# INSTALLATION INSTRUCTIONS

## Autopilot™ Automated Steering System

### AGCO RoGator ▪ RG700 Autoguide Ready

**Version 5.00**
Revision A
March 2014
Part number 54037-59-E05

Trimble

# Legal Notices

## Agriculture Business Area

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This is the March 2014 release (Revision A) of the Autopilot Automated Steering System Installation Instructions, part number 54037-59-E05. It applies to version 5.00 of the Autopilot automated steering system.

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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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5521 DZ Eersel, NL

# Safety Information

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

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

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

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

## Warnings

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

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

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

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

## Cautions

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

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

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

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

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

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



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

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

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CHAPTER 1

# Introduction

**In this chapter:**


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


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

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

## Technical assistance

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

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

# Manual system upgrade to Autopilot

## CFX-750 display and FmX integrated display

| Retain | Remove |
|---|---|
| **CFX-750™ display: P/N 94100-xx**<br>Power cable CFX-750 display: P/N 77282<br>**FmX® integrated display: P/N 93100-xx**<br>Power cable FmX display: P/N 66694<br>Antenna for display: P/N 60600-02 (DGPS) or 77038-00 (OmniStar/RTK)<br>Antenna to receiver cable: P/N 50449<br>Basic cable (both displays): P/N 67258 | |

# Required components

| Kits required | Special tools |
|---|---|
| Platform kit: P/N 54037-59 | Drill<br>$^{5}/_{16}$'' drill bit<br>$^{3}/_{8}$-16 tap<br>2" hole saw |

## Antenna mounting kits

| Kit options |
|---|
| Ag15 antenna mounting plate: P/N 62034 |
| Bracket, GPS - V Base Plate indexing: P/N 62388-02 |
| Spar that uses the bolts at front of cab: P/N 53676 |
| Spar that uses the bolts at front of cab: P/N 64898 |

## Accessory kits

| Kits required |
|---|
| 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 54037-59 | Steering interface cable | Chapter 2 |
| | Controller mounting bracket | Chapter 3 |
| | Bolt kit controller | Chapter 7 |
| Roof bracket kit:<br>• Ag15 antenna mounting plate: P/N 62034<br>• Bracket, GPS - V Base Plate indexing: P/N 62388-02<br>• Spar that uses the bolts at front of cab: P/N 53676<br>• Spar that uses the bolts at front of cab: P/N 64898 | Roof brackets | Chapter 3 |
| | Bolt kit, roof bracket | |
| GNSS receiver | GNSS receiver | Chapter 3 |
| | GNSS antenna | |
| | GNSS receiver power/data cable | |
| | RTK radio, cable, and radio antenna | |
| Display | CFX-750 display | Chapter 4 |
| | FmX integrated display | |
| | Display cable | |
| | Mounting bracket | |
| Common parts | Controller | Chapter 7 |
| | Controller mounting bracket | |
| | Cable kit:<br>Main wiring harness<br>Power bus auxiliary wiring harness<br>Sonalert alarm | |

# Preparing the vehicle for installation

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

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

CHAPTER 2

# Cable Installation

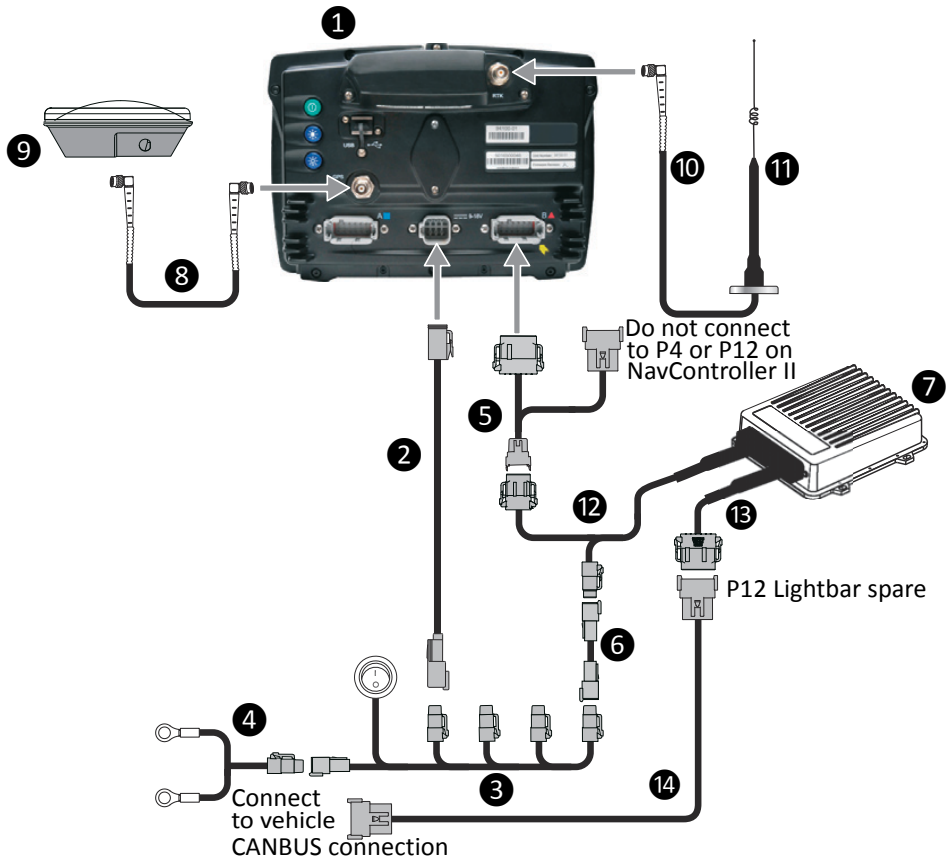
**In this chapter:**


- System cabling
- Installing the cables


This chapter describes how to install the cables.

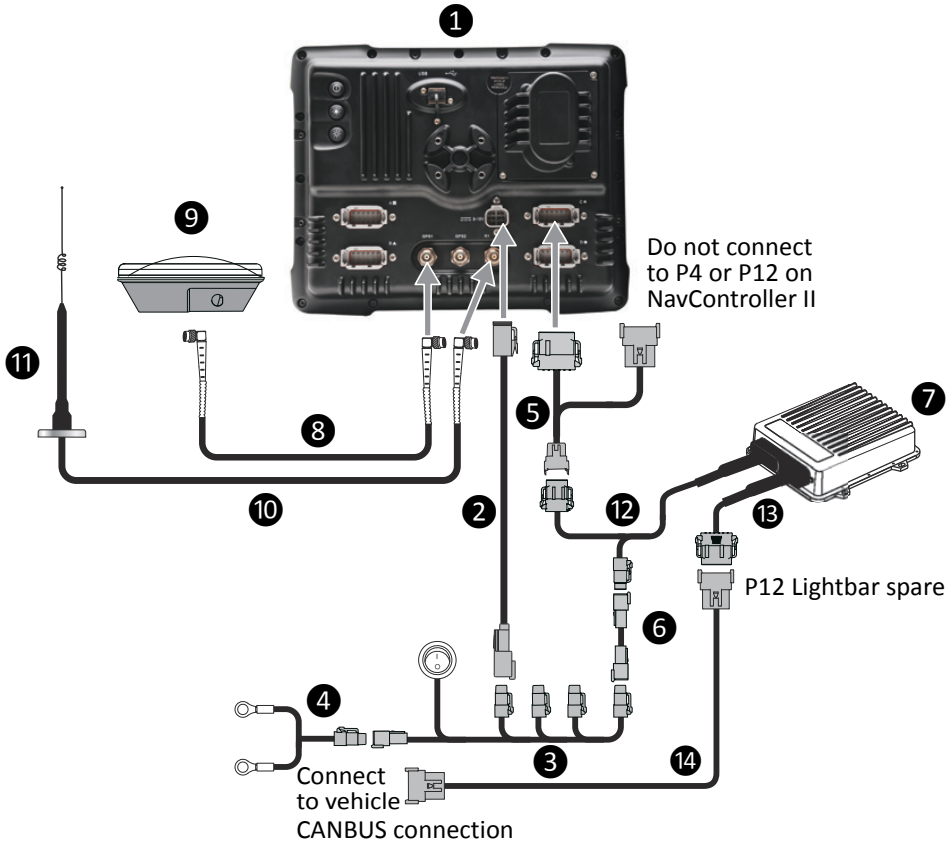
# System cabling

## CFX-750 display




| Item | Description | Trimble part number |
|---|---|---|
| ❶ | CFX-750 display<br>***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 | FmX to NavController II cable with port replicator | 75741 |
| ❻ | 2-pin DTM to 2-pin DT power adaptor | 67095 |
| ❼ | NavController II | 55563-00 |
| ❽ | 8 m GNSS TNC/TNC RT angle cable | 50449 |
| ❾ | 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 | NavController II auxiliary cable | 54602 |
| ⓮ | Rogator CAN interface cable | 98324 |

# FmX integrated display




| Item | Description | Trimble part number |
|---|---|---|
| ❶ | FmX integrated display | 93100-02 |
| ❷ | FmX power cable | 66694 |
| ❸ | FmX power cable with relay and switch (power bus) | 67259 |
| ❹ | Basic power cable | 67258 |
| ❺ | FmX to NavController II cable with port replicator | 75741 |
| ❻ | 2-pin DTM to 2-pin DT power adaptor | 67095 |
| ❼ | NavController II | 55563-00 |
| ❽ | 8 m GNSS TNC/TNC RT angle cable | 50449 |
| ❾ | 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 | NavController II auxiliary cable | 54602 |
| ⓮ | Rogator CAN interface cable | 98324 |

# Installing the cables

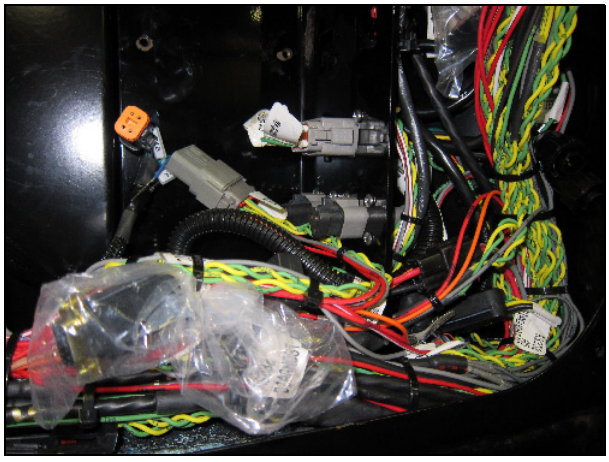
### Step 1

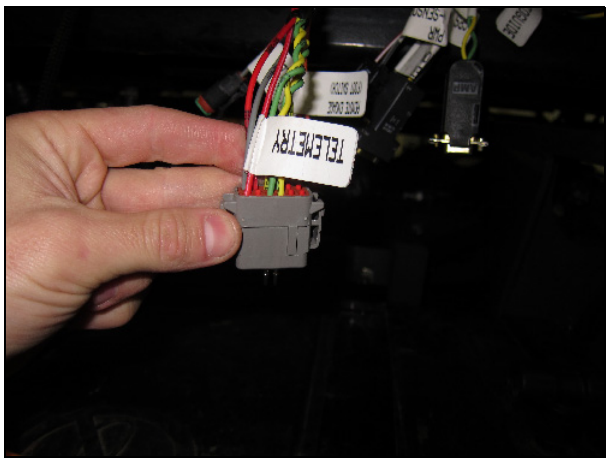
On the outside of the right hand side of the cab locate and remove the cover from the machine control cables compartment.



### Step 2

In the machine cable compartment, locate the plug labeled **TELEMETRY**.



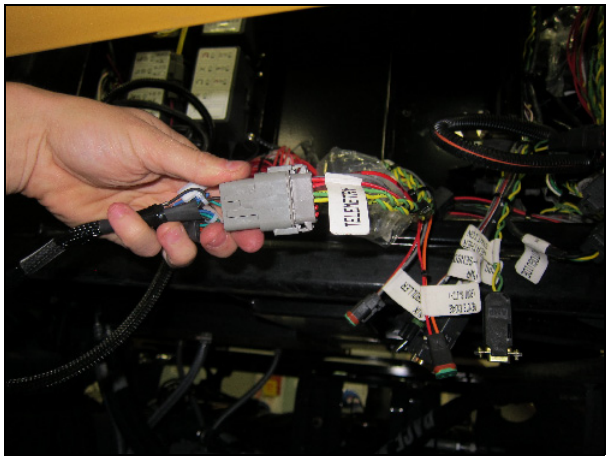


### Step 3

Connect the P/N 98324 cable to the **TELEMETRY** plug.

Make sure to assemble the correct end of the Autopilot cable to the machine: The correct end is labeled **TO MACHINE TELEMETRY**.

Route the other end of the cable to the NavController II harness (P/N 54602) and then attach it to the plug labeled **P12**.



CHAPTER 3

# Antenna/Receiver Installation

**In this chapter:**


- Antenna and receiver installation options
- Mounting an adjustable spar to roof bolts
- 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
- AgGPS 542 receiver components
- Installing the AgGPS 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 4, 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:

- **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 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 AG-372 receiver plate for permanent mounting.
- **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 21.
- **Magnetic mounting –** Magnetic mounting for quick release is available for both VHB and spar type mounting.

