Installation Instructions

*Ag*GPS® Autopilot™ Automated Steering System

John Deere

- **4720 Sprayer (AutoTrac Ready)**
- **4730 Sprayer (AutoTrac Ready)**
- **4830 Sprayer (AutoTrac Ready)**

Version 4.00
Revision A
October 2008
Part Number 54037-21-E04

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Safety Information

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



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



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

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

Warnings



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



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



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

Cautions



CAUTION – When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot. These hot parts 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. These can cause poisoning. Ensure that you wash you hands thoroughly after you have finished working on the system.



CAUTION – Battery posts, terminals, and related accessories contain lead and lead compounds. Lead poisoning can cause lowered intelligence and kidney problems. To avoid ingesting lead, ensure that you wash you hands thoroughly after touching the battery.



CAUTION – Vehicle cabs can be quite high in the air. Falling from this height can cause broken bones and internal injuries. To avoid falling from the vehicle, ensure that when you enter or exit the vehicle, you face the vehicle and use the steps and handrails.



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 proper protective welders clothing if you want to complete any 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 sprayer 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
- Manual system upgrade to Autopilot
- Required components
- Autopilot hardware organization – as installed
- Pre-installation vehicle preparation
- Your comments

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**.

Manual system upgrade to Autopilot

*Ag*GPS 150 EZ-Guide Plus lightbar

Retain	Remove
*Ag*GPS 150 EZ-Guide Plus lightbar Antenna for *Ag*GPS 150 EZ-Guide Plus lightbar Antenna to receiver cable (Optional) Remote keypad	Power cable (for modification)

EZ-Guide 500 manual guidance upgrade

Retain	Remove
EZ-Guide 500 lightbar Antenna for EZ-Guide 500 lightbar Antenna to receiver cable (Optional) Remote keypad	Power cable (for modification)

Required components

Kits required	Special tools
Platform kit: P/N 54037-21	$^{5}/_{16}$" drill bit Right angle drill or drill attachment Allen wrench set (metric and SAE)

Antenna mounting kits

Antenna options
Antenna spar mount: P/N 53676
Antenna V plate mount and *Ag*GPS 252 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the *Ag*GPS 252 receiver – see Chapter 3, Antenna/Receiver Installation).

Autopilot hardware organization – as shipped.

Hardware	Component	See...
Platform kit **(P/N 54037-21)**	Plugs and jumpers	Chapter 2
	Valve cable	Chapter 2
	Steering angle sensor	Chapter 2
	Phantom sensor	Chapter 2
	Steering angle cable	Chapter 2
	Manual override cable	Chapter 2
	Power cable and switch	Chapter 5
	Controller mounting bracket	Chapter 7
	Bolt kit	Chapter 7
Common parts	Controller	Chapter 7
	Cable kit: • Main wiring harness • Auxiliary wiring harness • Sonalert alarm	Chapter 7
GPS receiver	GPS receiver	Chapter 3
	GPS antenna	Chapter 3
	GPS receiver mounting bracket	Chapter 3
	GPS receiver power/data cable	Chapter 3
	RTK radio, cable, and radio antenna	Chapter 3
Display	*Ag*GPS FieldManager display	Chapter 4
	EZ-Guide 500 lightbar	Chapter 4
	Display cable	Chapter 4
	Mounting bracket	Chapter 4
	*Ag*GPS 150 lightbar	Chapter 4
Roof bracket kit **(P/N 53676)**	Roof brackets	Chapter 3
	Bolt kit, roof bracket	Chapter 3

Autopilot hardware organization – as installed

Hardware	Component	See...
AutoTrac	• Plugs and jumpers • Valve cable • Manual override cable • Steering angle cable • Steering angle sensor • Phantom sensor	Chapter 2
GPS receiver	• GPS receiver • GPS antenna • GPS receiver mounting bracket • GPS receiver power/data cable • Roof brackets	Chapter 3
Display	• EZ-Guide 500 lightbar • *Ag*GPS FieldManager display • Display cable(s) • Mounting bracket • EZ-Guide Plus lightbar	Chapter 4
Power	• Power cable and switch	Chapter 5
Controller	• Controller • Mounting plate • Bolt kit - controller • Main wiring harness • Aux. wiring harness • Sonalert alarm	Chapter 7

Pre-installation vehicle preparation

Step 1

Park the vehicle on a level, hard 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.*

Your comments

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

CHAPTER

2

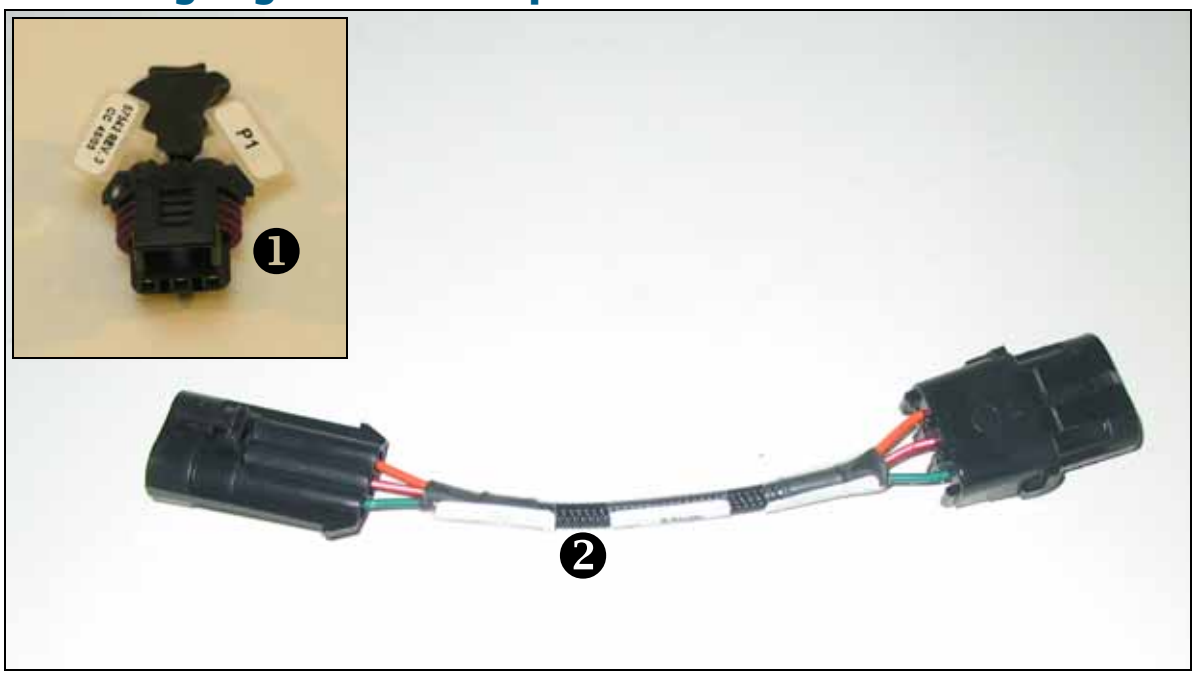
AutoTrac Harness Installation

In this chapter:

- Steering angle sensor components
- Connecting to the wheel angle sensor
- Steering control valve cable components
- Connecting to the steering control valve – 47x0 series
- Connecting to the steering control valve – 4830 model
- AutoTrac manual override harness components
- Termination steering encoder connector components
- Connecting the steering wheel encoder

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

Steering angle sensor components



Item	Description
❶	Termination Connector (P/N 57542)
❷	Steering angle sensor jumper (P/N 57541)

Connecting to the wheel angle sensor

Note – *Installation of this kit utilizes many existing components on the AutoTrac ready vehicle. To make the required connections, it will be necessary to disconnect existing vehicle sensor inputs and patch in the AgGPS Autopilot controller cables. If the Autopilot system is removed, all connections are easily reversible.*

Step 1

Locate the existing vehicle wheel angle sensor on the front left wheel.



Step 2

Locate the existing steering sensor assembly and the 3-pin connector shown.



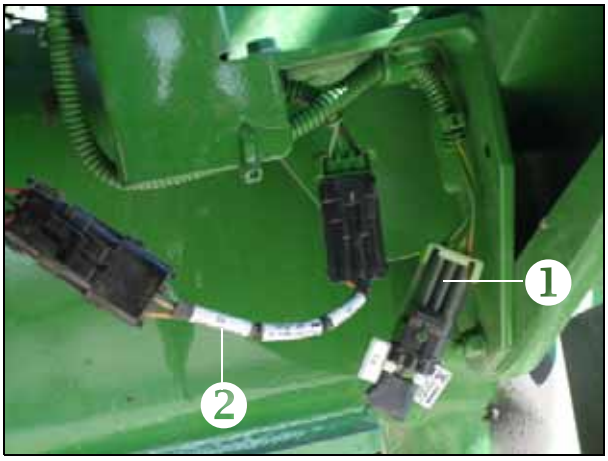
Step 3

Disconnect the connector halves.



Step 4

Connect the termination connector (P/N 57542) ❶ to the receptacle.



Step 5

Connect the steering angle sensor jumper (P/N 57541) ❷ to the plug connector.

Step 6

Connect the jumper (P/N 57541) to the steering angle sensor cable (P/N 54616).

Connect the other end of the steering angle sensor cable to P6 on the main controller harness. For more information, see Controller connections, page 104.

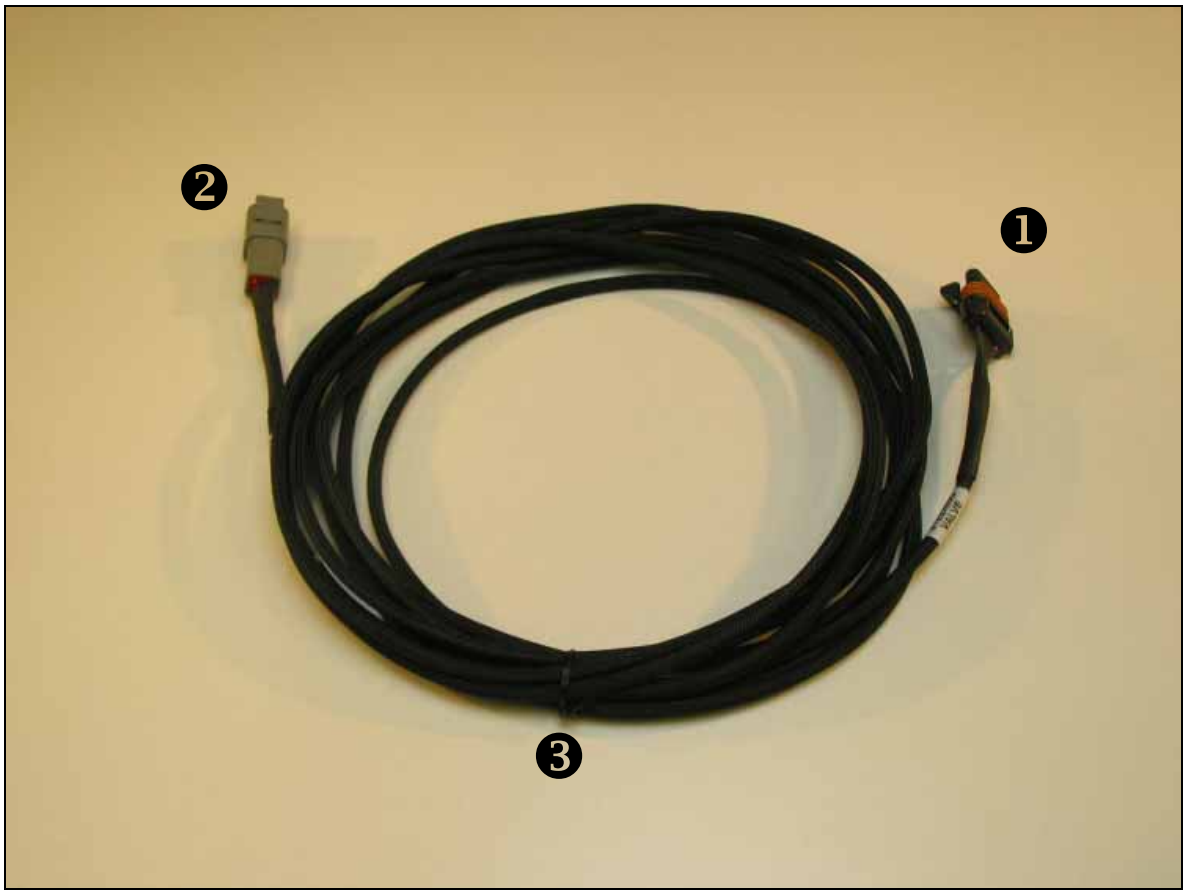


Step 7

Secure the termination connector to protect it from damage during operation and maintenance. Tie wrap the steering angle sensor cable to the existing cable. Ensure that it is protected along its length to the controller.



Steering control valve cable components



Item	Description
❶	Steering control valve connector
❷	P6 steering sensor connector
❸	Steering valve harness (P/N 57536)

Connecting to the steering control valve – 47x0 series

Step 1

Locate the steering control valve, which is under the cab.





Step 2

Unplug the existing cable and then plug the corresponding end of the replacement steering control valve cable into the valve connection. Route the other end of the replacement cable into the cab and connect it to P8 on the main controller harness. For more information, see Controller connections, page 104.



Connecting to the steering control valve – 4830 model

Step 1

Locate the steering control valve, which is under the cab.

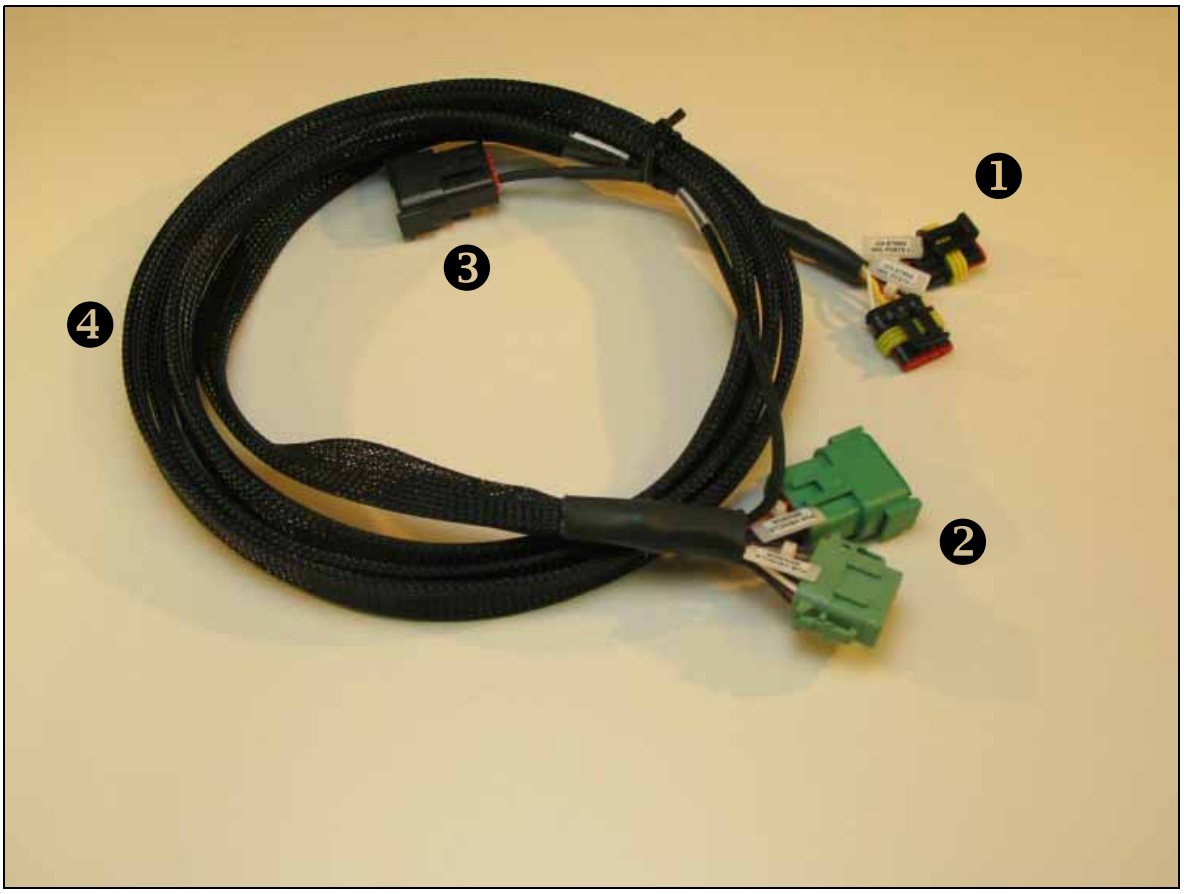


Step 2

Unplug the existing cable and then plug the corresponding end of the replacement steering control valve cable into the valve connection. Route the other end of the replacement cable into the cab and connect it to P8 on the main controller harness. For more information, see Controller connections, page 104.

