INSTALLATION INSTRUCTIONS

Autopilot™ Automated Steering System

AGCO AGR Combines

Challenger 500 C series

- 540C / 560C

Gleaner Super series

- S66 / S76 / S77

Massey Ferguson 9005 series

- 9695 / 9795 / 9895

Version 5.00
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This is the September 2012 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54038-62-E05.

It applies to version 5.00 of the Autopilot automated steering system.

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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

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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.

Contents

Safety Information 3

Warnings 3
Cautions. 4

1 Introduction 7

Technical assistance 8
Manual system upgrade to Autopilot. 8
CFX-750 display and FmX integrated display 8
Required components 9
Antenna mounting kits 9
Accessory kits 9
Autopilot hardware organization: As shipped 9
Preparing the vehicle for installation. 10
Pre-installation checks. 11

2 Steering Interface Cable Installation 13

Auto-Guide Ready Interface Cable 14
CAN interface cable for FmX integrated display 14
CAN interface cable for CFX-750 display 16
Installing the Auto-Guide Ready Cable 18

3 Antenna/Receiver Installation 19

Antenna and receiver installation options 20
Possible mounting methods 20
Attaching the plate with VHB adhesive 20
Installing the antenna mount 23
AgGPS 262/AG-372 GPS receiver with
AgGPS 450/900 radio module (if equipped) components 26
Installing the AgGPS 262/AG-372 GPS receiver with
AgGPS 450/900 radio module (if equipped) 28
Removable installation 28
AgGPS 432/442/542 receiver components 34
Installing the AgGPS 432/442/542 receiver 35

4 Display Installation 39

FmX integrated display components 40
CFX-750 display components 41
Preparing the FmX integrated display 43
Installing the FmX integrated display 44
FmX integrated display: Installing the wiring harness 45
Preparing the CFX-750 display. 46
Installing the CFX-750 display 47
CFX-750 display: Installing the wiring harness. 48

FmX and CFX-750 displays: Connecting accessory options. 49
AgCam 49
FmX and CFX-750 displays: Installing the GNSS antenna and plate 51
VHB adhesive method. 51
FmX and CFX-750 displays: Installing the RTK radio antenna 55

5 Power Harness Installation 57

FmX integrated display components. 58
CFX-750 display components 59
FmX and CFX-750 displays: Installing the power harness. 61
FmX and CFX-750 displays: Configuring the power bus options 63
Display power button is used to turn on the Autopilot system 63
External switch is used to turn on the Autopilot system 64
Ignition is used to turn on the Autopilot system 65

6 Controller Installation. 67

Installing the controller 68
Controller connections 70
Connecting the cables to the controller 71

7 Final Machine Check 73

Performing the final machine check 74

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.

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

CFX-750 display and FmX integrated display

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

Required components

Kits required	Special tools
Platform kit: P/N 54038-62	Drill $^{5}/_{16}$" and $^{7}/_{16}$" drill bits Allen wrench set (metric and SAE) Open ended wrench set (metric and SAE)

Antenna mounting kits

Antenna options
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 For AG15/AG25/Zephyr™ models use: • Magnetic GPS antenna bracket: P/N 46706 • Magnetic mount: P/N AG12920-00 • Elevated Roof Mount: 62380-00

Accessory kits

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

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit (P/N 54038-62)	CAN Bus cable	Chapter 2
	Bolt kit controller	Chapter 6
Common parts	Controller	Chapter 6
	Controller mounting bracket	Chapter 1
	Cable kit: • Main wiring harness • Power bus auxiliary wiring harness • Sonalert alarm	Chapter 6
GNSS receiver	GNSS receiver	Chapter 3
	GNSS antenna	
	GNSS receiver power/data cable	
	RTK radio, cable, and radio antenna	

Hardware	Component	See...
Display	CFX-750 display	Chapter 4
	FmX integrated display	
	Display cable	
	Mounting bracket	
Roof bracket kit: (P/N 62380-00)	Roof brackets	Chapter 3
	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.*

Pre-installation checks

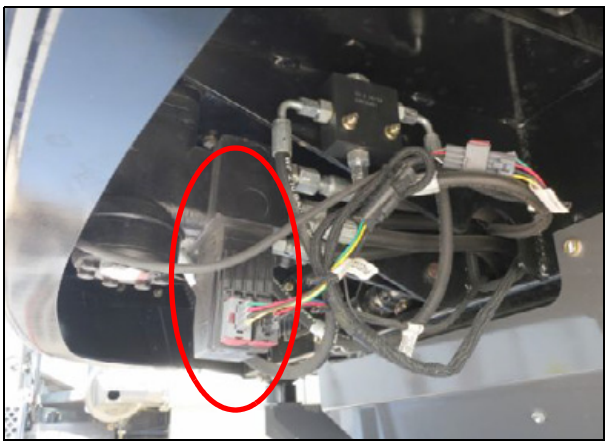
Step 1

Verify that the combine is Auto-Guide Ready before you begin. There are two easy ways to check:

There should be an Auto-Steer switch under the right armrest in the cab. If this switch is not present, the combine is probably not AGR.



Also, look for the Sauer-Danfoss control module next to the hand pump, underneath the cab. This installation can be performed if, and only if this module is present.



Step 2

After you have confirmed that the machine is Auto-Guide Ready, AGCO recommends that the steering system be calibrated with their Electronic Diagnostic Tool (EDT) prior to installation of 3rd party guidance. Please contact your local AGCO dealer to perform this calibration procedure to ensure optimal system performance.

CHAPTER

2

Steering Interface Cable Installation

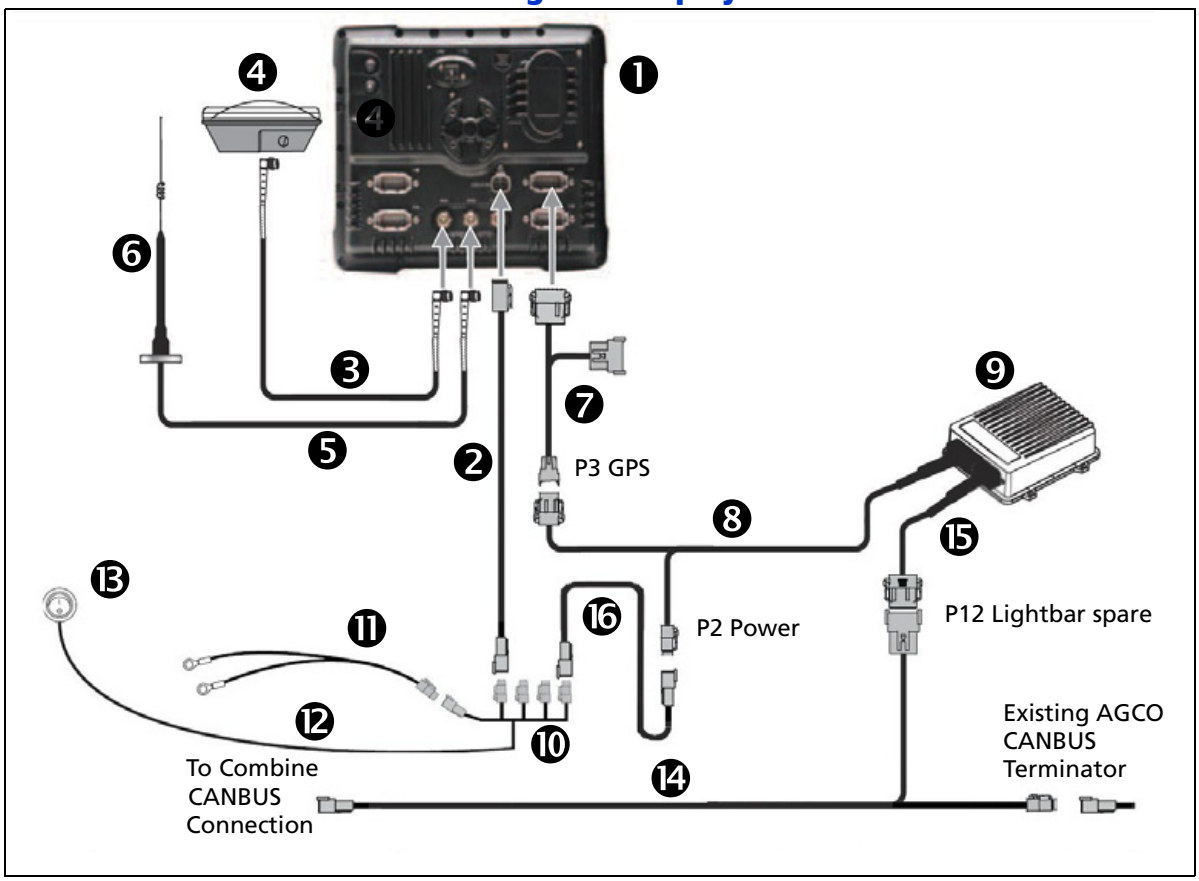
In this chapter:

- Appendix , Auto-Guide Ready Interface Cable
- Appendix , Installing the Auto-Guide Ready Cable

This chapter describes how to install the CAN interface cable in the vehicle.

Auto-Guide Ready Interface Cable

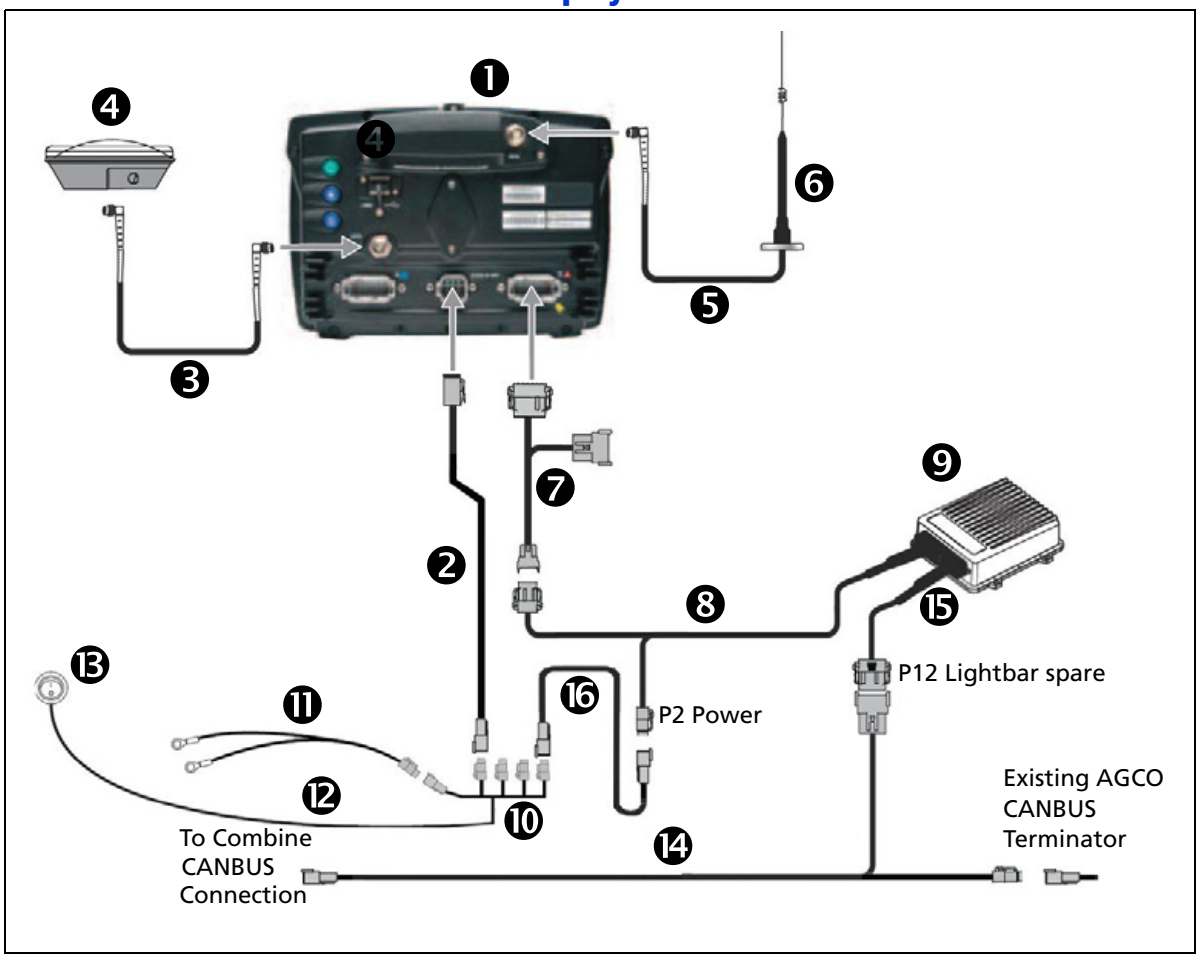
CAN interface cable for FmX integrated display



Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	GPS, 5M, TNC/TNC RT angle cable	50449
❹	GNSS antenna	77038-00
❺	Antenna cable and base	62120
❻	SNB900 radio antenna kit	28822-10
❼	FmX to NavController II cable with port replicator ***Note –*** *Do not connect to P4 or P12 on NavController II*	75741
❽	NavController II main cable	54601
❾	NavController II	55563-00
❿	FmX power cable with relay and switch	67259
⓫	FmX basic power cable	67258

Item	Description	Trimble part number
⓬	Switch cable: Included with P/N 67259	
⓭	Switch - optional: Included with P/N 67259 (illuminated switch sold separately)	
⓮	CAN Interface cable	90324
⓯	NavController II auxiliary harness	54602
⓰	2 pin DTM to 2 pin DT power adaptor	67095

CAN interface cable for CFX-750 display



CAUTION – Connecting the Port Replicator on the CFX-750 display to NavController II cable ❼ to the P4 or P12 connector of the NavController II harness ❽ 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.*	94100-01
❷	CFX-750 power cable	77282
❸	8 m GPS TNC/TNC RT angle cable	50449
❹	AG25 GNSS antenna	77038-00
❺	NMO to TNC 20ft antenna cable and base	62120
❻	900 MHz radio antenna kit	22882-10
❼	CFX-750 to NavController II cable with port replicator ***Note –*** *Do not connect to P4 or P12on NavController II*	75741

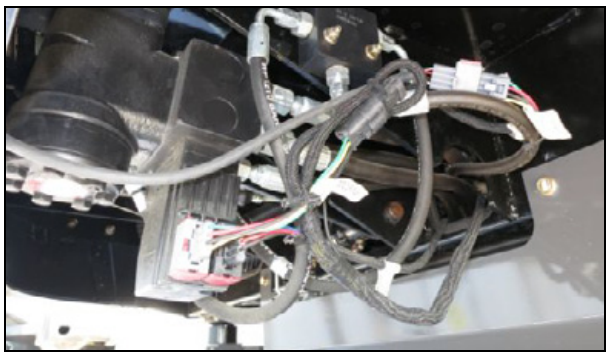
Item	Description	Trimble part number
❽	Main NavController II cable	54601
❾	NavController II	55563-00
❿	CFX power cable with relay and switch (power bus)	67259
⓫	Basic power cable	67258
⓬	Switch cable: Included with P/N 67259	
⓭	Switch - optional: Included with P/N 67259 (illuminated switch sold separately)	
⓮	CAN Interface cable	90324
⓯	NavController II auxiliary harness	54602
⓰	2 pin DTM to 2 pin DT power adaptor	67095

Installing the Auto-Guide Ready Cable

Step 1

Underneath the cab, on the Sauer-Danfoss module by the hand pump, locate the free 3-pin Deutsch connector. It is triangular and black, and should be secured to other wire harnesses with a zip tie.

Locate the valve/manifold assembly.



Step 2

Unplug the terminator from this connector, it should have the Deutsch P/N DT04-3P.

Set this terminator aside, but do not throw it away. The machine will not function properly without this terminator.

Plug the CAN interface cable (P/N 90324) into this location with connector R1.



Step 3

Plug the terminator back into the CAN interface cable on the other end, at connector P1.

Step 4

Plug the remaining connector, R12, into P12 on the NavController II auxiliary harness (P/N 54602).

CHAPTER

3

Antenna/Receiver Installation

In this chapter:

- Installing the antenna mount
- AgGPS 262/AG-372 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)
- 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, or an *Ag*GPS 432/442/542 receiver and antenna.

To install the antenna for an FmX integrated display or CFX-750 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:

- **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 20.
- **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
FmX integrated display; CFX-750 display	✓	✓
EZ-Guide 500 lightbar	✓	✓
*Ag*GPS 262 / AG-372 / 252 receiver	x	✓
*Ag*GPS 432 / 442 / 542 receiver	✓	✓

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.

- **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 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.

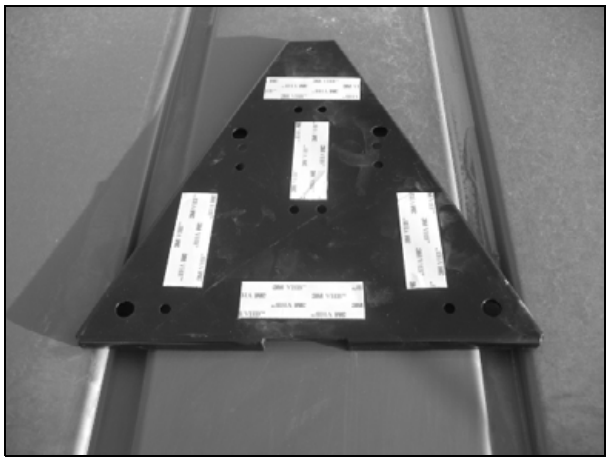


Step 2

V plate only

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

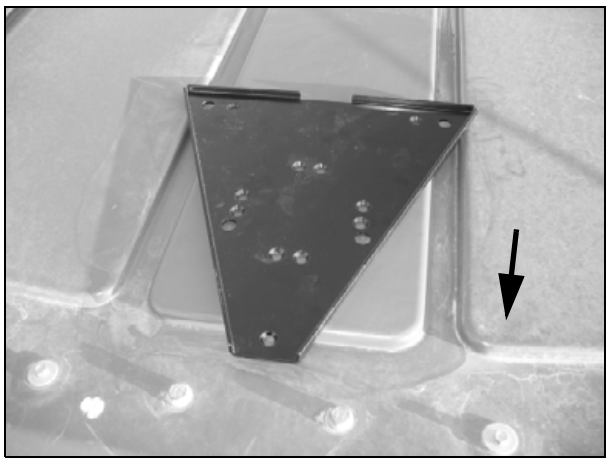
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



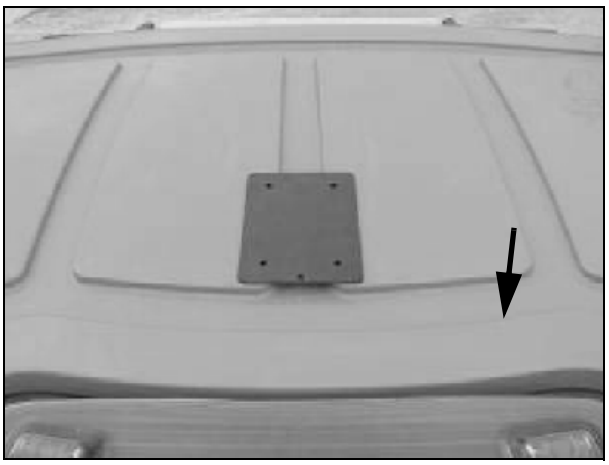
Step 3

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



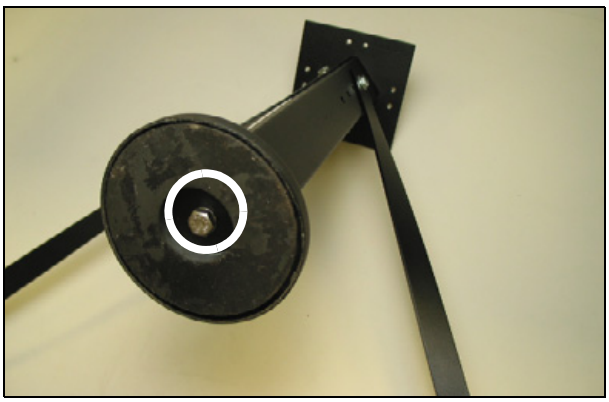
4" x 6" plate

Installing the antenna mount

Note – *Because elevated grain bin extensions may block satellite signals, Trimble recommends that you do not use low roof mounts for this series of machines.*

Step 1

Attach the 5" round magnet to the 2" square tubing. Use the provided $^{3}/_{8}$" screw and washer.



Step 2

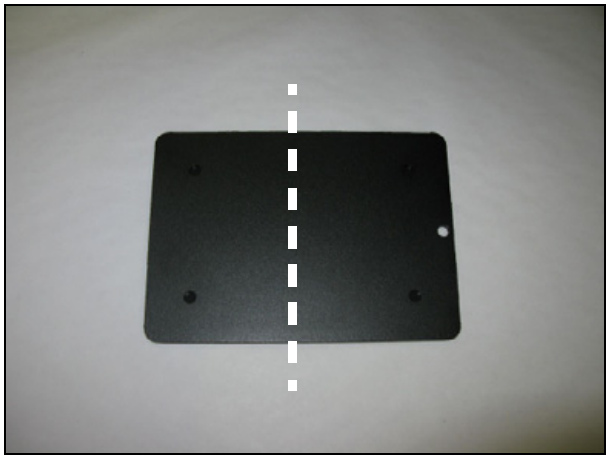
Attach the support braces to the second set of holes with the ¼" hardware provided.





Step 3

Cut one of the supplied mount plates in half to allow the plate to fit between the ribs on the roof.



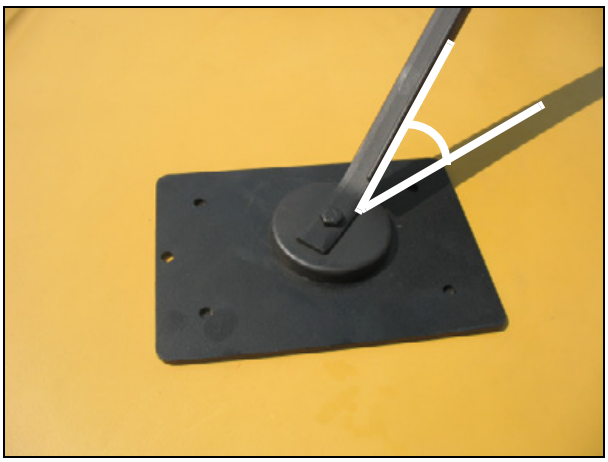
Step 4

Position the bracket and supports on the roof of the cab, placing the 5" magnet mount plate centered on, and in front of the two bolts as shown.



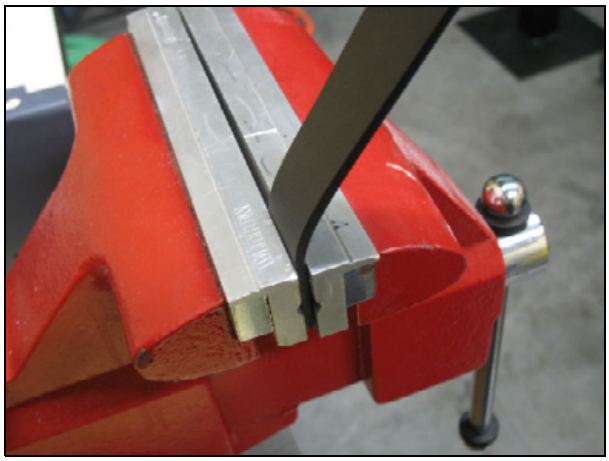
Step 5

Extend the legs to the cab roof and measure the angle of the roof relative to the supports.



Step 6

Approximately 1½" in from the end of the support leg, bend the leg to match the angle of the roof.



