*Ag*GPS® Autopilot™ Automated Steering System

Installation Instructions

Case IH

- **STX 280 Steiger**
- **STX 330 Steiger**
- **STX 380 Steiger**
- **STX 430 Steiger**
- **STX 480 Steiger**
- **STX 530 Steiger**

New Holland

- **TJ 280**
- **TJ 330**
- **TJ 380**
- **TJ 430**
- **TJ 480**
- **TJ 530**

Version 3.00
Revision A
Part Number 54036-16-E03
August 2006

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Class B Statement – Notice to Users. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

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For product recycling instructions and more information, please go to:

www.trimble.com/ev.shtml

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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 the Autopilot System

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

Retain	Remove
*Ag*GPS 21A lightbar *Ag*GPS 114 antenna/receiver	Lightbar cable (P/N 35204) **NOTE**: Replace with lightbar only cable from conversion kit. *Ag*GPS 114 receiver cable (P/N 40947) **NOTE**: Replace with cable 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 Antenna for *Ag*GPS 124 or 132 receiver *Ag*GPS 124 or 132 receiver Antenna to receiver cable	Lightbar to receiver cable **NOTE**: Replace with lightbar only cable from conversion kit. Remote keypad

*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 required
Platform kit: P/N 54036-16 Hydraulic hose kit STX 280 – 530: P/N 59867 Roof bracket kit: P/N 49307	5 mm allen driver with short shaft (3") and long shaft (5") extension for 1/4" drive ratchet 1/4 inch drill bit Open end wrench set (metric and SAE) Allen wrench set (metric and inch sizes)

Autopilot Hardware Organization - as Shipped

Platform Kit (P/N 54036-16)	Common parts	GPS receiver	Display	Hyd. hose kit (P/N 59867)	Roof bracket kit (P/N 49307)
(2) Hydraulic valve module (2) Flow switch (2) Hydraulic valve cable (2) Manual override 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 harness • Aux 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 display (5) *Ag*GPS 170 cable (5) *Ag*GPS 170 mounting bracket (5) *Ag*GPS 50 lightbar (5) *Ag*GPS 150 lightbar	(2) Hyd. adaptors	(4) Roof brackets (4) Bolt kit, roof bracket

Autopilot Hardware Organization - as Installed

Hydraulics (2)	Steering Sensor (3)	GPS Receiver (4)	Display (5)	Power (6)	Controller (8)
• Hydraulic valve module • Flow switch • Hydraulics/ 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 • Sonalert • Main harness • Aux harness

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:

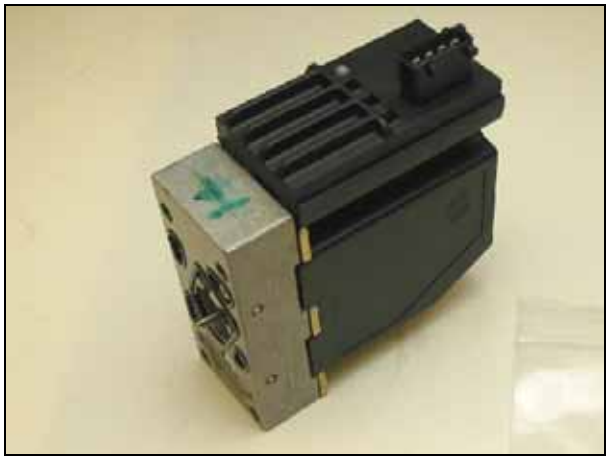
- Identifying the Hydraulic Valve Module
- 280 and 330 Model Components
- 280 and 330 Models: Install the Hydraulic Valve Actuation Module
- 280 and 330 Models: Install the Flow Switch
- 380 – 530 Model Components
- 380 – 530 Models: Install the Hydraulic Valve Actuation Module
- 380 – 530 Models: Install the Flow Switch

This chapter describes how to install the hydraulic hoses and flow switch.

