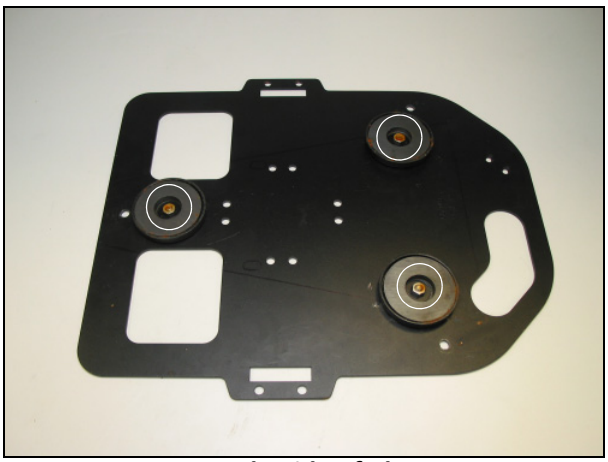
Attach the V plate to the spar using the ¼" flathead screws provided in the V plate bolt kit. Ensure that the narrow end points forward.

For spar mounting instructions, see page 27.



Mounting plate

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



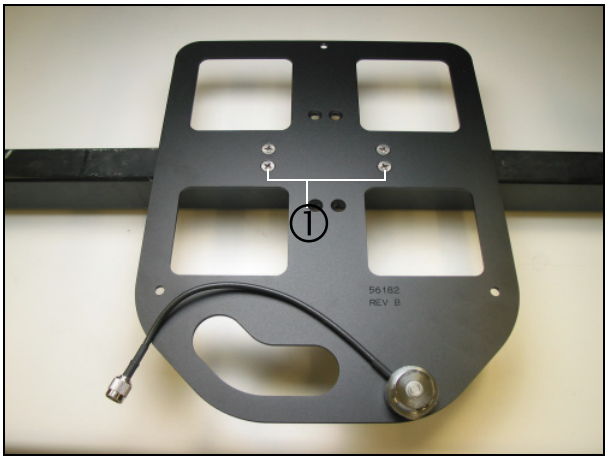
Underside of plate

Permanent installation

Step 1

Use the four provided ¼" flathead screws ❶ to attach the receiver mounting bracket to the spar.

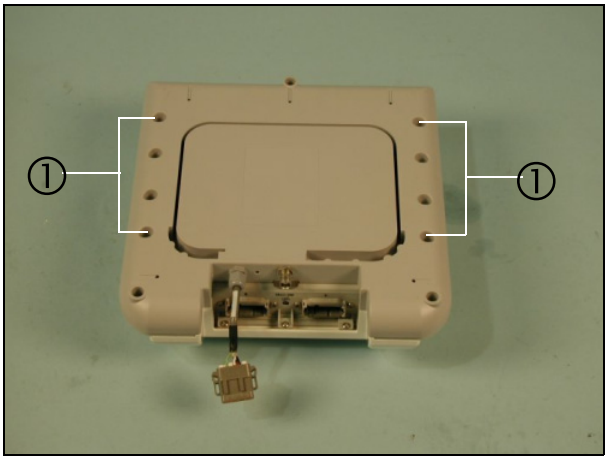
For spar mounting instructions, see page 27.



Step 2

Both installation methods

Place the radio module on the *Ag*GPS 262/AG-372 receiver. Secure it with the eight screws in the positions shown ❶.



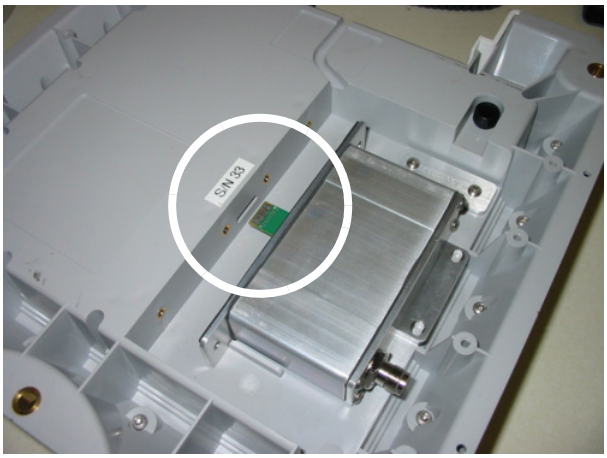
Step 3

Remove the blanking plate and set it aside.



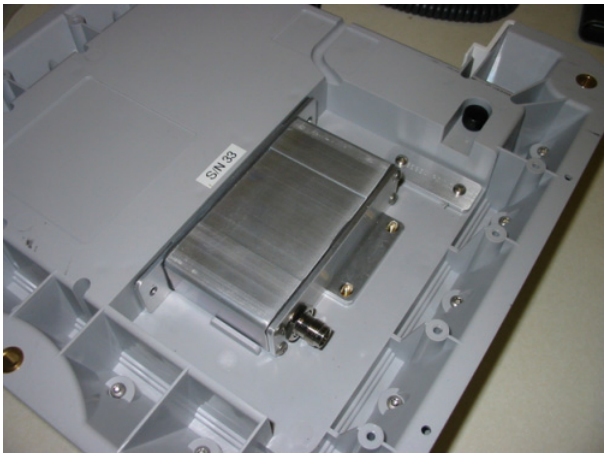
Step 4

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.



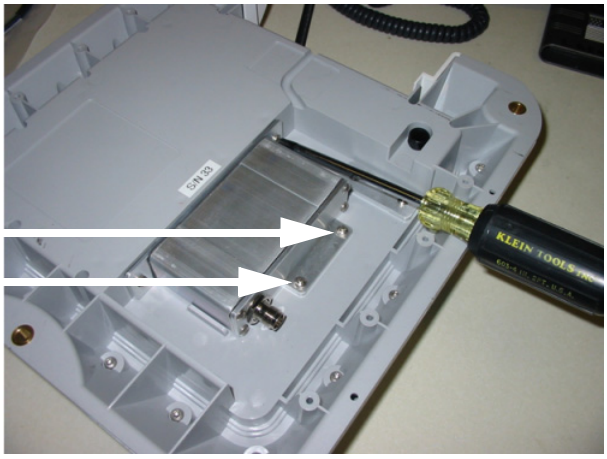
Step 5

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



Step 6

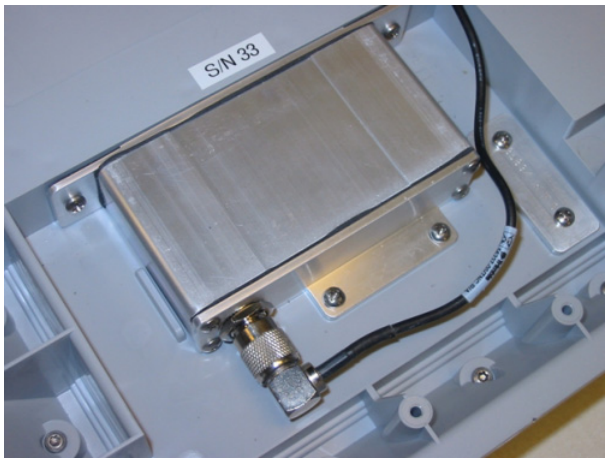
Use a #1 or #2 Phillips screwdriver and the supplied screws to install the integrated radio. First insert and tighten the two screws on the horizontal wall (arrowed), and then insert the remaining screws.



Step 7

Install the supplied antenna cable.

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

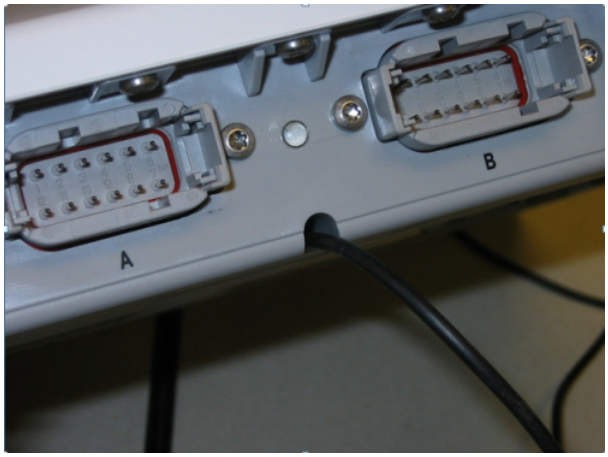


Step 8

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

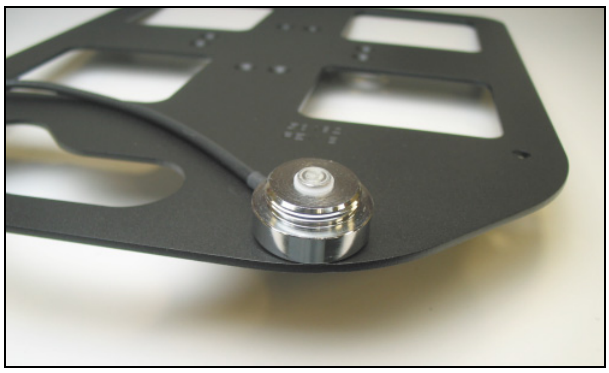


This image shows the unit with the cable routed through the channel.



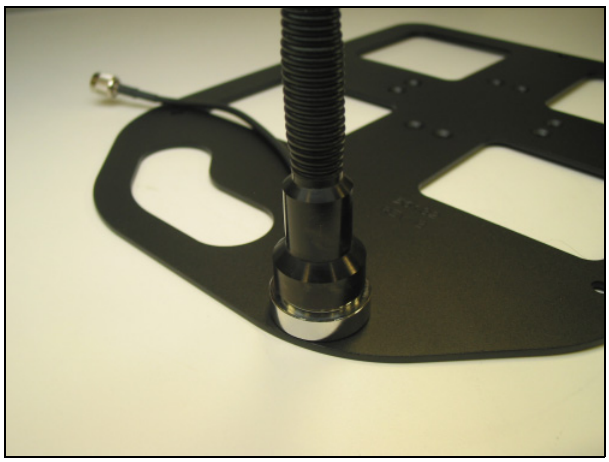
Step 9

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



Step 10

Attach the radio antenna to the antenna base.



Step 11

Position the *Ag*GPS 262/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.



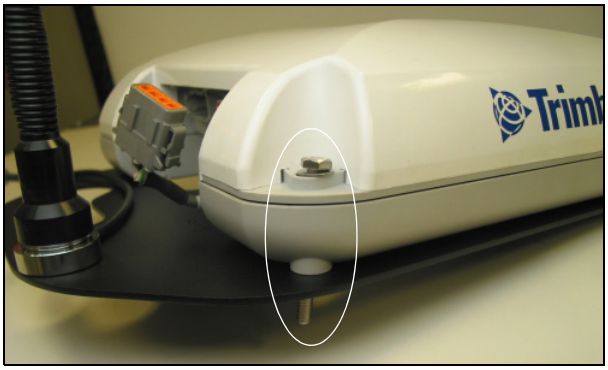
Step 12

Insert the nylon bushings provided.



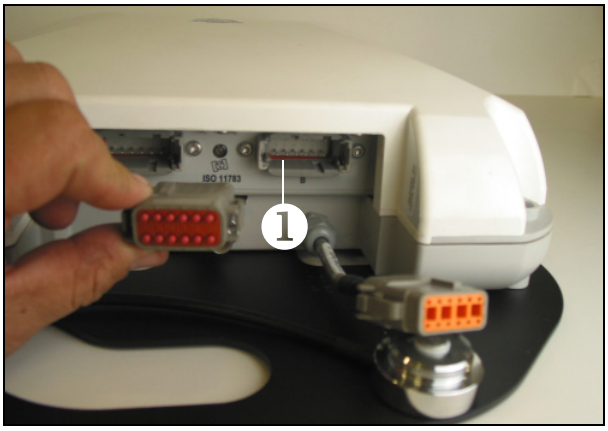
Step 13

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



Step 14

Remove the connector plug from port B ❶.



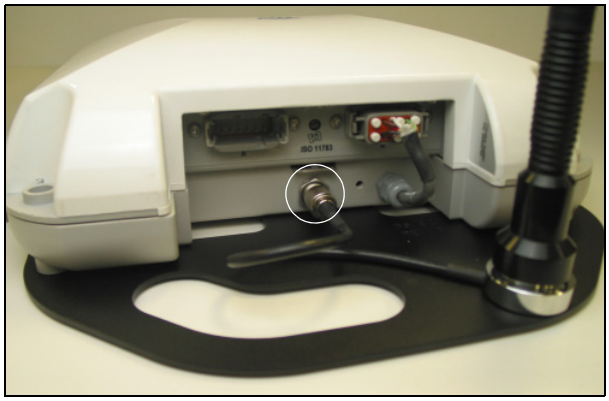
Step 15

Place the radio module connector into port B of the receiver.



Step 16

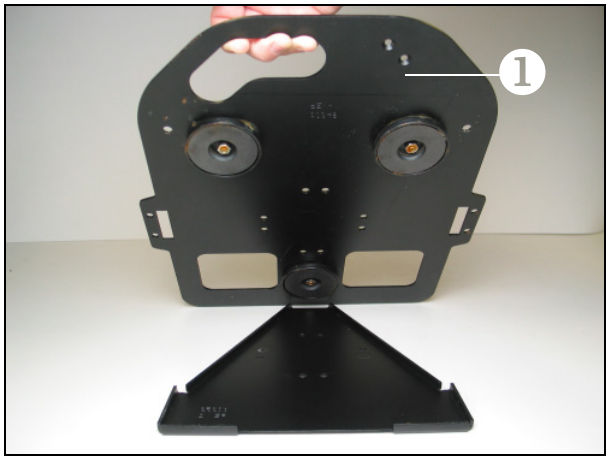
Connect the radio antenna to the antenna port.



Step 17

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.

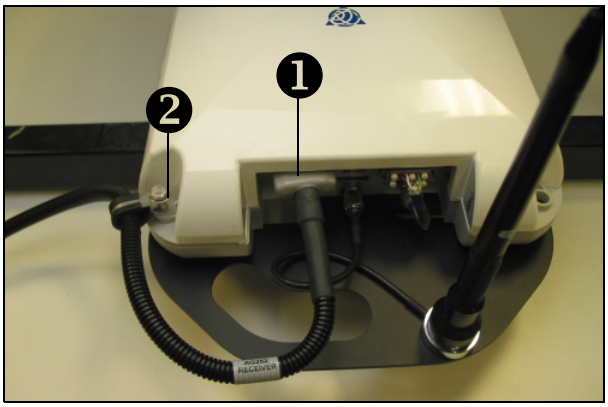


Step 18

Both methods

Connect the cable from the cab controller into port A ❶ of the *Ag*GPS 262/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*GPS 262/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 chapter.

