*Ag*GPS® Autopilot™ Automated Steering System

Installation Instructions

AGCO

- **MT945B**
- **MT955B**
- **MT965B**
- **MT975B**

Version 4.00
Revision A
Part Number 54036-60-E03
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Trimble®

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

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission rules.

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Or
Mail a request for recycling instructions to:
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c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL



Safety Information

In this chapter:

- Warnings
- Cautions

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

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** button at the top of the screen. The Support A–Z list of products appears.
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

*Ag*GPS 150 EZ-Guide Plus lightbar

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

EZ-Guide 500 manual guidance upgrade

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

Required components

Kits required	Special tools
Platform kit: P/N 54036-60	1" hole saw
Hydraulic hose kit: P/N 64877	5/16" drill bit
	Allen wrench set (metric and SAE)

Antenna mounting kits

Antenna options
Antenna spar mount: P/N 64871 (recommended) or 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 2, Hydraulic Control Valve Installation).

Autopilot hardware organization – as shipped

Platform kit (P/N 54036-60)	Common parts	GPS receiver	Display	Hyd. hose kit (P/N 64877)	Roof bracket kit (P/N 64871 or P/N 53676)
(2) Hydraulic valve (2) Hydraulic manifold (2) Transducer, flow switch (2) Manual override cable (2) Hydraulic brackets and bolt kits (2) Hydraulic valve cable (3) AutoSense steering device and cabling (3) AutoSense mounting bracket and hardware (6) Power cable and switch (8) Controller mounting bracket (8) Bolt kit, controller	(8) Controller (8) Cable kit • Main wiring harness • Auxiliary wiring harness • Sonalert alarm	(4) GPS receiver (4) GPS antenna (4) GPS receiver mounting bracket (4) GPS receiver power/data cable (4) RTK radio, cable, and radio antenna	(5) *Ag*GPS FieldManager display (5) EZ-Guide 500 lightbar (5) Display cable(s) (5) Mounting bracket (5) *Ag*GPS 150 lightbar	(2) Hyd. adaptors	(4) Roof brackets (4) Bolt kit, roof bracket

Note – *The number in brackets refers to the chapter where that component is installed.*

Autopilot hardware organization – as installed

Hydraulics (2)	AutoSense steering device (3)	GPS Receiver (4)	Display (5)	Power (6)	Controller (8)
• Flow switch • Hydraulic valve cable • Manual override cable	• AutoSense steering device and cabling • AutoSense mounting brackets and hardware	• GPS receiver • GPS antenna • GPS receiver mounting bracket • GPS receiver power/data cable • Roof brackets	• EZ-Guide 500 lightbar • *Ag*GPS FieldManager display • Display cable(s) • Mounting bracket • EZ-Guide Plus lightbar	• Power cable and switch	• Controller • Mounting plate • Bolt kit - controller • Main wiring harness • Aux. wiring harness • Sonalert alarm

Pre-installation vehicle preparation

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:

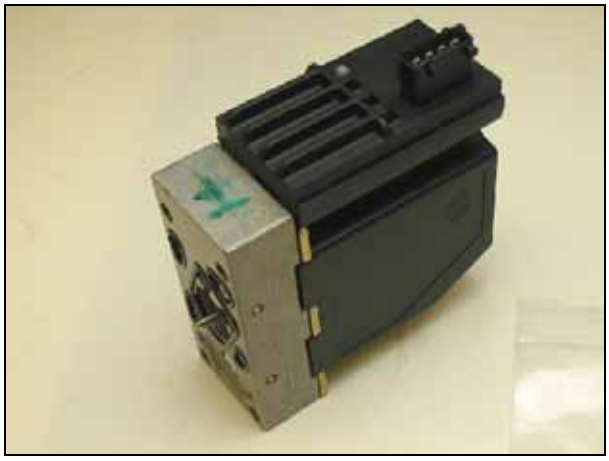
- Identifying the hydraulic valve module
- Hydraulic control valve components
- Installing the hydraulic valve actuation module
- Installing the flow switch

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

Identifying the hydraulic valve module

Step 1

Locate the hydraulic valve electronic actuator module provided in the kit.

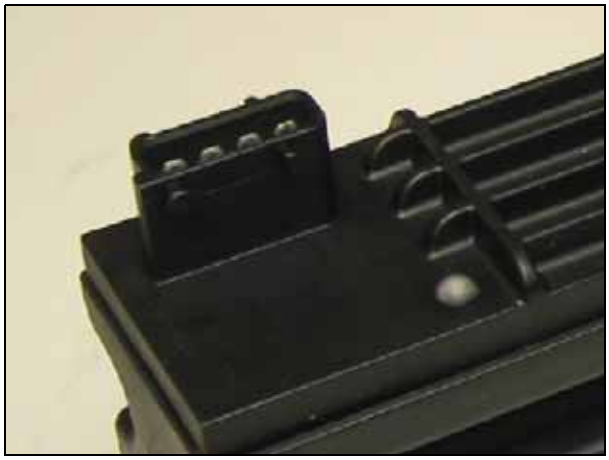


Step 2

Identify the connector type on the module.



DEUTSCH DT TYPE

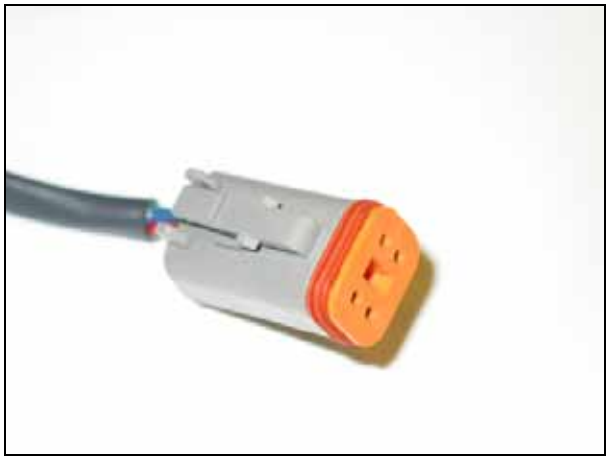


AMP JPT TYPE

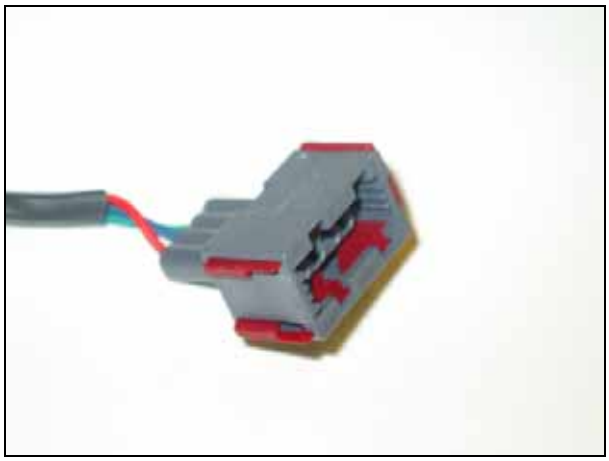
Step 3

Select the hydraulic valve cable that corresponds to the valve. Both types of valve cables are provided.

Note – *The alternate cable will not be used.*

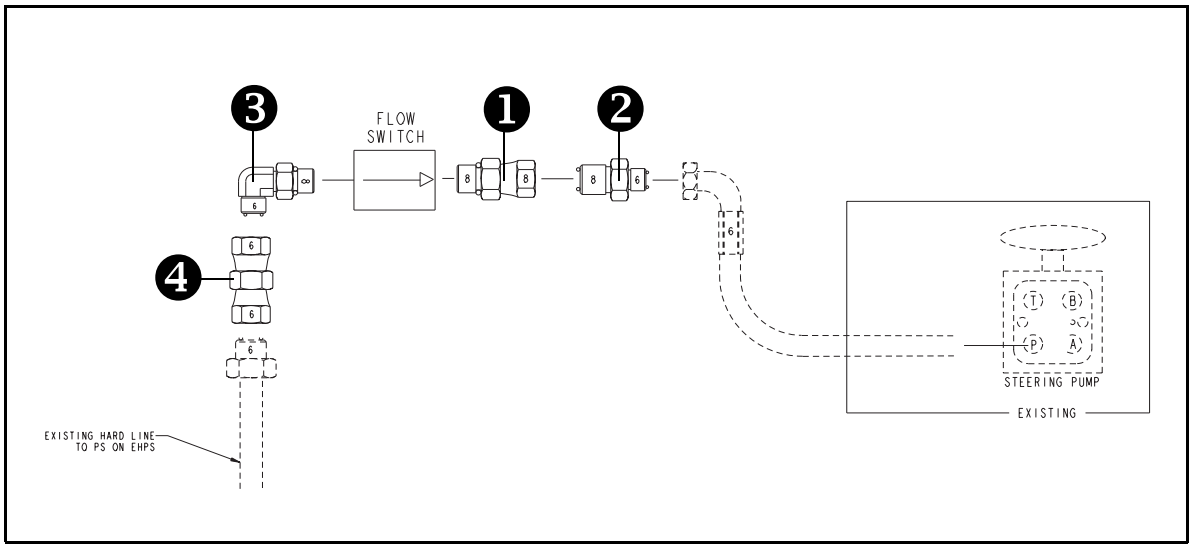


DEUTSCH DT VALVE CABLE:
USE P/N 59870



AMP JPT VALVE CABLE
USE P/N 59816

Hydraulic control valve components



Item	Description	Part number
1	Fitting	8 F65OL-S
2	Fitting	8-6 HLO-S
3	Fitting	6-8 C5OLO-S
4	Fitting	6 HL6-S

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

Installing the hydraulic valve actuation module

Step 1

Locate the steering valve on the driver's right in the service cabinet next to the stairs.



Step 2

Locate the steering valve inside the cabinet.



Step 3

Inspect the electrical actuation module for damaged or unseated O-rings. The irregular shaped O-rings may be round when removed.

Note – *In some cases, a small amount of silicone or grease must be used to hold the O-rings in place during installation.*



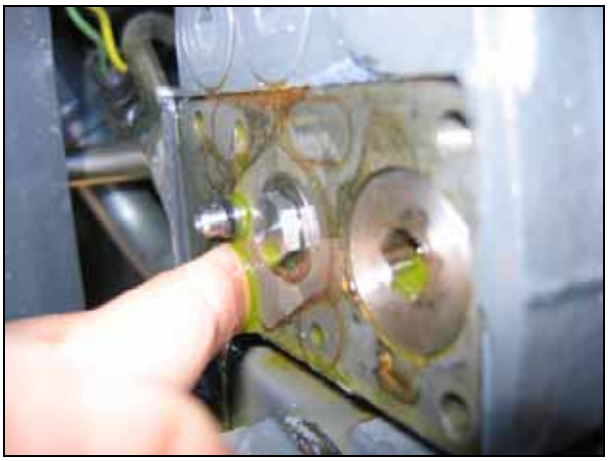
Step 4

Remove the current actuation module or block off plate and then set it aside.



Step 5

Ensure that the shuttle valve is in place. If it is not there, use the one provided in the kit.



Step 6

Install the actuation valve provided in the platform kit in place of the one that came with the tractor.



If the tractor was delivered with the shuttle valve from Step 5, go to Installing the flow switch, page 22. If you had to use the shuttle valve supplied in the kit, complete Steps 7–13.

Step 7

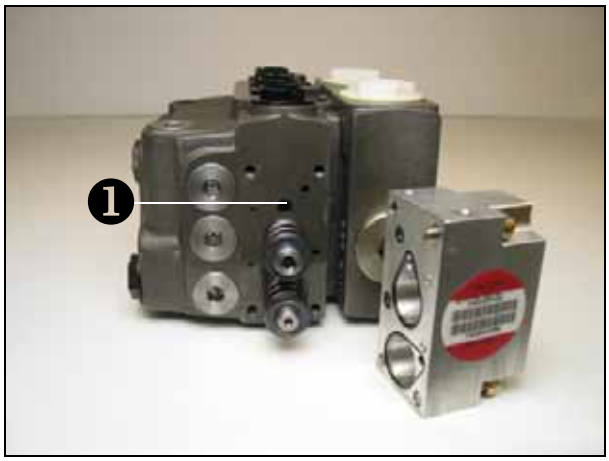
Remove the cover at the rear of the valve. Retain the end plate and bolts.

Note – *Use caution to keep the O-rings in the cover in place. If an O-ring is damaged or lost, replace the O-ring with one provided by the manufacturer.*



Step 8

Locate the shuttle valve cavity in the valve body as shown ❶.



Step 9

Identify the cone-shaped end of the shuttle valve shown. The cone-shaped end will face out of the cavity.



Step 10

Insert the shuttle valve cavity into the valve body with the cone facing outward.



Step 11

Inspect the O-rings in the cover removed in Step 7.



Step 12

Reinstall the cover at the rear of the valve.

Note – *If the O-rings do not seat correctly, the valve will leak.*



Step 13

Connect the valve cable connector as identified in the beginning of the chapter and route it to the controller.



DT CONNECTOR STYLE CABLE



AMP CONNECTOR STYLE CABLE

Installing the flow switch

Step 1

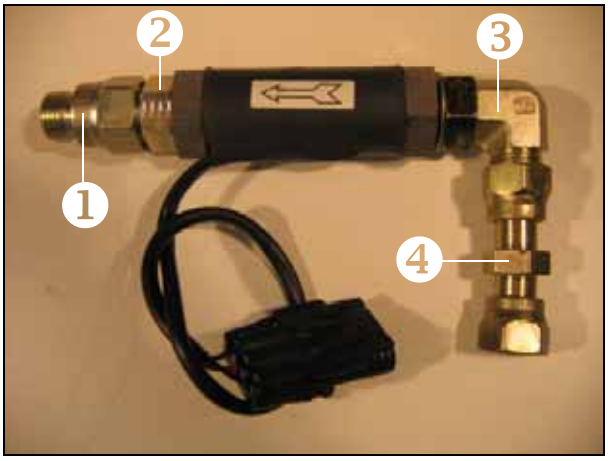
Locate the flow switch supplied in the kit and then install the following adaptors:

❶ a -8 Female ORS to -6 Male ORS reducer to the downstream end

❷ a -8 Male to -8 Male ORS adaptor to the downstream end

❸ a -8 Male ORB to -6 Male ORS 90° elbow to the upstream end

❹ a -6 Female ORS to -6 Female ORS union to the upstream end



Step 2

Locate the hydraulic hoses coming from the steering hand pump directly under the cab of the tractor.

Note – *This view is from the back of the tractor.*



Step 3

Remove the rear hose where it meets the hardline.



Step 4

Loosen but do not remove the bottom rear-most hose at the steering hand pump.



Step 5

Install the flow switch between the hardline and the hose going to the steering hand pump. Turn the hose from the handpump 90° counter-clockwise so it will easily engage the flow switch. The arrow on the flow switch points towards the steering hand pump.



Step 6

Connect the flow switch cable and route it to the controller.

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.