## Possible mounting methods

| GNSS receiver | VHB mounted plate | VHB V mounted plate | AG-15/AG-25/Zephyr/ AG-372 bolted to spar mount |
|---|---|---|---|
| CFX-750 display; FmX integrated display | ✓ | ✓ | ✓ |
| AG-372 receiver | ✗ | ✓ | ✓ |
| Trimble®*Ag*GPS® 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

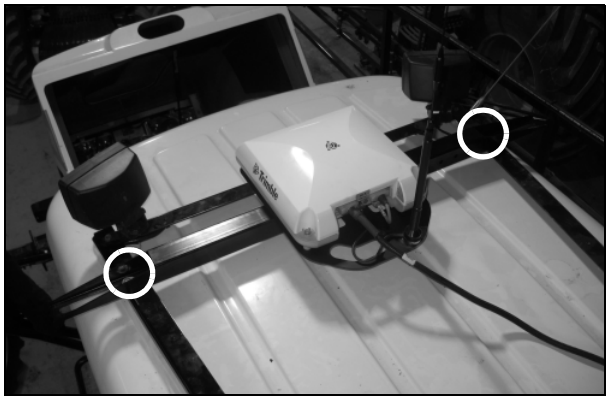
**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

### Step 1

Position the cab bolts on the roof of the vehicle.

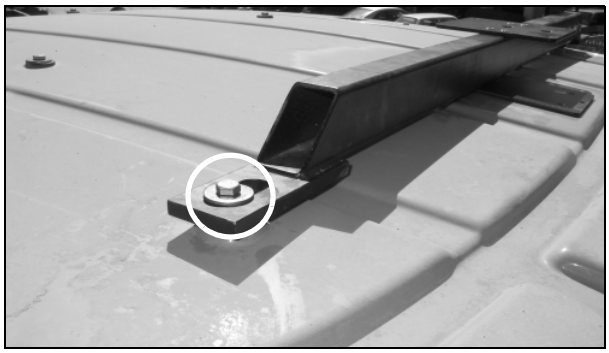


If a light bracket already occupies the roof studs, mount the spar directly onto the light bracket.



### Step 2

If required, replace the existing bolts with longer bolts.



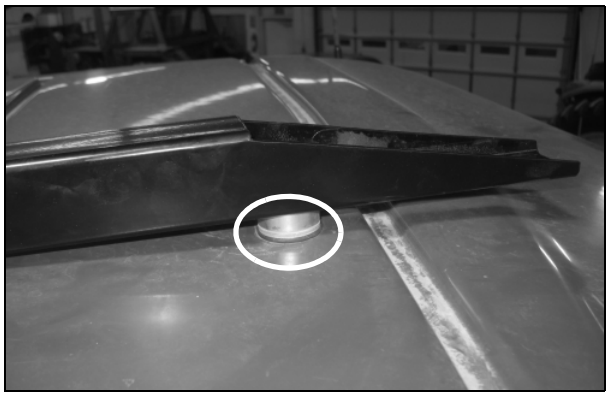
If you use the light bracket, drill two holes to match the spar width.



### 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.*



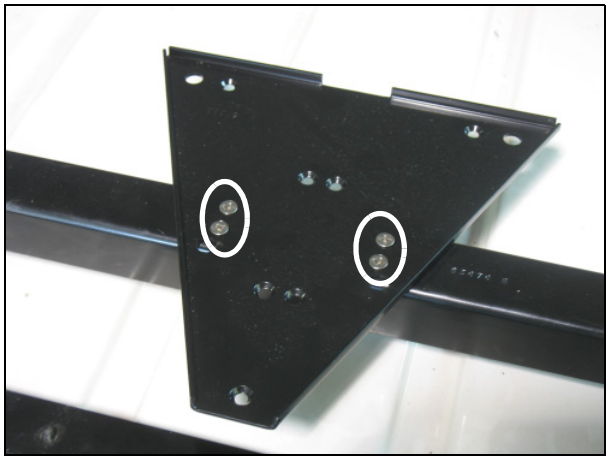
### Step 4

For either of the following applications:

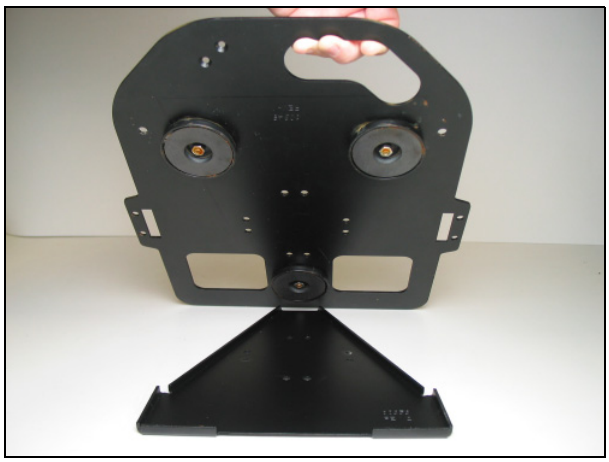
- A single magnet antenna mount
- An AG-372 receiver with magnetic option for quick removal

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.

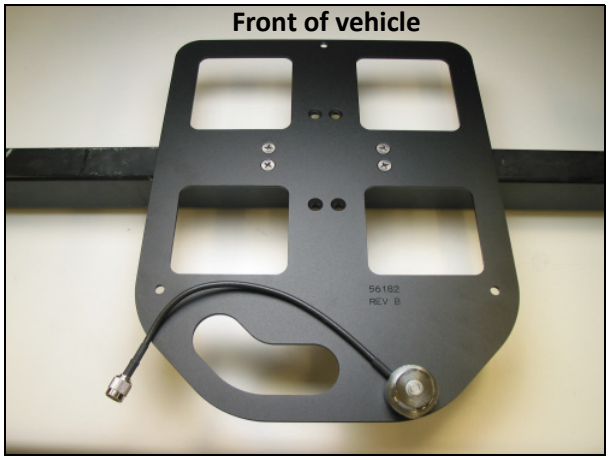



**Plate on the spar**

# 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 most kits. You can use the VHB mounting method to attach either a P/N 62034 plate or a V plate.

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

### Step 1

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

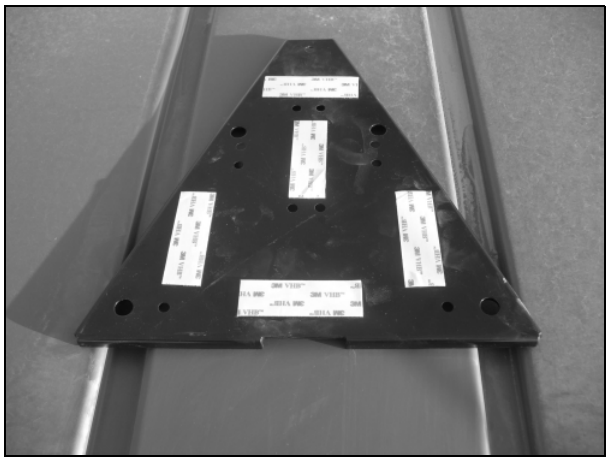


### Step 2

***V plate only***

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

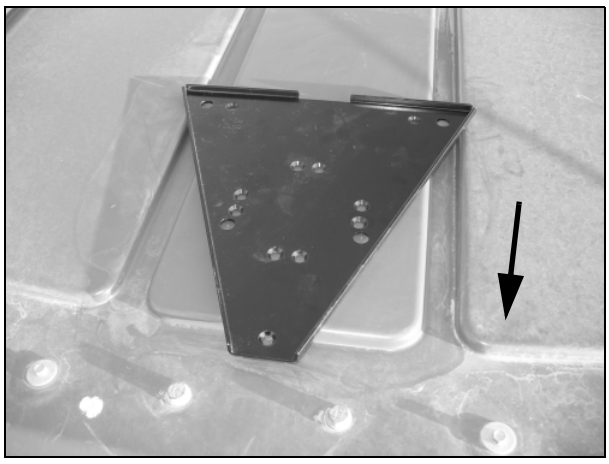
***Note –*** *The VHB strips are pre-applied to the P/N 62034 plate.*



### 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 to adhere.

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

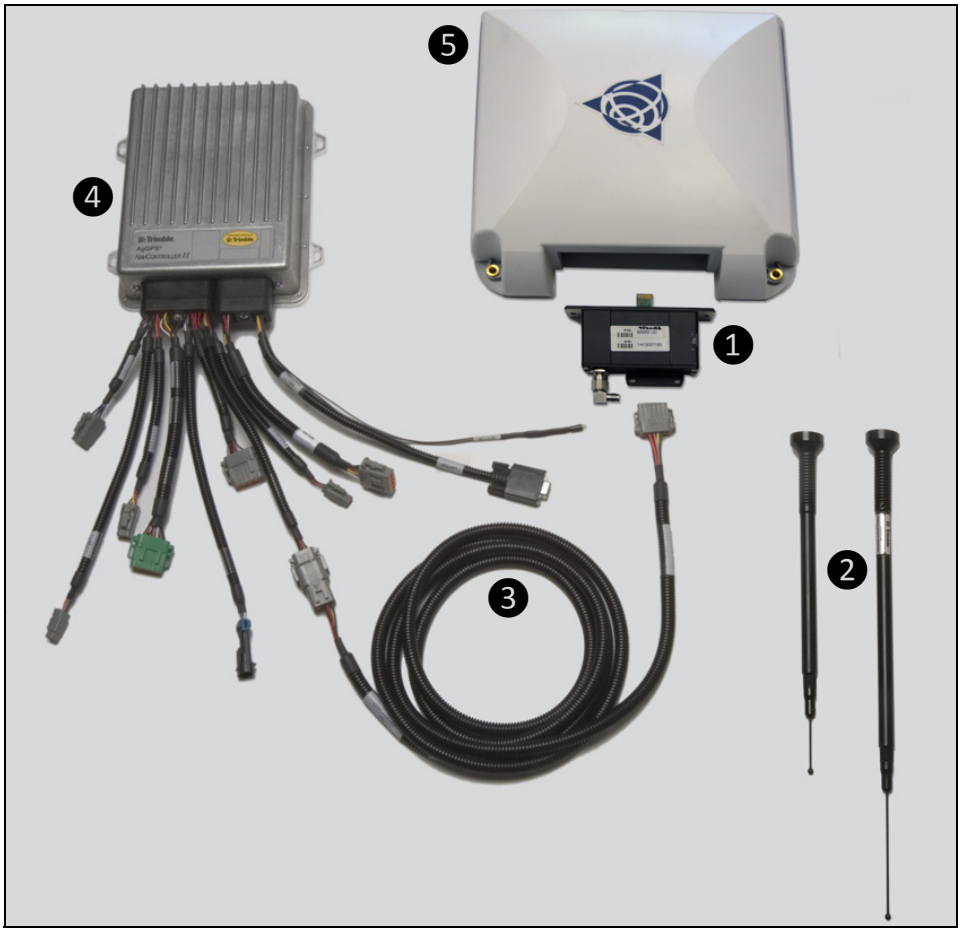


**V plate**



**P/N 62034**

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

# Installing the AG-372 GPS receiver with *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.

To attach the 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.

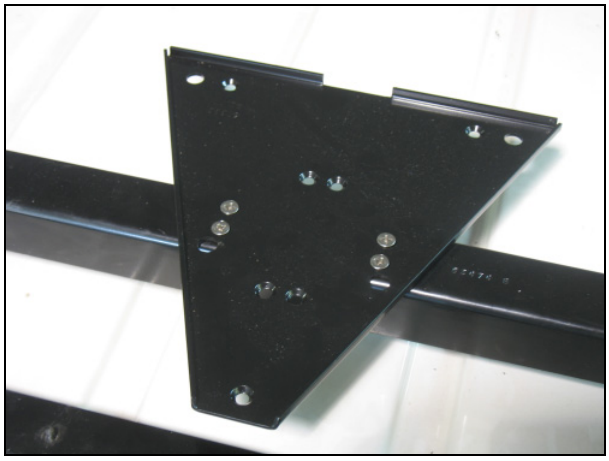
## Removable installation

### Step 1

***V plate***

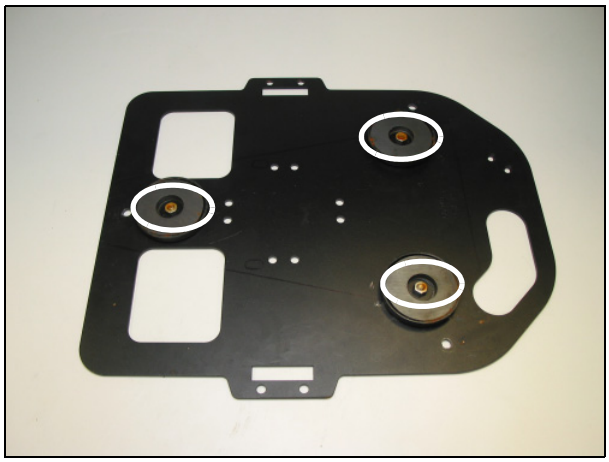
Attach the V plate to the spar using the ¼" flathead screws provided in the V plate bolt kit. Ensure that the narrow end points forward.