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

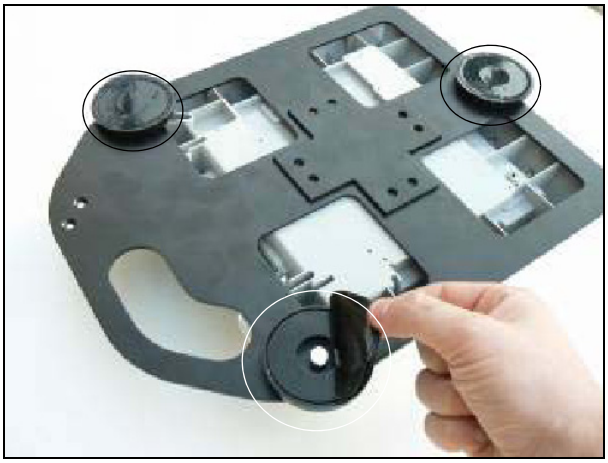
Attach the magnets to the receiver mounting plate. Mount the *Ag*GPS 262/AG-372 GPS receiver using the three ¼" bolts.

Place the nuts on the receiver side.



Step 2

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

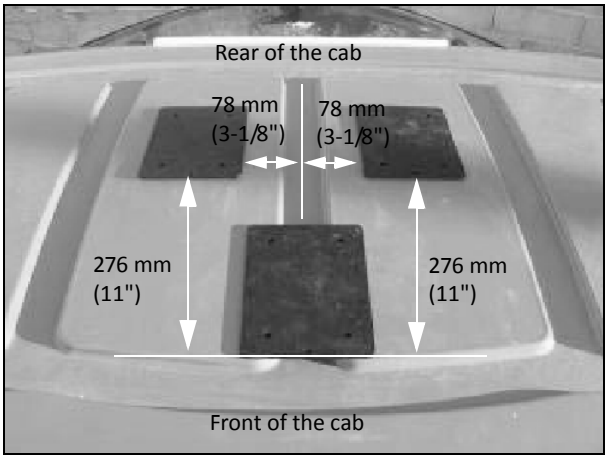


Step 3

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

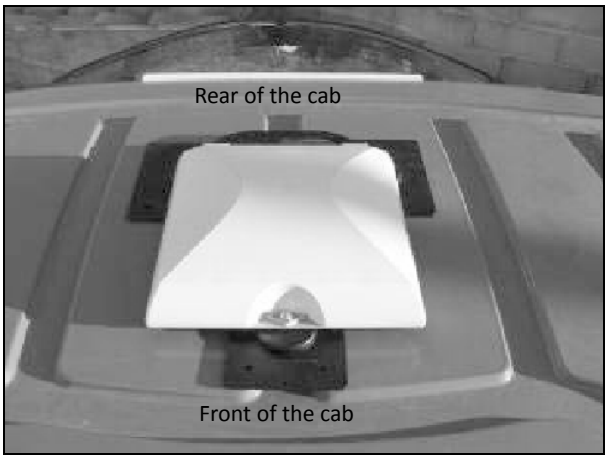
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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



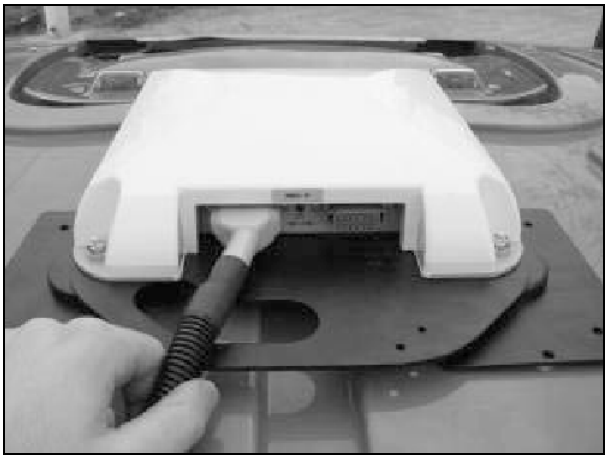
Step 4

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

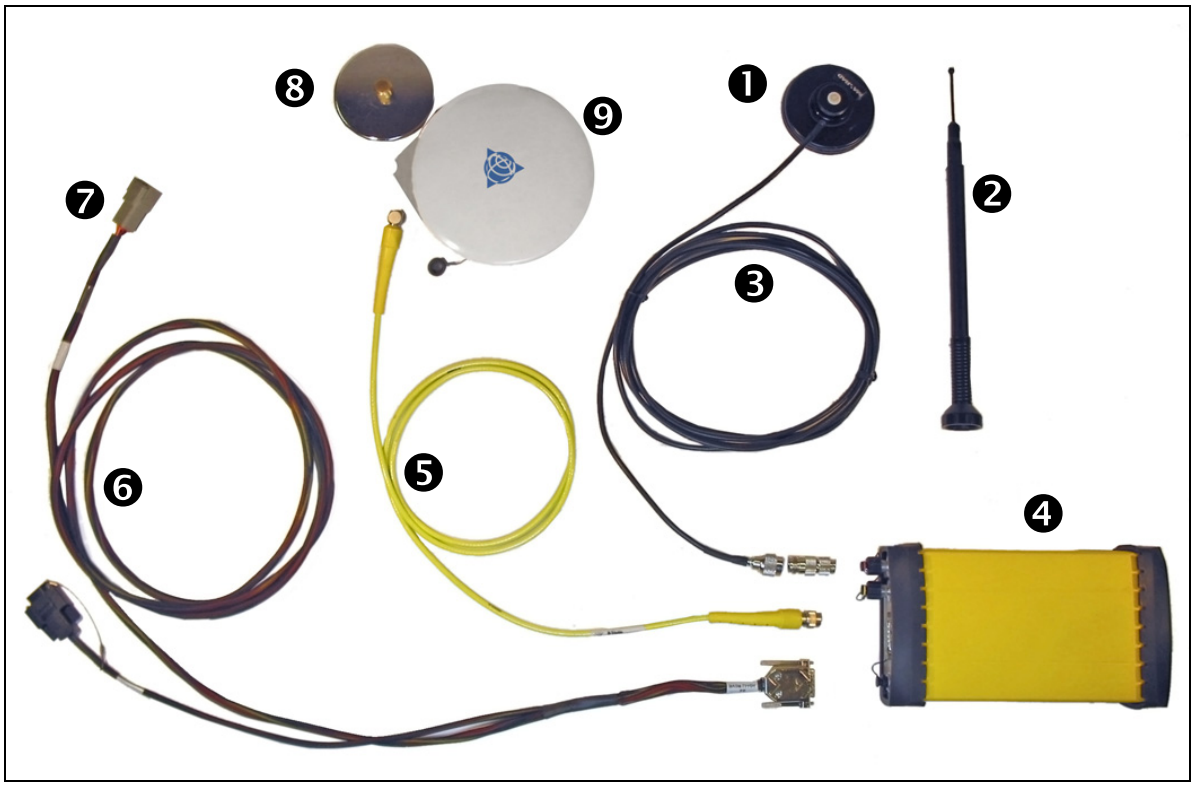


Step 5

Connect the antenna cable to port A of the *Ag*GPS 262/AG-372 GPS receiver and then route the cable toward the NavController II harness.



*Ag*GPS 432/442/542 receiver components



Item	Description	Trimble part number
❶	Radio antenna magnetic base	
❷	Radio antenna	
❸	Radio antenna cable	
❹	*Ag*GPS 432/442 GPS receiver	
❺	Antenna cable	
❻	Receiver cable	62037
❼	To controller “P3 GPS”	
❽	Antenna magnetic mount	
❾	*Ag*GPS 432/442 antenna	

Installing the *Ag*GPS 432/442/542 receiver

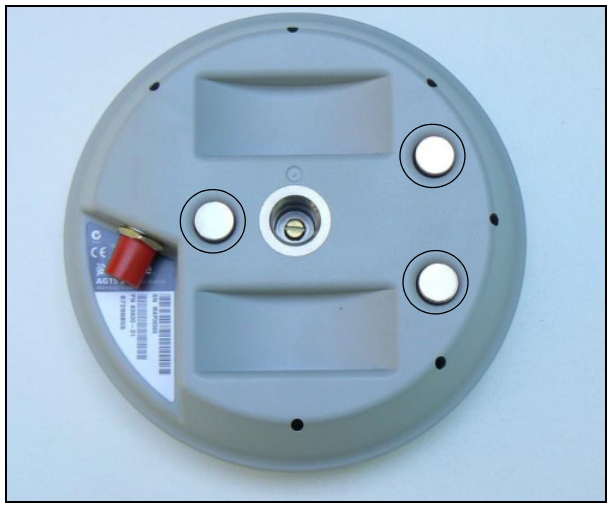
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

GNSS, 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.



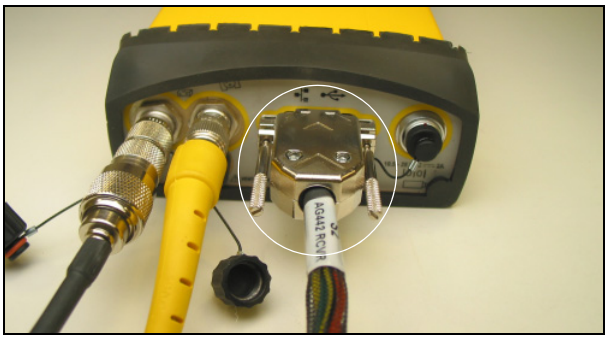
Step 7

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 later in the section Connecting the controller, page 99.



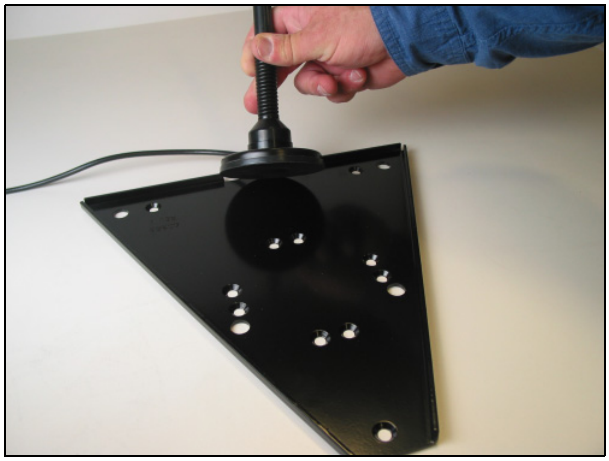
Step 9

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.



CHAPTER

4

Display Installation

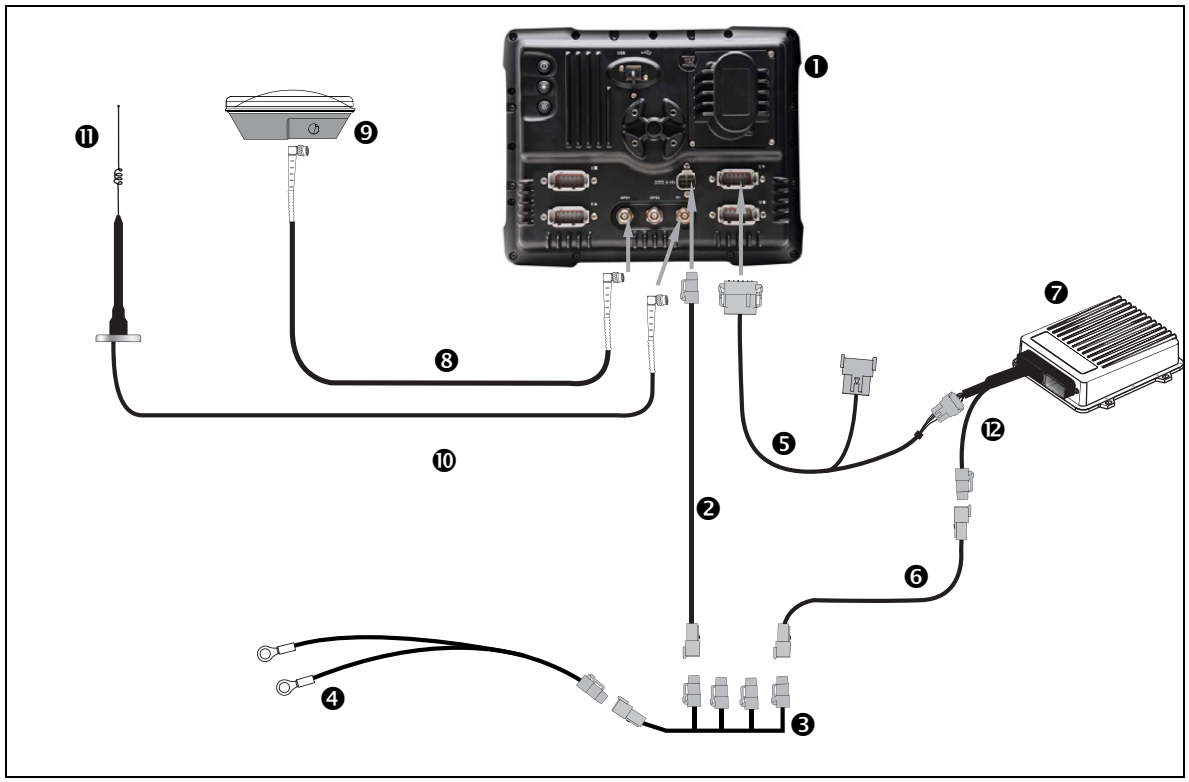
In this chapter:

- FmX integrated display components
- CFX-750 display components
- EZ-Guide 500 lightbar components: With SNB900 radio for RTK corrections (if equipped)
- Preparing the FmX integrated display
- Installing the FmX integrated display
- FmX integrated display: Installing the wiring harness
- Preparing the CFX-750 display
- Installing the CFX-750 display
- CFX - 750 display: Installing the wiring harness
- FmX integrated display and CFX-750 display: Connecting accessory options
- Preparing the EZ-Guide 500 lightbar
- Connecting the EZ-Guide 500 lightbar cables
- Installing the EZ-Guide 500 lightbar
- EZ-Guide 500 lightbar, and CFX-750 and FmX displays: Installing the GNSS antenna and plate
- EZ-Guide 500 lightbar, and CFX-750 and FmX displays: Installing the RTK radio antenna

This chapter describes and how to install and connect the FmX integrated display, CFX-750 display, or the EZ-Guide 500 lightbar in the vehicle.