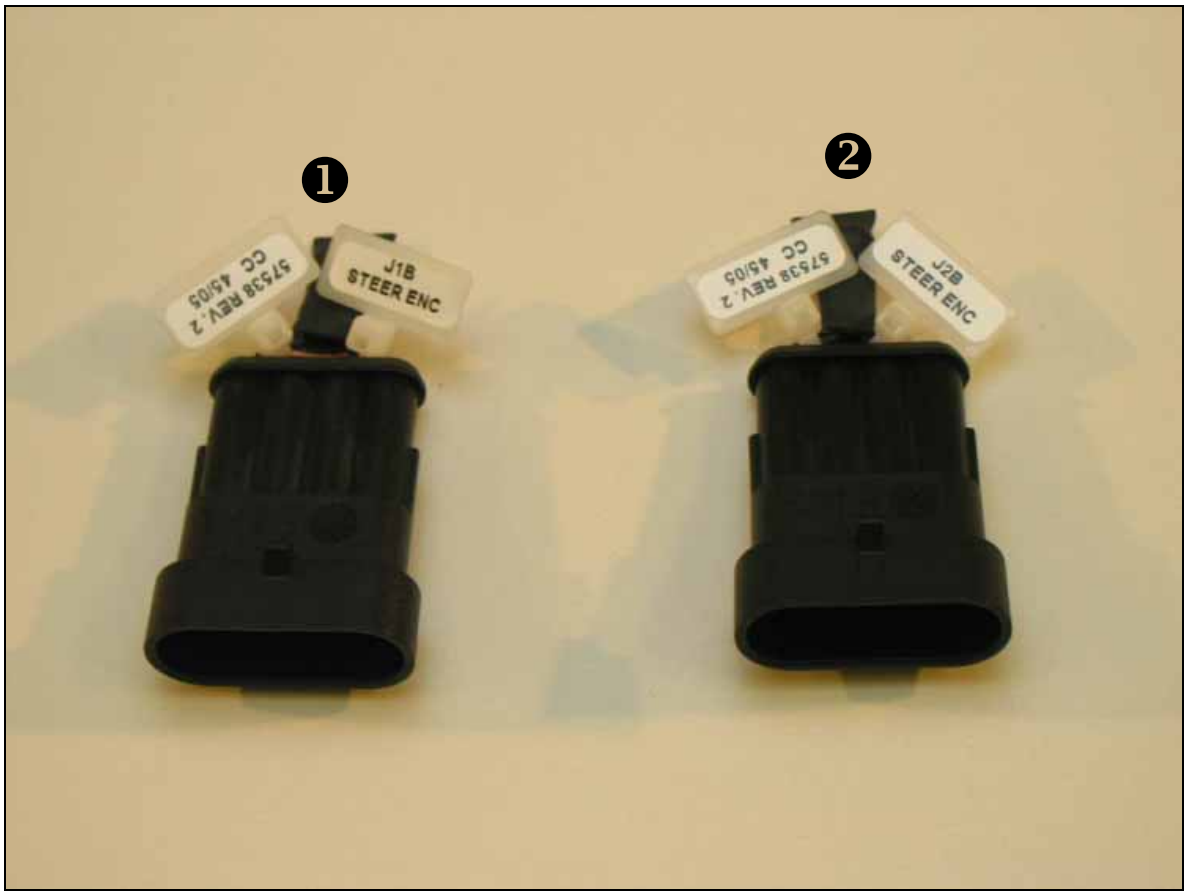


AutoTrac manual override harness components



Item	Description
1	J1A and J2A steering encoder jumper
2	P5A and P5B vehicle sensor
3	P13 spare sensor
4	Manual override harness (P/N 57535

Termination steering encoder connector components



Item	Description
❶	J1B termination steering encoder connector (P/N 58871)
❷	J2B termination steering encoder connector (P/N 58871)

Connecting the steering wheel encoder

Step 1

Remove the steering column cover.

Tip – It is possible to reach connectors on the 4830 model without removing the panel cover.



Step 2

Locate the steering wheel encoder harness and then unplug the two 4-pin connectors.



Step 3

Connect the two termination connectors J1B and J2B ❶ into the mating connectors on the tractor harness (it does not matter which connector is connected to which mating connector).

Connect J1A and J2A ❷ into the mating connector of the tractor harness (it does not matter which sensor is connected to which connector).



Step 4

Connect P13 to the main controller harness. Connect P5A to the main controller harness.

For more information, see Controller connections, page 104.

CHAPTER

3

Antenna/Receiver Installation

In this chapter:

- Antenna and receiver installation options
- Installing the John Deere Starfire Antenna Adapter
- AgGPS 252 GPS receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AgGPS 252 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AgGPS 252 receiver with magnetic feet
- AgGPS 332 receiver components
- Installing the AgGPS 332 receiver
- AgGPS 442/432 receiver components
- Installing the AgGPS 442/432 receiver
- Installing a SiteNet radio and antenna
- Installing a PDL radio modem

This chapter describes how to install an *Ag*GPS 252 receiver and *Ag*GPS radio module, an *Ag*GPS 332 receiver and antenna, or an *Ag*GPS 442 receiver and antenna.

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

Antenna and receiver installation options

There are several options for mounting components (the antenna, radio module, or GPS receiver) on the cab roof depending on the accuracy required and 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. It is recommended for *Ag*GPS 252 mounting. 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 252 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 30.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting.
  - For quick release magnetic mounting with an *Ag*GPS 252 receiver, order the kit listed in Antenna mounting kits, page 9 and bolt the V plate to the spar. When spar mounting is not available and high accuracy is required, see Installing an AgGPS 252 receiver with magnetic feet, page 41 for mounting magnetic feet directly to the base plates.
  - 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.

This table shows the possible mounting methods for each GPS receiver:

GPS receiver	V plate on spar (removable)	VHB plate on roof (removable)	Standard *Ag*GPS 252 plate bolted to spar (permanent)
*Ag*GPS 252 receiver	✓	X	✓
*Ag*GPS 332 receiver	✓	✓	X
*Ag*GPS 432/442 receiver	✓	X	X
EZ-Guide 500 lightbar	✓	✓	X

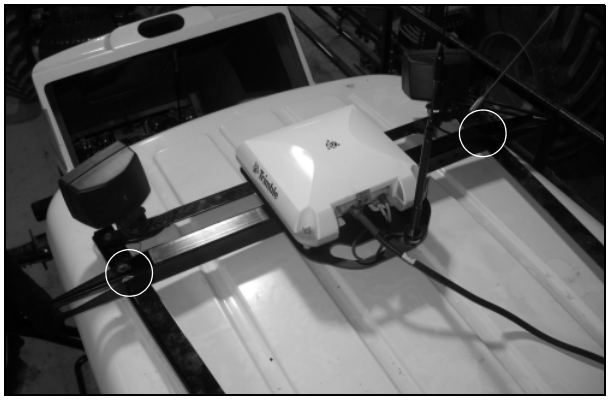
Mounting an adjustable spar to roof bolts

Step 1

Locate the cab bolts on the roof of the vehicle.

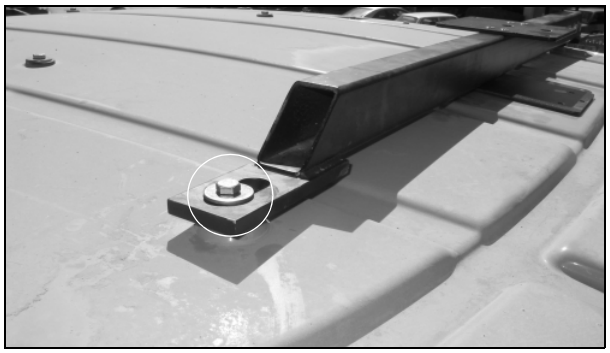


If a light bracket already occupies the roof studs, mount the spar directly to the light bracket.



Step 2

Replace the existing bolts with longer bolts if required.



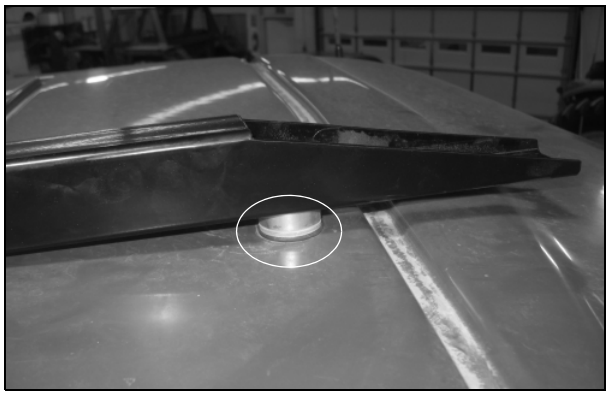
If you use the light bracket, drill two holes to match the spar width.



Step 3

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

Note – *If the receiver is offset to the left or the right of the vehicle, AgGPS Autopilot system performance may be affected. Ensure that the GPS antenna is aligned with the center of the vehicle before you tighten the cab bolts.*



Step 4

For either of the following applications:

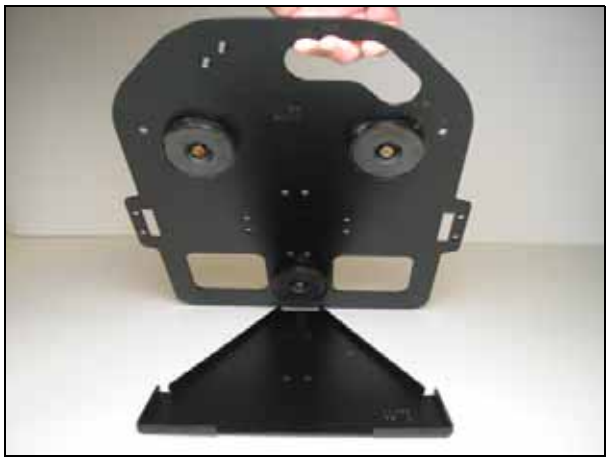
- A single magnet antenna mount
- An *Ag*GPS 252 receiver with magnetic option for quick removal

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 252 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.

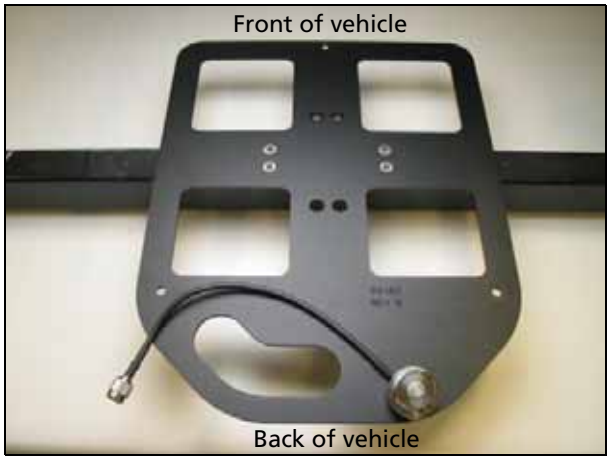


PLATE ON SPAR

Mounting with Very High Bond (VHB) adhesive

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.

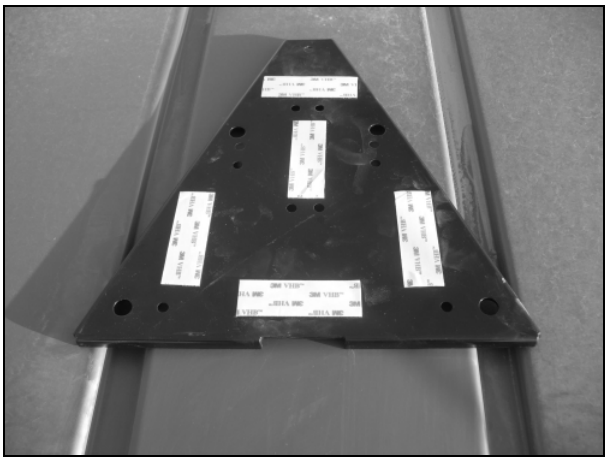


Step 2

V PLATE ONLY

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

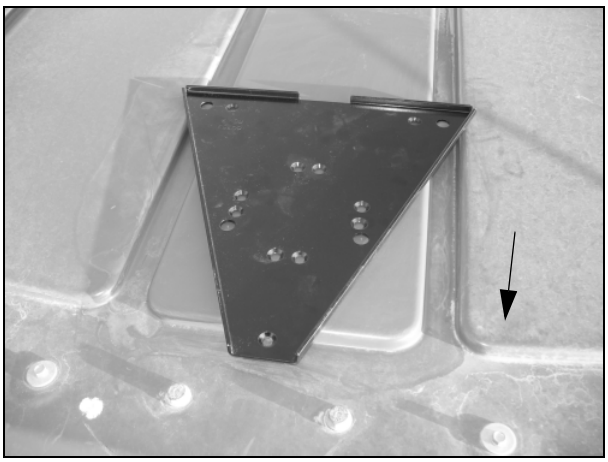
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



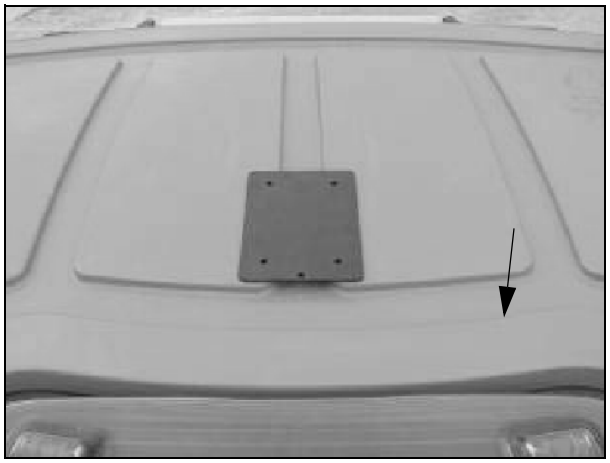
Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof pointed 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 SHOWN



4" x 6" PLATE

Installing the John Deere Starfire Antenna Adapter

On vehicles equipped with the John Deere optional Starfire antenna bracket, you can use the Trimble JD ATR antenna bracket (P/N 65555) to provide a fast release antenna mount.

Step 1

Using the hardware provided, install the lock-pin and the lanyard as shown.



Step 2

Install two washers and a knob on each lock stud.



Step 3

Standard mount

For antennas using a standard $^{5}/_{8}$"-11 threaded mount, attach the antenna to the bracket with a $^{5}/_{8}$"-11 bolt.



Plate mount

For antennas that use a plate mount attach the adapter to the plate with four ¼"-20 flat head screws.

Note – *The magnetic mount (P/N 60353) is shown.*



Step 4

Insert the tab at the bottom of the adapter into the slot in the vehicle mounted antenna bracket.



Step 5

Tip the adapter back until the pin holes line up and then insert the attached steel lock-pin through the bracket and adaptor.