For spar mounting instructions, see page 18.



***Mounting plate***

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



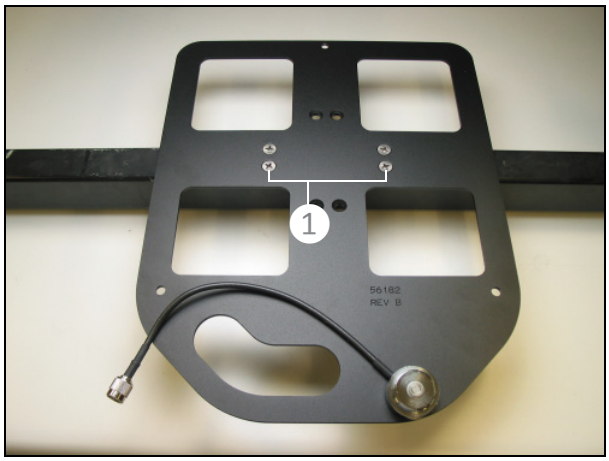
**Underside of plate**

# 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 18.



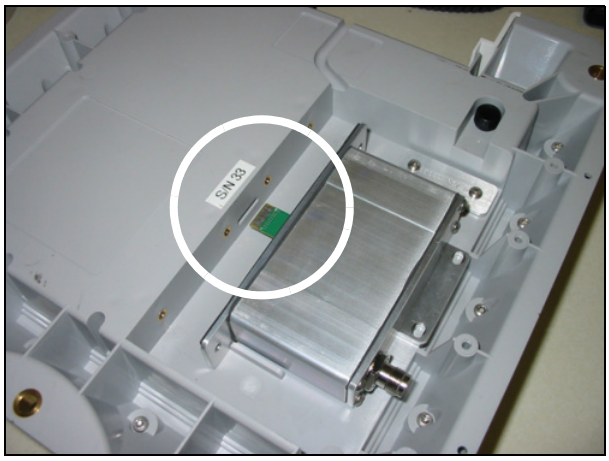

### Step 2

Remove the blanking plate and set it aside.



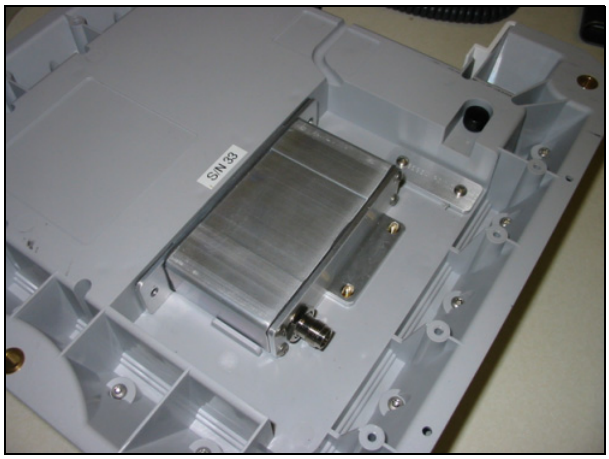

### Step 3

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.



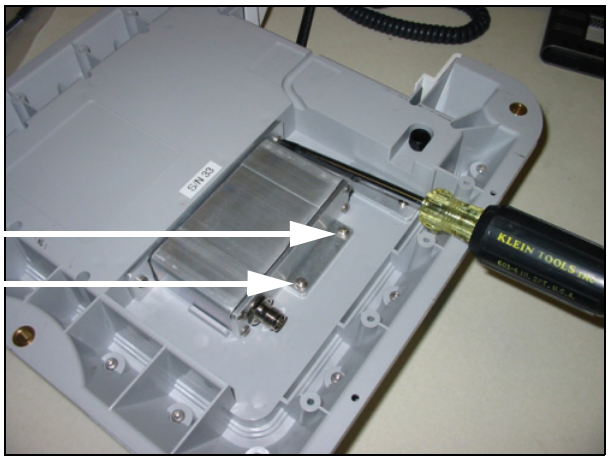
### Step 4

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




### Step 5

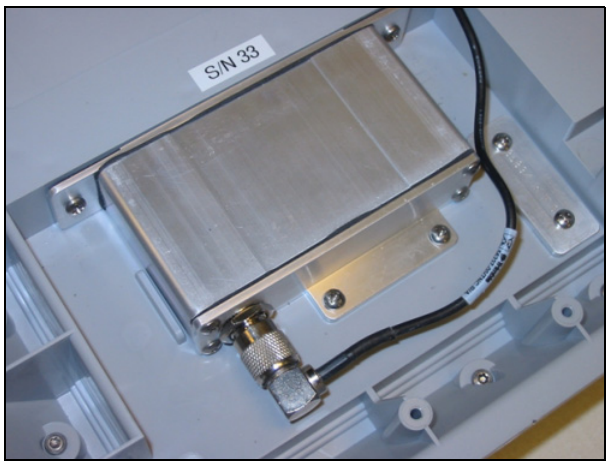
Use a #1 or #2 Phillips screwdriver and the supplied screws to install the integrated radio. First insert and tighten the two screws on the horizontal wall (arrowed), and then insert the remaining screws.




### Step 6

Install the supplied antenna cable.

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

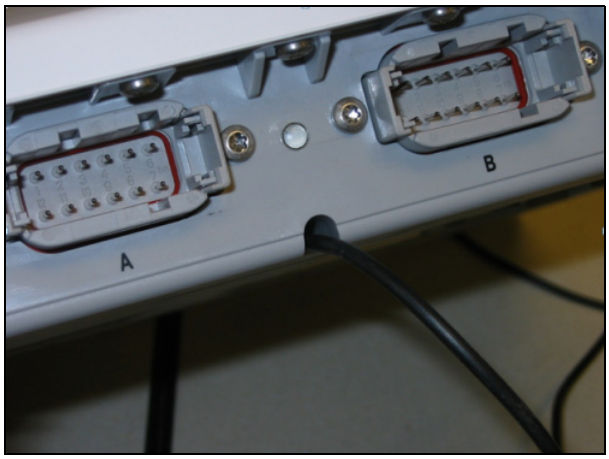


### Step 7

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

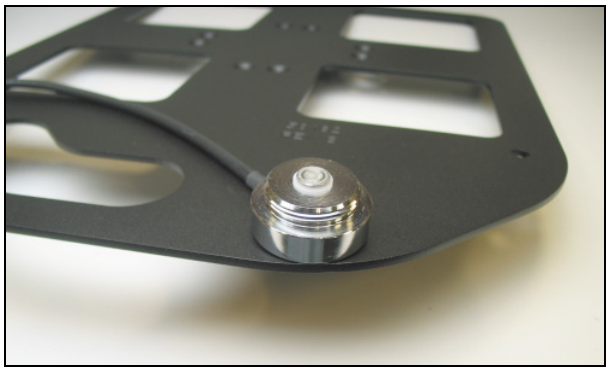


This image shows the unit with the cable routed through the channel.



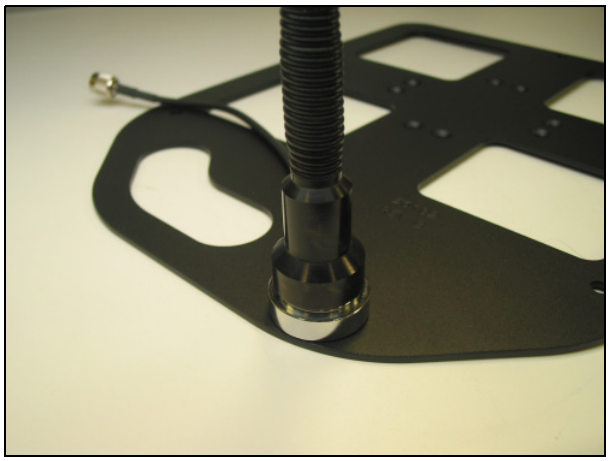

### Step 8

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



### Step 9

Attach the radio antenna to the antenna base.



### Step 10

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.



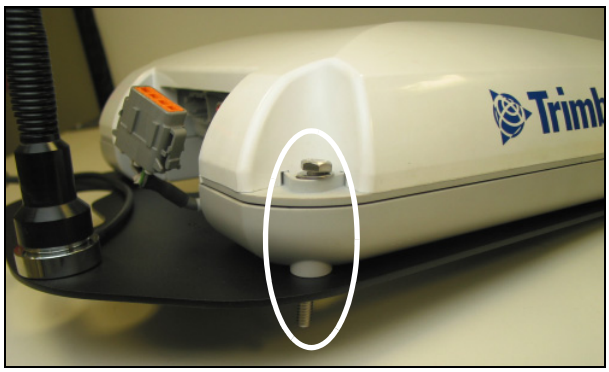

### Step 11

Insert the nylon bushings provided.



### Step 12

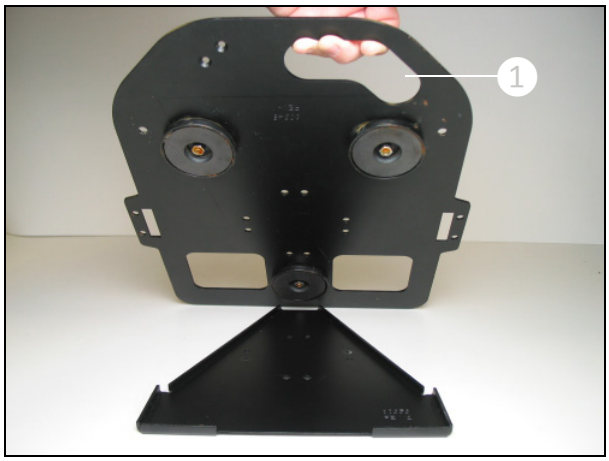
Insert the bolts through the receiver, radio, and mounting bracket. Place nuts on the bolt ends and then tighten them.



### Step 13

***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.

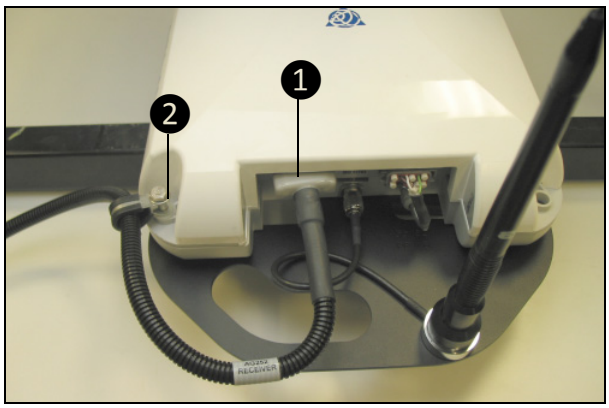



### Step 14

***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

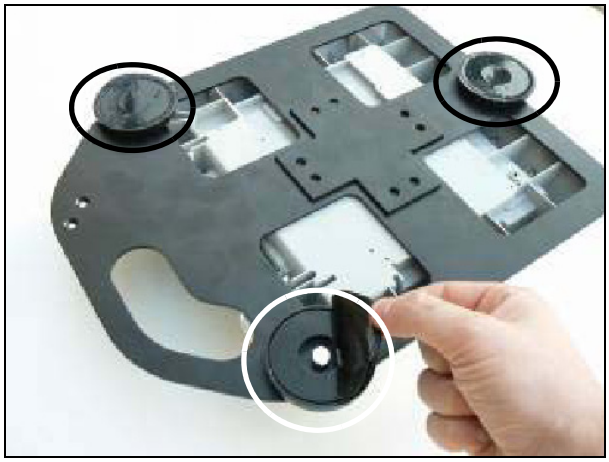
Attach the magnets to the receiver mounting plate. Use the three ¼" bolts to mount the AG-372 receiver.

Place the nuts on the receiver side.



### Step 2

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

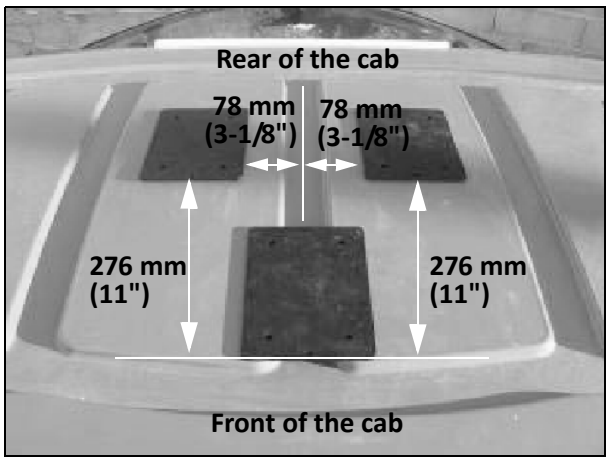


### Step 3

Clean the antenna location on the roof of the cab with denatured alcohol to remove oil and dust.

