*Ag*GPS® Autopilot™ Automated Steering System

Installation Instructions

Case IH

- **7210 MFD MX Magnum**
- **7220 MFD MX Magnum**
- **7230 MFD MX Magnum**
- **7240 MFD MX Magnum**
- **7250 MFD MX Magnum**

Version 3.00
Revision B
Part Number 54035-23-ENG



June 2006

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:
Trimble Europe BV
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

EZ-Guide SL *Ag*GPS 114 manual guide system

Retain	Remove
*Ag*GPS 21A lightbar	Lightbar cable (P/N 35204)
*Ag*GPS 114 antenna/receiver	**NOTE**: *Replace with lightbar only cable from conversion kit.*
	*Ag*GPS 114 receiver cable (P/N 40947)
	NOTE: *Replace with cable (P/N 47045) from conversion kit. Extension cable available as accessory.*
	Remote keypad

*Ag*GPS 124 or *Ag*GPS 132 PSO system

Retain	Remove
*Ag*GPS 21A lightbar	Lightbar to receiver cable
Antenna for *Ag*GPS 124 or 132 receiver	**NOTE**: *Replace with lightbar only cable from conversion kit.*
*Ag*GPS 124 or 132 receiver	Remote keypad
Antenna to receiver cable	

*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	

Required Components

Kits required	Special tools
Platform kit: P/N 54035-23	5/8" hole saw
Hydraulic hose kit: P/N 59148	Open end wrench set (metric and SAE)
Roof bracket kit: P/N 53676	Allen wrench set (metric and SAE)
	5/16" drill bit

Note – *The platform kit includes a steering sensor bracket for the Mechanical Front Drive (MFD) axles only. For additional variations, see the Partners website at http://agpartners.trimble.com.*

Autopilot Hardware Organization - as Shipped

Platform kit (P/N 54035-23)	Common parts	GPS receiver	Display	Hyd. hose kit (P/N 59148)	Roof bracket kit (P/N 53676)
(2) Hydraulic valve (2) Hydraulic manifold and counterbalance (2) Transducer, flow switch (2) Manifold mounting bracket (2) Manual override cable (2) Bolt kit - hydraulics (2) Hydraulic valve cable (3) Steering angle cable (3) Steering angle sensor, mounting brackets, and hardware (6) Power cable (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 mounting bracket kit (supplied separately)	(5) Lightbar (5) *Ag*GPS 170 (5) *Ag*GPS 170 cable (5) *Ag*GPS 170 mounting bracket (5) *Ag*GPS 50 lightbar (5) *Ag*GPS 150 lightbar	(2) Hyd. hoses (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)	Steering sensor (3)	GPS receiver (4)	Display (5)	Power (6)	Controller (8)
• Hydraulic valve, manifold, flow switch, manifold mounting bracket • Hydraulic valve cable • Manual override cable	• Steering angle sensor assembly, mounting brackets, and hardware • Steering angle cable	• GPS receiver • GPS antenna • GPS receiver mounting bracket • GPS receiver power/data cable • Roof brackets	• Lightbar • *Ag*GPS 170 • Lightbar cable • *Ag*GPS 170 cable • Lightbar mounting bracket • EZ-Guide Plus	• Power cable	• Controller • 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

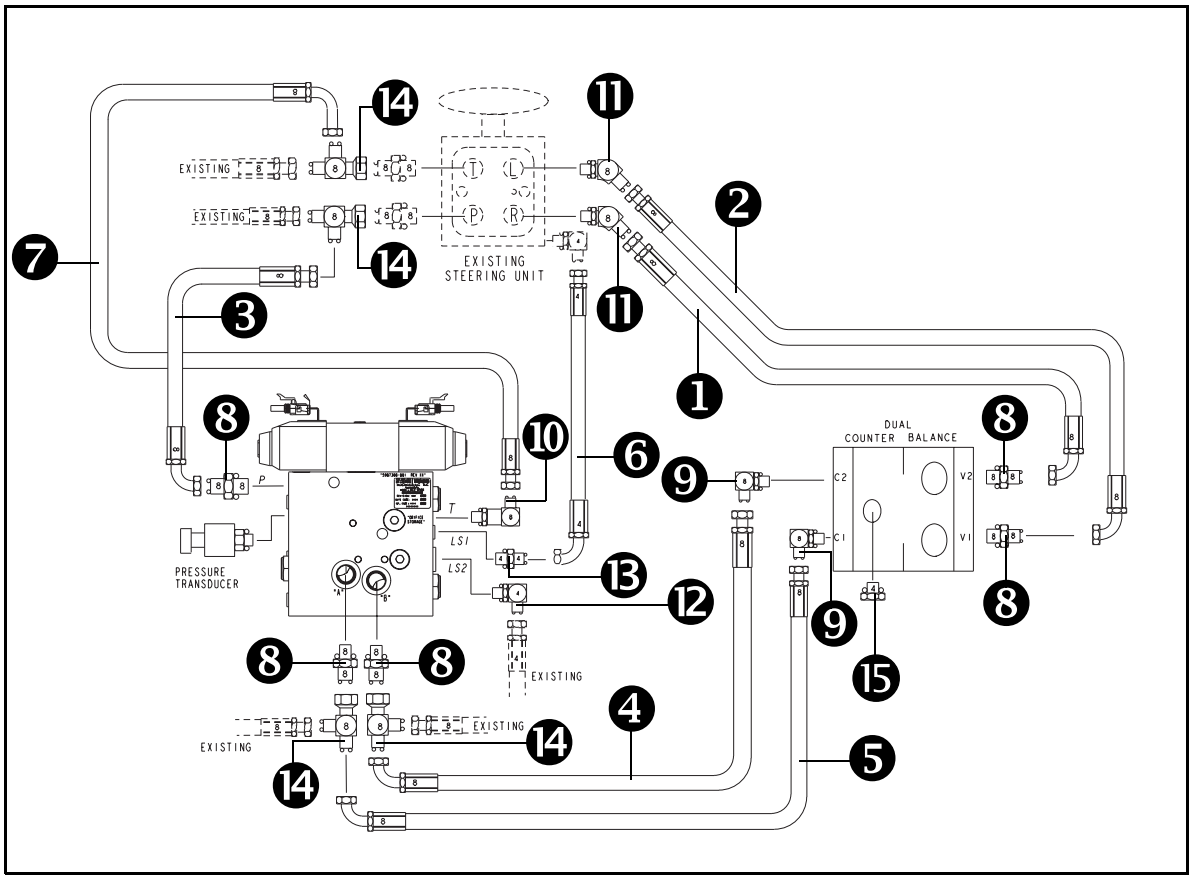
Hydraulic Control Valve Installation

In this chapter:

- Hydraulic Control Valve Components
- Prepare the Hydraulic Control Valve and Counterbalance
- Mounting the Hydraulic Manifold
- Hydraulic Hose Installation Process
- Secure the Electrical Connectors

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

Hydraulic Control Valve Components



Item	Description	Part number
❶	22" hose	451TCJSJ9-8-8-8-22
❷	22" hose	451TCJSJ9-8-8-8-22
❸	20" hose	451TCJSJ9-8-8-8-20
❹	18" hose	451TCJSJ9-8-8-8-18
❺	18" hose	451TCJSJ9-8-8-8-18
❻	18" hose	451TCJSJ9-4-4-4-18
❼	17" hose	451TCJSJ1-8-8-8-17
❽	Fitting (x5)	8 F5OLO-S

Item	Description	Part number
❾	Fitting (x2)	8 C5OLO-S
❿	Fitting	8 CC5OLO-S
⓫	Fitting (x2)	8 V5OLO-S
⓬	Fitting(x2)	4 C5OLO-S
⓭	Fitting	4 F5OLO-S
⓮	Fitting (x4)	8 R6LO-S
⓯	Fitting	4 HP5ON

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

Prepare the Hydraulic Control Valve and Counterbalance

Note – *Place the hydraulic control valve on a clean work surface.*

Step 1

Locate the manifold, pilot-to-shift cartridge, and pressure compensation cartridge.

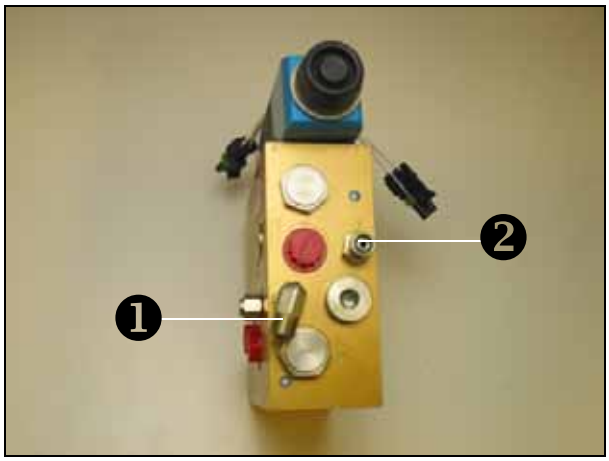


Step 2

Install the following fittings in the ports as shown:

❶ -4 ORFS 90 in LS2 port

❷ -4 ORFS straight in LS1 port



Step 3

Locate the pilot-to-shift cartridge (PTS) with "PTS3-10-0-160" stamped on the head.



Step 4

Remove the -10 ORB plug from the port above the “PTS” label.

Note – *To make removal easier, tap the plug with a ball peen hammer several times.*



Step 5

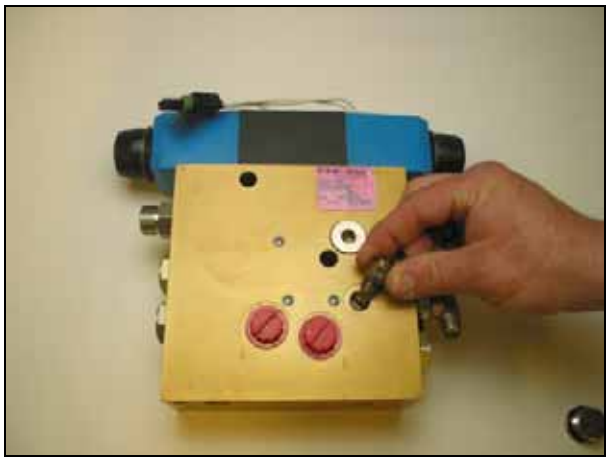
Insert the pilot-to-shift cartridge in the cavity as shown. The cartridge should match the cavity dimensions.

The o-rings and backup rings must be clean and in place to seal the cavity correctly.



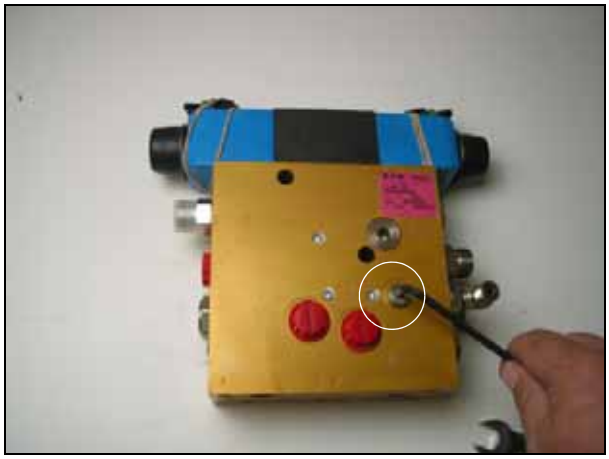
Step 6

If installed, remove the check valve from the LS line.



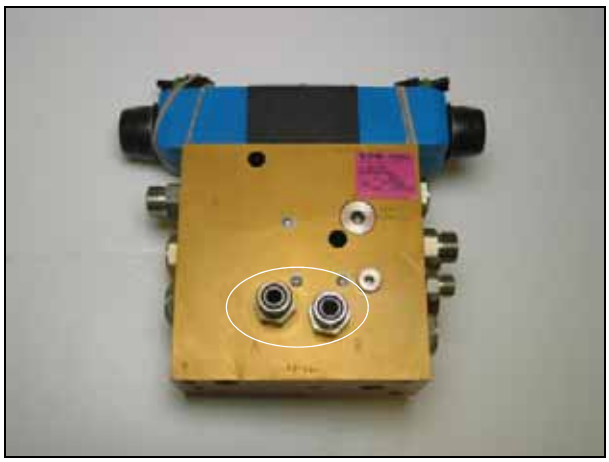
Step 7

Install a -4 O-ring boss plug in place of the check valve.



Step 8

Install two -8 ORFS straight fittings in the A and B ports.



Step 9

Install a -8 ORFS straight fitting in the P port.



Step 10

Locate the pressure compensation port plug. The head is labeled "C 10-3S" or "2186484".



Step 11

Remove the plastic plug from the P-COMP port.



Step 12

Install the P-Comp cartridge plug.

Note – *The o-rings and backup rings must be clean and in place to seal the cavity correctly.*



Step 13

Install the pressure transducer in the PX port.

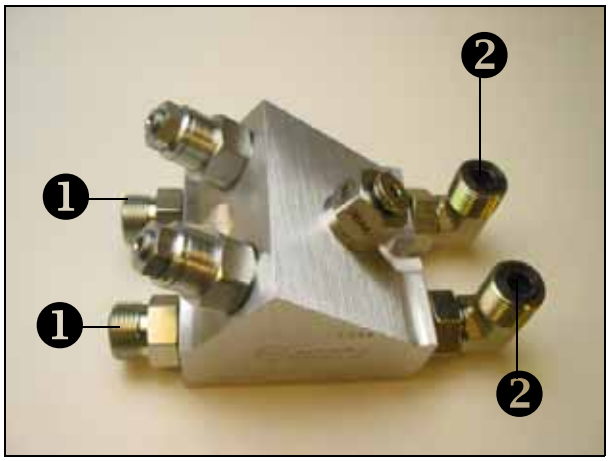


Step 14

Install the following fittings in the counterbalance valve:

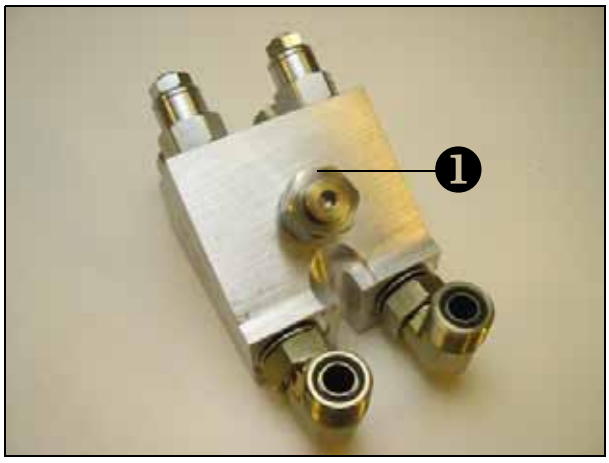
❶ Two -8 ORFS straight fittings to the V1 and V2 ports.