Note – *The pin prevents the bracket from falling if you forget to tighten the locking knobs.*

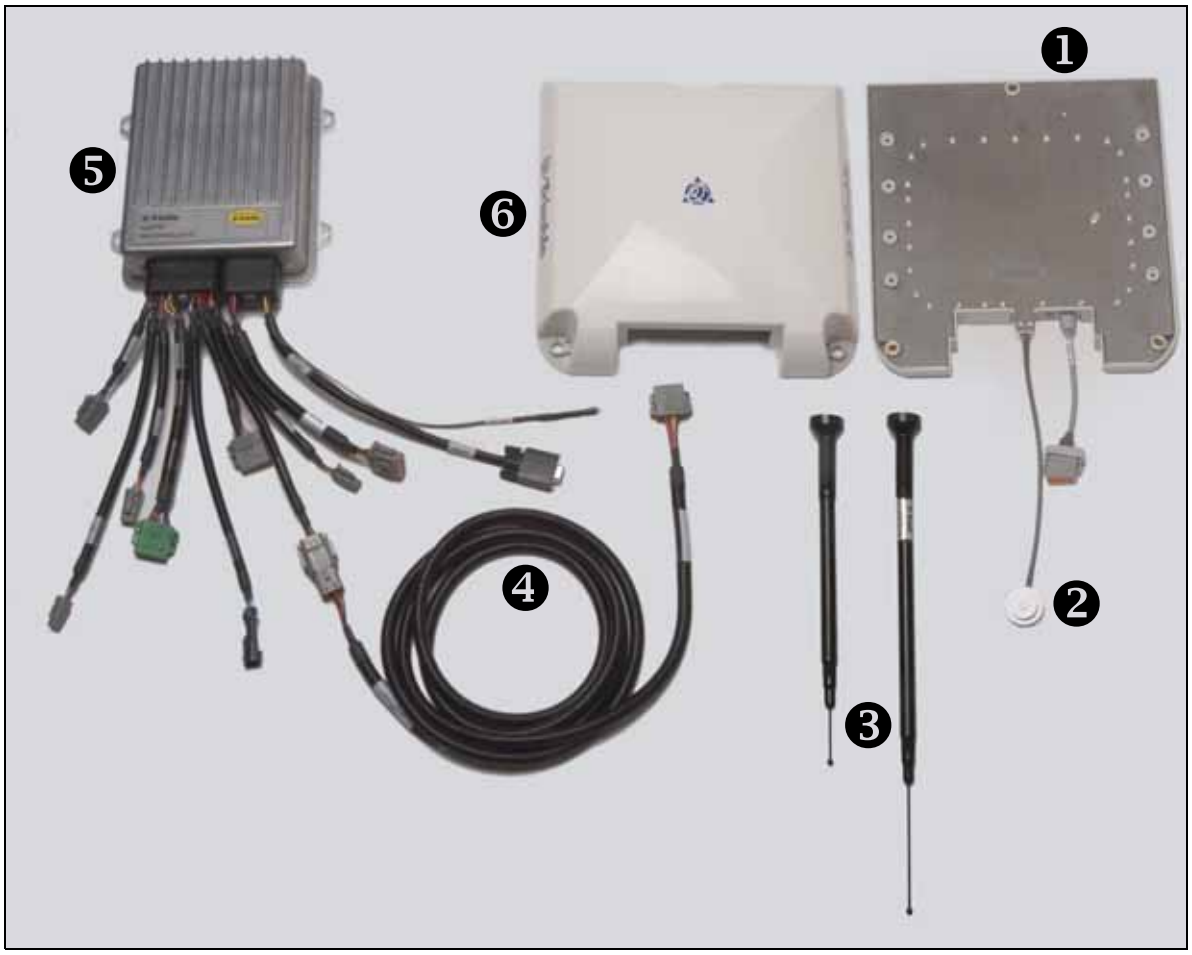


Step 6

Tighten both knobs securely.



*Ag*GPS 252 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 252 antenna/receiver

Installing the *Ag*GPS 252 GPS receiver with *Ag*GPS 450/900 radio module (if equipped)

To attach the *Ag*GPS 252 receiver plate to the cab roof, do one of the following:

- Attach a V plate to a spar and then stick the receiver plate to the V plate with magnets, for a removable installation.
- Bolt the receiver plate to a spar, for a permanent installation.

Removable magnet mounting option

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 "V" points forward.

For spar mounting instructions, see page 27.



MOUNTING PLATE

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



UNDERSIDE OF PLATE SHOWN

Permanent mounting option

Step 1

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

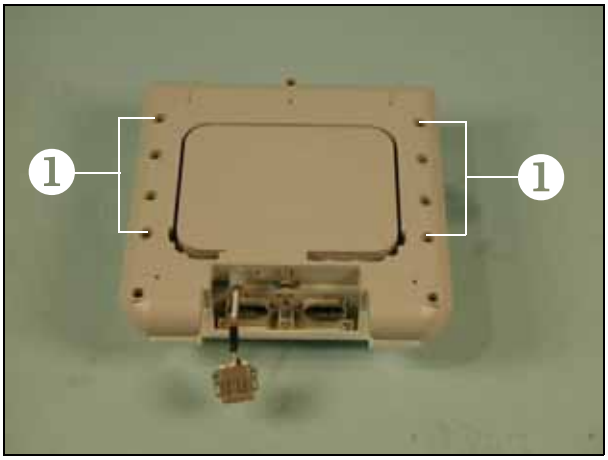
For spar mounting instructions, see page 27.



Step 2

BOTH METHODS

Place the radio module on the *Ag*GPS 252 receiver. Install eight screws in the holes ❶ as shown.



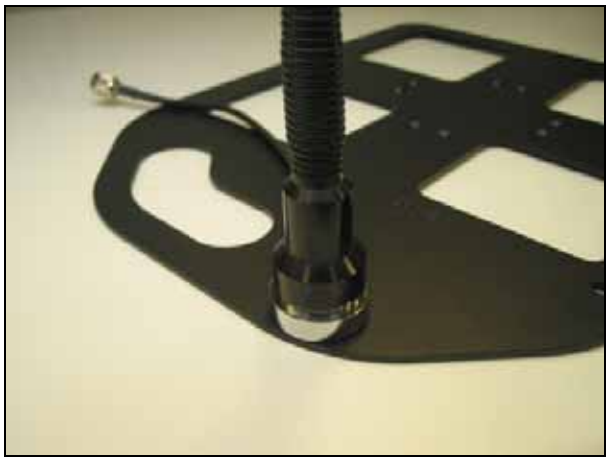
Step 3

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



Step 4

Install the radio antenna to the antenna base.



Step 5

Position the *Ag*GPS 252 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

Install the nylon bushings provided.



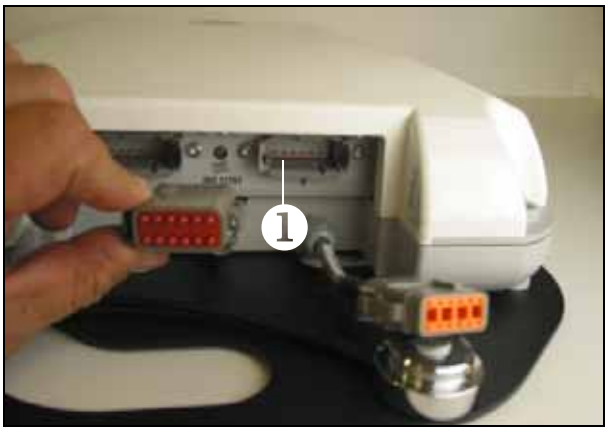
Step 7

Install 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

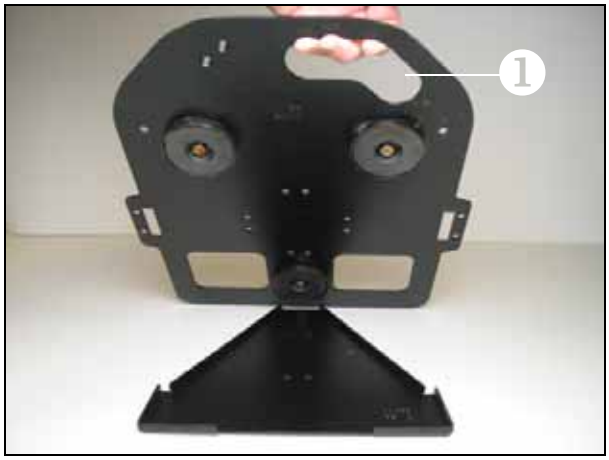
Connect the radio antenna to the antenna port.



Step 11

MAGNET METHOD

Place the receiver on the roof by aligning the magnets with the V plate. Ensure that the handle ❶ is to the back of the vehicle.

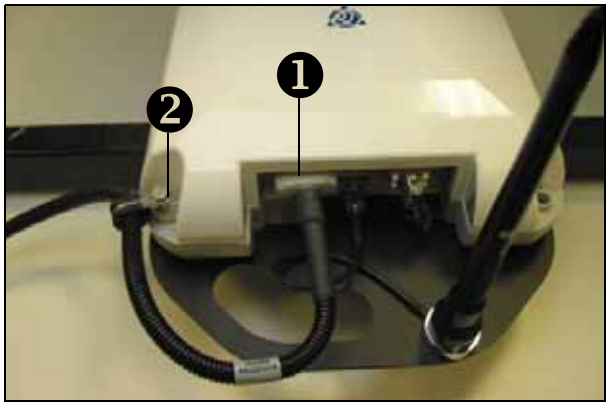


Step 12

BOTH METHODS

Connect the cable from the cab controller into port A ❶ of the *Ag*GPS 252 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 252 receiver with magnetic feet

Only use this option 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 and may require drilling or fabrication if a firm location is not available.

Step 1

Attach the magnets to the receiver mounting plate. Mount the *Ag*GPS 252 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.

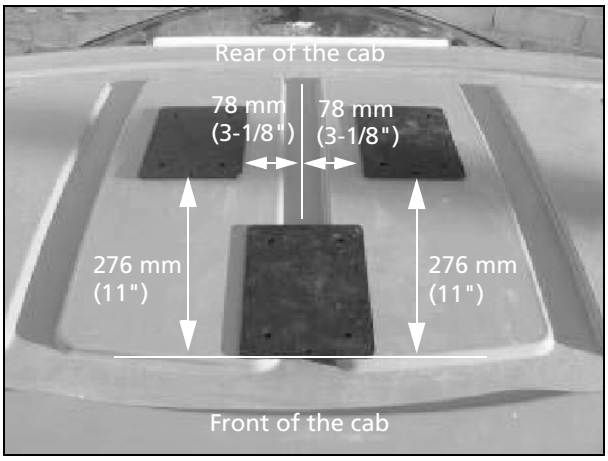


Step 3

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

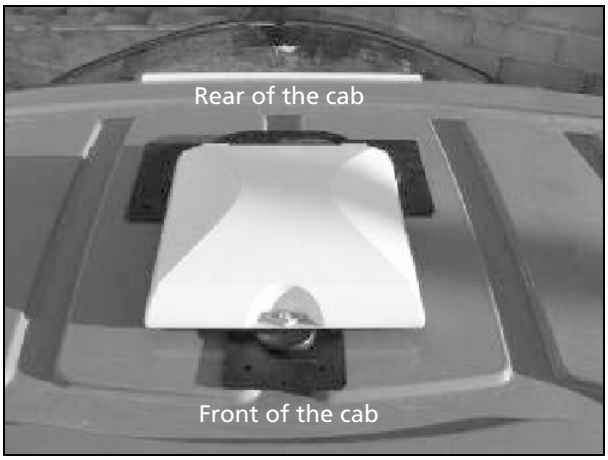
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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



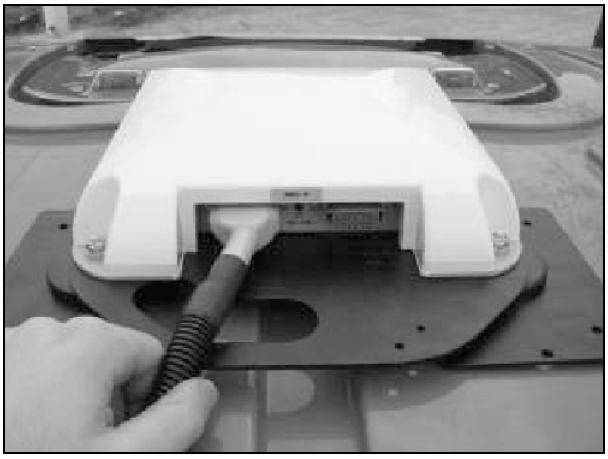
Step 4

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



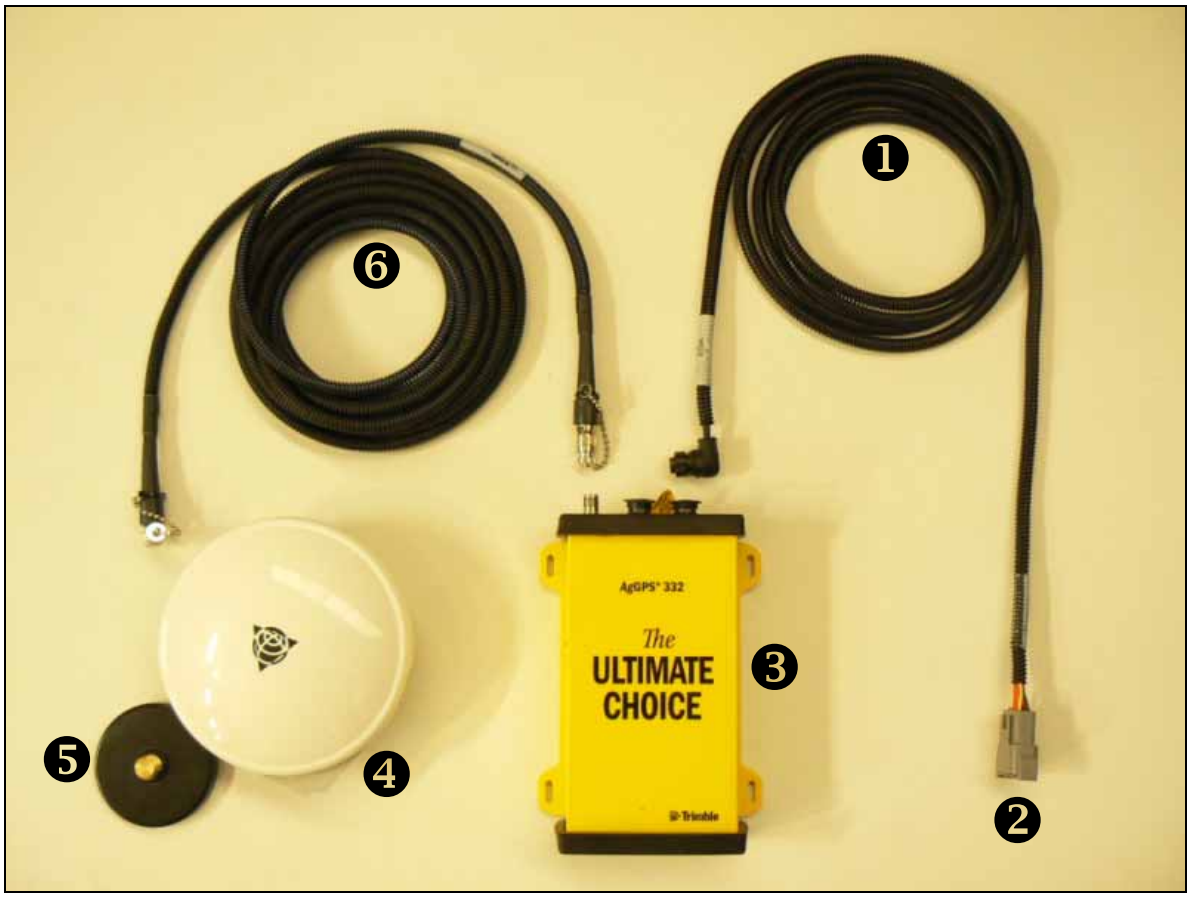
Step 5

Connect the antenna cable to port A of the *Ag*GPS 252 GPS receiver and then route the cable toward the NavController II controller harness.



*Ag*GPS 332 receiver components

Note – *To receive RTK corrections with a radio, Trimble recommends the use of the AgGPS 432 GPS receiver with integrated radio modem.*



Item	Description
❶	Receiver-to-Autopilot controller cable (P/N 54610)
❷	To controller "P3 GPS" connection
❸	*Ag*GPS 332 GPS receiver
❹	GPS antenna
❺	Magnetic mount
❻	GPS antenna cable

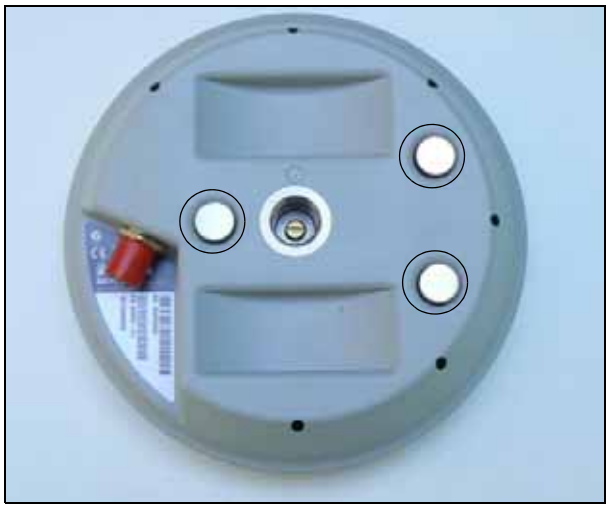
Installing the *Ag*GPS 332 receiver

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)

Place the antenna against the lip at the point of the V plate for repeatable positioning.