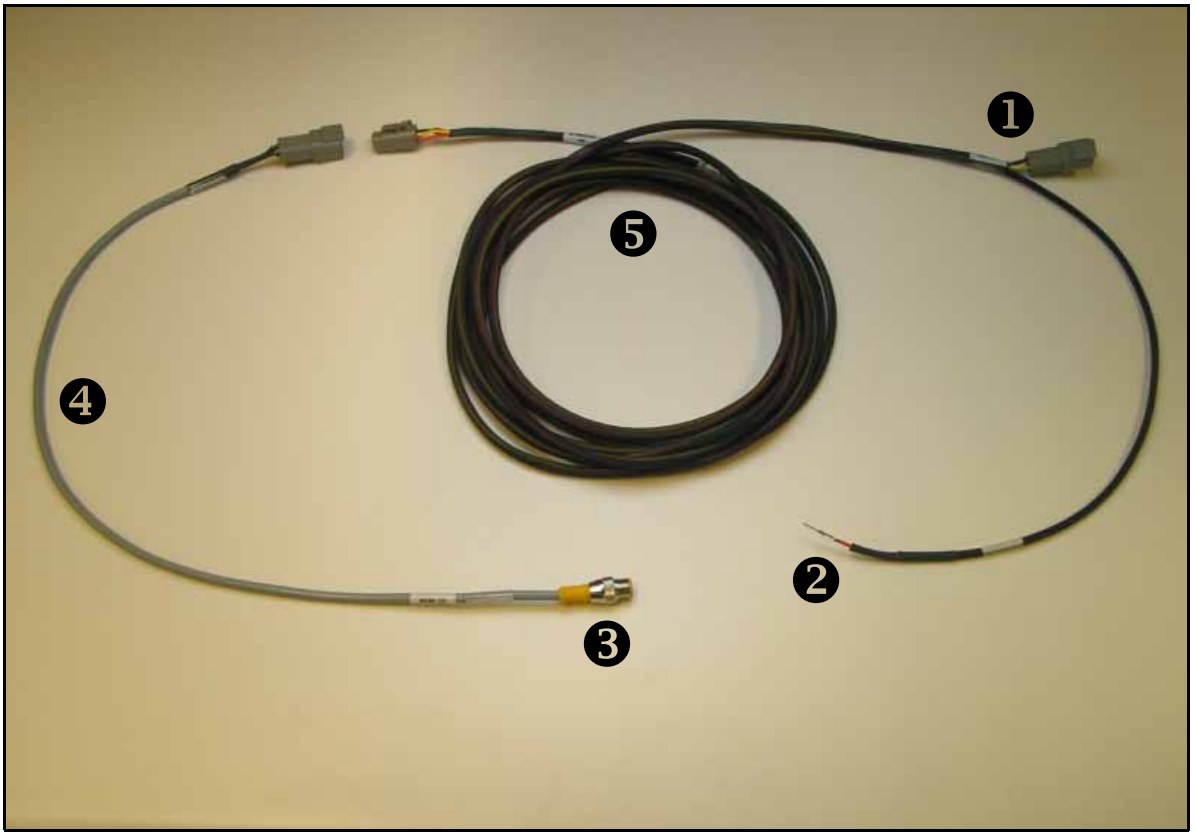
If the described mounting location is not accessible, chose an alternate location. To ensure proper function, the AutoSense device must be located in a position that is free of obstructions and allows it to rotate with the wheels when they turn.

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
1	P-6 connector
2	Power connector
3	AutoSense connector
4	Jumper cable (P/N 57560)
5	AutoSense steering cable (P/N 57885)

Installing the *Ag*GPS AutoSense steering device

Step 1

Locate the mounting location on the rear frame, just behind the articulation point.



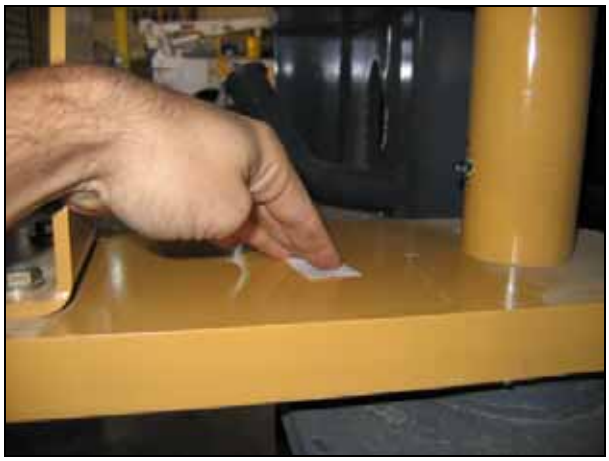
Step 2

Use the AutoSense device to estimate the final mounting location.



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 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 tape. If the adhesive becomes contaminated, apply new tape.*



Step 6

Attach the AutoSense device and bracket to the center of the steering 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.*

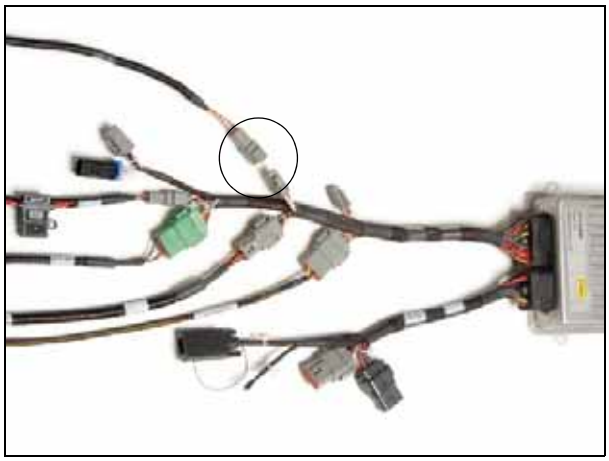


Step 7

Route the steering cable to the steering device along the existing hoses and connect it to the steering device. Leave adequate length on the service loop to avoid stretching the cable.

Step 8

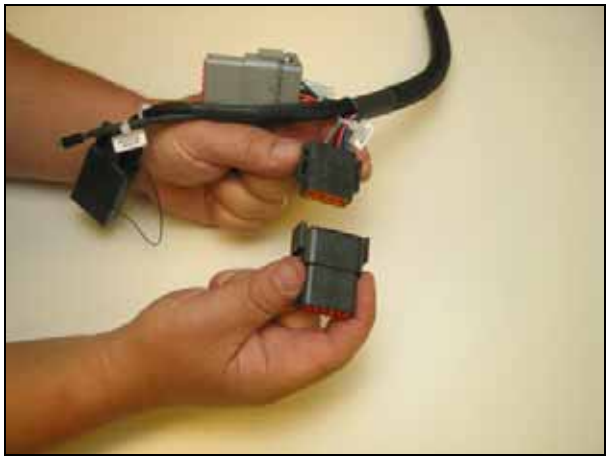
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Preparing the harness (P/N 54602 Rev C)

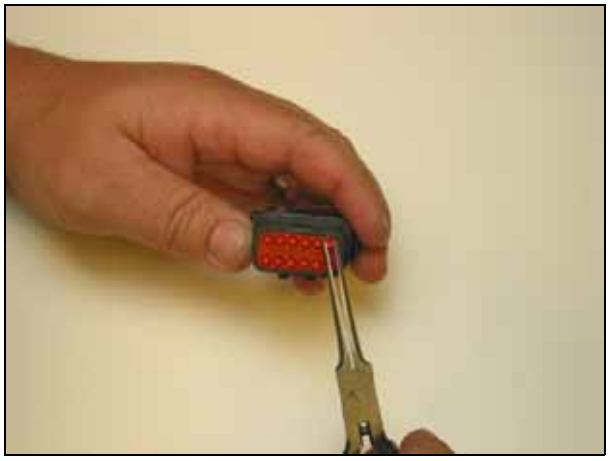
Step 1

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



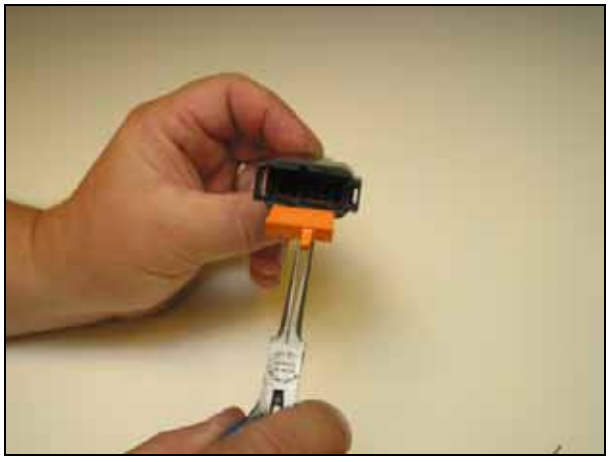
Step 2

Remove the plug from cavity number 1.



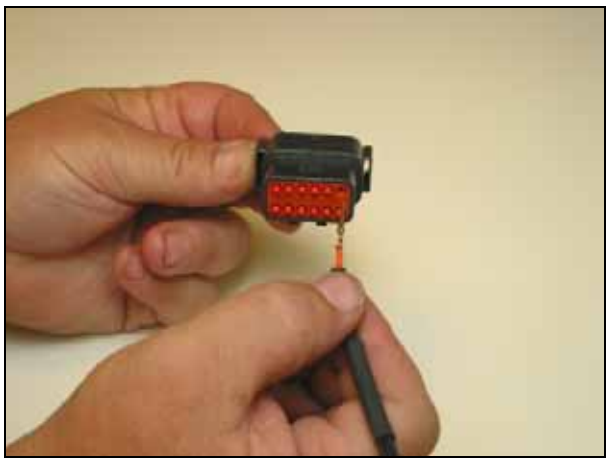
Step 3

Remove the wedge from the connector.



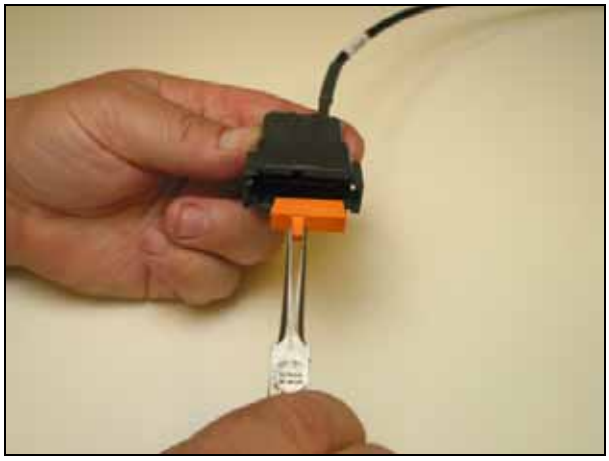
Step 4

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 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 5, Display Installation.*

Antenna and receiver installation options

There are two mounting options. The spar mount is recommended, as it positions the antenna directly over the front axle.

- **Spar mount (recommended)** – The spar 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.
- **Roof bracket mount** – This bracket is a crossbar that mounts on the cab roof. See Mounting an optional single spar bracket, page 37.
  - 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 bracket mounting is not available and high accuracy is required, see Installing an AgGPS 252 receiver with magnetic feet, page 45 for mounting magnetic feet directly to 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 spar struts.



Step 2

Install the two spars using the existing bolts on the cab roof. The longer spar goes towards the front of the tractor.



Step 3

Use the slotted holes to center the spar and then tighten the bolts.

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

Bolt the long antenna spar into the channels of the two shorter cross spars using the hardware provided.

Step 5

For either of the following applications:

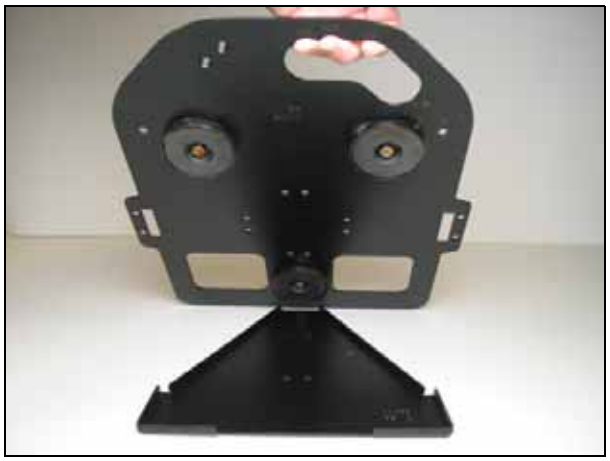
- A single magnet antenna mount
- An *Ag*GPS 252 receiver with magnetic option for quick removal

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.

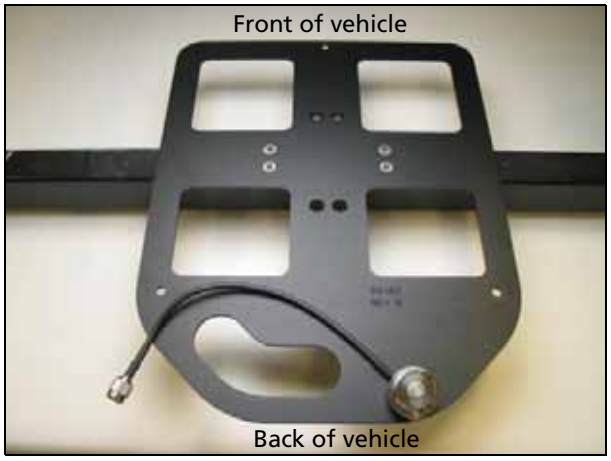


PLATE ON SPAR

Mounting an optional single spar bracket

Step 1

Remove the 2 existing bolts at the front of the cab roof. Retain the bolts.

Step 2

Place the bracket over the bolt holes.



Step 3

Use the existing bolts to secure the bracket. Tighten the bolts.

Note – *Replace the existing bolts with longer ones if necessary.*



Step 4

For either of the following applications:

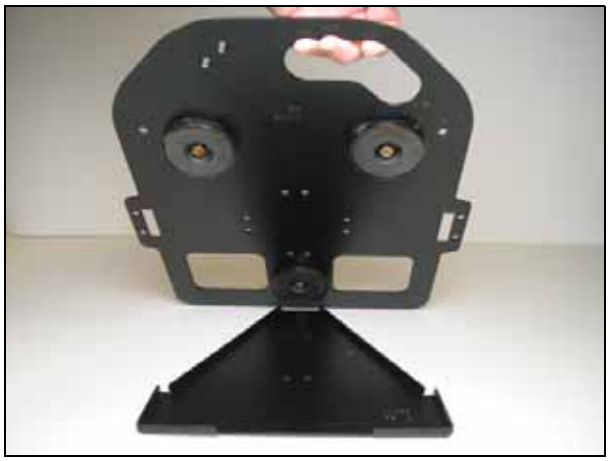
- A single magnet antenna mount
- An *Ag*GPS 252 receiver with magnetic option for quick removal



V PLATE ON SPAR

Install a V plate with four ¼" flathead screws.

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



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.