Note – *Unless otherwise stated, instructions for "the display" refer to both the FmX integrated display and the CFX-750 display.*

FmX integrated display components

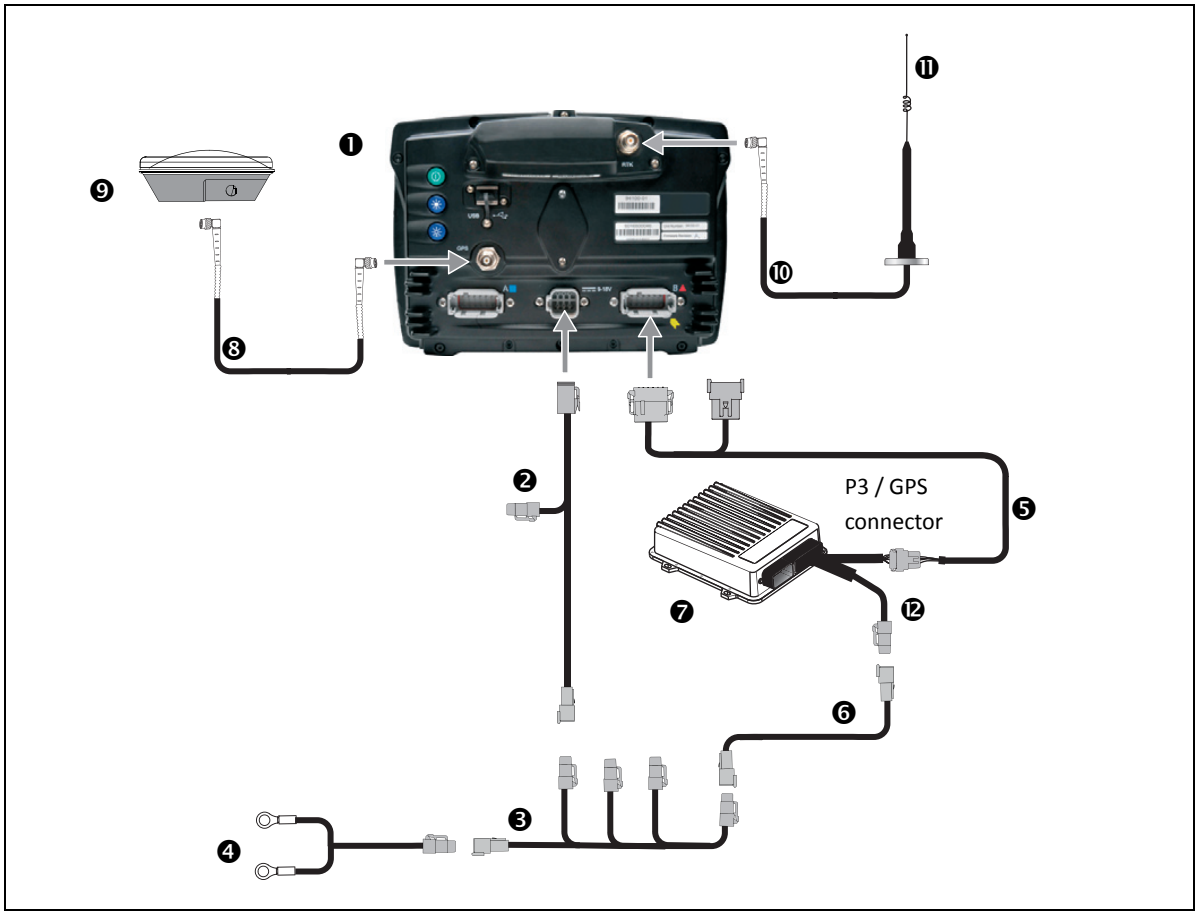


CAUTION – Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	FmX power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GPS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	62120

Item	Description	Trimble part number
⓫	900 MHz radio antenna kit	22882-10
⓬	Main NavController II cable	54601

CFX-750 display components

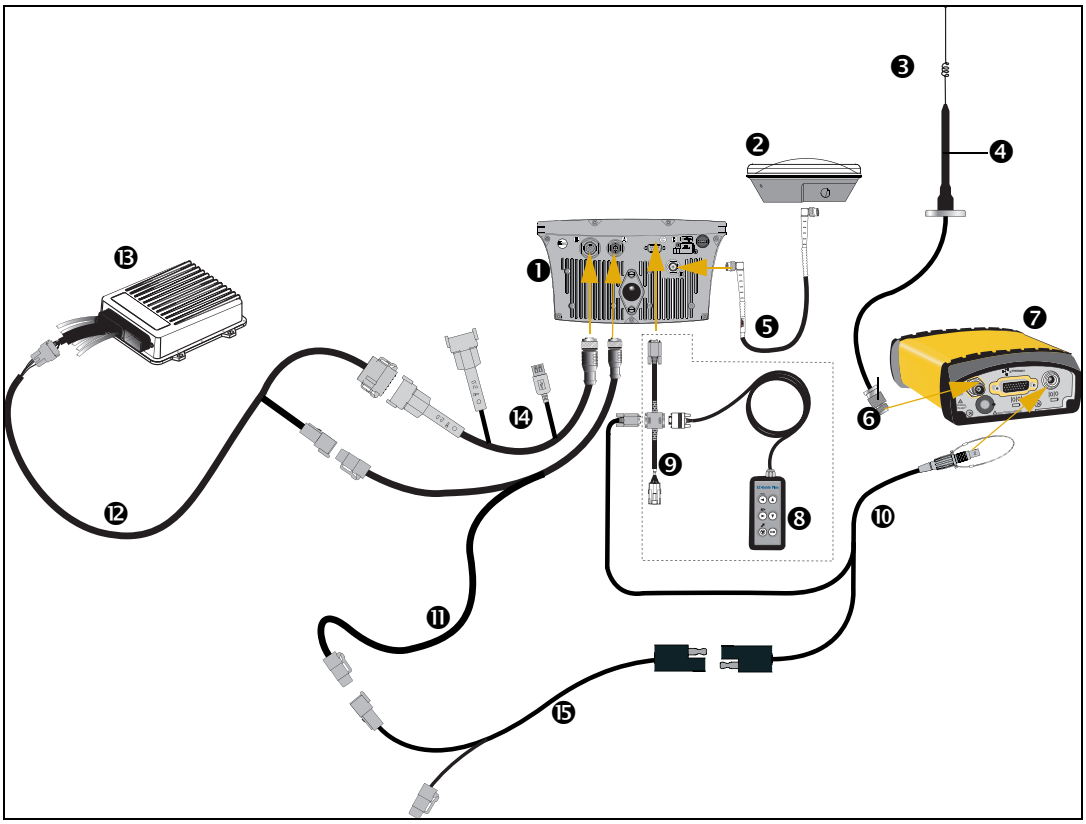


CAUTION – Connecting the Port Replicator on the CFX-750 display to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the CFX-750 display and will void the warranty.

Item	Description	Trimble P/N
❶	CFX-750 display **Note –** *RTK password required.*	94100-01
❷	CFX-750 power cable	77282
❸	CFX-750 power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	CFX-750 to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00

Item	Description	Trimble P/N
❽	8 m GPS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	62120
⓫	900 MHz radio antenna kit	22882-10
⓬	Main NavController II cable	54601

EZ-Guide 500 lightbar components: With SNB900 radio for RTK corrections (if equipped)


❸
❷
❹
❶
❺
❼
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Item	Description	Trimble part number
⓮	Port expansion cable	62609
⓯	Power tap to PDL radio	63185

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

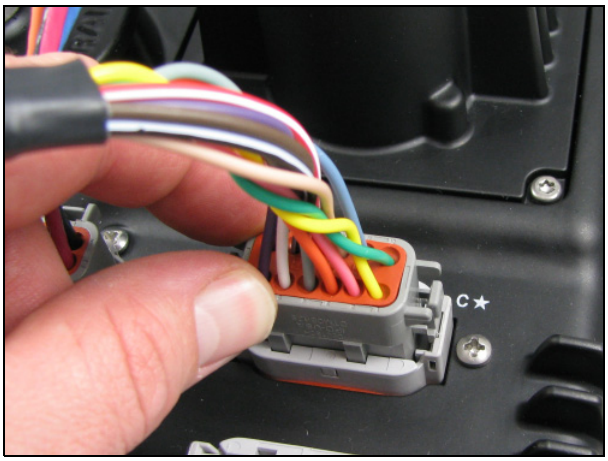
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

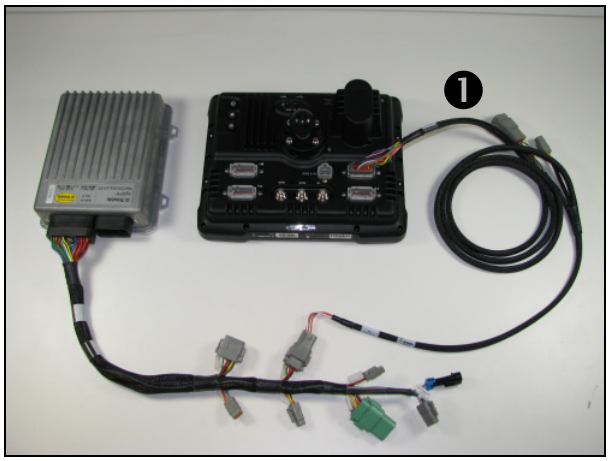
Connect the cable to the C port of the FmX integrated display.



FmX integrated display: Installing the wiring harness

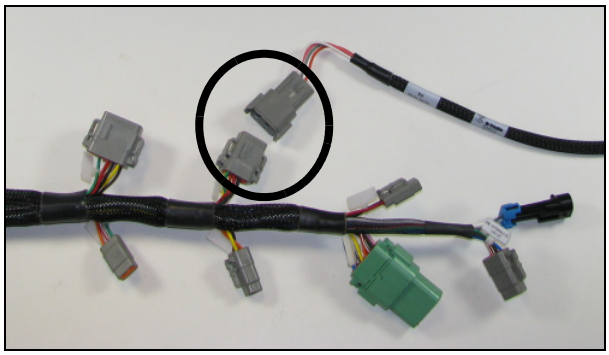
Step 1

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.



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 chapter.

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.



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.



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

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

AgCam

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

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.



FmX display



CFX-750 display

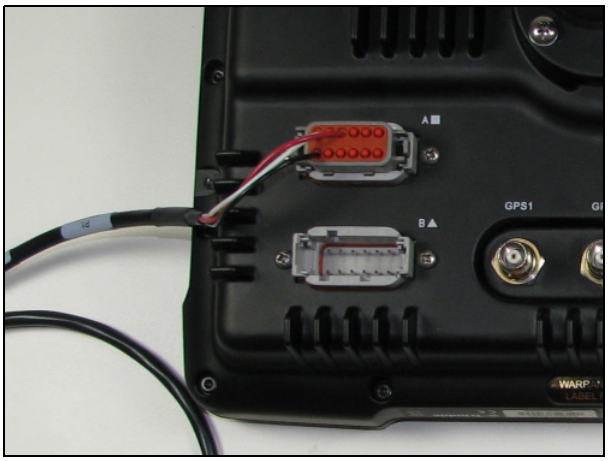
Step 3

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.



Preparing the EZ-Guide 500 lightbar

Note – *Before you attach the lightbar to the RAM mount, connect the EZ-Guide 500 cables to the back of the lightbar.*

Step 1

Locate the EZ-Guide 500 lightbar, the RAM mount and hardware, and the RAM mount clamp.



Step 2

Attach the RAM mount diamond base to the display using the hardware provided.

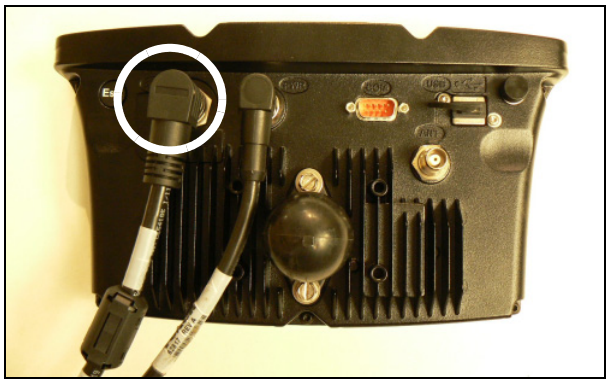


Connecting the EZ-Guide 500 lightbar cables

Note – *Before you attach the lightbar to the RAM mount, connect the EZ-Guide 500 cables to the back of the lightbar.*

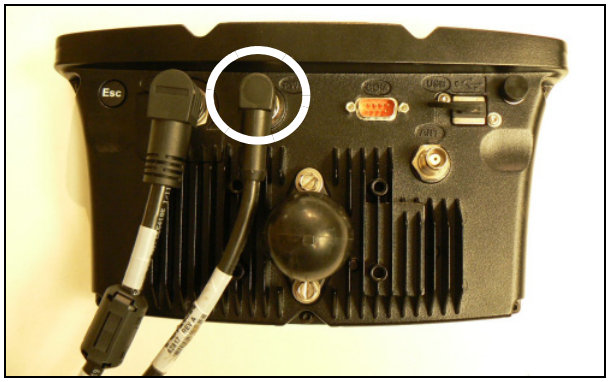
Step 1

Connect the port expansion cable (P/N 62609) to the AUX port on the back of the lightbar.



Step 2

Connect the EZ-Guide 500 power cable (P/N 62817) to the PWR port on the back of the lightbar.

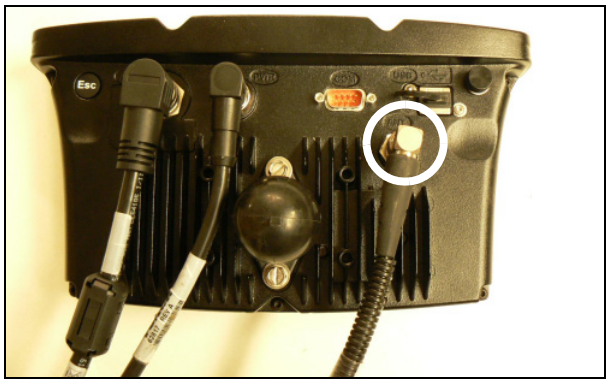


Step 3

Connect the 2-pin connector on the port expansion cable and the 12-pin connector on the power cable to the matching connectors on the EZ-Guide 500-to-Autopilot cable (P/N 62754).

Step 4

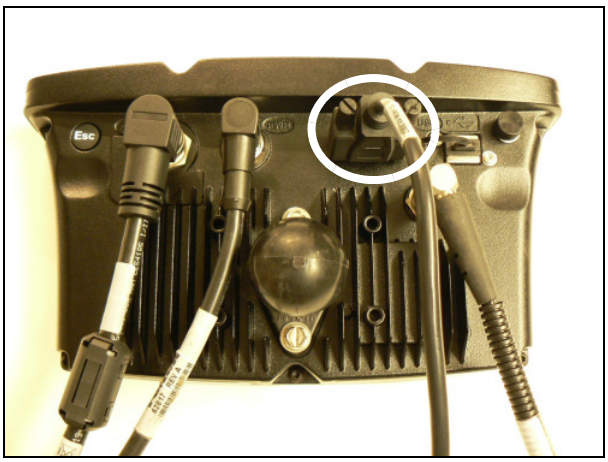
Feed the GPS antenna cable into the cab and then connect it to the antenna port on the back of the lightbar.



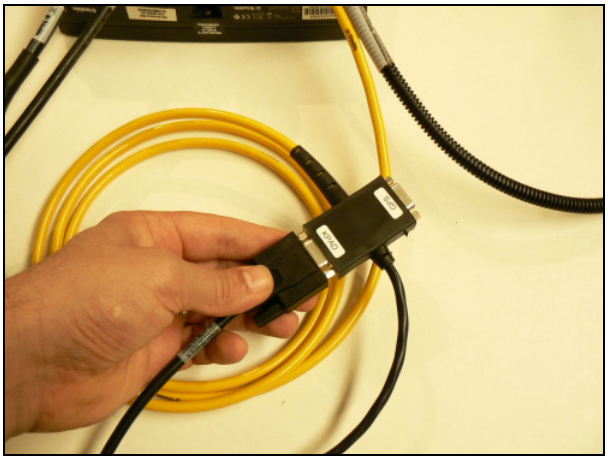
Step 5

With keypad

Connect the external interface cable (P/N 66030-00) to the serial port on the back of the lightbar.

