Installation Instructions

*Ag*GPS® Autopilot™ Automated Steering System

Buhler

- **2290**
- **2335**
- **2360**
- **2375**
- **2425**
- **435**
- **485**
- **535**

New Holland

- **9180 High Flow Hydraulic Option**
- **9280 High Flow Hydraulic Option**
- **9282**
- **9284**
- **9480 High Flow Hydraulic Option**
- **9482**
- **9484**
- **9680 High Flow Hydraulic Option**
- **9682**
- **9684**
- **9880 High Flow Hydraulic Option**
- **9882**
- **9884**

Version 4.00
Revision B
July 2009
Part Number 54036-50-E04

Trimble®

Contact Information

Trimble Agriculture Division
10355 Westmoor Drive
Suite #100
Westminster, CO 80021
USA
(877) 447-7785 (US toll free)
+1-408-856-6491 (International)
trimble_support@trimble.com
www.trimble.com

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This is the July 2009 release (Revision B) of the *Ag*GPS *Autopilot Automated Steering System Installation Instructions*, part number 54036-50-E04. It applies to version 4.00 of the *Ag*GPS Autopilot automated steering system

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Trimble warrants that this Trimble product and its internal components (the "Product") shall be free from defects in materials and workmanship and will substantially conform to Trimble's applicable published specifications for the Product for a period of one (1) year, starting from the earlier of (i) the date of installation, or (ii) six (6) months from the date of product shipment from Trimble. This warranty applies only to the Product if installed by Trimble or a distributor authorized by Trimble to perform Product installation services.

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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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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.

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CHAPTER

1

Introduction

In this chapter:

- Technical assistance
- Your comments
- Manual system upgrade to Autopilot
- Required components
- Autopilot hardware organization – as shipped
- Autopilot hardware organization – as installed
- Preparing the vehicle for installation

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

Even if you have used other 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 GPS, visit the Trimble website (www.trimble.com) for an interactive look at Trimble and GPS.

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**.

Your comments

Your feedback about the supporting documentation helps us to improve it with each revision. Email your comments to ReaderFeedback@trimble.com.

Manual system upgrade to Autopilot

EZ-Guide 500 manual guidance upgrade

Retain	Remove
*Ag*GPS® EZ-Guide® 500 lightbar P/N 66100-xx Antenna for EZ-Guide 500 lightbar: P/N 60600-xx (DGPS) or 57200-00 (OmniStar/RTK) Antenna to receiver cable: P/N 50449 Power cable: P/N 62817 *Optional.* Remote keypad	Power connection cable: P/N 62818

FmX integrated display

Retain	Remove
Trimble® FmX™ integrated display: P/N 93100-xx Antenna for FmX integrated display: P/N 60600-02 (DGPS) or 57970-00 (OmniStar/RTK) Antenna to receiver cable: P/N 50449 Power cable: P/N 67258 & 66694	

Required components

Kits required	Special tools
Platform kit: P/N 54036-50 Buhler 435–535 hydraulic hose kit: P/N 76046 Hydraulic hose kit for all other models: P/N 64864	2" hole saw $^{5}/_{16}$" and $^{7}/_{16}$" drill bits Solder gun and solder Electrical ring terminal kit WeatherPack pin removal tool (see *Troubleshooting Guide* for purchasing information) Allen wrench set (metric and SAE)

Antenna mounting kits

Antenna options
Antenna spar mount: P/N 64898 (recommended for *Ag*GPS 262 receiver or RTK applications)
Antenna V plate mount and *Ag*GPS 262 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the *Ag*GPS 262 receiver – see Chapter 2, Hydraulic Control Valve Installation).

Accessory kits

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

Autopilot hardware organization – as shipped

Hardware	Component	See...
Platform kit **(P/N 54036-50)**	Hydraulic valve	Chapter 2
	Hydraulic manifold	Chapter 2
	Transducer flow switch	Chapter 2
	Manual override cable	Chapter 2
	Hydraulic brackets and bolt kits	Chapter 2
	Hydraulic valve cable	Chapter 2
	AutoSense™ steering device and cabling	Chapter 3
	AutoSense mounting bracket and hardware	Chapter 3
	Power cable and switch	Chapter 6
	Bolt kit controller	Chapter 8
Common parts	Controller	Chapter 8
	Controller mounting bracket	Chapter 8
	Cable kit: • Main wiring harness • Auxiliary wiring harness • Sonalert alarm	Chapter 8
GPS receiver	GPS receiver	Chapter 4
	GPS antenna	Chapter 4
	GPS receiver mounting bracket	Chapter 4
	GPS receiver power/data cable	Chapter 4
	RTK radio, cable, and radio antenna	Chapter 4
Display	EZ-Guide 500 lightbar	Chapter 5
	FmX integrated display	Chapter 5
	*Ag*GPS FieldManager™ display	Chapter 5
	Display cable	Chapter 5
	Mounting bracket	Chapter 5
Hydraulic hose kit **(P/N 76046)**	Hydraulic hoses	Chapter 2
	Hydraulic adaptors	Chapter 2
Roof bracket kit **(P/N 64898)**	Roof brackets	Chapter 4
	Bolt kit, roof bracket	Chapter 4

Autopilot hardware organization – as installed

Hardware	Component	See...
Hydraulics	• Hydraulic valve, manifold, pressure transducer, or flow switch • Hydraulic valve cable • Manual override cable • Hydraulic brackets and bolt kits	Chapter 2
AutoSense steering device	• AutoSense steering device and cabling • AutoSense mounting brackets and hardware	Chapter 3
GPS receiver	• GPS receiver • GPS antenna • GPS receiver mounting bracket • GPS receiver power/data cable • Roof brackets	Chapter 4
Display	• *Ag*GPS EZ-Guide 500 lightbar • FmX integrated display • *Ag*GPS FieldManager display • Display cable(s) • Mounting bracket	Chapter 5
Power	• Power bus and switch	Chapter 6
Controller	• Controller • Mounting plate • Bolt kit - controller • Main wiring harness • Aux. wiring harness • Sonalert alarm	Chapter 8

Preparing the vehicle for installation

Step 1

Park the vehicle on a hard, level surface. Block the front and rear wheels.

Step 2

Align the steering straight ahead. On an articulated vehicle, install the articulation locks.

Step 3

Remove all dirt and debris from the areas of the vehicle where the *Ag*GPS Autopilot™ system will be installed.

Step 4

Open all kit boxes and check the contents of the box against the packing list/s. Lay all of the parts out on a clean workbench.

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

CHAPTER

2

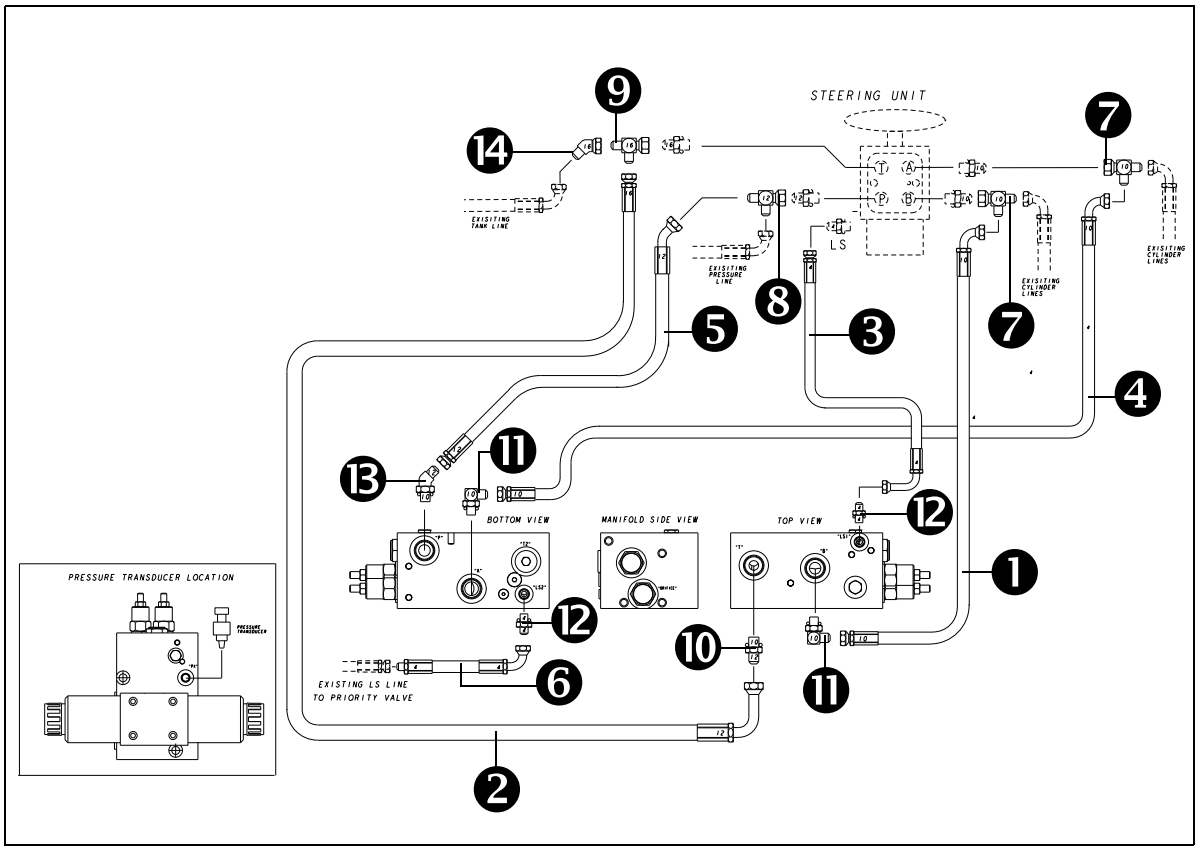
Hydraulic Control Valve Installation

In this chapter:

- Hydraulic components for all models, except Buhler 435–535
- Hydraulic components for Buhler 435–535 models
- Preparing the hydraulic manifold for all models, except Buhler 435–535
- Mounting the hydraulic manifold for all models, except Buhler 435–535
- Installing the hydraulic hoses for all models, except Buhler 435–535
- Preparing the hydraulic manifold for the Buhler 435–535 models
- Installing and connecting the manifold for the Buhler 435–535 models
- Securing the electrical connections for all models

This chapter describes how to install the hydraulic control valve and hoses.

Hydraulic components for all models, except Buhler 435–535

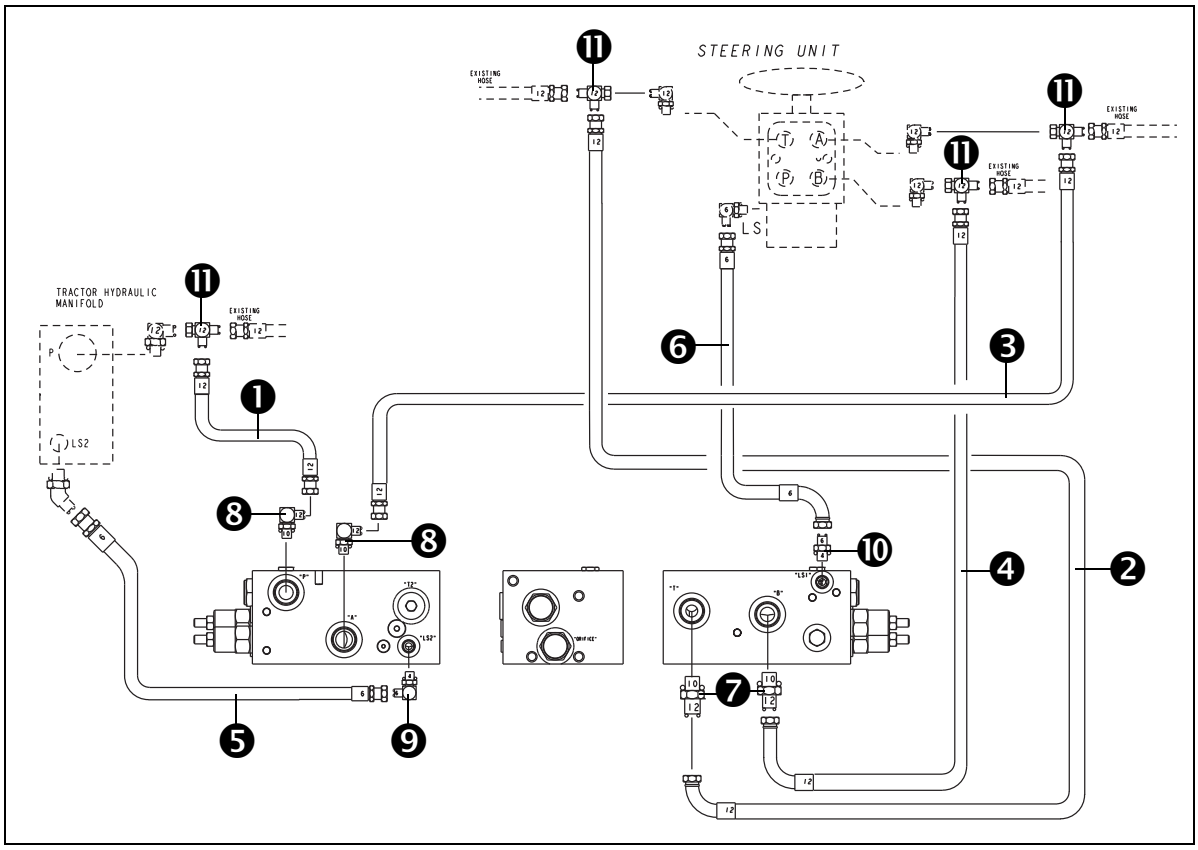


Item	Description	Part number
❶	53 inch hose	F451TC0639-10-10-10-53
❷	37 inch hose	F5451TC0641-16-12-12-37
❸	33 inch hose	F451TC0639-4-4-4-33
❹	31 inch hose	F451TC0639-10-10-10-31
❺	30 inch hose	F451TC0637-12-12-12-30
❻	28 inch hose	F451TC0339-4-4-4-28
❼	Fitting (x2)	10 R6X-S

Item	Description	Part number
❽	Fitting	12 R6X-S
❾	Fitting	16 R6X-S
❿	Fitting	12-10-F5OX-S
⓫	Fitting (x2)	10 C5OX-S
⓬	Fitting (x2)	4 F5OX-S
⓭	Fitting	12-10 V5OX-S
⓮	Fitting	16 V6X-S

Note – *Part numbers are Parker numbers and are for reference only.*

Hydraulic components for Buhler 435–535 models



Item	Description	Part number
❶	36" hose	F451TCJSJS-12-12-12-36"
❷	40" hose	F451TCJSJ9-12-12-12-40"
❸	50" hose	F451TCJSJS-12-12-12-50"
❹	47" hose	F451TCJSJI-12-12-12-47"
❺	32" hose	F451TCJSJS-06-06-06-32"
❻	41" hose	F451TCJSJ9-06-06-06-41"

Item	Description	Part number
❼	Fitting (x2)	12–10 F5OLO
❽	Fitting (x2)	12–10 C5OLO
❾	Fitting	6–4 C5OLO
❿	Fitting	6–4 F5OLO
⓫	Fitting (x4)	12 R6LO

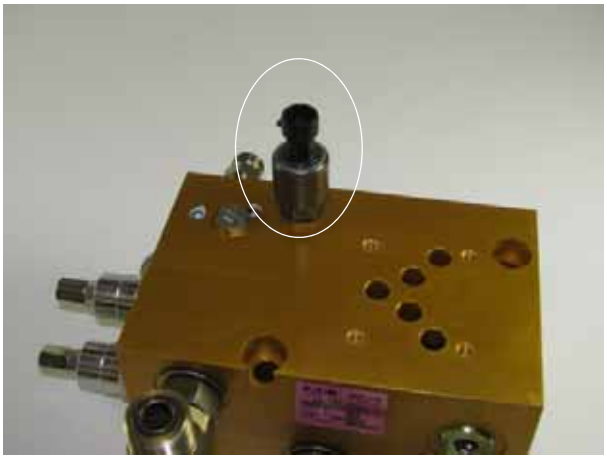
Note – *Part numbers are Parker numbers and are for reference only.*

Preparing the hydraulic manifold for all models, except Buhler 435–535

Note – *For instructions on how to configure and install the hydraulic valve on the Buhler 535, see* *Preparing the hydraulic manifold for the Buhler 435–535 models, page 31*.

Step 1

Install and tighten the pressure sensor to the manifold PX port.



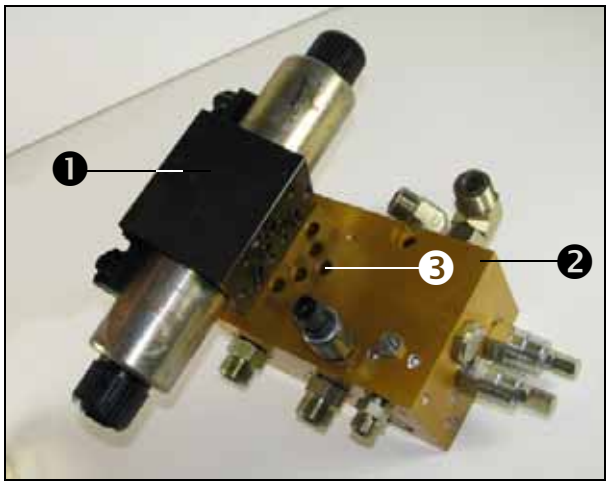
Step 2

Note – *Place the hydraulic components from the kit on a clean work surface*

Lubricate the O-rings and connect the control valve (❶) to the manifold (❷) with four M6 x 40 socket head bolts. Tighten the bolts to 14 –16 Nm (10 – 12 ft. lbs.).

Note – *Match the V pattern of the oil passages (❸) between the manifold (❷) and control valve (❶).*

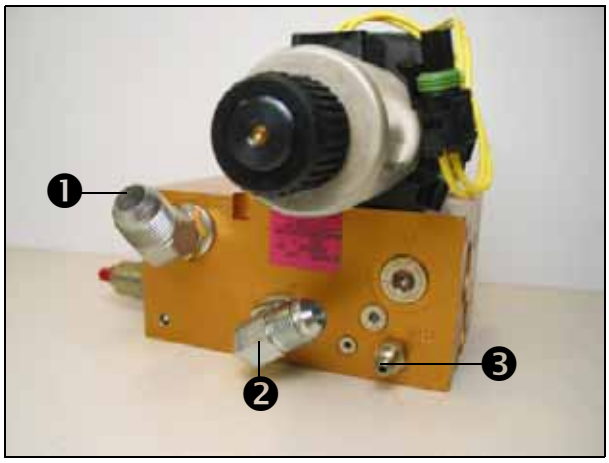
Note – *This requires a 5mm Allen wrench.*



Step 3

With the manifold positioned as shown, install and tighten the fittings and orientate them as shown:

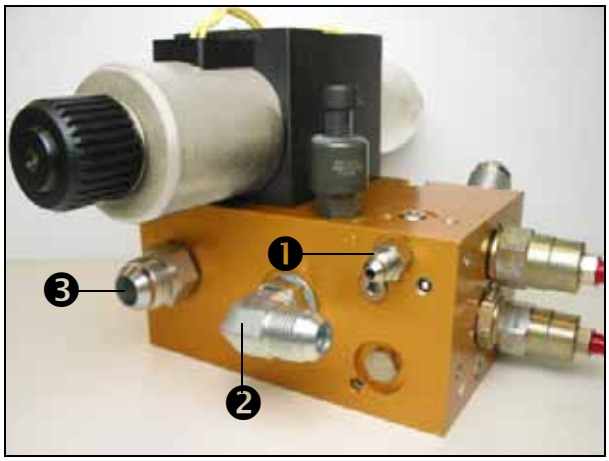
- 12–10 JIC-ORB 45° fitting (❶) to the P port
- 10–10 JIC-ORB 90° (❷) to the A port
- 4–4 JIC-ORB fitting (❸) to LS2 port



Step 4

With the manifold positioned as shown, install and tighten the fittings and orientate them as shown:

- 4–4 ORB fitting (❶) to LS1 port
- 10–10 JIC-ORB 90° fitting (❷) to B port
- 12–10 JIC-ORB fitting (❸) to T port



Mounting the hydraulic manifold for all models, except Buhler 435–535

Step 1

Identify the valve mounting location in front of the cab.



Step 2

If necessary, adjust the valve location to accommodate engine type and air filter location.



CUMMINS N14



CUMMINS M11

Step 3

Place the manifold and valve on the steel plate between the engine and cab with the Tank port facing up and counterbalance valves to the right of the tractor.



Step 4

Clamp the manifold to the plate using the dimensions shown as a guide.