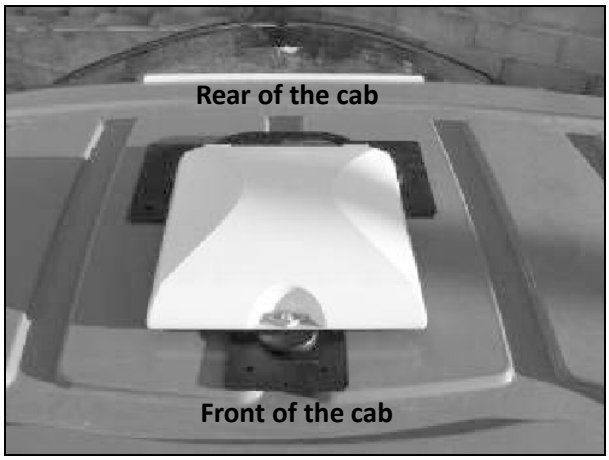
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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



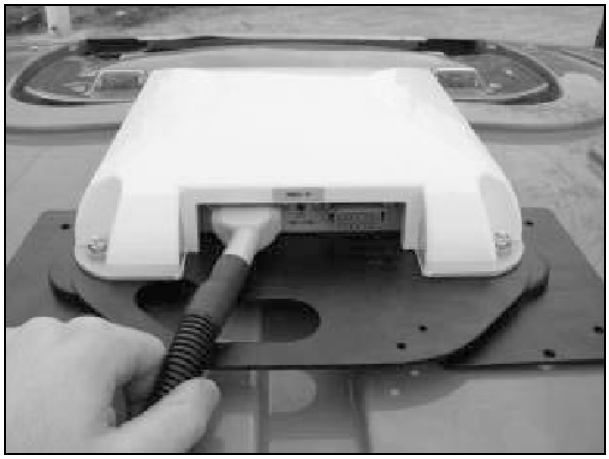
### Step 4

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

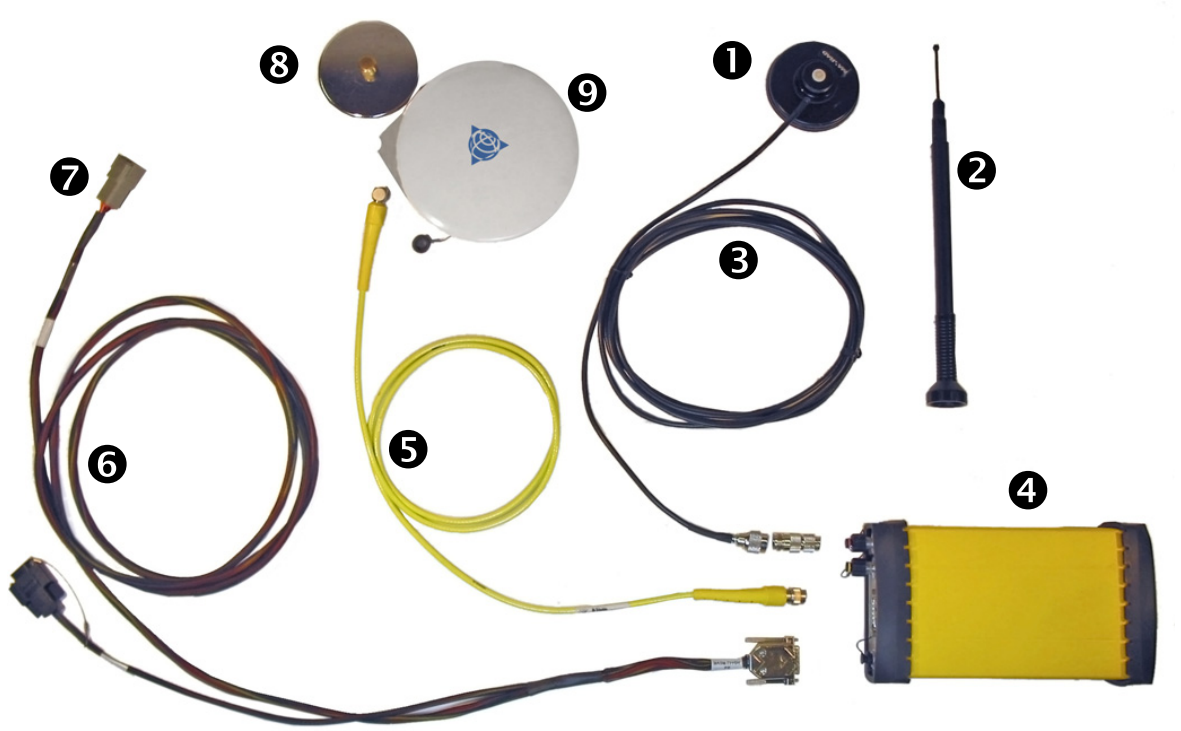



### Step 5

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



# *Ag*GPS 542 receiver components




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

# Installing the *Ag*GPS 542 receiver

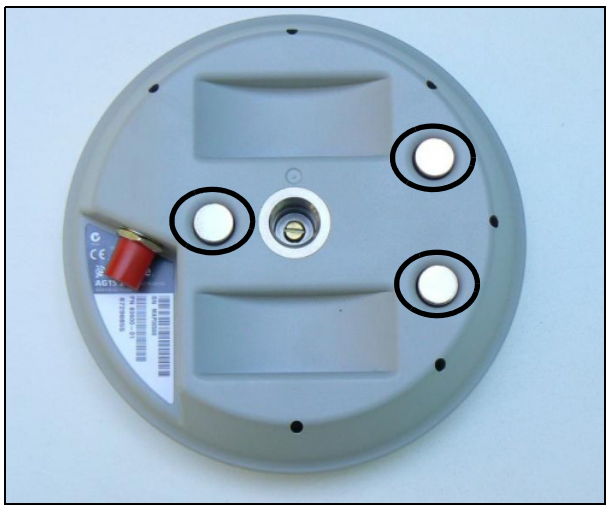
**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

### Step 1

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



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



### Step 2

***GLONASS, RTK, OmniSTAR, DGPS applications***

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



### Step 3

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



### Step 4

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

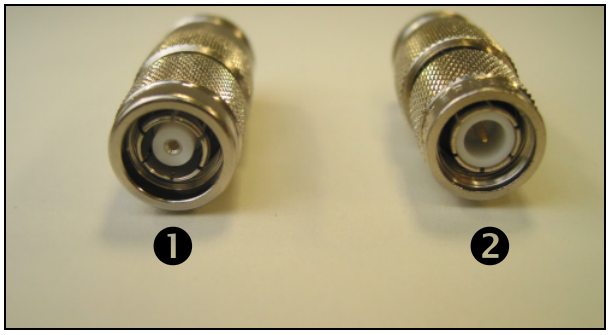


### Step 5

Identify the correct adaptor for the radio connection:

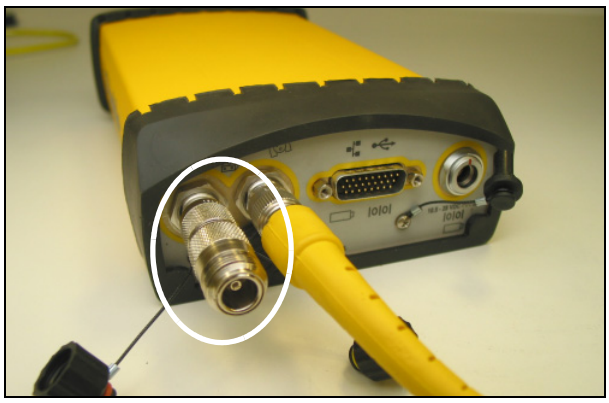
❶ Reverse polarity TNC-to-N for 900 MHz radios

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



### Step 6

Attach the adaptor to the radio port.



### Step 7

Connect the radio antenna cable to the radio port adaptor.



### Step 8

Connect the controller cable to the 26-pin connector of the receiver. Controller cable connections will be completed in Chapter 7, Controller Installation.



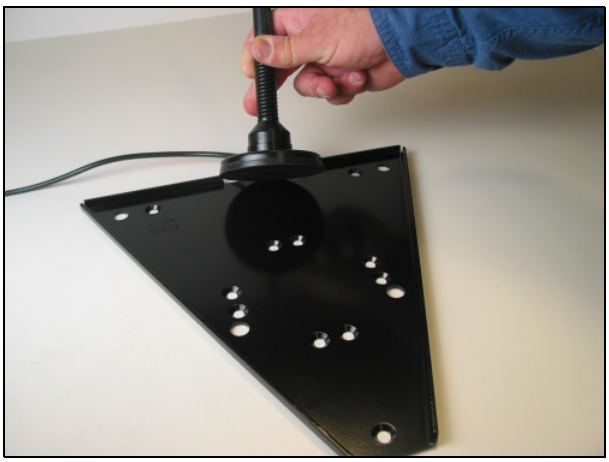
### Step 9

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 4

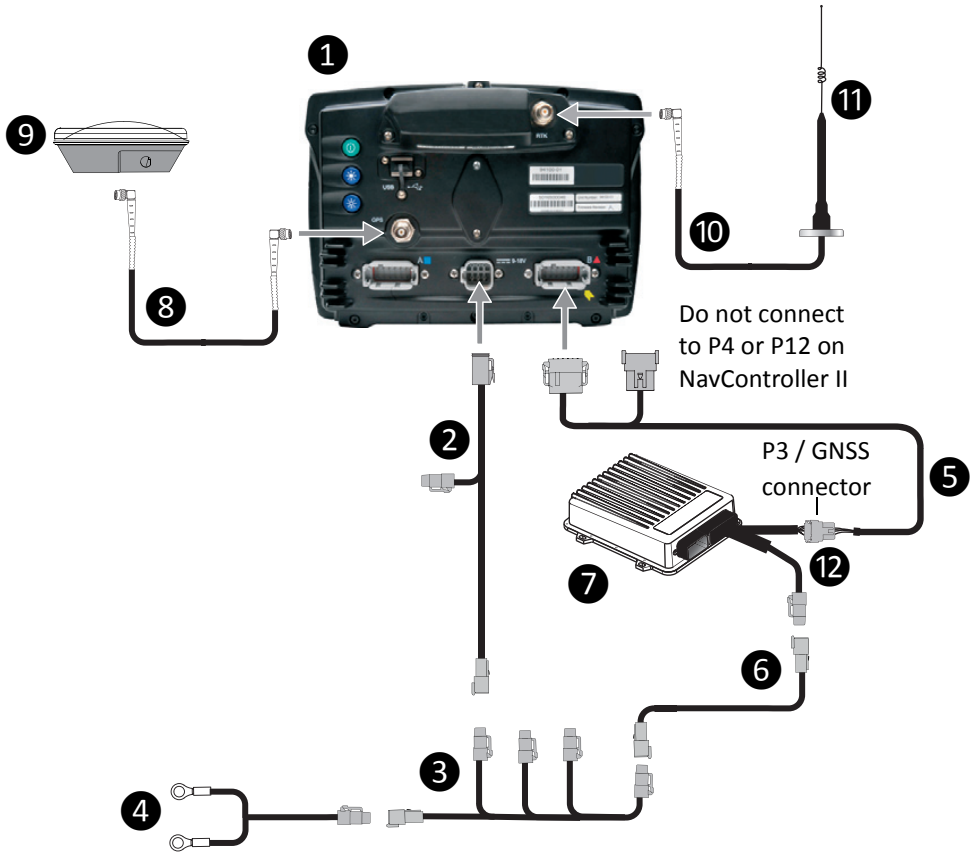
# Display Installation

**In this chapter:**


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


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

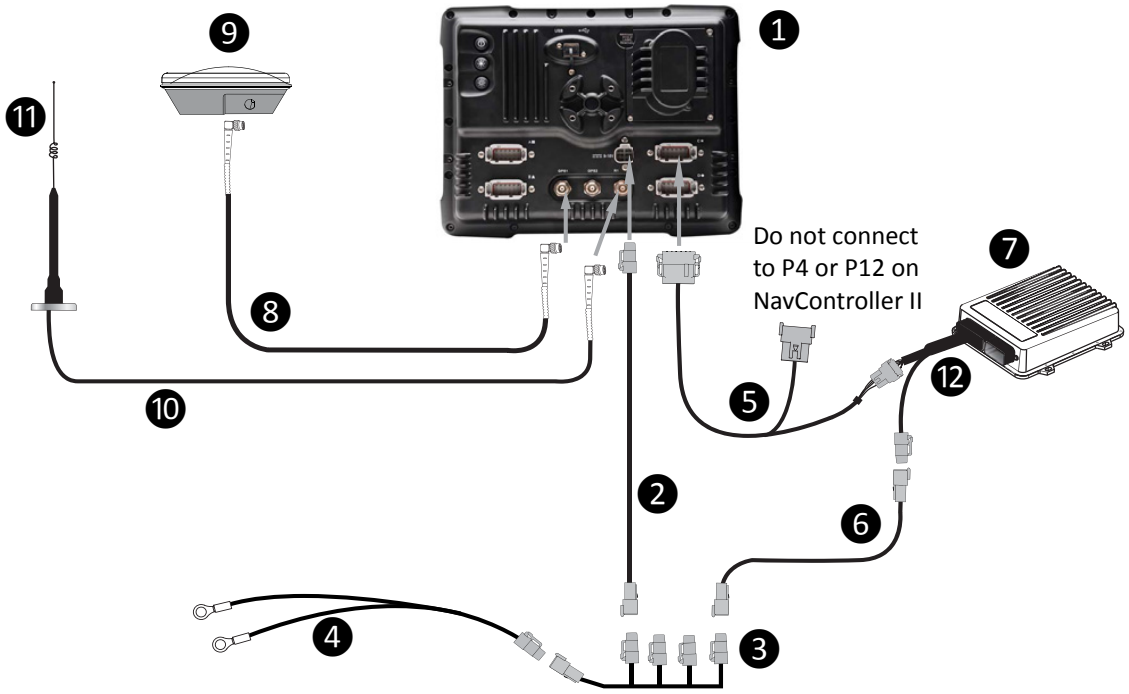
# CFX-750 display components




⚠ **CAUTION –** Connecting the Port Replicator on the 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 part number |
|---|---|---|
| ❶ | CFX-750 display<br>***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 | FmX to NavController II cable with port replicator | 75741 |
| ❻ | 2-pin DTM to 2-pin DT power adaptor | 67095 |
| ❼ | NavController II | 55563-00 |
| ❽ | 8 m GNSS TNC/TNC RT angle cable | 50449 |
| ❾ | 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 |