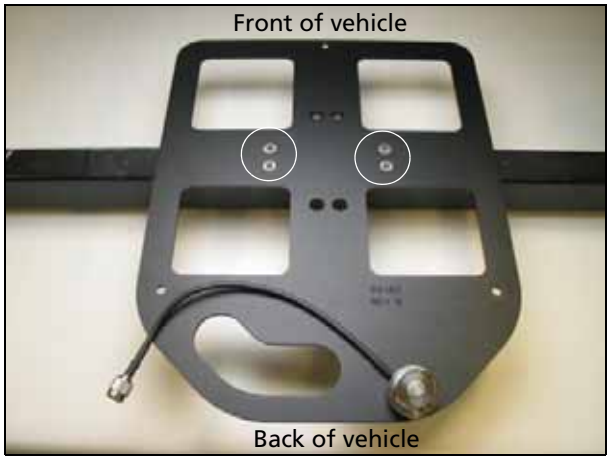
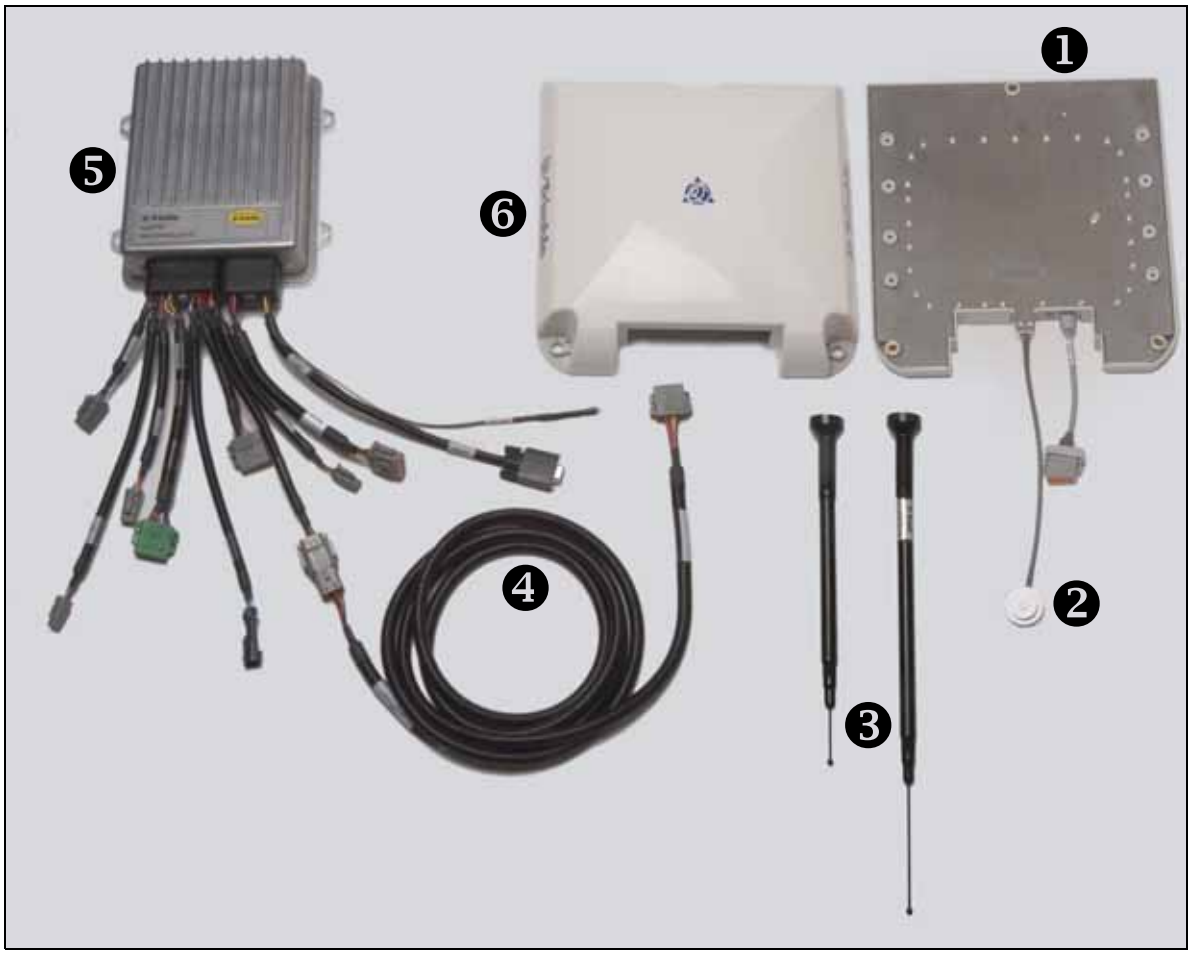


PLATE ON SPAR

*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

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 34.



V PLATE

MOUNTING PLATE

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



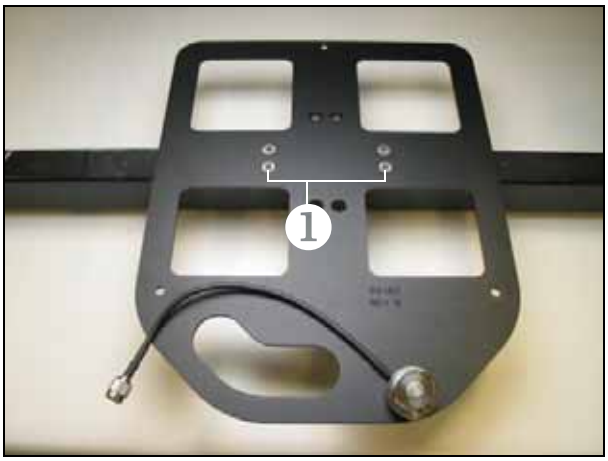
UNDERSIDE OF PLATE SHOWN

Permanent mounting option

Step 1

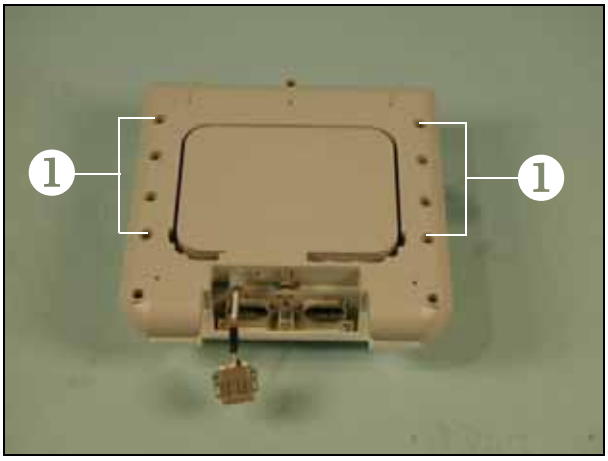
Use the four provided ¼" flathead screws ❶ to attach the receiver mounting bracket to the spar.

For spar mounting instructions, see page 34.



Step 2 BOTH METHODS

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



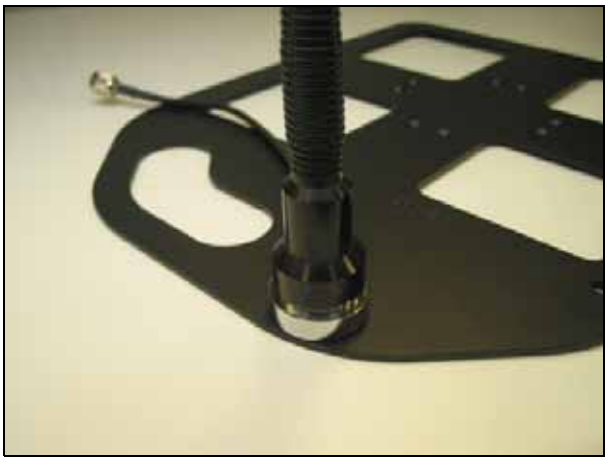
Step 3

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.



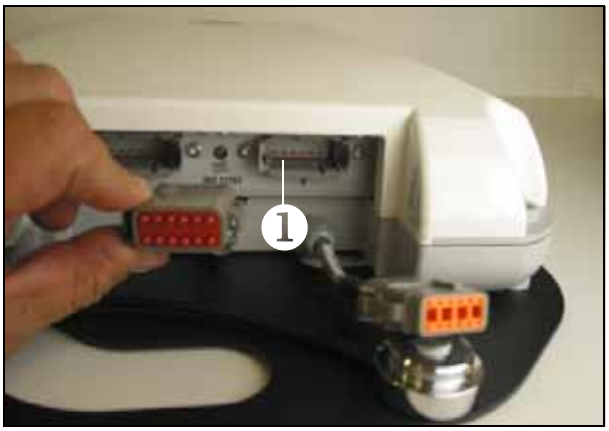
Step 7

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.



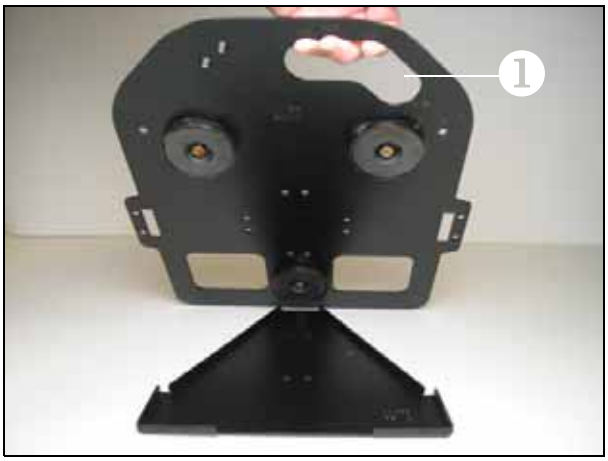
Step 10

Connect the radio antenna to the antenna port.



Step 11 MAGNET METHOD

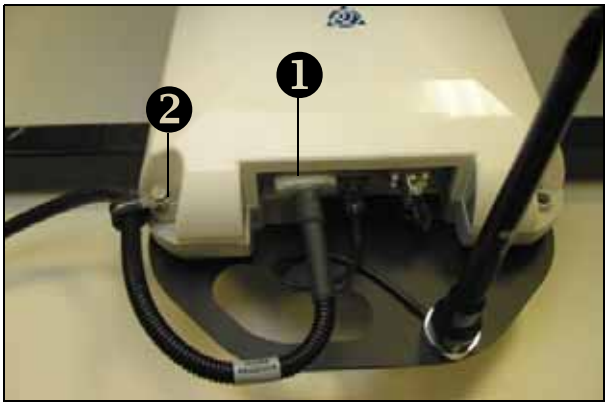
Place the receiver on the roof by aligning the magnets with the V plate. Ensure that the handle ❶ is to the back of the vehicle.



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.

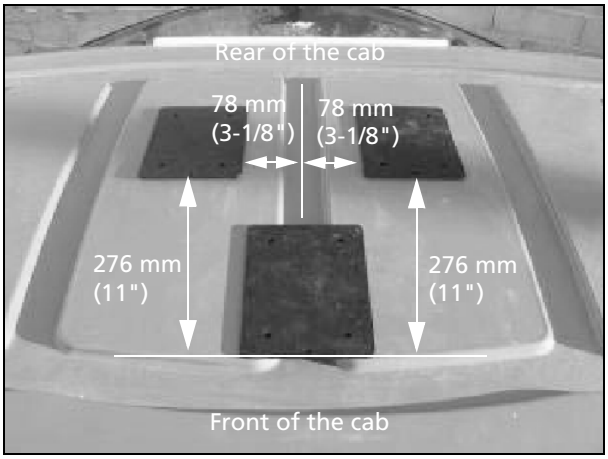


Step 3

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

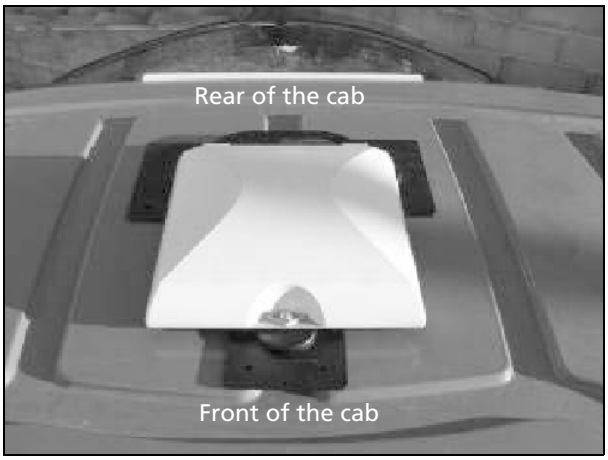
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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.



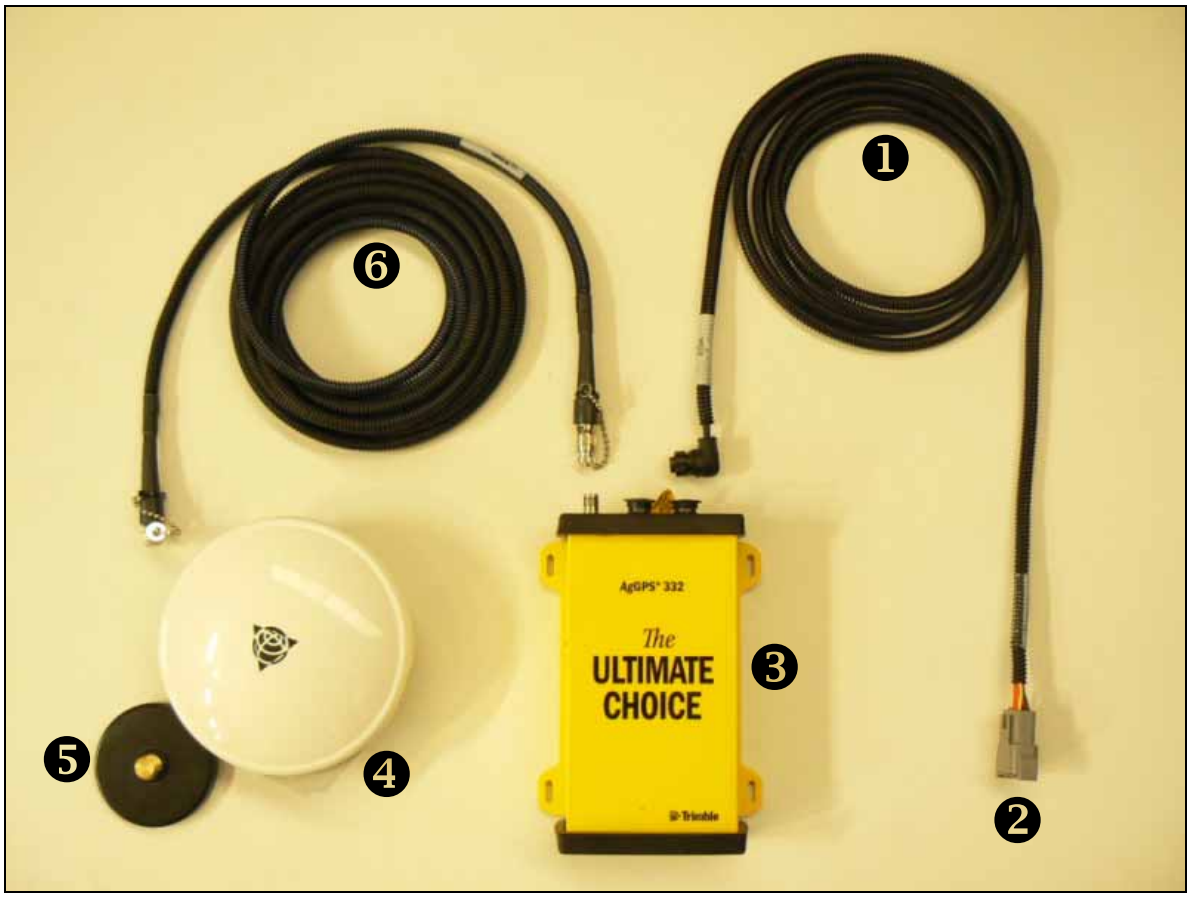
Step 5

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

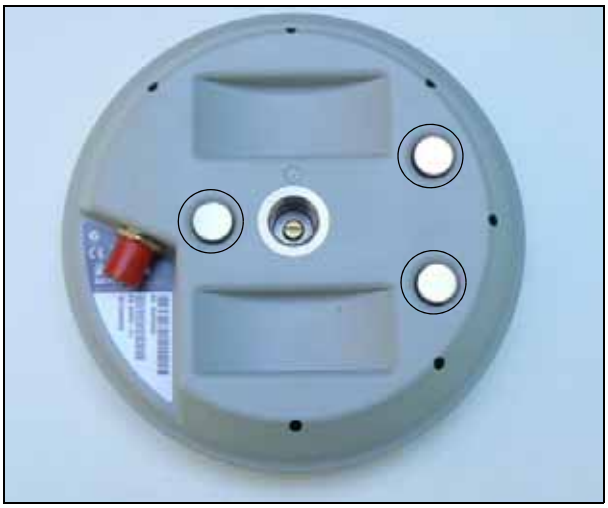
Installing the *Ag*GPS 332 receiver

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 or use the 5/8-11 bolt provided to mount the antenna directly to the long spar.