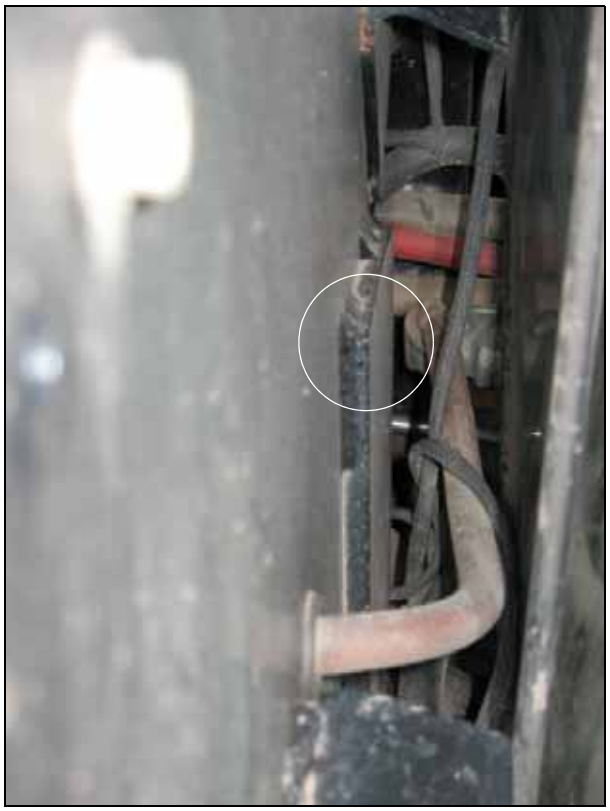
Step 5

CAUTION – Before you begin drilling, inspect the area behind the plate to avoid drilling through welds or the $^{3}/_{8}$" flat plate.

Drill two $^{7}/_{16}$" holes using the manifold through-holes as a template.



Note – *The hole to the right side should narrowly clear the $^{3}/_{8}$" plate.*



Step 6

Bolt the hydraulic manifold to the vertical plate as shown using the through holes and $^{3}/_{8}$" x 4" long socket head cap screws, washers, and nuts.



Installing the hydraulic hoses for all models, except Buhler 435–535

Step 1

Locate the hand pump steering connections.



Step 2

This view shows the steering valve from the left of the vehicle.

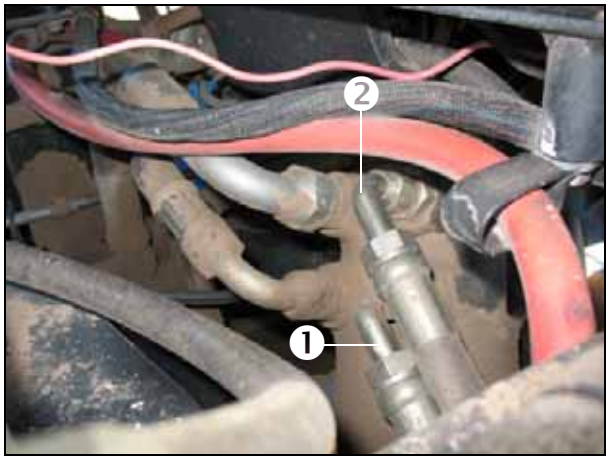
The steering hand pump will have ports labeled:

- P: pressure port
- T: Tank port
- L: Cylinder port L
- R: Cylinder port R



Step 3

Label the upper hose (❶) “A” and the lower hose (❷) “B”.

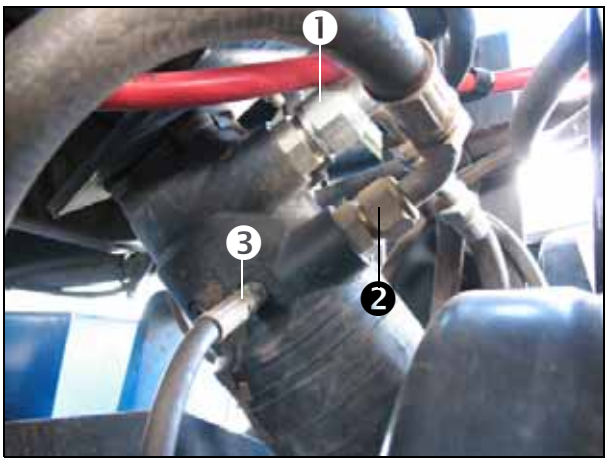


Step 4

This view shows the steering valve from the right side of the vehicle.

Label the upper hose (❶) “T” and the lower hose (❷) “P”. Label the small line on the hand pump (❸) “LS” for load sense.

Disconnect the hoses.



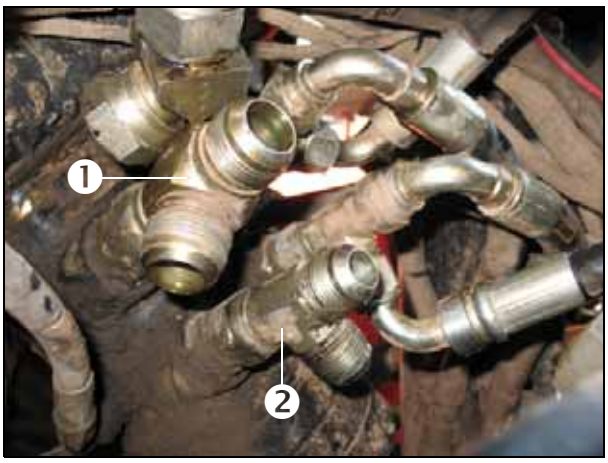
Step 5

Install -10 JIC T-fittings to the A and B ports.



Step 6

Install a -16 T-fitting (❶) to the tank port and a -12 T-fitting (❷) to the pressure port.



Step 7

Connect the -10 JIC 90° end of the 31" kit provided hose to the A port on the steering hand pump.



Step 8

Connect the straight end of the hose to the manifold A port.



Step 9

Connect the -10 JIC 90° end of the 53" kit provided hose (❶) to the B port on the steering hand pump.



Step 10

Connect the straight end of the hose to the manifold B port.



Step 11

Reconnect the existing A and B steering lines to the tees on the hand pump.



Step 12

Connect the -12 JIC 90° end of the 37" kit provided tank hose to the T port on the manifold. Route the hose to the right of the tractor.



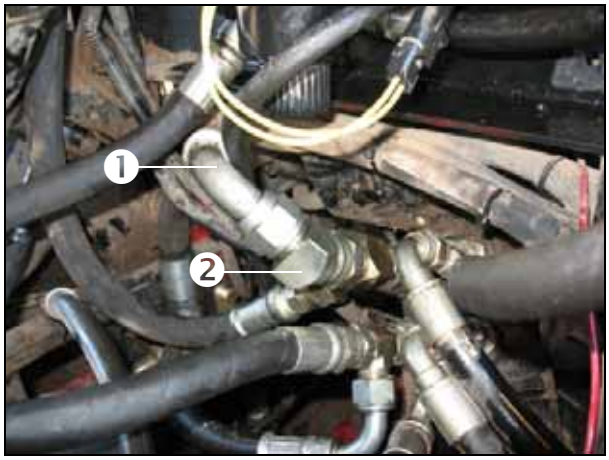
Step 13

Connect the -16 end of the tank hose to the T-fitting previously installed at the hand pump.



Step 14

Connect the existing tank line (❶) to the -16 T-fitting using a swivel 45° adaptor (❷). Loosen the opposite end of the hose to allow normal flex in the hose.



Step 15

Reconnect the existing pressure hose to the branch of the (❶). Loosen the opposite end of the hose to rotate the hose and release stress.



Step 16

Connect the -12 JIC 45° end of the 30" kit supplied pressure hose to the end of the T-fitting at the hand pump (❷).



Step 17

Connect the straight end of the pressure hose to the P port on the manifold.



Step 18

Remove the load sense (LS) line at the hand pump.



Step 19

Connect the -4 JIC male end of the 28" kit supplied LS line to the existing hose.



Step 20

Connect the extended existing LS line to the LS2 port on the manifold.



Step 21

Connect the -4 JIC 90° end of the 33" kit supplied hose to the LS1 port on the manifold.



Step 22

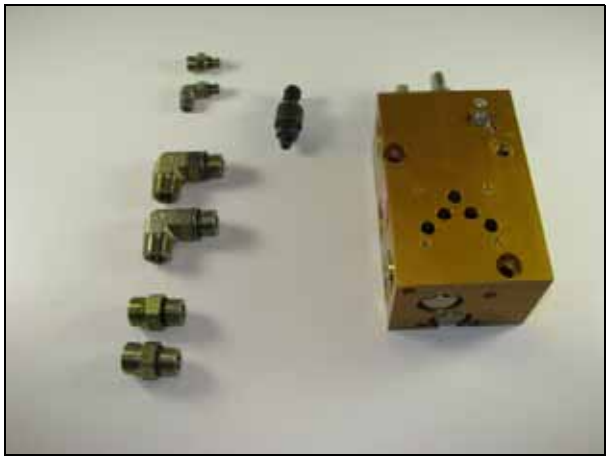
Connect the opposite end of the LS1 hose to the hand pump.



Preparing the hydraulic manifold for the Buhler 435–535 models

Step 1

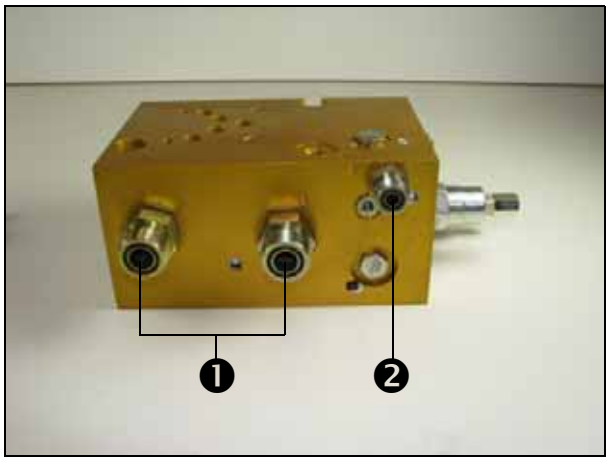
Locate the manifold and all fittings and place them on a clean work surface.



Step 2

Install the following fittings:

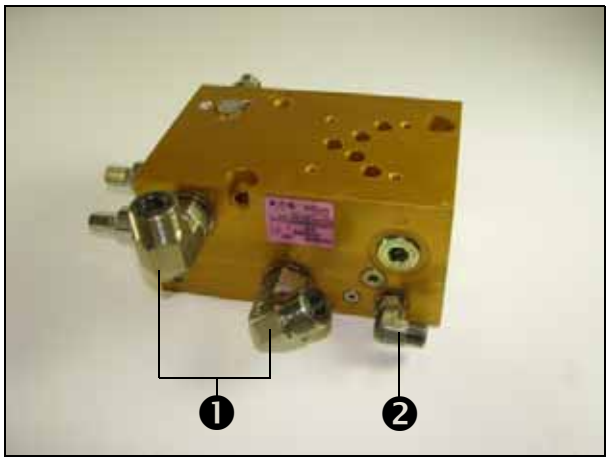
- 10–12 ORB-ORS fitting (❶) into the T and B ports
- 4–6 ORB-ORS fitting (❷) into the LS1 port



Step 3

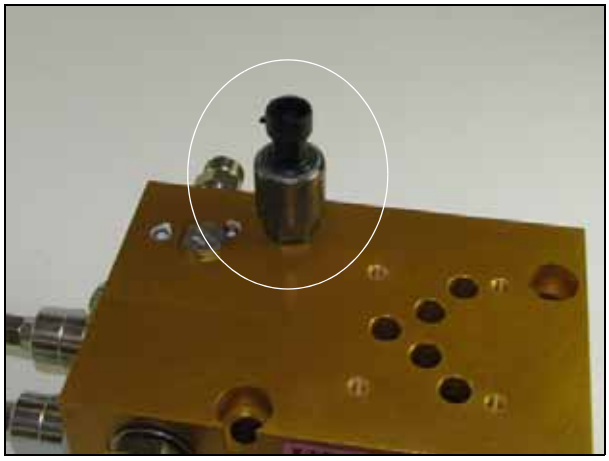
Install the following fittings, orientated as shown:

- 10–12 ORB-ORS 90° fittings (❶) into the P and A ports
- 4–6 ORB-ORS 90° fitting (❷) into the LS2 port



Step 4

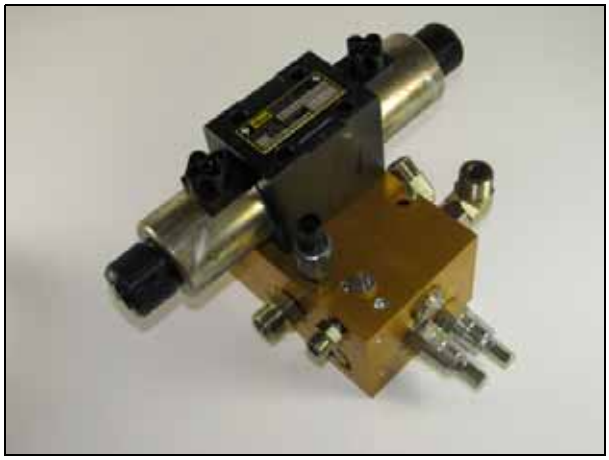
Install the supplied pressure transducer into the manifold.



Step 5

Note – *The port O-rings must be lubricated and installed before attempting the following.*

Install the *Ag*GPS Autopilot system steering valve to the manifold using the supplied hardware.



Installing and connecting the manifold for the Buhler 435–535 models

Step 1

Locate manifold mount location on the bulkhead behind the engine, in front of the cab.



Step 2

Drill two holes and mount the Autopilot manifold using the supplied hardware.



Step 3

Locate the tank line (❶) on the steering hand pump. Remove the line and install the provided T-fitting to the pump and attach the tractor's tank line to the T-fitting. Install the straight end of the provided 40" hose onto the branch of the T-fitting.



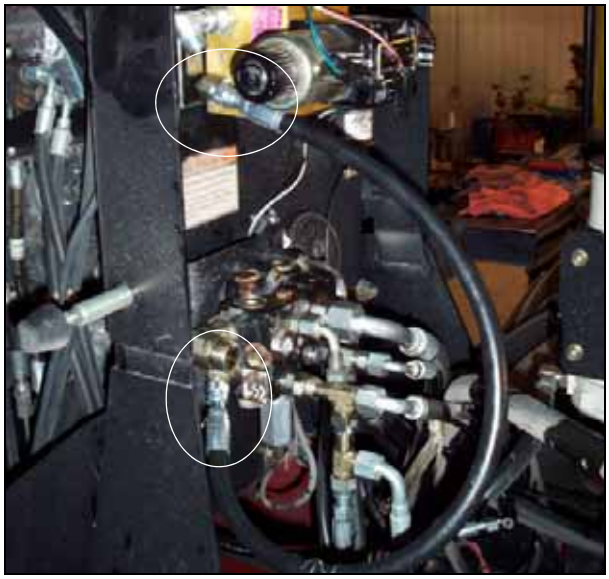
Step 4

Route the tank line under the engine bulkhead to the Autopilot manifold. Attach the 90° fitting of the "T" line hose to the T port on the Autopilot manifold



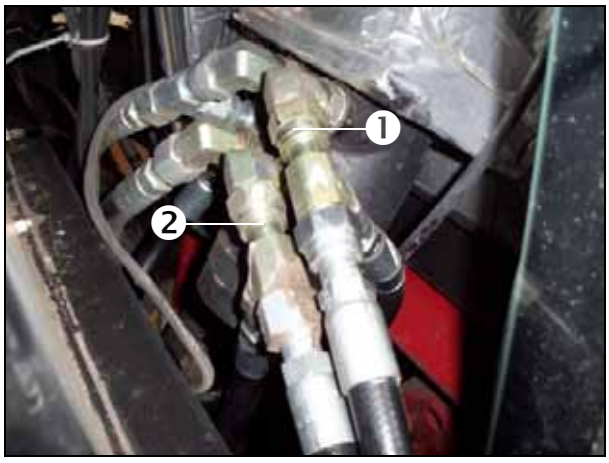
Step 5

Locate the LS2 port on the existing hydraulic manifold and disconnect the hose. Attach the supplied 32" hose to this fitting and attach the other end to the LS2 port on the Autopilot manifold.



Step 6

Locate the steering hand pump between the cab and the engine bulkhead. Identify, label and disconnect the "A" (❶) and "B" (❷) lines from the 90° fitting. Install the provided T-fittings into the lines and reconnect the "A" and "B" lines to the end of the T-fittings.



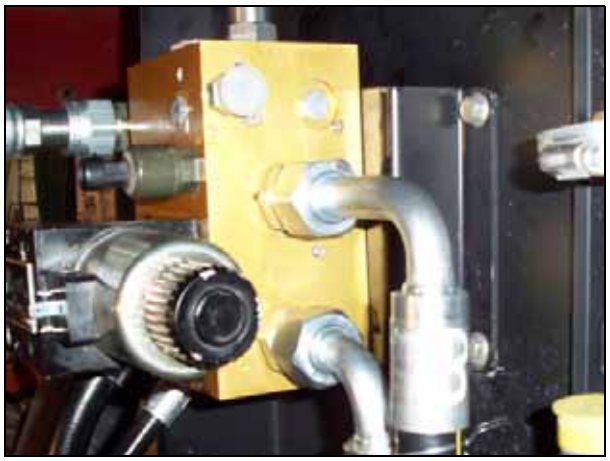
Step 7

Attach the provided 50" "A" line to the previously attached T-fitting on the "A" steering line. Route the hose under the bulkhead and attach the other end of the hose to the 90° fitting on the A port of the Autopilot manifold.



Step 8

Attach the straight fitting of the supplied 47" "B" line to the previously attached T-fitting on the "B" steering line. Route the hose under the bulkhead and attach the other end of the hose to the fitting on the B port of the Autopilot manifold.



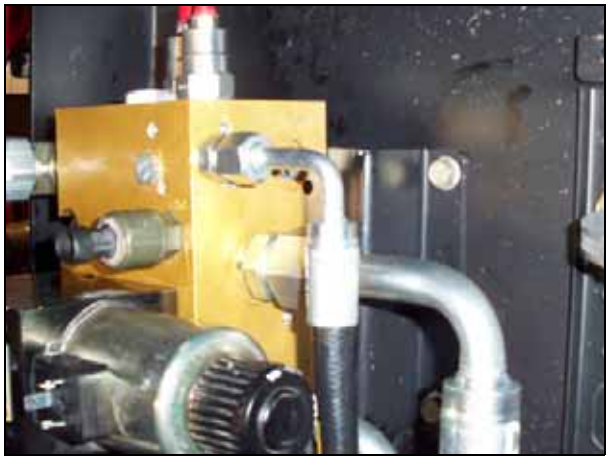
Step 9

Remove the LS2 hose from the steering hand pump (the other end of this hose was removed in Step 5). Connect the provided 32" hose to the LS2 fitting on the hand pump.



Step 10

Route the hose under the engine bulkhead and connect the 90° fitting to the LS1 port on the Autopilot manifold and tighten all the connections.



Step 11

Locate and remove the pressure line (❶) from the existing manifold mounted on the bulkhead.



Step 12

Install a run T-fitting with the fitting pointing upwards, and then reconnect the pressure line to the end of the T-fitting.



Step 13

Connect the supplied 36" pressure hose from the T-fitting to the Autopilot manifold's P port as shown and tighten both ends.



Securing the electrical connections for all models

Step 1

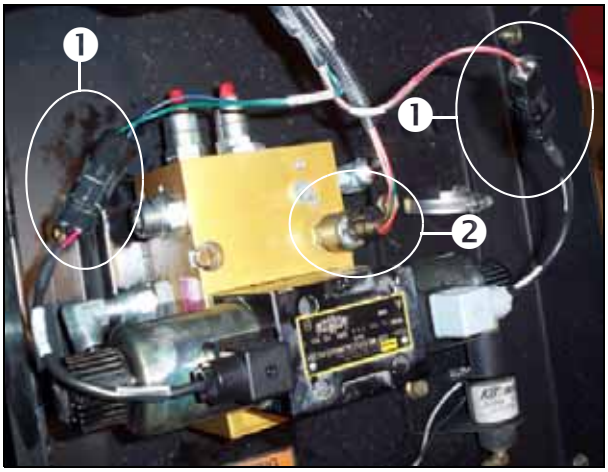
Route the cables through the right rear corner of the cab to the controller location.





Step 2

Connect and secure the left and right valve cables (❶) and the pressure transducer cable (❷).



CHAPTER

3

AutoSense Steering Device Installation

In this chapter:

- AgGPS AutoSense steering device components
- Installing the AgGPS AutoSense steering device
- Preparing the harness (P/N 54602 Rev C)

This chapter describes how to install the *Ag*GPS AutoSense™ steering device.