Step 2

L1 SINGLE BAND ANTENNA (WAAS, EGNOS, VBS, Beacon)

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



Step 3

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

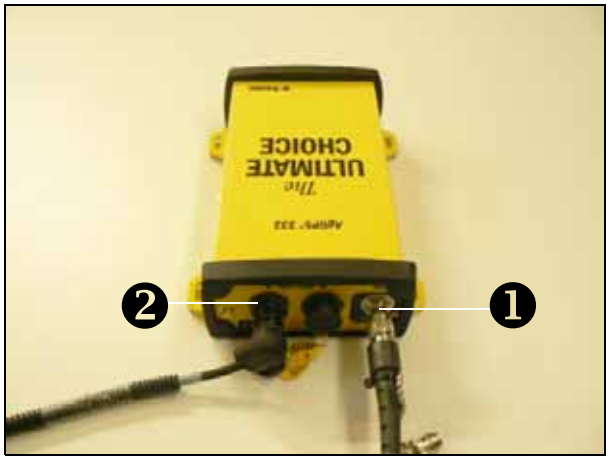


Step 4

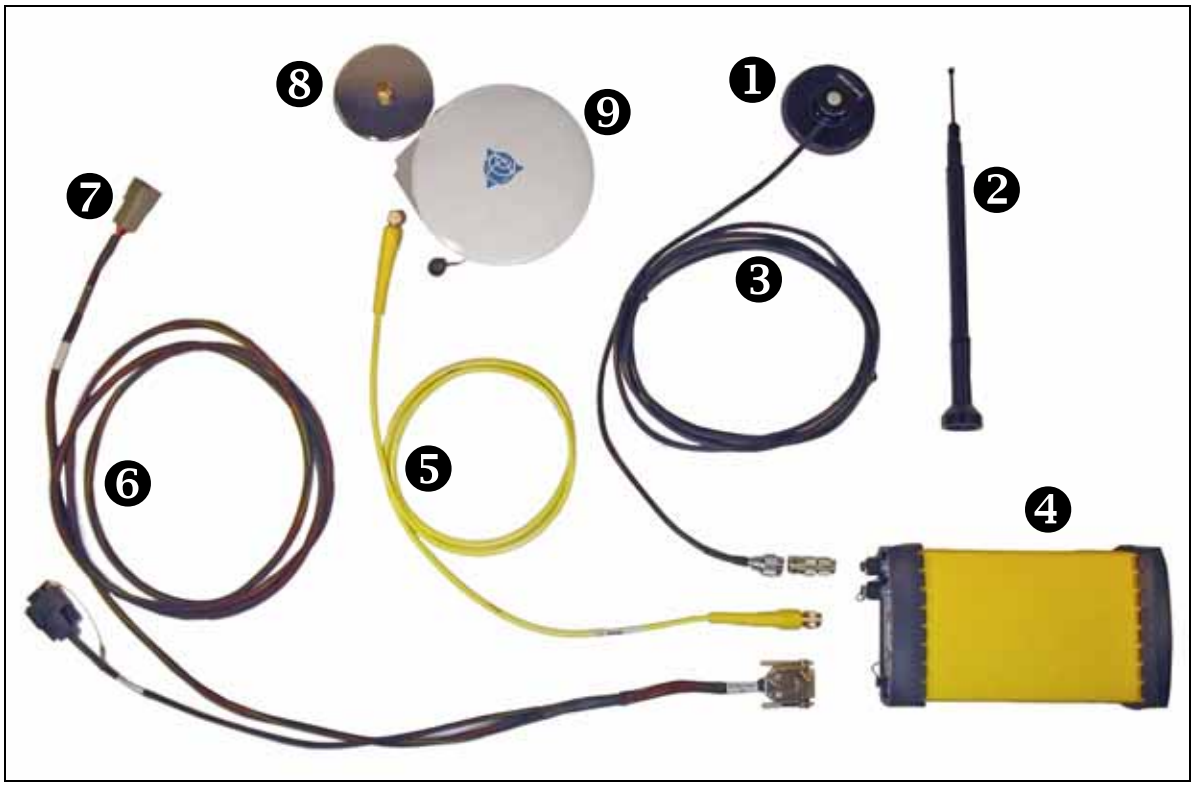
Mount the receiver in a convenient location in the cab.

Route the antenna cable ❶ to the receiver and then connect it. Connect the controller cable to cavity "A" ❷ of the receiver.

Controller cable connections will be established later in the *Installation Instructions*.



*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

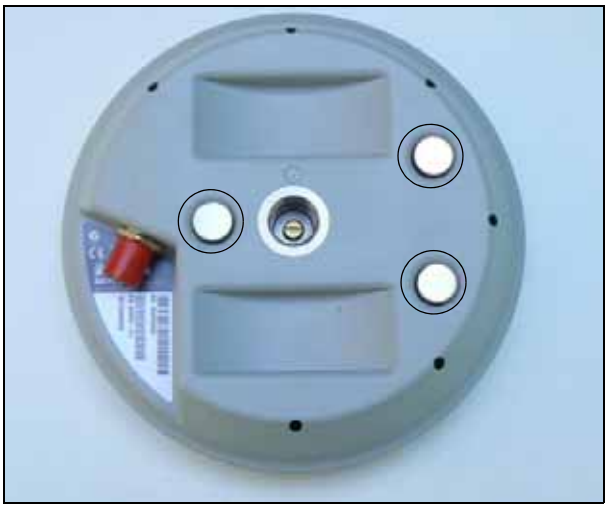
Installing the *Ag*GPS 442/432 receiver

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)

Place the antenna against the lip at the point of the V plate for repeatable positioning.



Step 3

BOTH ANTENNAS

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



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 MGHz radios

❷ Normal polarity TNC-to-N for 400 MGHz 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 established later in the *Installation Instructions*.



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 SiteNet radio and antenna

Step 1

Install the SiteNet radio in the cab in a location where it is hidden and secured from rolling. Connect the antenna adaptor to the SiteNet radio.



Step 2

Connect the radio antenna to the magnetic antenna base.



Step 3

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



Step 4

Feed the radio antenna cable down from the roof and into the cab to the radio. Connect the cable to the radio.



Installing a PDL radio modem

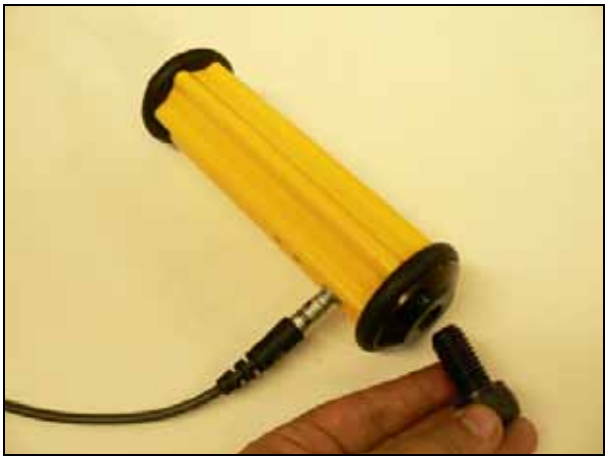
Step 1

Install the radio in a location where it is accessible when the operator needs to select a new radio channel ID.



There are several mounting options:

- For a permanent mount, bolt the radio onto a bracket with a 5/8" UNC screw.

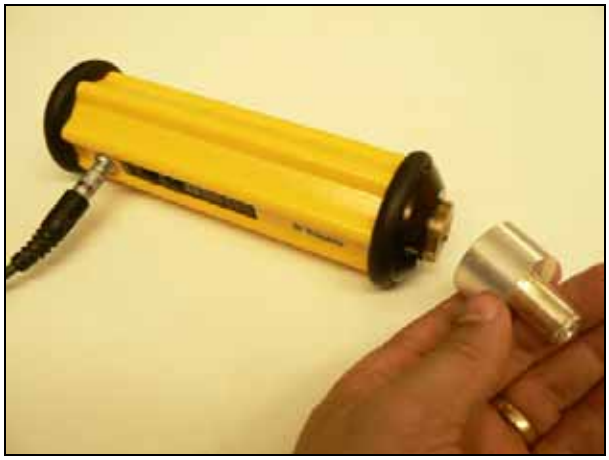


- For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a 5/8" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

4

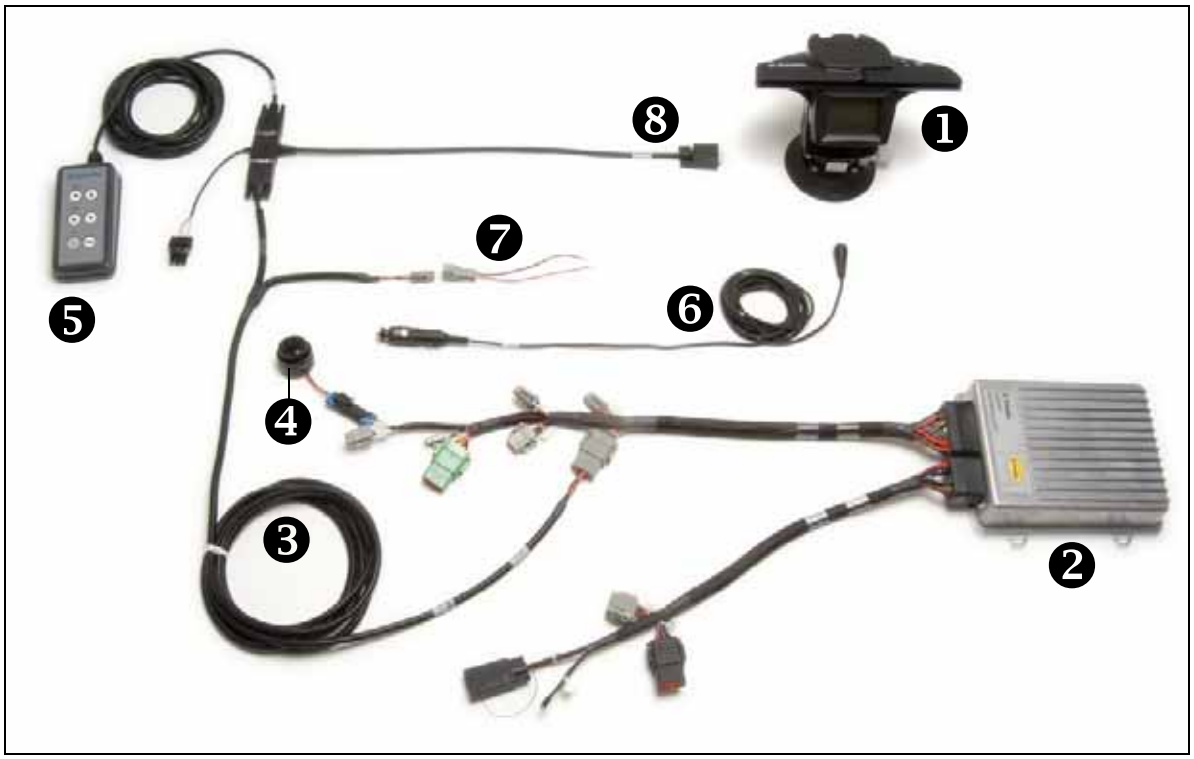
Display Installation

In this chapter:

- EZ-Guide Plus lightbar components
- Installing the EZ-Guide Plus lightbar
- Mounting the EZ-Guide Plus lightbar
- Preparing the existing EZ-Guide Plus power cable
- AgGPS FieldManager display components
- Preparing the AgGPS FieldManager display
- Installing the AgGPS FieldManager display
- Preparing the AgGPS FieldManager display wiring harness
- EZ-Guide 500 lightbar components
- EZ-Guide 500 lightbar: Installing the antenna plate and GPS antenna
- EZ-Guide 500 lightbar: Installing the SiteNet radio and antenna
- Connecting the EZ-Guide 500 lightbar cables
- Installing the EZ-Guide 500 lightbar

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

EZ-Guide Plus lightbar components

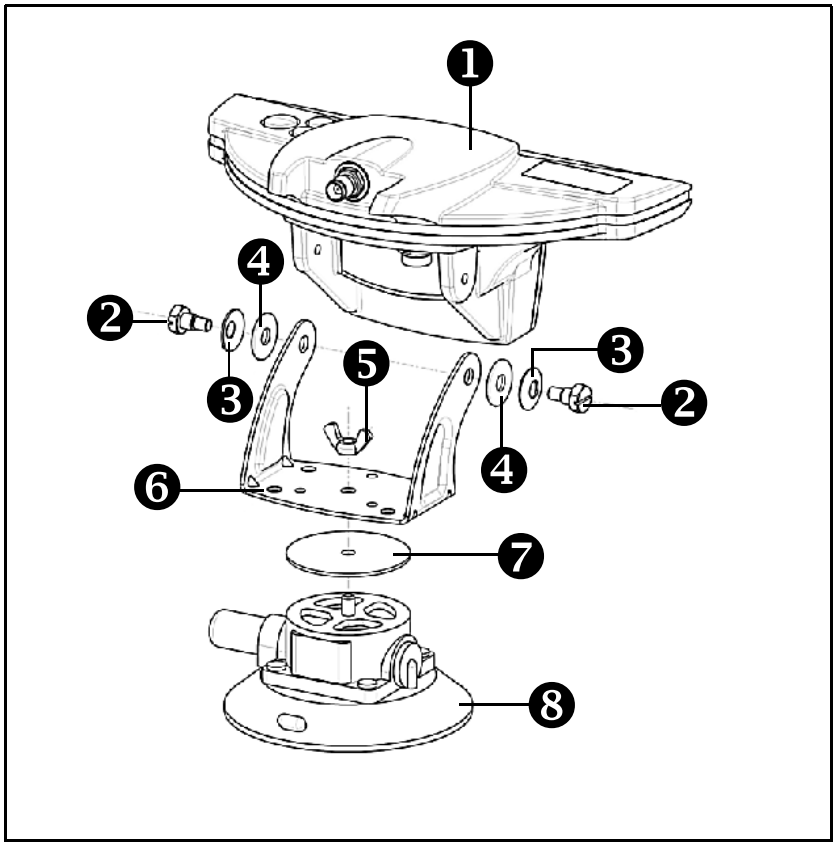


Item	Description
❶	EZ-Guide Plus lightbar
❷	Controller
❸	Display cable (P/N 54612)
❹	Sonalert alarm (if connected)
❺	Optional remote keypad
❻	Power harness
❼	Alternative power supply
❽	External interface cable

Installing the EZ-Guide Plus lightbar

Step 1

Assemble the lightbar as shown below.



Item	Description
❶	EZ-Guide Plus lightbar
❷	Bracket screw
❸	Bracket lock-washer
❹	Bracket flat-washer

Item	Description
❺	Bracket wing-nut
❻	Mount bracket
❼	Bracket pad
❽	Suction cup mount

Step 2

Check that the bracket is correctly oriented, insert the screws ❷ and then tighten them to a torque of 170 cNm (15 in/lbs). Screws require liquid thread-locking compound for optimum performance; re-apply thread-lock after every ten insertions..s.

Mounting the EZ-Guide Plus 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.

Use one of the following methods to mount the EZ-Guide Plus lightbar:

- On a vertical, or near vertical surface, such as a window, use a suction cup vacuum mount.

Note – *This is a temporary mounting device. Before you use it, read the manufacturer's instructions provided with the mounting kit.*

- On a horizontal, or near horizontal surface, such as a vehicle dash, use a screw-on mount bracket.

Installing the vacuum mount

Step 1

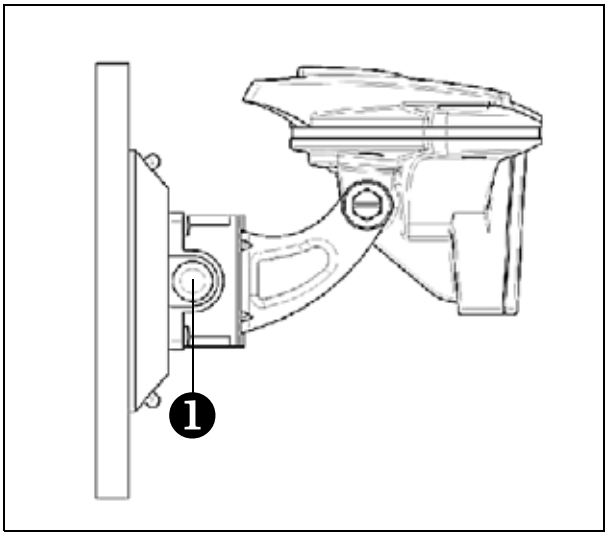
Secure the vacuum mount to the mounting bracket using the hardware provided.

Step 2

Dampen the rubber seal on the suction cup.