❷ Two -8 ORFS 90 fittings to the C1 and C2 ports.



Step 15

If required, install a -4 ORB plug ❶ into the shuttle port at the center of the block.



Mounting the Hydraulic Manifold

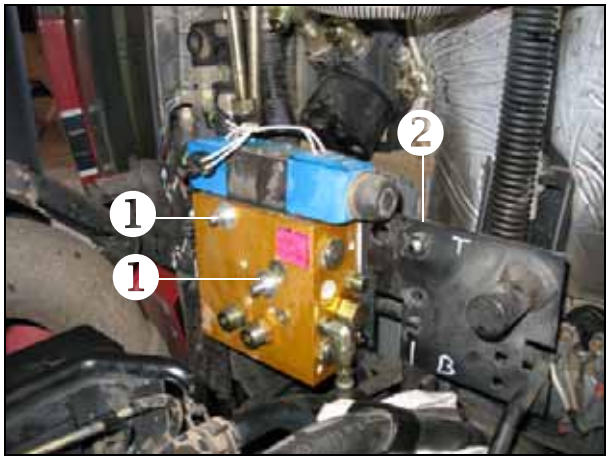
Step 1

The manifold is mounted under the hood in front of the cab.



Step 2

Clamp the manifold to the bulkhead and match drill the 3/8" through holes ❶. Position the top edge of the gold manifold even with the top of the bulkhead ❷ and centered.



Step 3

Use 3/8" by 3½" long cap screws and hardware provided to install the manifold to the bulkhead, as shown.



Step 4

Locate the counterbalance manifold, forward of the manifold.



Step 5

Clamp the counterbalance to the structure, as shown. Match drill two 5/16" holes.



Step 6

Use ¼" by 2¼" long screws and hardware provided to install the counterbalance valve. The C1 and C2 ports face to the right of the vehicle.



Hydraulic Hose Installation Process

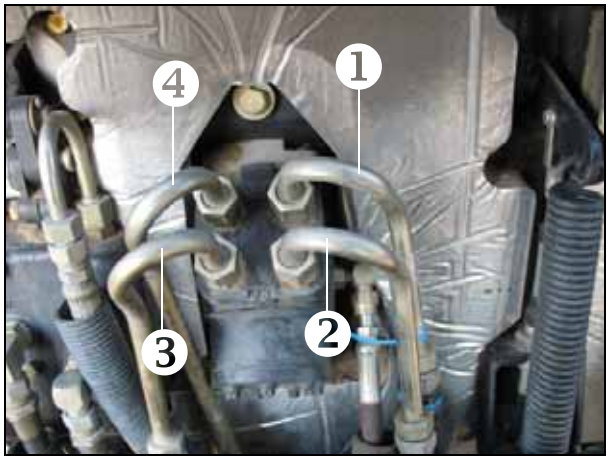
Step 1

Locate the hand pump.



Step 2

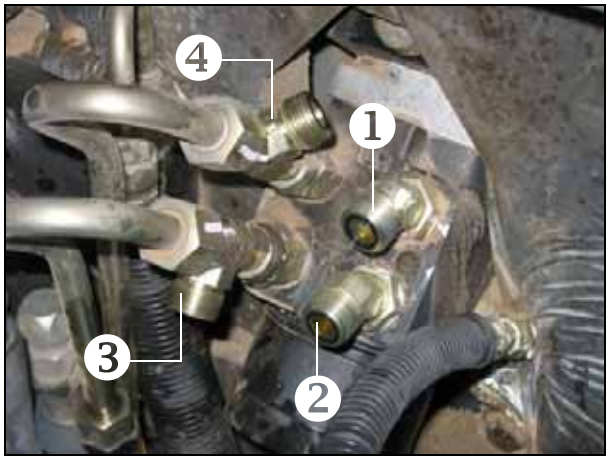
Mark and remove the lines connected to the L (left/A) and R (right/B) connections at the hand pump. Remove the steel portion of the left and right lines.



❶ Left port
❷ Right port
❸ "P" (pressure) port
❹ "T" (tank) port

Step 3

Replace the existing fittings with -8 ORFS 45 degree fittings in the left ❶ and right ❷ ports. Add -8 ORFS run tees to the P ❸ and T ❹ ports.



Step 4

Install two run tees to the *Ag*GPS Autopilot manifold A and B ports.



Step 5

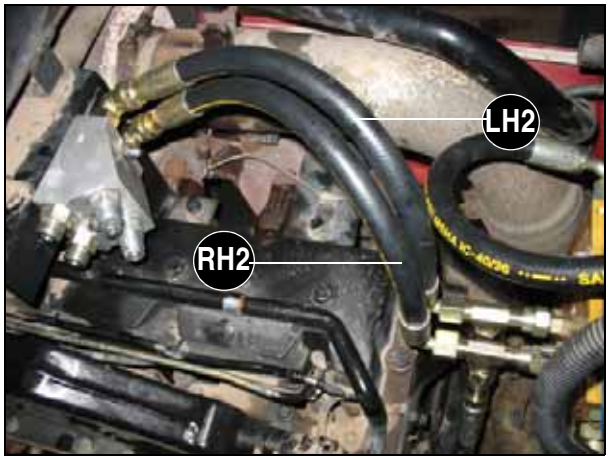
Re-route the existing left and right hoses to the *Ag*GPS Autopilot manifold. Connect the left hose to the A port run tee and the right hose to the B port tee. Discard the steel lines and route the hoses to avoid rubbing on the drive line.



Step 6

Connect the kit supplied -8 ORFS 90 end of the “R-H2” 18" hose to the B port tee at the manifold. Connect the opposite end to the C2 port on the counterbalance.

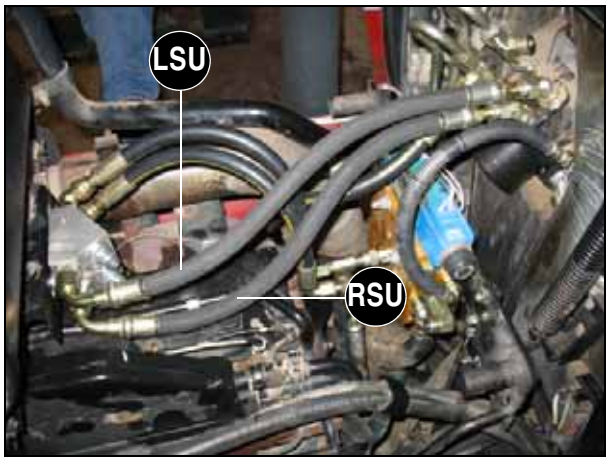
Connect the “L-H2” 18" hose from the A port at the manifold to the C1 port.



Step 7

Connect the straight end of the kit supplied “R-SU" 22” hose to the hand pump right connection and then to the V2 port at the counterbalance valve.

Connect the kit supplied “L-SU” 22” hose to the right hand pump port and to the V1 port.



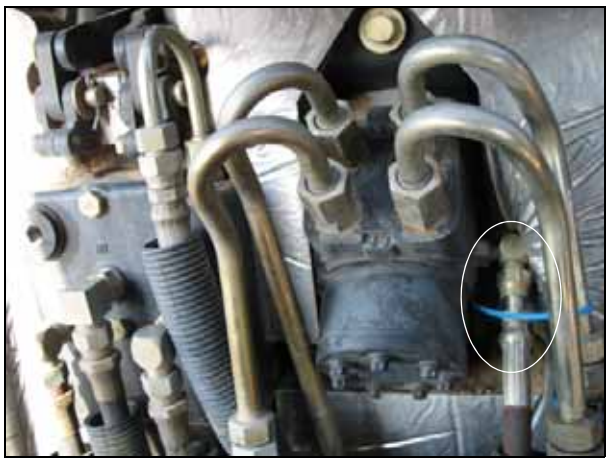
Step 8

Connect the kit supplied -8 ORFS 90 end of the pressure hose to the manifold and then to the tee at the hand pump P port ❶.



Step 9

Disconnect the load sense line at the hand pump and reroute it to the *Ag*GPS Autopilot manifold.



Step 10

Connect the existing load sense line to the LS2 port on the manifold.



Step 11

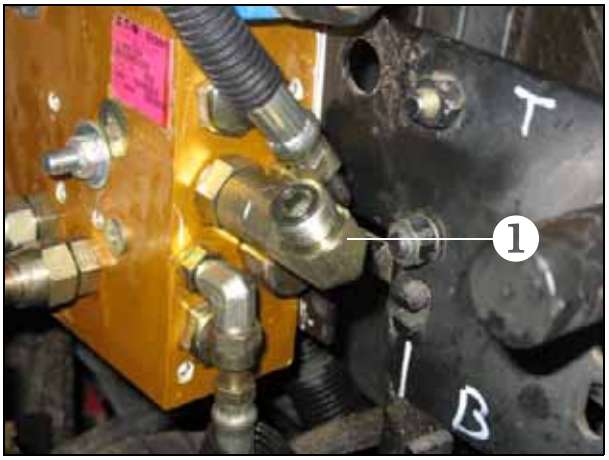
Connect the -4 ORFS swivel 90 end of the kit supplied load sense line ❶ to the LS1 port on the *Ag*GPS Autopilot manifold. Connect the other end of the hose to the hand pump where the original line was removed.



Step 12

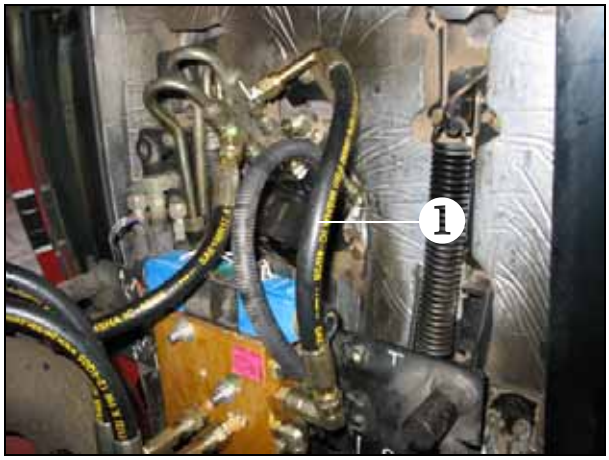
Install a -8 extension 90 fitting ❶ into the T port.

Note – *The load sense line must be installed before this fitting is inserted.*



Step 13

Connect the kit supplied -8 ORFS 90 end of the tank hose to the tee at the hand pump and then to the T port on the manifold ❶.



Secure the Electrical Connectors

Step 1

Route the steering valve and manual override cables to the manifold through the front right corner of the cab.



Step 2

Connect the manual override cable to the pressure transducer.



Step 3

Connect the valve cable to the left and right coils.



CHAPTER

3

AutoSense Device Installation

In this chapter:

- AutoSense Device Components
- Install the AutoSense Device
- Harness Preparation (P/N 54602 Rev C)

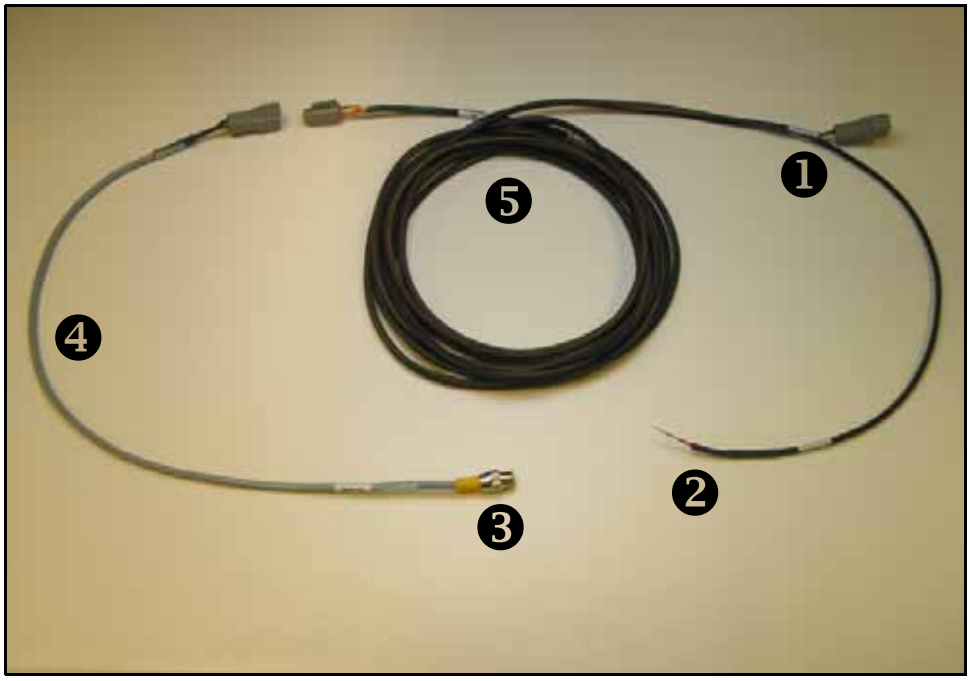
This chapter describes how to install the *Ag*GPS AutoSense™ device.

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.

For two wheel drive vehicles, you need to fabricate a bracket. 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. The connector can be pointed in any horizontal direction to reduce cable strain or obstruction.

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

AutoSense Device Components



Item	Description
1	P-6 connector
2	Power connector
3	AutoSense connector
4	Jumper cable
5	AutoSense steering cable

Install the AutoSense Device

Step 1

Locate the mounting location at the kingpin.



Step 2

Use the existing bolts to mount the bracket on the vehicle.