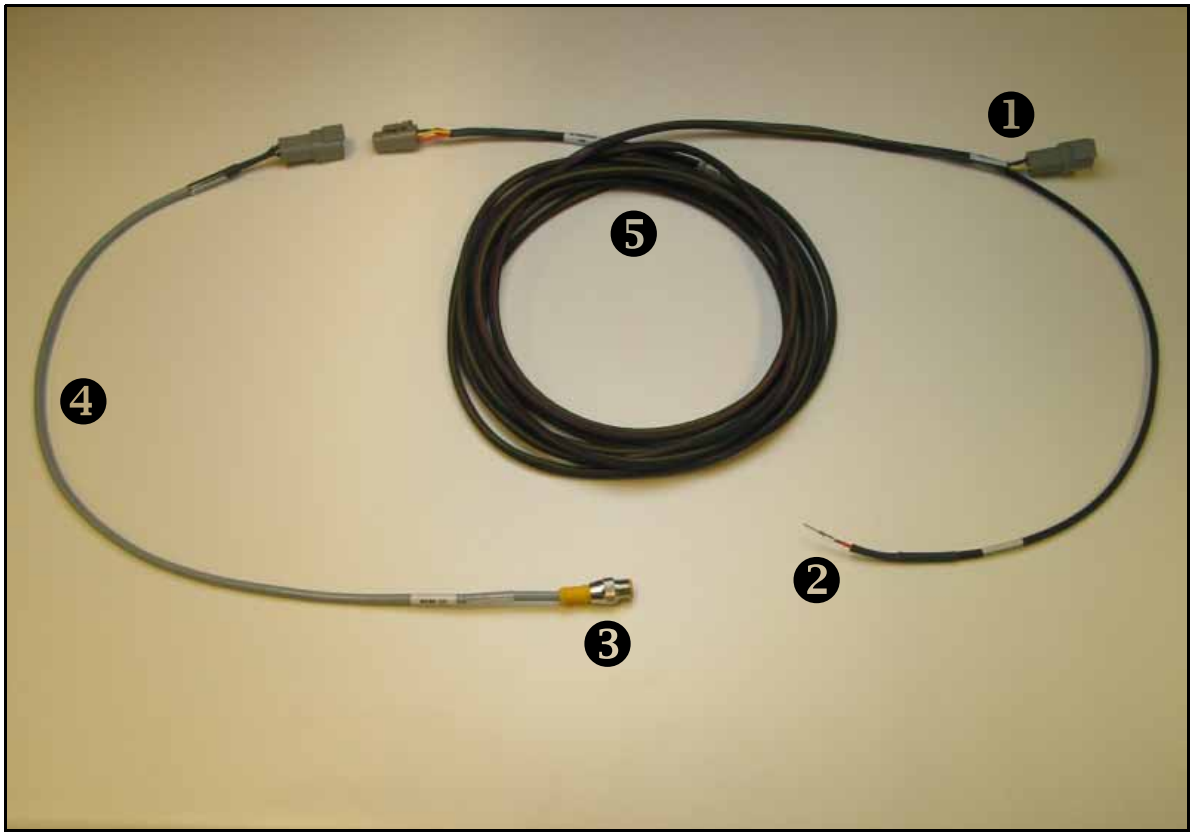
If the described mounting location is not accessible, chose an alternate location. To ensure proper function, the AutoSense device must be located in a position that is free of obstructions and allows it to rotate with the wheels when they turn.

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

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

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

*Ag*GPS AutoSense steering device components



Item	Description
❶	P-6 connector
❷	Power connector
❸	AutoSense connector
❹	Jumper cable (P/N 57560)
❺	AutoSense steering cable (P/N 57885)

Installing the *Ag*GPS AutoSense steering device

Step 1

Locate the mounting position on the rear articulating structure.

Note – *You can place the device on the left or the right of the hoses. Place it in the most protected location.*



Step 2

Use the AutoSense device to estimate the final mounting location approximately 7" from the end of the plate. Adjust the position to avoid contact with hoses during full articulation.

Note – *The distance from the center of articulation is not critical.*



Step 3

Clean the mounting surface with the alcohol swab provided or an equally aggressive cleanser to remove all dust and oil.



Step 4

Use the four #6-32 socket head screws to attach the *Ag*GPS AutoSense device to the bracket.



Step 5

Remove the protective plastic from the VHB (Very High Bond) adhesive.

Note – *Dust will rapidly reduce the adhesive strength of the VHB adhesive. If the adhesive becomes contaminated, apply new tape.*



Step 6

Attach the AutoSense device and bracket to the flat plate member and then apply firm pressure. The surface must be completely dry. If desired mechanically secure the bracket using the center hole and hardware.

Note – *Once applied, the bracket cannot be reapplied. Allow the VHB several hours to adhere to the surface. If the VHB is contaminated, reapply VHB.*



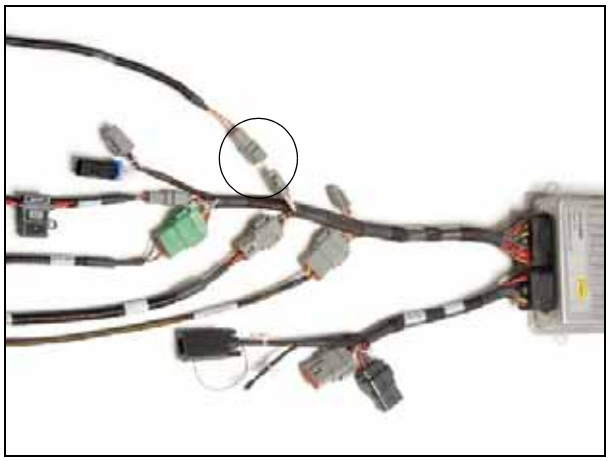
Step 7

Route the steering cable and then connect the jumper cable to the steering device. Leave adequate length in the cable to avoid tension at full left or right turns.



Step 8

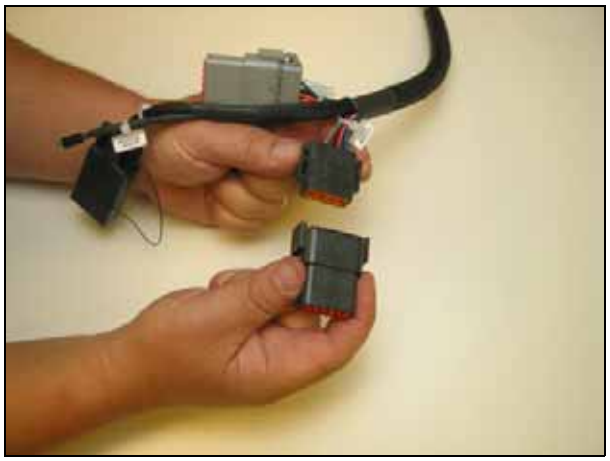
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Preparing the harness (P/N 54602 Rev C)

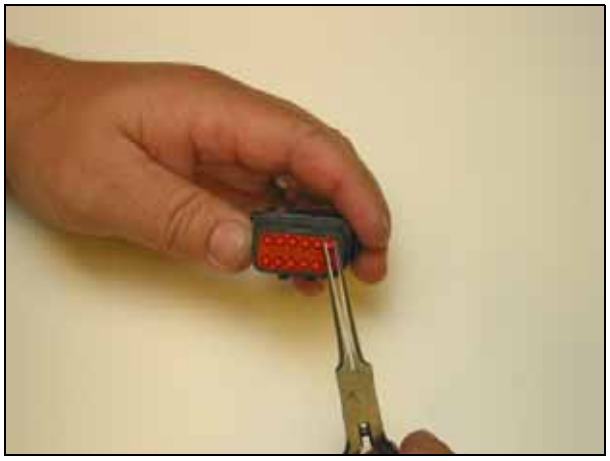
Step 1

Remove the black Deutsch DTM receptacle from the P-13 sensors leg of the auxiliary harness. See Controller connections, page 123.



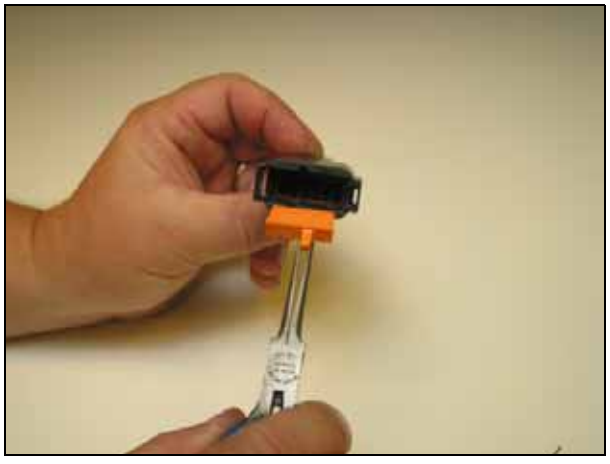
Step 2

Remove the plug from cavity number 1.



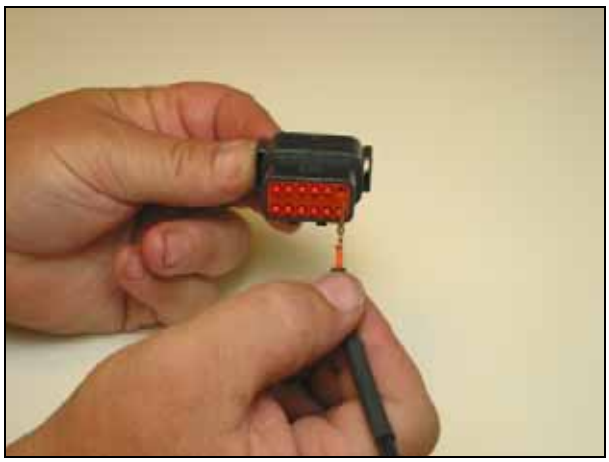
Step 3

Remove the wedge from the connector.



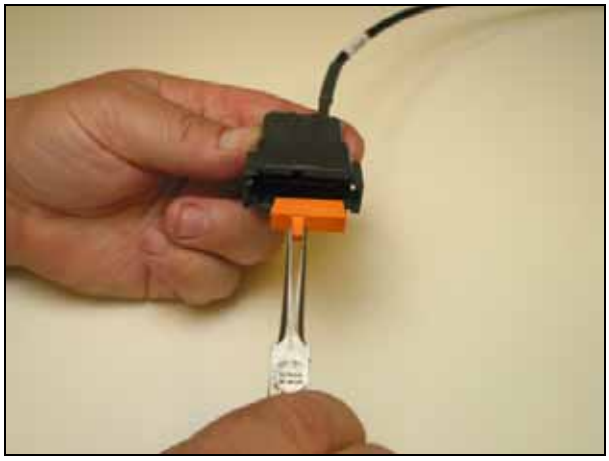
Step 4

Insert the DTM pin labeled "Cavity 1" into the connector.



Step 5

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



CHAPTER

4

Antenna/Receiver Installation

In this chapter:

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

This chapter describes how to install an *Ag*GPS 262 receiver and *Ag*GPS radio module, an *Ag*GPS 432 receiver and antenna, or an *Ag*GPS 442 receiver and antenna.

Note – *To install the antenna for an EZ-Guide 500 system, see Chapter 5, Display Installation.*

Antenna and receiver installation options

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

- **Spar mount** – This bracket mounts directly to the roof bolts and is required for all high accuracy applications such as RTK and OmniSTAR. Trimble recommends this method for mounting an *Ag*GPS 262 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*GPS 262 receiver plate for permanent mounting.
- **VHB mount** – Attach a 4" x 6" plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 51.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting:

Possible mounting methods

GPS receiver	V plate on spar (removable)	VHB plate on roof (removable)	Standard *Ag*GPS 262 plate bolted to spar (permanent)
*Ag*GPS 262 receiver	✓	X	✓
*Ag*GPS 432/442 receiver	✓	X	X
EZ-Guide 500 lightbar	✓	✓	X
FmX integrated display	✓	✓	✓

Notes:

– *For quick release magnetic mounting with an AgGPS 262 receiver, order the kit listed in Antenna mounting kits, page 11 and bolt the V plate to the spar. When spar mounting is not available and high accuracy is required, see Installing an AgGPS 262 receiver with magnetic feet, page 59.*

– *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 antenna roof spar

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

Note – *The antenna bracket positions the antenna over the front axle. Mounting the antenna in other locations will degrade the performance.*

Step 1

Remove the bolts and washers from the cab roof.



Step 2

Secure the bracket with a 12 mm x 60 mm long bolt and washer, using the ½" thick spacer ❶ between the cab and spar for clearance.



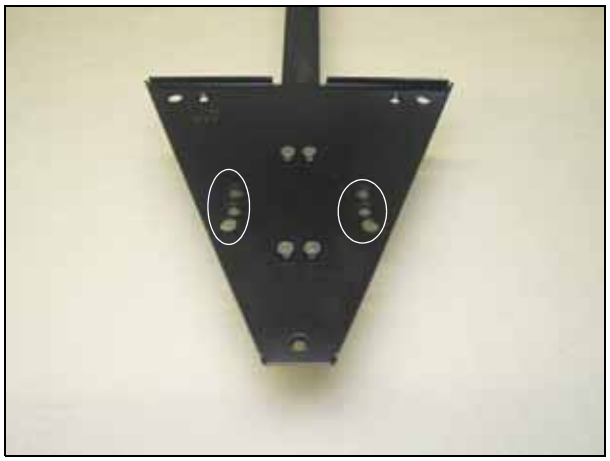
Step 3

For either of the following applications:

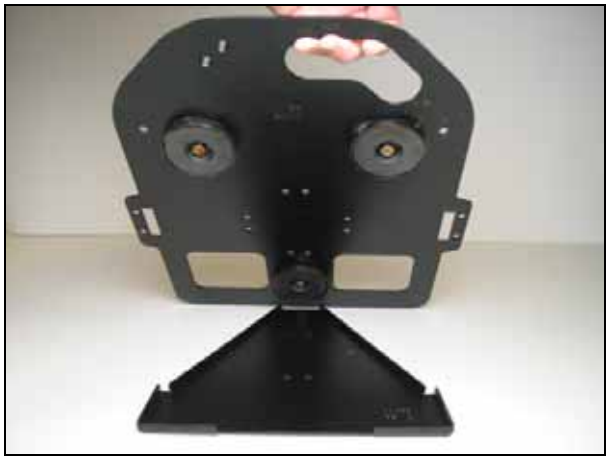
- A single magnet antenna mount
- An *Ag*GPS 262 receiver with magnetic option for quick removal

Install a V plate with four ¼" flathead screws.

The "V" points to the front of the vehicle.



V PLATE ON SPAR



MAGNETIC MOUNT ON V PLATE

If you use a standard *Ag*GPS 262 plate for permanent mounting, complete the radio antenna installation first. Use four ¼" flathead screws to mount the plate with the handle to the back of the vehicle.

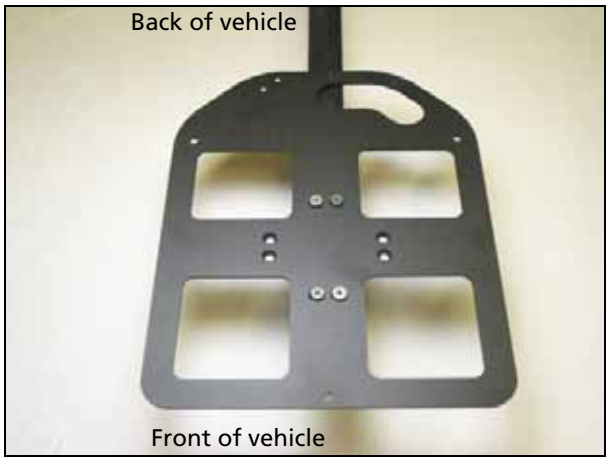


PLATE ON SPAR

Attaching the plate with VHB adhesive

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

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

- **L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)** – 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.
- **L1 single band antenna (WAAS, EGNOS, OmniSTAR VBS, Beacon)** – Use a 4" x 6" plate for simplified installation in applications where high accuracy is not critical.

Step 1

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

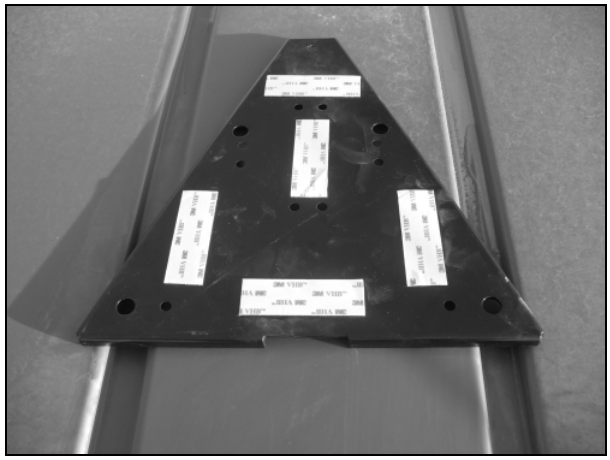


Step 2

V plate only

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

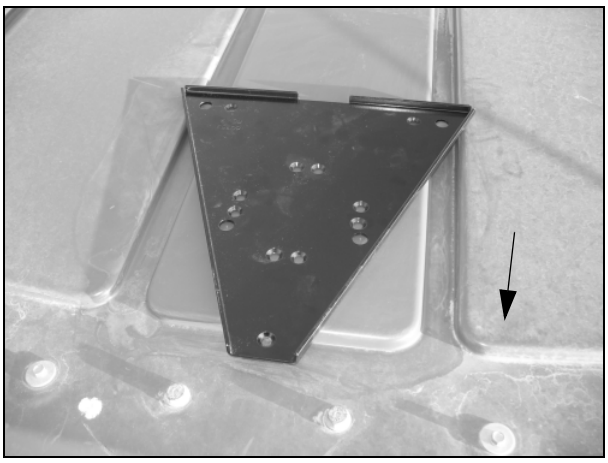
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



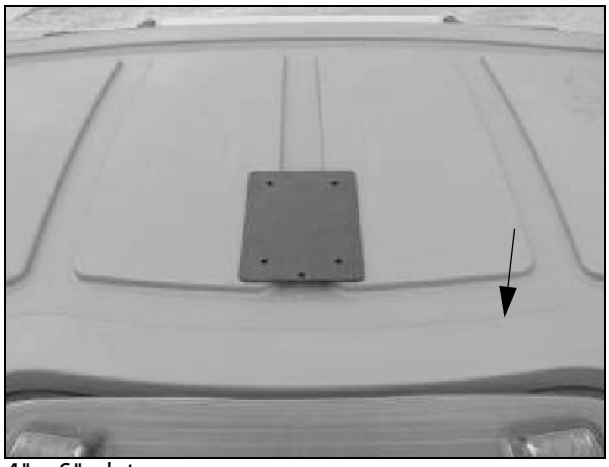
Step 3

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

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

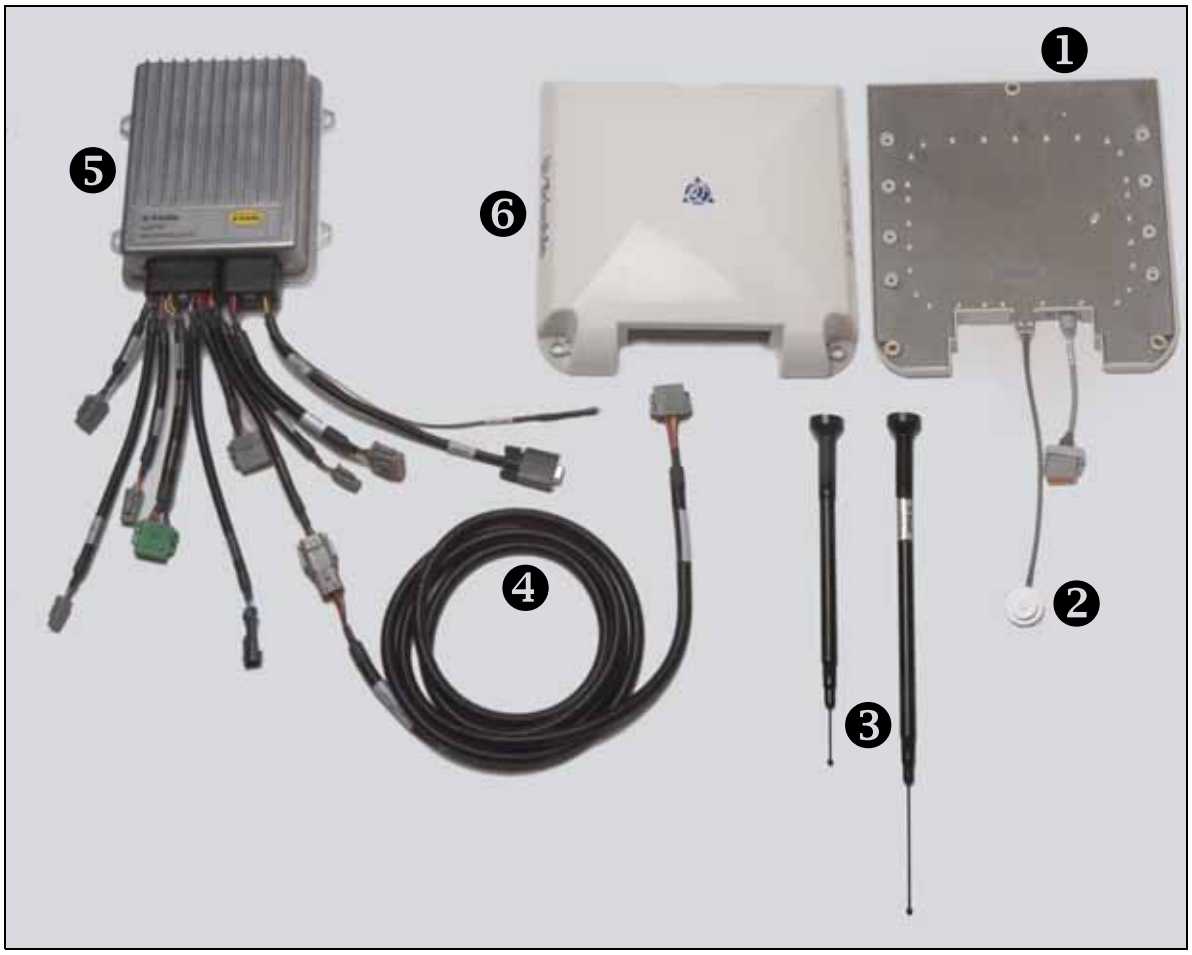


V plate



4" x 6" plate

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



Item	Description
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 (P/N 54608)
❺	*Ag*GPS Autopilot controller
❻	*Ag*GPS 262 antenna/receiver

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

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

To attach the *Ag*GPS 262 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 Mounting an antenna roof spar, page 49.