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.

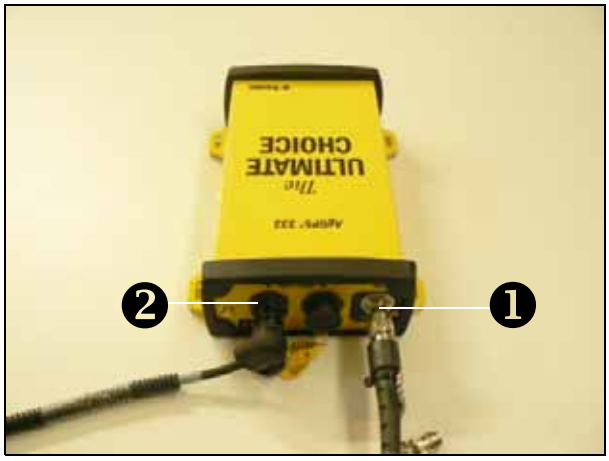


Step 4

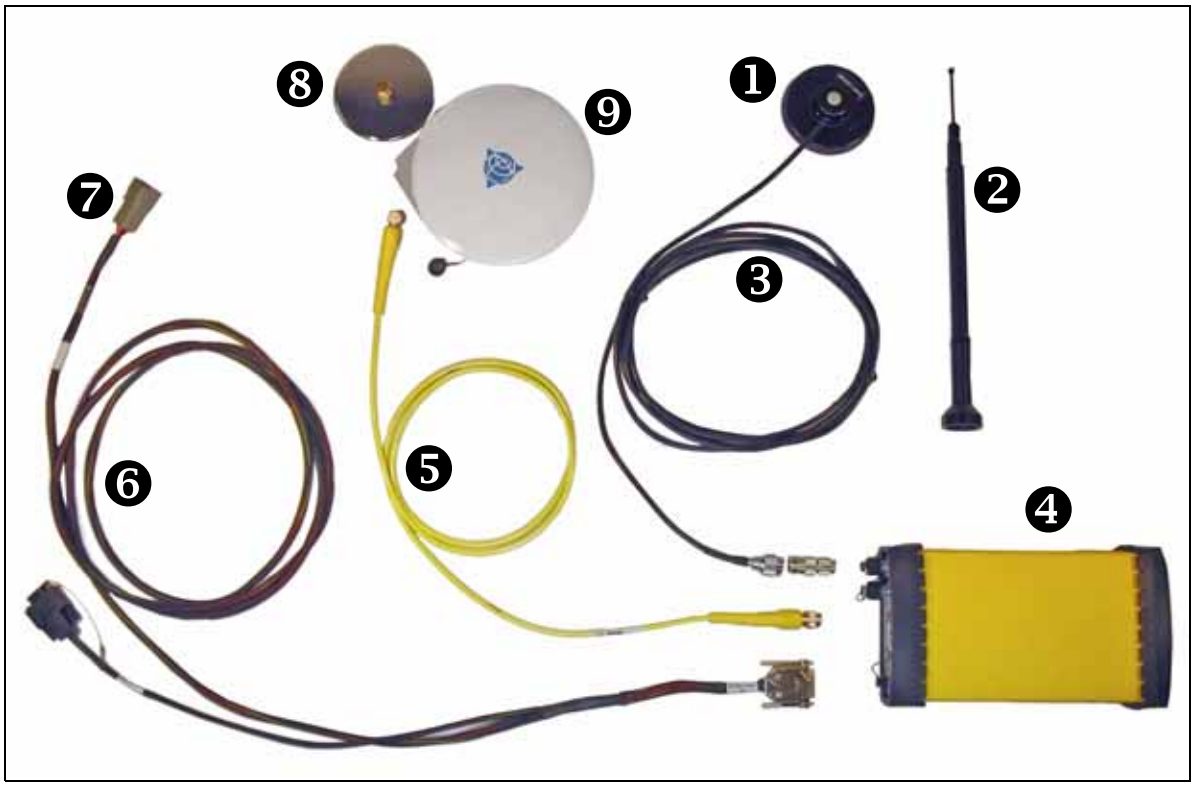
Mount the receiver in a convenient location in the cab.

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

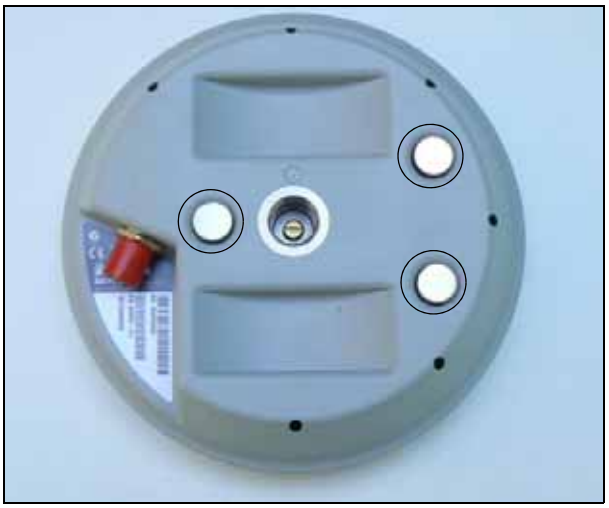
Installing the *Ag*GPS 442/432 receiver

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.

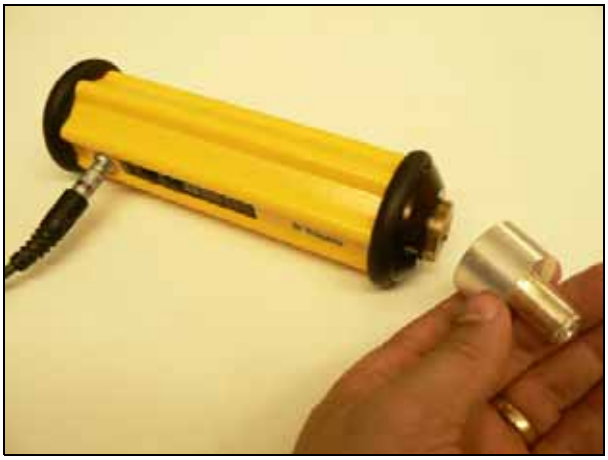


- For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a 5/8" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

5

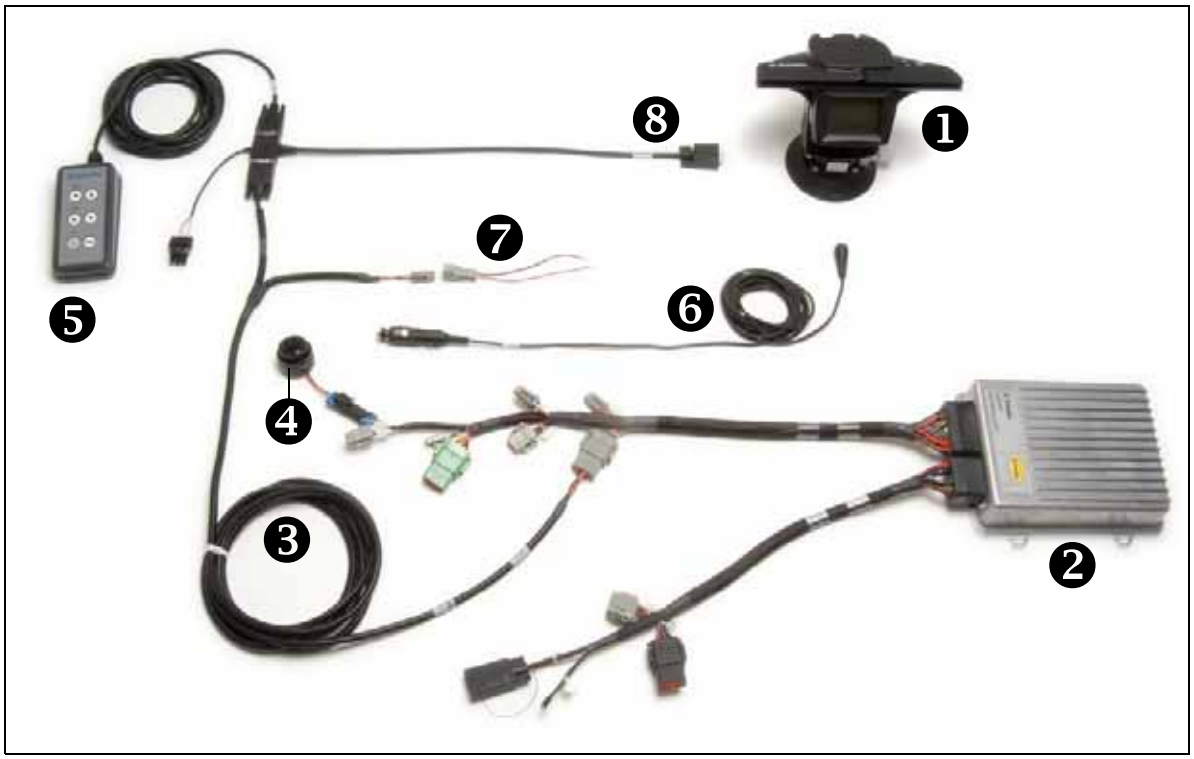
Display Installation

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

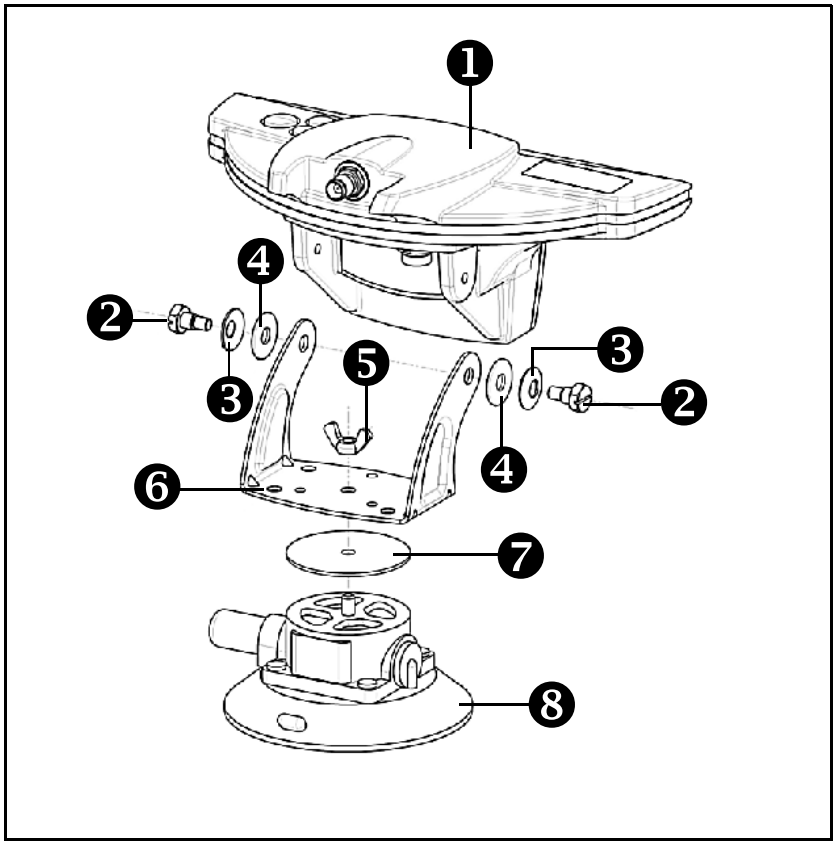


Item	Description
❶	EZ-Guide Plus lightbar
❷	Controller
❸	Display cable (P/N 54612)
❹	Sonalert alarm (if connected)
❺	Optional remote keypad
❻	Power harness
❼	Alternative power supply
❽	External interface cable

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

Tighten the screws ❷ to a torque of 170 cNm (15 in/lbs). Re-apply thread-lock after every ten insertions. Screws require liquid thread-locking compound for optimum performance.

Note – *Check orientation of bracket before inserting screws.*

Mounting the EZ-Guide Plus lightbar

There are two methods of mounting the EZ-Guide Plus lightbar:

- On a vertical, or near vertical surface, using a suction cup vacuum mount, for example to mount the lightbar on a window.
- On a horizontal, or near horizontal surface, using a mount bracket, for example to mount the lightbar directly on the dashboard with screws.

Installing the vacuum mount

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

Step 1

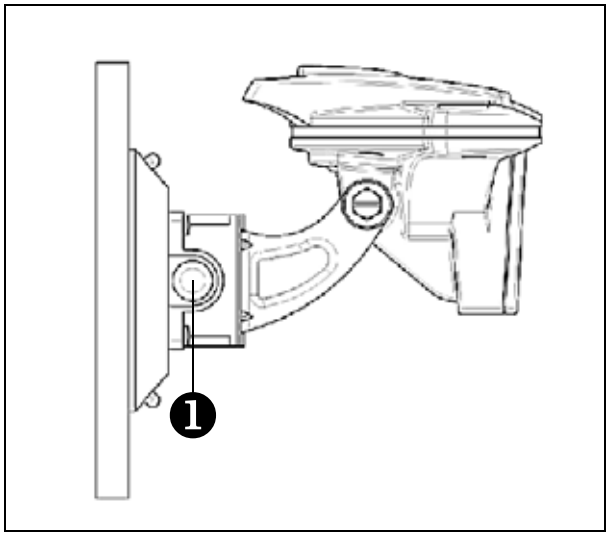
Secure the vacuum mount to the mounting bracket using the hardware provided.

Step 2

Dampen the rubber seal on the suction cup.