Step 7

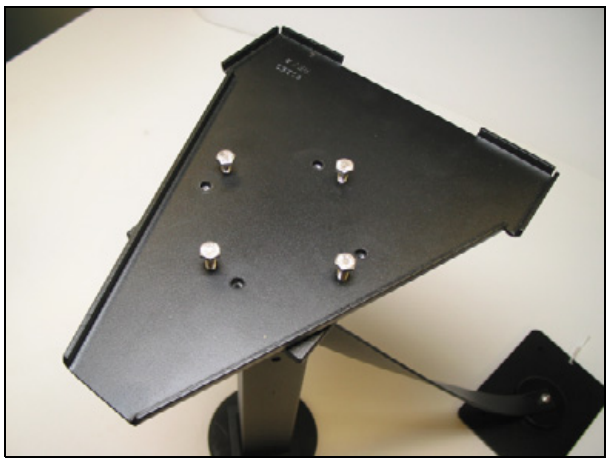
Attach the 3" magnets to the supports. Use the ¼" hardware provided.



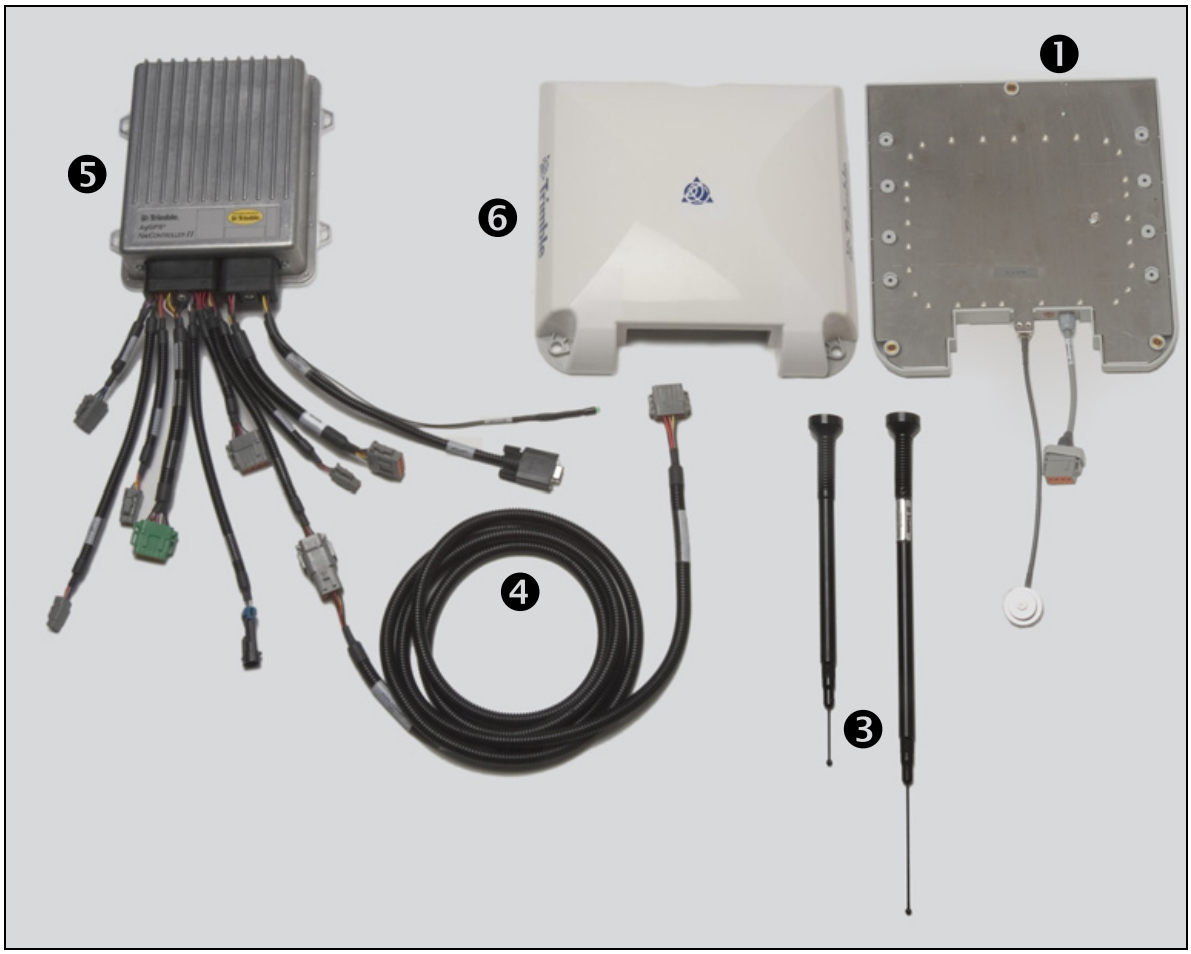
Step 8

Mount the magnet base plate or receiver plate directly to the 2" tubing with the ¼" flathead screws provided.

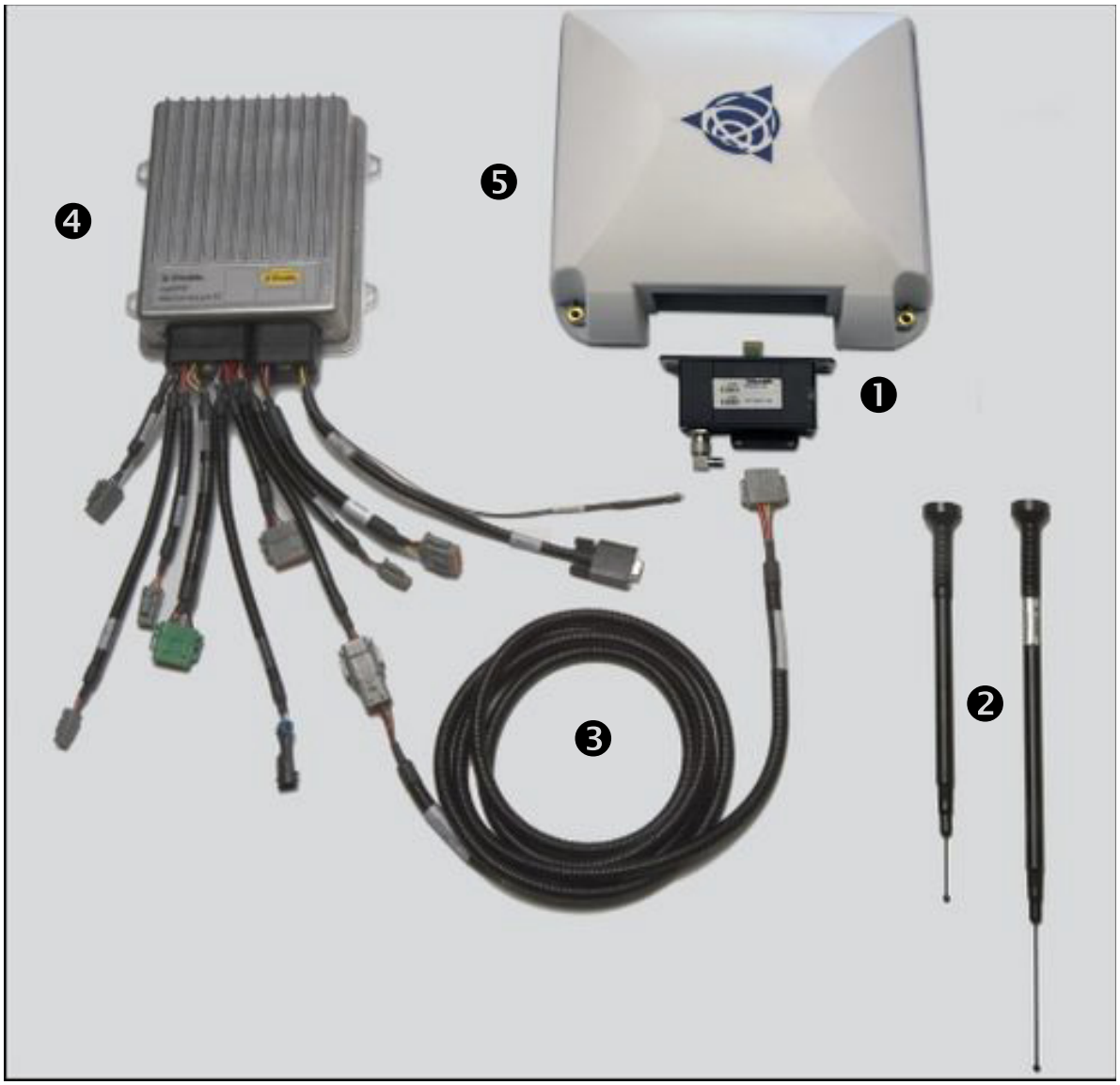
Note – *The triangle should point forward.*



*Ag*GPS 262/AG-372 GPS receiver with *Ag*GPS 450/900 radio module (if equipped) components



Item	Description	Trimble part number
1	*Ag*GPS 450 or 900 radio (if equipped)	
2	Radio antenna cable and magnetic mount	
3	*Ag*GPS 450 or 900 radio antenna	
4	Antenna/receiver cable	54608
5	*Ag*GPS Autopilot controller	
6	*Ag*GPS 262 antenna/receiver	



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	
❹	Autopilot controller	54608
❺	AG-372 antenna/receiver	

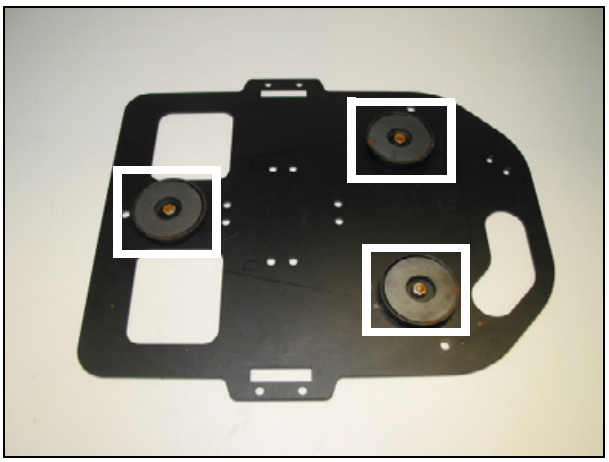
Installing the *Ag*GPS 262/AG-372 GPS receiver with *Ag*GPS 450/900 radio module (if equipped)

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.

Removable installation

Step 1

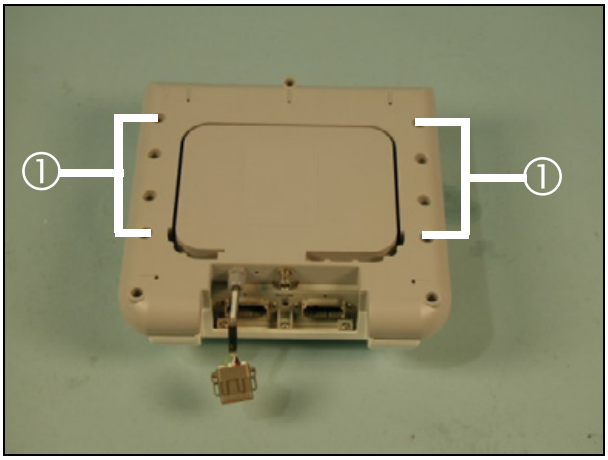
Attach the three supplied magnets to the plate with the ¼" flathead screws and hardware provided.



Underside of plate

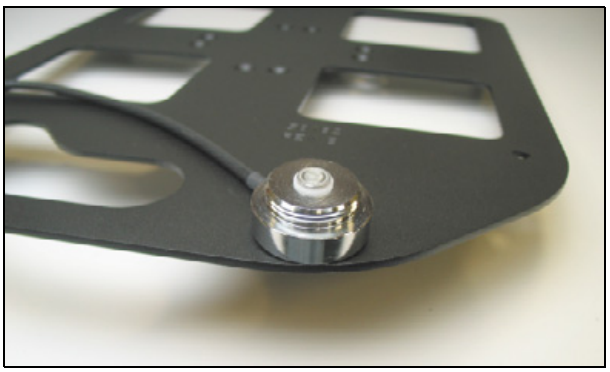
Step 2

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



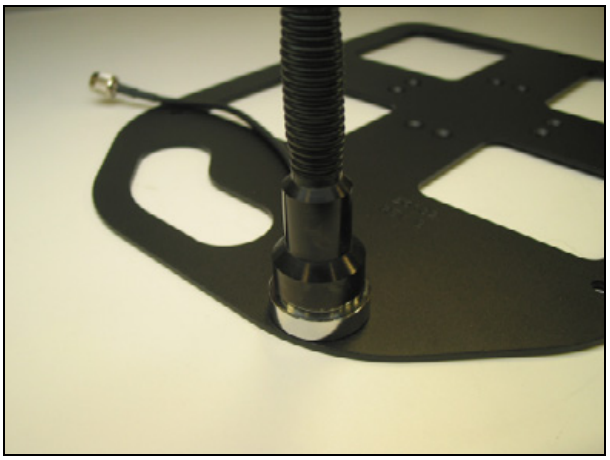
Step 3

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



Step 4

Attach the radio antenna to the antenna base.