Identifying the Hydraulic Valve Module

Step 1

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

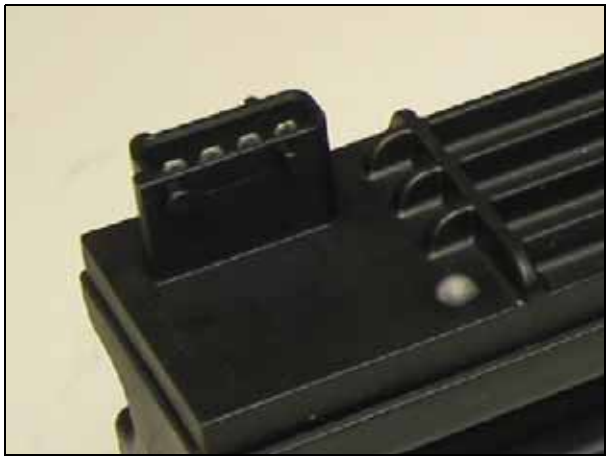


Step 2

Identify the connector type on the module.



DEUTSCH DT TYPE

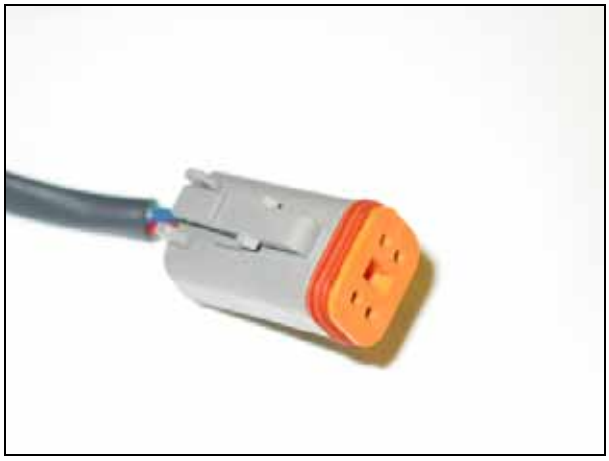


AMP JPT TYPE

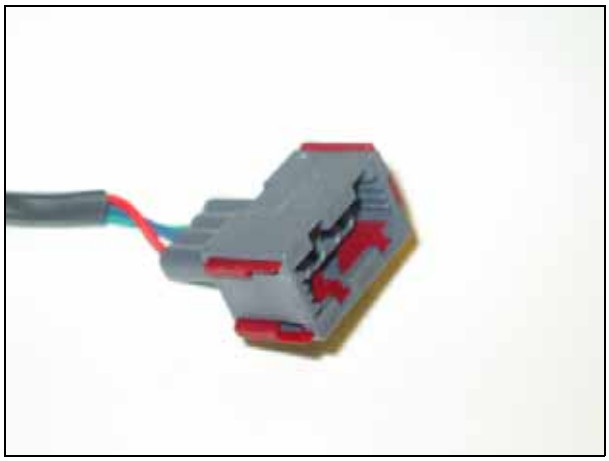
Step 3

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.*

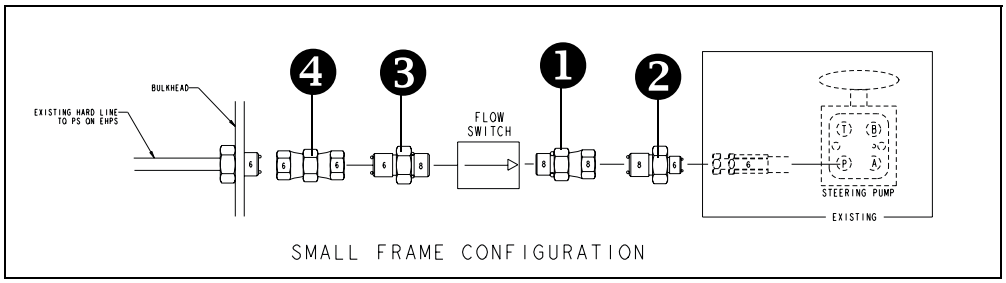


DEUTSCH DT VALVE CABLE



AMP JPT VALVE CABLE

280 and 330 Model Components



Item	Description	Part number
❶	Fitting	8 F6OL-S
❷	Fitting	8-6 HLO-S
❸	Fitting	6-8 F5OLO-S
❹	Fitting	6 HL6-S