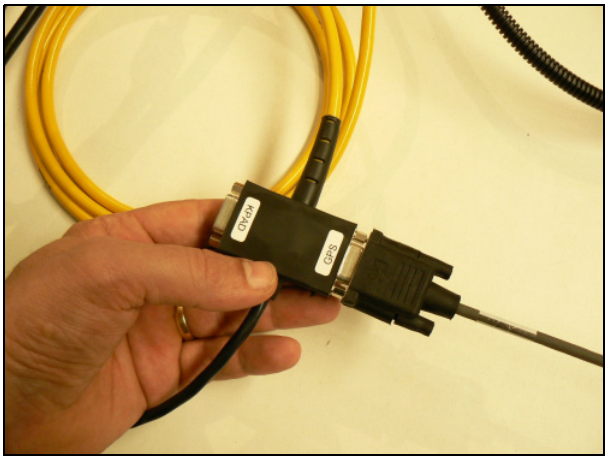


Connect the remote keypad to the KPAD serial port on the external interface cable.



Connect the appropriate cable to the GPS serial port on the interface cable:

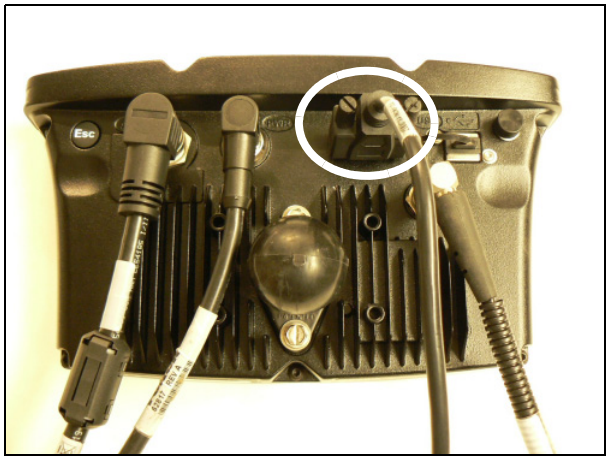
Radio type	Cable to connect
SNB900 radio	EZ-Guide 500-to-radio cable (P/N 61158)
PDL 450 radio	PDL radio power/data cable (P/N 51861-00)



Without keypad

Connect the appropriate cable to the serial port on the back of the lightbar:

Radio type	Cable to connect
SNB900 radio	EZ-Guide 500-to-radio cable (P/N 61158)
PDL 450 radio	PDL radio power/data cable (P/N 51861-00)



Step 6

Connect the other end of the radio cable to the radio.

Step 7

Connect the remaining connector on the PDL radio power/data cable to the matching connector on the power tap cable (P/N 63185).

Connect the connector at the other end of the power tap cable to the EZ-Guide 500 power cable.

Installing the EZ-Guide 500 lightbar

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

Test a location for the lightbar in the cab (there must be a bar that the RAM mount can be attached to); sit in the driver's seat and hold the lightbar in place.

Note – *Make sure the position allows comfortable access to the display buttons and does not obstruct instruments.*



Step 2

Attach the RAM mount to the ball on the rear of the lightbar.



Step 3

Attach the free end of the RAM mount to the bar mount, tighten the clamp on the RAM mount so that the lightbar is held securely in place and then adjust the angle of the RAM mount for ease of use.



EZ-Guide 500 lightbar, and 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 chapter.

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

Use one of the following methods:

- Rigid mount
- VHB adhesive

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 (P/Ns 12920-00 and 46706) or a V plate (P/N 62388-01).

- **GLONASS, RTK, OmniSTAR, and 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 rigid method is recommended. The V plate provides repeatable positioning of the antenna.
- **WAAS, EGNOS, OmniSTAR VBS, and 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.

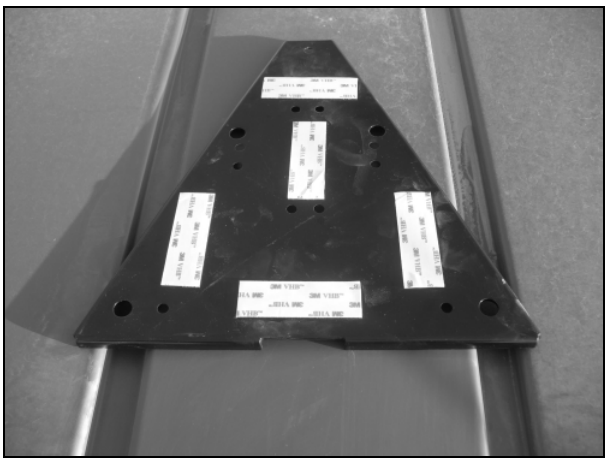


Step 2

V plate only

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

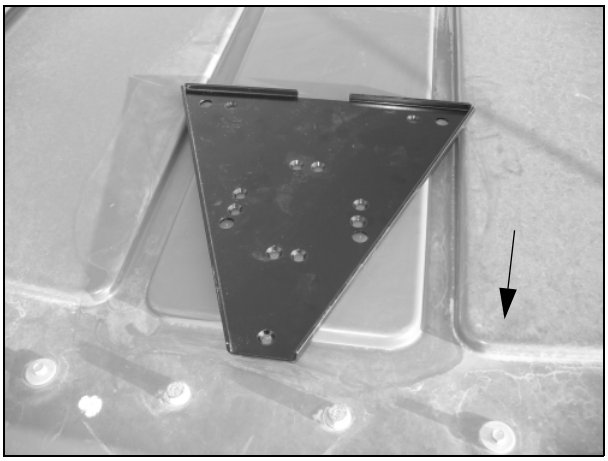
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



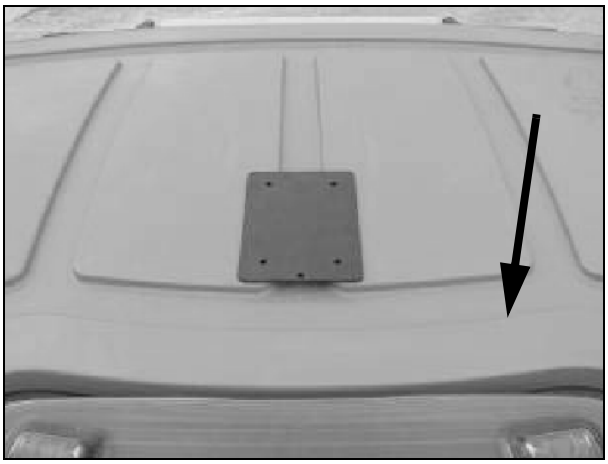
Step 3

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.*



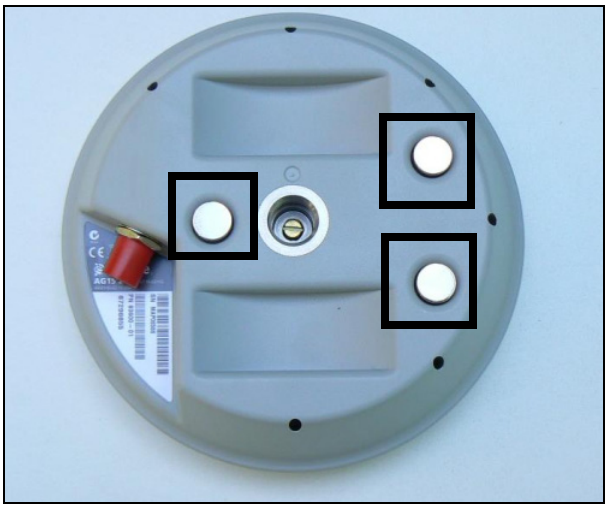
V plate



4" x 6" plate

Step 4

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



Otherwise, attach the large magnet with a $^{5}/_{8}$" 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.



L1/L2 dual 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.



EZ-Guide 500 lightbar, and 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 chapter.

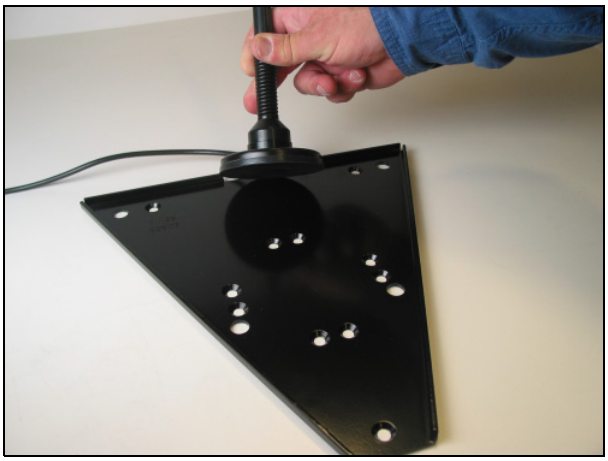
Step 1

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

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

CHAPTER

5

Power Harness Installation

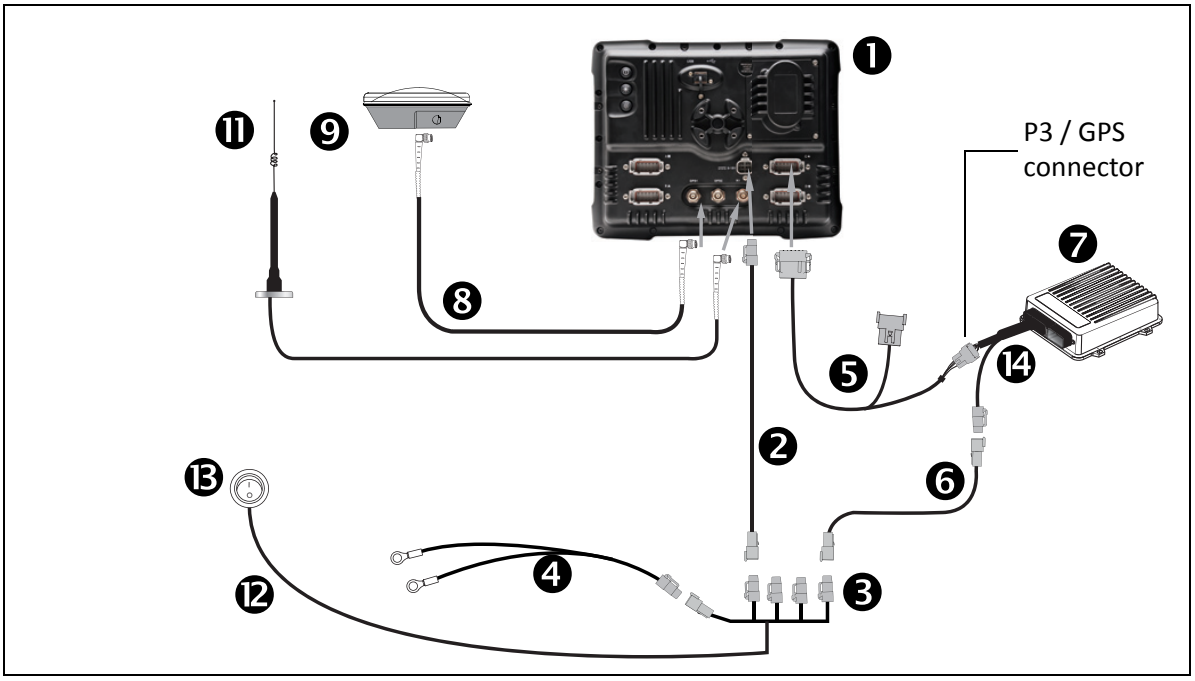
In this chapter:

- FmX integrated display components
- CFX-750 display components
- EZ-Guide 500 lightbar components
- FmX and CFX-750 displays: Installing the power harness
- FmX and CFX-750 displays: Configuring the power bus options
- Configuring the power bus options for the EZ-Guide 500 lightbar

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

Note – *Unless otherwise stated, instructions for "the display" refer to either the FmX integrated display or the CFX-750 display.*

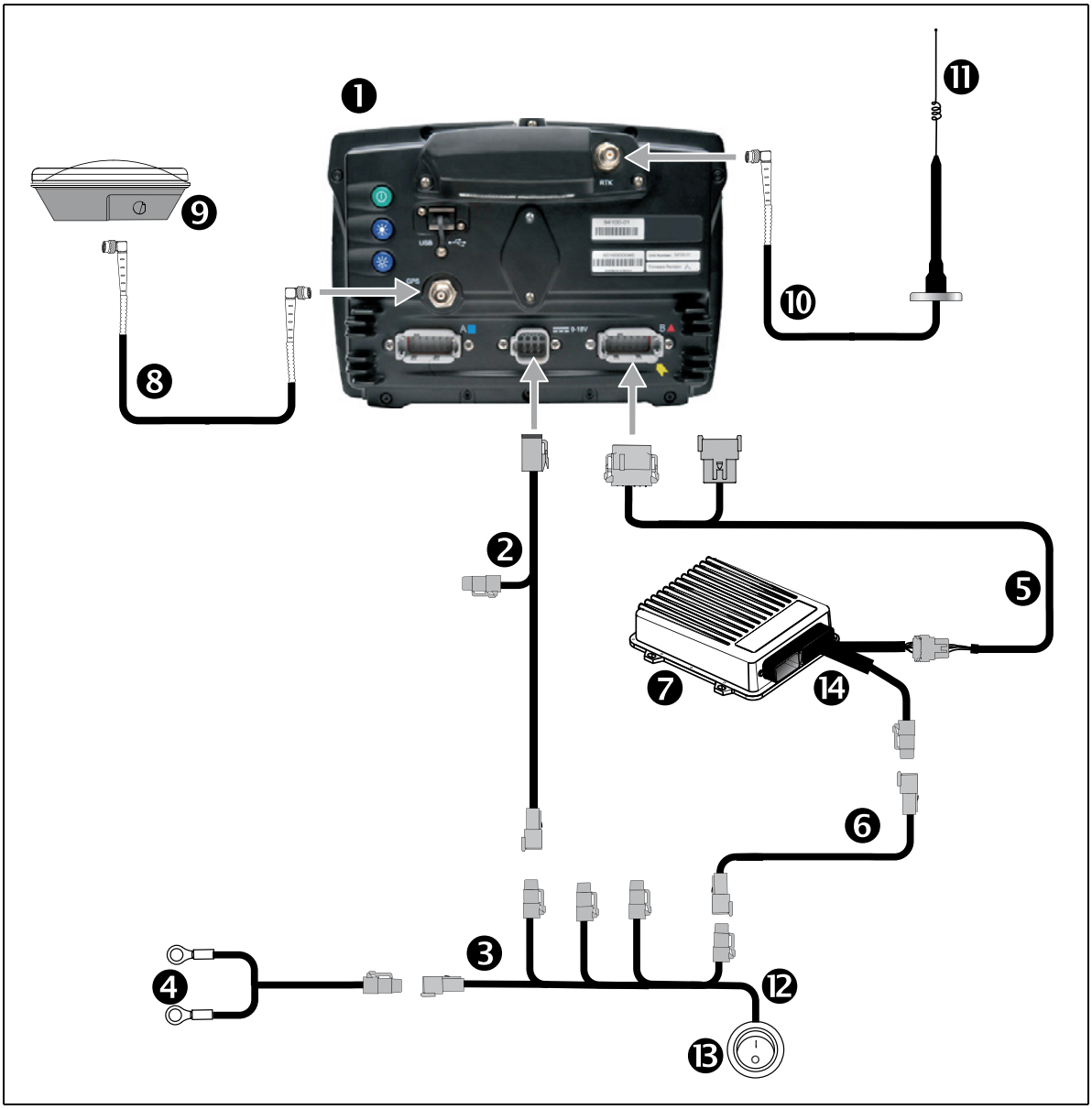
FmX integrated display components



CAUTION – Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓮ 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	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GPS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	62120
⓫	900 MHz radio antenna kit	22882-10
⓬	External switch cable included with kit	Part of P/N 67259
⓭	Switch	67095