Step 5

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.



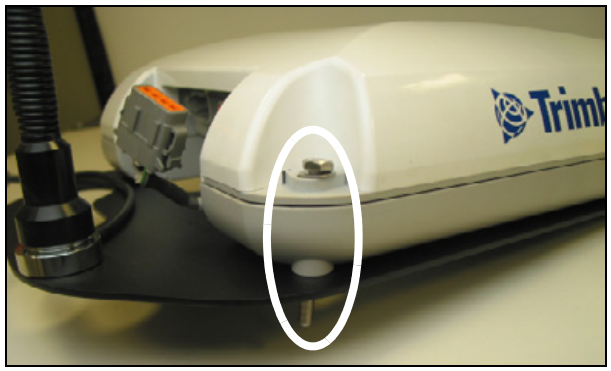
Step 6

Insert the nylon bushings provided.



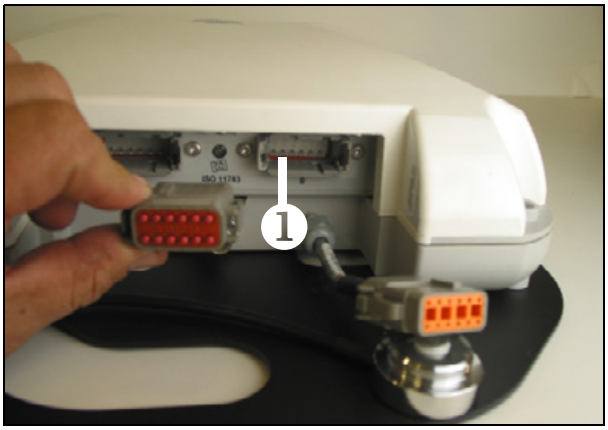
Step 7

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



Step 8

Remove the connector plug from port B ❶.



Step 9

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



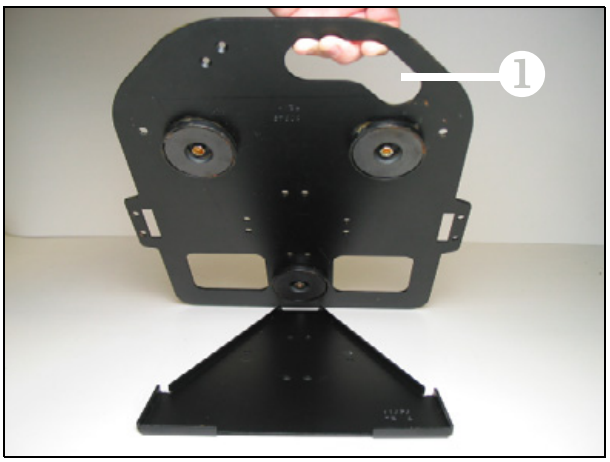
Step 10

Connect the radio antenna to the antenna port.



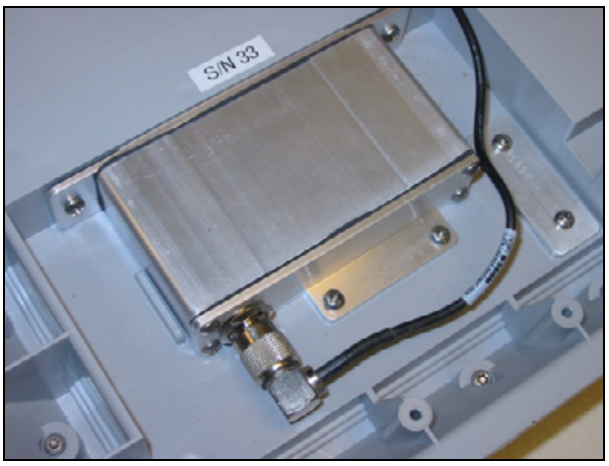
Step 11

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.



AG-372 receiver only

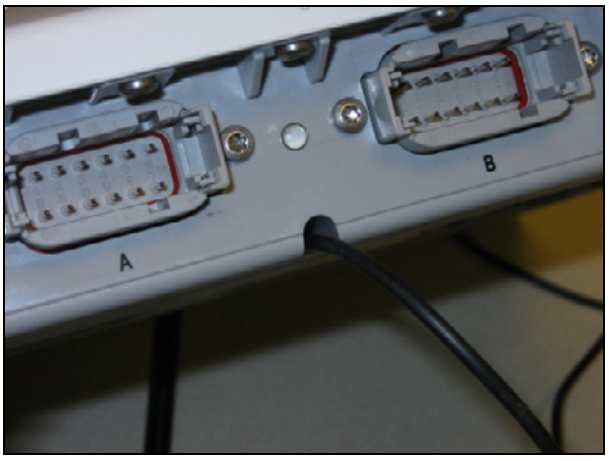
Attach the radio antenna to the internal radio. Route the cable as shown.



Route the cable through the cable pass as shown.



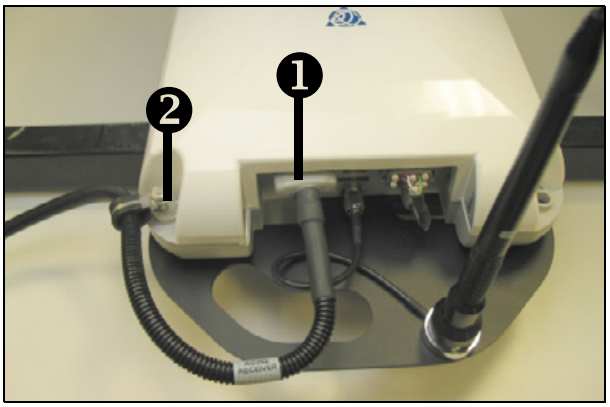
Run the cable out to RTK antenna.



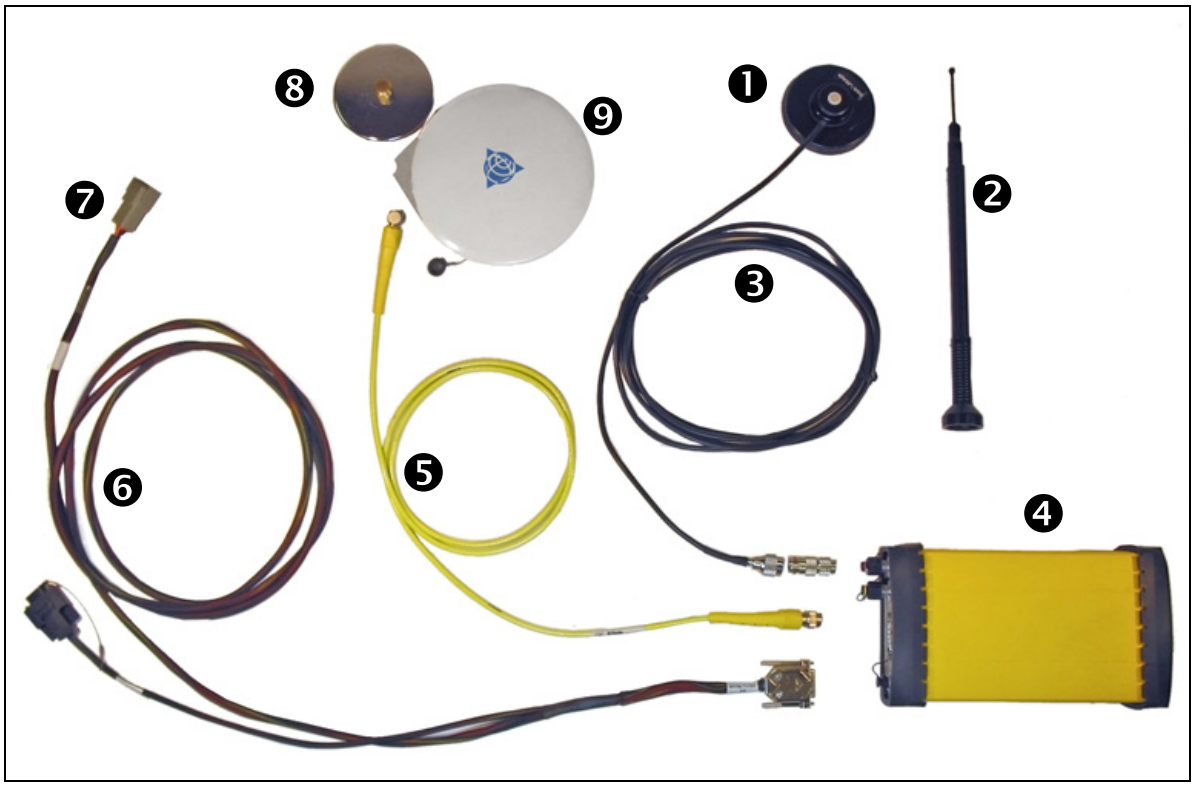
Step 12

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.



*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 432/442/542 GPS receiver	
❺	Antenna cable	
❻	Receiver cable	62037
❼	To controller “P3 GPS”	
❽	Antenna magnetic mount	
❾	*Ag*GPS 432/442/542 antenna	

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

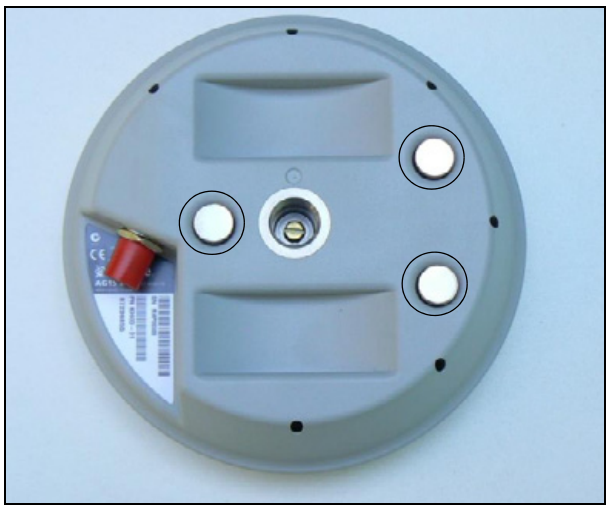
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

GLONASS, RTK, or OmniSTAR 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.

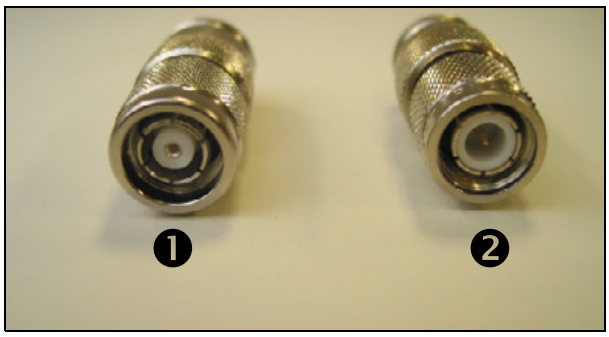


Step 5

Identify the correct adaptor for the radio connection:

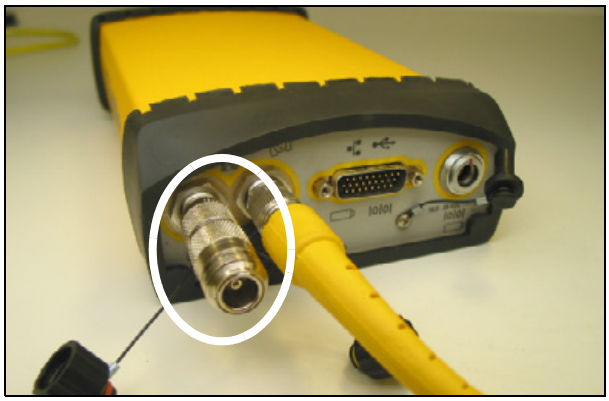
❶ Reverse polarity TNC-to-N for 900 MHz radios

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



Step 6

Attach the adaptor to the radio port.