Step 3

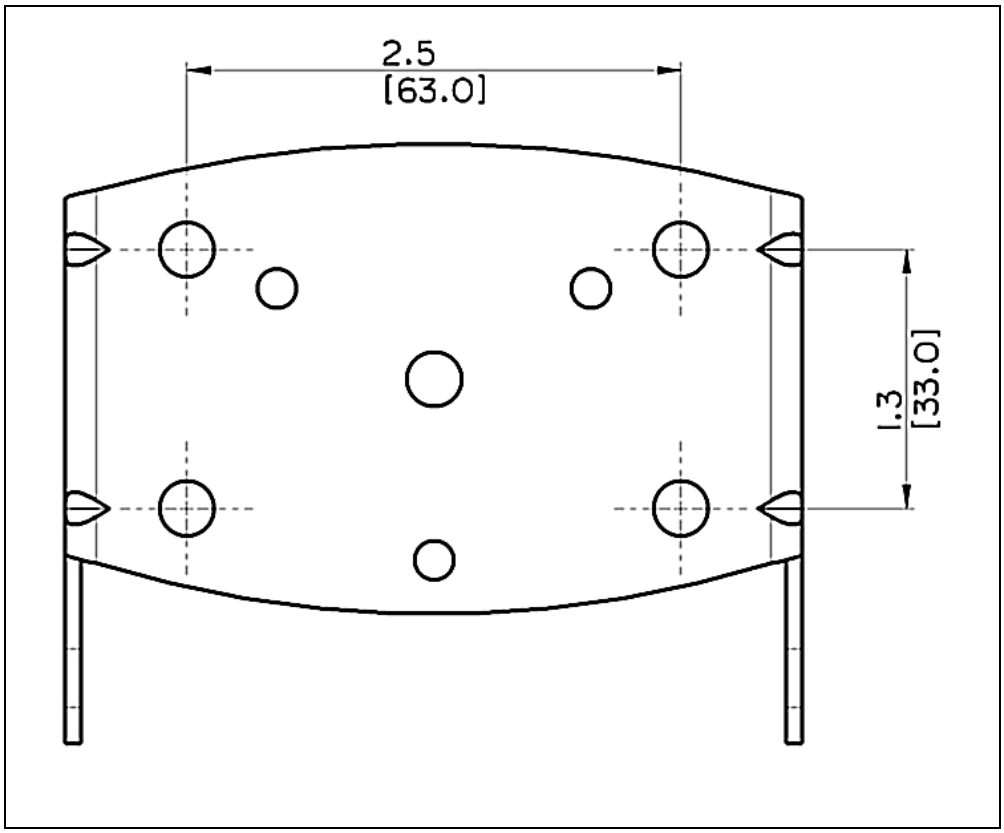
To secure the lightbar in position, press the suction cup against a flat surface and then pump the gray button ❶ until the red line is no longer visible.



Installing the mount bracket

Step 1

Use a pen or awl with the bracket drilling template below to mark where the four holes are to be drilled on the mount plate.



Step 2

Drill the holes in the bracket at the marked points.

Step 3

Screw the mount bracket to the horizontal surface.

Step 4

Attach the EZ-Guide Plus lightbar to the mount bracket.

Step 5

Connect the cable to the EZ-Guide Plus lightbar.

Step 6

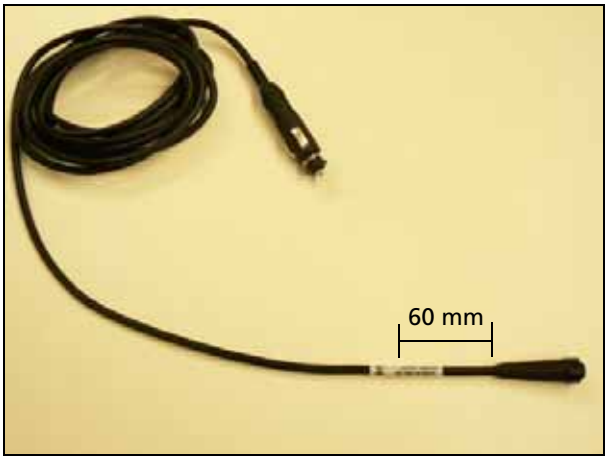
Attach the EZ-Guide Plus display cable to the main harness connection labeled “Display”.

Note – *If the cable is connected to the auxiliary harness connection labeled “Spare”, the display will act as a lightbar only.*

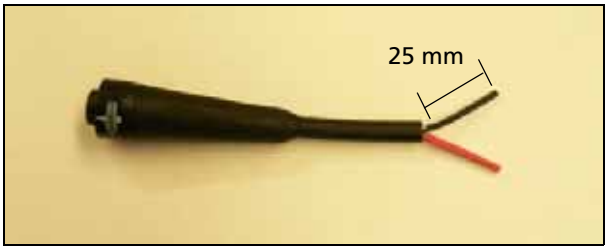
Preparing the existing EZ-Guide Plus power cable

Step 1

a. Locate the EZ-Guide Plus power cable and then cut it as shown.

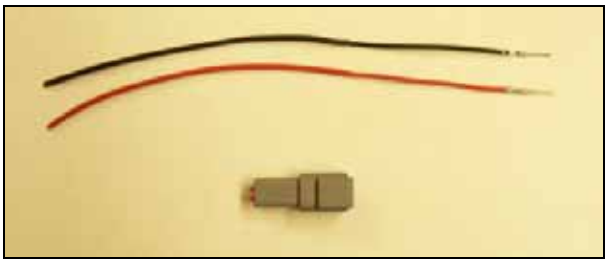


b. Strip 25 mm of insulation off the EZ-Guide Plus power cable.



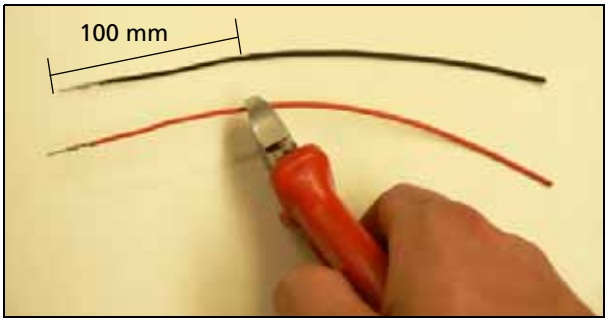
Step 2

Locate the power leads (with one open end) and the two-cavity Deutsch connector that come with the Autopilot display cable (P/N 54612).



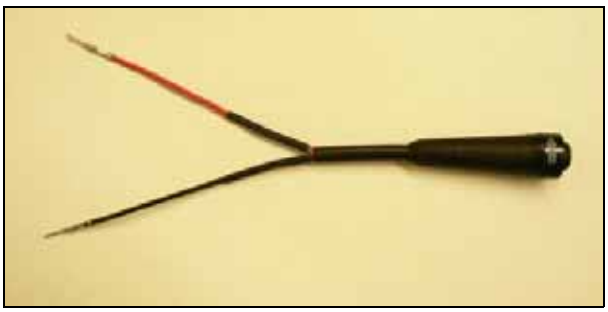
Step 3

Cut the two power lead wires as shown.



Step 4

Crimp new TM pins on the ends of the wires or strip approximately 10 mm of insulation off the four wires and then add solder to the ends.



Step 5

Insert the wires into the Deutsch connector as follows:

Wire	Cavity
Red	Deutsch connector position A
Black	Deutsch connector position B

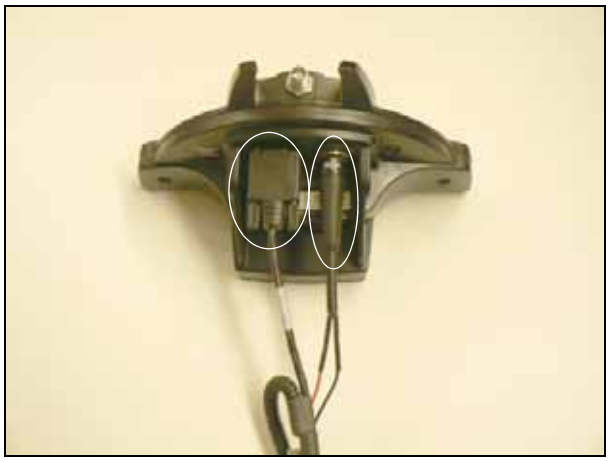
Step 6

Connect the two Deutsch connectors together, coil the power cable, and then attach it to the cable end with a DB9 connector so that both ends are at the same length.

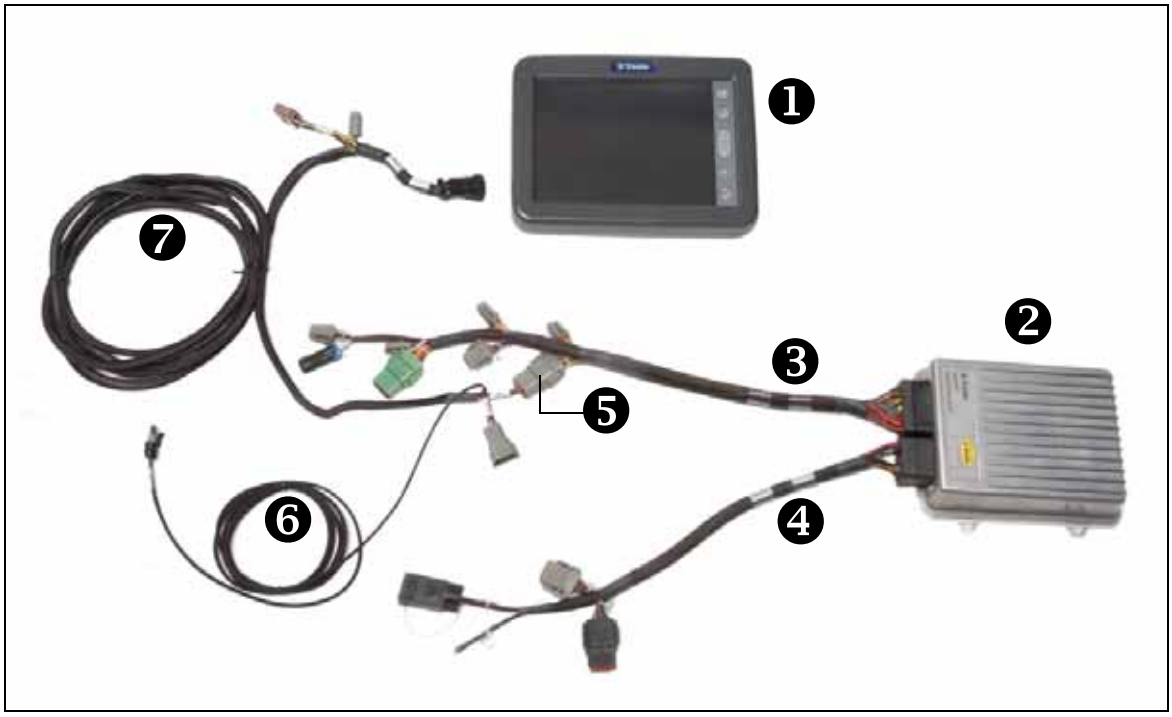


Step 7

Attach the DB9 connector and the power connector from the Autopilot display cable to the lightbar as shown.



*Ag*GPS FieldManager display components



Item	Description
❶	*Ag*GPS 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 *Ag*GPS 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 *Ag*GPS 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

a. Decide where you will mount the display in the cab. Use the provided bolts to attach the bar mount to the rail.

b. 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 the display is held securely in place.



Step 3

a. Attach the Autopilot cable to the back of the FieldManager display.

b. Route the cable to the Autopilot controller and then connect it to the connection labeled "Display" on the main harness connection.

Do not *connect the FieldManager display connection to the auxiliary harness connection labeled "Spare".*

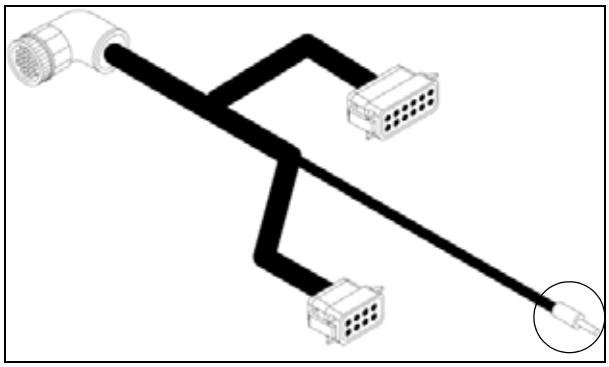


Preparing the *Ag*GPS FieldManager display wiring harness

The FieldManager display requires a constant unswitched B+ power lead.

Step 1

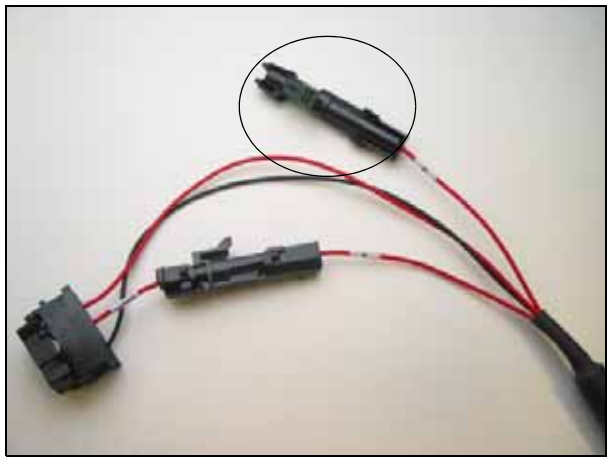
Locate the P9 “Continuous Power” connector on the FieldManager display harness.



Step 2

Locate the unused connector labeled “B” on the power harness at the power switch and then verify that it is the unswitched power lead. If it is not, swap the “A” and “B” leads so that unswitched power is available in the extra lead.

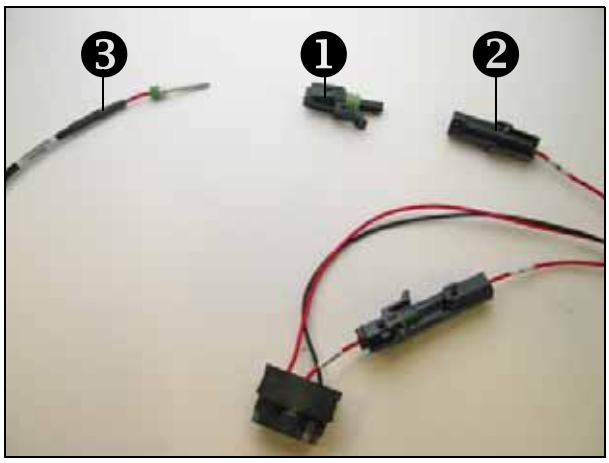
To determine which lead is constant battery power, turn off the vehicle key and then use a volt meter on each lead.



Step 3

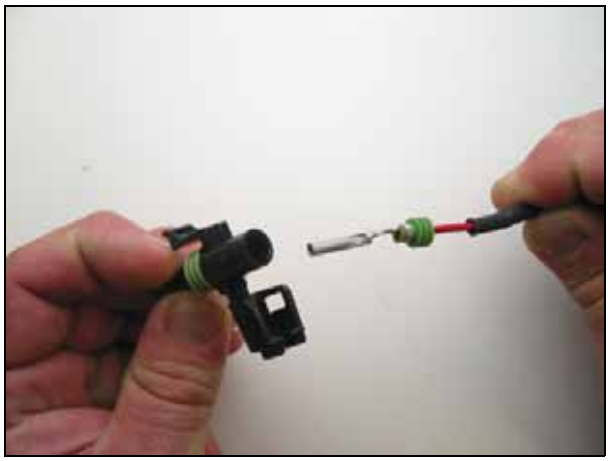
Remove the plug ❶ in the unswitched power lead ❷ and then insert the FieldManager display P9 ❸ pin into the female 1-pin Weatherpack plug. Connect to the mating connector.

To verify that the lead is battery power, turn off the vehicle key and then turn on the display.