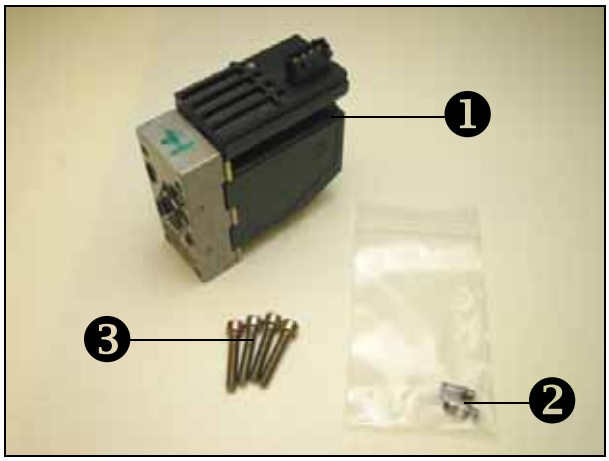
Note – *Part numbers are Parker numbers and are for reference only.*

280 and 330 Models: Install the Hydraulic Valve Actuation Module

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

Step 1

Locate the electrical actuation module, shuttle valves, and screws provided in the kit.



1. Electrical actuation module
2. 2 x shuttle valves
3. Socket head cap screws

Step2

Locate the steering control valve under the hood, directly in front of the cab steering wheel.



Step3

Loosen the steel hard lines as necessary to access the rear cover plate ❶.



Step 4

Loosen the valve mounting bolts to allow the valve to be tilted forward.



Step 5

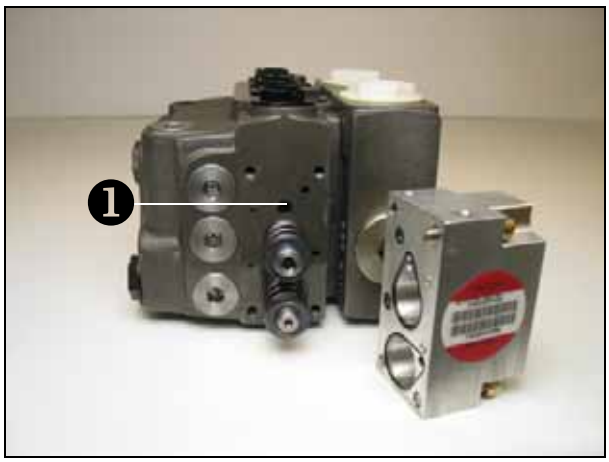
Remove the cover at the rear of the valve. Retain the end plate and bolts.

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 6

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



Step 7

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



Step 8

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

Note – *Do not replace the cover until the electronic actuation module is installed in the following steps.*



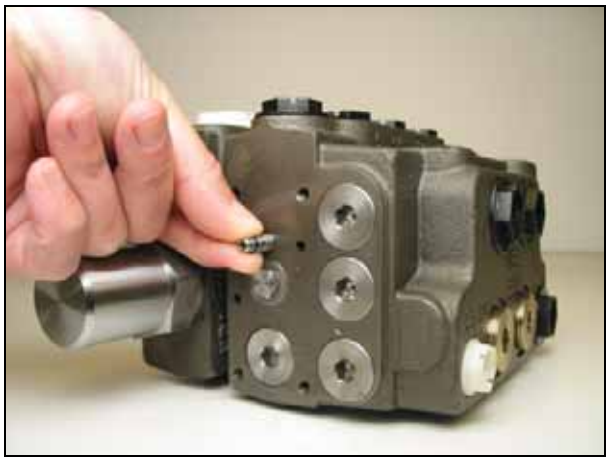
Step 9

Remove the end plate at the front of the valve. The plate will be replaced by the electronic actuation module provided in the kit.