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.

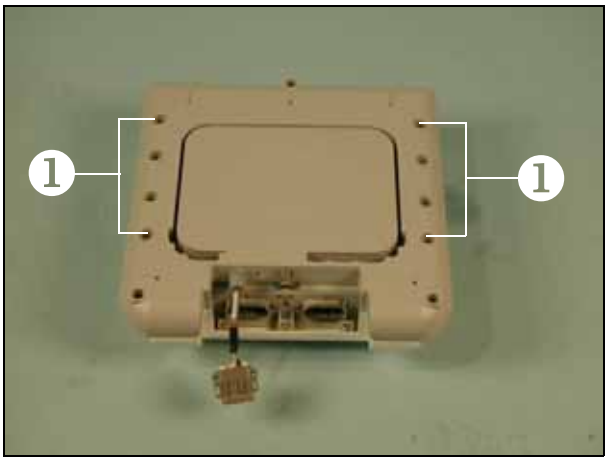
For spar mounting instructions, see Mounting an antenna roof spar, page 49.



Step 2

Both installation methods

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



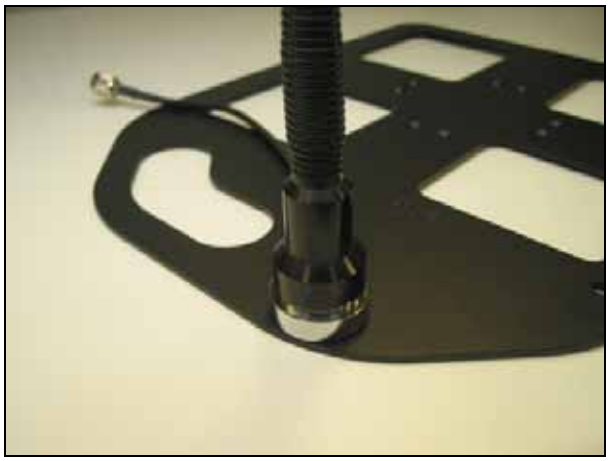
Step 3

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 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.



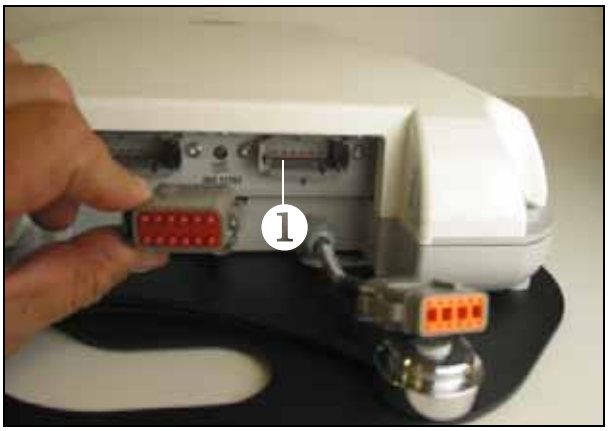
Step 7

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

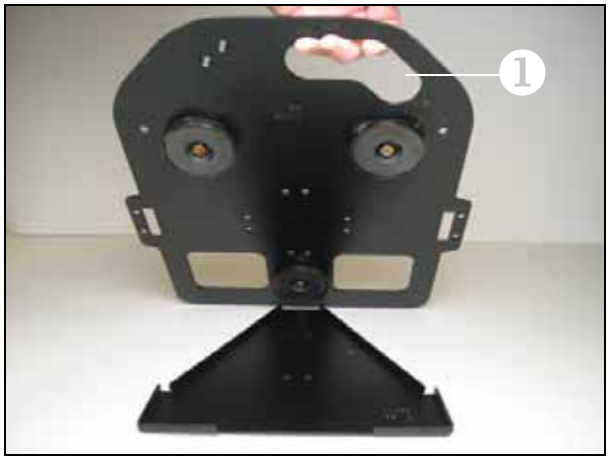
Connect the radio antenna to the antenna port.



Step 11

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.

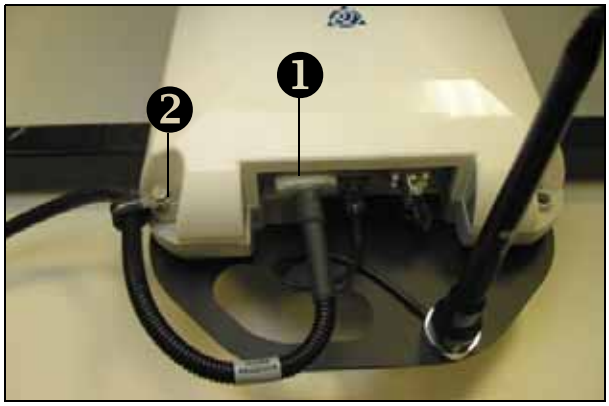


Step 12

Both methods

Connect the cable from the cab controller into port A ❶ of the *Ag*GPS 262 receiver. Bolt the cable clamp ❷ to the left side of the receiver.

Route the cable into the cab and into the controller.



Installing an *Ag*GPS 262 receiver with magnetic feet

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

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

Step 1

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

Place the nuts on the receiver side.



Step 2

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

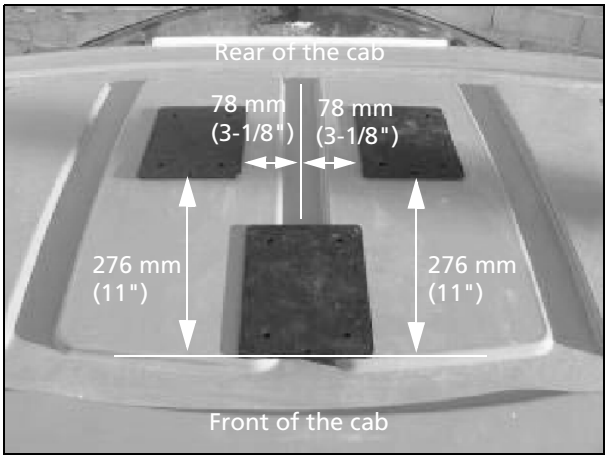


Step 3

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

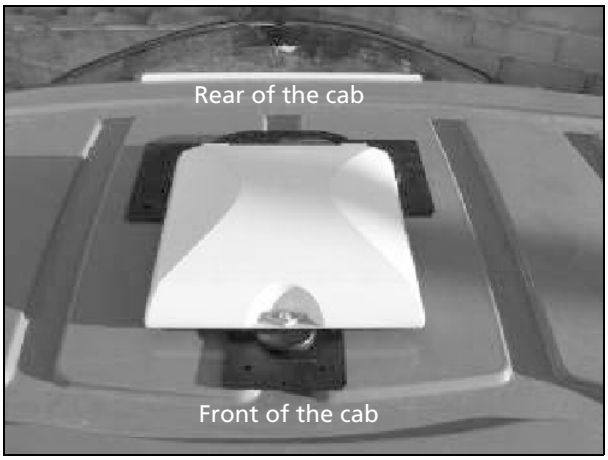
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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



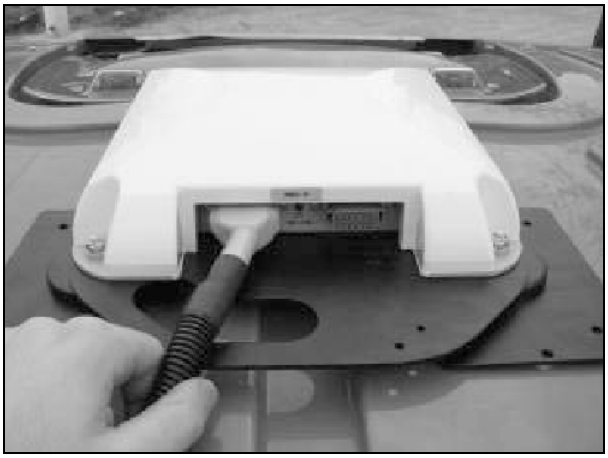
Step 4

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

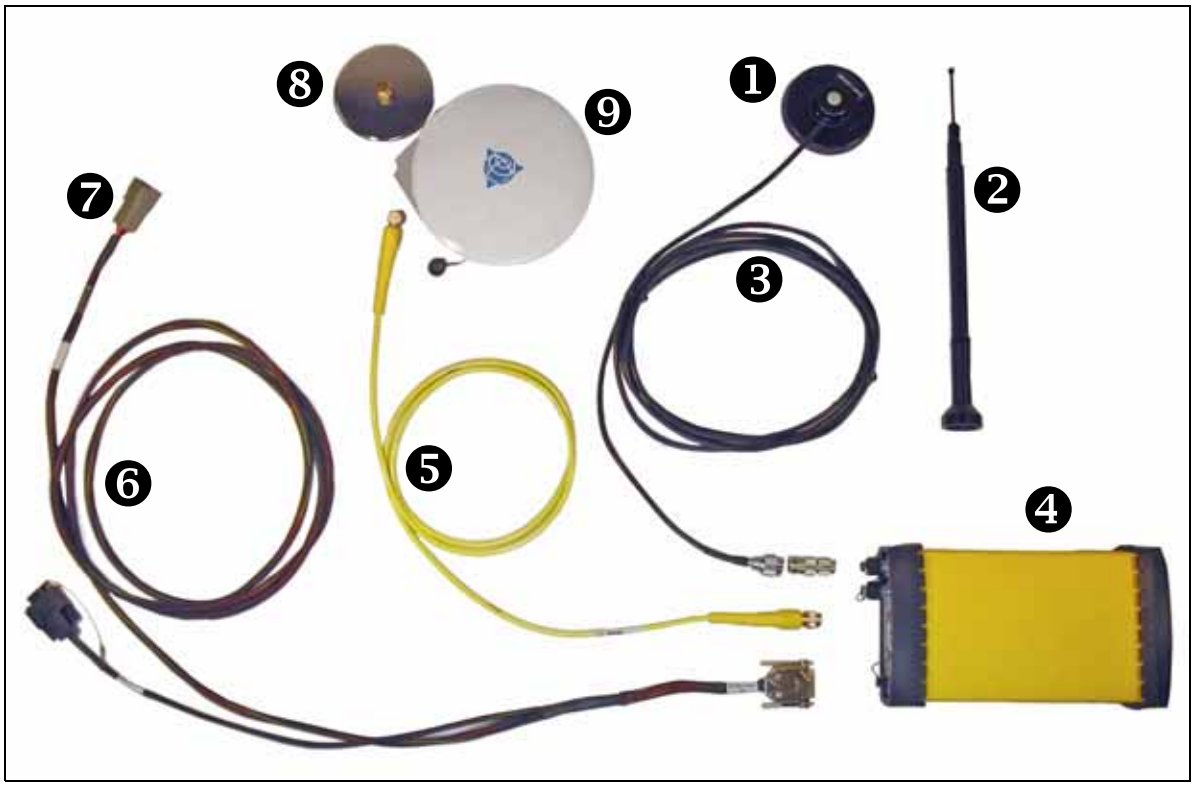


Step 5

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



*Ag*GPS 442/432 receiver components



Item	Description
❶	Radio antenna magnetic base
❷	Radio antenna
❸	Radio antenna cable
❹	*Ag*GPS 442/432 GPS receiver
❺	Antenna cable
❻	Receiver cable (P/N 62037)
❼	To controller "P3 GPS"
❽	Antenna magnetic mount
❾	*Ag*GPS 442/432 antenna

Installing the *Ag*GPS 442/432 receiver

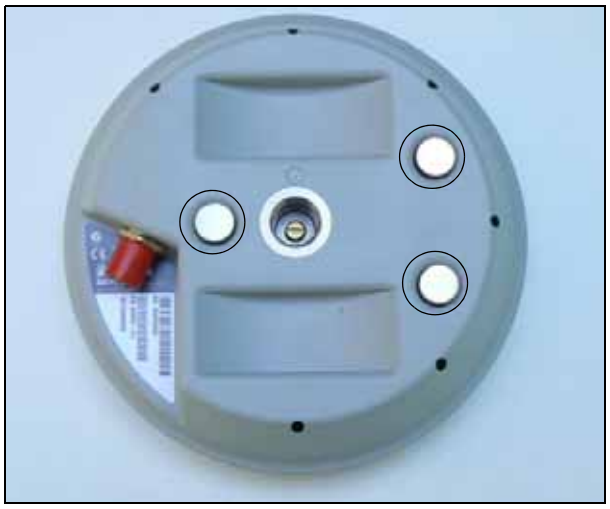
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)

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.

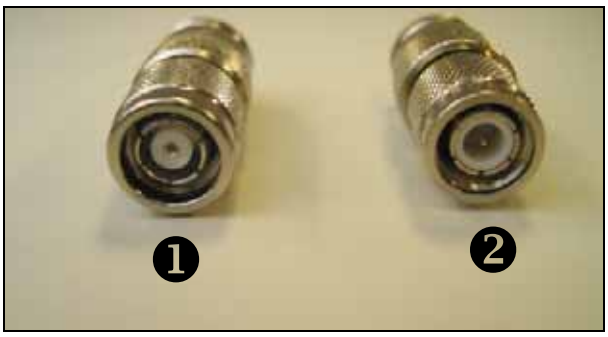


Step 5

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, page 123.



Step 9

Connect the radio antenna to the magnetic antenna base.



Step 10

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



Installing a PDL radio modem

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

Step 1

Position the radio where it is accessible for the operator to select a new radio channel ID.



Permanent mount

For a permanent mount, bolt the radio onto a bracket with a $^{5}/_{8}$" UNC screw.



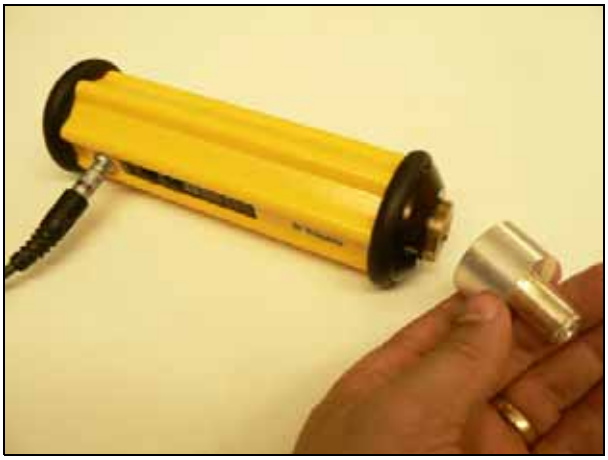
Temporary mount

For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a $^{5}/_{8}$" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

5

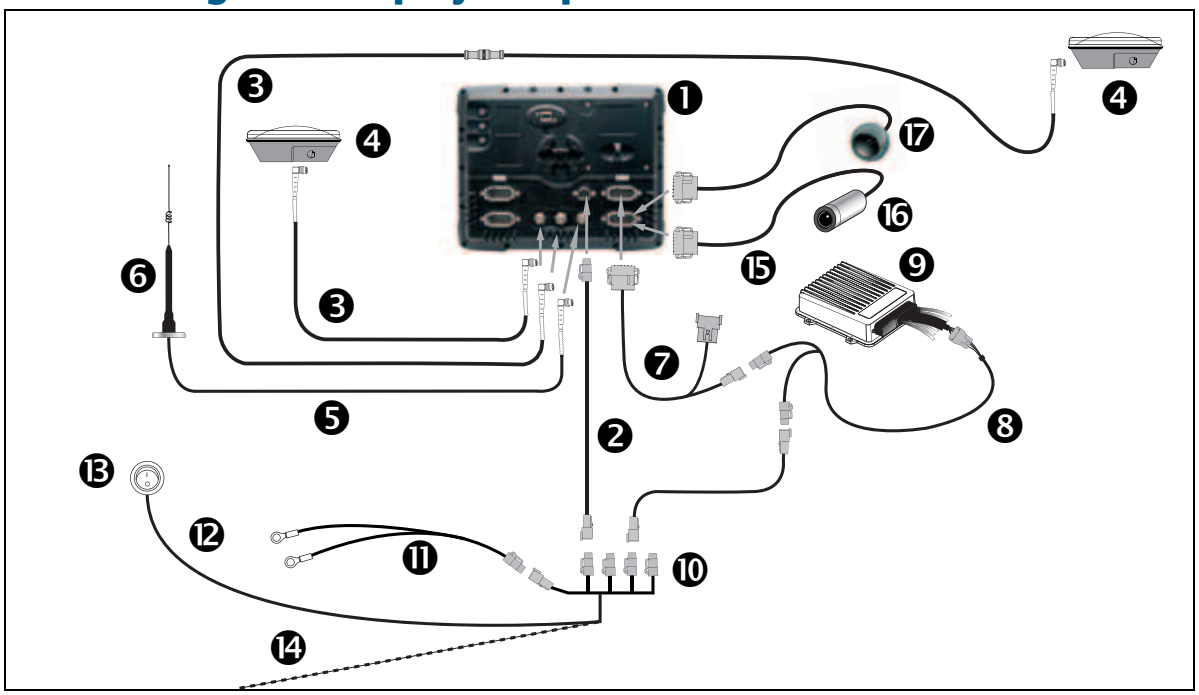
Display Installation

In this chapter:

- FmX integrated display components
- EZ-Guide 500 lightbar components
- Preparing the FmX integrated display
- Installing the FmX integrated display
- FmX integrated display: Installing the wiring harness
- FmX integrated display: Connecting accessory options
- Preparing the EZ-Guide 500 lightbar
- Connecting the EZ-Guide 500 lightbar cables
- Installing the EZ-Guide 500 lightbar
- EZ-Guide 500 lightbar and FmX integrated display: Installing the GPS antenna and plate
- FmX integrated display: Installing the RTK radio antenna
- EZ-Guide 500 lightbar: Installing a PDL radio modem
- FieldManager display components
- Preparing the FieldManager display
- Installing the FieldManager display

This chapter describes and how to install and connect the FmX integrated display, the EZ-Guide 500 lightbar, or the *Ag*GPS FieldManager display in the vehicle.