Step 3

Mount the AutoSense device with the connector pointing toward the rear of the vehicle.

Note – *The arrow indicates the rear of the vehicle.*



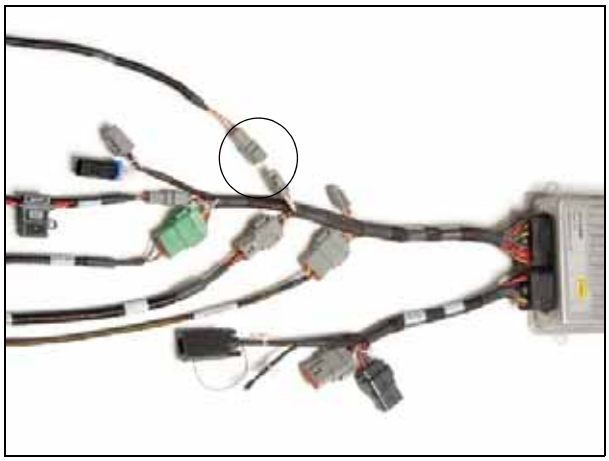
Step 4

Route the steering cable to the steering device along the tie rods and then connect it to the steering device. Leave adequate length on the service loop to avoid stretching the cable.



Step 5

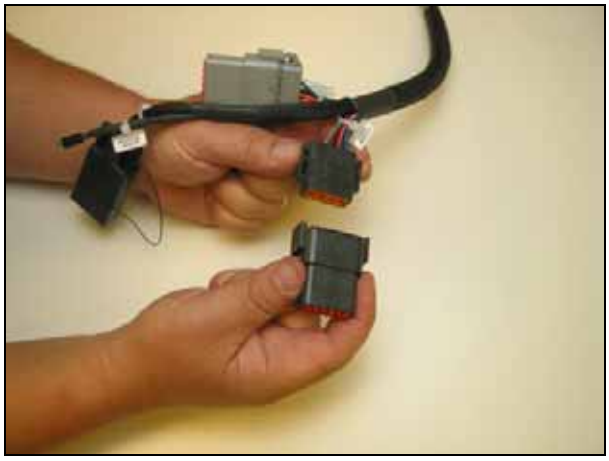
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Harness Preparation (P/N 54602 Rev C)

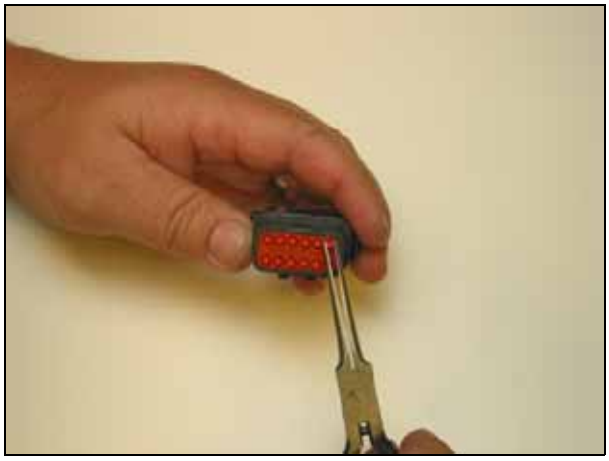
Step 1

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



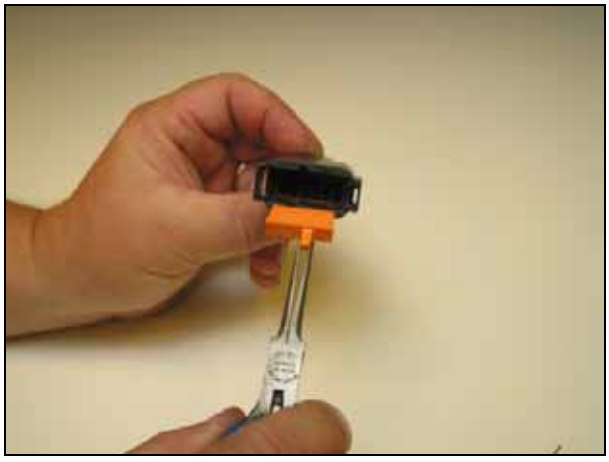
Step 2

Remove the plug from cavity number 1.



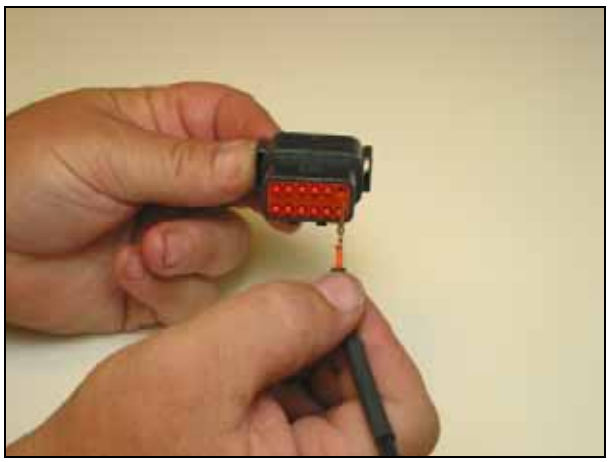
Step 3

Remove the wedge from the connector.



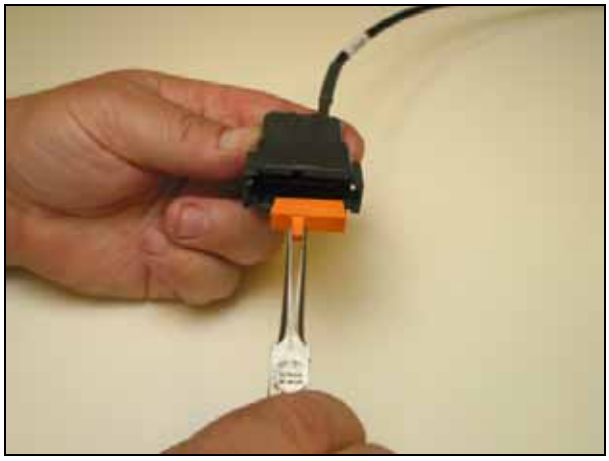
Step 4

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

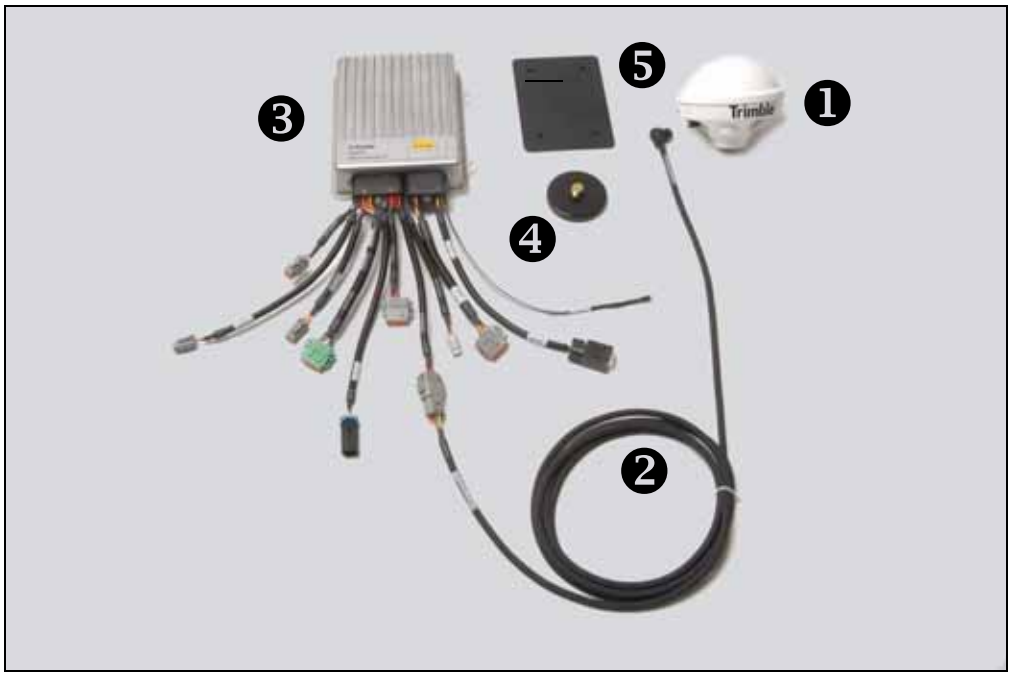
Antenna/Receiver Installation

In this chapter:

- AgGPS 114 Components
- AgGPS 132 Components
- AgGPS 114/132 Installation Process
- AgGPS 252 GPS Receiver with SiteNet Radio (If Equipped) Components
- AgGPS 252 GPS Receiver with SiteNet Radio (If Equipped) Installation Process
- AgGPS 252 GPS Receiver with AgGPS 900 Radio Module (If Equipped) Components
- AgGPS 252 GPS Receiver with AgGPS 900 Radio Module (If Equipped) Installation Process

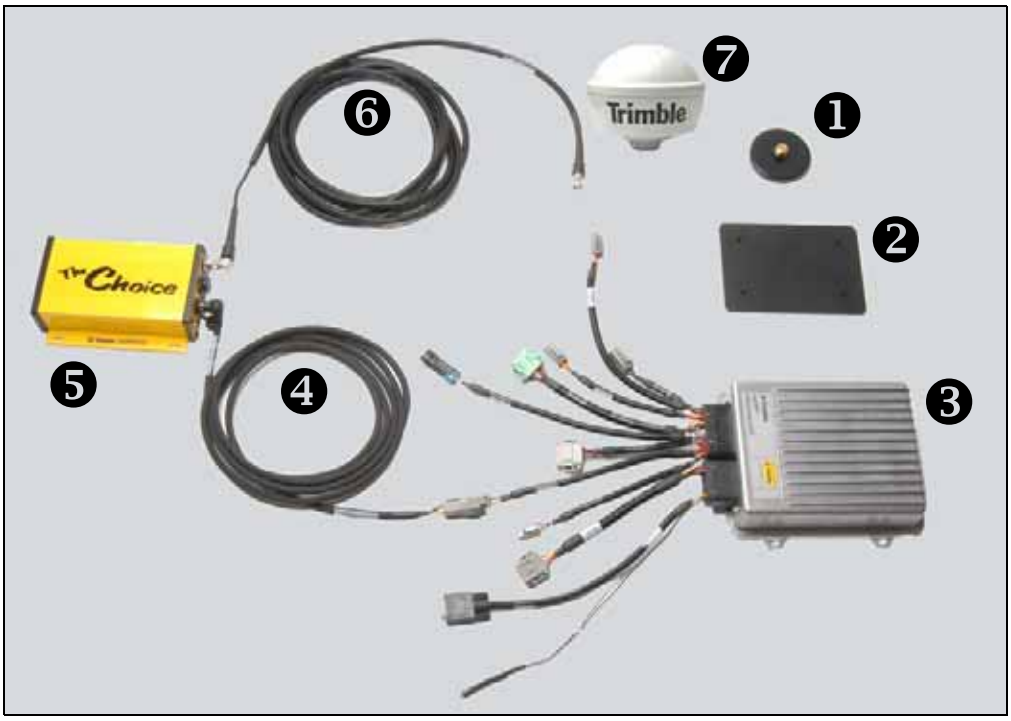
This chapter describes how to install an *Ag*GPS 114 antenna/receiver, an *Ag*GPS 132 receiver and antenna, an *Ag*GPS 252 receiver and SiteNet™ radio, or an *Ag*GPS 252 receiver and *Ag*GPS 900 radio module.

*Ag*GPS 114 Components



Item	Description
❶	*Ag*GPS 114 antenna/receiver
❷	Antenna/receiver cable
❸	Controller
❹	Magnetic mount
❺	Mount plate

*Ag*GPS 132 Components



Item	Description
❶	Magnetic mount
❷	Mount plate
❸	Controller
❹	Receiver cable
❺	*Ag*GPS 132 receiver
❻	Antenna cable
❼	*Ag*GPS 132 antenna

*Ag*GPS 114/132 Installation Process

Step 1

Measure from side to side on the cab roof. Locate and mark the center point of the cab roof. Clean the area around the center of the cab roof.



Step 2

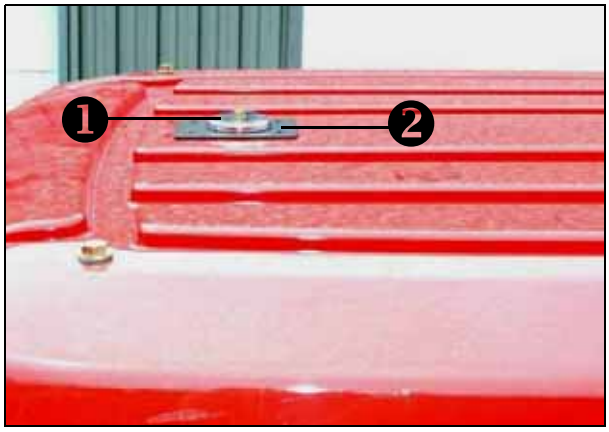
Remove the backing on the mounting plate's adhesive strips. Mount the plate on the center point mark.

Note – *The antenna may be placed in an accessible location anywhere between the front and rear of the cab. However, it must be centered left to right.*



Step 3

Attach the magnetic mount ❶ to the plate. Use the four holes ❷ in the plate as a guide for putting the mount in the center of the plate.



Step 4

Install the antenna on the magnetic mount.



Step 5 *Ag*GPS 114 Only

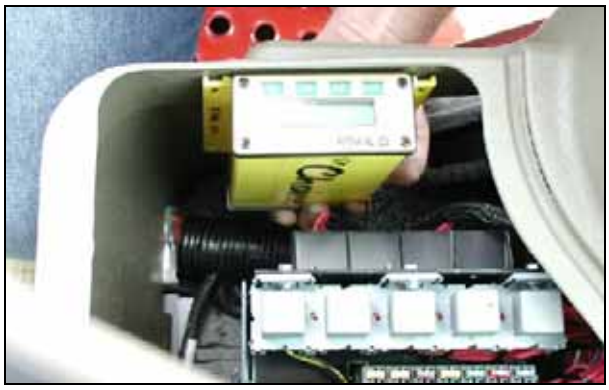
Attach the antenna/receiver cable and then route the cable toward the C post at the right rear of the cab. Secure the cable to the grab rail with ties. Route the cable into the cab through the hole in the rear window or cab floor. Route the remaining cable toward the trainer seat.