Step 3

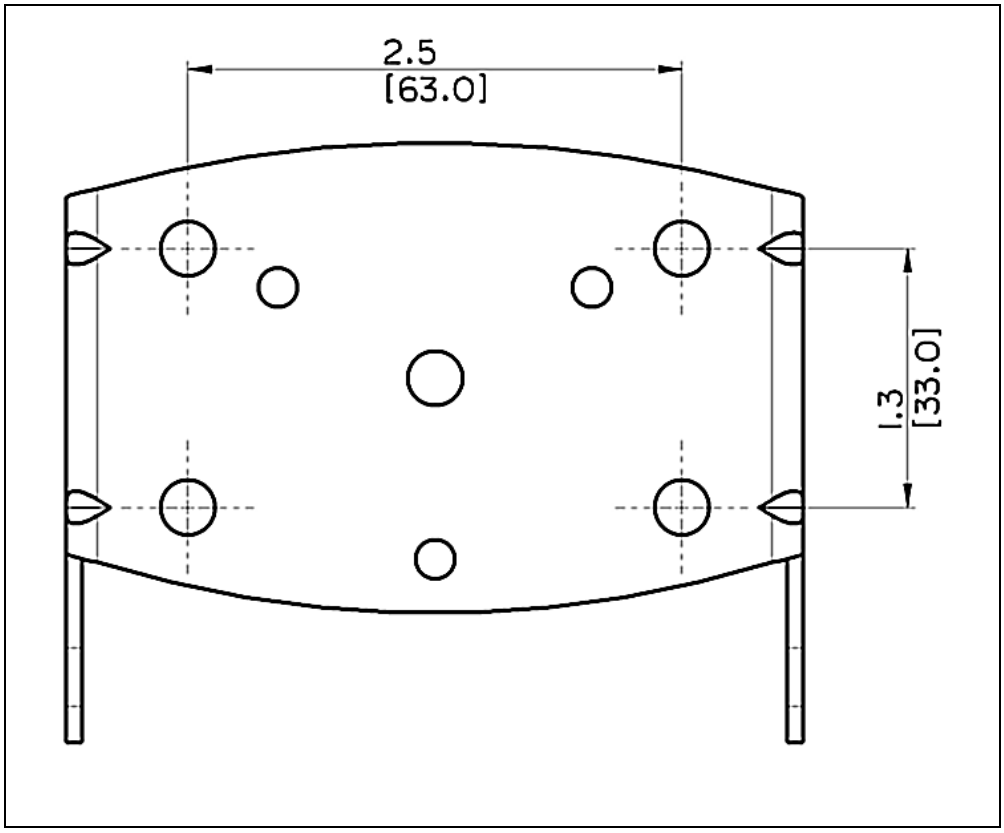
Secure the lightbar in the desired location by pressing the suction cup against a flat surface and pumping the gray button ❶ until the red line is no longer visible.



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

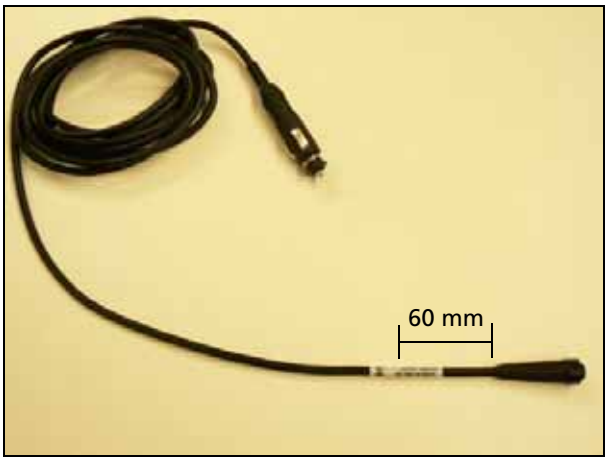
Attach the EZ-Guide Plus display cable to the main harness connection labeled “Display”.

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

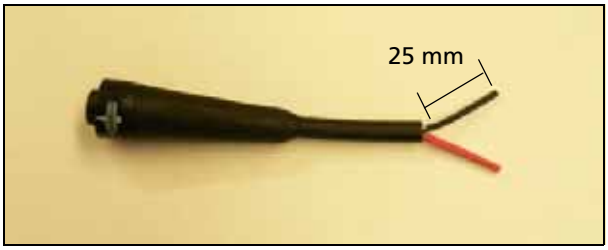
Step 1

Locate the EZ-Guide Plus power cable and then cut the excess cable to match the power lead on the display cable.



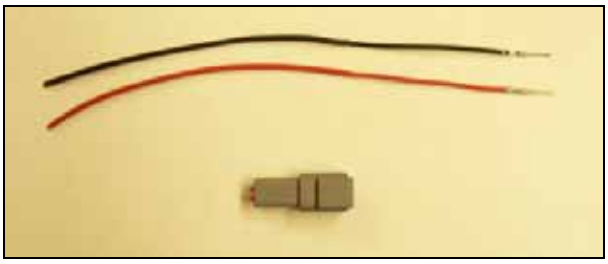
Step 2

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



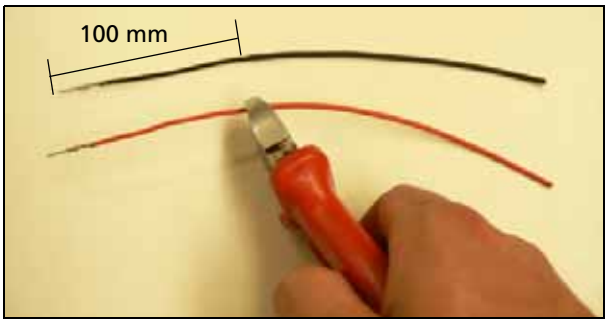
Step 3

If possible, crimp new Deutsch DTM pins onto the red and black leads and skip to Step 7. If you do not have a crimper tool, locate the power leads (with pins on one end) and the two-cavity Deutsch connector that come with the Autopilot display cable.



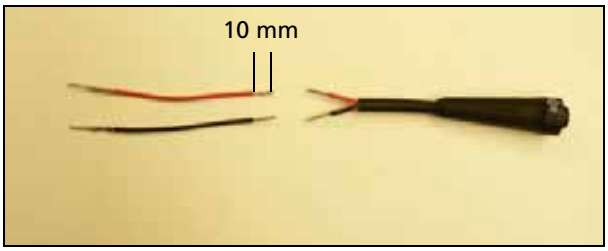
Step 4

Cut the two power lead wires as shown.



Step 5

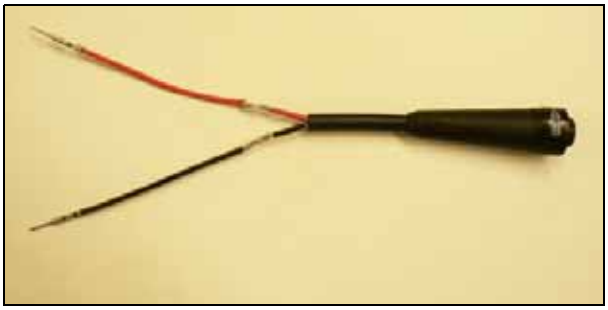
Strip approximately 10 mm of insulation off the four wires and then add solder to the ends.



Step 6

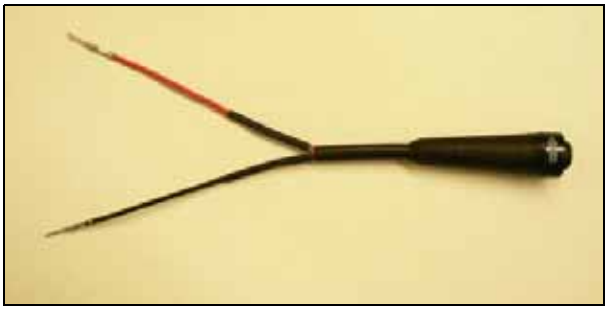
OPTION 1 (RECOMMENDED)

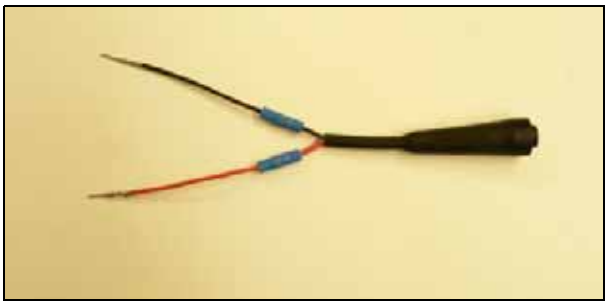
Solder the same colored wires together and then insulate them with 35 mm of heat shrink tubing.



OPTION 2

Clamp the same colored wires together with some crimping lugs.





Step 7

Insert the wires into the Deutsch connector as follows:

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

Step 8

Connect the two Deutsch connectors together so that both ends are at the same length.

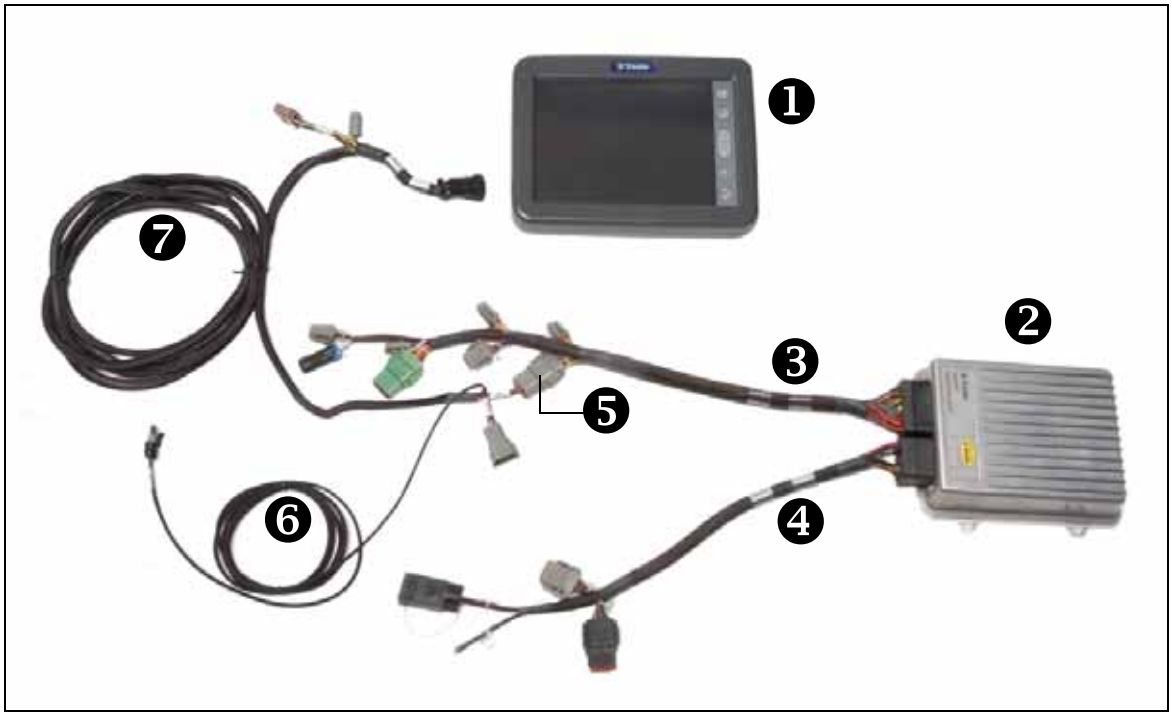


Step 9

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

Step 1

Locate the *Ag*GPS 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

Step 1

The *Ag*GPS FieldManager display is mounted in the cab with a bar style RAM mount. Determine the mounting location in the cab. Use the provided bolts to attach the bar mount to the rail.

Feed the *Ag*GPS Autopilot harness through to the display location.





Step 2

Attach the other 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

Attach the *Ag*GPS Autopilot cable to the back of the *Ag*GPS FieldManager display. Route the cable to the *Ag*GPS Autopilot controller and then connect it to the connection labeled "Display" on the main harness connection.

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

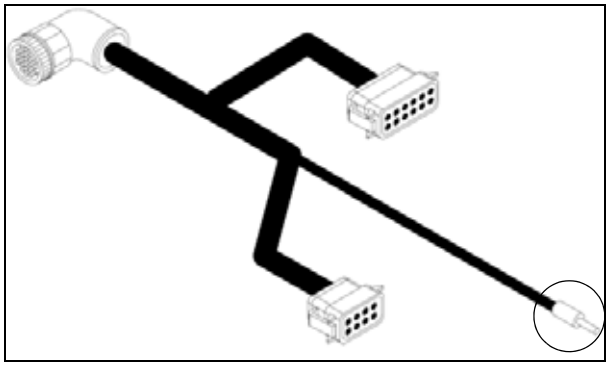


Preparing the *Ag*GPS FieldManager display wiring harness

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

Step 1

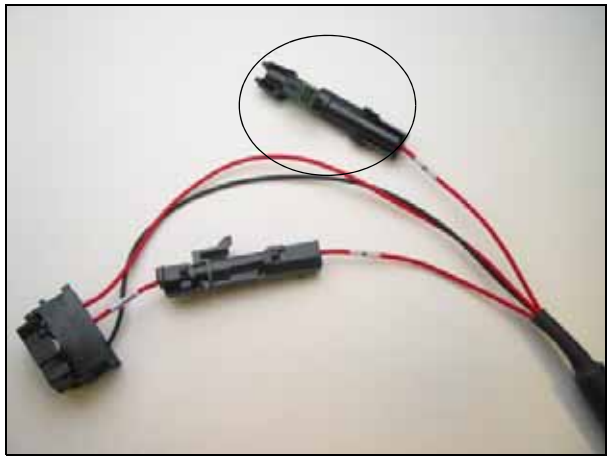
Locate the P9 "Continuous Power" connector on the FieldManager display harness.



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.

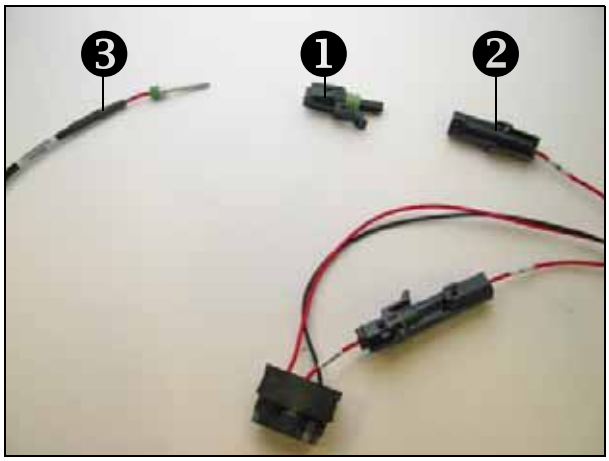
Tip – Turn the key off and then use a volt meter to determine which lead is constant battery power.