FmX integrated display components

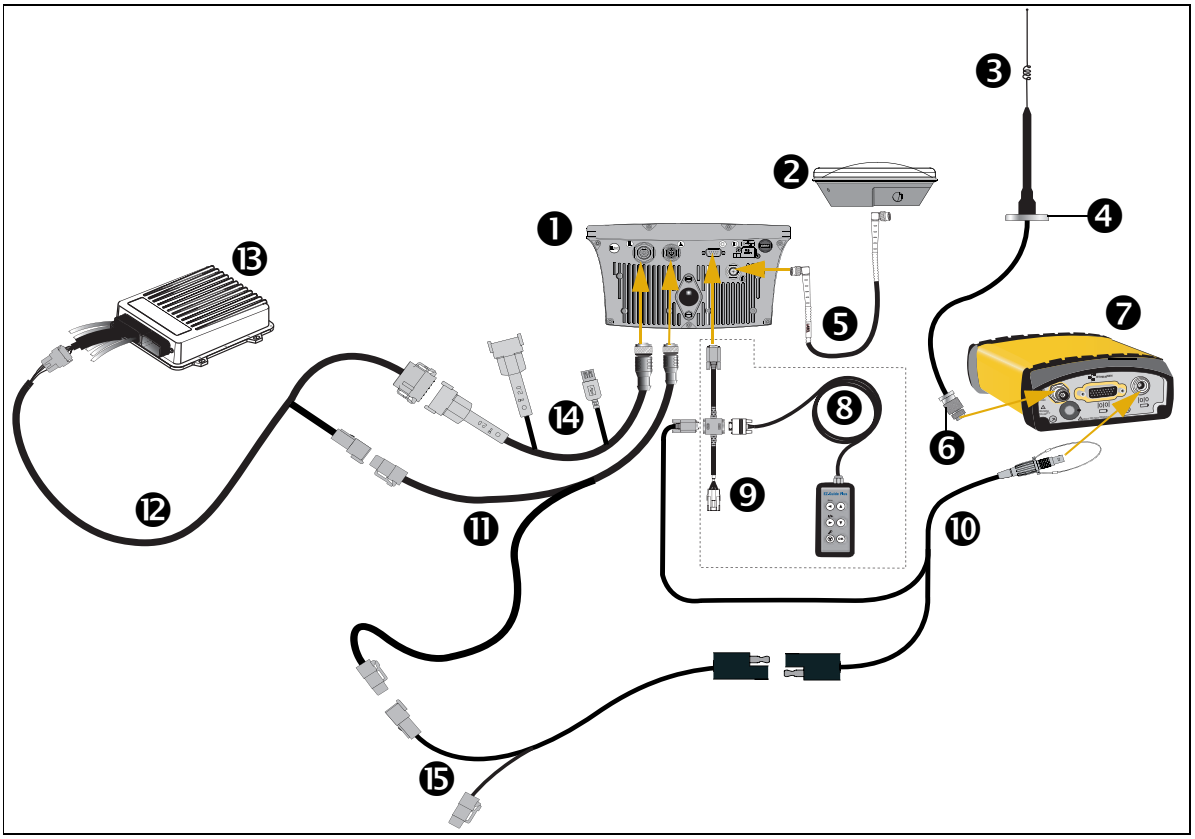


Item	Description
❶	FmX integrated display: P/N 93100-02
❷	FmX power cable: P/N 66694
❸	GPS, 5M, TNC/TNC RT angle cable: P/N 50449
❹	GPS antenna: P/N 57200-00
❺	Antenna cable and base: P/N 62120
❻	SNB900 radio antenna kit: P/N 28822-10
❼	FmX to NavController II cable w/ port replicator: P/N 65522
❽	NavController II main cable: P/N 54601
❾	NavController II: 55563-00

Item	Description
❿	FmX power cable w/ relay and switch: P/N 67259
⓫	FmX basic power cable: P/N 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	FmX to camera cable: P/N 67090
⓰	AgCam (purchased separately)
⓱	External speaker

EZ-Guide 500 lightbar components

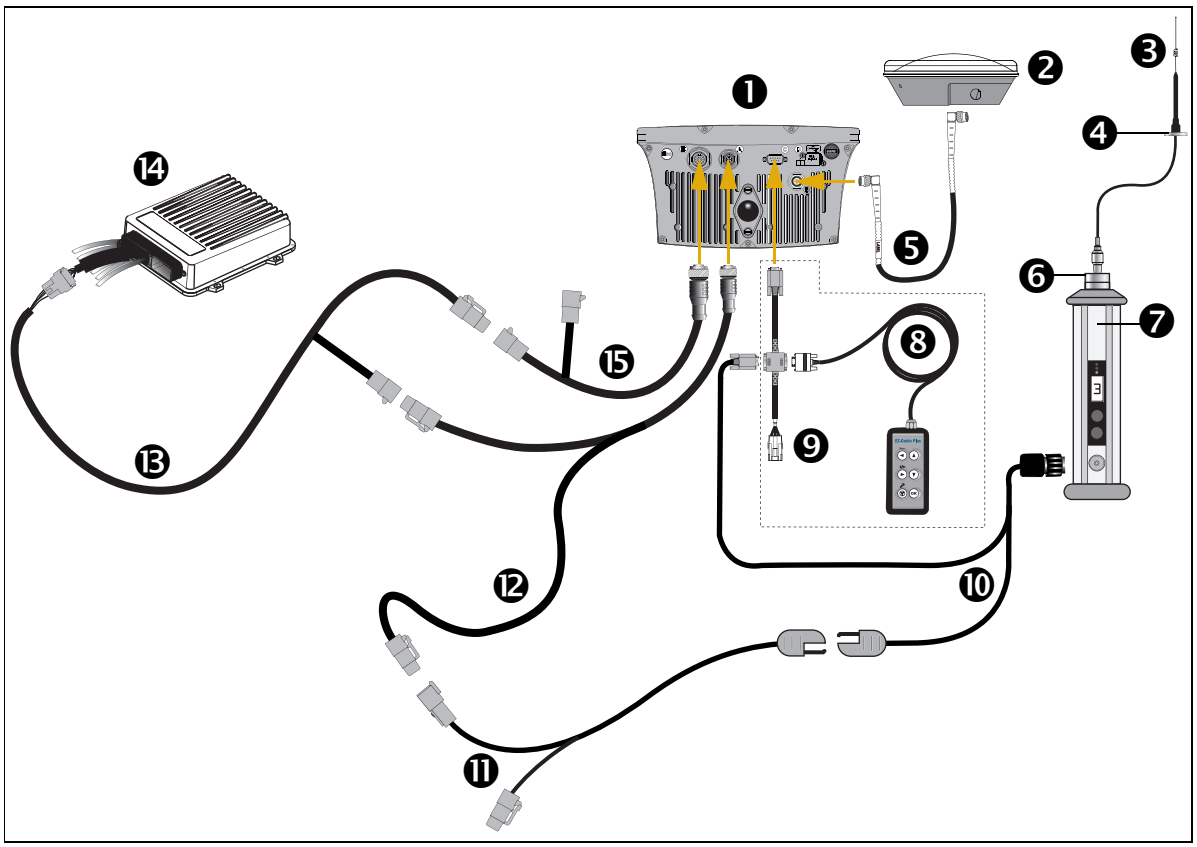
With SNB900 radio for 900 MHz RTK corrections (if equipped)



Item	Description
❶	EZ-Guide 500 lightbar
❷	GPS antenna: P/N 57200-00
❸	SNB900 radio antenna: P/N 22882-00
❹	SNB900 radio antenna magnetic mount: P/N 62109
❺	GPS antenna cable: P/N 50449
❻	N Female to REV. POL TNC Male: P/N 62114
❼	SNB900 radio: P/N X8480-X0
❽	Remote keypad (optional): P/N 66030-00)

Item	Description
❾	External interface cable: P/N 62749
❿	Radio power/data cable: P/N 61158
⓫	EZ-Guide 500 power cable: P/N 62817
⓬	EZ-Guide 500-to-Autopilot cable: P/N 62754
⓭	NavController II: P/N 55563-00
⓮	Port expansion cable: P/N 62609
⓯	Power tap to PDL radio: P/N 63185

With a PDL 450 radio for 450 MHz RTK corrections (if equipped)



Item	Description
❶	EZ-Guide 500 lightbar
❷	GPS antenna: P/N 57200-00)
❸	PDL 450 radio antenna: P/N 5187-x0-x0
❹	Radio antenna magnetic mount: P/N 62109
❺	GPS antenna cable: P/N 50449
❻	Radio antenna connector: P/N 63278
❼	PDL 450 radio: P/N 62550-4x-xx
❽	Remote keypad (optional): P/N 66030-00

Item	Description
❾	External interface cable: P/N 62749
❿	PDL radio power/data cable: P/N 51861-00
⓫	Power tap to PDL radio: P/N 63185
⓬	EZ-Guide 500 power cable: P/N 62817
⓭	EZ-Guide 500-to-Autopilot cable: P/N 62754
⓮	NavController II: P/N 55563-00
⓯	Port expansion cable: P/N 62609

Preparing the FmX integrated display

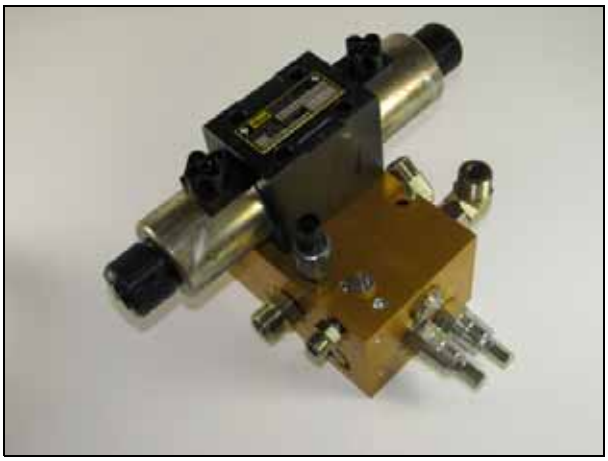
Step 1

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

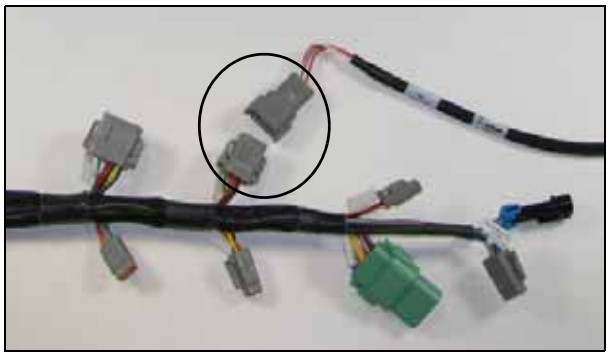
Step 1

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



Step 2

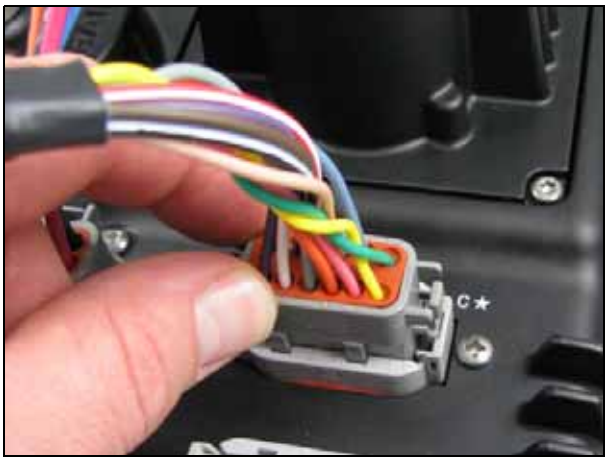
Connect the cable to the P3 connector on the NavController II main harness, and then route the cable from the NavController II to the mounting location on the FmX integrated display.



Step 3

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

Note – *To connect power to the FmX integrated display, see Chapter 6, Power Harness Installation.*



FmX integrated display: Connecting accessory options

AgCam

The AgCam and AgCam cable are accessory items that you can purchase separately from the FmX integrated display. The FmX integrated display will allow for up to four video inputs.

Step 1

Locate the AgCam and AgCam cable.



Step 2

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

Step 3

Connect the AgCam cable to the FmX integrated display adaptor cable.



Step 4

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



Speaker

Step 1

Locate the speaker and cable assembly that connects to the FmX integrated display.



Step 2

Mount the speaker in the required location and then route the cable to the FmX integrated display.

Step 3

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



Preparing the EZ-Guide 500 lightbar

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

Step 1

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



Step 2

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



Connecting the EZ-Guide 500 lightbar cables

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

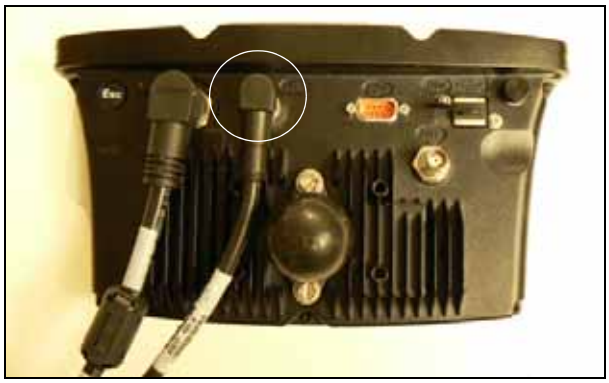
Step 1

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



Step 2

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



Step 3

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

Step 4

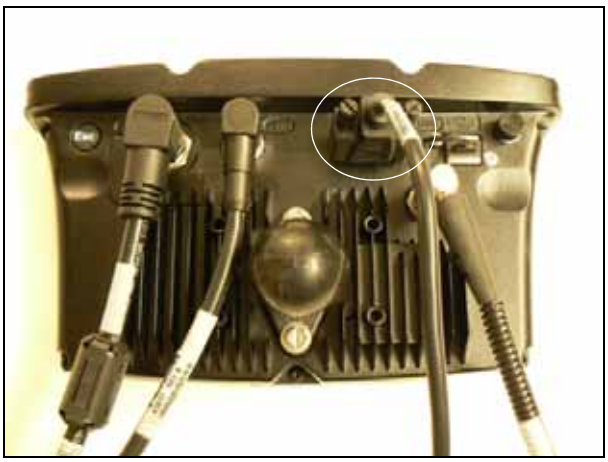
Feed the GPS antenna cable into the cab and then connect it to the antenna port on the back of the lightbar.



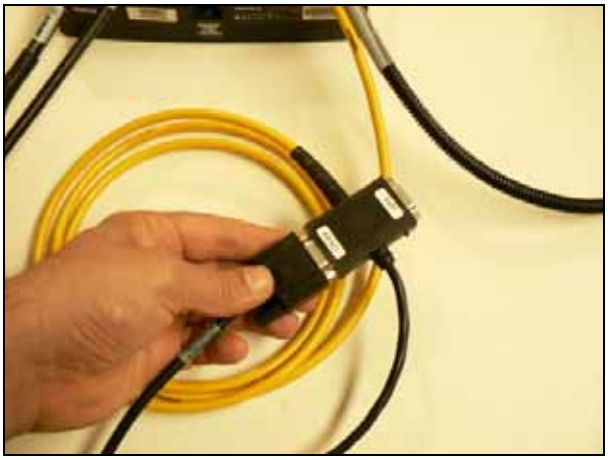
Step 5

With keypad

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

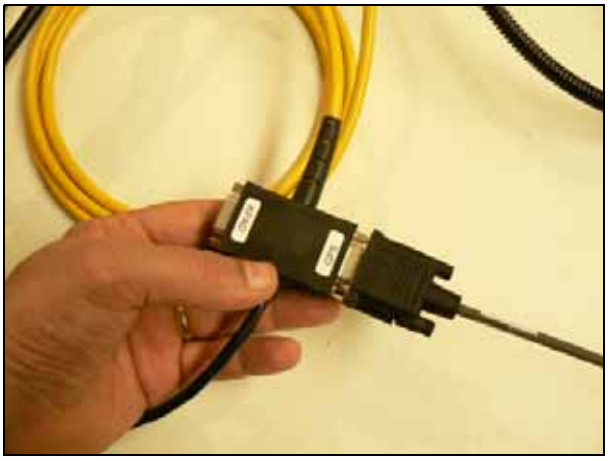


Connect the remote keypad to the KPAD serial port on the external interface cable.



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

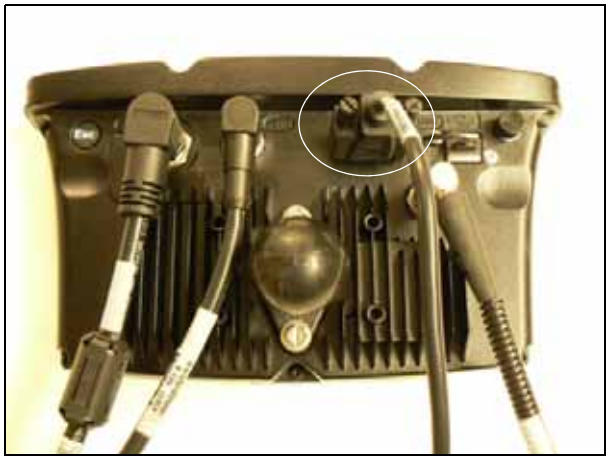
Radio type	Cable to connect
SNB900 radio	EZ-Guide 500-to-radio cable (P/N 61158)
PDL 450 radio	PDL radio power/data cable (P/N 51861-00)



Without keypad

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

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



Step 6

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

Step 7

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

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

Installing the EZ-Guide 500 lightbar

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

Step 1

Select the location for the lightbar in the cab. There must be a bar that the RAM mount can be attached to.



Step 2

Sit in the driver's seat and hold the lightbar in place. Ensure that it allows comfortable access to the display buttons and does not obstruct instruments.



Step 3

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



Step 4

Attach the free end of the RAM mount to the bar mount. Tighten the clamp on the RAM mount so that the lightbar is held securely in place.



Step 5

Adjust the angle of the RAM mount for ease of use.



EZ-Guide 500 lightbar and FmX integrated display: Installing the GPS antenna and plate

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

Note – *The V plate antenna bracket is available on the Autopilot price list. See* *Antenna mounting kits, page 11*.

Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations. For more information, see Antenna and receiver installation options, page 48.

Attach the V plate to the spar with the four supplied ¼"-20 flathead screws as shown. The narrow end points forward.



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.

- **L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)** – 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.
- **L1 single band antenna (WAAS, EGNOS, OmniSTAR VBS, Beacon)** – 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.

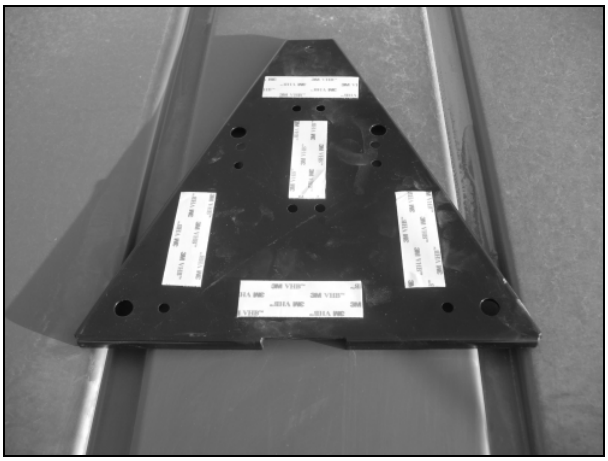


Step 2

V plate only

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

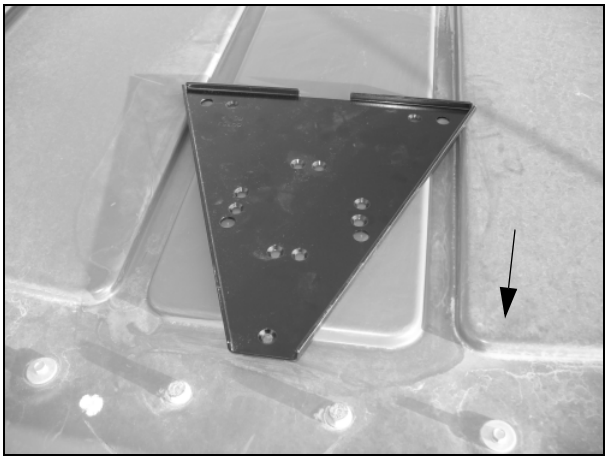
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



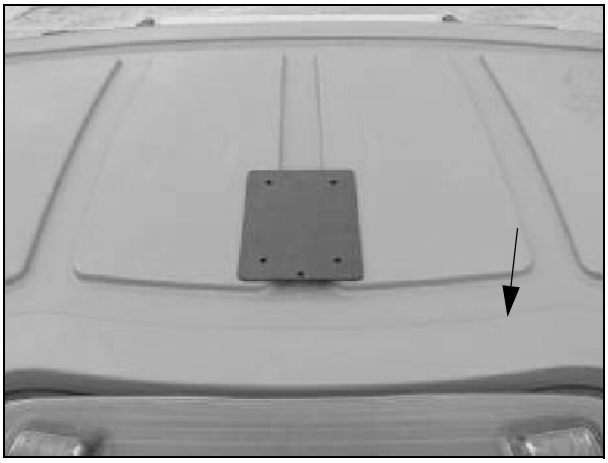
Step 3

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.*



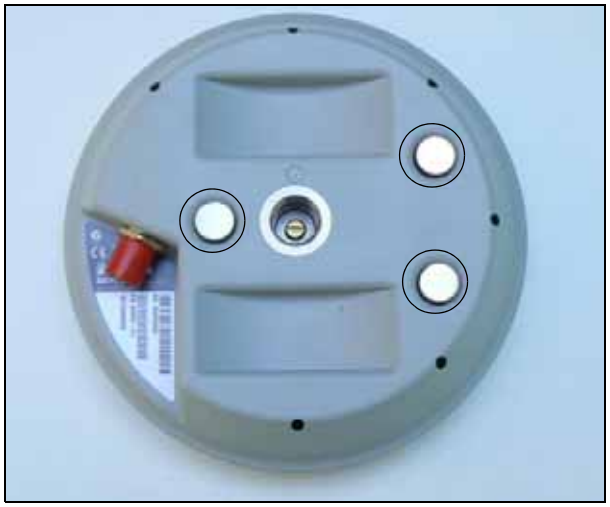
V plate



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 GPS antenna.