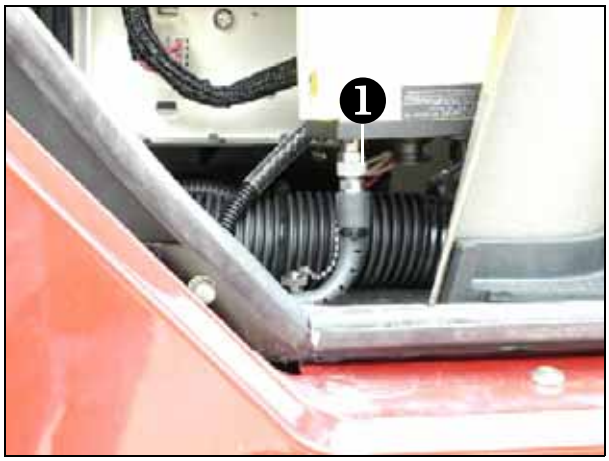
*Ag*GPS 132 Only

Attach the antenna/receiver cable and then route the cable toward the "C" post at the right rear of the cab. Secure the cable along the way. Route the cable into the cab through the hole in the rear window or cab floor. Route the remaining cable toward the trainer seat. Connections will be made later.

The *Ag*GPS 132 receiver may be mounted anywhere in the cab in a convenient location.

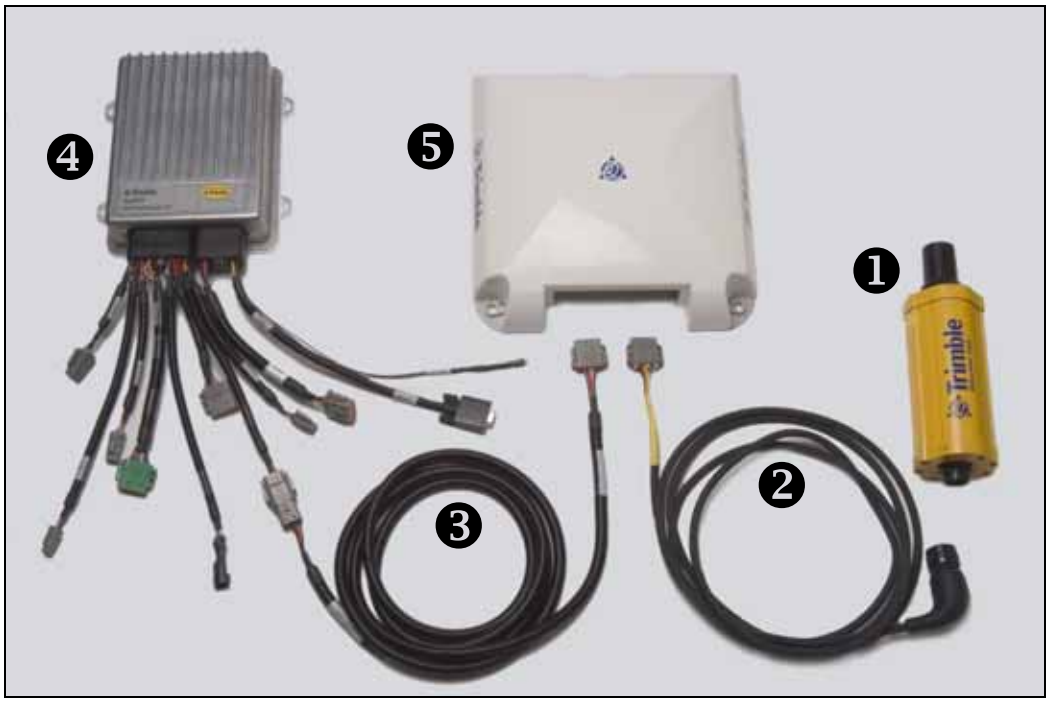


Route the antenna cable ❶ and then connect it to the receiver. Connect the controller cable to cavity "A" of the receiver. Leave the power and ground wires on the controller cable near the base of the right control console. Route the remaining cable toward the rear of the operator's seat base. The connections will be established later.



RIGHT SIDE SHOWN

*Ag*GPS 252 GPS Receiver with SiteNet Radio (If Equipped) Components



Item	Description
❶	SiteNet radio (if equipped)
❷	SiteNet radio cable (if equipped)
❸	Antenna/receiver cable
❹	Controller
❺	*Ag*GPS 252 antenna/receiver

*Ag*GPS 252 GPS Receiver with SiteNet Radio (If Equipped) Installation Process

Step 1

Place the mounting bar on a clean, level surface. Rotate the mounting bar so the four side holes ❶ are on your left.



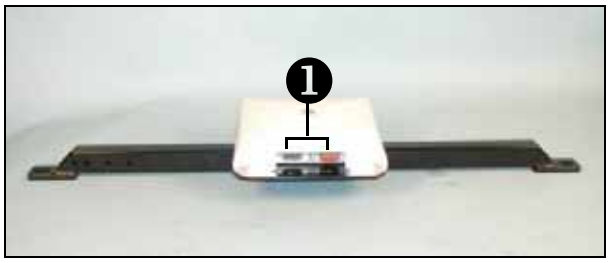
Step 2

Use the four 1/4-20 x 1/2 flat head screws ❶ to attach the receiver mounting bracket to the top of the bar. The curved edge of the mounting bracket should face you.



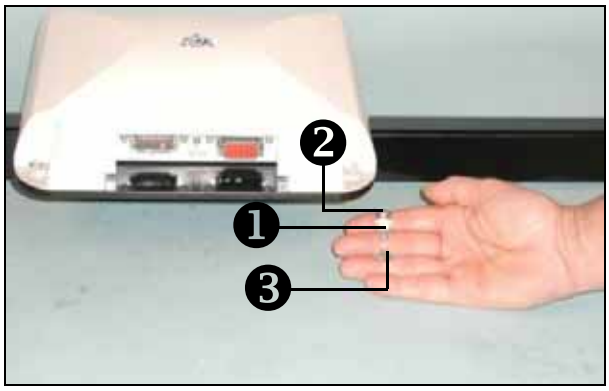
Step 3

Position the *Ag*GPS 252 receiver on the bracket with the connector cavities ❶ facing you.



Step 4

Install the nylon shoulder washers ❶, 1/4 x 7/8 hex bolts ❷, and 1/4 lock nuts ❸ through the receiver and mounting bracket.

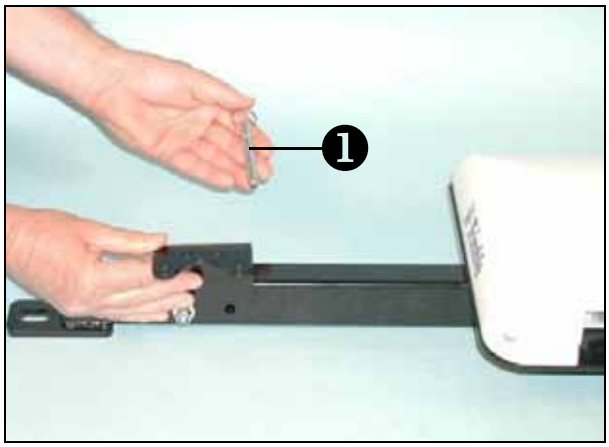


Step 5 If Equipped With SiteNet Radio

Install the SiteNet radio mount bracket. Place a flat washer onto the 3/8 x 2-1/2 hex bolt. Install the bolt through the back of the mounting bar in the third hole from your left. Install another washer. Place the radio mounting bracket on the bolt through the hole shown. Install another washer and lock nut.

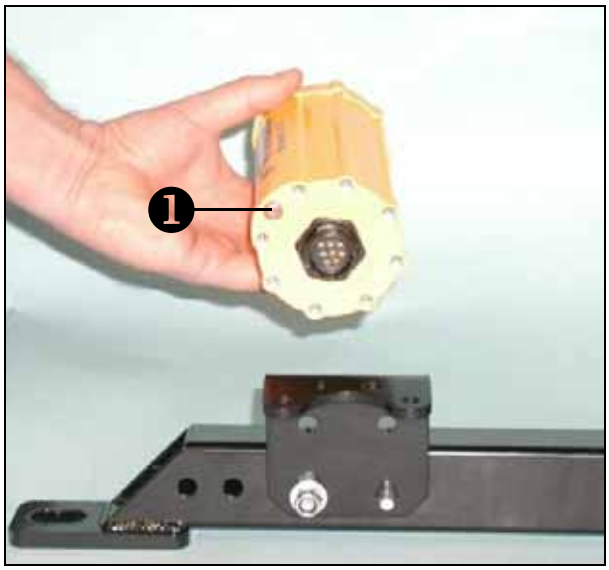


Install a ring grip retaining pin ❶ through the back side of the bracket next to the bolt.

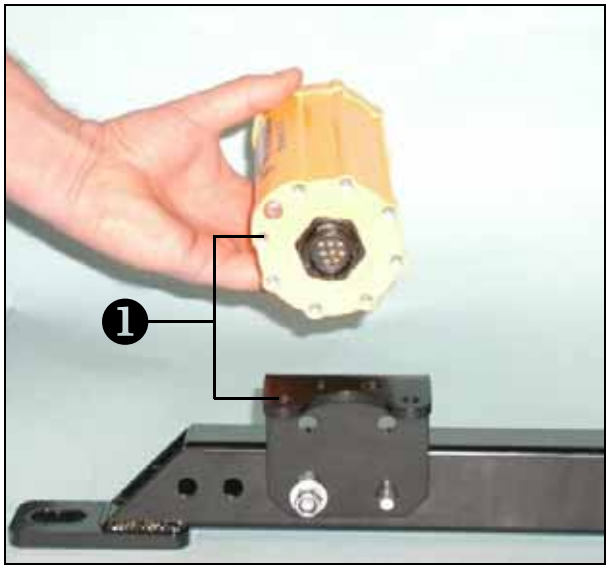


Install the radio on the mount bracket with the connector cavity underneath.

Note – *The radio must be mounted so the LED ❶ on the bottom of the radio is visible.*

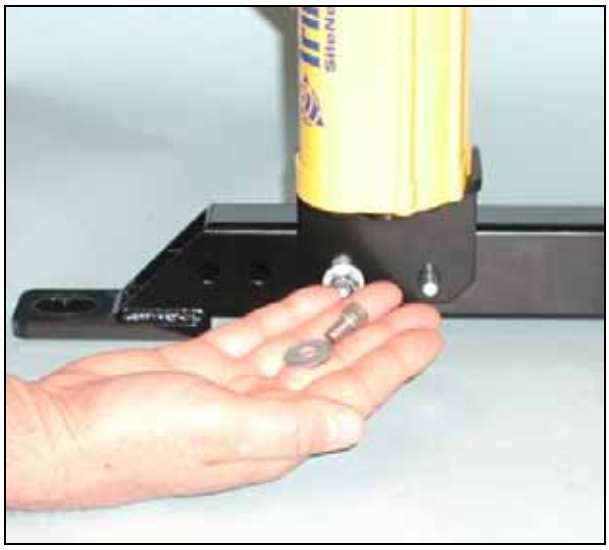


Position the radio so the LED is as close to the mounting bracket as possible without covering the LED. Align the hole on the radio with the hole on the bracket as shown ❶.



Install two 5/16 x 5/8 socket head bolts and washers into the mount bracket and radio.

Note – *Not all bolts provided for the radio will be needed.*

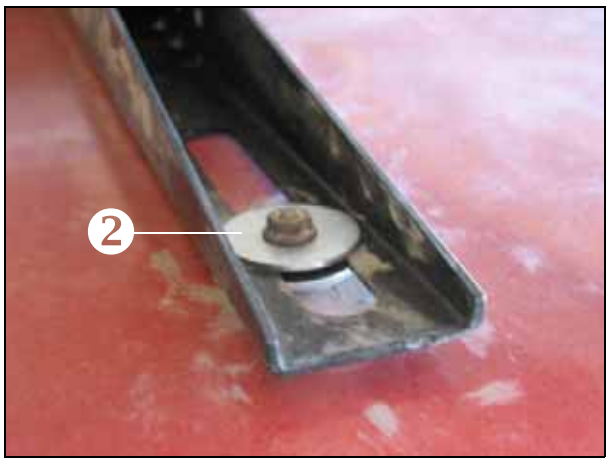


Step 6

Remove the two nuts ❶ on the cab roof. Place the roof bracket assembly over the existing studs. Re-use the existing cab studs and install nuts and washers ❷ onto the bracket. The connector cavities should face the rear of the cab.



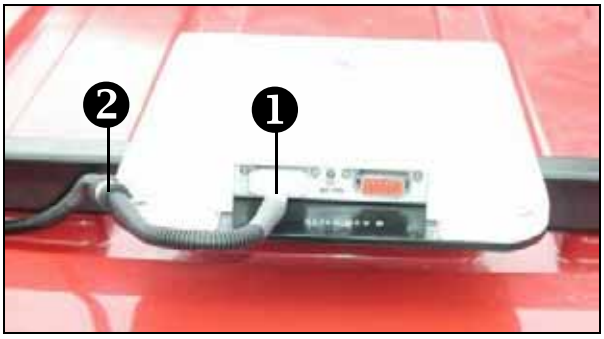
Note – *If the receiver is offset to the left or the right of the vehicle, AgGPS Autopilot system performance can be affected. Ensure that the GPS receiver and bracket are both aligned with the center of the vehicle before you tighten the cab bolts.*



Step 7

Connect the cable from the cab controller into cavity "A" ❶ of the *Ag*GPS 252 receiver. Use the existing bolt to secure the cable clamp ❷ to left side of the receiver.

Route the cable along the roof bracket, toward the right side of the cab. Place the cable along the “C” post of the cab, through the opening in the bottom of the electronics bay. Place ties along the cable to secure it.