Step 3

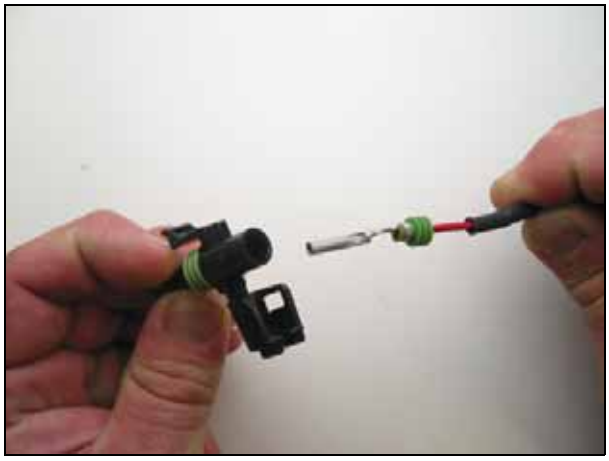
Remove the plug ❶ in the unswitched power lead ❷ and then insert the FieldManager display P9 ❸ pin into the female 1-pin WeatherPack plug. Connect to the mating connector.

Note – *Verify that the lead is battery power by turning on the display while the vehicle key is turned off.*



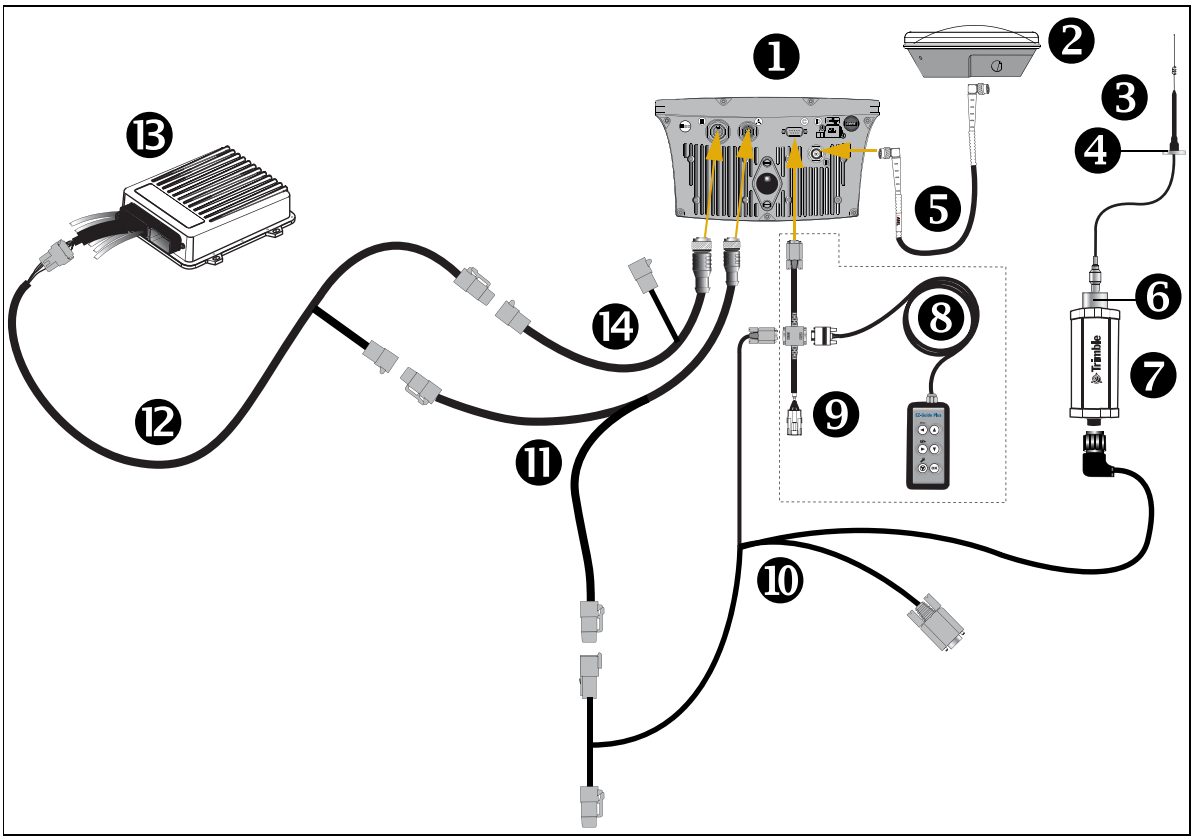
Step 4

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

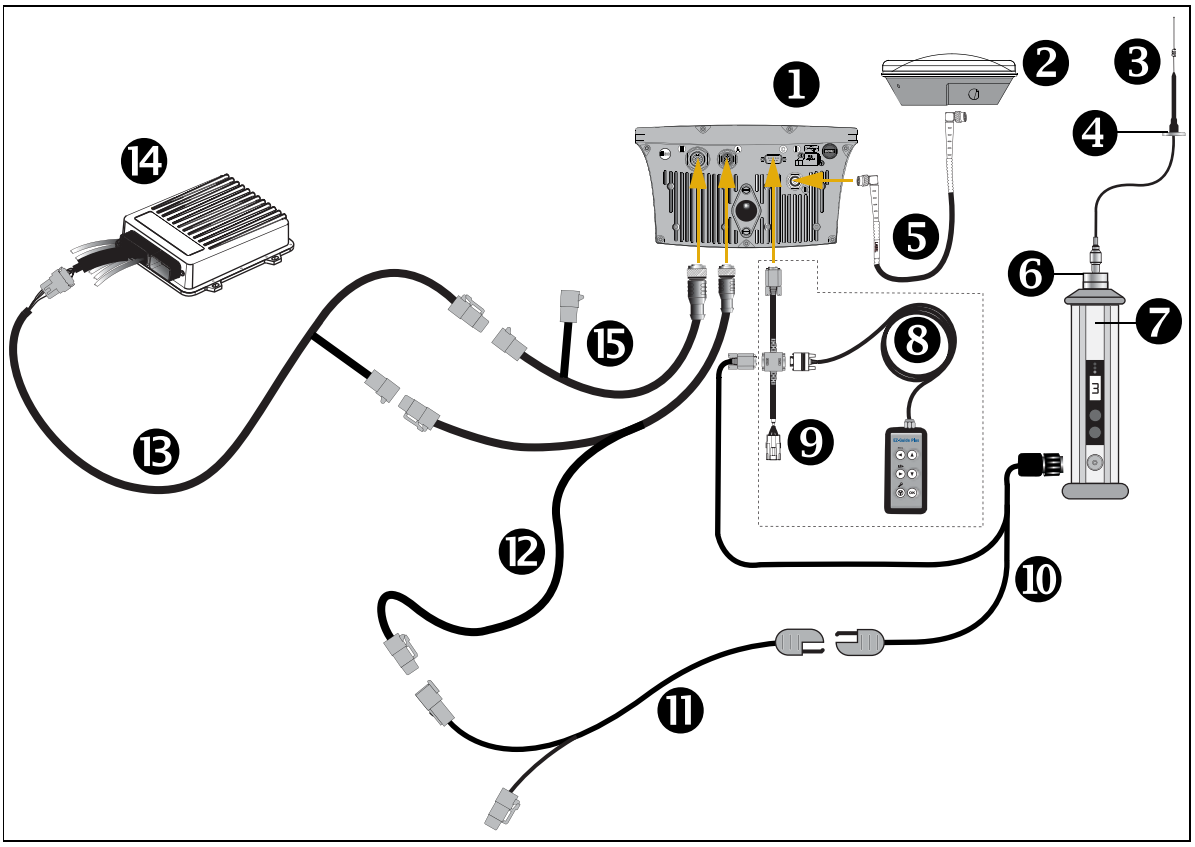
900 MHz radio (North America)



Item	Description
❶	EZ-Guide 500 lightbar
❷	GPS antenna
❸	SiteNet radio antenna
❹	SiteNet radio antenna magnetic mount
❺	GPS antenna cable
❻	Radio antenna connector
❼	SiteNet radio

Item	Description
❽	(Optional) Remote keypad
❾	External interface cable
❿	EZ-Guide 500-to-radio cable
⓫	EZ-Guide 500 power cable
⓬	EZ-Guide 500-to-Autopilot cable
⓭	*Ag*GPS Autopilot controller
⓮	Port expander cable

450 MHz radio (Europe)



Item	Description
❶	EZ-Guide 500 lightbar
❷	GPS antenna
❸	Radio antenna connector
❹	Radio antenna magnetic mount
❺	GPS antenna cable
❻	Radio antenna connector
❼	PDL 450 radio
❽	(Optional) Remote keypad

Item	Description
❾	External interface cable
❿	PDL radio power/data cable
⓫	Power tap to PDL radio
⓬	EZ-Guide 500 power cable
⓭	EZ-Guide 500-to-Autopilot cable
⓮	*Ag*GPS Autopilot controller
⓯	Port expansion cable

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

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

Spar mount method for RTK and OmniSTAR HP (recommended)

Note – *For spar mounting instructions, see* *Antenna and receiver installation options, page 34**.*

Step 1

Mount the V plate to the spar with the four ¼"-20 flathead screws provided. The "V" points forward.



Step 2

Attach the large magnet with a 5/8" stud to the GPS antenna.



Step 3

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



Step 4

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.



EZ-Guide 500 lightbar: Installing the 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.

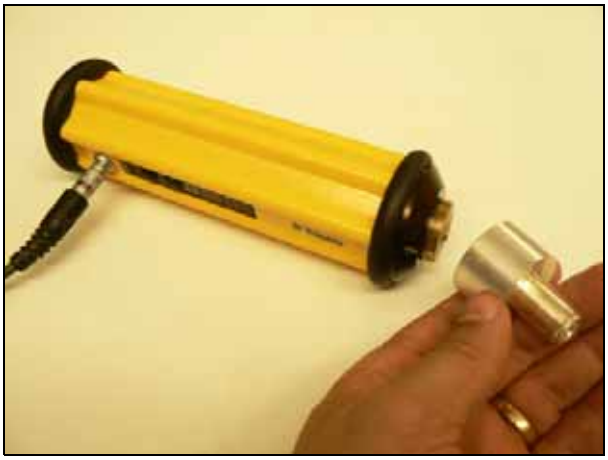


- For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a 5/8" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



Preparing the EZ-Guide 500 lightbar

Note – *Connect the EZ-Guide 500 cables to the back of the lightbar before you attach the lightbar to the RAM mount.*

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.

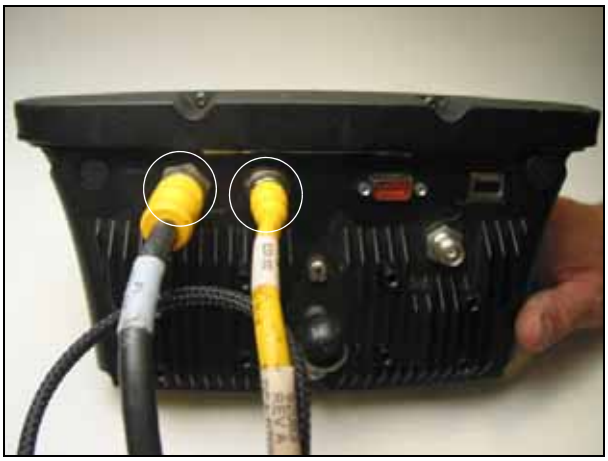


Connecting the EZ-Guide 500 lightbar cables

Note – *Connect the EZ-Guide 500 cables to the back of the lightbar before you attach the lightbar to the RAM mount.*

Step 1

Connect the two round connectors on the EZ-Guide 500-to-Autopilot cable to the power and extension ports on the back of the lightbar.

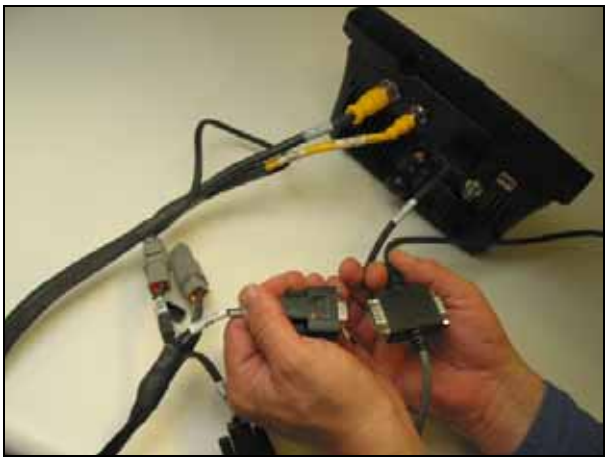


Step 2 With keypad

If you are using the optional keypad, connect the external interface cable to the serial port on the back of the lightbar.

Connect the remote keypad to one of the serial ports on the external interface cable.

Connect the EZ-Guide 500-to-radio cable to one of the other serial ports on the external interface cable.



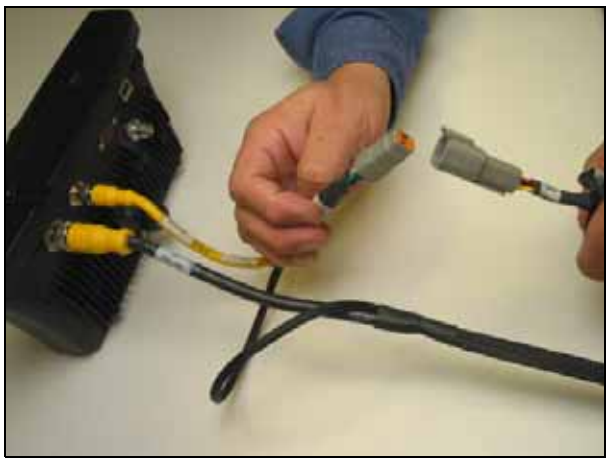
Without keypad

Connect the EZ-Guide 500-to-radio cable to the serial port on the back of the lightbar.



Step 3

Connect the 4-pin Deutsch DTM connector on the EZ-Guide 500-to-radio cable to the matching Deutsch connector on the EZ-Guide 500-to-Autopilot cable.



Step 4

Connect the large, circular antenna connector on the EZ-Guide 500-to-radio cable to the SiteNet radio.



Step 5

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



Installing the EZ-Guide 500 lightbar

Step 1

Select the location for the lightbar in the cab. The mounting location requires a bar that the RAM mount can be attached to.



Step 2

Sit in the driver's seat and hold the lightbar in the location. 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 other end of the RAM mount to the bar mount. Tighten the clamp on the RAM mount so the lightbar is held securely in place.