Step 5

L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)

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



L1 single band antenna (WAAS, EGNOS, VBS, Beacon)

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 integrated display: 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 FmX integrated display.

EZ-Guide 500 lightbar: Installing a PDL radio modem

Step 1

Position the radio where it is accessible for the operator to select a new radio channel ID.



Permanent mount

For a permanent mount, bolt the radio onto a bracket with a $^{5}/_{8}$" UNC screw.



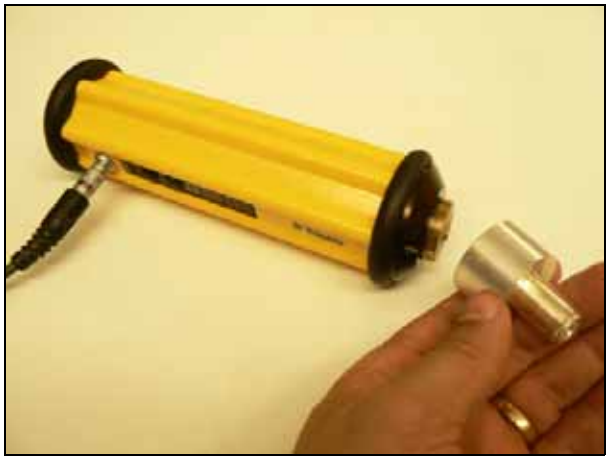
Temporary mount

For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a $^{5}/_{8}$" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.

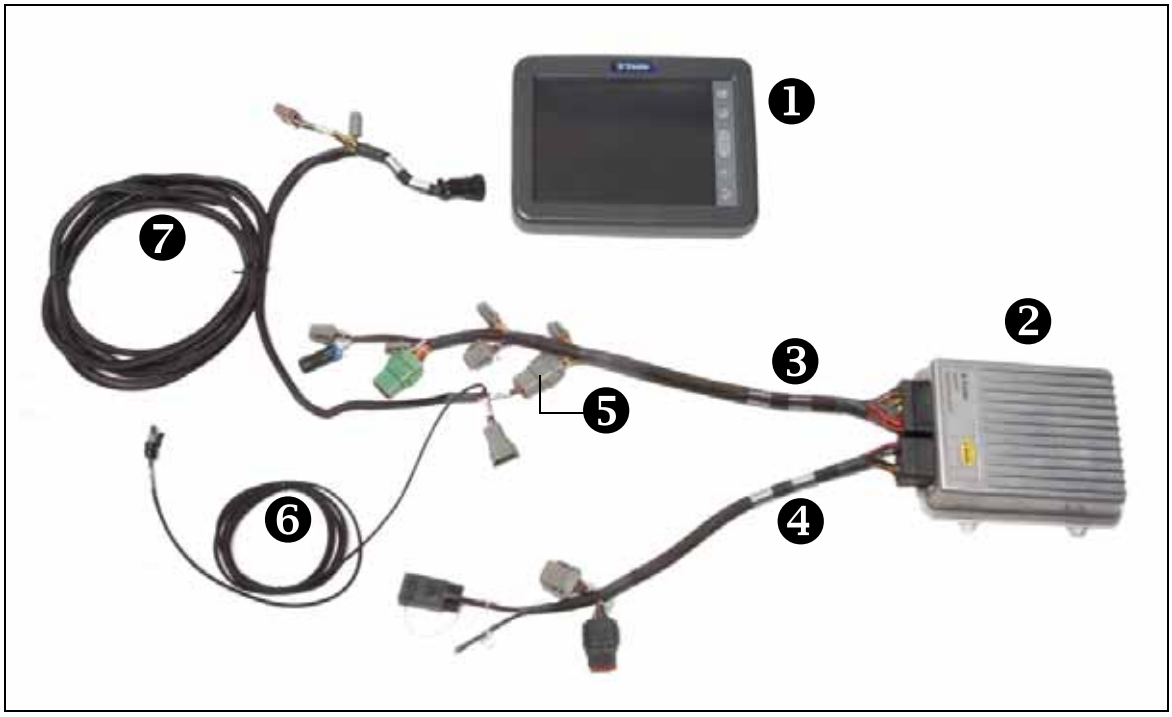


Step 3

Connect the radio cable to the adaptor.



FieldManager display components



Item	Description
❶	AgGPS FieldManager display
❷	Autopilot NavController II navigation controller
❸	Autopilot main harness
❹	Autopilot auxiliary harness
❺	P4 connector – “Display”
❻	Power lead
❼	FieldManager display harness (P/N 59872)

Preparing the FieldManager display

The *Ag*GPS FieldManager display is mounted in the cab with a bar-style RAM mount.

Step 1

Locate the FieldManager display, the RAM mount bracket, and the RAM mount clamp.



Step 2

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



Step 3

Attach the RAM mount to the rear of the display.



Installing the FieldManager 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 cab. Use the provided bolts to attach the bar mount to the rail and then feed the Autopilot harness through to the display position.





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 held securely in place.



Step 3

Attach the Autopilot cable to the back of the FieldManager display. Route the cable to the Autopilot controller and then connect it to the connection labeled “Display” on the main harness.

Do not connect the FieldManager display connection to the auxiliary harness connection labeled “Spare”.



CHAPTER

6

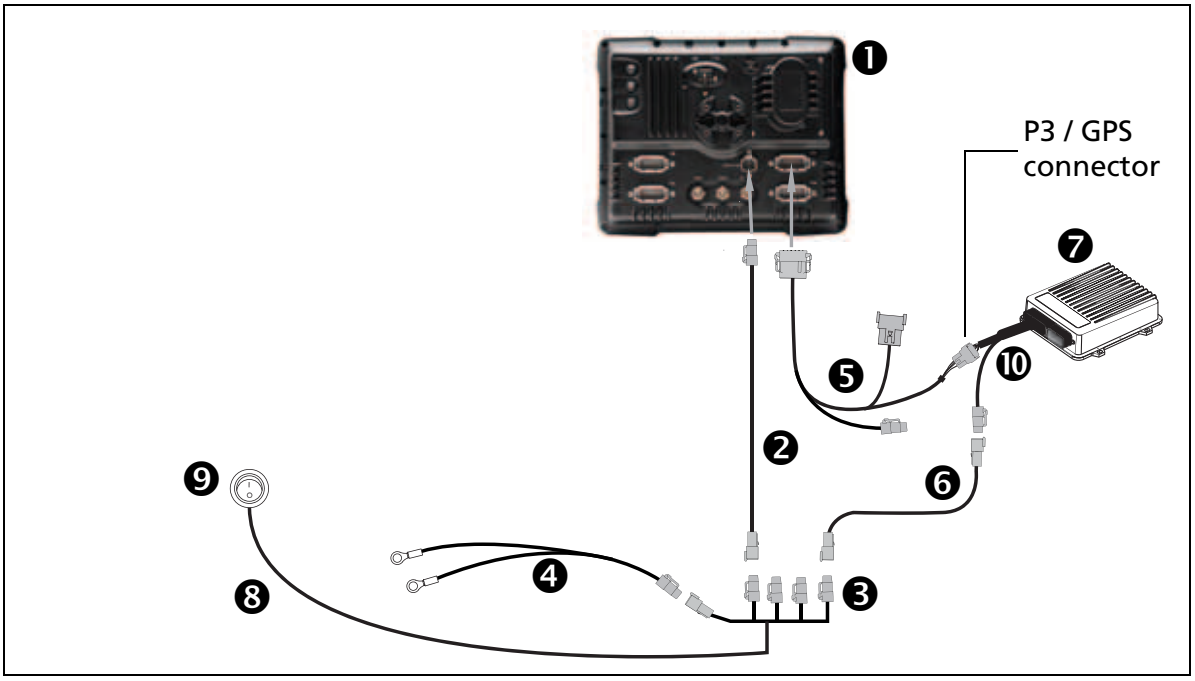
Power Harness Installation

In this chapter:

- FmX integrated display components
- EZ-Guide 500 lightbar components
- Installing the power harness for the FmX integrated display
- Configuring the power bus options for the FmX integrated display
- Configuring the power bus options for the EZ-Guide 500 lightbar
- FieldManager display components
- Configuring the power bus options for the FieldManager display

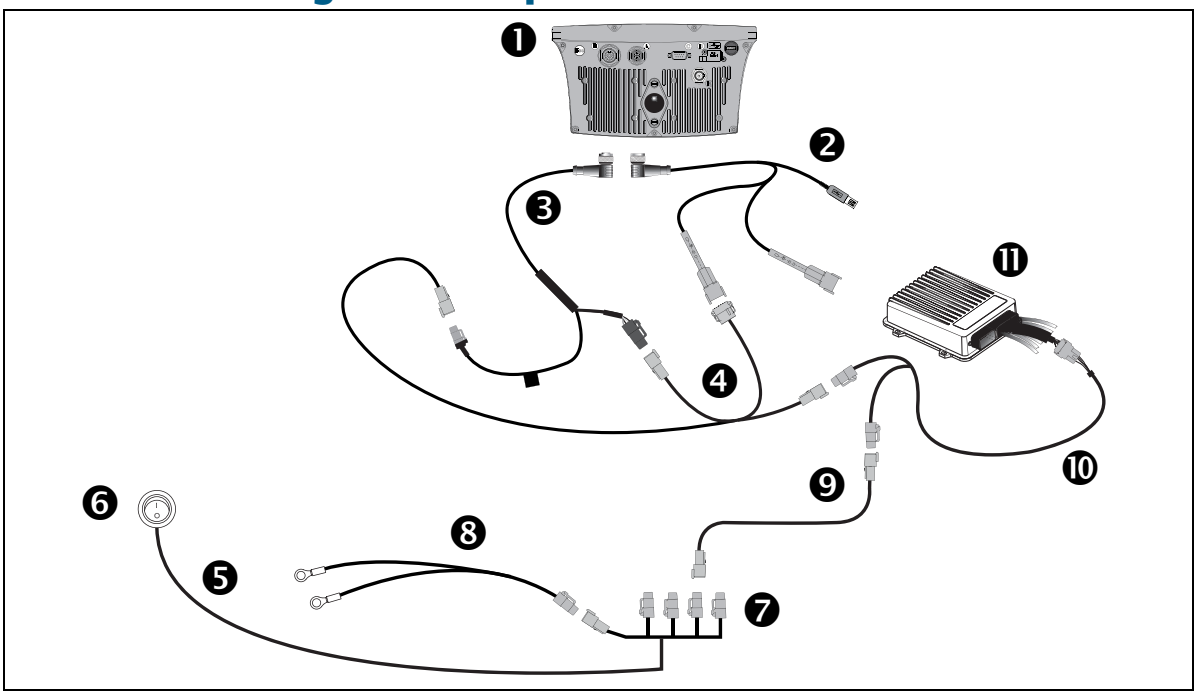
This chapter describes how to install the power harness in the vehicle.

FmX integrated display components



Item	Trimble Part No.	Description
❶	93100-02	FmX integrated display
❷	66694	FmX power cable
❸	67259	FmX power cable with relay and switch (power bus)
❹	67258	Basic power cable
❺	65522	FmX to NavController II cable with port replicator
❻	67095	2 pin DTM to 2 pin DT power adaptor
❼	55563-00	NavController II
❽	Part of P/N 67259	External switch cable incl with kit
❾	Part of P/N 67259	External switch incl with kit
❿	54601	Main NavController II cable

EZ-Guide 500 lightbar components



Item	Trimble Part No.	Description
❶		*Ag*GPS EZ-Guide 500 lightbar
❷	62069	*Ag*GPS EZ-Guide 500 lightbar 19 pin port expansion cable (P/N 62069)
❸	62817	*Ag*GPS EZ-Guide 500 lightbar/CAN 90° 5 pin connector (P/N 62817)
❹	62754	*Ag*GPS EZ-Guide 500 lightbar port A to NavController II cable (P/N 62754)
❺	Part of P/N 67259	Switch cable (included with P/N 67259)
❻	67095	Switch
❼	67259	FmX power cable with relay and switch
❽	67258	FmX basic power cable
❾	67095	2 pin DTM to 2 pin 2 DT power adaptor
❿	54601	NavController II main cable
⓫	55563-00	NavController II

Installing the power harness for 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.

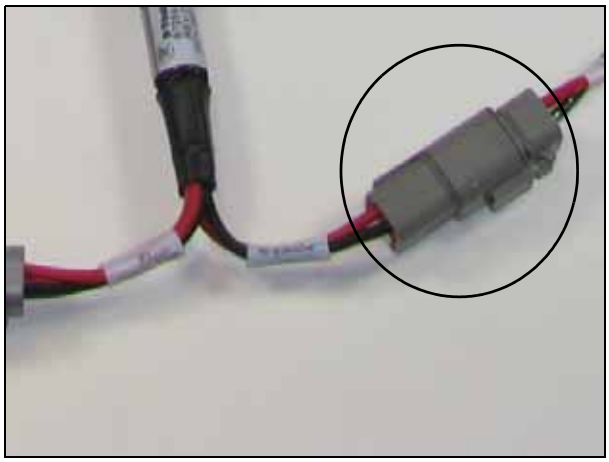
Step 1

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



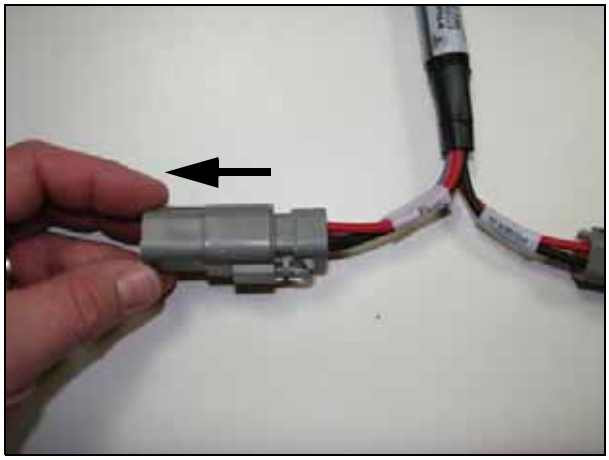
Step 2

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



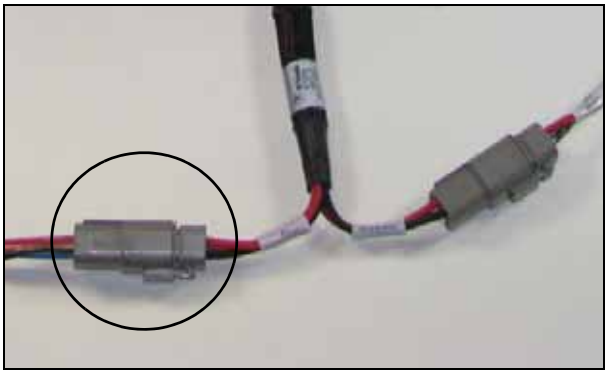
Step 3

Remove the protective receptacle from the power bus.



Step 4

Locate and connect the 4-pin Deutsch DTP receptacle on the FmX integrated display power adaptor to the 4-pin Deutsch DTP plug on the power bus.



Step 5

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



Configuring the power bus options for the FmX integrated display

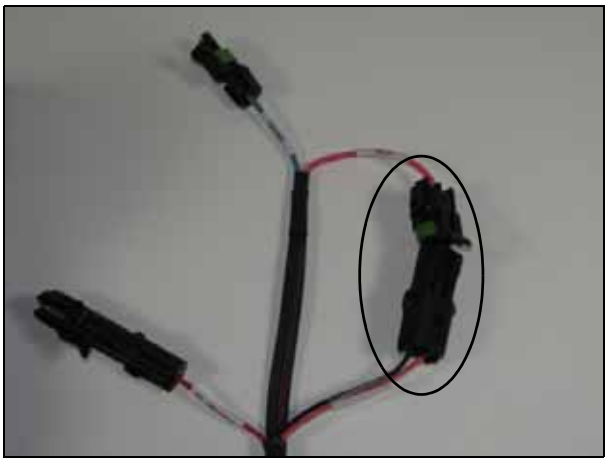
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

- FmX integrated 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

FmX integrated display power button is used to turn on the Autopilot system

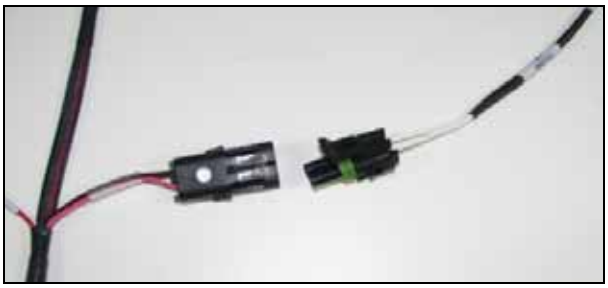
Connect the 2 pin connectors labeled R2 and P2 on the power bus.



External switch is used to turn on the Autopilot system

Step 1

Connect the cable labeled R7 switch (included with the power bus) to connector labeled P2 on the power bus.



Step 2

Route the cable labeled R7 to a switch location.

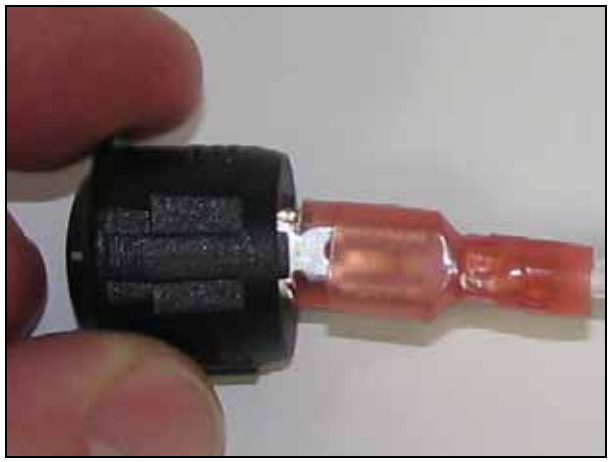
Note – *To install the switch provided, drill a ¾" hole.*



Step 3

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.*

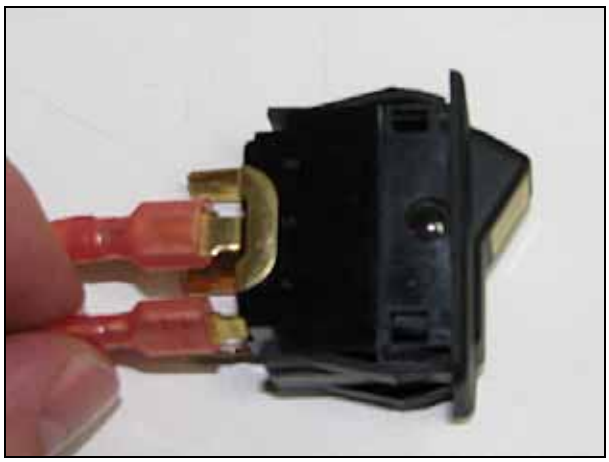


Step 2

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.