# FmX integrated display components




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

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

# 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.



# 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.

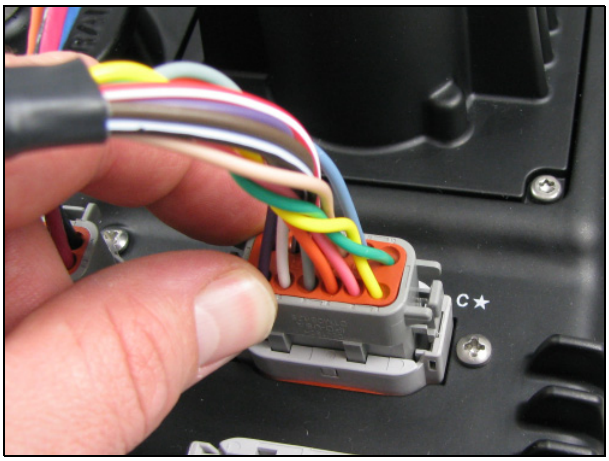
### Step 1

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.

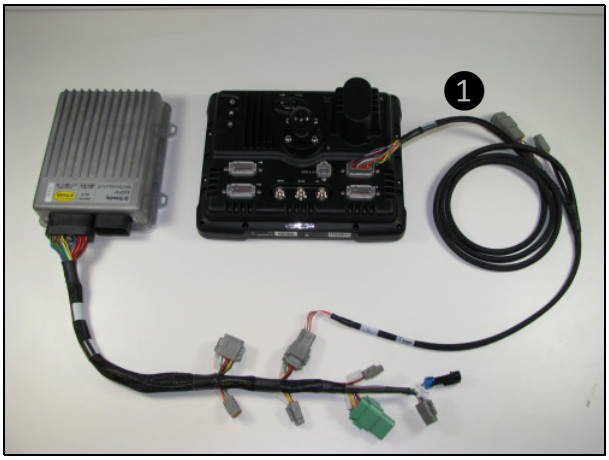
To connect power to the FmX integrated display, see Chapter 7, Controller Installation.



# FmX integrated display: Installing the wiring harness

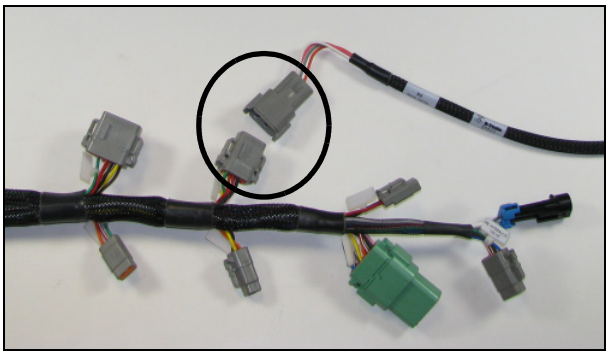
### Step 1

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.



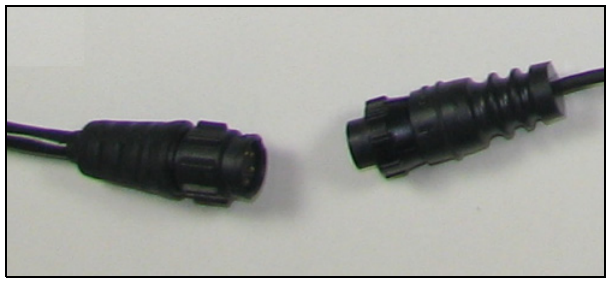
**CFX-750 display**



**FmX display**

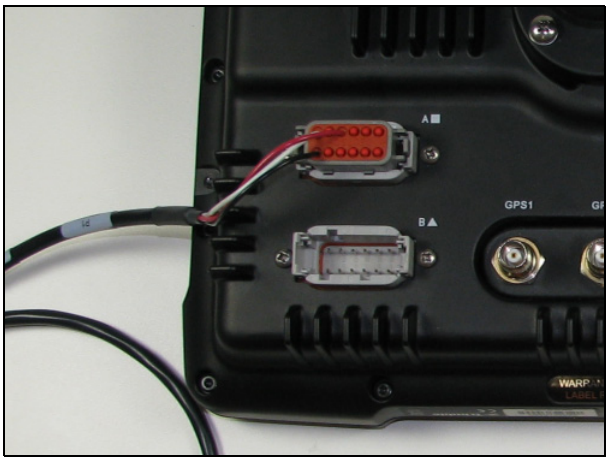
### Step 3

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 and OmniSTAR operations. For more information, see Antenna and receiver installation options, page 17.

Use a $^{5}/_{8}$" bolt to attach the AG-25 antenna to the spar, as shown.



## VHB adhesive method

Standard P/N 62034 plates are provided in most 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 the 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 denatured alcohol to remove oil and dust.

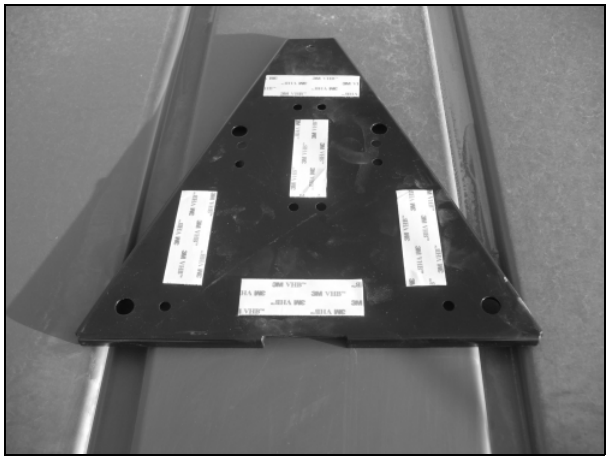


### Step 2

***V plate only***

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

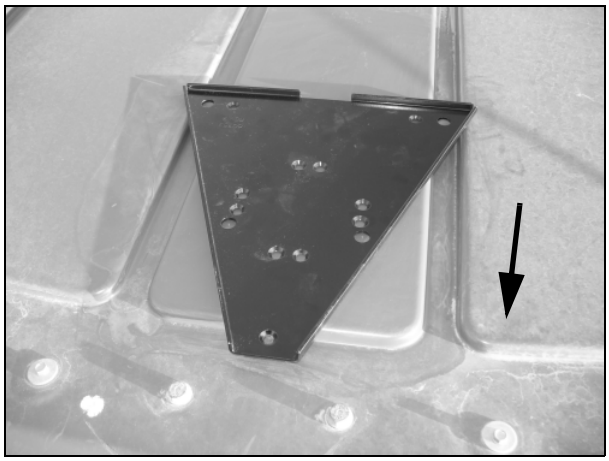
***Note –*** *The VHB strips are pre-applied to the P/N 62034 plate.*



### 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 points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure to adhere.