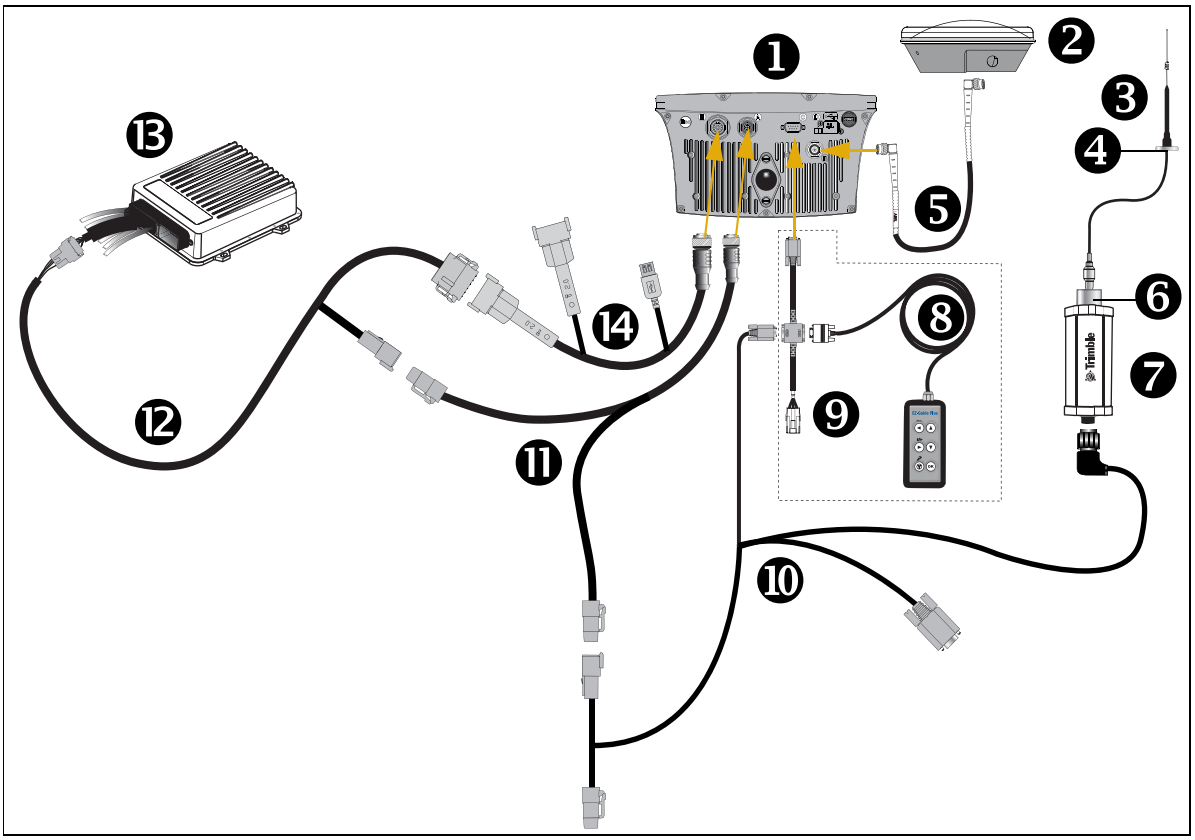
Step 4

To insert the wire end into the connector, release the clips and then remove the cavity plug. Insert the pin.



EZ-Guide 500 lightbar components

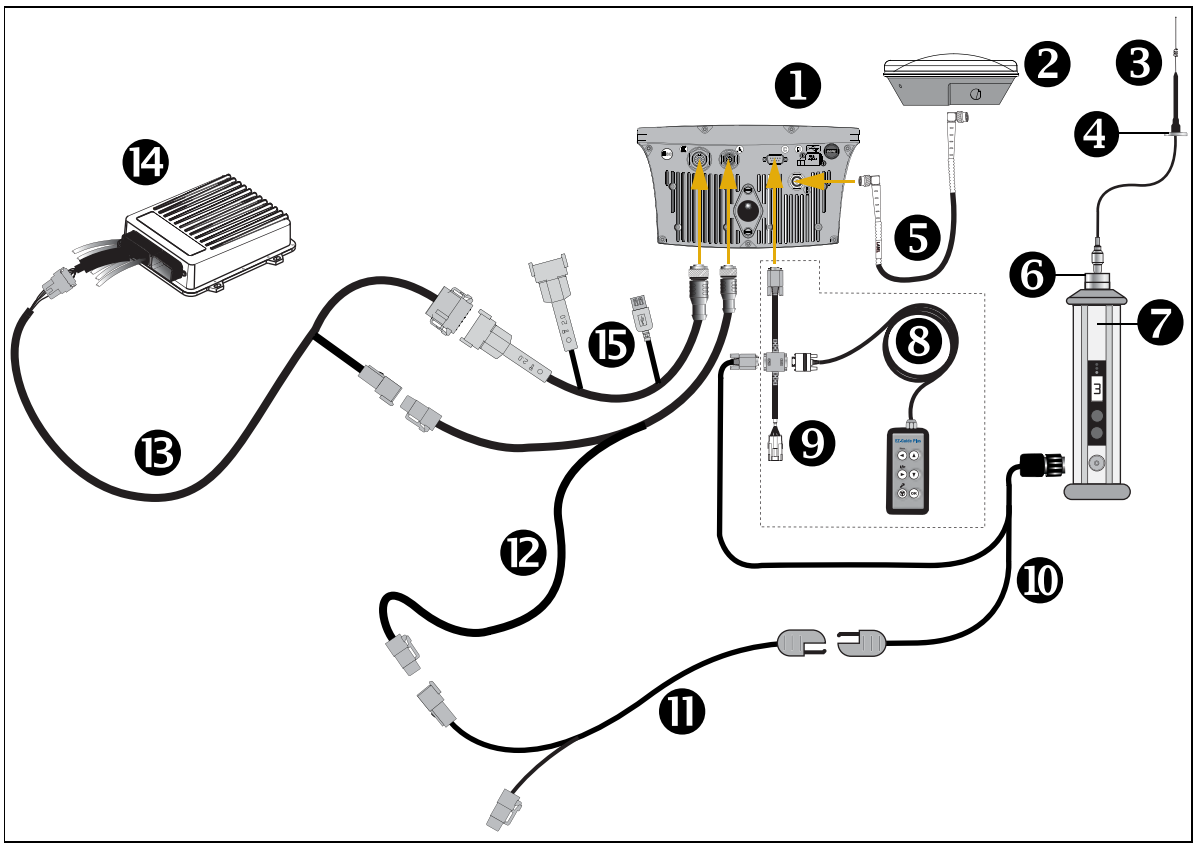
With a SiteNet radio for 900 MHz RTK corrections (if equipped)



Item	Description
❶	EZ-Guide 500 lightbar
❷	GPS antenna (P/N 57200-00)
❸	SiteNet radio antenna (P/N 22882-00)
❹	SiteNet radio antenna magnetic mount (P/N 62109)
❺	GPS antenna cable (P/N 50449)
❻	Radio antenna connector (P/N 46740)
❼	SiteNet radio

Item	Description
❽	*Optional*. Remote keypad (P/N 66030-00)
❾	External interface cable (P/N 62749)
❿	EZ-Guide 500-to-radio cable (P/N 62082)
⓫	EZ-Guide 500 power cable (P/N 62817)
⓬	EZ-Guide 500-to-Autopilot cable (P/N 62754)
⓭	*Ag*GPS Autopilot controller
⓮	Port expansion cable (P/N 62609)

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	*Ag*GPS Autopilot controller
⓯	Port expansion cable (P/N 62609)

EZ-Guide 500 lightbar: Installing the antenna plate and GPS 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.

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

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, *Antenna and receiver installation options, page 26*.

Attach the V plate to the spar with the four ¼"-20 flathead screws provided. 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.

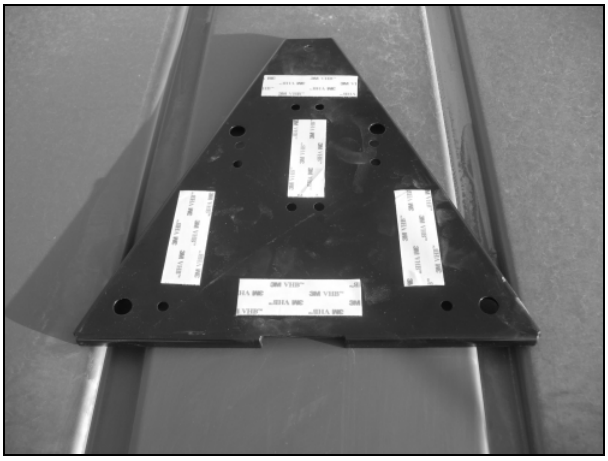


Step 2

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.*

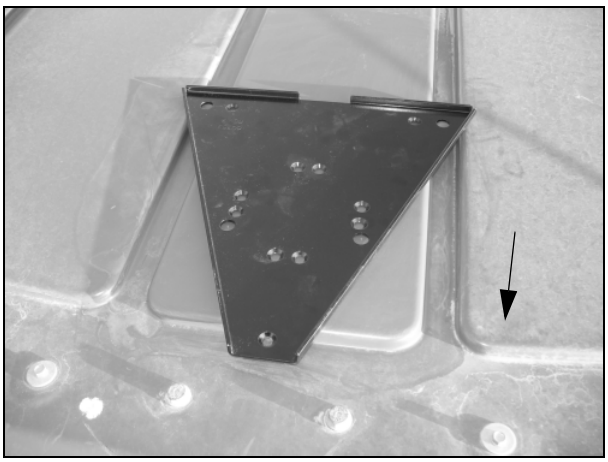


Step 3

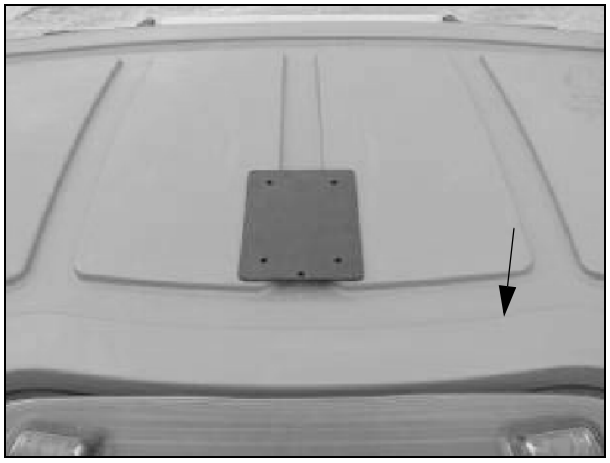
a. Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end points forward. Ensure that the VHB strips make even contact with the surface.

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

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



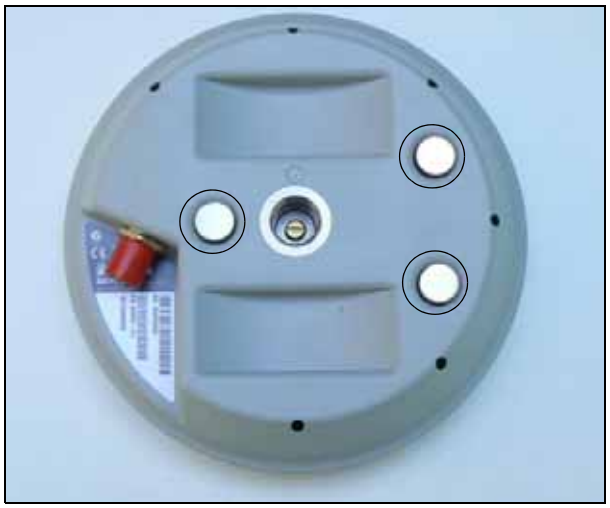
V plate shown



4" x 6" plate

Step 4

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



Otherwise, aAttach 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.



Step 6

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

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



Step 7

Both models

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



EZ-Guide 500 lightbar: Installing the SiteNet radio and 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

Position the SiteNet radio in the cab where it is out of sight and secured from rolling. Connect the antenna adaptor to the SiteNet radio.



Step 2

Connect the radio antenna to the magnetic antenna base.



Step 3

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



Step 4

a. Feed the radio antenna cable down from the roof and into the cab to the radio.

b. Connect the cable to the radio.



Installing a PDL radio modem

Step 1

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



There are several mounting options:

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

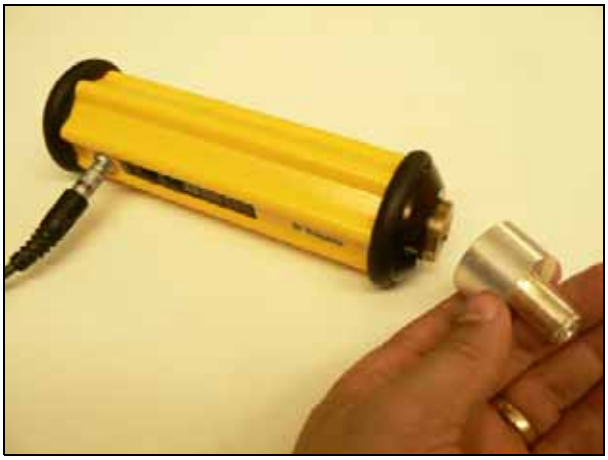


- For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a $^{5}/_{8}$" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



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

Install 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.*

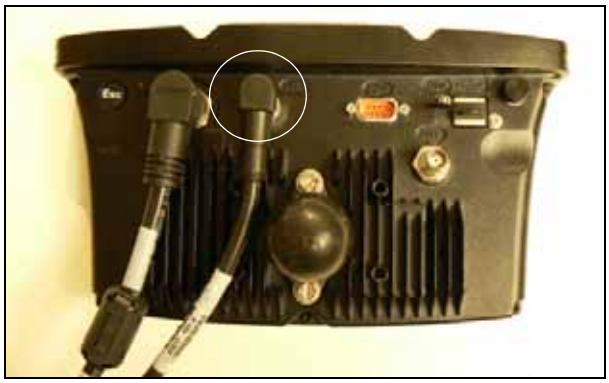
Step 1

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

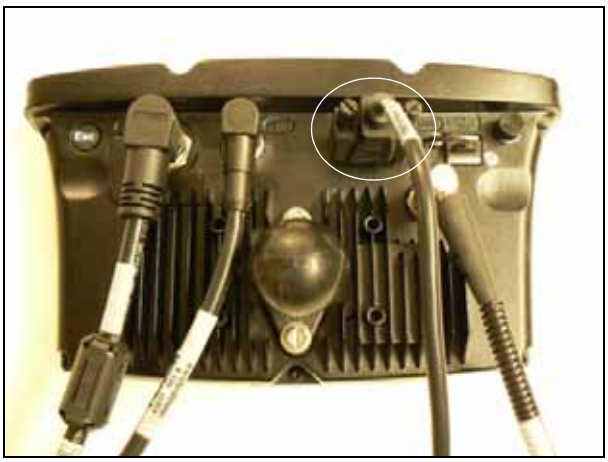
Feed the GPS antenna cable into the cab and then connect it to the antenna port on the back of the lightbar.



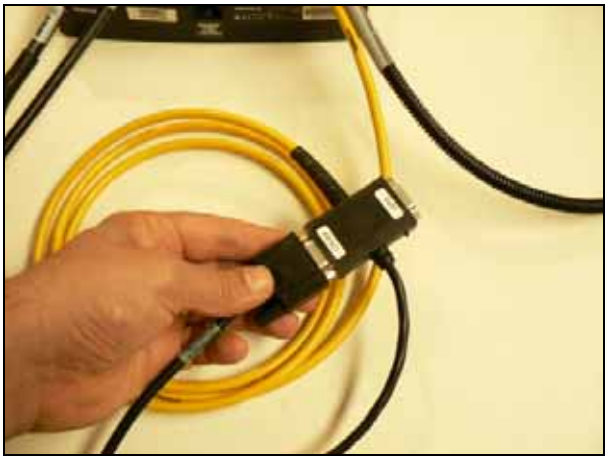
Step 5

With keypad

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

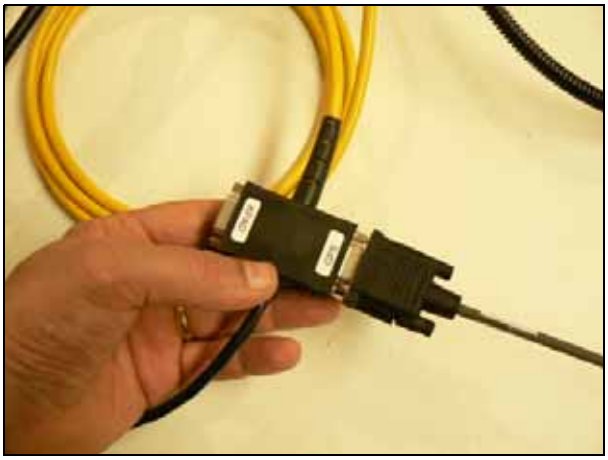


Connect the remote keypad to the KPAD serial port on the external interface cable.



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

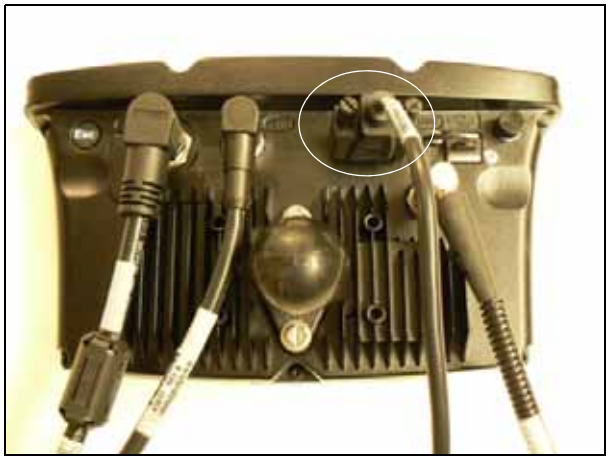
Radio type	Cable to connect
SiteNet radio	EZ-Guide 500-to-radio cable (P/N 62082)
PDL 450 radio	PDL radio power/data cable (P/N 51861-00)



Without keypad

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

Radio type	Cable to connect
SiteNet radio	EZ-Guide 500-to-radio cable (P/N 62082)
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.