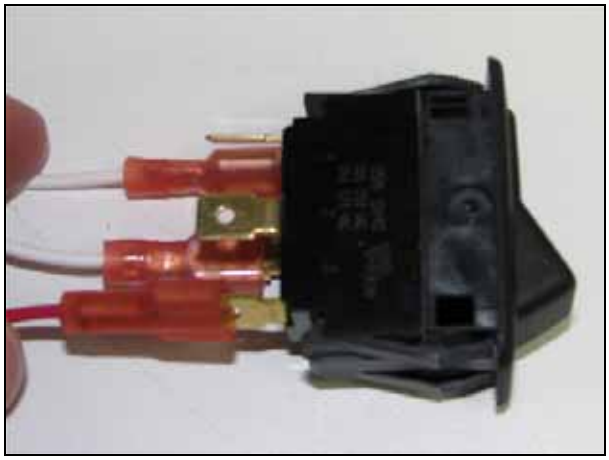
Note – *Polarity is important.*



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.*

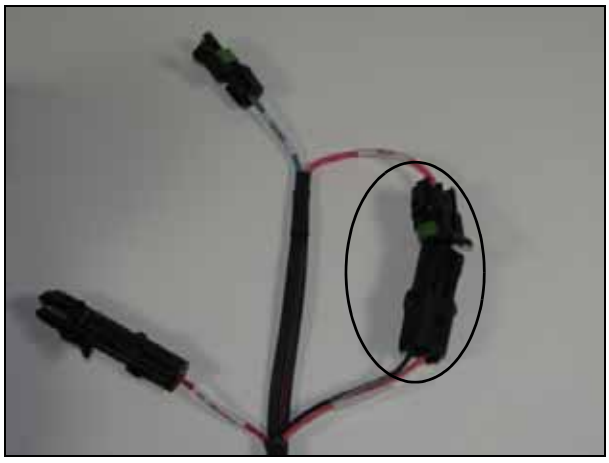


Ignition is used to turn on the Autopilot system

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

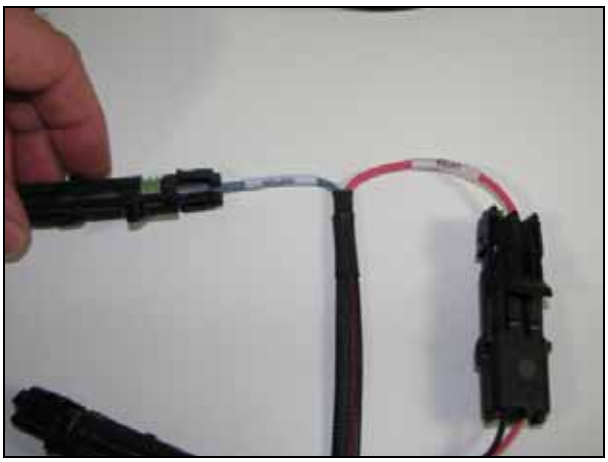
Step 1

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.

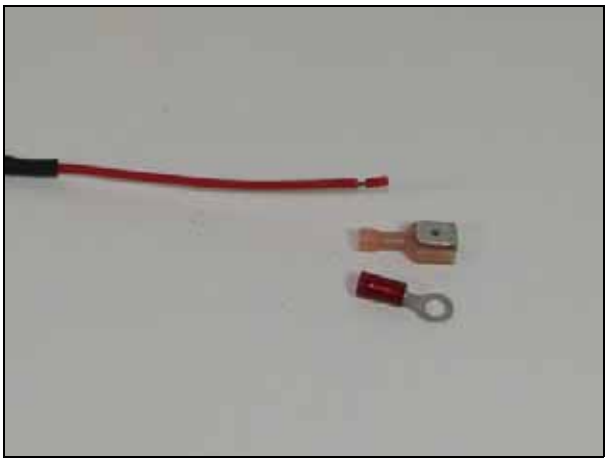


Step 3

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.



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

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

Note – *For the AgGPS EZ-Guide 500 lightbar cable installation instructions see,* *EZ-Guide 500 lightbar components, page 97*

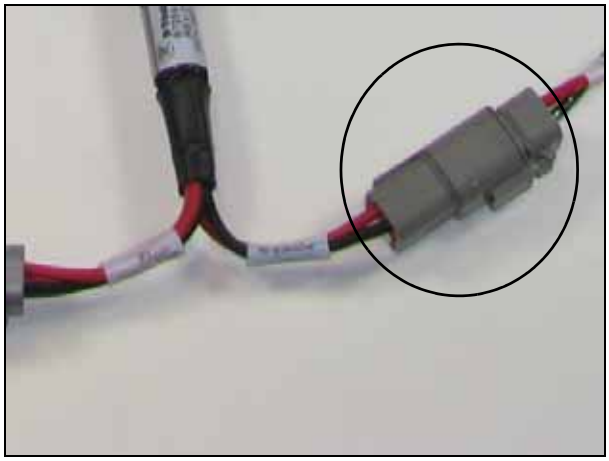
Step 1

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



Step 2

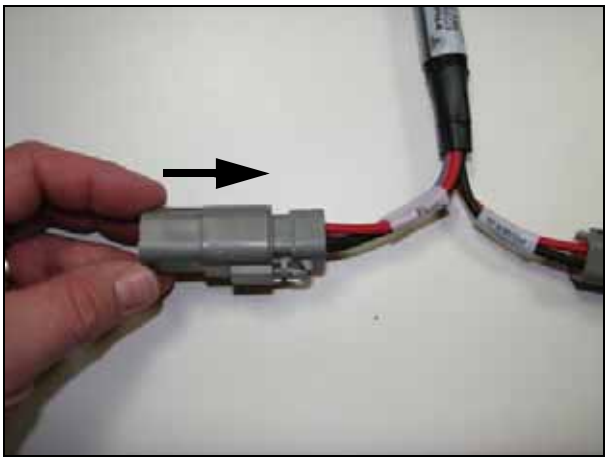
Locate and connect the 4-pin Deutsch DTP receptacle on the power bus to the 4-pin Deutsch DTP plug on the basic power cable.



Step 3

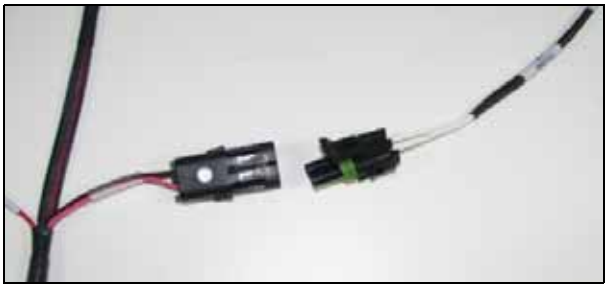
Verify that the protective receptacle is installed on the power bus.

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



Step 4

Connect the cable labeled R7 switch (included with the power bus) to the connector labeled P2 on the power bus.



Step 5

Route cable labeled R7 to a switch location.

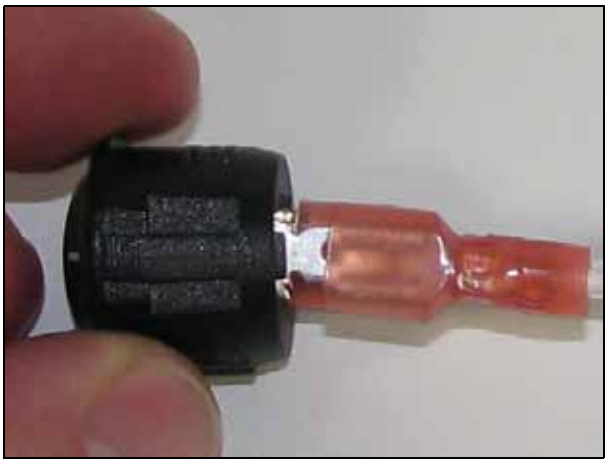
Note – *To install the switch provided, drill a ¾" hole.*



Step 6

Connect cable labeled R7 to the switch pins

Note – *Polarity is not important.*



Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

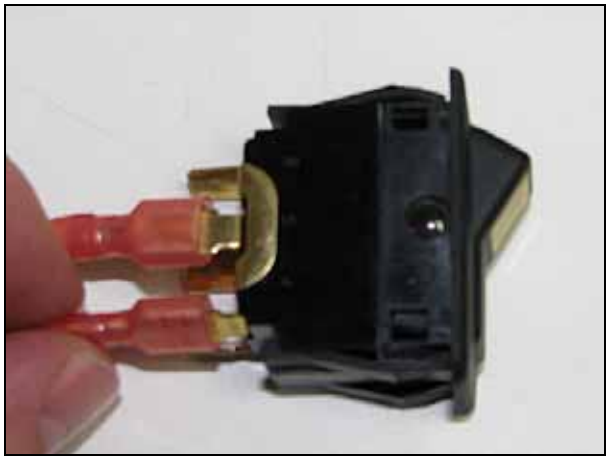


Step 2

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

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

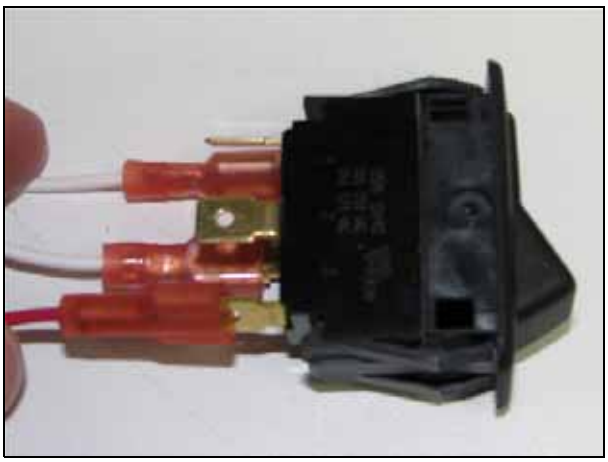
Note – *Polarity is important.*



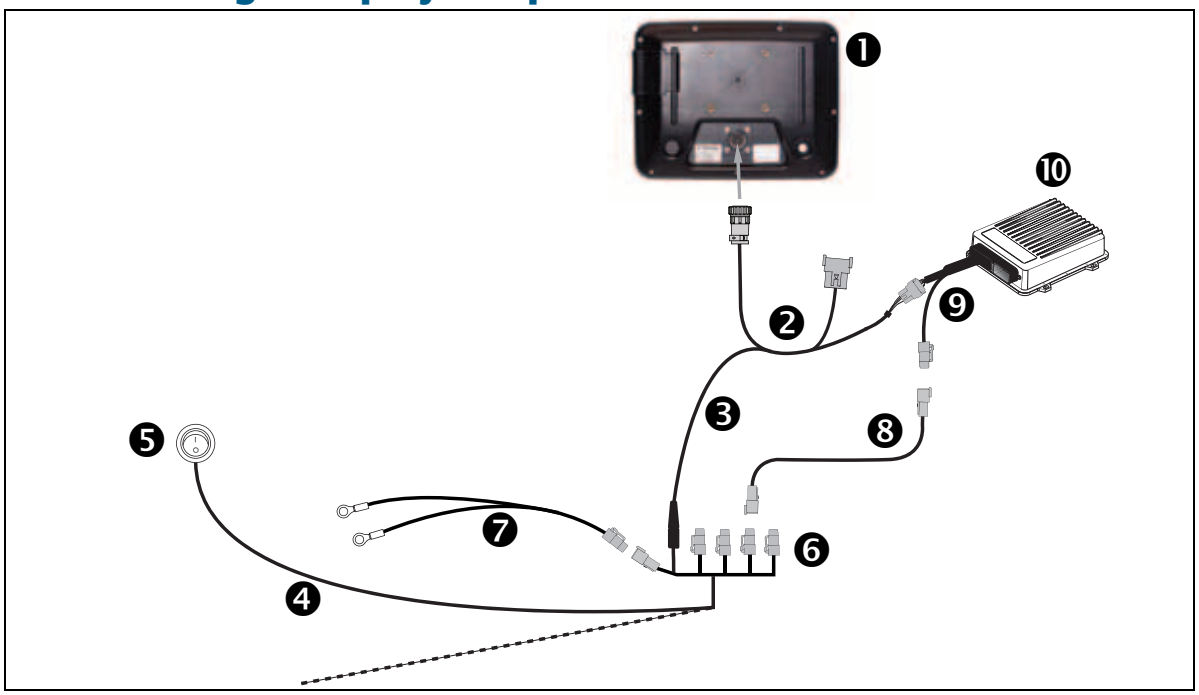
Step 3

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

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



FieldManager display components



Item	Trimble Part No.	Description
❶		FieldManager™ display
❷	59872	Basic FMD/AP cable
❸	Part of P/N 59872	Continuous power cable
❹	Part of P/N 67259	Switch cable
❺	Part of P/N 67259	Switch
❻	67259	FmX power cable with relay and switch
❼	67258	Basic power cable
❽	67095	2 pin DTM to 2 pin 2 DT power adaptor
❾	54601	NavController II main cable
❿	55563-00	NavController II

Configuring the power bus options for the FieldManager 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.

To install the power bus with the FieldManager display, follow the Configuring the power bus options for the EZ-Guide 500 lightbar installation instructions, with the addition of the following step:

Continuous power connection

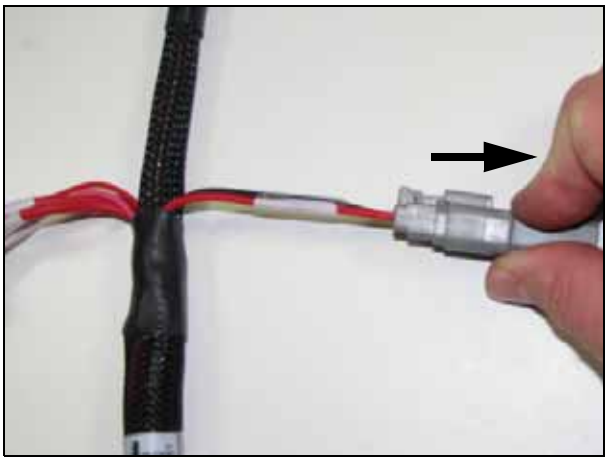
Locate the P9 connector on the FieldManager display harness. Route the cable and then connect P9 to the continuous power connector on the power bus.



Connecting power to the NavController II

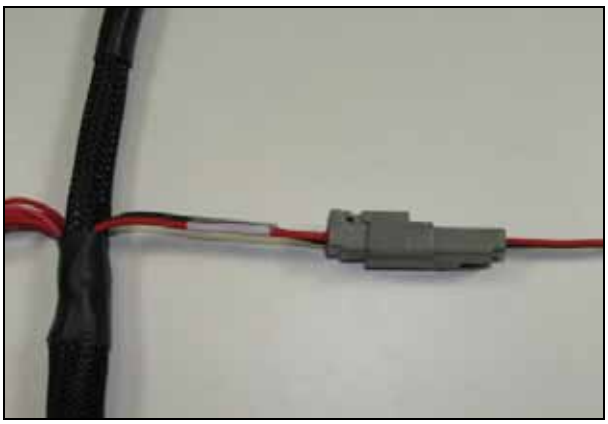
Step 1

Remove the protective receptacle from the power connector on the power bus.



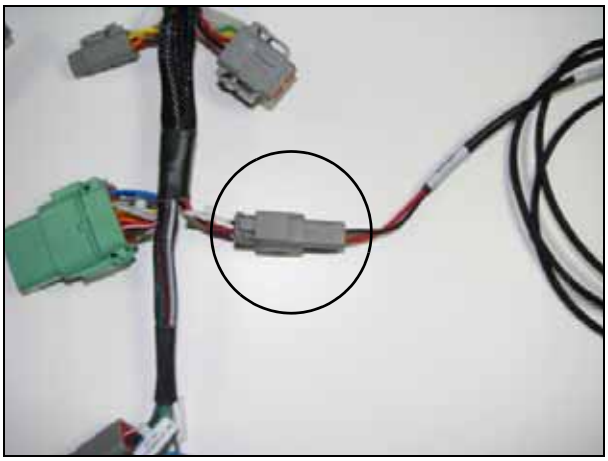
Step 2

Connect the P4 connector on the power bus to the NavController II adaptor cable. Route the cable to the NavController II mounting location.



Step 3

Connect the NavController II adaptor cable to P2 of the NavController II main harness.



CHAPTER

7

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.

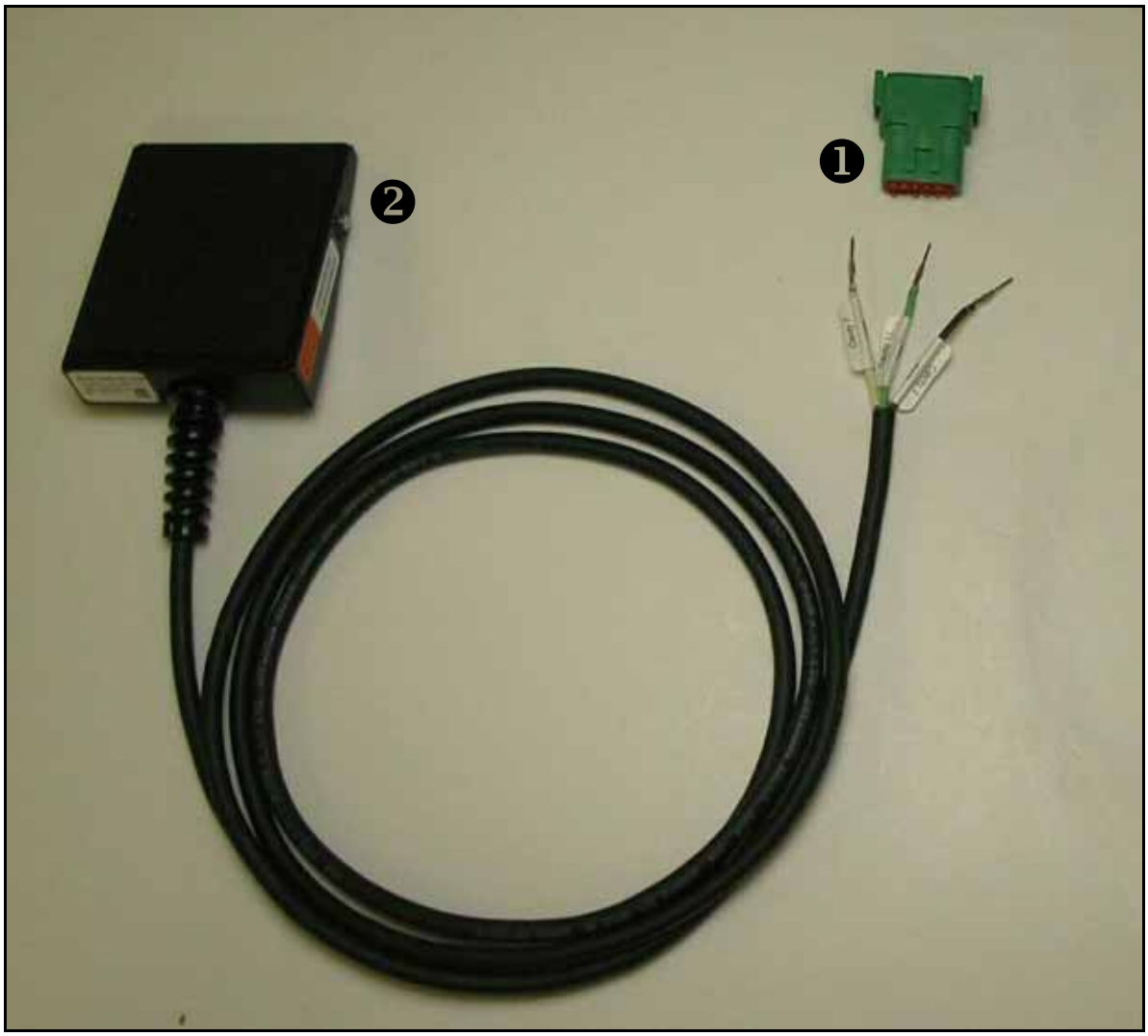
Remote engage switch components: Rocker switch



Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

Note – *Full or Standard Euro switch, depending on kit ordered.*

Remote engage switch components: Foot switch

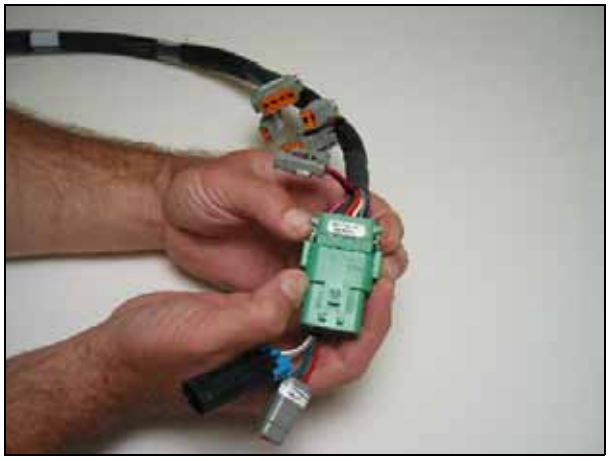


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Preparing the remote engage cable

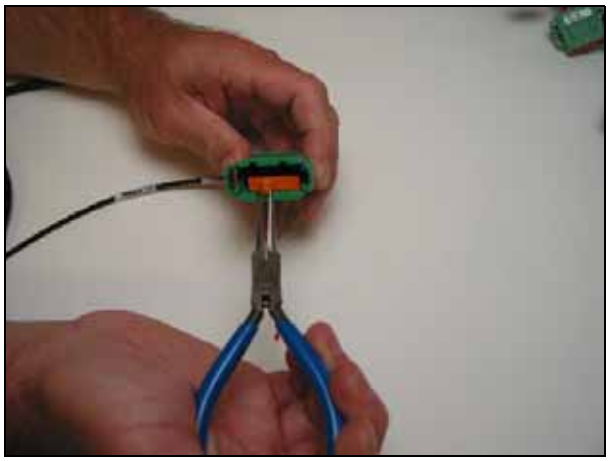
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. See Controller connections, page 123.