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



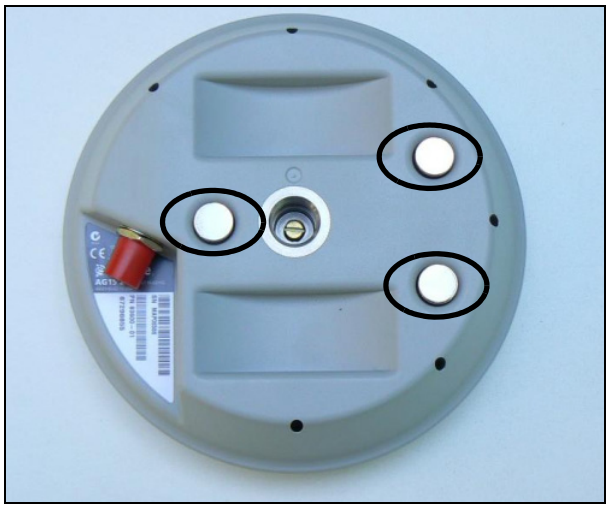
**V plate**



**P/N 62034**

### 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.



***WAAS, EGNOS, VBS, Beacon applications***

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



### Step 6

***Both models***

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



# CFX-750 and 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.

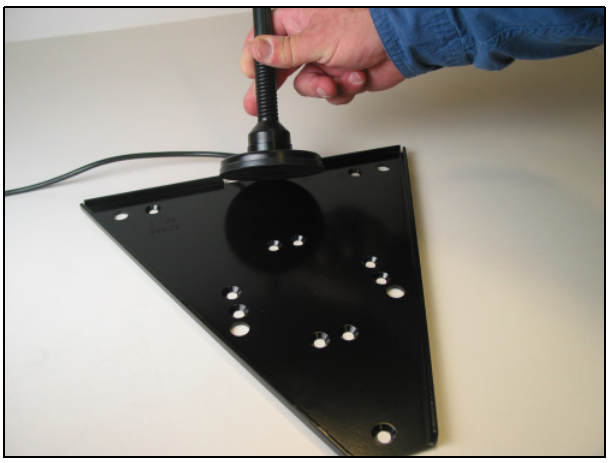
### Step 1

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

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

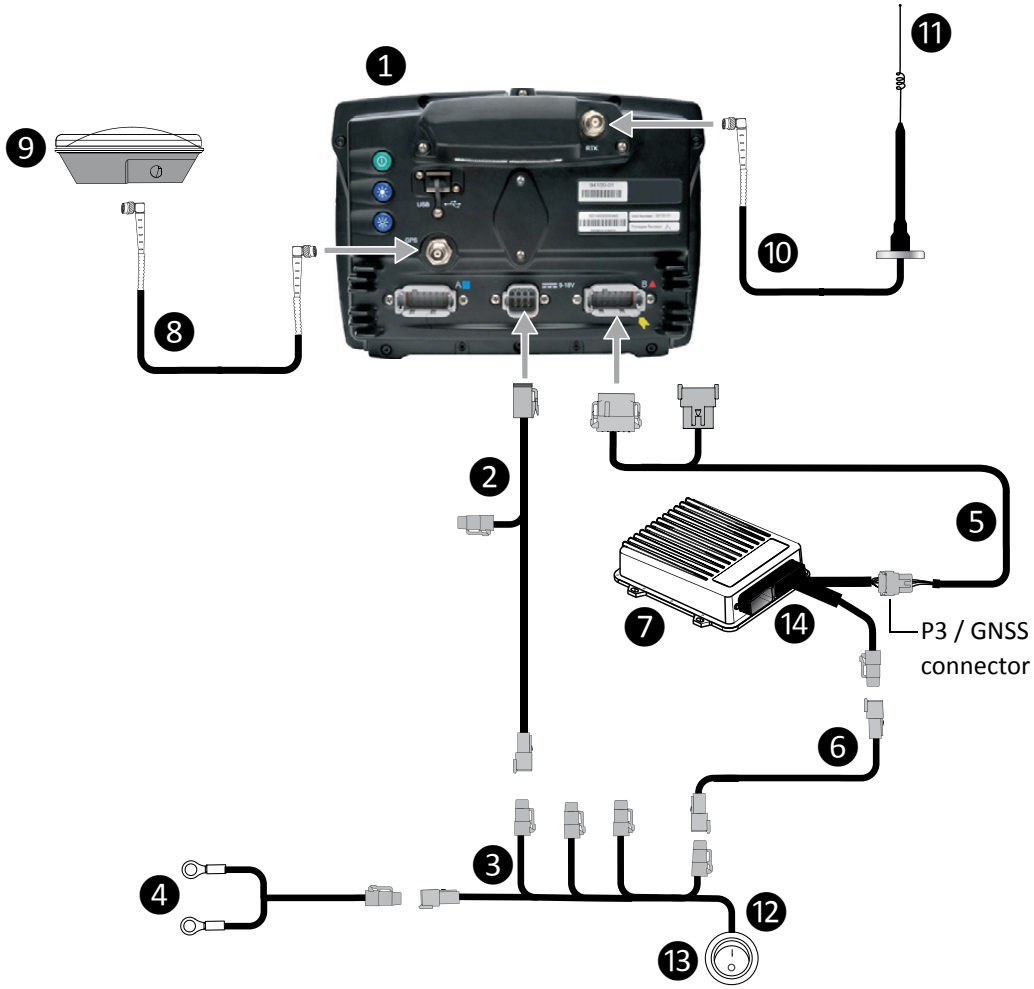
# Power Harness Installation

**In this chapter:**


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


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

# CFX-750 display components

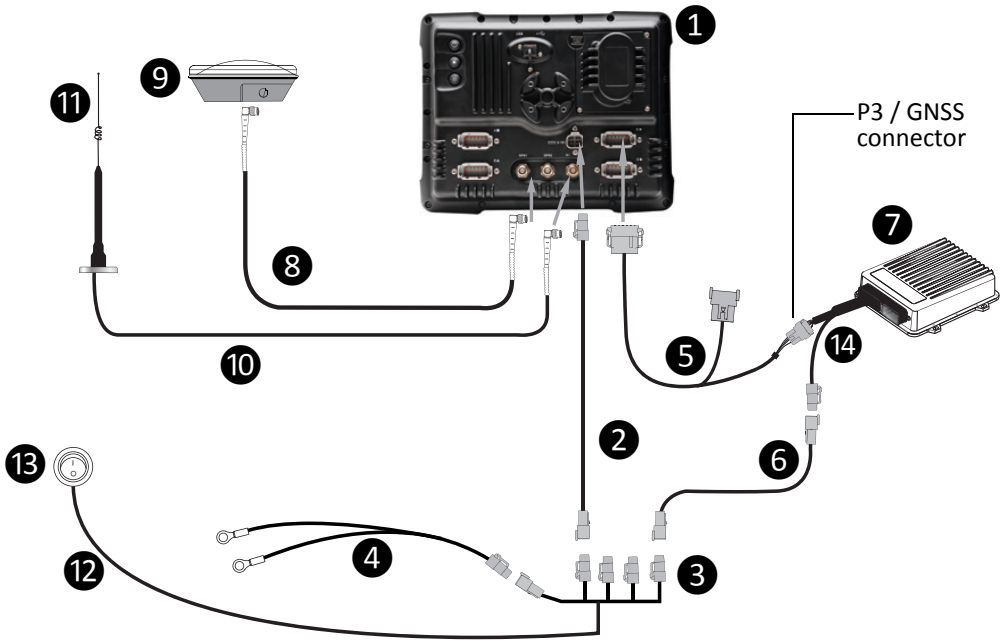



⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓮ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

| Item | Description | Trimble part number |
|---|---|---|
| ❶ | CFX-750 display<br>***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 | FmX to NavController II cable with port replicator | 75741 |
| ❻ | 2-pin DTM to 2-pin DT power adaptor | 67095 |
| ❼ | NavController II | 55563-00 |
| ❽ | 8 m GNSS TNC/TNC RT angle cable | 50449 |
| ❾ | AG-25 GNSS antenna | 77038-00 |

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

# FmX integrated display components




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

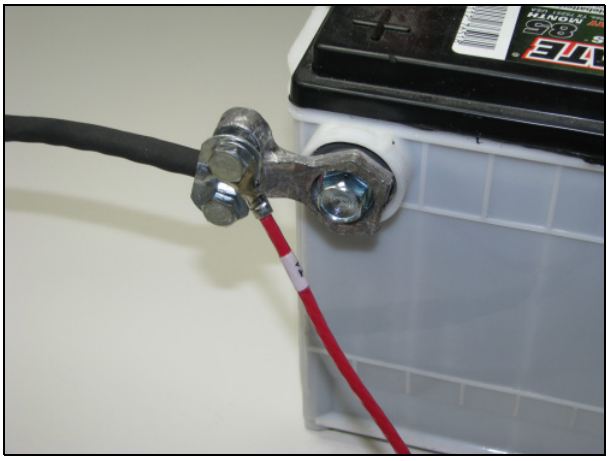
| Item | Description | Trimble part number |
|---|---|---|
| ❶ | FmX integrated display | 93100-02 |
| ❷ | FmX power cable | 66694 |
| ❸ | FmX power cable with relay and switch (power bus) | 67259 |
| ❹ | Basic power cable | 67258 |
| ❺ | FmX to NavController II cable with port replicator | 75741 |
| ❻ | 2-pin DTM to 2-pin DT power adaptor | 67095 |
| ❼ | NavController II | 55563-00 |
| ❽ | 8 m GNSS TNC/TNC RT angle cable | 50449 |
| ❾ | 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 | External switch cable included with kit | Part of P/N 67259 |
| ⓭ | Switch | 67095 |
| ⓮ | NavController II harness | 54601 |

# Installing the power harness for the display

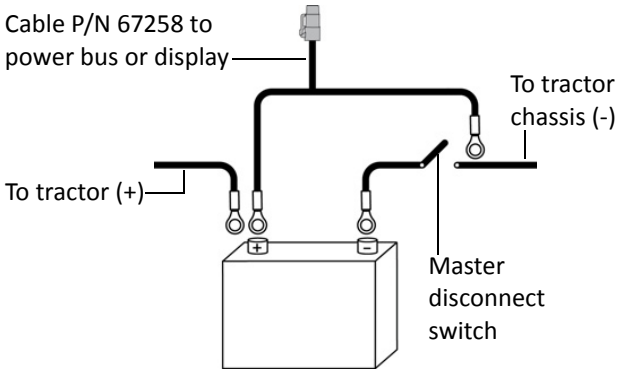
**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

### Step 1

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

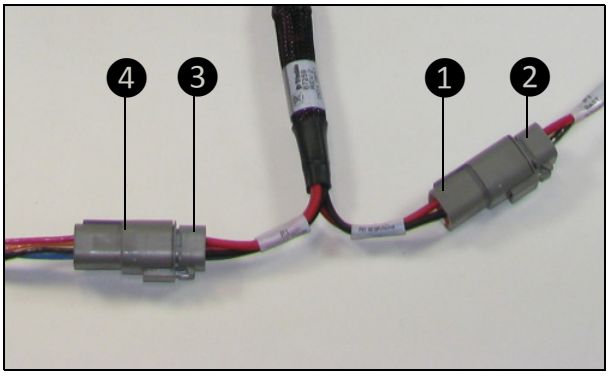


**CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258) is ***not*** directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example.
Attach this terminal side just past the main disconnect so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

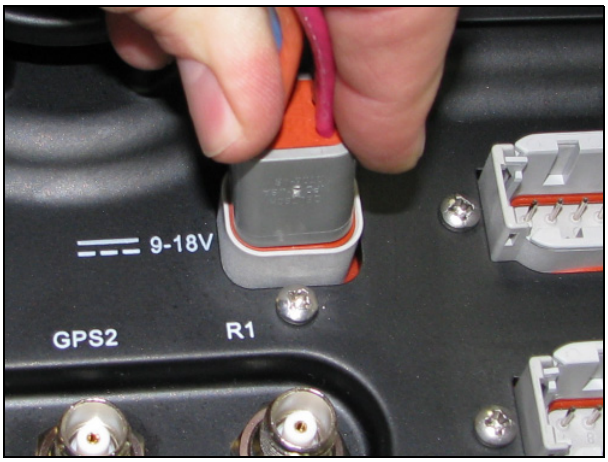


### Step 3

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

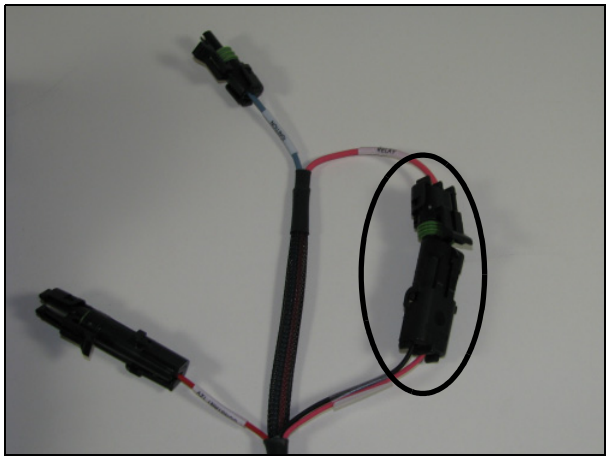
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

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

- The display power button
- An external switch
- Ignition sensing

## The display power button

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



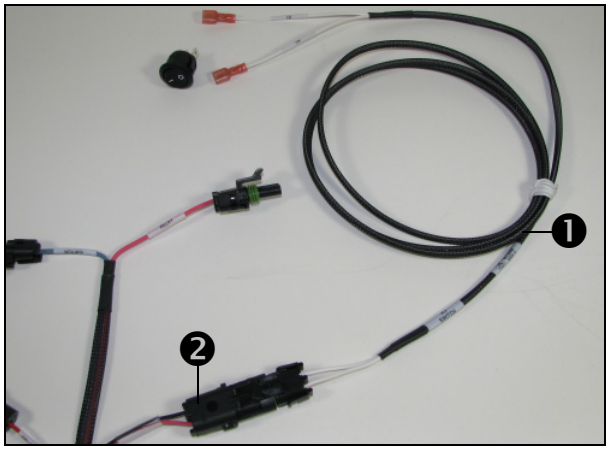
## An external switch

### Standard switch option

#### 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.

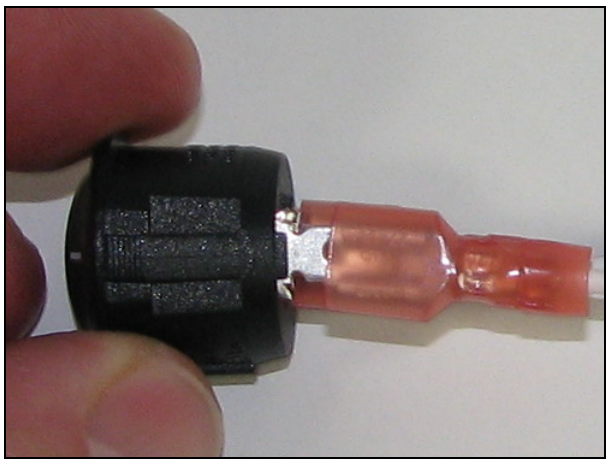
***Note –*** *To install the switch provided, drill a ¾" hole.*



### Step 2

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

***Note –*** *Polarity is not important.*

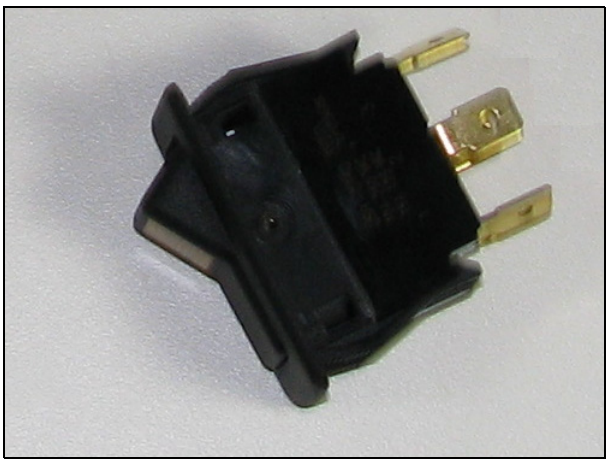


## Illuminated full or standard Euro switch option

### Step 1

Find an available knockout location on the vehicle console.