CFX-750 display components

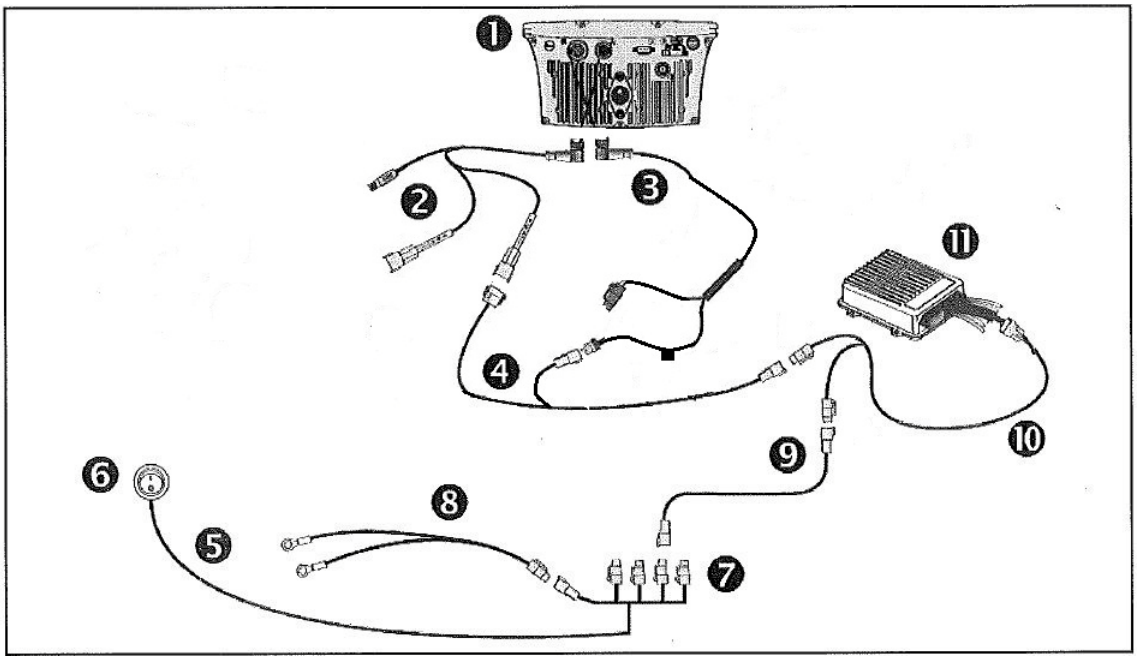


CAUTION – Connecting the Port Replicator on the CFX-750 display to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓮ will result in damage to the CFX-750 display and will void the warranty.

Item	Description	Trimble part number
❶	CFX-750 display **Note –** *RTK password required.*	94100-02
❷	CFX-750 power cable	77282

Item	Description	Trimble part number
❸	CFX-750 power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	CFX-750 to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GPS TNC/TNC RT angle cable	50449
❾	AG25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	62120
⓫	900 MHz radio antenna kit	22882-10
⓬	External switch cable included with kit	Part of P/N 67259
⓭	External switch included with kit	Part of P/N 67259
⓮	Main NavController II cable	54601

EZ-Guide 500 lightbar components



Item	Description	Trimble part number
❶	EZ-Guide 500 lightbar	
❷	EZ-Guide 500 lightbar 19 pin port expansion cable	62069
❸	EZ-Guide 500 lightbar/CAN 90° 5 pin connector	62817
❹	EZ-Guide 500 lightbar port A to NavController II cable	62754
❺	Switch cable	Part of 67259
❻	Switch	67095
❼	FmX power cable with relay and switch	67259
❽	FmX basic power cable	67258
❾	2 pin DTM to 2 pin 2 DT power adaptor	67095
❿	NavController II main cable	54601
⓫	NavController II	55563-00

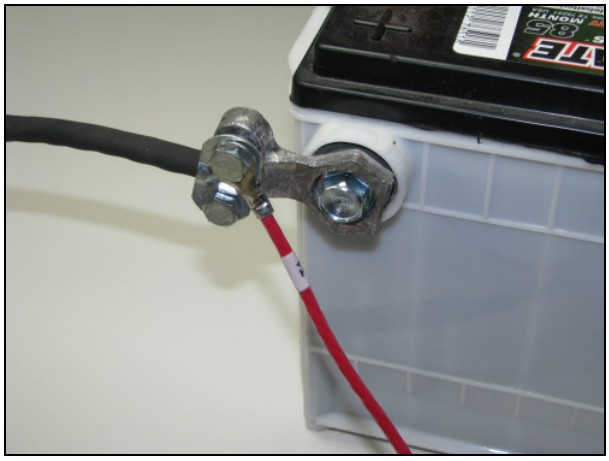
FmX and CFX-750 displays: Installing the power harness

Note – *Unless otherwise stated, instructions for "the display" refer to either the FmX integrated display 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.

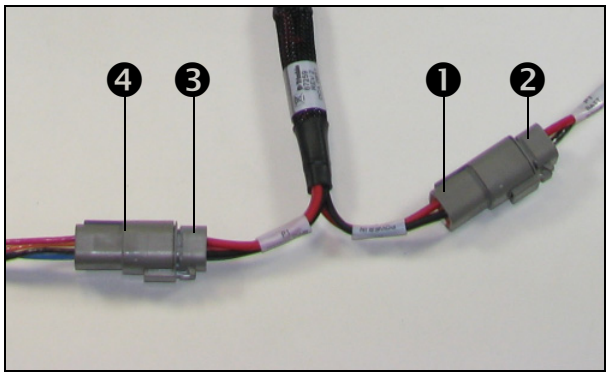
Step 1

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



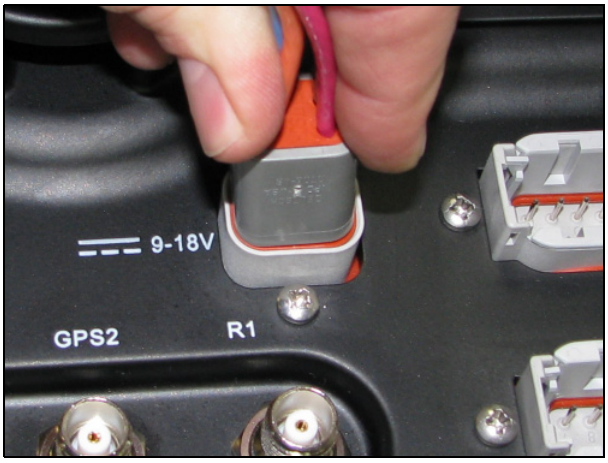
Step 2

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.



FmX display



CFX-750 display

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

Note – *Unless otherwise stated, instructions for "the display" refer to either the FmX integrated display or the CFX-750 display.*

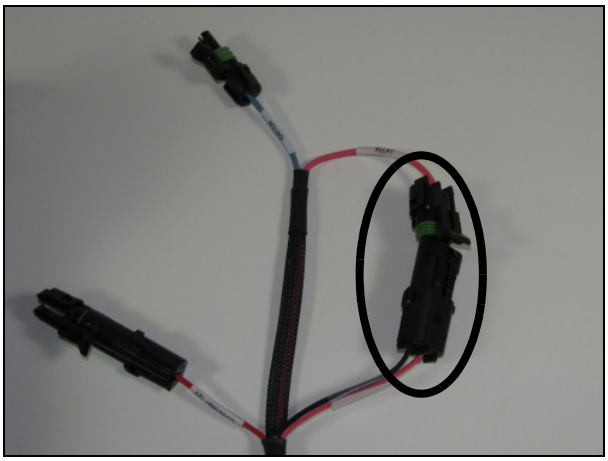
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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.

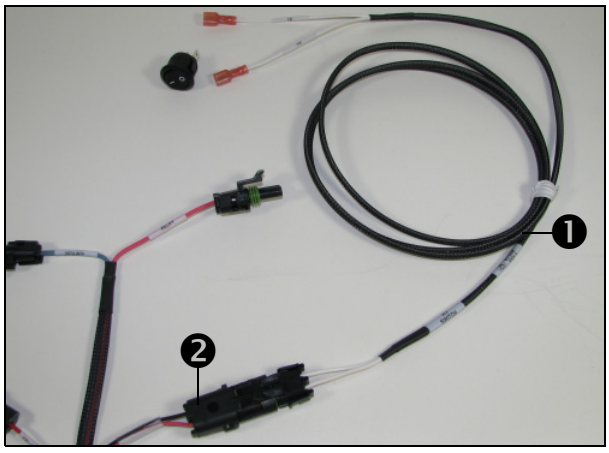


External switch is used to turn on the Autopilot system

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.

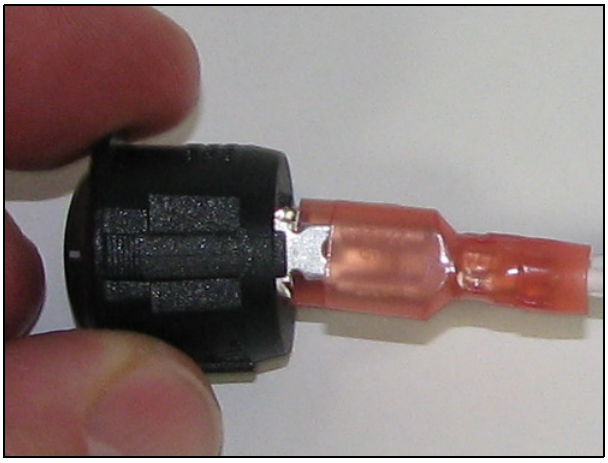
Note – *To install the switch provided, drill a ¾" hole.*



Step 2

Connect the cable labeled R7 to the switch pins.

Note – *Polarity is not important.*

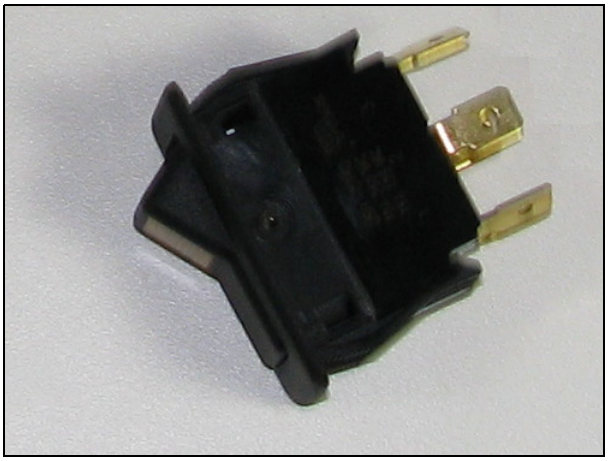


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

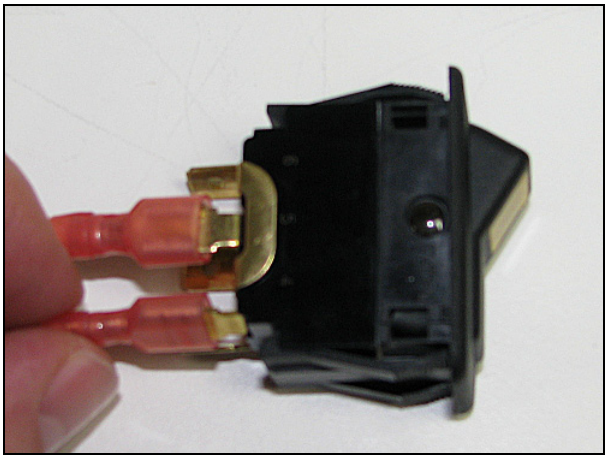


Step 2

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

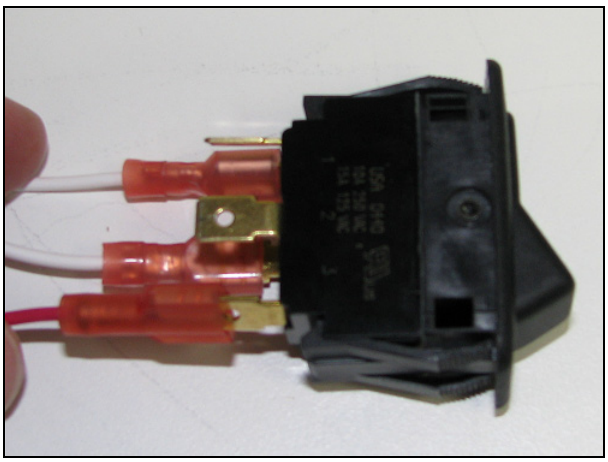
Connect the wire labelled S1 to pin 5 on the switch and then connect the wire labelled S2 to pin 4 on the switch.

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.



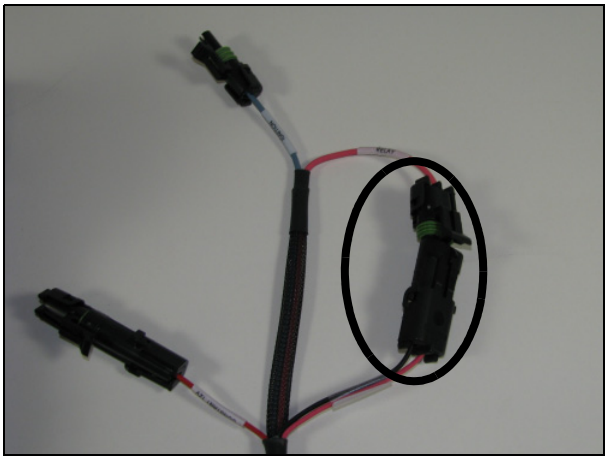
Note – *This additional wire is required to allow the switch to illuminate.*

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.