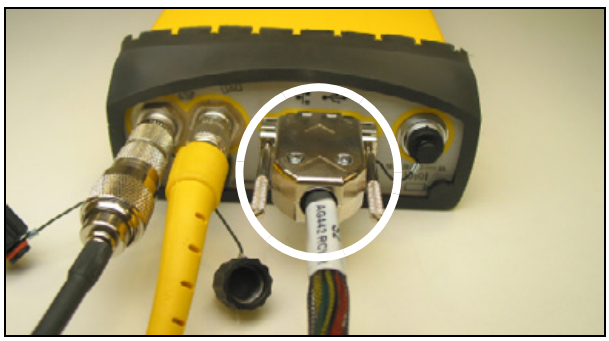
Step 7

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 Controller connections.



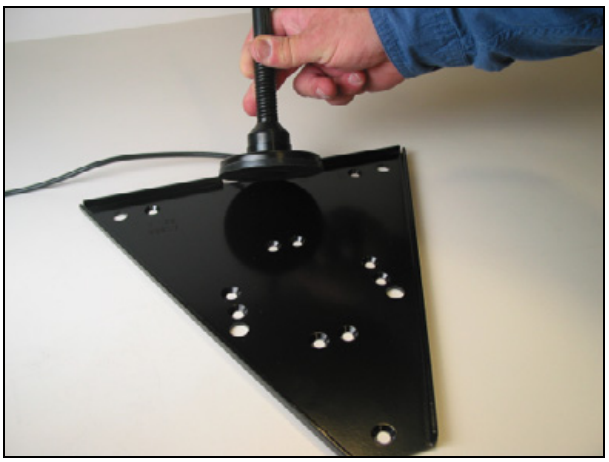
Step 9

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

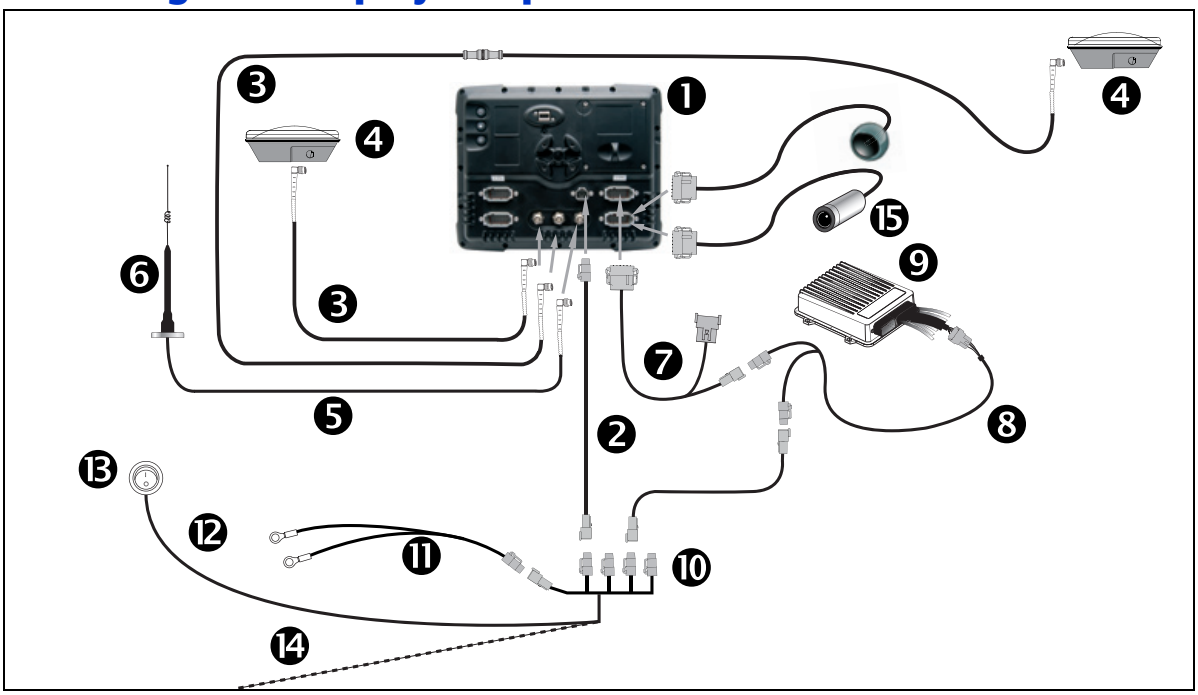
Display Installation

In this chapter:

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

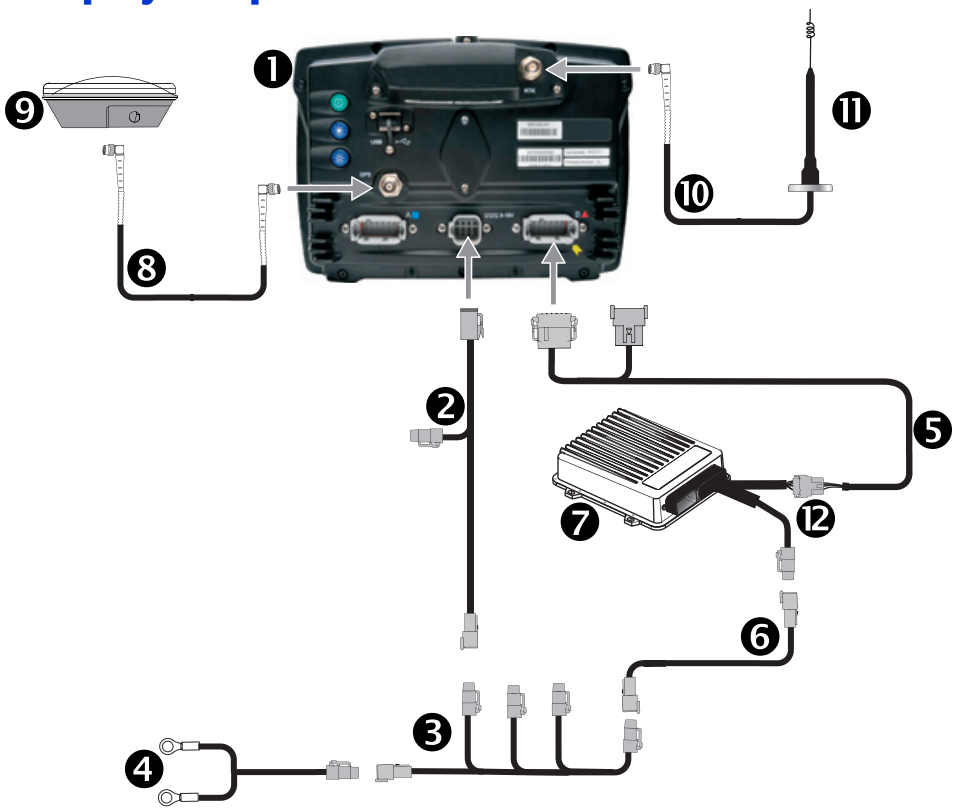
This chapter describes and how to install and connect the FmX integrated display, or the CFX-750 display in the vehicle.

FmX integrated display components



Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	GPS, 5M, TNC/TNC RT angle cable	50449
❹	GNSS antenna	77038-00
❺	Antenna cable and base	62120
❻	SNB900 radio antenna kit	28822-10
❼	FmX to NavController II cable w/ port replicator	75741
❽	NavController II main cable	54601
❾	NavController II	55563-00
❿	FmX power cable w/ relay and switch	67259
⓫	FmX basic power cable	67258
⓬	Switch cable: Incl with P/N 67259	
⓭	Switch - optional: Incl with P/N 67259 (illuminated switch sold separately)	
⓮	Ignition sense cable: Incl with P/N 67259	
⓯	AgCam (purchased separately)	

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 ***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
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

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. Use the provided bolts to attach the bar mount to the rail

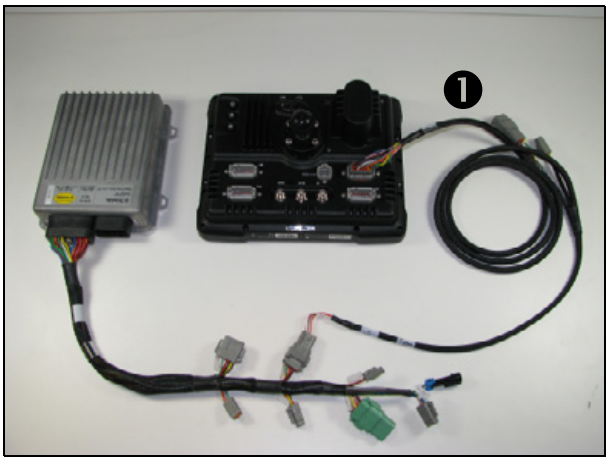
Step 2

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

FmX integrated display: Installing the wiring harness

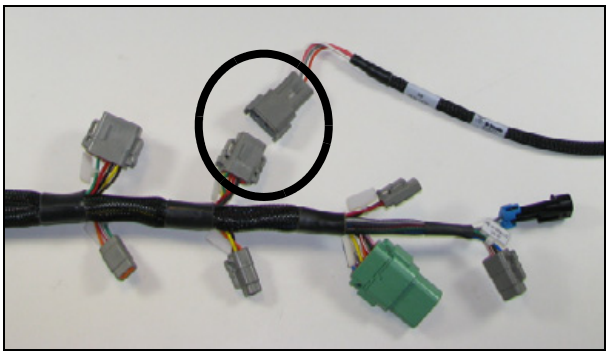
Step 1

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



Step 2

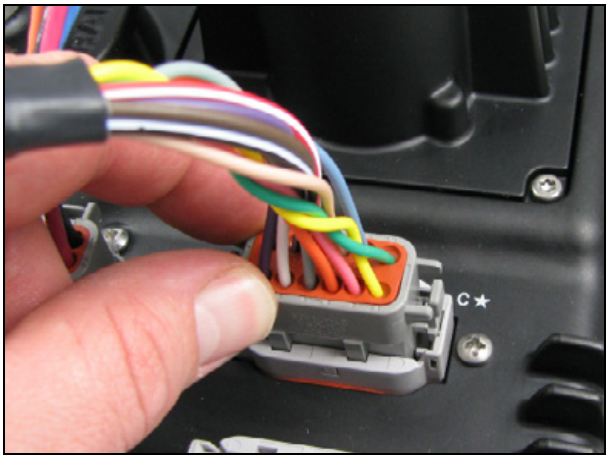
Connect the cable to the P3 connector on the NavController II main harness, and then route the cable from the NavController II to the mounting location on the FmX integrated display.



Step 3

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

Note – *To connect power to the FmX integrated display, see Power Harness Installation.*



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.

To connect power to the CFX-750 display, see *Power Harness 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.



FmX and CFX-750 displays: Connecting accessory options

AgCam

The AgCam and AgCam cable are accessory items that you can purchase separately from the display. The FmX 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 toward the display.



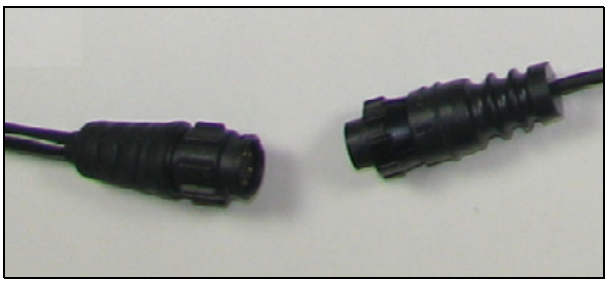
FmX display



CFX-750 display

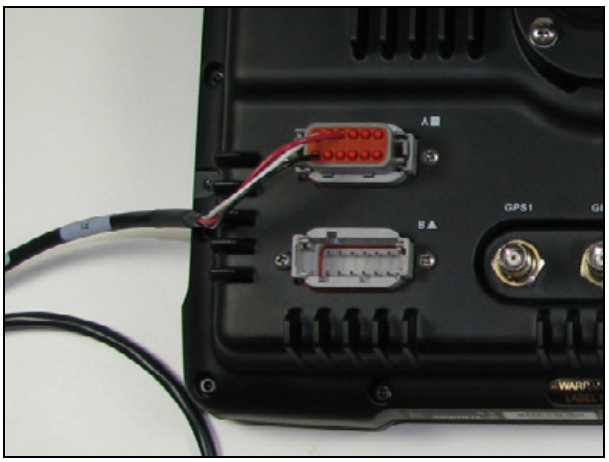
Step 3

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.