SiteNet radio

Step 7

SiteNet radio only

Connect the S5 connector on the EZ-Guide 500-to-radio cable to the connector on the EZ-Guide 500 power cable.

PDL radio only

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

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.



CHAPTER

5

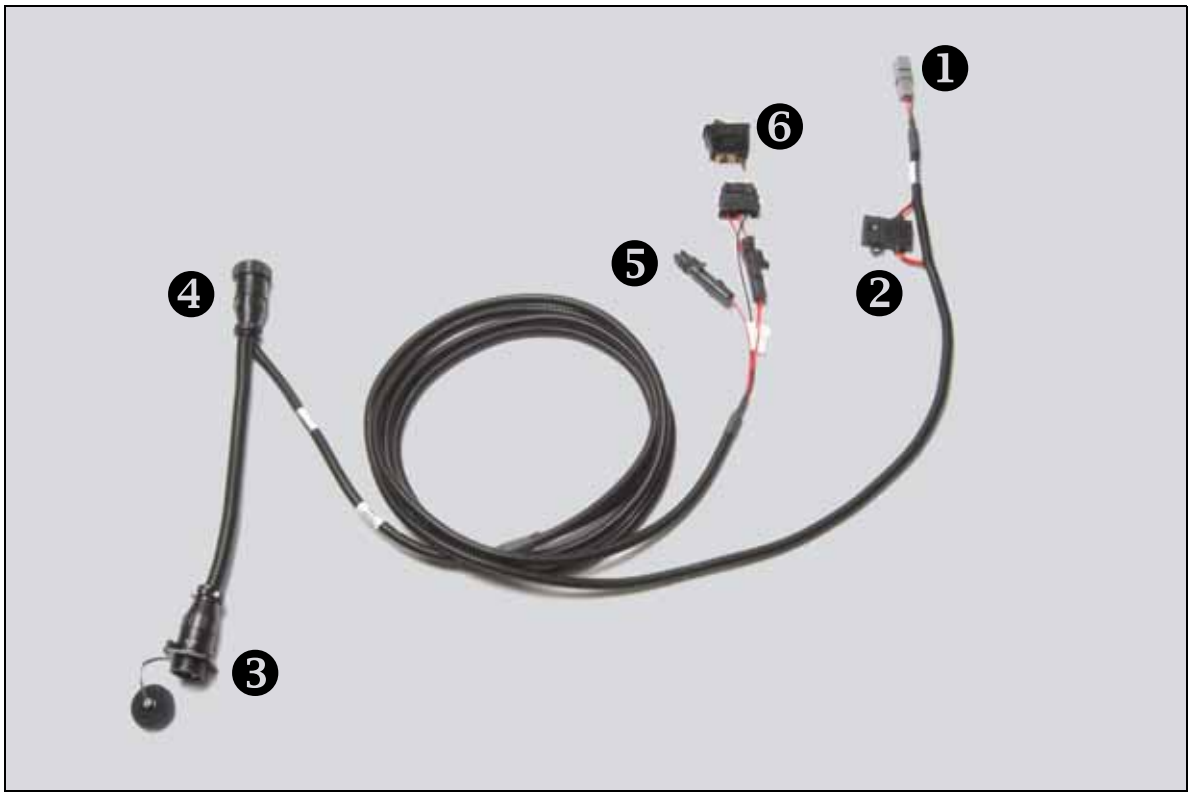
Power Harness Installation

In this chapter:

- Power harness components
- Installing the power harness

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

Power harness components



Item	Description
1	Controller power connection
2	Fuse holder - Littlefuse 257010, 10 amp
3	Extra accessory outlet
4	Accessory jumper cable (P/N 54630)
5	Switch receptacle
6	Switch

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, the 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 to conceal all routings.*

Note – *Make note of where you remove any wire harness and hose tie straps during disassembly so you can properly install them during assembly.*

Installing the power harness

Step 1

Locate the switch panels on the right hand console. Remove the panel closest to the rear of the cab.



Step 2

Find and remove a blank in the console to install the switch. Route the switch leads from the power cable up inside the console and pass the switch socket through the hole. Plug the switch into the socket and snap it into the hole.



Step 3

Plug the power connector into the accessory power jack and route the cable with the 2-pin connector to the Autopilot controller. Connect it to the appropriate connector on the main harness.



CHAPTER

6

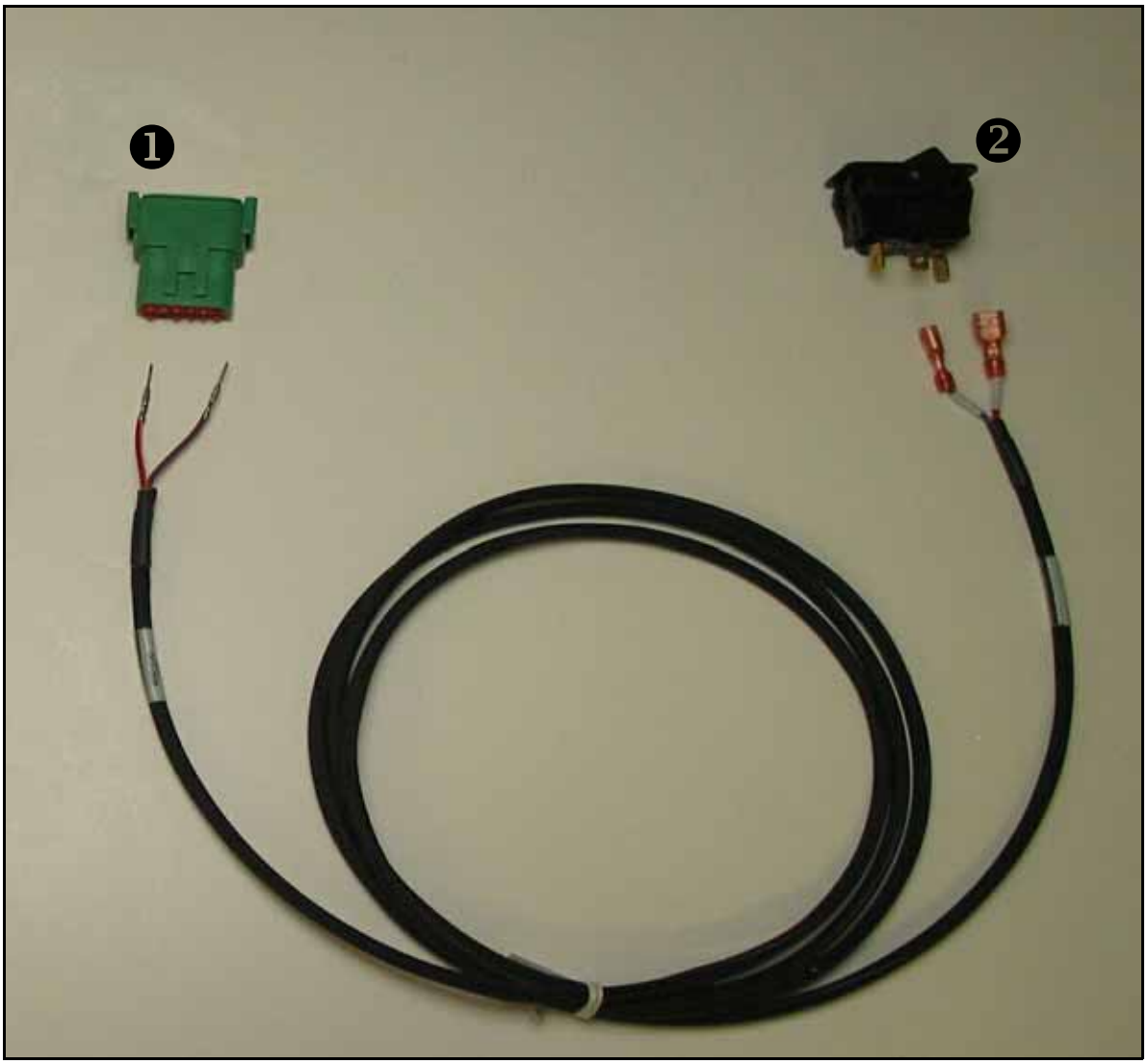
Remote Engage Switch Installation

In this chapter:

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

This chapter describes how to install the remote engage switch.

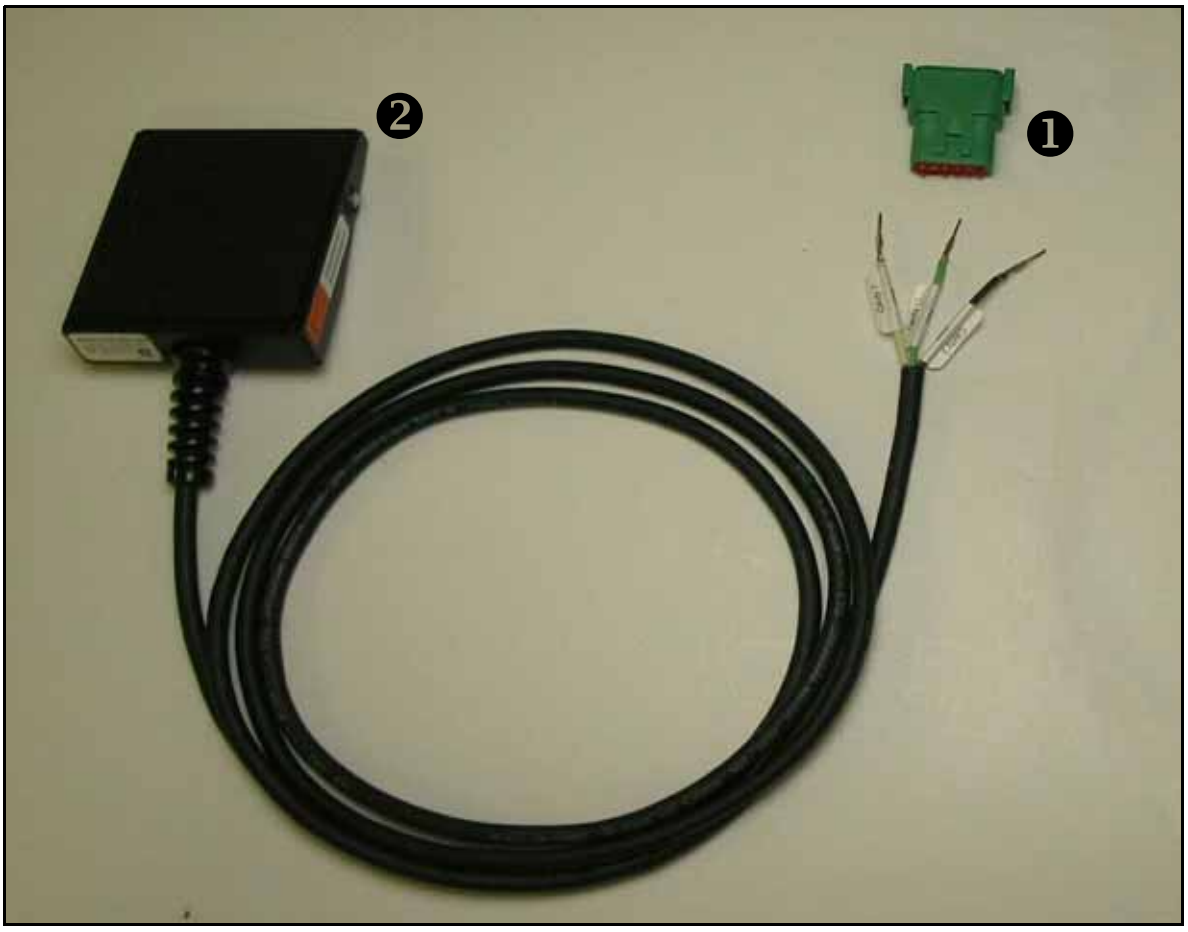
Remote engage switch components: Rocker switch



Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

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

Remote engage switch components: Foot switch

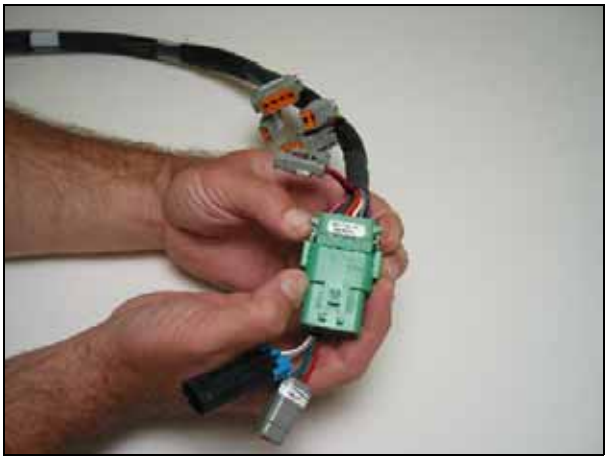


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Preparing the remote engage cable

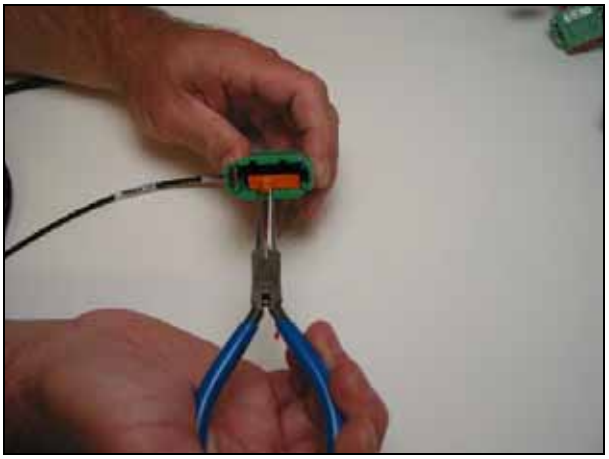
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. See Chapter 7.1, Controller connections.



Step 2

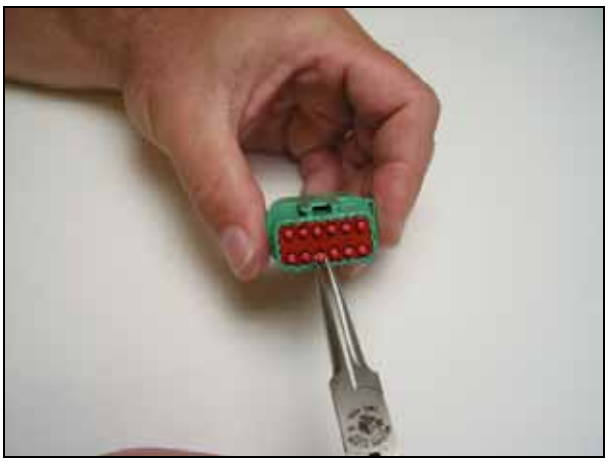
Remove the wedge from the connector.



Step 3

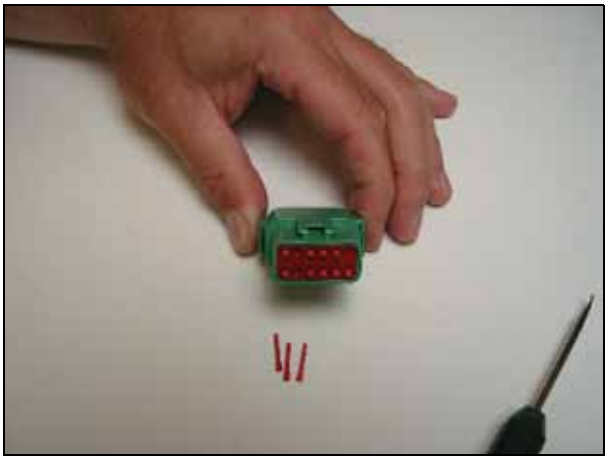
Rocker switch only

Remove the plugs from cavity 2 and 7.



Foot Switch Only

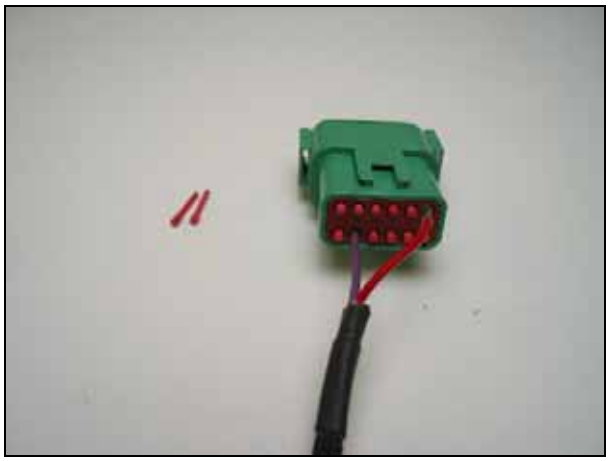
Remove the plugs from cavity 2, 7, and 11.