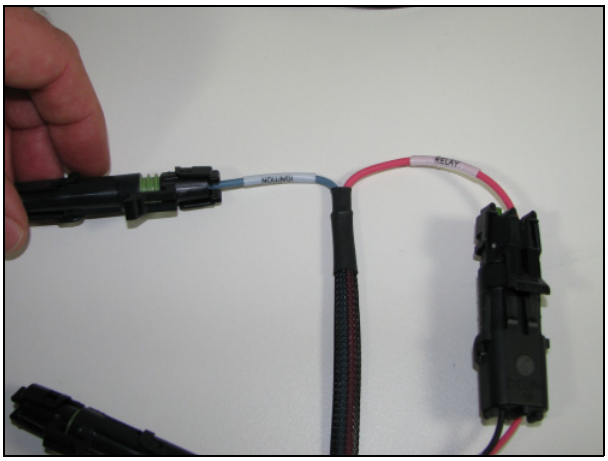


Step 2

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

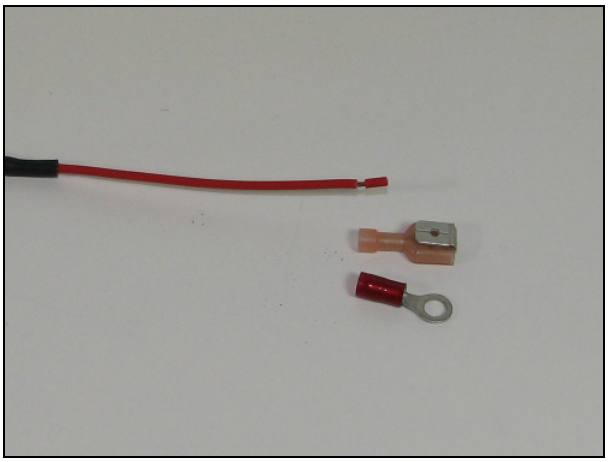
Step 3

Route the cable to the vehicle's ignition.



Step 4

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



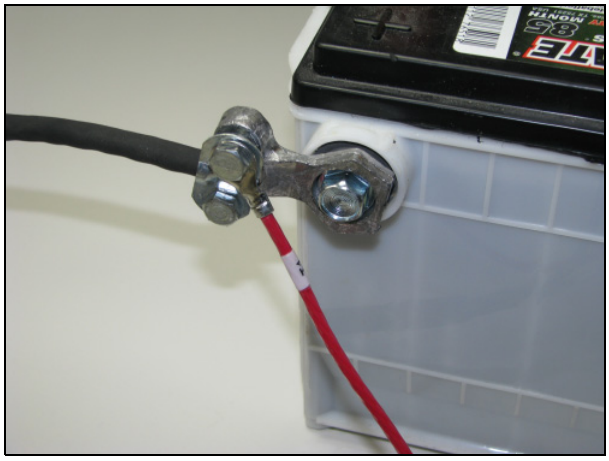
Configuring the power bus options for the EZ-Guide 500 lightbar

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.

Note – *For the EZ-Guide 500 lightbar cable installation instructions see, EZ-Guide 500 lightbar components, page 79.*

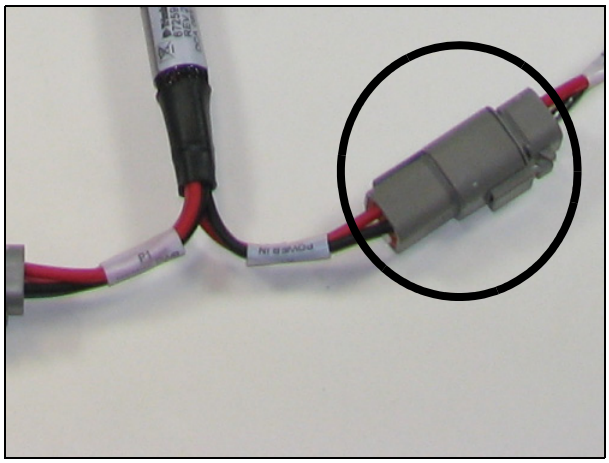
Step 1

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



Step 2

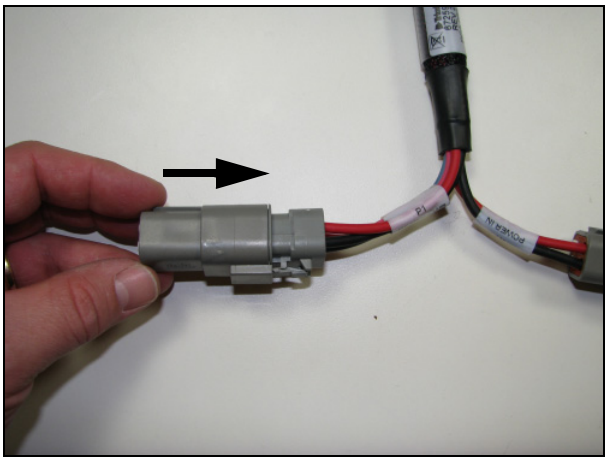
Locate and connect the 4-pin Deutsch DTP receptacle on the power bus to the 4-pin Deutsch DTP plug on the basic power cable.



Step 3

Verify that the protective receptacle is installed on the power bus.

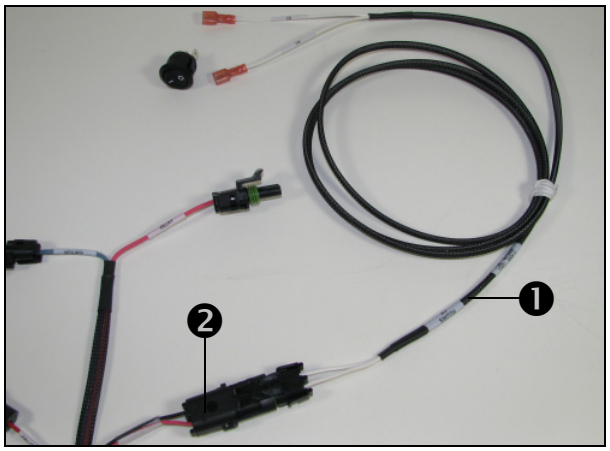
Note – *Damage to the system may result if the protective receptacle is not in place.*



Step 4

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.

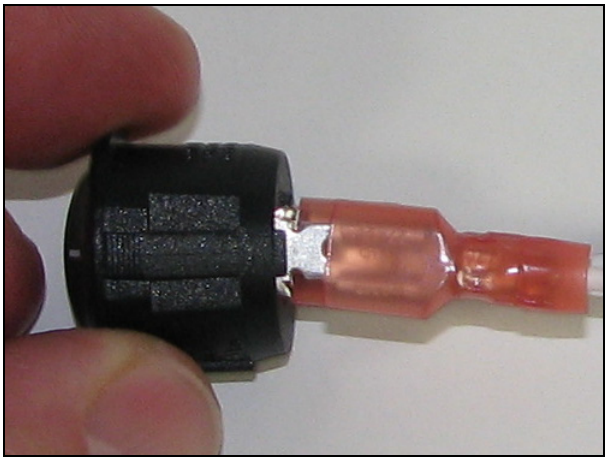
Note – *To install the switch provided, drill a ¾" hole.*



Step 5

Connect cable labeled R7 to the switch pins

Note – *Polarity is not important.*

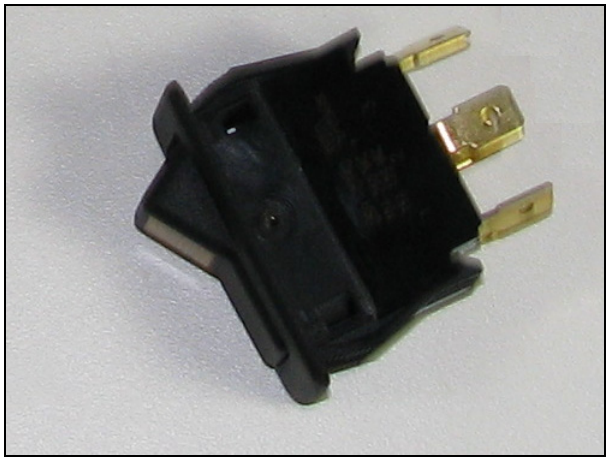


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

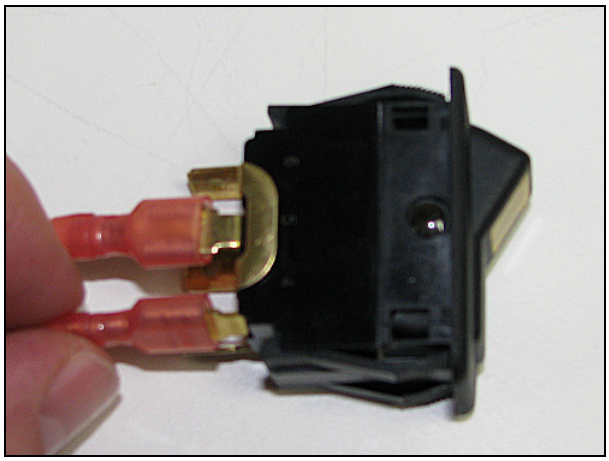


Step 2

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.

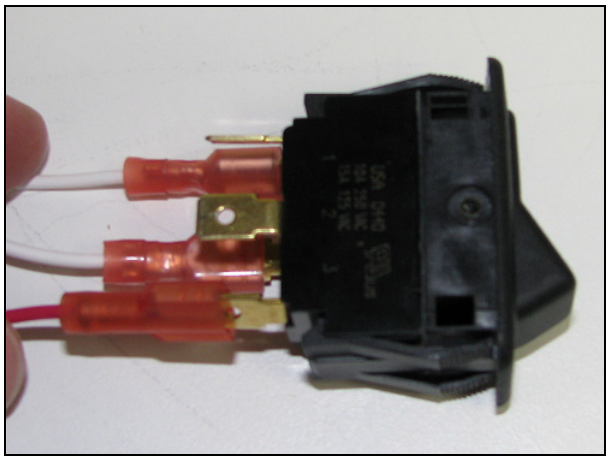
Note – *Polarity is important.*



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 vehicles switched power.

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



CHAPTER

6

Controller Installation

In this chapter:

- Installing the controller: 7R, 8R, 9R, 8RT, 9RT machines
- Installing the controller: 6R machines
- Connecting the controller
- Connecting the cables to the controller

This chapter describes how to install the controller unit in the vehicle.

Installing the controller: 7R, 8R, 9R, 8RT, 9RT machines

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

Install the controller where shown.



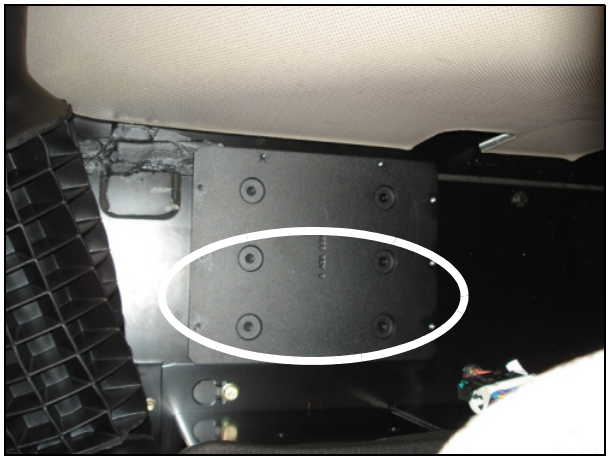
Step 2

Fold the floor mat under the brake pedal.



Step 3

Place the NavController II plate on floor next to the seat. Line up the edge of plate with the edge seat flange a ½'' back from the front edge and mark the four holes shown.



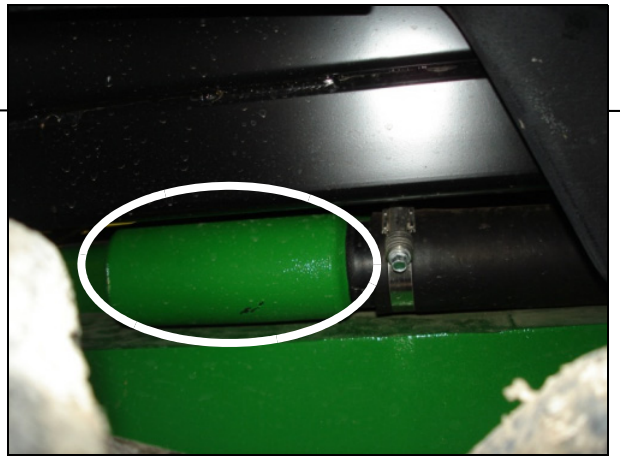
Step 4

Before you drill the holes in the floor, note the location of the fuel tank.



WARNING – *Do not* drill into the fuel tank or fuel lines.

WARNING – This piece is part of the fuel tank and is made of plastic.



Step 5

Drill and tap the hole 1/4” 20 tap.



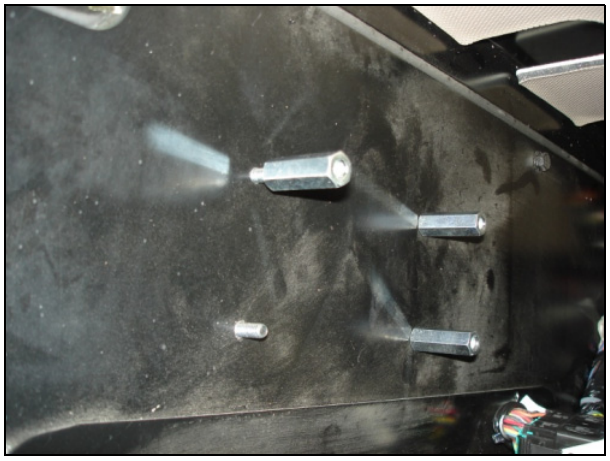
Step 6

Screw the bolts into place.



Step 7

Attach standoff nut to the bolts.



Step 8

Cut holes in the floor mat for the standoff nuts to go through.



Step 9

Use the bolts provided to attach the controller mounting plate to the previously installed standoff nuts.



Step 10

With the cables positioned toward the back of the tractor, use the 10-32 screws provided to attach the controller.

Attach the cables to the controller.



Step 11

At the rear of the machine, remove the rear access panel.



Step 12

Remove the tray that holds the owner's manual.

Lift the tray straight up and then move it toward the seat.



Step 13

Carefully remove the weather stripping.





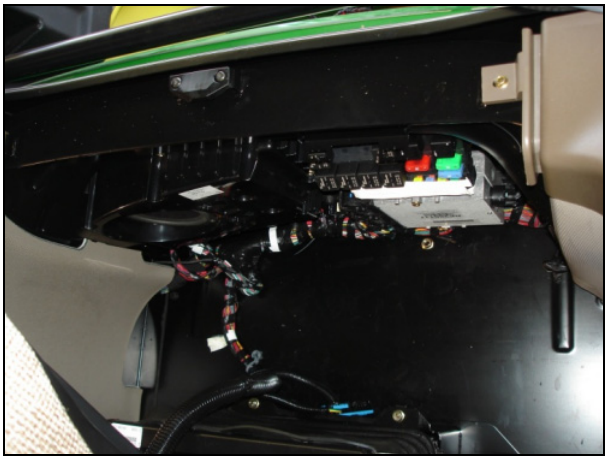
Step 14

Loosen both bolts using #30 torques bit. You do not need to remove the bolts.