FmX and CFX-750 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 – *Because elevated grain bin extensions may block satellite signals, Trimble recommends that you use an elevated roof mount. See Chapter 3, Antenna/Receiver Installation.*

Note – *The V plate antenna bracket is available on the Autopilot price list. See Antenna mounting kits, page 9.*

VHB adhesive method

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

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

Step 1

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

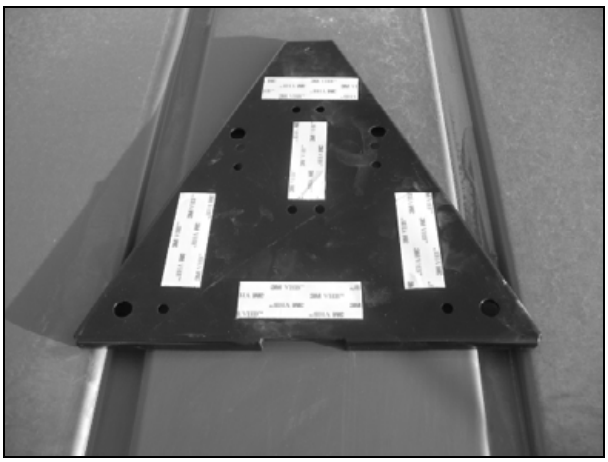


Step 2

V plate only

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

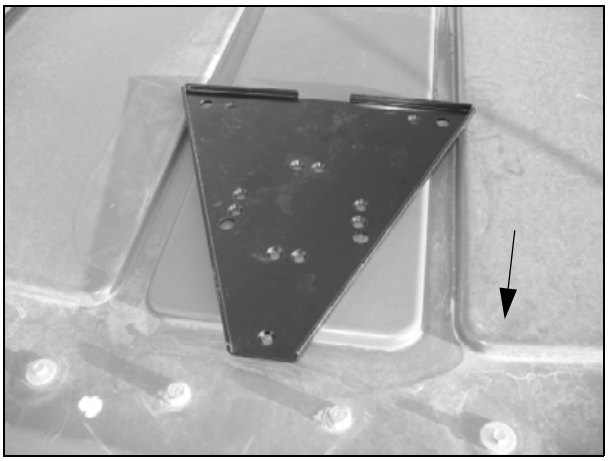
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



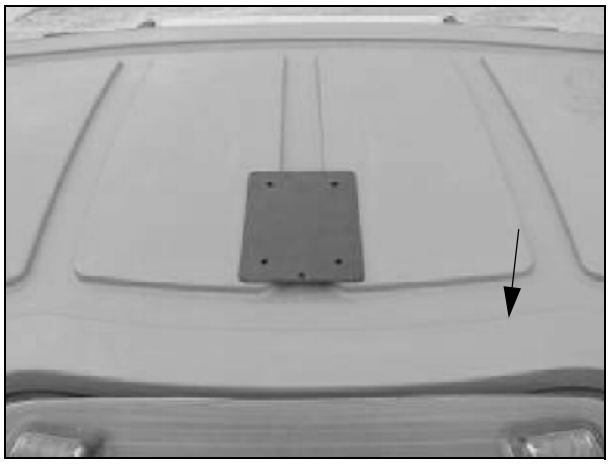
Step 3

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

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



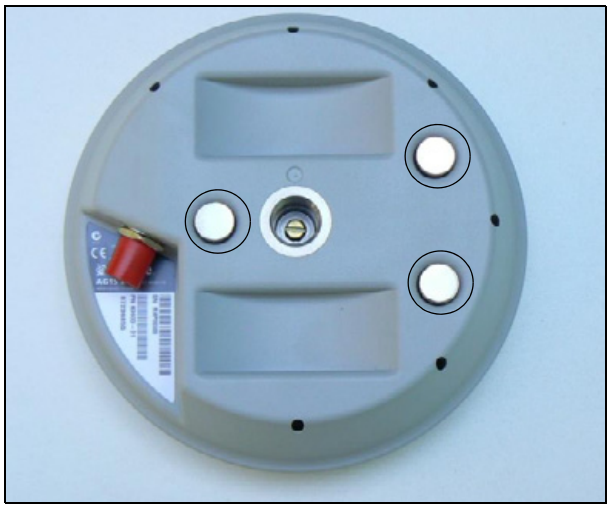
V plate



4" x 6" plate

Step 4

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



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



Step 5

RTK, OmniSTAR, DGPS, GLONASS applications

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



WAAS, EGNOS, VBS, Beacon applications

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



Step 6

Both models

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



FmX and CFX-750 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.

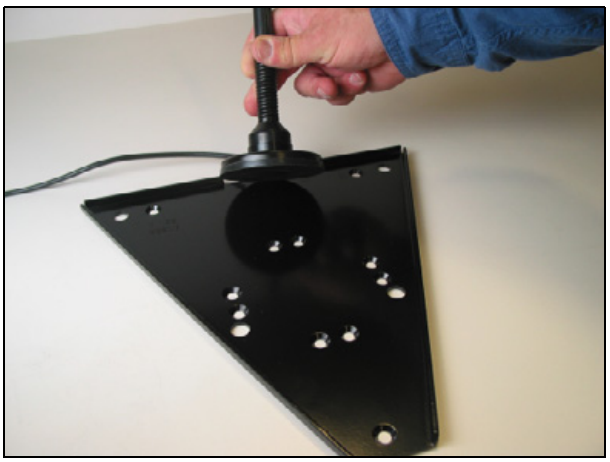
Step 1

Connect the radio antenna to the magnetic antenna base



Step 2

Attach the magnetic radio antenna base to the rear f 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

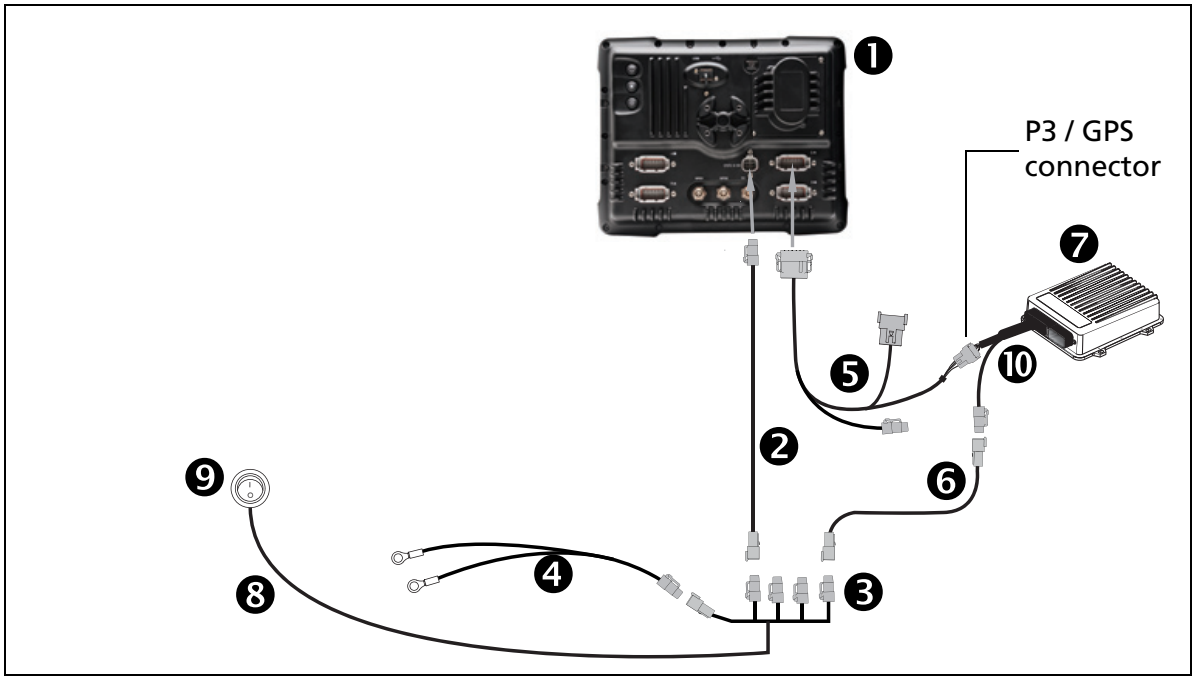
Power Harness Installation

In this chapter:

- FmX integrated display components
- CFX-750 display components
- FmX and CFX-750 displays: Installing the power harness
- FmX and CFX-750 displays: Configuring the power bus options

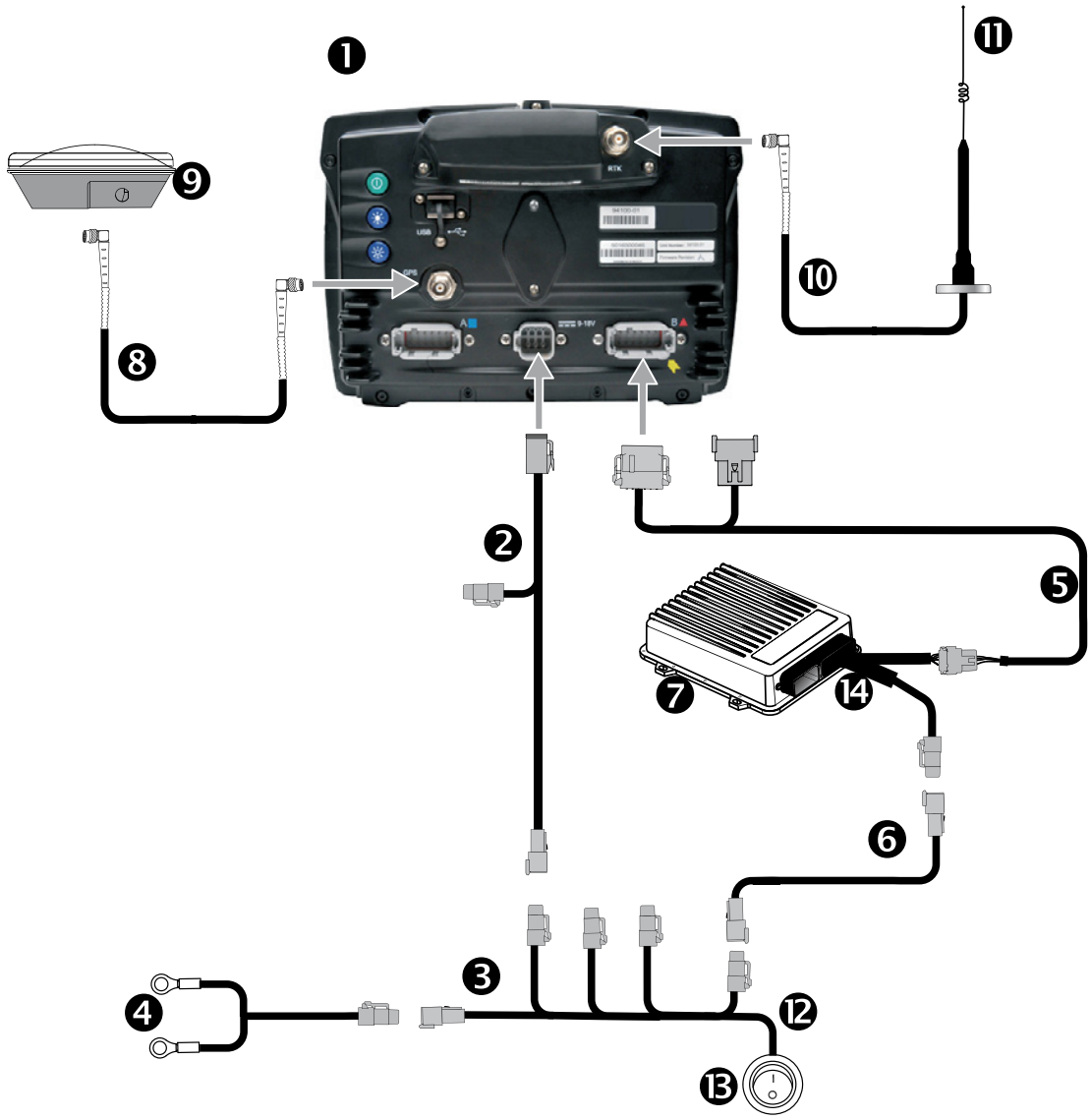
This chapter describes how to install the power harness in the vehicle.