Step 8

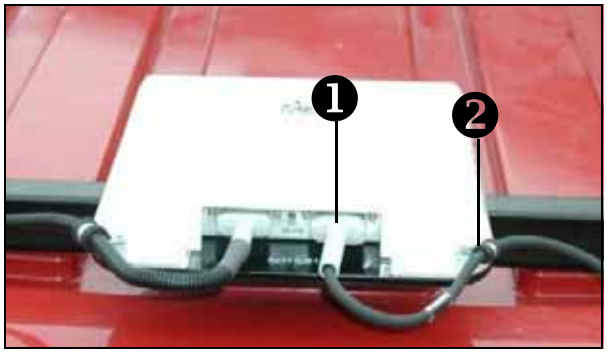
Route cable toward the front of the seat bottom. Connections will be established later.

Step 9 If Equipped With SiteNet Radio

Connect the cable to the SiteNet radio. Rotate the connector until it seats and then turn the lock ring into place.



Place the opposite connector end of the radio cable into cavity "B" ❶ of the *Ag*GPS 252 receiver. Remove the plug from cavity "B" and then install the connector. Use the existing bolt to secure the cable clamp ❷ to receiver.



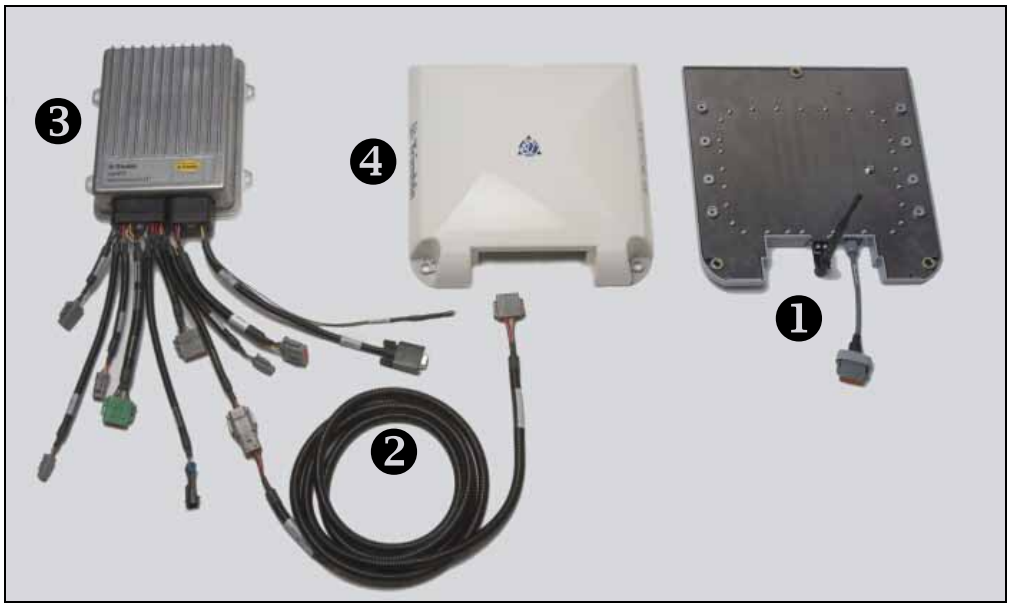
Coil the excess cable, tie it together, and secure it to the cab or roof bracket.



The radio mount bracket may be repositioned for clearance while travelling. Pull the pin on the mount bracket and then push the radio down toward the left side of the cab. Reinstall the pin through the mount brackets.



*Ag*GPS 252 GPS Receiver with AgGPS 900 Radio Module (If Equipped) Components



Item	Description
❶	*Ag*GPS 900 radio module (if equipped)
❷	Antenna/receiver cable
❸	Controller
❹	*Ag*GPS 252 antenna/receiver

*Ag*GPS 252 GPS Receiver with AgGPS 900 Radio Module (If Equipped) Installation Process

Step 1

Place the mounting bar on a clean, level surface. Rotate the mounting bar so the four side holes ❶ are on your left.



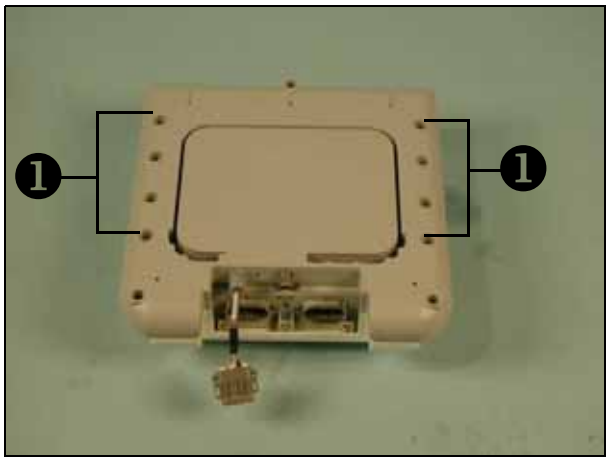
Step 2

Use the four screws ❶ to attach the receiver mounting bracket to the top of the bar. The curved edge of the mounting bracket should face you.



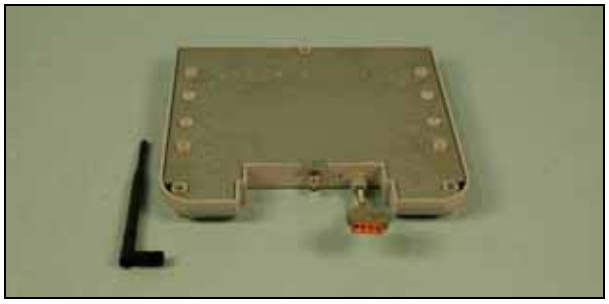
Step 3

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



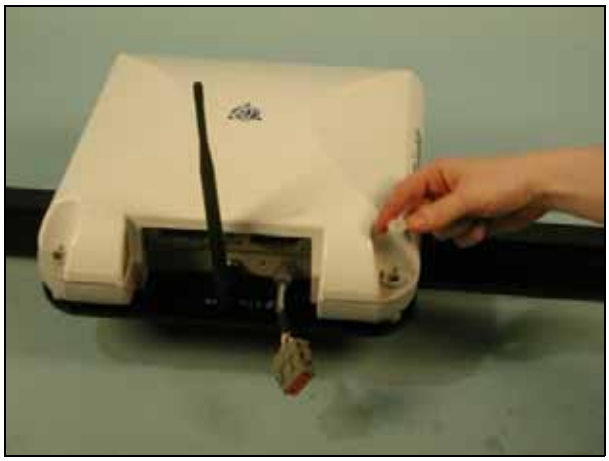
Step 4

If it is not already installed, attach the antenna to the radio module.



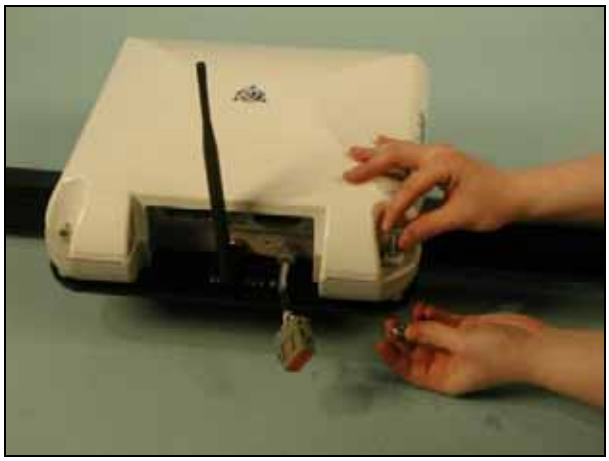
Step 5

Position the *Ag*GPS 252 receiver and radio on top of the mounting plate with the connector ports facing you. Align the three bolt holes with the receiver, radio, and mounting plate. Install the nylon bushings.



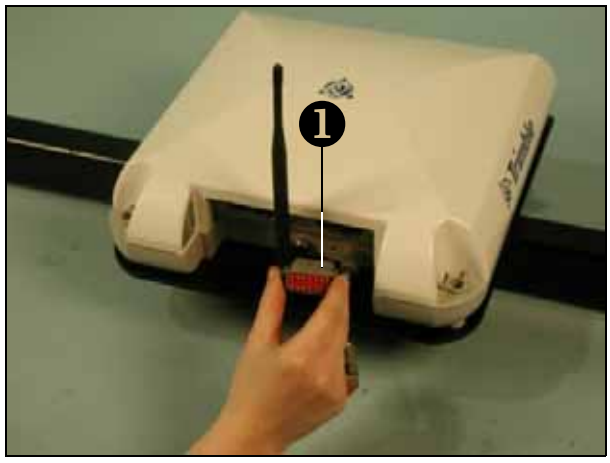
Step 6

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



Step 7

Remove the connector plug from port B ❶.



Step 8

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

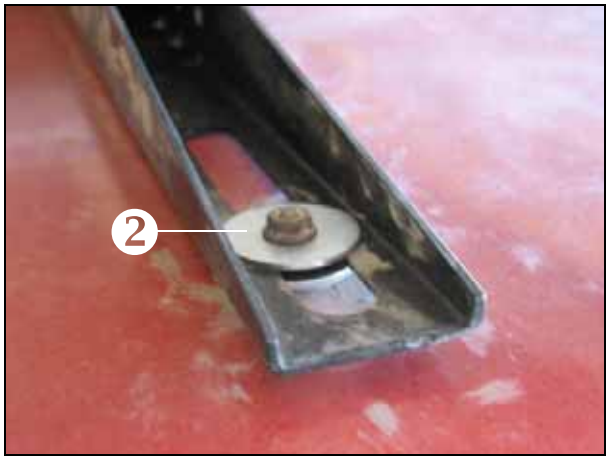


Step 9

Remove the two nuts ❶ on the cab roof. Place the roof bracket assembly over the existing studs. Re-use the existing cab studs and install nuts and fender washers ❷ onto the bracket. The connector ports should face the rear of the cab.



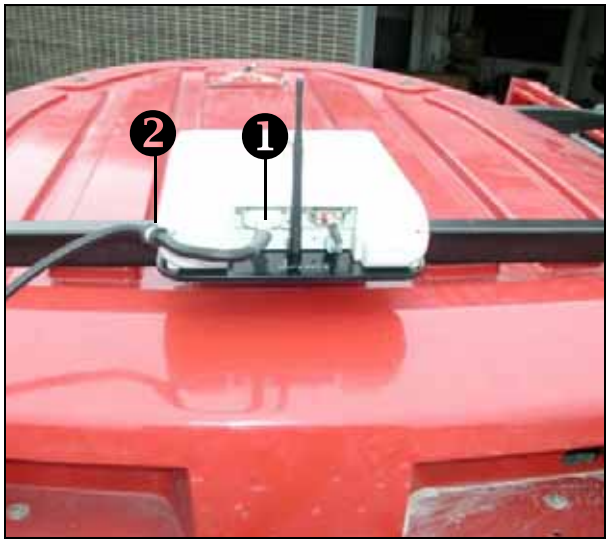
Note – *If the receiver is offset to the left or the right of the vehicle,AgGPS Autopilot system performance can be affected. Make sure that the GPS receiver and bracket are both aligned with the center of the vehicle before you tighten the cab bolts.*



Step 10

Connect the cable from the cab controller into port A ❶ of the *Ag*GPS 252 receiver. Bolt the cable clamp ❷ to left side of receiver.

Route the cable under the receiver, along the roof bracket, toward the right side of cab. Place the cable along the C post of the cab, through the opening in the bottom of the electronics console. Continue to route cable toward the front of the seat bottom behind the floor mat. Place ties along cable to secure it.



CHAPTER

5

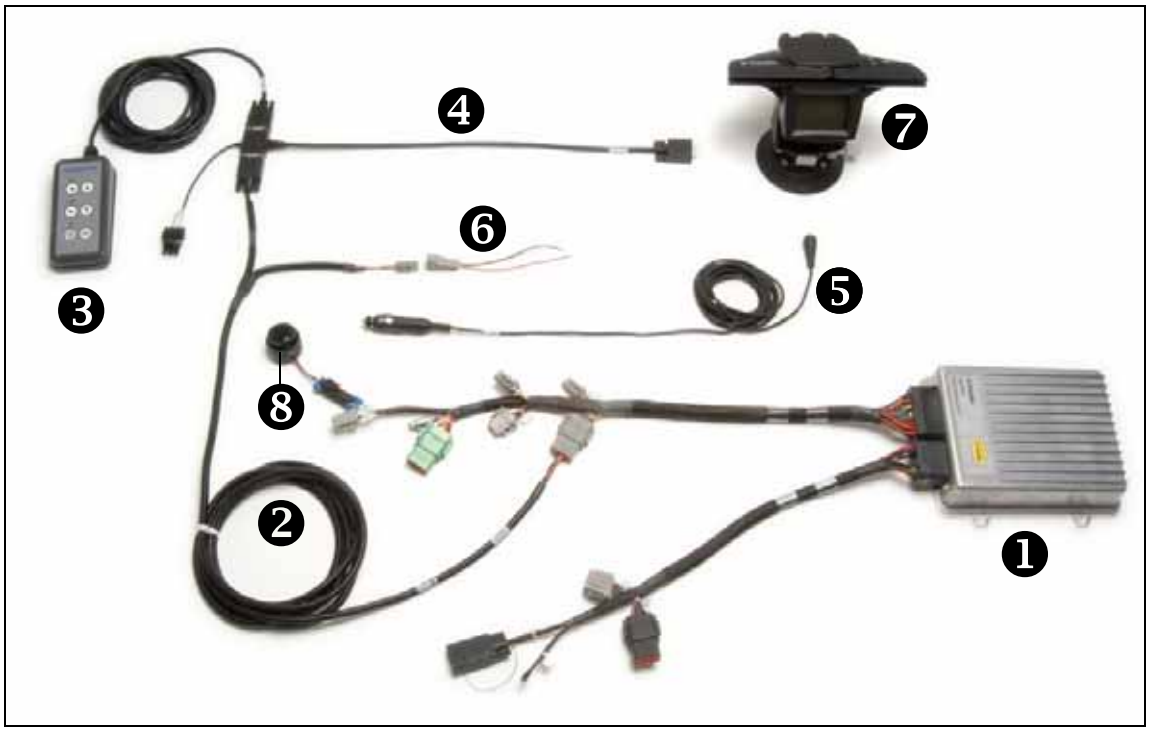
Display Installation

In this chapter:

- EZ-Guide Plus Lightbar Components
- EZ-Guide Plus Lightbar Display Installation
- Mounting the Lightbar
- AgGPS 170 Field Computer System Components
- AgGPS 170 Field Computer System Installation Process

This chapter describes and how to install and connect the EZ-Guide Plus lightbar and the *Ag*GPS 170 Field Computer in the vehicle.