Step 5

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



CHAPTER

6

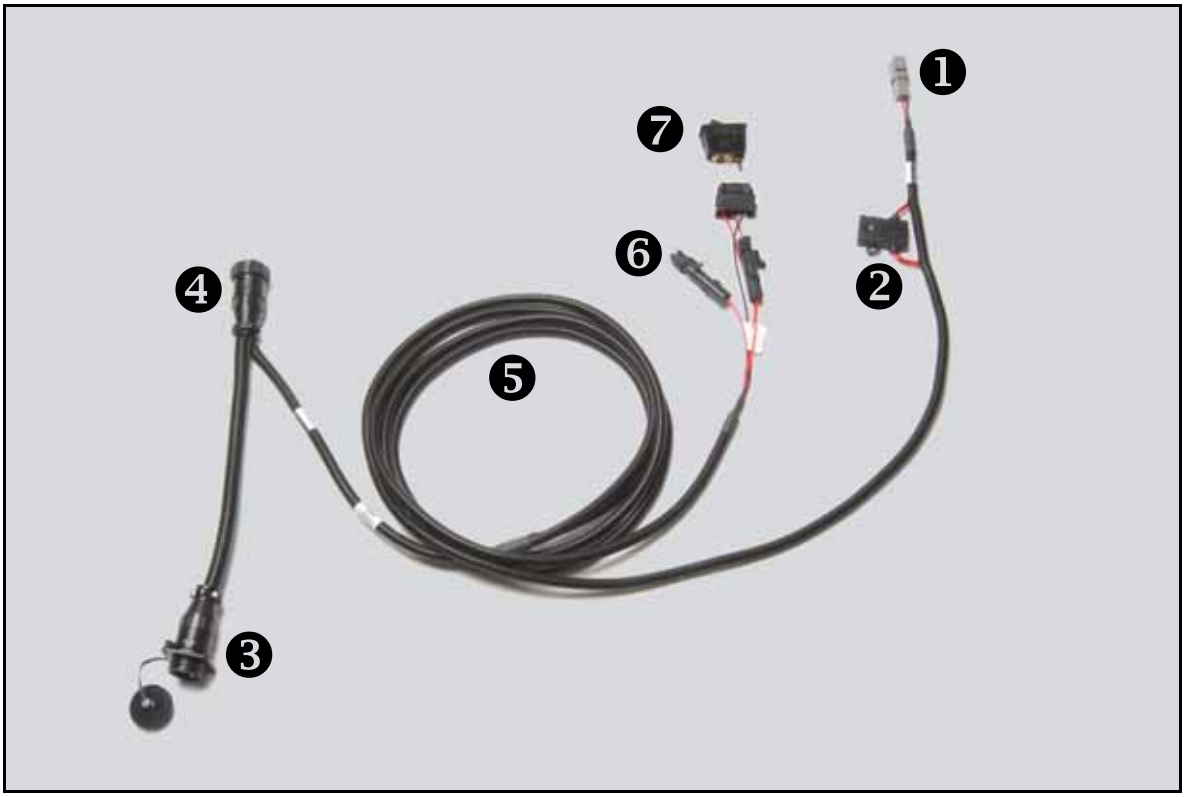
Power Harness Installation

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
❶	Controller power connection
❷	Fuse holder - Littlefuse 257010, 10 amp
❸	Extra accessory outlet
❹	Accessory jumper cable
❺	Power harness cable (P/N 54630)
❻	Switch receptacle
❼	Switch

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

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

Installing the power harness

Step 1

Locate the switches and the lowest power connector on the console.



Step 2

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



Step 3

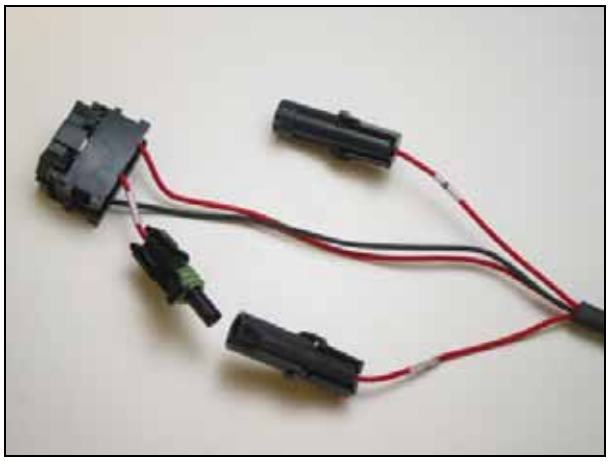
To install the switch, find and remove a blank in the console. Route the switch leads from the power cable up inside the console and pass the switch socket through the hole. Plug the switch into the socket and snap it into the hole.



Step 4

Move the switched power from the "A" lead to the "B" lead at the 1-pin WeatherPack connector.

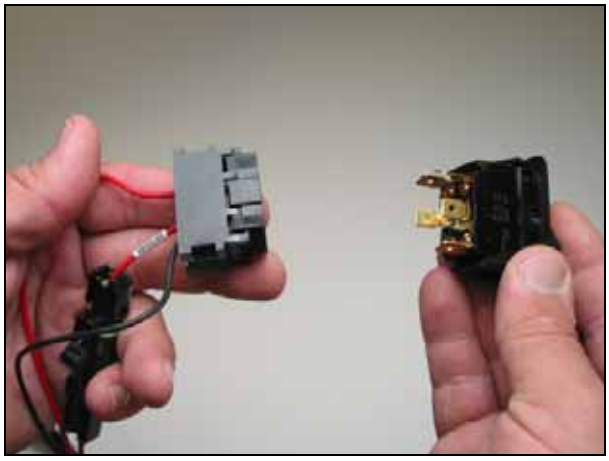
Note – *The "A" lead is battery power. The "B" lead is switched power.*



Step 5

Mate the black (ground) wire in the receptacle with pin 3 of the switch. The pins are marked on the sides of the switch.

*If the switch is properly connected, the switch will light up when you turn on the Ag*GPS *Autopilot system.*



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.

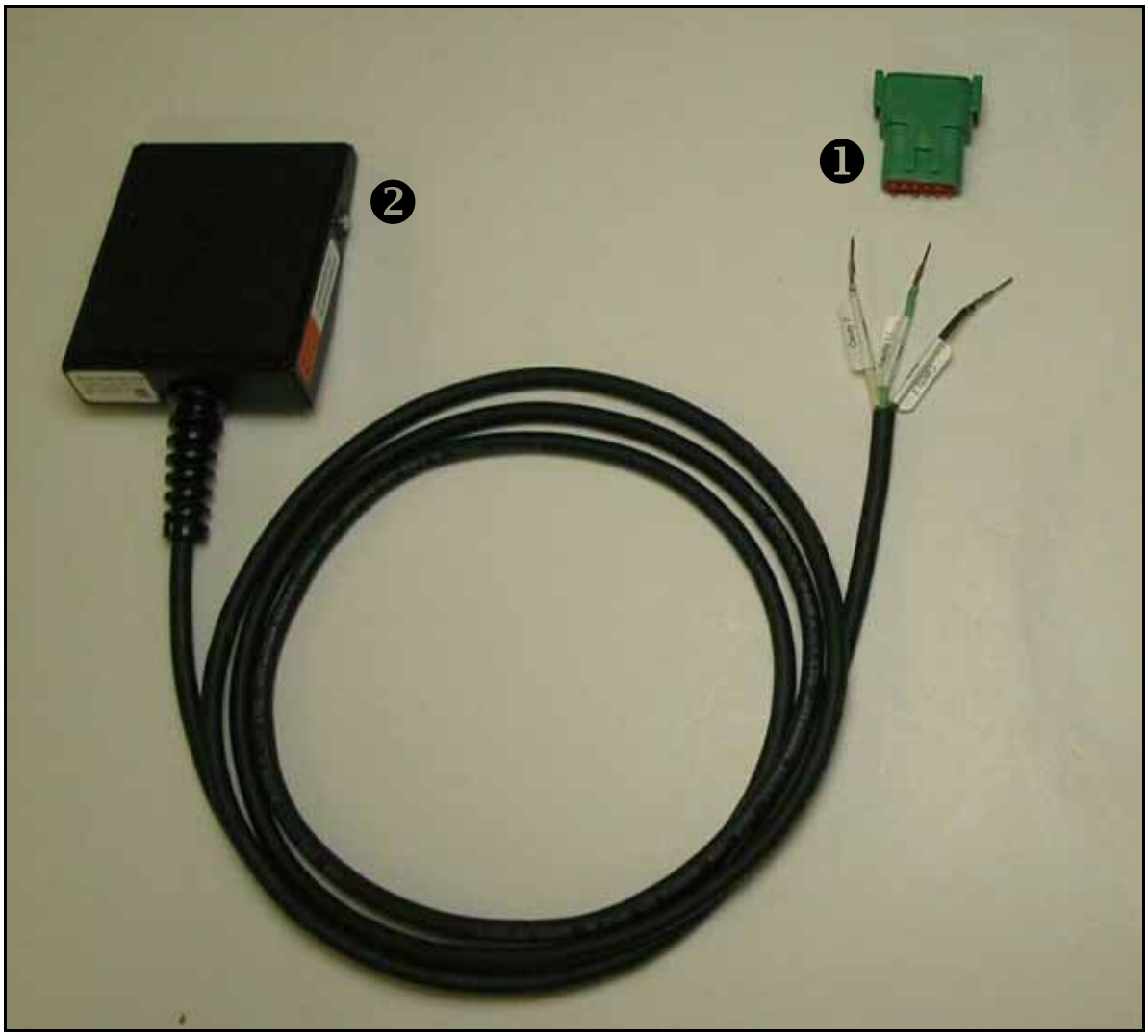
Remote engage switch components: Rocker switch



Item	Description
1	DTM receptacle
2	Remote engage rocker switch

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

Remote engage switch components: Foot switch

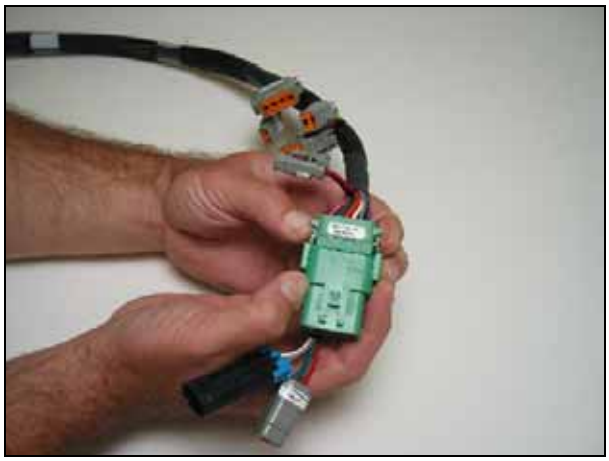


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Preparing the remote engage cable

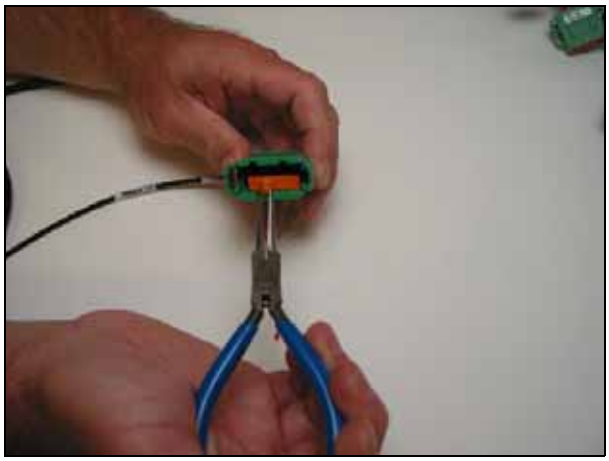
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. See Chapter 8, Controller connections.



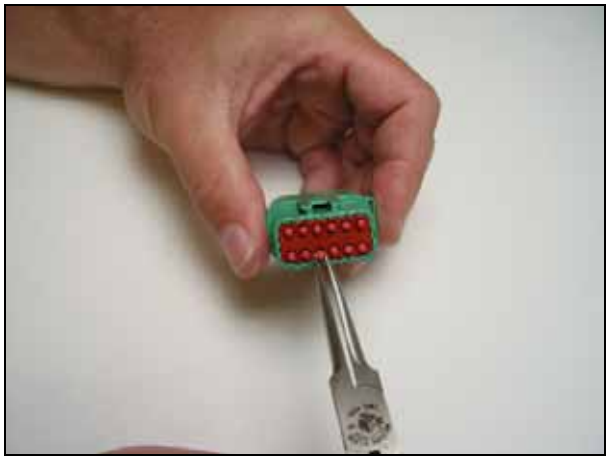
Step 2

Remove the wedge from the connector.



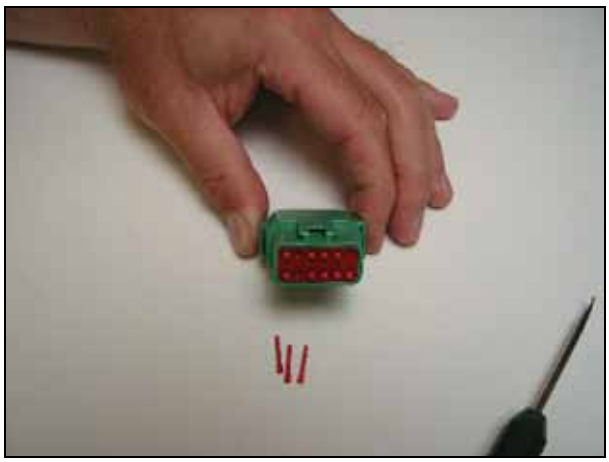
Step 3 Rocker switch only

Remove the plugs from cavity 2 and 7.



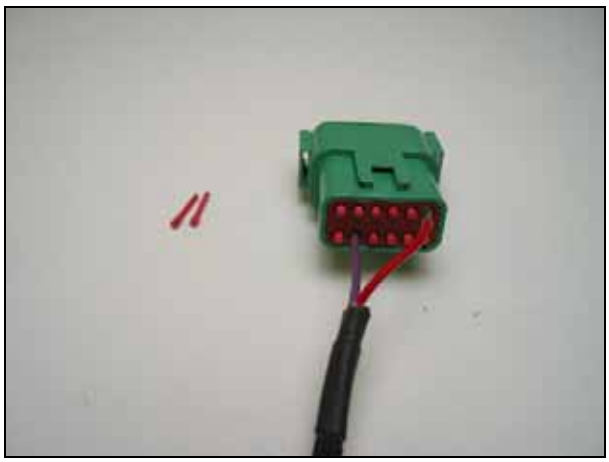
Foot Switch Only

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



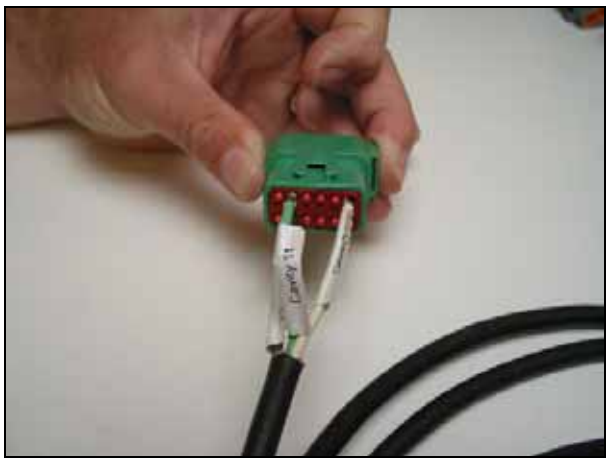
Step 4 Rocker Switch Only

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



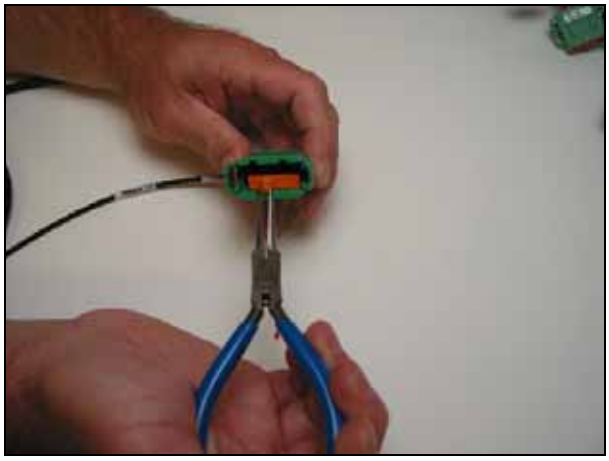
Foot Switch Only

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.