FmX integrated display components



Item	Description	Trimble Part No.
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	External switch cable incl with kit	Part of P/N 67259
❾	External switch incl with kit	Part of P/N 67259
❿	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 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
❸	CFX-750 power cable with relay and switch (power bus)	67259

Item	Description	Trimble part number
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

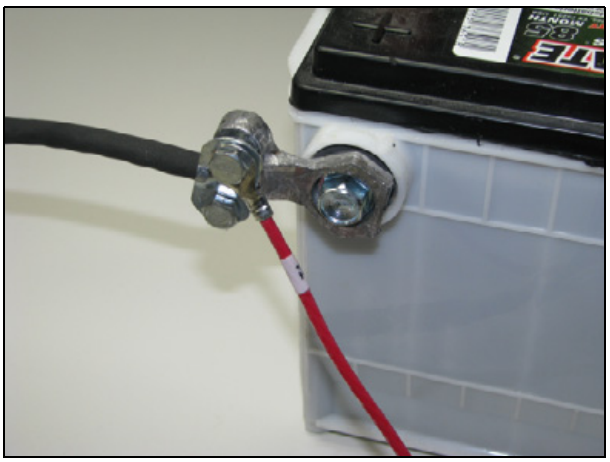
FmX and CFX-750 displays: Installing the power harness

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.

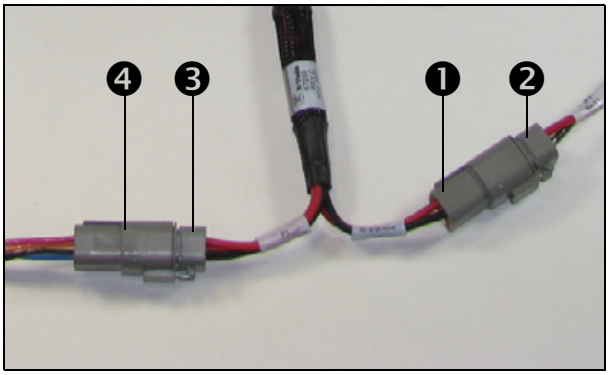
Step 1

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



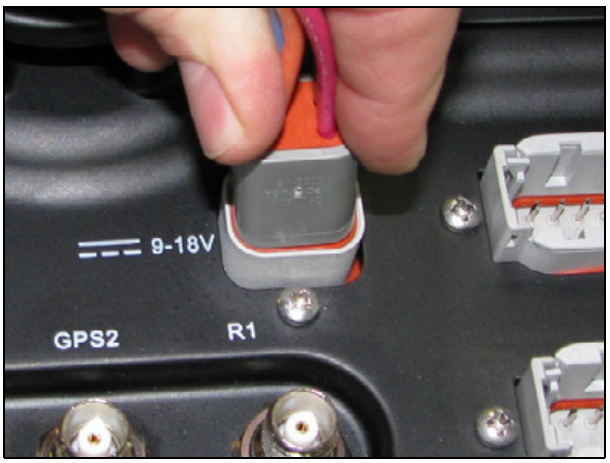
Step 2

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.*

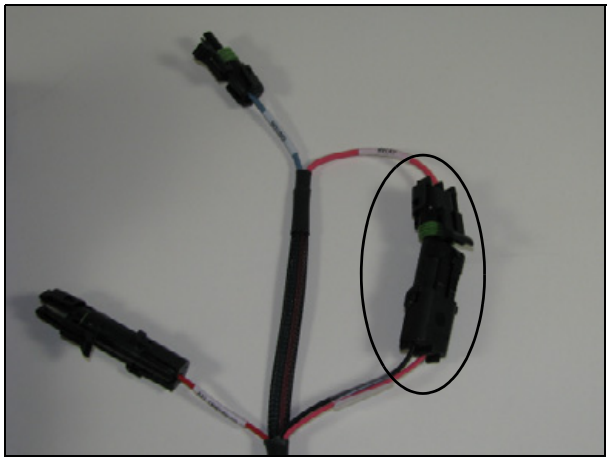
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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.

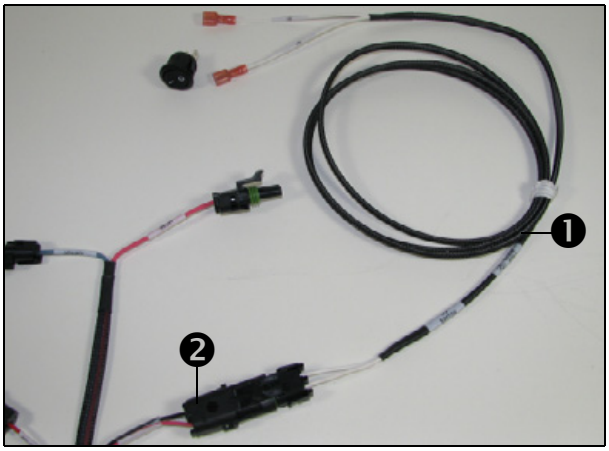


External switch is used to turn on the Autopilot system

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.

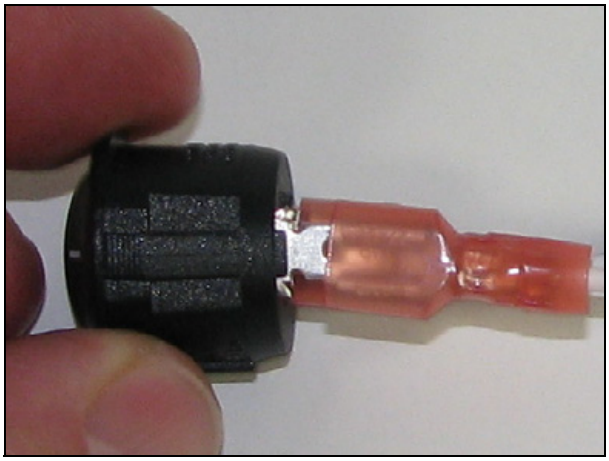
Note – *To install the switch provided, drill a ¾" hole.*



Step 2

Connect the cable labeled R7 to the switch pins.

Note – *Polarity is not important.*

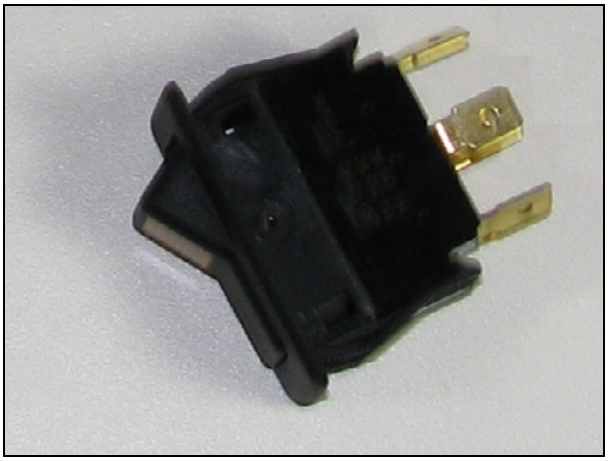


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

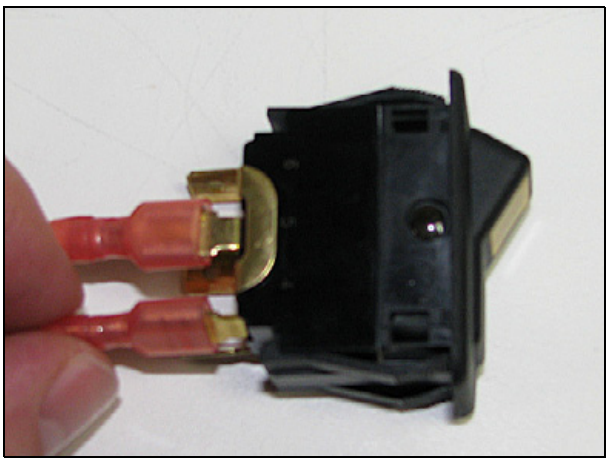


Step 2

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.

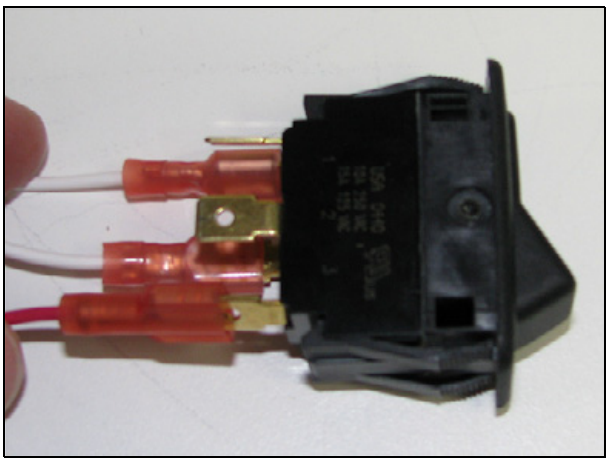
Note – *Polarity is important.*



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.*

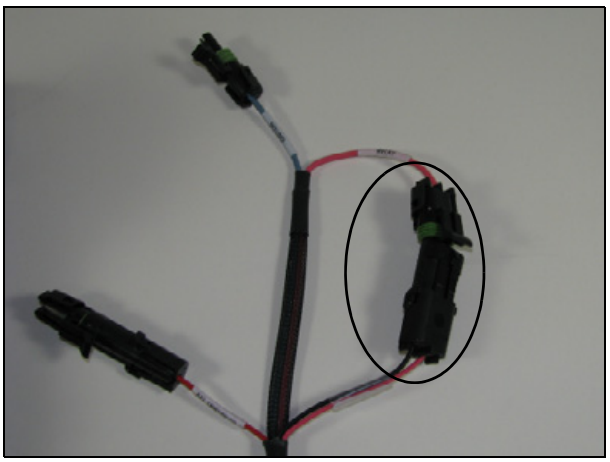


Ignition is used to turn on the Autopilot system

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

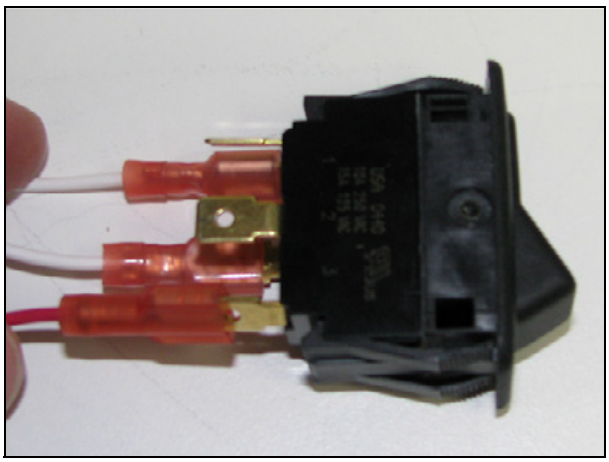
Step 1

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.

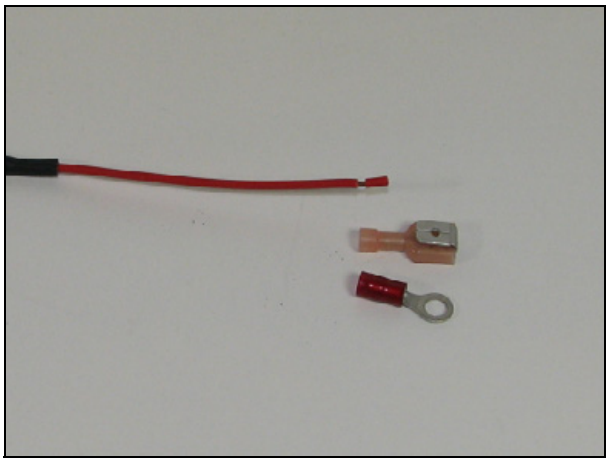


Step 3

Route the cable to the vehicles ignition.