EZ-Guide Plus Lightbar Components



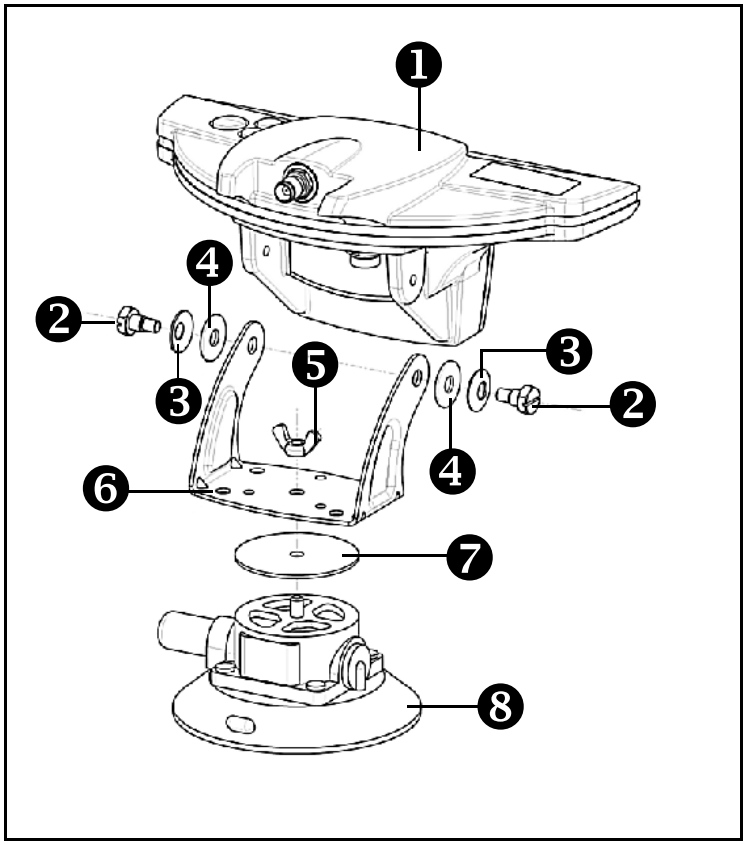
Item	Description
1	Controller
2	Display cable
3	Optional remote keypad
4	External interface cable

Item	Description
5	Power harness
6	Alternative power supply
7	EZ-Guide Plus lightbar
8	Sonalert alarm (if connected)

EZ-Guide Plus Lightbar Display Installation

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 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.

Vacuum mount installation

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

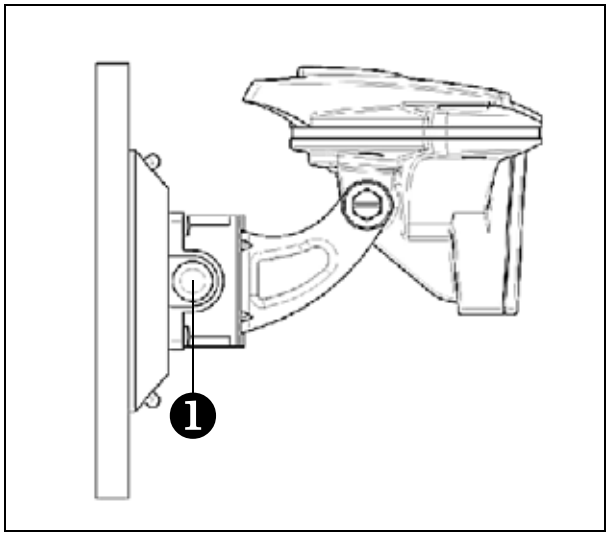
Secure the vacuum mount to the mounting bracket using the hardware provided.

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.



Mount bracket installation

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.

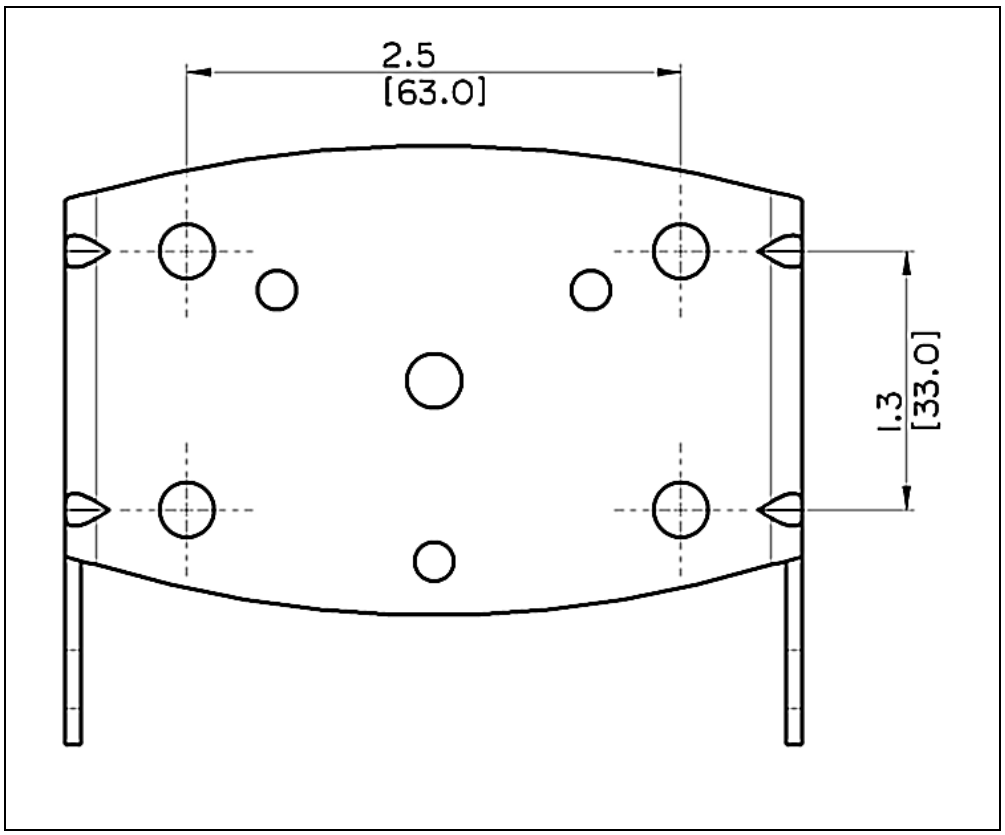


Figure 5.1 Bracket drilling template

Step 3

Screw the mount bracket to the horizontal surface.

Step 4

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

Step 5

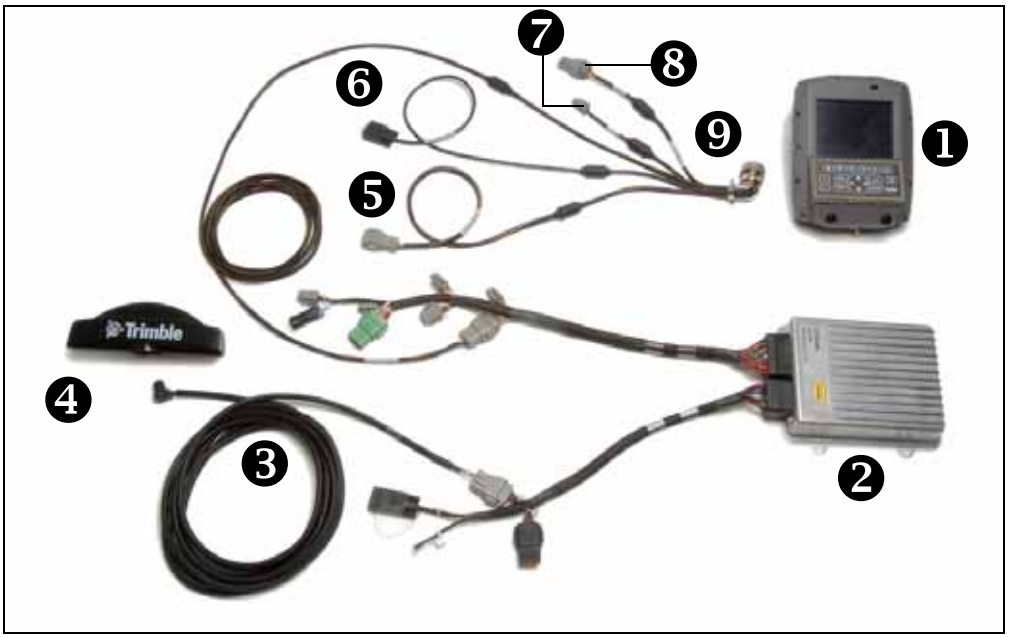
Connect the cable to the EZ-Guide Plus lightbar.

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.*

*Ag*GPS 170 Field Computer System Components



Item	Description
❶	*Ag*GPS 170 Field Computer
❷	Controller
❸	Lightbar cable (optional)
❹	Lightbar (optional)
❺	Switch + *Ag*GPS 170 alarm (not used)
❻	Com 1 serial I/O (not used)
❼	CAN (not used)
❽	*Ag*GPS 170 lightbar (not used)
❾	Display harness

*Ag*GPS 170 Field Computer System Installation Process

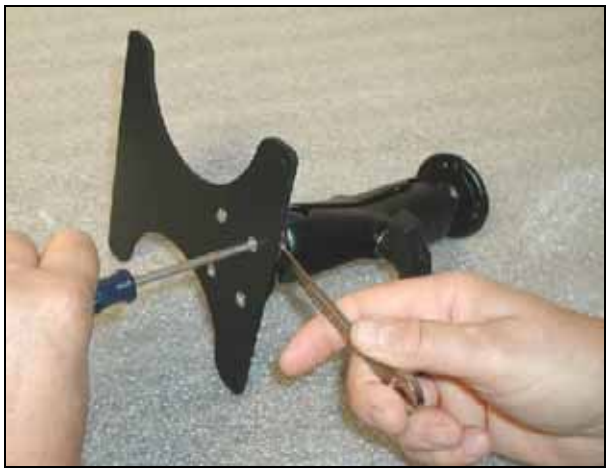
Step 1

The *Ag*GPS 170 display mounts in the cab with a bar mount ram mount. Decide where in the cab it will be mounted.



Step 2

Use the hardware provided to attach the display mounting bracket onto the ram mount.



Step 3

Place a spacer over each threaded hole on the back of the display.



Step 4

Install the display mount assembly over the spacers. Secure the mount with the hardware provided.

The mount is being secured so that, with the display facing you, the mount is on the left side. Install the display mount bracket according to where you will mount the display in the cab.



Step 5

Use the hardware provided to attach the bar clamp mount to the ram mount. The display can now be mounted in the cab.



Step 6

Connect the *Ag*GPS 170 display harness to the display. Route the cable to the controller and then connect it to the connection labeled "Display" on the main harness connection.

Note – *Do not connect the AgGPS 170 connection to the auxiliary harness connection labeled "Spare".*

Step 7

Connect the lightbar display cable to the *Ag*GPS 21A lightbar. Route the cable to the controller and connect to the connection labeled "Spare".

CHAPTER

6

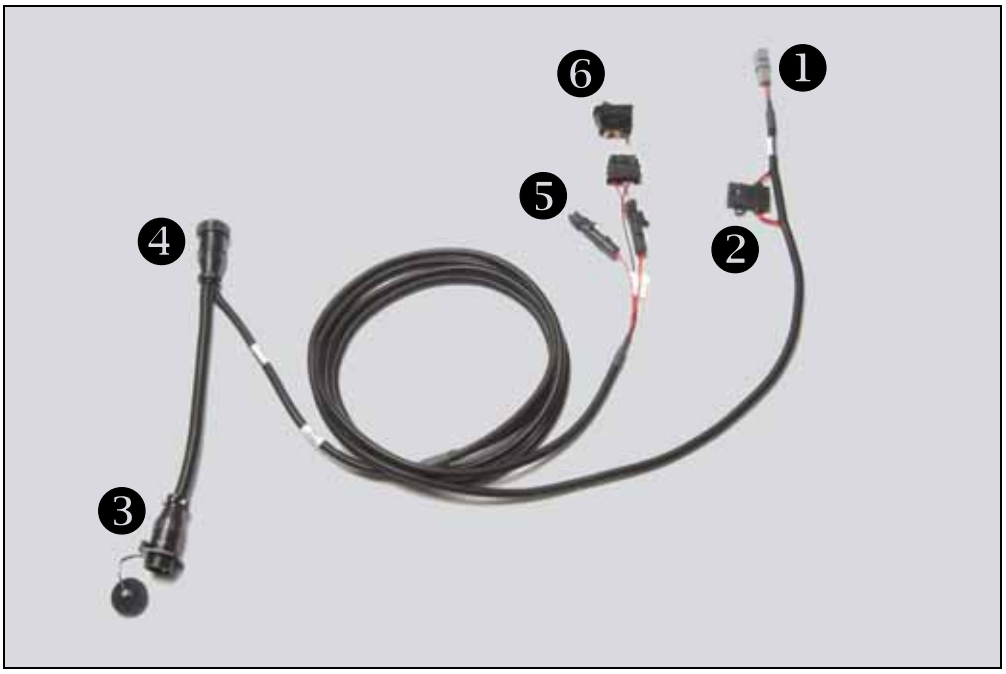
Power Harness Installation

In this chapter:

- Power Harness Components
- Power Harness Installation Process

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	Switch receptacle
❻	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.*

Power Harness Installation Process

Step 1

Locate the accessory outlet ❶ at the front right corner of the cab.



Step 2

Connect the power cable and route the cables behind the panel.

Note – *You can also install the power cable under the console by replacing the existing auxiliary connection with the same end from the power cable provided.*



Step 3

Select a power switch location.