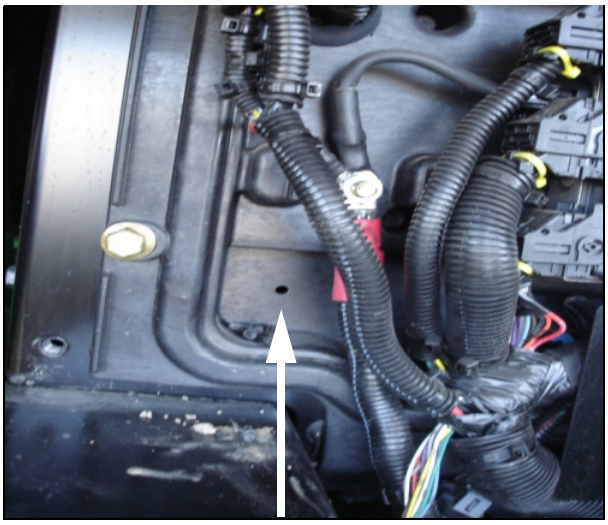
Step 15

Slowly pull the back plate toward the front of tractor. It has two friction clips holding it place.



Step 16

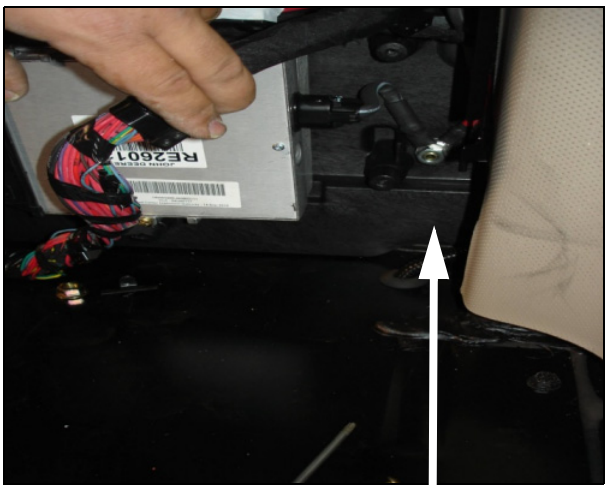
Behind the panel, mark the place to drill the access hole.



Approximate drill location

Step 17

From the inside, move the wiring harness into the corner.



Approximate drill location

Step 18

Drill the 2" access hole.

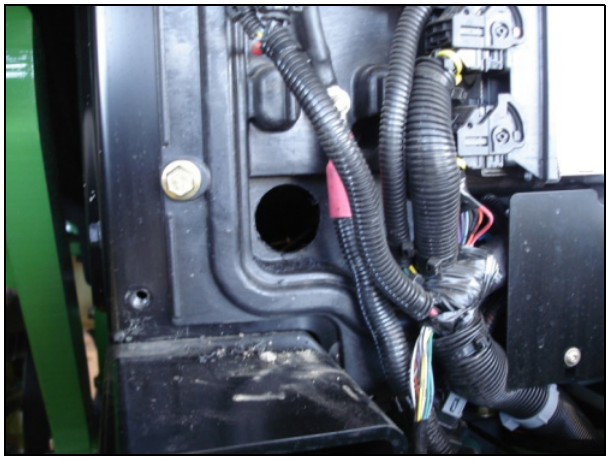
Make sure that you avoid the wiring harness.



Step 19

Route power and interface connections through the access hole.

Tip – *To prevent wire damage, line the access hole with a rubber gromet.*



Installing the controller: 6R machines

The controller will be installed next to the operator's seat with the connector facing the rear of the machine.

CAUTION – The air conditioning unit is under the floor in the area where you will attach the controller: Make sure that you do not drill into the AC unit.

Step 1

Place the controller mounting bracket next to the seat and then mark and drill four $^{5}/_{16}$" holes for attaching the bracket to the machine.



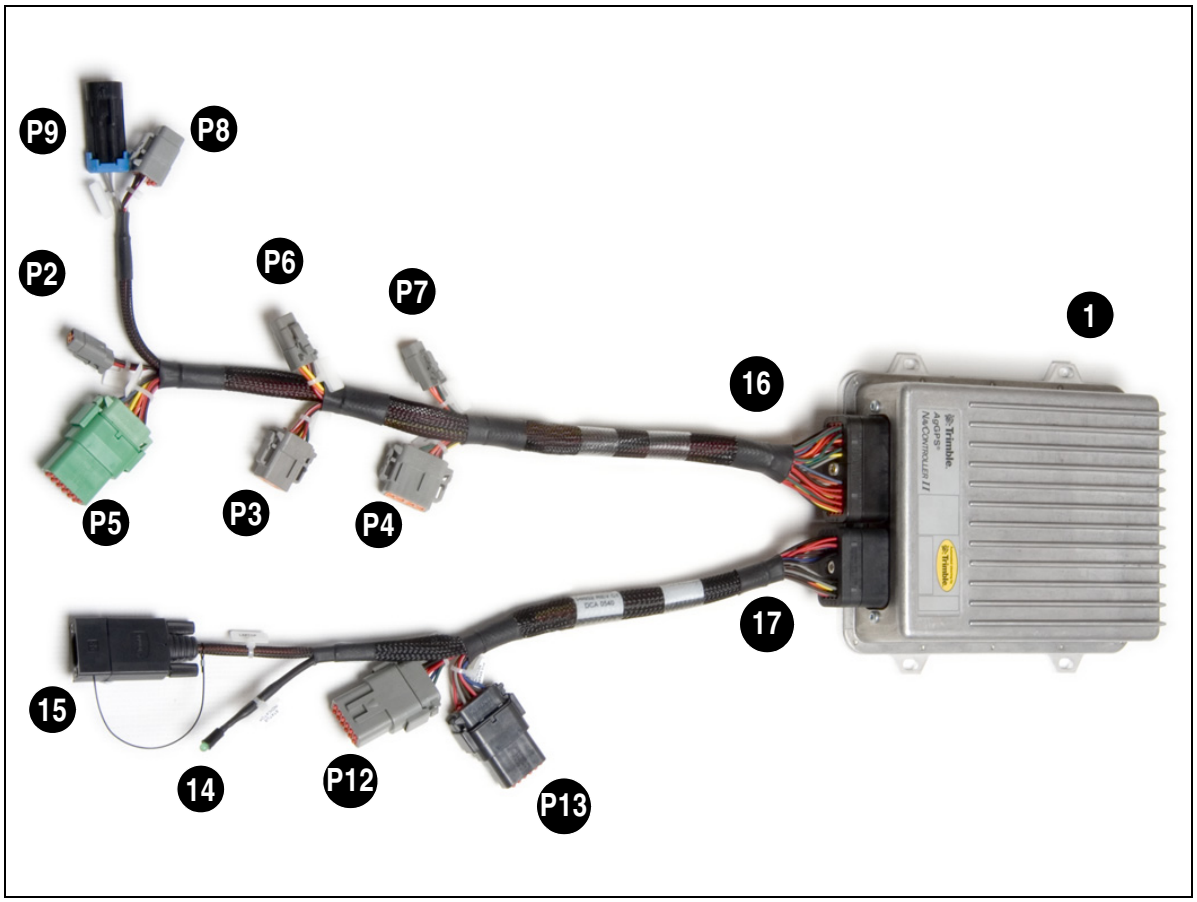
Step 2

Use the provided ¼" bolts to attach the controller mounting bracket to the floor of the machine using the.

Use the provided 10-23 Phillips head screws to attach the controller to the bracket.



Connecting the controller



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

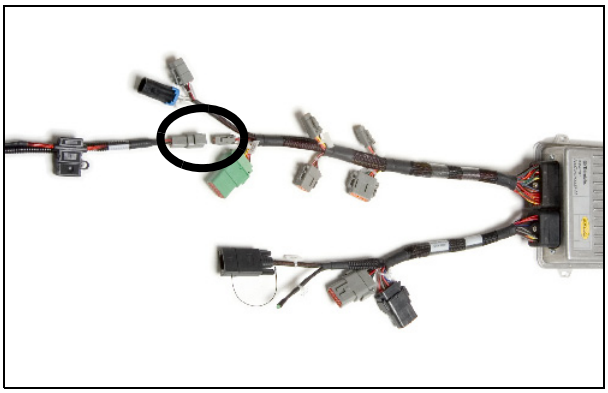
Item	Description
P9	Sonalert connector
P12	Lightbar/spare connector
P13	Spare sensors connector
14	Status indicator
15	Laptop connector
16	Main harness
17	Auxiliary harness

Connecting the cables to the controller

Step 1

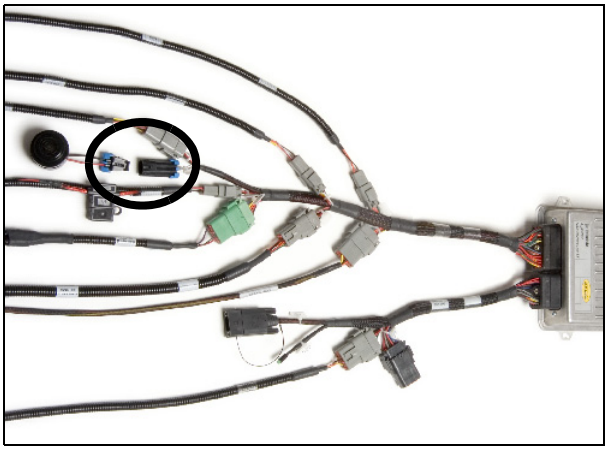
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is on the main wiring harness.

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



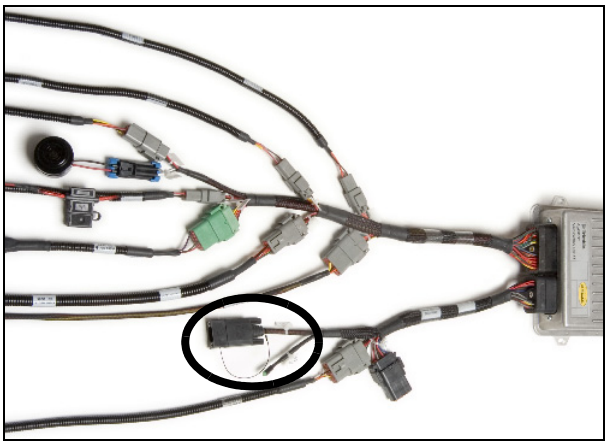
Step 2

Connect the Sonalert P-9 to the 2-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 3

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 4

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

7

Final Machine Check

In this chapter:

- Performing the final machine check
- Autopilot calibrations: John Deere 7R and 8R machines
- Autopilot calibrations: John Deere 8RT and 9RT machines
- Operating the Autopilot system through the John Deere CAN interface: 8RT and 9RT machines
- Autopilot calibrations: John Deere 6R machines
- Operating the Autopilot system through the John Deere CAN interface: 6R machines

This chapter describes how to perform a final check of the vehicle.

Performing the 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. 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.
3. Do the following:
   a. Load the correct configuration file into the NavController II for the tractor model being used.
   b. Download the latest set of configuration files from http://www.agpartners.trimble.com.
   c. Locate latest External Vehicle Profiles on http://www.agpartners.trimble.com.
   d. Use the correct VDB file for the tractor being used.

   You can use Autopilot Toolbox II software version 2.91 to load the configuration file into the Autopilot controller: Download it from http://agpartners.trimble.com.
4. Calibrate the Autopilot system using the Trimble display or Autopilot Toolbox II software version 2.91. 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

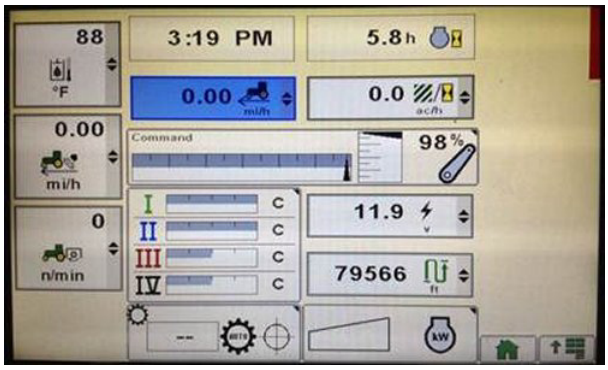
Note – *NavController II version 5.22 is recommended for both R and RT series tractors. With this version, you can use Autopilot Toolbox 2.91 to help diagnose CAN connection problems. For more help, contact Trimble Support.*

Autopilot calibrations: John Deere 7R and 8R machines

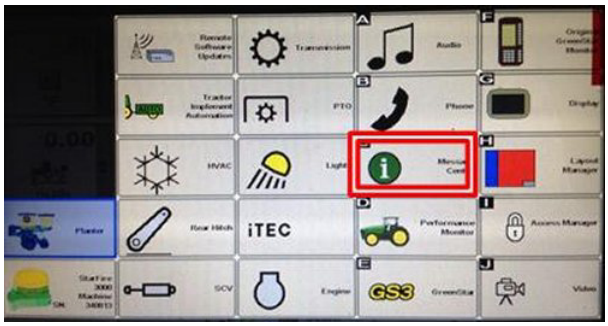
Note – *For more information about any of the following steps, refer to the John Deere Service manual, P/N TM110219.*

Verify that the XMC address 237 shows RE557218 or later. If it does not, contact your local John Deere dealer and have them update the firmware. Reference DTAC solution 92089 7R/8R/9R Wheeled Tractors - AutoTrac Performance Wandering and/or S-ing

1. Press *Menu*.



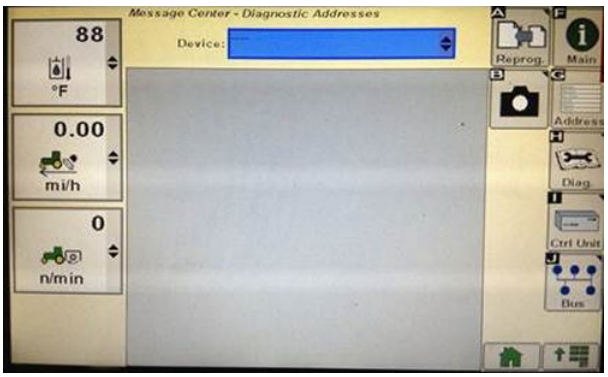
2. Press **Message Center**.