Step 4

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



CHAPTER

6

Controller Installation

In this chapter:

- Installing the controller
- Controller connections
- Connecting the cables to the controller

This chapter describes how to install the controller unit.

Installing the controller

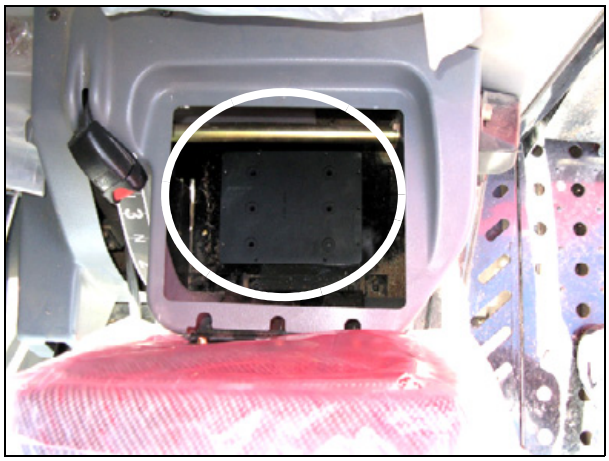
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Note – *Trimble recommends that the controller be mounted in the compartment below the buddy seat, with the electronic connectors orientated towards the right of the vehicle.*

Step 1

Locate the plate in the recommended mounting location and ensure the plate is orientated square to the centerline of the vehicle.

Note – *Degraded performance can be observed if the orientation of the NavController II is not square with the frame/front axle of the vehicle*



Step 2

Use the plate to mark locations for the 4 mounting holes and then drill the holes.

CAUTION – Ensure the location for the holes does not allow the drill to damage components situated below the plate.



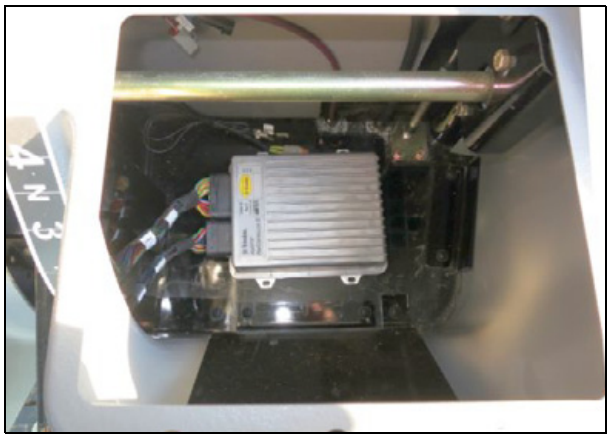
Step 3

To gain access to the compartment under the buddy seat, fold the seat back down, and lift up from the rear.



Step 4

Install the controller to the floor with the supplied controller bracket (P/N 54828), with the label up and connectors pointing to the right of the vehicle.

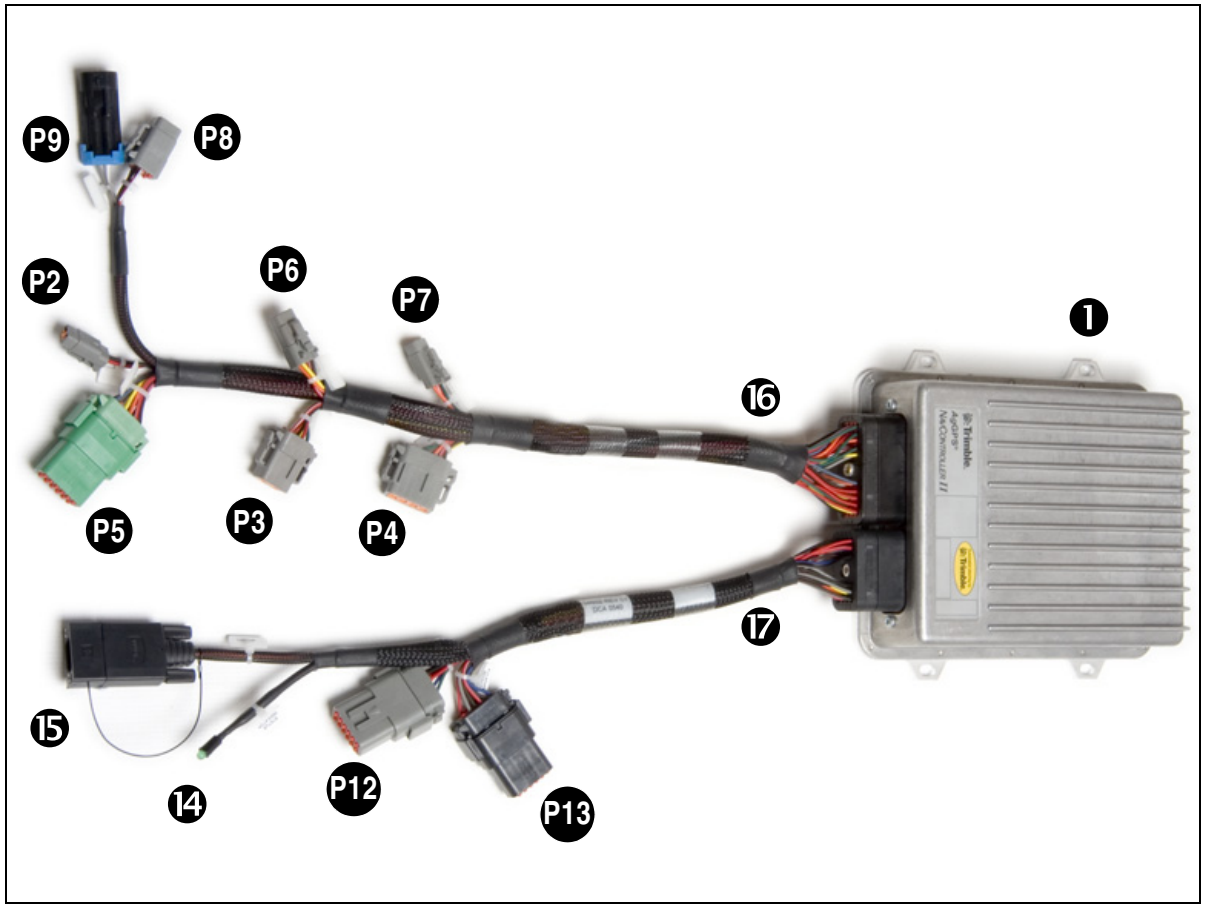


Step 5

Make sure to route the cables clear of the emergency brake and gear selector, which are located between the driver's seat and the buddy seat. Return the buddy seat to its original position.



Controller connections



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

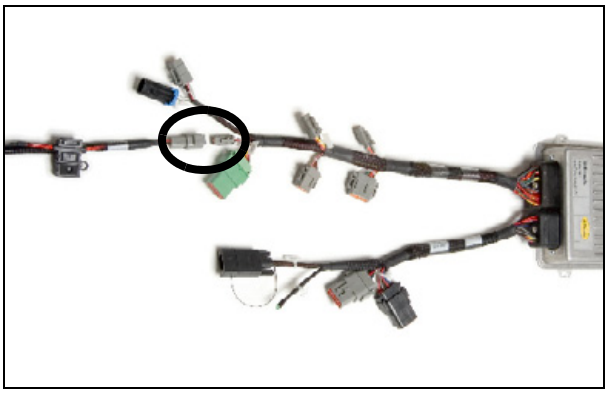
Item	Description
P9	Sonalert connector
P12	Lightbar/spare connector
P13	Spare sensors connector
14	Status indicator
15	Laptop connector
16	Main harness
17	Auxiliary harness

Connecting the cables to the controller

Step 1

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

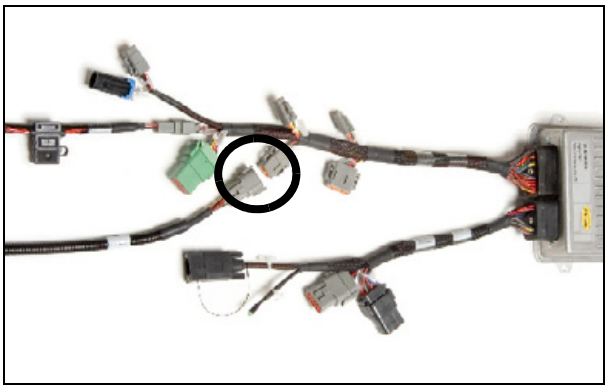
Note – *The power connection supplies power through the controller to all connected devices, including GPS and displays.*



Step 2

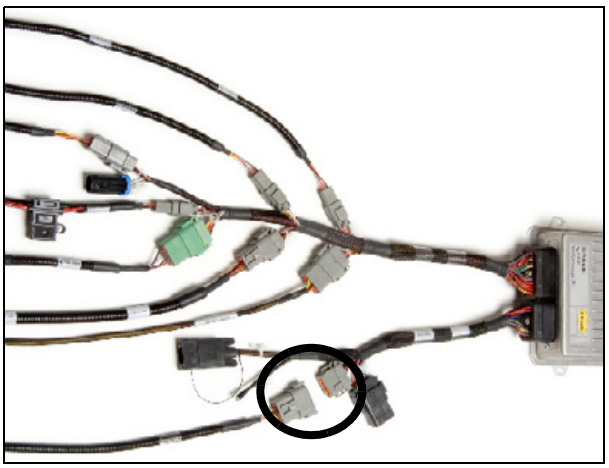
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.

For FmX and CFX-750 installations, plug the main display cable in here



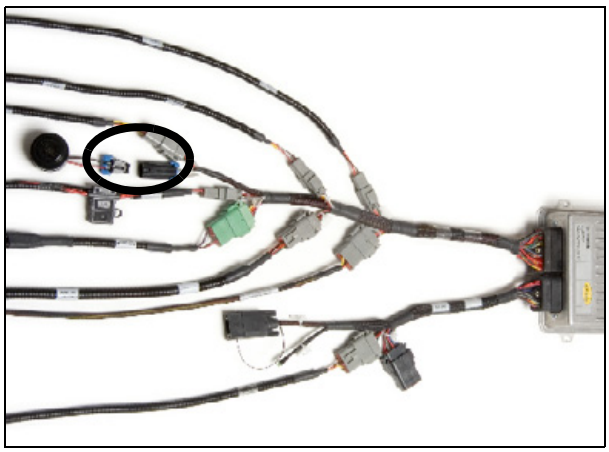
Step 3

Plug the Can interface cable connector, R12, into P12 on the NavController II auxiliary harness (P/N 54602).



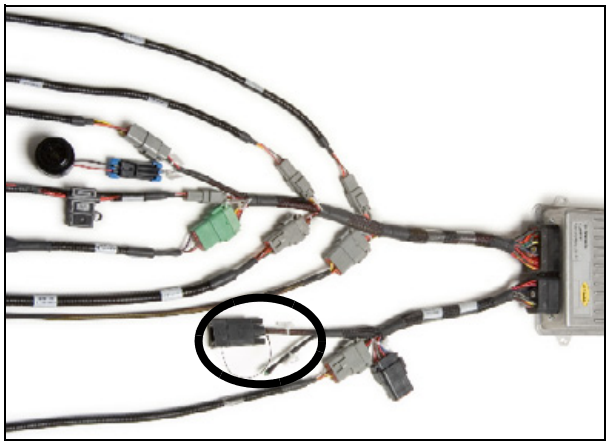
Step 4

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 5

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 6

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

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. Download the latest external vehicle profiles, NavController II firmware, Flashloader 200 and Autopilot Toolbox from http://agpartners.trimble.com.
3. Connect and run the Autopilot Toolbox II software for system setup and calibration. For more information, refer to the *Autopilot Toolbox II Software User Guide*.
4. Open the *Diagnostic* page of the Autopilot Toolbox II software and ensure that all signals from the hydraulics and sensors are active.