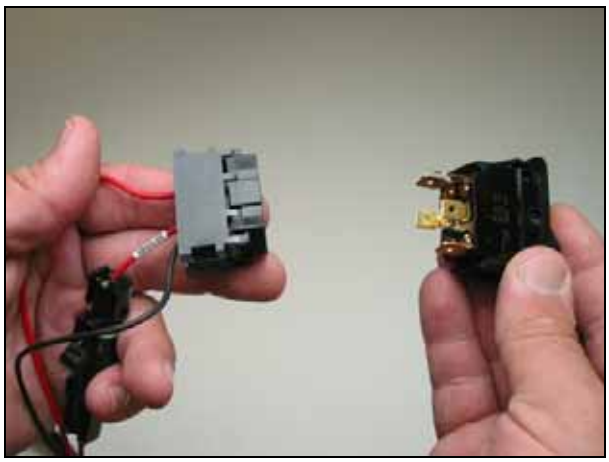
Step 4

Route the power switch receptacle to the knockout and controller leg to the controller. Remove the back foam panel to hide cabling.



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.



Step 6

Install the switch in the console.



CHAPTER

7

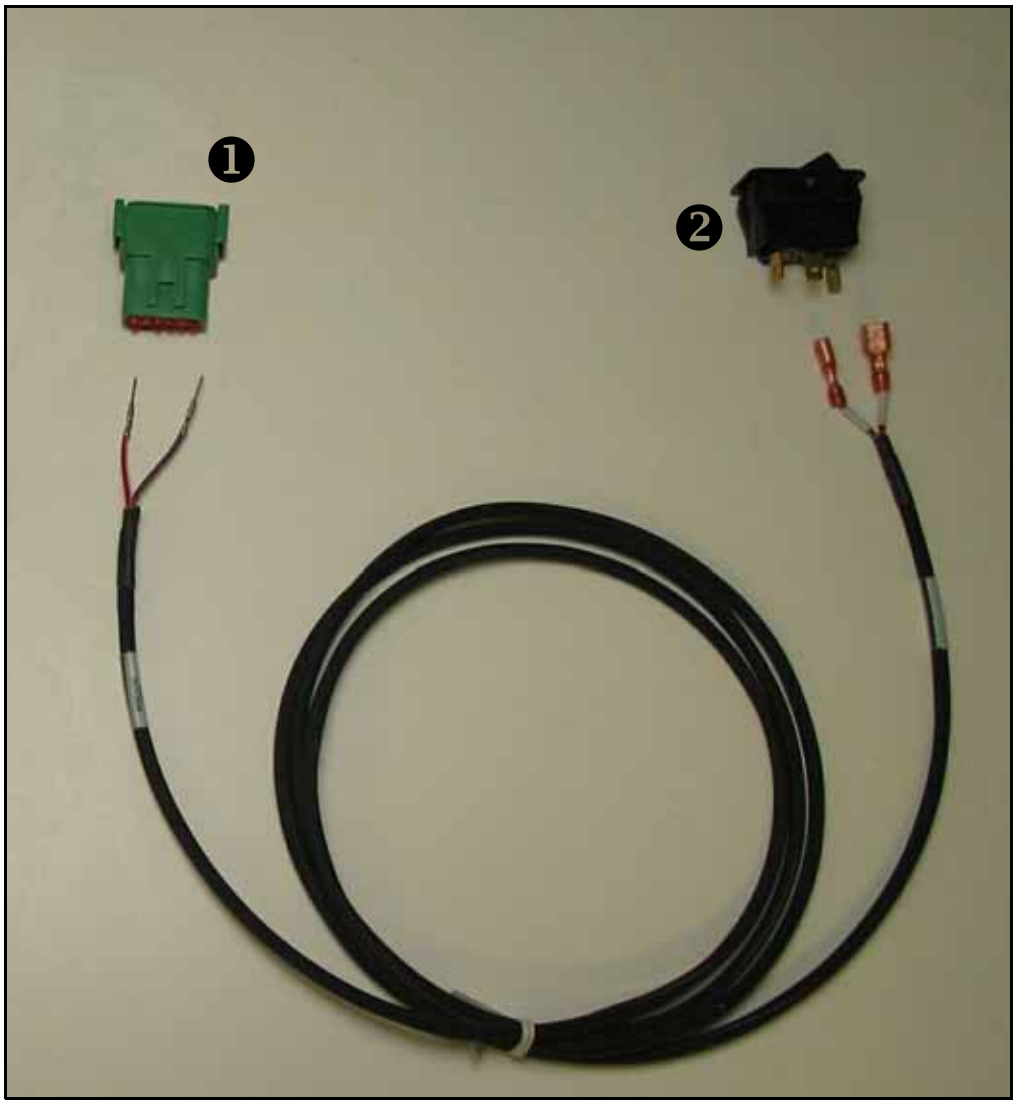
Remote Engage Switch Installation

In this chapter:

- Remote Engage Switch Components: Rocker Switch
- Remote Engage Switch Components: Foot Switch
- Prepare the Remote Engage Cable
- Using the Remote Engage Switch

This chapter describes how to install the remote engage switch.

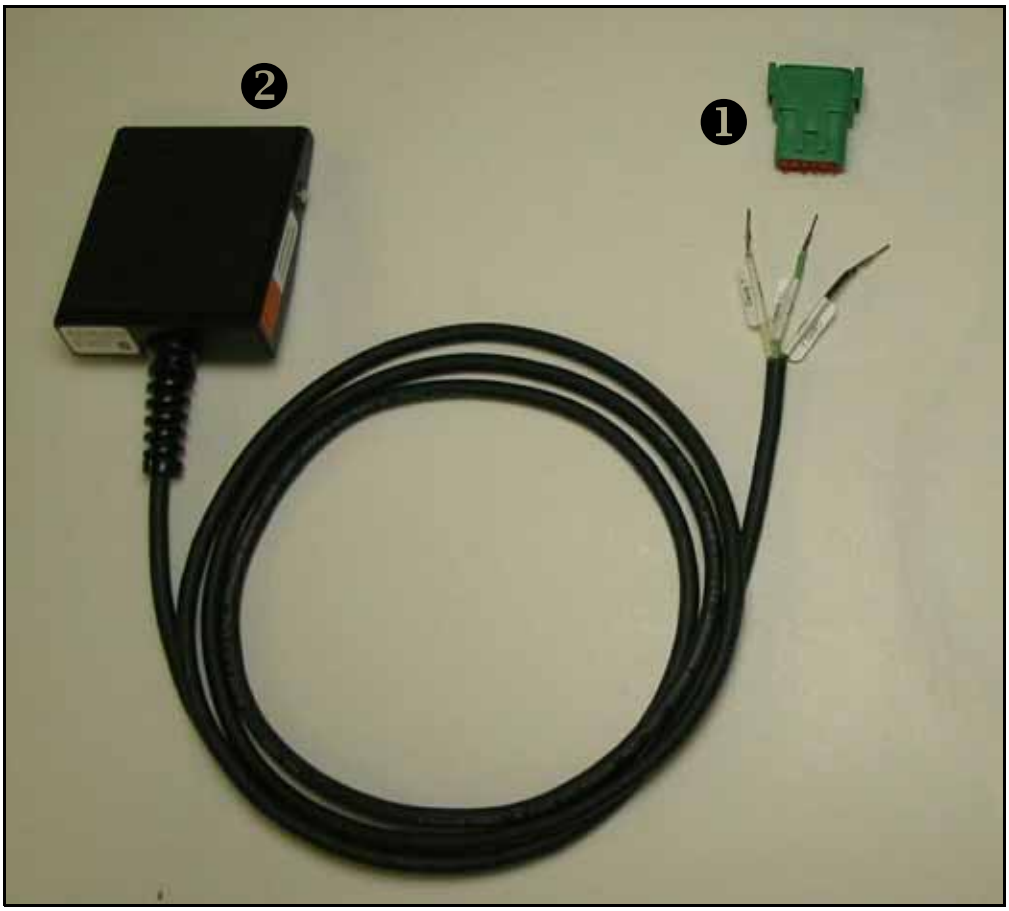
Remote Engage Switch Components: Rocker Switch



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

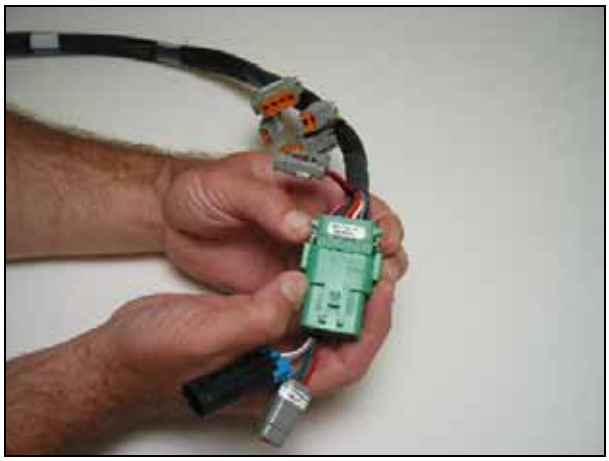


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Prepare the Remote Engage Cable

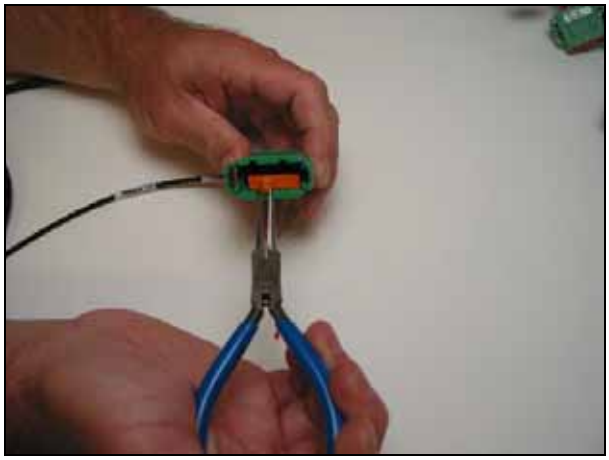
Step 1

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



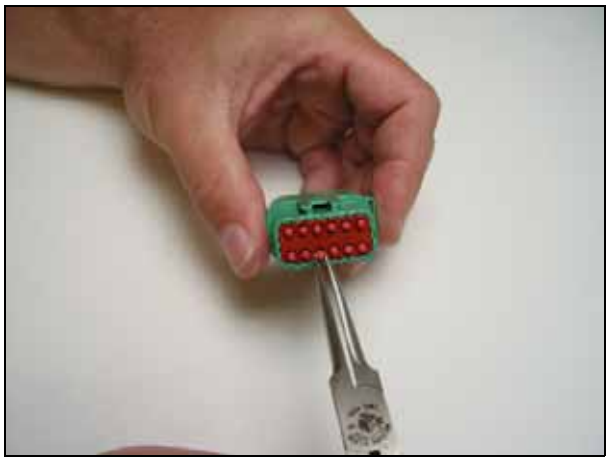
Step 2

Remove the wedge from the connector.



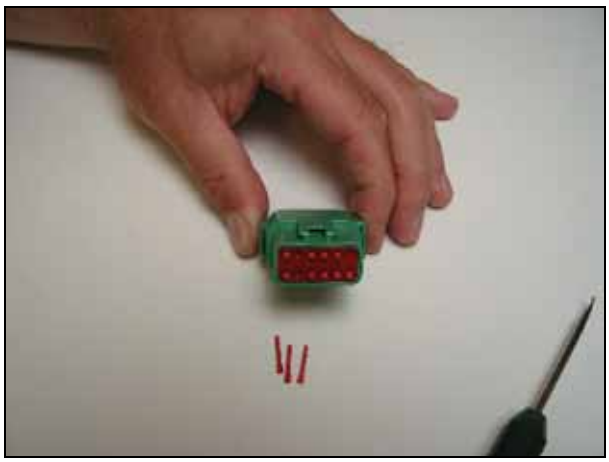
Step 3 Rocker switch only

Remove the plugs from cavity 2 and 7.



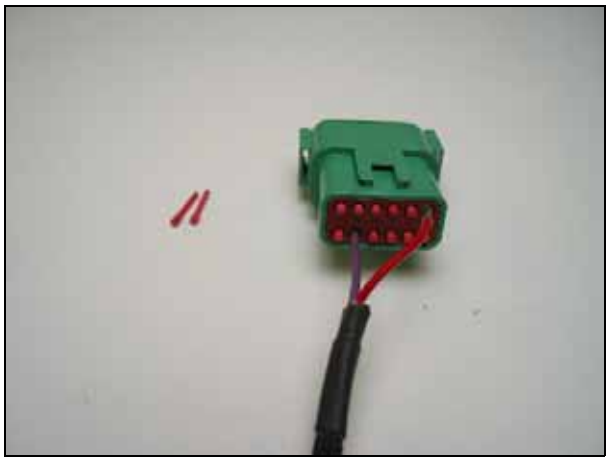
Foot Switch Only

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



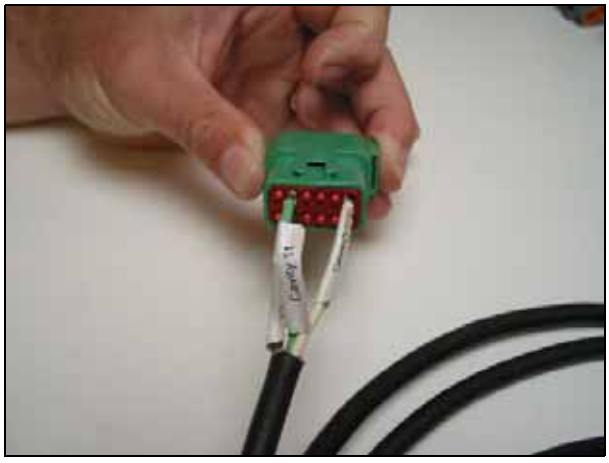
Step 4 Rocker Switch Only

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



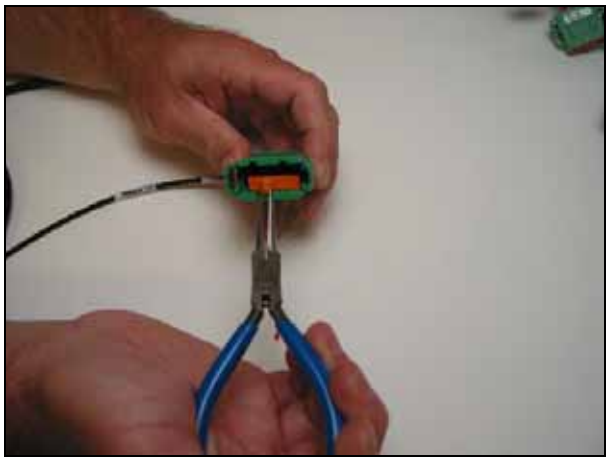
Foot Switch Only

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.