Step 4

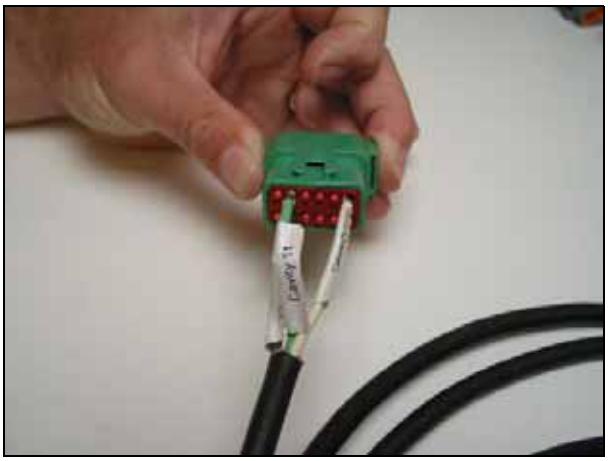
Rocker Switch Only

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



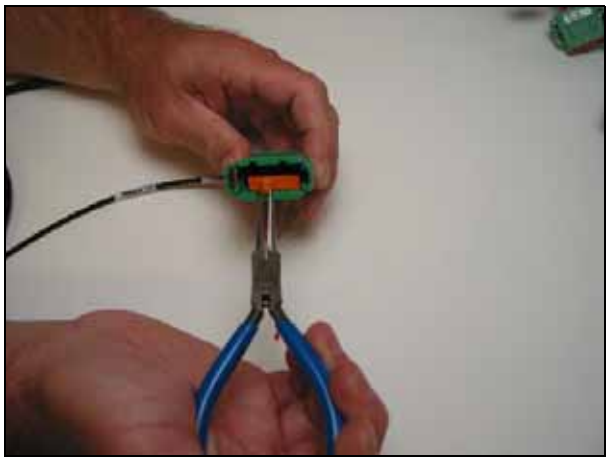
Foot Switch Only

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



Step 5

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



Step 6

Rocker Switch Only

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



Foot Switch Only

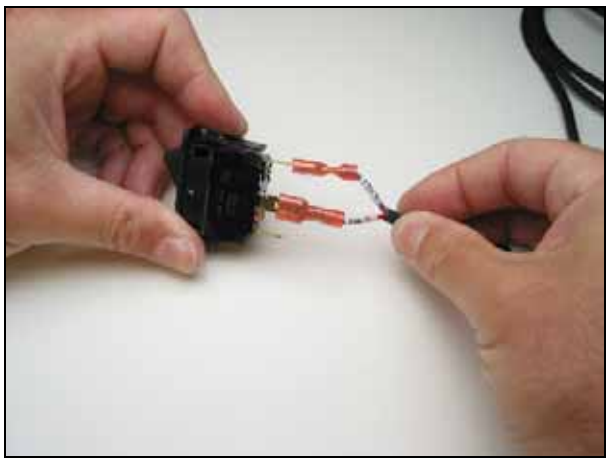
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 7

Rocker Switch Only

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



Step 8

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

7

Controller Installation

In this chapter:

- Installing the controller
- Controller connections

This chapter describes the installation of the controller unit in the vehicle.

Installing the controller

Step 1

Pull back the floor mat between the operator's seat and the left hand console.



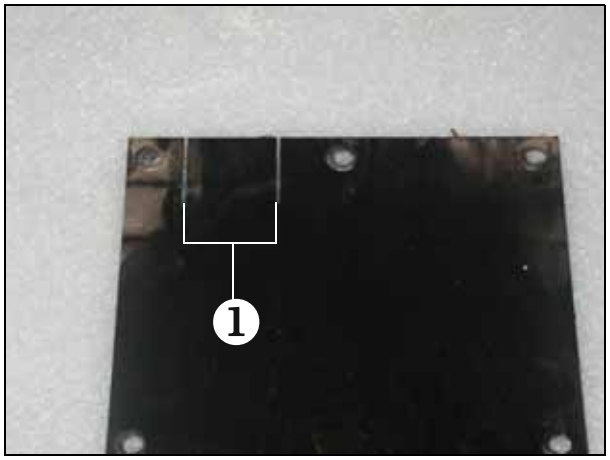
Step 2

Locate the plate bolted to the floor and then remove the bolts.



Step 3

Remove the plate and then cut 2 notches ❶ in the back corner of the plate between the bolt holes.



Step 4

Bend back the piece between the cuts. Smooth the rough edges on the plate with a file.



Step 5

Replace the plate in the floor and then tighten the bolts. Route all cables except the antenna/receiver cables into the cab through this access hole. Leave the cables out from under the mat.



Step 6

Place the controller mounting plate against the left side of the seat base, slightly off the floor.

Note – *Be sure the counter sink holes are over the metal seat base but are up as high as possible on the seat. This is to allow clearance for the floor mat.*



Step 7

Drill four holes to match the fasteners using the mounting plate as a template.

Note – *It is necessary to drill through the track for the drawer, as well. You may need to clamp the track and seat base while drilling.*



Step 8

Mount the plate with four ¼-20 bolts supplied. Install lockwashers and nuts on the inside of the seat base. Tighten securely.



Step 9

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



Step 10

Attach the controller to the mount plate using the four #10-32 Philips head screws provided. Tighten securely.

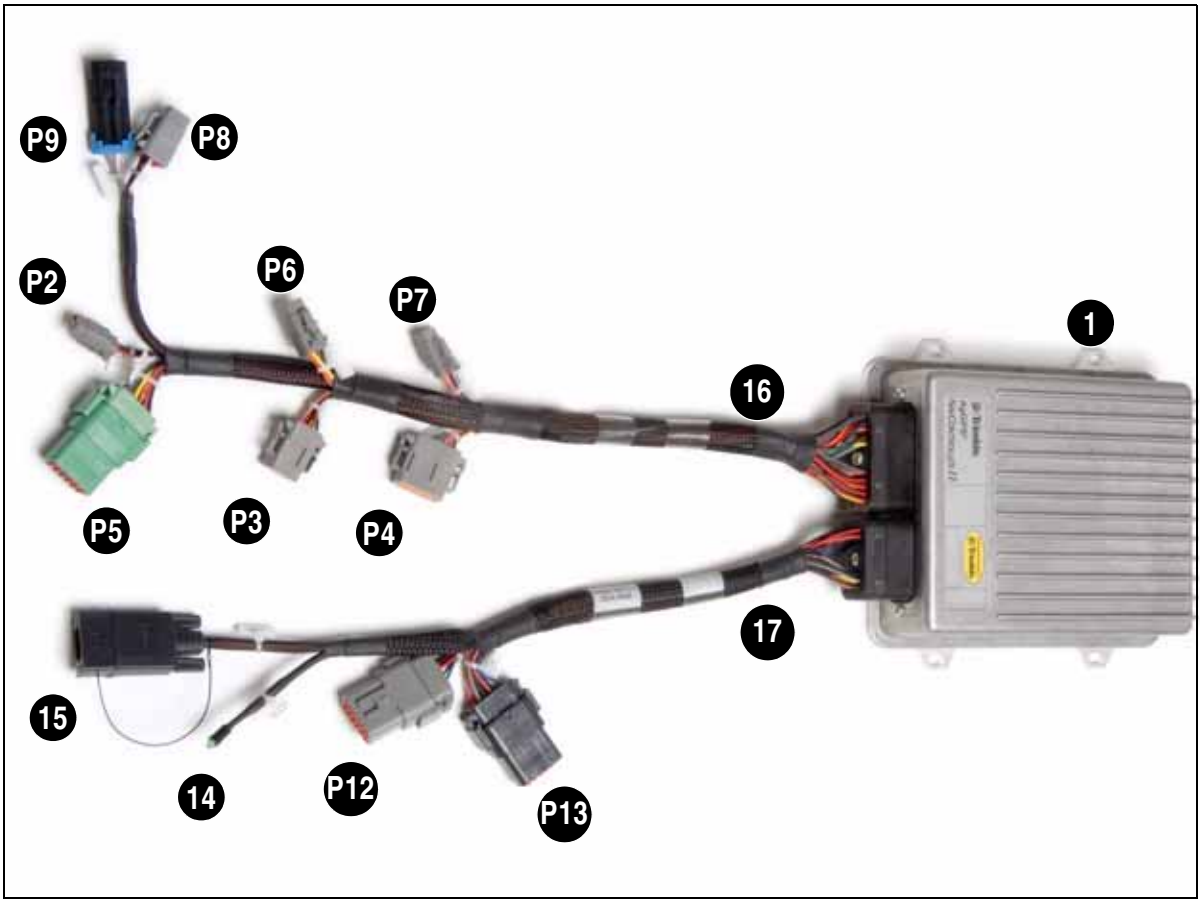


Step 11

Connect the various cables to the appropriate leads on the controller main harness. The connectors are marked with identifying labels for ease of connection.



Controller connections



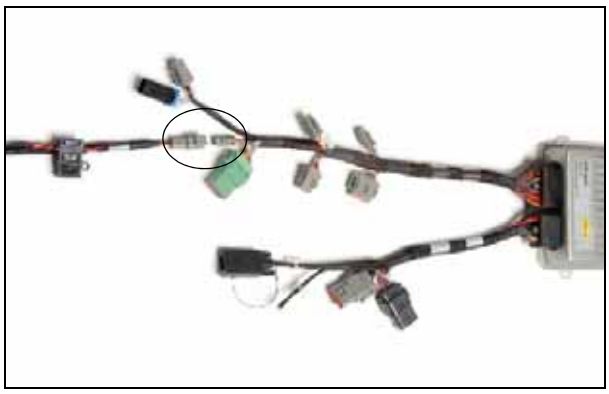
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

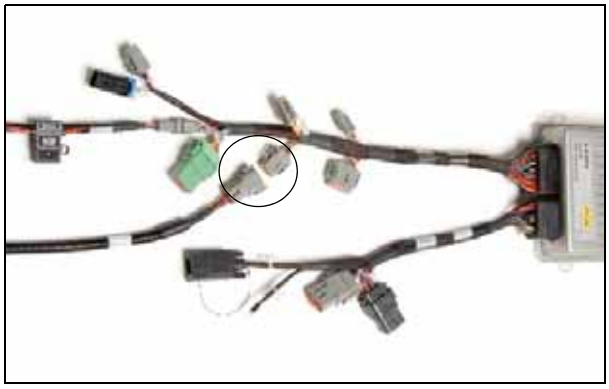
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

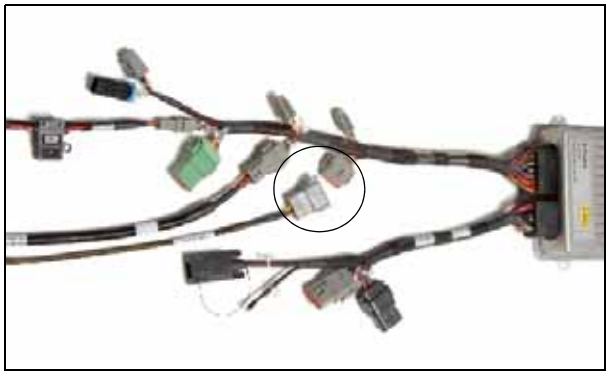
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

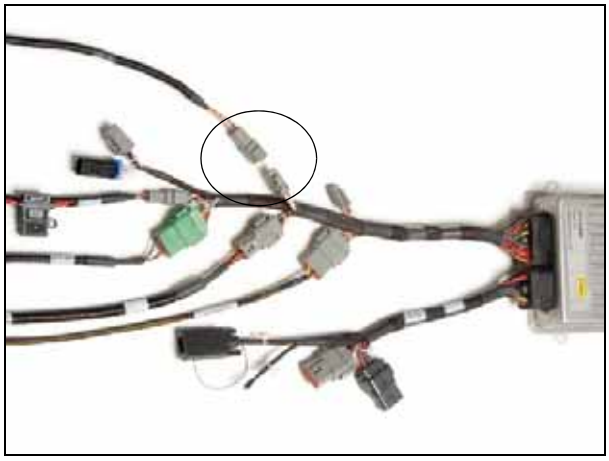
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

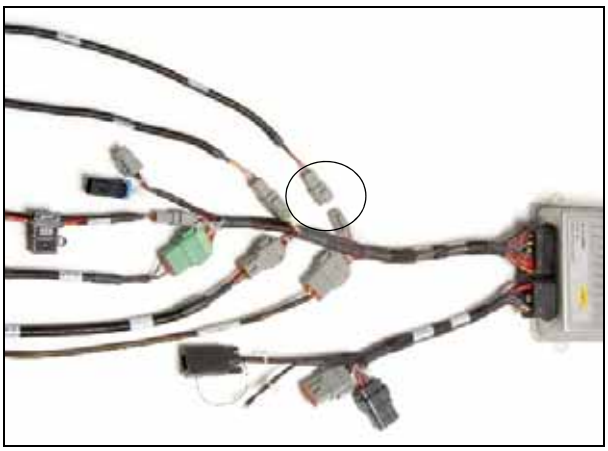
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

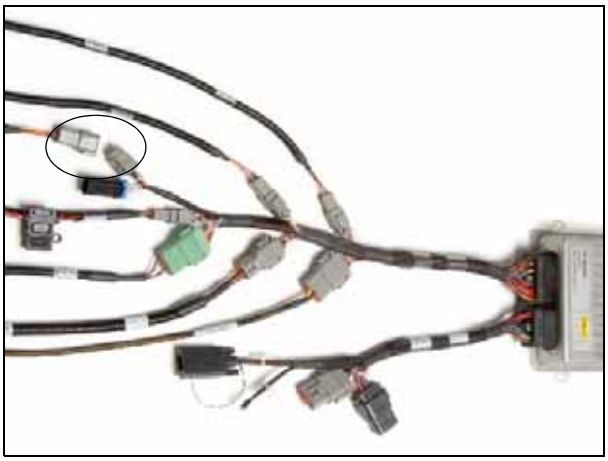
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 6

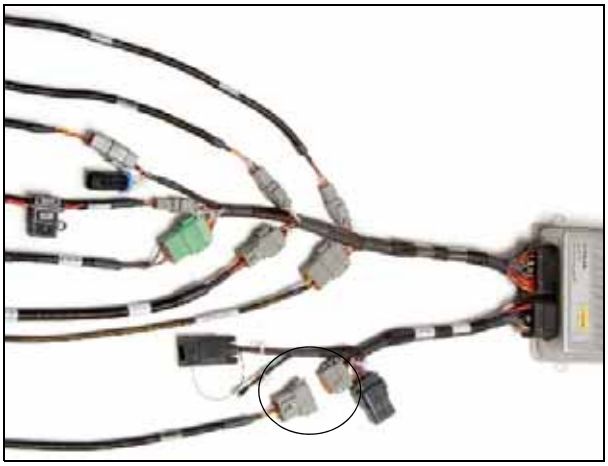
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 7

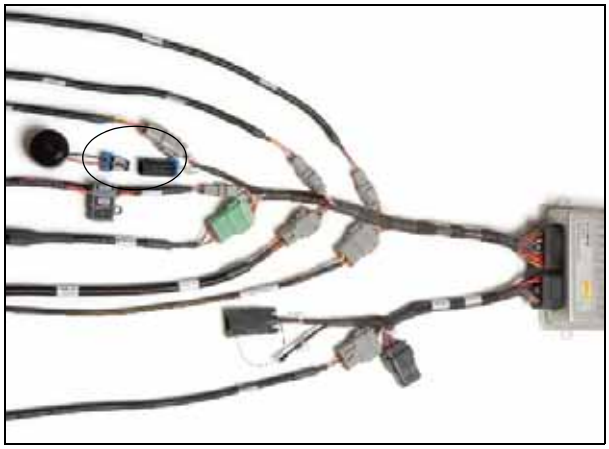
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



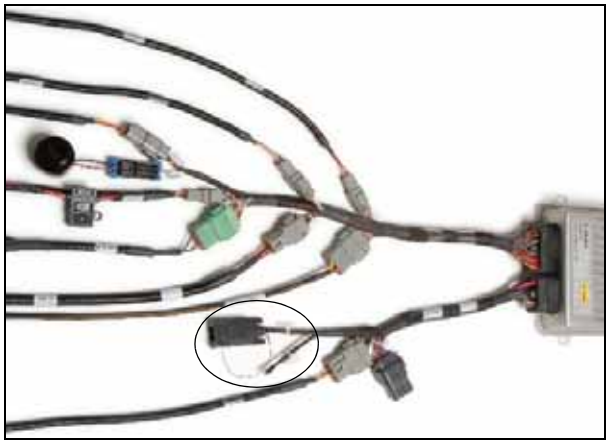
Step 8

Connect the Sonalert P-9 to the 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 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

8

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.