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

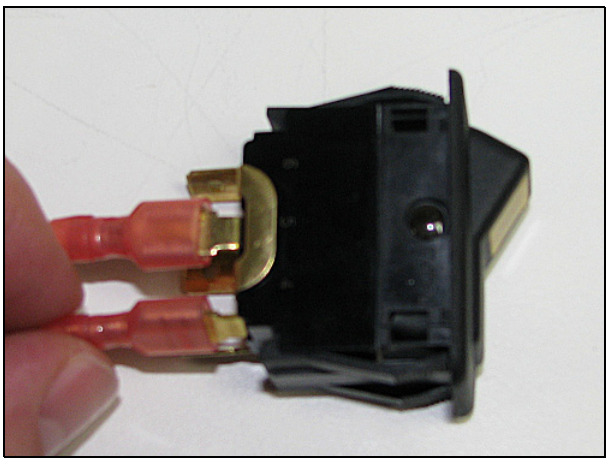


### Step 2

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

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

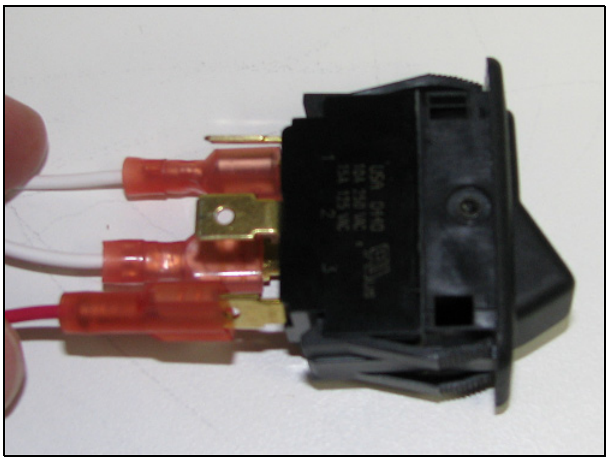
***Note –*** *Polarity **is** important.*



### Step 3

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

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

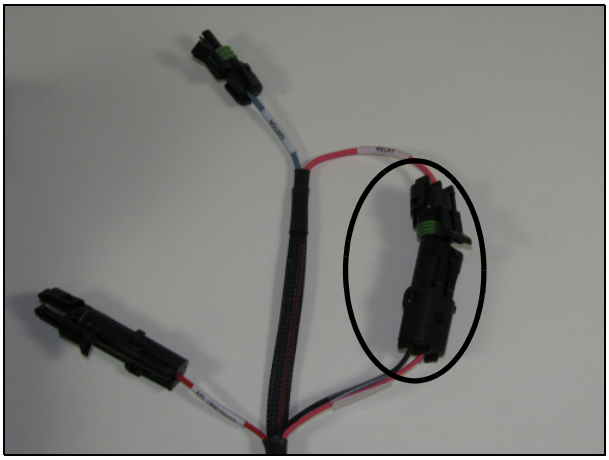


## Ignition sensing

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

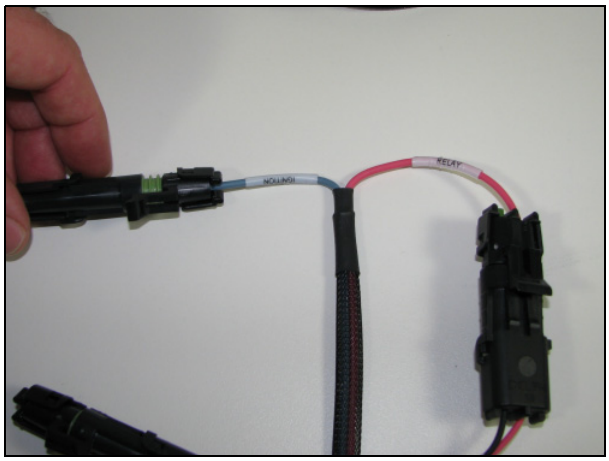
### Step 1

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.

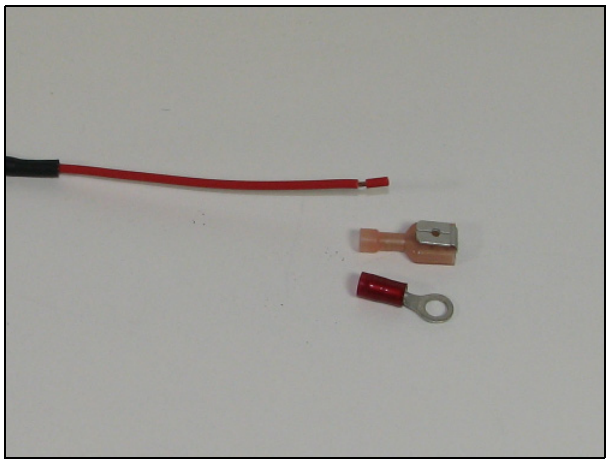


### Step 3

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.



CHAPTER 6

# Remote Engage Switch Installation

**In this chapter:**


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

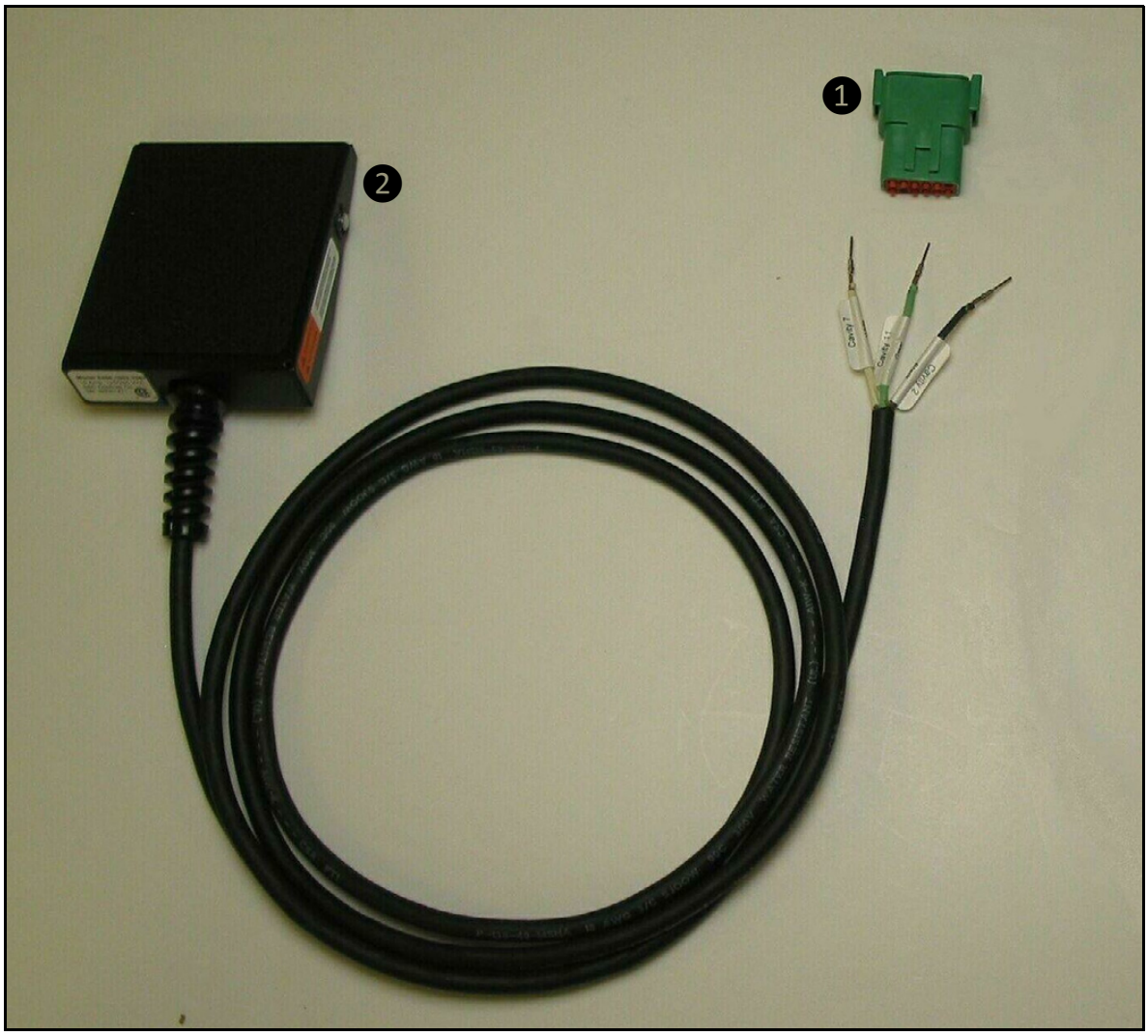

This chapter describes how to install the remote engage switch.

# Remote engage switch components: Rocker switch




| Item | Description |
|---|---|
| ❶ | DTM receptacle |
| ❷ | Remote engage rocker switch |

# Remote engage switch components: Foot switch

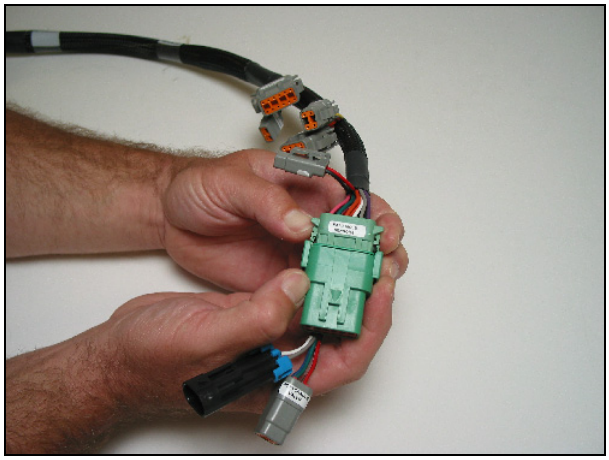



| Item | Description |
|---|---|
| ❶ | DTM receptacle |
| ❷ | Remote engage foot switch |

# Preparing the remote engage cable

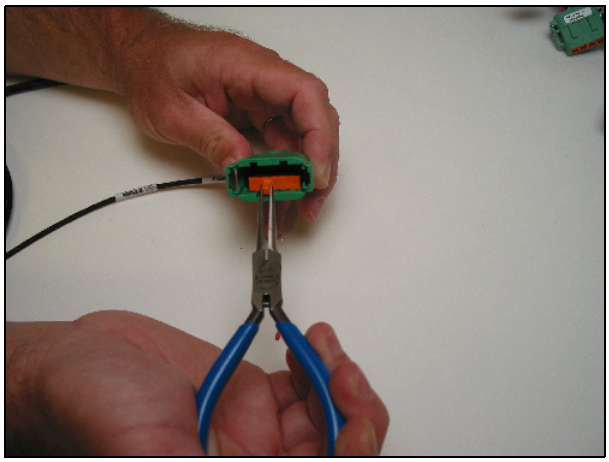
### Step 1

Locate the green 12-pin Deutsch receptacle on the P5 leg of the main controller harness. For more information, see Chapter 7, Controller Installation.



### Step 2

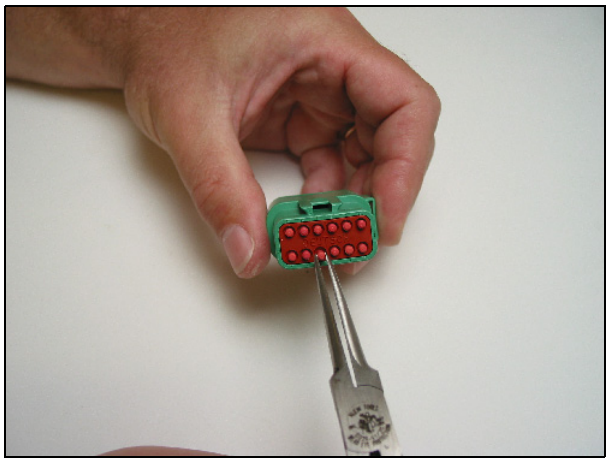
Remove the wedge from the connector.



### Step 3

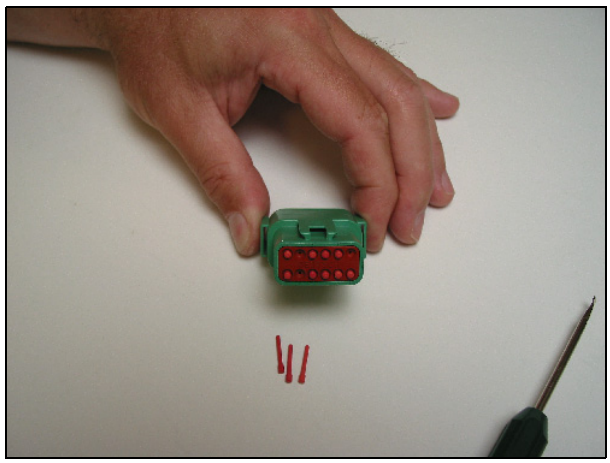
***Rocker switch only***

Remove the plugs from cavity 2 and cavity 7.



***Foot Switch Only***

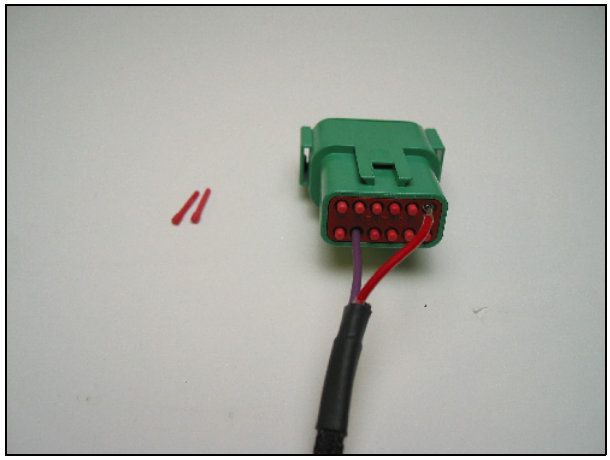
Remove the plugs from cavity 2, cavity 7, and cavity 11.