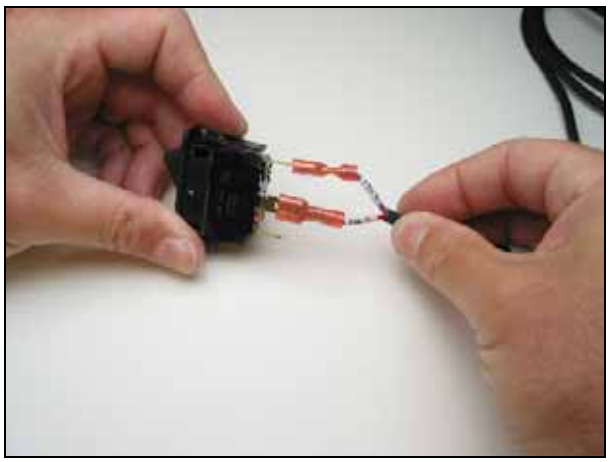
Foot Switch Only

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:

- Controller Installation
- Controller Connections

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

Controller Installation

Step 1

Locate the mounting location to the left of the driver's seat.



Step 2

Before you begin drilling, remove the floor mat and inspect the area under the cab for fuel lines or electrical wiring.



Step 3

Position the controller mounting plate with a tape measure so it is parallel to the seat base. Use the controller mounting plate as a template to mark the four holes shown.



Step 4

Use a hole saw to drill four 5/8" holes through the floor mat. Continue drilling four 5/16" holes through the steel floorboard.



Step 5

Install the standoffs and 1/4" hardware from the controller bolt kit.



Step 6

Tighten the standoffs and then lay the mat over them.



Step 7

Attach the controller mounting plate to the standoffs. Ensure that the plate is firm and rigid before you mount the controller to the plate.



Step 8

Attach the main and auxiliary cable harnesses prior to installing the controller. Use an Allen wrench to secure the connectors to the controller.



Step 9

Use the #10 screws provided to mount the controller to the plate.



Step 10

Route the cables behind the seat. Remove the rear foam panel to hide the harness.

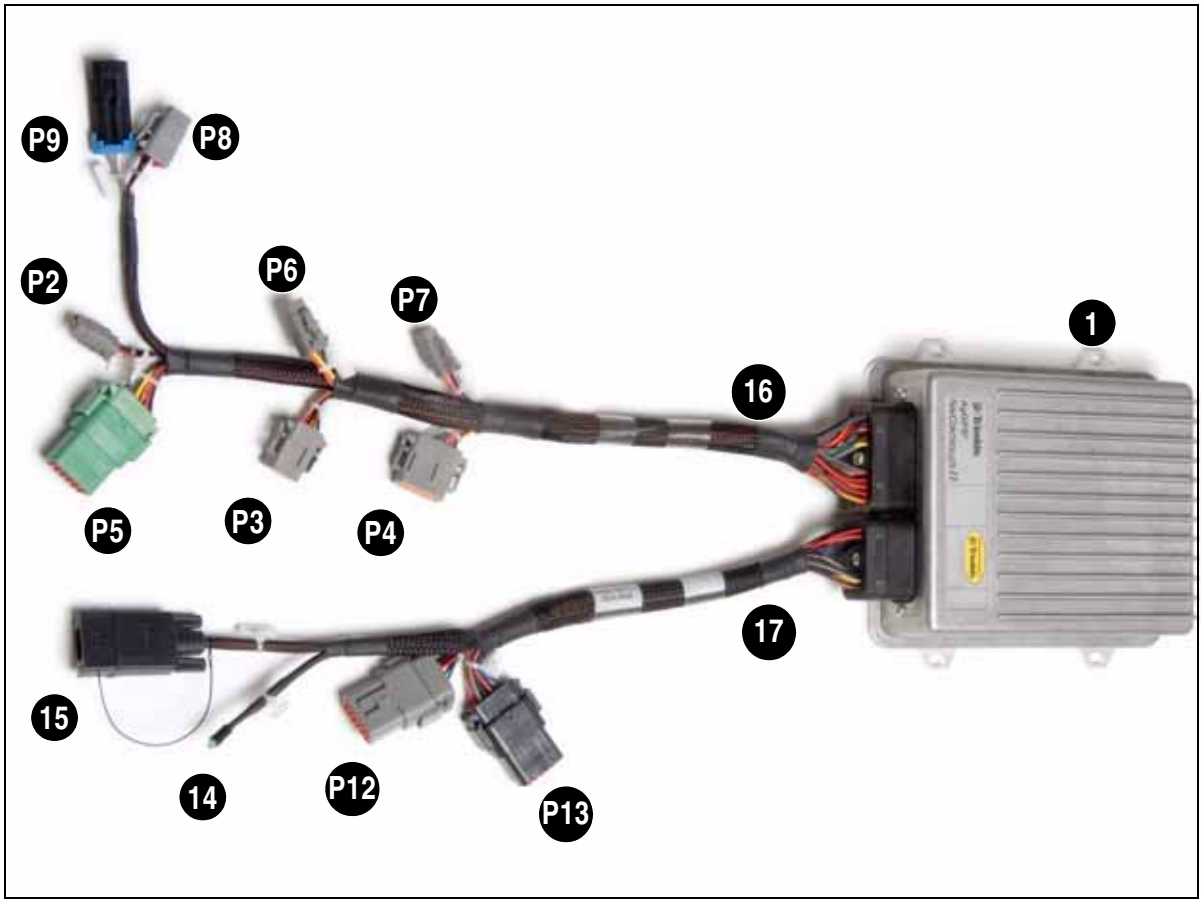


Step 11

Make the required connections in the cab. See Controller Connections, page 74. Store the cable connections behind the cover.



Controller Connections



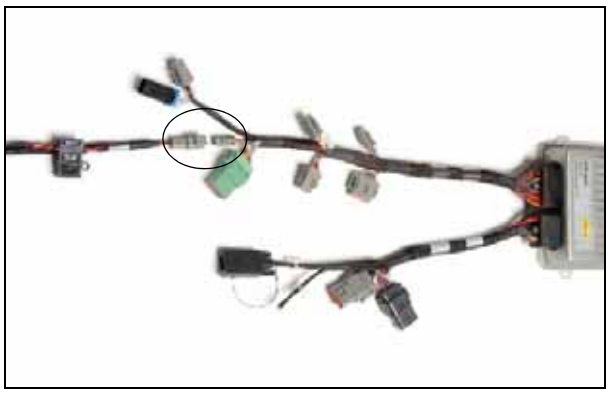
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

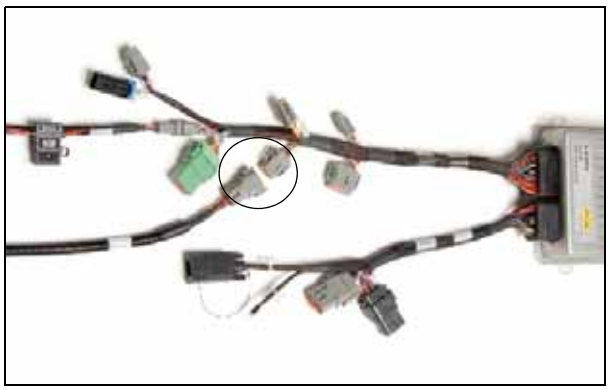
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

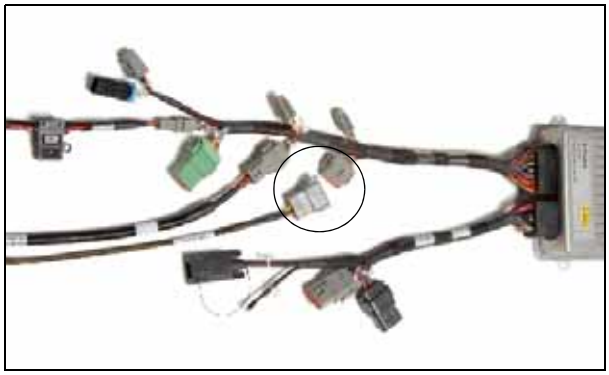
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

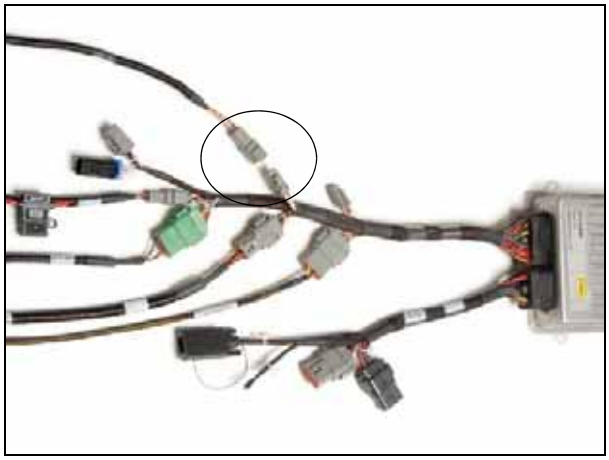
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

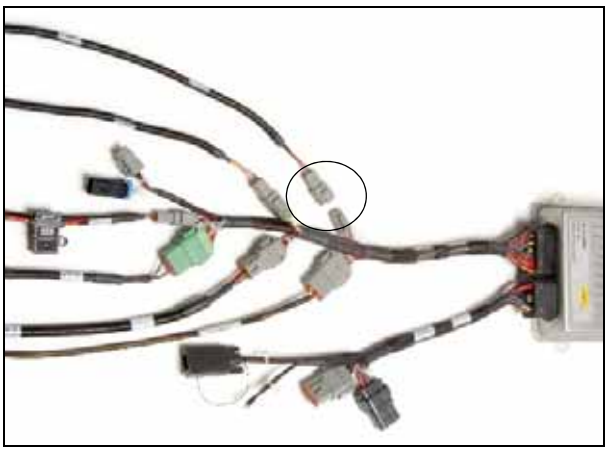
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

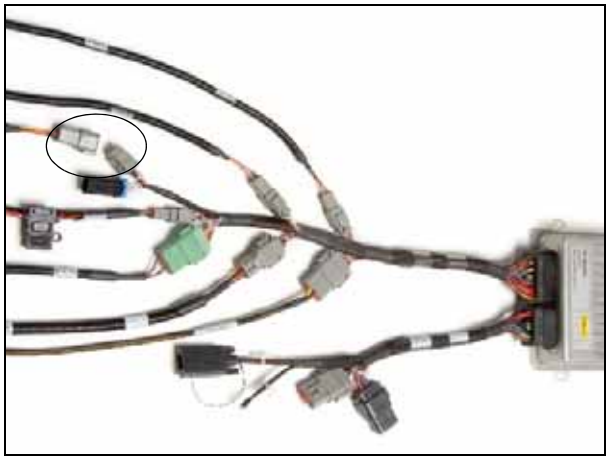
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 6

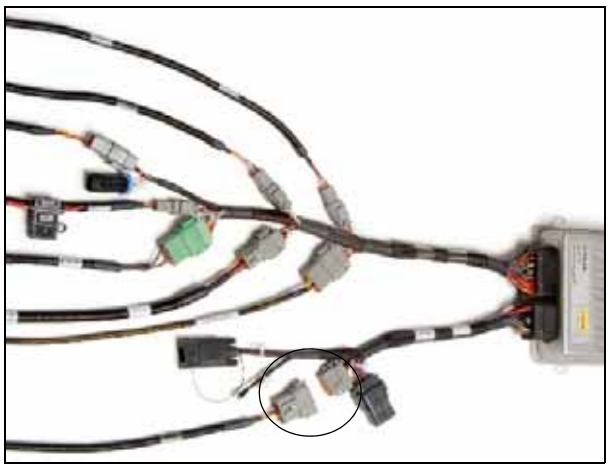
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 7

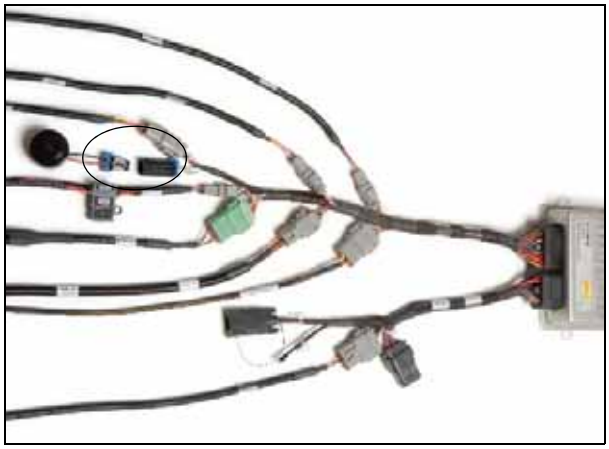
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



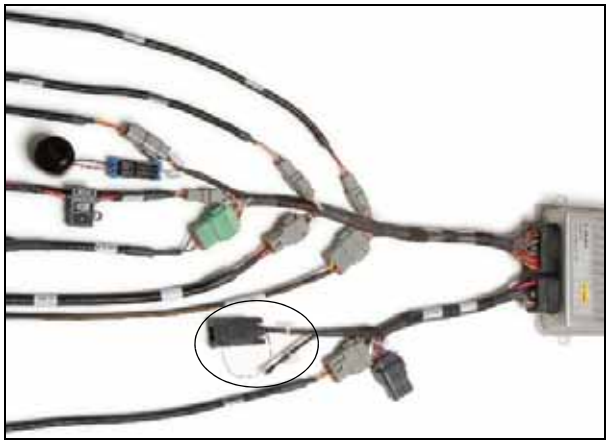
Step 8

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.