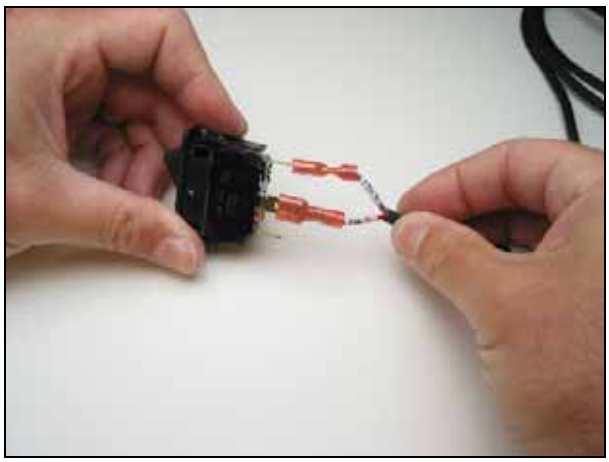
Foot Switch Only

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

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.

Installing the controller

Step 1

Mount the *Ag*GPS Autopilot controller on the floor, to the right of the driver's seat.



Step 2

Use a T-30 Torx bit to remove the bolts on the shield where the armrest harness meets the seat base.



Step 3

Remove the bolt holding the cable clip to the shield. Remove the shield and set it aside.



Step 4

Place the controller mounting plate (P/N 54828) on the floor. Ensure it is square with the seat base. Mark the two outer forward holes and the two inner aft holes.

Note – *It is very important that only the four holes pictured are used. There is a structure under the floor that will interfere with the other holes.*



Step 5

Use a 1" hole saw with a ¼" center bit to drill a 1" hole in the two layer floor mat and only a ¼" hole in the sheetmetal floor that is underneath.

CAUTION – Do not drill a 1" hole all the way through the sheetmetal.



Notice the black sheetmetal floor under the mat with only a ¼" hole in it.

Note – *Use a 5/16" drill bit to enlarge the holes so the hardware will fit through easily.*

Note – *If a second person is available to tighten the standoff bolts from underneath the cab, you can skip steps 6–11.*



Step 6

Peel both floor mats up to expose the entire right half of the cab floor.



Step 7

Locate the access panel on the floor.



Step 8

Use a T-30 Torx bit to remove the six screws in the access panel.



Step 9

Remove the panel and then set it aside.



Step 10

To install the standoffs and bolts (which are provided in the kit), reach through the access panel.



Step 11

Tighten the standoffs into place. Re-install the access panel.



Step 12

Replace the mat over the standoffs.



Step 13

Place the plate (P/N 54828) over the mat and standoffs and tighten into place.



Step 14

Place the *Ag*GPS Autopilot controller on the controller mounting plate (P/N 54828) with the connectors facing aft. Mark the area on the mat that will interfere with the connector.



Step 15

Use heavy sheers to cut away the mat so the connector will fit.



Step 16

Clamp the shield in a vise. Wrap it in a rag to protect the paint.



Step 17

Bend the shield as shown.



Step 18

Clamp the other side of the shield in the vise.



Step 19

Bend the shield as shown.



Step 20

Reinstall the newly bent shield.



Step 21

Attach the main and auxiliary cable harnesses. Use an Allen wrench to secure the connector to the *Ag*GPS Autopilot controller.

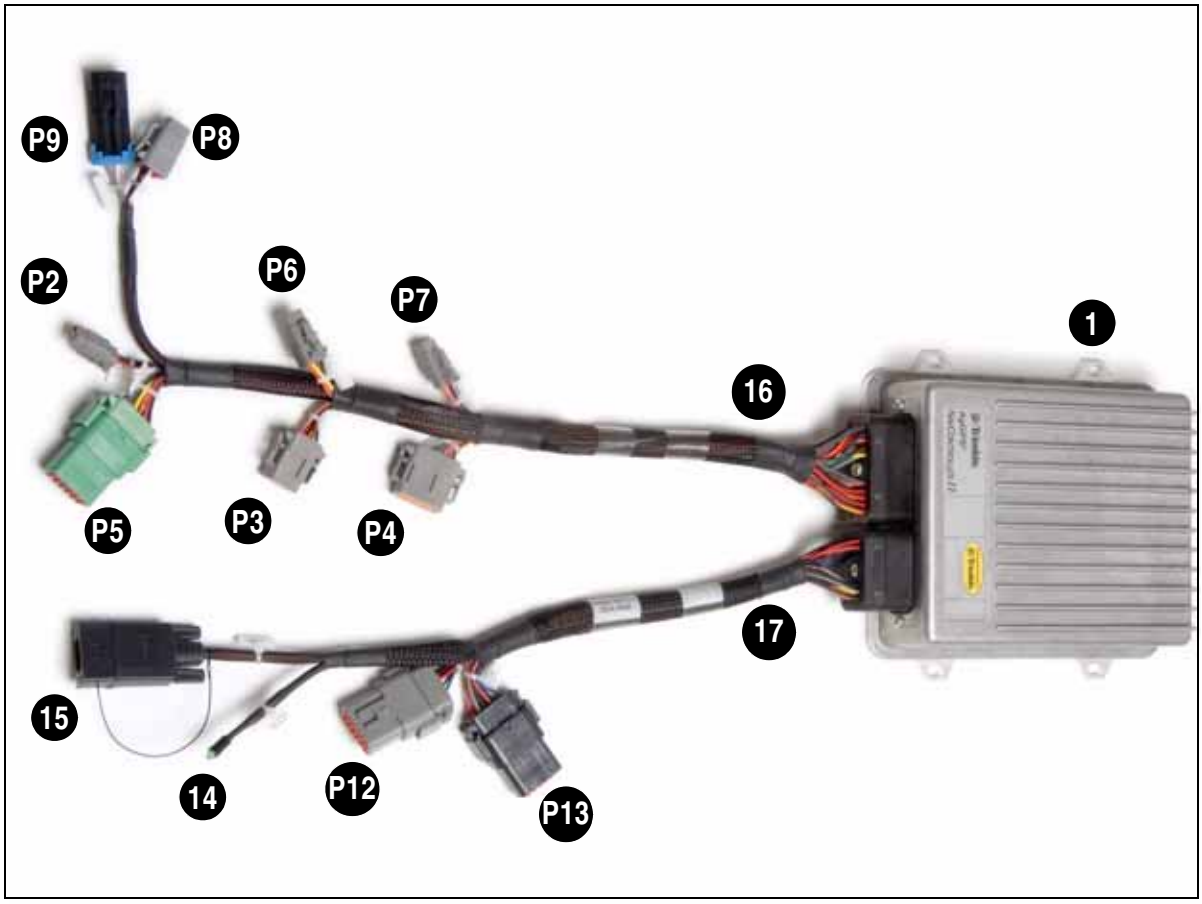


Step 22

Use the supplied hardware to attach the *Ag*GPS Autopilot controller to the plate.



Controller connections



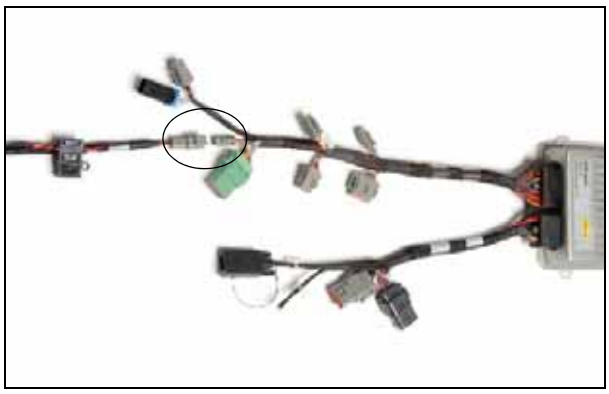
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

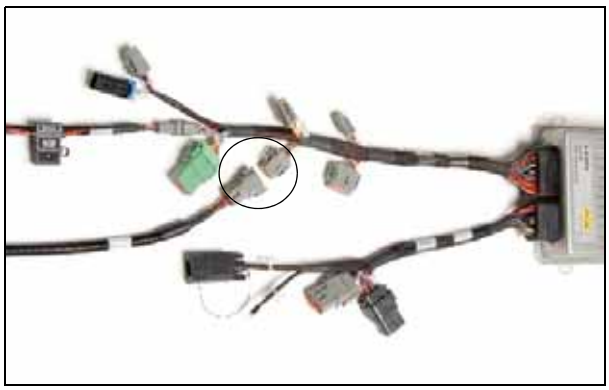
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

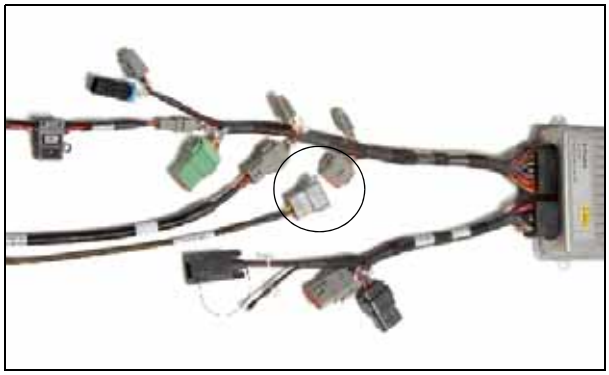
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

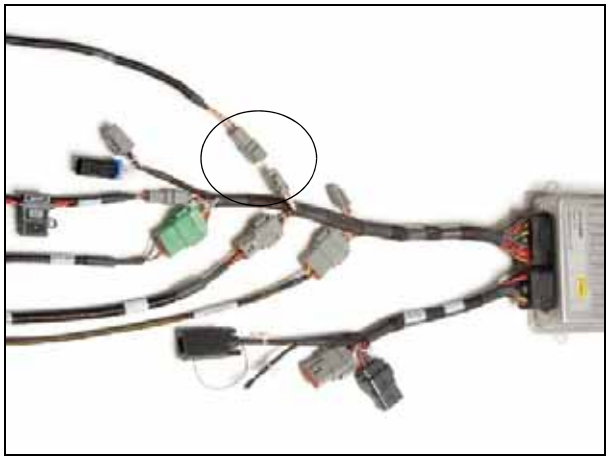
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

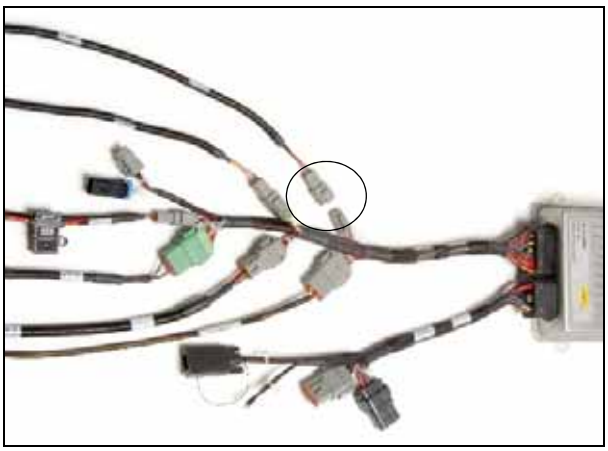
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

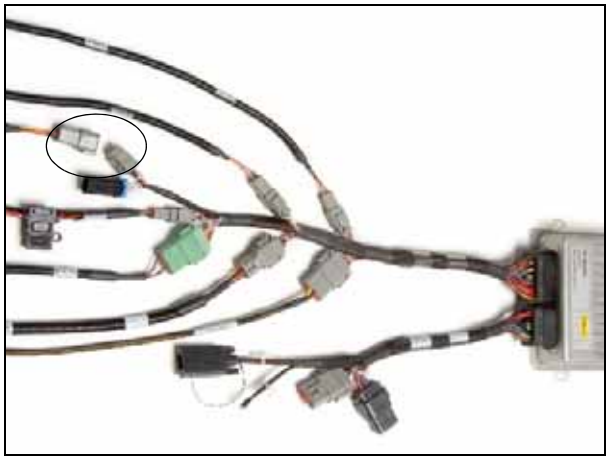
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 6

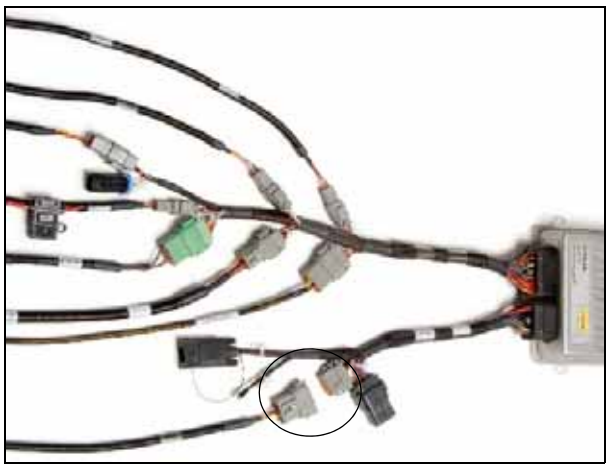
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 7

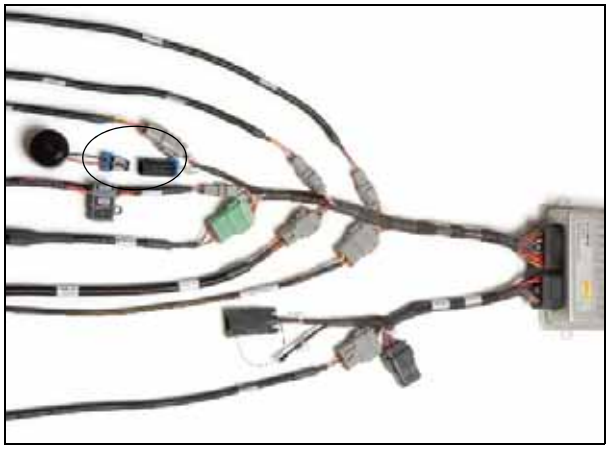
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



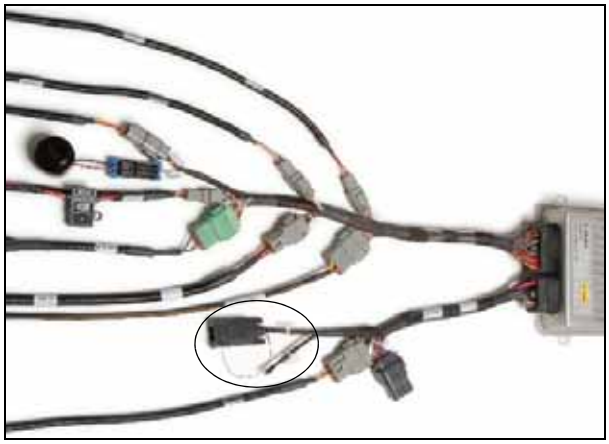
Step 8

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.