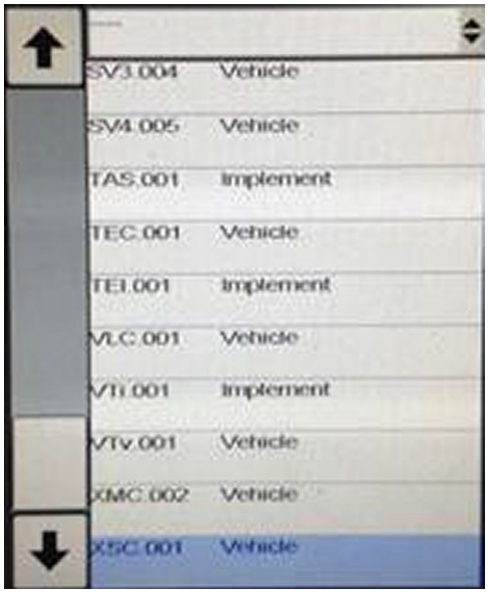
3. On the armrest control, press and hold **G** for 8 seconds. This will put the system into Technician Mode.



4. Press *Device*.



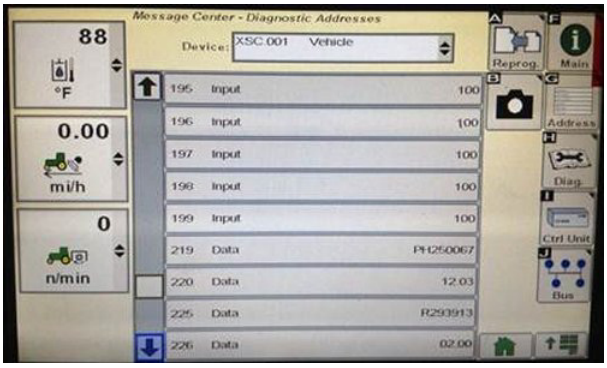
5. Select *XSC.001 Vehicle*.



Calibrating the steering sensor

1. Make sure you are on smooth, flat, hard ground.
2. Select *Address 22 Input*.
3. Rotate the thumb wheel to the Enter Data icon and then press **Confirm**.

   The display shows **000 - No calibration points found.**



Each 0 represents one of the three calibration points for the wheel angle sensors. The software uses the steering valve to move the front wheels left and right to find these calibration points: Once it finds each point, it replaces 0 with X.

4. Let the tractor steer back and forth until the screen shows Success. This will take a while, so make sure that you have plenty of space to maneuver.
5. Rotate the thumb wheel to the Save icon and then press **Confirm**.

   The display shows **RWAS Cal-Procedure Complete.**

During this process, you may see one or more of the following error messages.

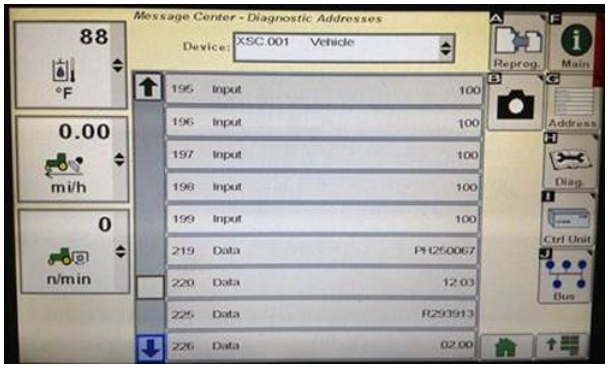
Wheel angle sensors calibration error codes		
Code	**Description**	**Test**
E2-1	Center reading of sensors is outside of valid range.	Non ACS - Wheel Angle Sensor Circuit Test
E2-2	Range of wheel angle sensors is too small.	Non ACS - Wheel Angle Sensor Circuit Test
E2-3	Sensor outputs inverted.	Non ACS - Wheel Angle Sensor Circuit Test
E-Speed	Vehicle is not in stationary position.	Recalibrate wheel angle sensors with vehicle stationary.
E-HWPS	Steering wheel moved during calibration.	Recalibrate wheel angle sensors.
E-DTC	Diagnostic trouble code is present, preventing calibration to proceed.	Recall, Record, and Clear Codes for this control unit and reattempt calibration.
E-Engine	Engine must be running to complete calibration.	Start engine and reattempt calibration.
E-Time	Calibration procedure timed out.	Recalibrate wheel angle sensors.

Calibrating the valve deadzone

This calibration is automatic: Make sure that the front wheel travel is free.

1. Make sure you are on smooth, flat, hard ground, with plenty of room to maneuver.
2. Select *Address 23* input.
3. Rotate the thumb wheel to the Enter Data icon and then press **Confirm**.

   The display shows **Setup-Calibration will begin,** and then shows **SXYZ: NNN**.
4. Let the tractor steer back and forth until the screen shows **Success**.



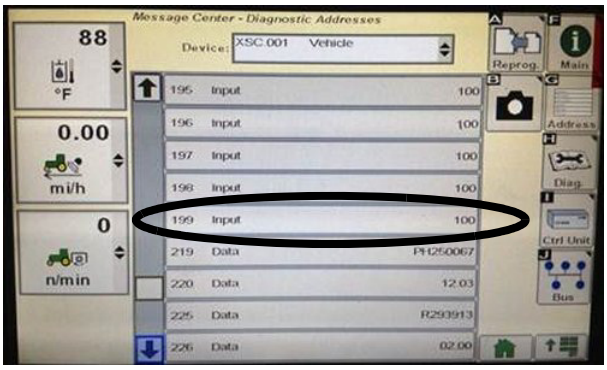
5. Rotate the thumb wheel to the Save icon and then press **Confirm**.
6. The display shows **Valve Cal-End of Calibration**.

During this process, you may see one or more of the following error messages.

Steering valve calibration error codes		
Code	**Description**	**Test**
E1-1	Steer Left Valve deadband low.	Non ACS - Steer Left Solenoid Circuit Test
E1-2	Steer Left Valve deadband high.	Non ACS - Steer Left Solenoid Circuit Test
E1-3	Steer Right Valve deadband low.	Non ACS - Steer Right Solenoid Circuit Test
E1-4	Steer Right Valve deadband high.	Non ACS - Steer Right Solenoid Circuit Test
E-3	Could not find initial wheel angle sensor position.	Non ACS - Wheel Angle Sensor Circuit Test
E-4	Could not find Steer Right 1 Valve deadband.	Non ACS - Steer Right Solenoid Circuit Test. Non ACS - Wheel Angle Sensor Circuit Test
E-5	Could not find Steer Left 1 Valve deadband.	Non ACS - Steer Left Solenoid Circuit Test. Non ACS - Wheel Angle Sensor Circuit Test
E-Speed	Vehicle is not in stationary position.	Recalibrate wheel angle sensors with vehicle stationary.
E-HWPS	Steering wheel moved during calibration.	Recalibrate wheel angle sensors.
E-DTC	Diagnostic trouble code is present, preventing calibration to proceed.	Recall, Record, and Clear Codes for this control unit and reattempt calibration.
E-Engine	Engine must be running to complete calibration.	Start engine and reattempt calibration.
E-OilTemp	Steering oil temperature was below 20 °C during calibration.	Heat steering oil and reattempt calibration.

Adjusting the P-Gain

1. Select *Address 199* input.
2. Press **Proceed**.



3. Adjust the value. See the *Deere Steering Response Rate guidelines* below.



Steering Response Rate

Determines the maximum speed the wheels turn to make corrections. Higher gains will turn the wheels faster. The maximum wheel speed increases with steer wheel speed settings from 50 to 200. From 190 to 200 the maximum steering wheel speed stays the same, but the rate at which the steering wheel accelerates increases. The steer wheel speed should be adjusted in increments of 10 between 20 and 190 and in increments of 2 between 190 and 200. Setting the steer wheel speed too high may cause ATU unit to deactivate. **Adjust the steer wheel speed as high as possible without causing deactivations of the steering wheel.**

Higher settings: Results in better tracking performance but may also cause increased wheel motion or jittery behavior.

Lower Settings: Results in decreased wheel motion but may also result in worse tracking performance.



Steering Response Rate

Continued on next page

Operating the Autopilot system through the John Deere CAN interface: 7R and 8R machines

Due to the relationship between Trimble and John Deere, the Autopilot system has a few variations from normal Autopilot operation.

- Engagement must be done through the John Deere **Resume** button on the console. Disengagement can be done by turning the steering wheel or by pressing the steering wheel button on the display used—the **Resume** button will not disengage the system.
- The system will disengage if the operator is out of the seat for more than five seconds.
- The system will disengage if the operator puts the vehicle transmission into park.

- The system will disengage if the vehicle sits still for 30 seconds or more; but it can be shuttled between forward and reverse.
- If any faults are present on the tractor side (engine related, transmission related, and so on), the Autopilot system will not be allowed to engage.

Autopilot calibrations: John Deere 8RT and 9RT machines

For the Autopilot system to function correctly on the John Deere 8RT and 9RT series of machines, you must calibrate the system through the John Deere computer.

To calibrate the steering system, you must correctly set the steering wheel, steering valve, and track spacing calibrations through the John Deere control unit addresses.

Note – *For more information about any of the following steps, refer to the John Deere Service manual.*

1. Use a tape measure to accurately measure the track spacing of the machine to the nearest inch. You will enter this value in a calibration step.
2. To access the Control address of the machine, press the main program list button on the screen or on the right arm control pad.



3. To access the message center, select the message center area on the screen, or press **C** on the control pad.

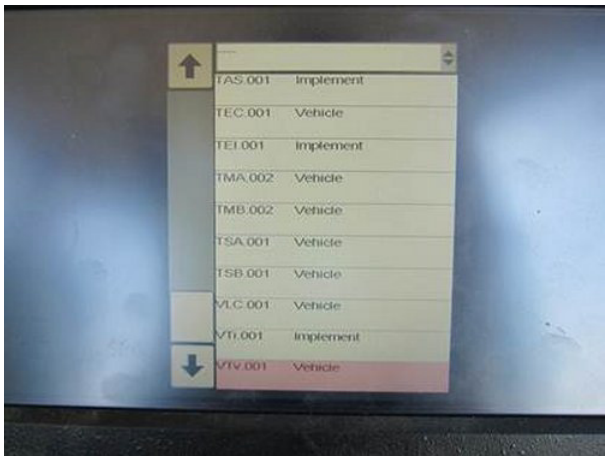


4. Place the machine into Technician mode.

   To do this, press and hold **G** on the control pad for approximately eight seconds. When you release the button, **T** (for Technician), appears on the screen.



5. Navigate to the TSA.001 vehicle controller address.



6. Select the TSA.021 address window and then follow the instructions for calibrating the machines steering wheel.



7. To begin the calibration, select the button shown.



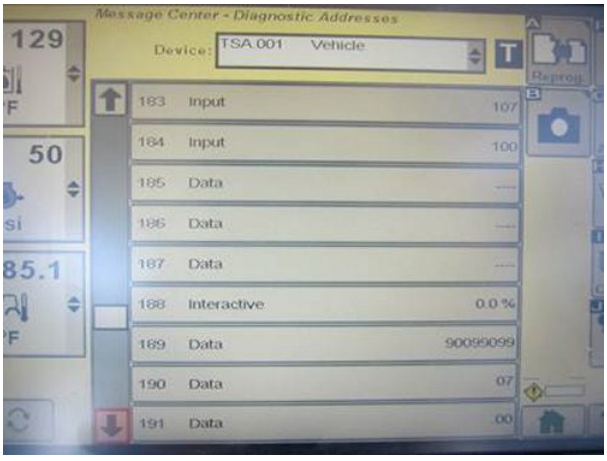
8. Select the TSA.023 address window and then follow the instructions for calibrating the machines steering valve.

   To begin the calibration, select the button shown.

Note – *For this test, the oil temperature must be above 55 °C. This value appears under TSA 159.*



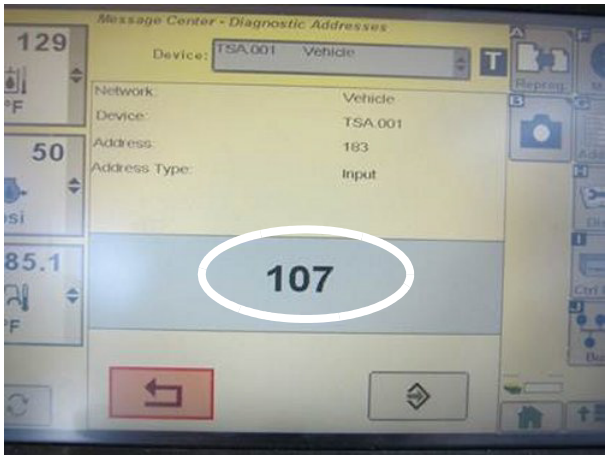
9. Select TSA.183 in the address window.



10. Select the track spacing field and then enter the machine's track spacing in inches.

    To confirm that the track spacing changed correctly, look at the value for TSA.183 in the TSA controller menu.

11. Exit the Diagnostic addresses. When prompted, confirm that do not need the machine in technician mode.



Operating the Autopilot system through the John Deere CAN interface: 8RT and 9RT machines

Due to the relationship between Trimble and John Deere, the Autopilot system has a few variations from normal Autopilot operation.

- Engagement must be done through the John Deere **Resume** button on the console. Disengagement can be done by turning the steering wheel or by pressing the steering wheel button on the display used—the **Resume** button will not disengage the system.
- The system will disengage if the operator is out of the seat for more than 5 seconds.
- The system will disengage if the operator puts the vehicle transmission into park.
- The system will disengage if the vehicle sits still for 30 seconds or more but it can be shuttled between forward and reverse.
- If any faults are present on the tractor side (engine related, transmission related, and so on), the Autopilot system will not be allowed to engage.

Autopilot calibrations: John Deere 6R machines

For the Autopilot system to function correctly on a John Deere 6R machine, you must calibrate the system through the John Deere computer.

To calibrate the steering system, you must correctly set the steering angle sensor and the steering valve through the John Deere control unit addresses.

Note – *For more information about any of the following steps, refer to the John Deere Service manual.*

1. Before you perform this calibration, make sure that the steering oil is up to the correct temperature (55 °C). The temperature is listed under address XSC.159.
2. To access the machine's Control address, press the main program list button on the screen or on the right arm control pad.



3. To access the message center, select the message center area on the screen or press **C** on the control pad.



4. Place the machine into Technician mode: On the control pad, press and hold **G** for approximately eight seconds. When you release the button, **T** (for Technician mode), appears on the screen.



5. Navigate to the XSC.001 Vehicle controller address.
6. Select the XSC.022 address window and then follow the instructions for calibrating the steering angle sensor.
7. Select the right arrow and then follow the instructions on the screen for completing this calibration.
8. Select the XSC.023 address window and then follow the instructions for calibrating the steering valve.



9. Select the right arrow and then follow the instructions on the screen for completing this calibration.



Operating the Autopilot system through the John Deere CAN interface: 6R machines

Due to the relationship between Trimble and John Deere, the Autopilot system has a few variations from normal Autopilot operation.

- Engagement must be done through the John Deere **Resume** button on the console. Disengagement can be done by turning the steering wheel or by pressing the steering wheel button on the display used—the **Resume** button will not disengage the system.
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- The system will disengage if the vehicle sits still for 30 seconds or more but it can be shuttled between forward and reverse.
- If any faults are present on the tractor side (engine related, transmission related, and so on), the Autopilot system will not be allowed to engage.