Step 2

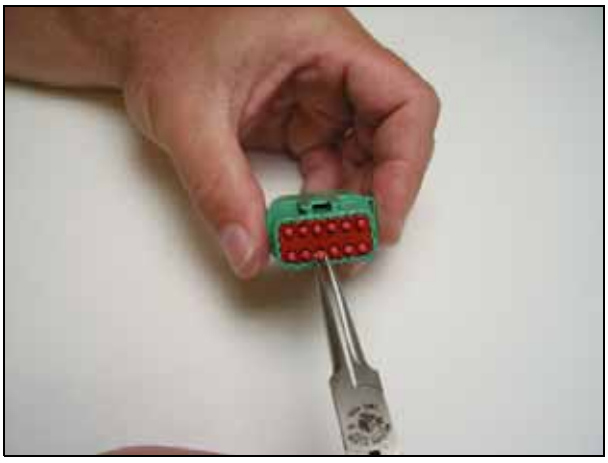
Remove the wedge from the connector.



Step 3

Rocker switch only

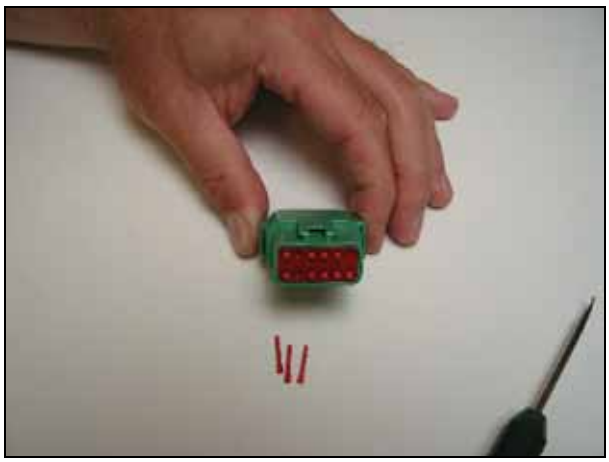
Remove the plugs from cavity 2 and 7.



Step 4

Foot Switch Only

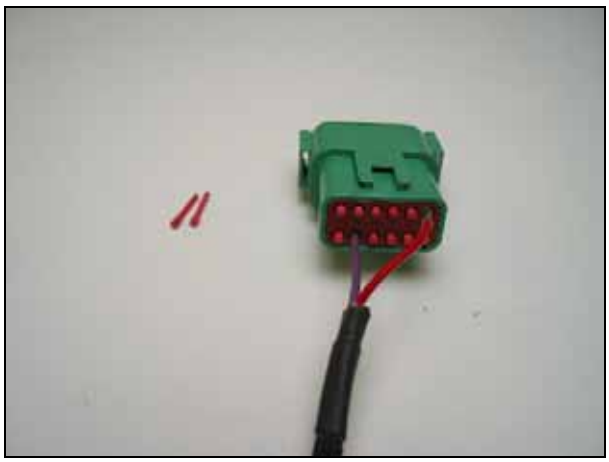
Remove the plugs from cavity 2, 7, and 11.



Step 5

Rocker Switch Only

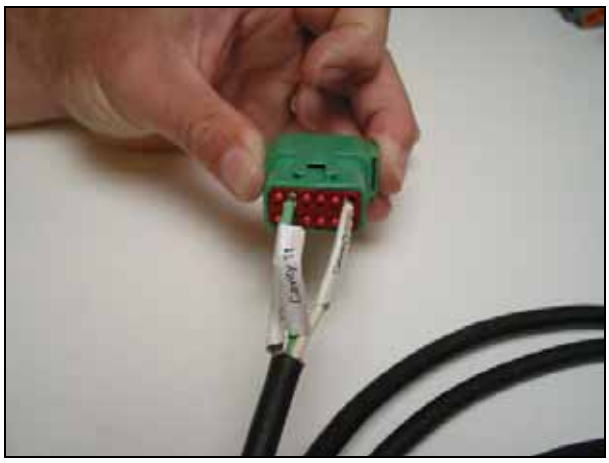
Insert the DTM pins into cavity 2 and 7 according to the labels on the wires.



Step 6

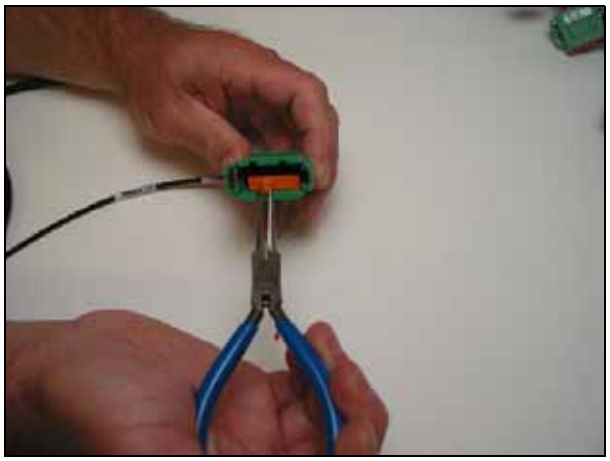
Foot Switch Only

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



Step 7

Pull on the wires to seat them in place. Replace the wedge in the connector.



Step 8

Rocker Switch Only

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



Step 9

Foot Switch Only

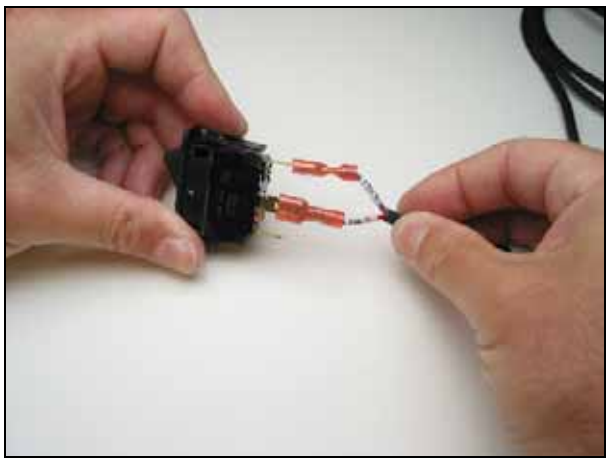
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 10

Rocker Switch Only

Connect the wires to the switch that matches the print on the switch body and labels on the wires.



Step 11

Rocker Switch Only

Place the switch in the console.



Using the remote engage switch

Step 1

Hold the switch down for at least 0.5 seconds.

Note – *Holding the switch shorter than 0.5 seconds will not engage the system.*

Step 2

Release the switch between 0.5 and 4.0 seconds. The vehicle will engage when the switch is released.

CHAPTER

8

Controller Installation

In this chapter:

- Installing the controller
- Controller connections

This chapter describes how to install the *Ag*GPS Autopilot controller in the vehicle.

Note – *Route all harnesses, wires, and cables along routes that are free of obstructions and pinch points. Use wire ties where necessary. For ease of installation, connectors on all harnesses are identified by component. The following instructions will only give you the general direction to route the components. You will be responsible for determining the best method of concealing all routings.*

Note – *Make note of where any wire harness and hose tie straps are removed during disassembly so they can be properly installed during assembly.*

Installing the controller

Step 1

Locate the controller mounting position behind the seat inside the cab of the tractor.



Step 2

CAUTION – Before drilling, clear the area behind the plate.

On the back wall drill 4 clearance holes for the controller mounting bolts.



Step 3

Use the ¼" bolts and hardware provided in the bolt kit to attach the plate to the console wall. Tighten the nuts from outside the cab.



Step 4

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



Step 5

Use the four #10 Phillips screws provided in the bolt kit to mount the controller to the bracket. When mounting the controller directly to the vehicle, use the ¼" cap screws and hardware provided in the bolt kit.

Note – *The controller is shown bolted directly to the panel. If moving the controller from vehicle to vehicle, Trimble recommends the use of a controller mounting plate.*



Step 6

Remove the rear panel and then cut a notch or 2" hole for cable routing. Secure the cabling behind the panel.



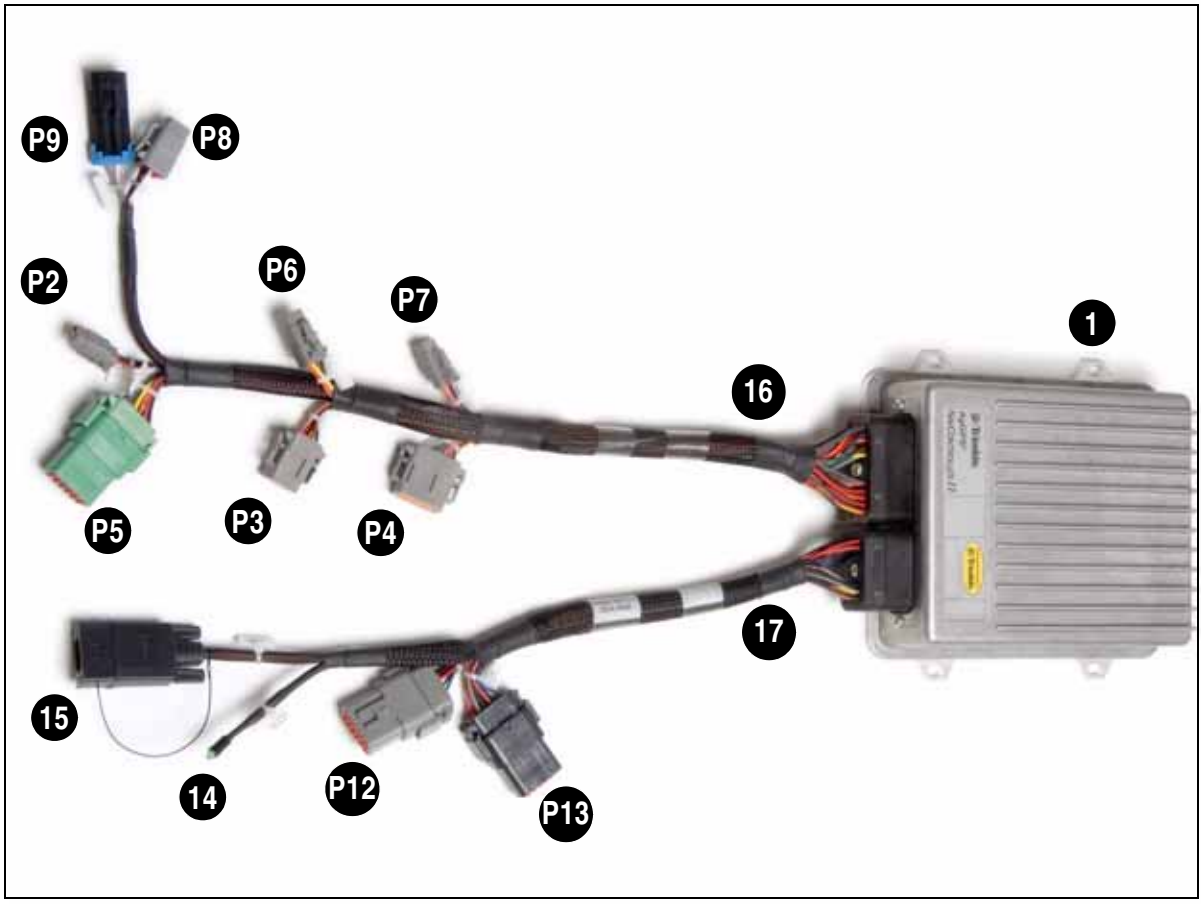
Step 7

Route the cables out of the cab through the right rear corner.





Controller connections



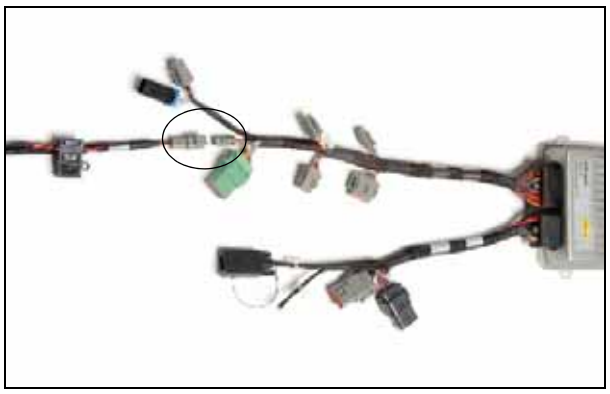
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

Step 1

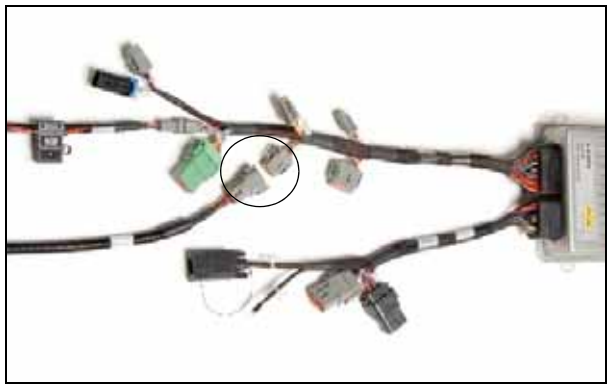
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

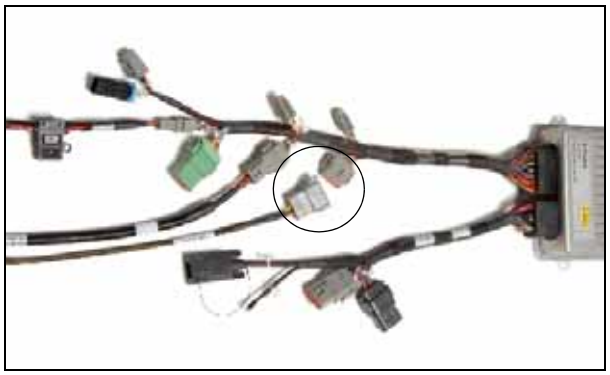
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

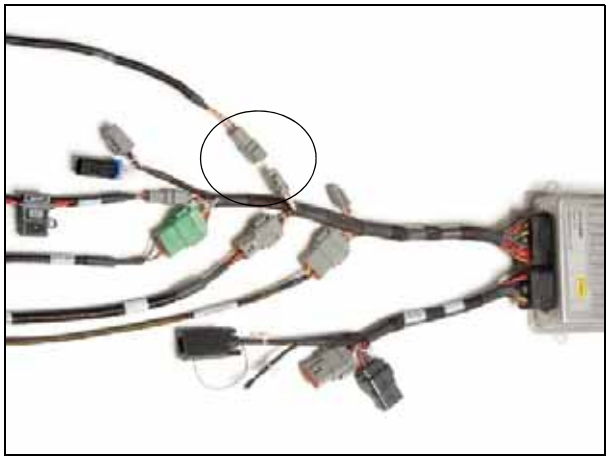
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

Note – *Do not connect the cable to the connector labeled “Spare” on the auxiliary harness.*



Step 4

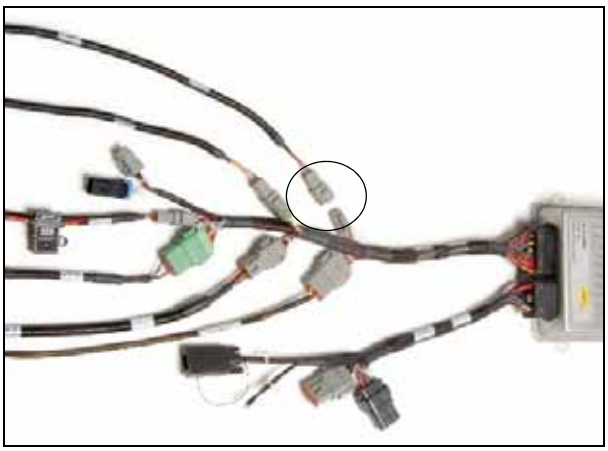
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

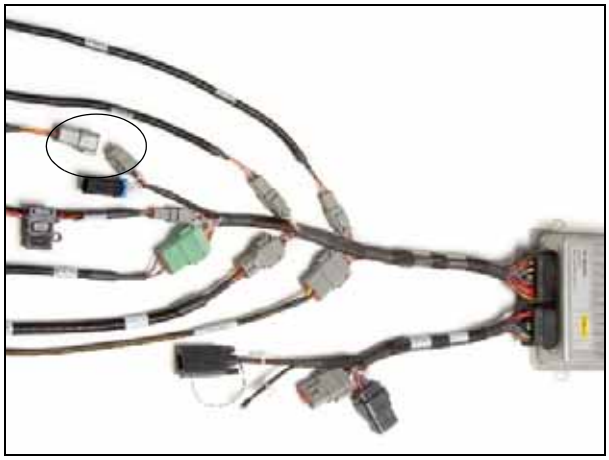
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 6

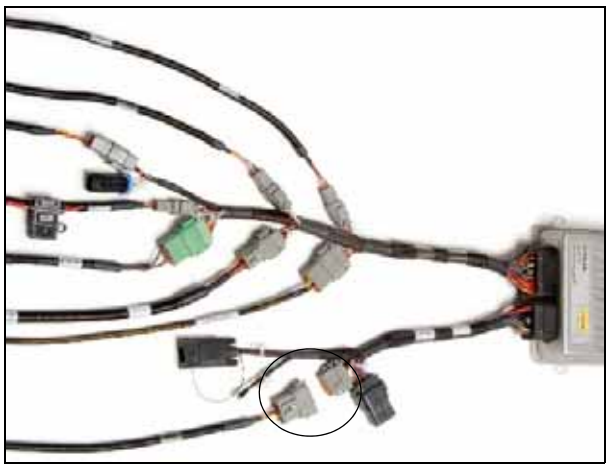
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 7

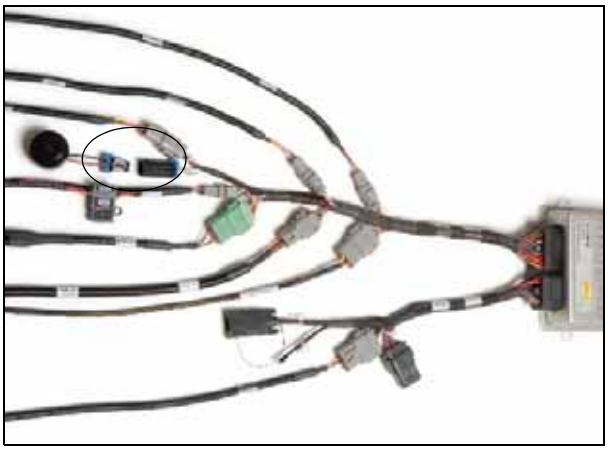
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

Note – *If an AgGPS 50 or AgGPS 150 lightbar is connected to P-12, it will act as a lightbar only.*



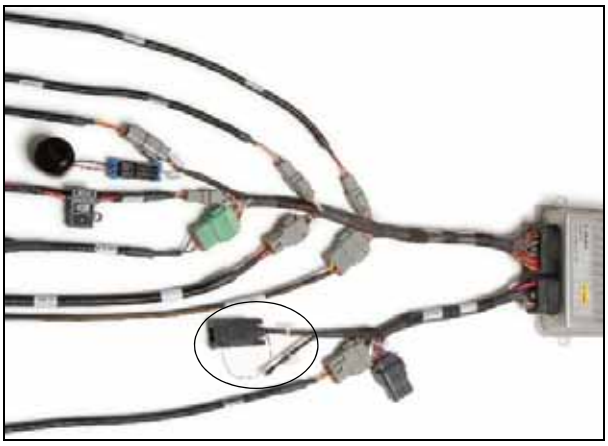
Step 8

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



Step 9

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 10

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

9

Final Machine Check

In this chapter:

- Final machine check

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

Final machine check

Step 1

Connect the battery.

Step 2

Start the machine and check for hydraulic leaks. Correct as needed.

Step 3

Connect and run the *Ag*GPS Autopilot Toolbox II software for system setup and calibration. For more information, refer to the *AgGPS Autopilot Toolbox II Software User Guide*.

Step 4

Open the Diagnostic page of the *Ag*GPS Autopilot Toolbox II software and ensure that all signals from the hydraulics and sensors are active.