## Step 4

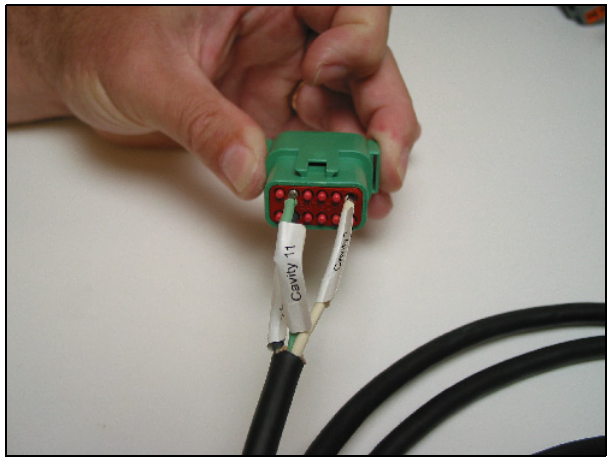
***Rocker switch only***

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



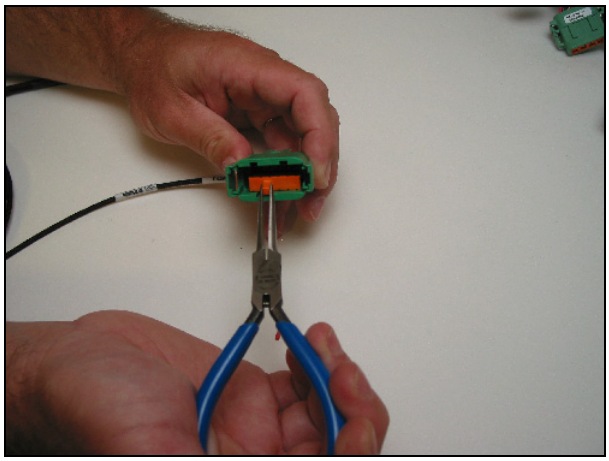
***Foot switch only***

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



### Step 5

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



### Step 6

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

### Step 7

***Rocker switch only***

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



***Foot switch only***

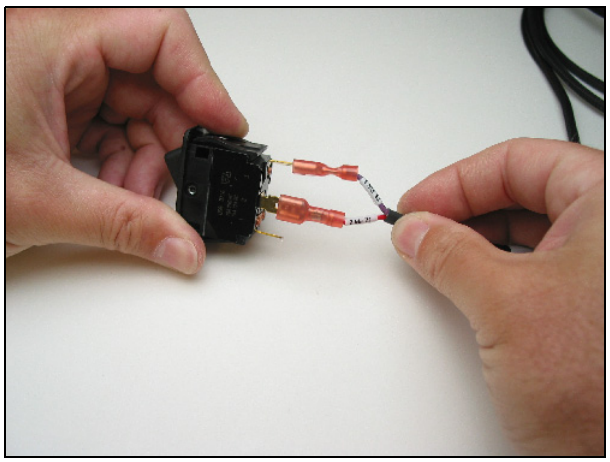
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



### Step 8

***Rocker Switch Only***

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



### Step 9

***Rocker Switch Only***

Place the switch in the console.



# Using the remote engage switch

To use NavController II to engage the system:

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

The system engages when you release the switch.

CHAPTER 7

# Controller Installation

**In this chapter:**


- Installing the controller
- Controller connections


This chapter describes how to install the controller unit.

# Installing the controller

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

The NavController II controller will be installed on the back of the cab behind the rear seat, in the location shown.



### Step 1

Use the controller as a template to mark four hole locations for drilling 5⁄16" mounting holes.

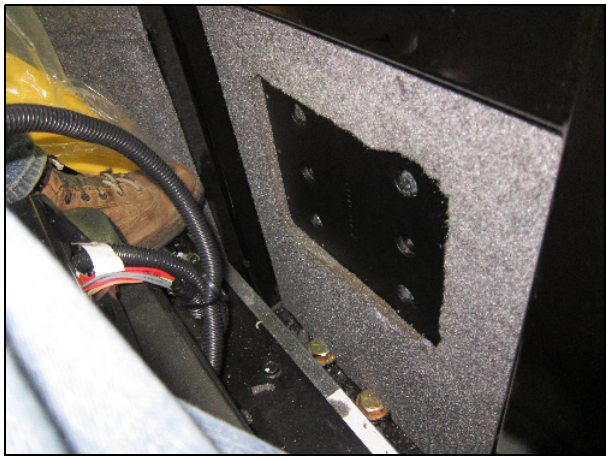


### Step 2

Drill the four mounting holes, and then either:

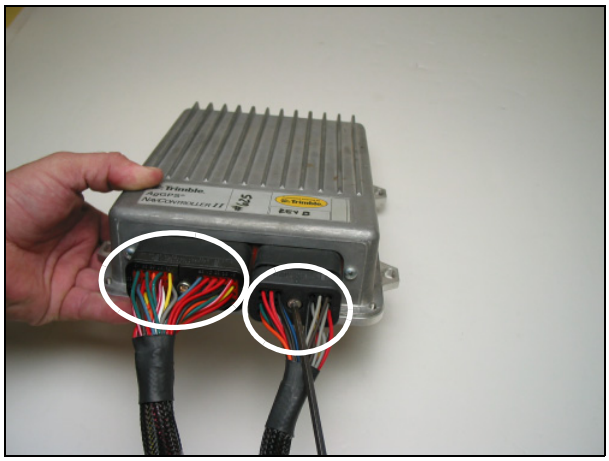
- Use the provided standoffs to mount the controller mounting plate, or;
- Trim the padding to fit the controller mounting plate.

Then mount the controller with the provided ¼" hardware, as shown.



### Step 3

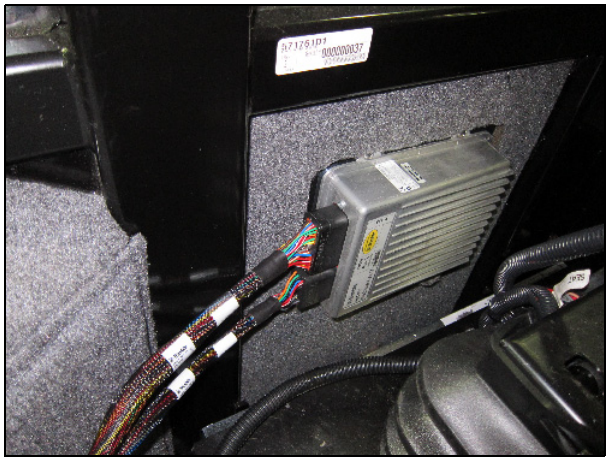
Before you install the controller, attach the main and auxiliary cable harnesses. Use an Allen wrench to secure the connectors to the controller.



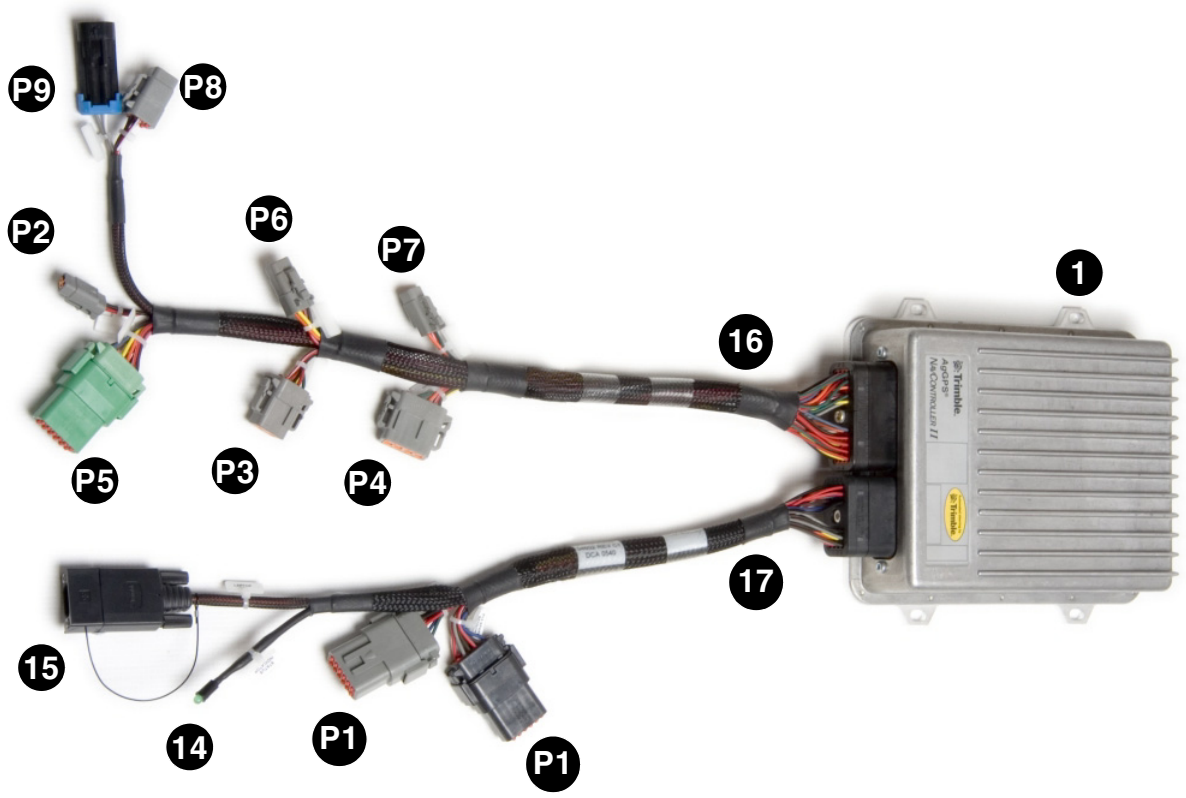
### Step 4

Use the provided #10 screws to assemble the controller to the controller mounting plate.





# Controller connections



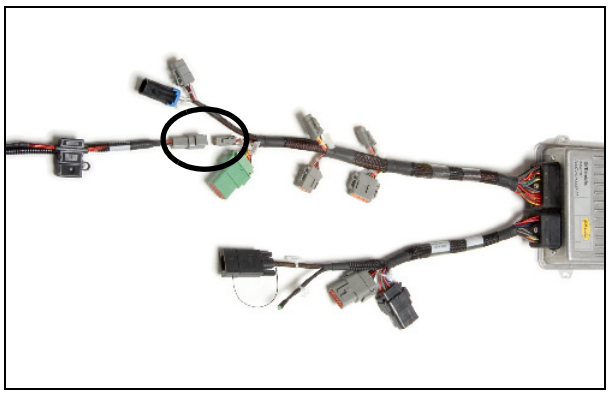

| Item | Description |
|---|---|
| 1 | NavController II |
| P2 | Power connector |
| P3 | GNSS connector |
| P4 | Display connector |
| P5 | Vehicle sensors connector |
| P6 | Steering sensor connector |
| P7 | Manual override connector |
| P8 | Hydraulic valve connector |

| 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

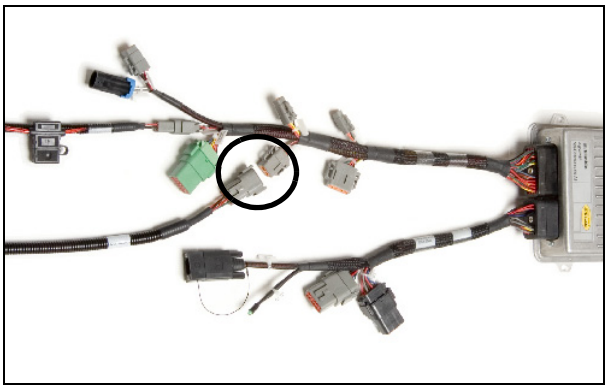
Connect the power cable connection to P2, which is labeled **Power**. P2 is located on the main wiring harness.

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



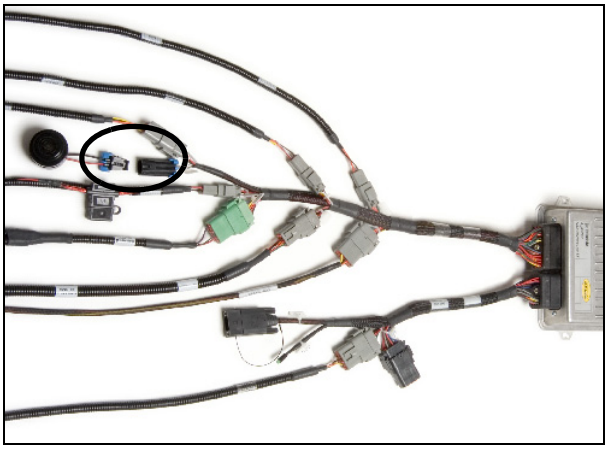
### Step 2

Connect the CFX-750 display or FmX integrated display to P3, which is labeled **GPS**. P3 is located on the main wiring harness.



### Step 3

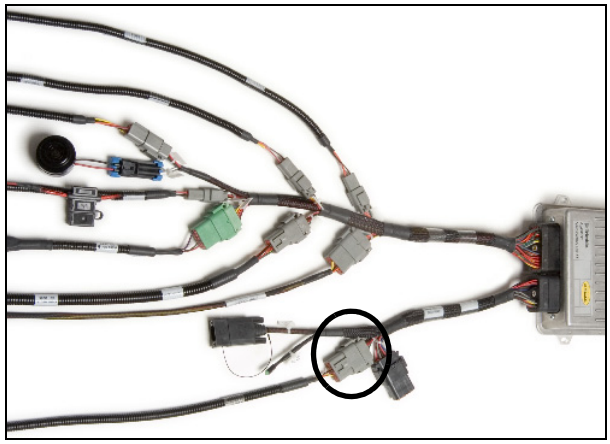
Connect the Sonalert P9 to the 2-pin Delphi connector on the main wiring harness. Route the cable so the Sonalert warning device is in a position that is audible to the operator.



### Step 4

Make sure that the interface cable is attached to P12 for CAN communication.

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 5

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. 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.
3. 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.
4. 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
   - Antenna height/Antenna axle offset, and Roll offset
5. Setup items on the RG C1000 Display.