Step 10

Insert the second shuttle valve into the electronic module end of the valve body with the cone end facing out.



Step 11

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 12

Install the module to the front of the valve using the kit provided metric socket head cap screws.

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



Step 13

Inspect the O-rings in the cover removed in Step 5.



Step 14

Reinstall the cover at the rear of the valve.

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



Step 15

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

280 and 330 Models: Install the Flow Switch

Step 1

Locate the flow switch and install the following adaptors:

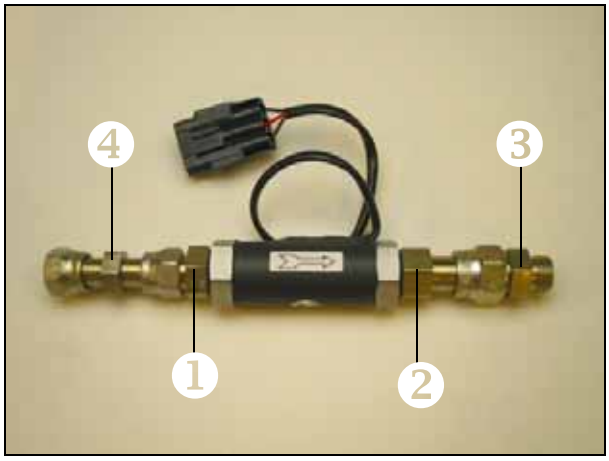
❶ -6 ORS male by -8 ORB male straight to the upstream end

❷ -8 ORS female by -8 ORB male straight to the downstream end

❸ -8 ORS male by -6 ORS male reducer

❹ -6 ORS female union

Note – *The arrow must point to the* ❷ *and* ❸ *fittings.*



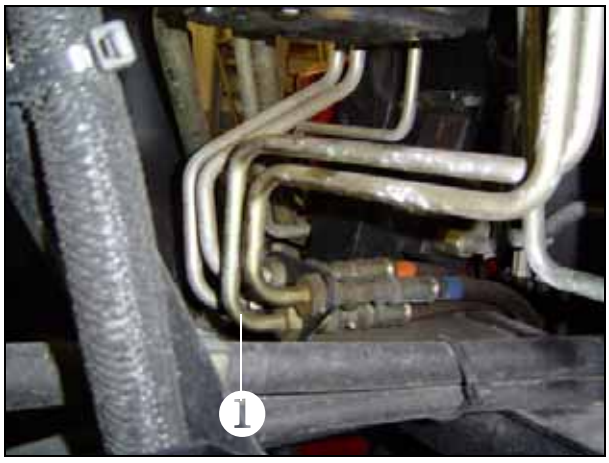
Step 2

Locate the "PS" (pilot signal) line at the valve body. Follow the line to the hand pump to verify



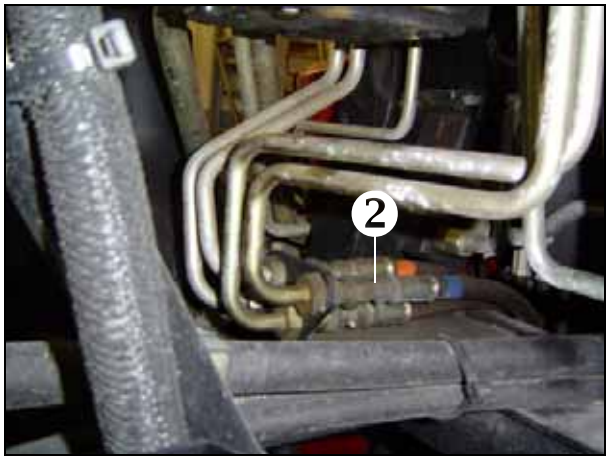
Step 3

Follow the steel line to the bulk head below the valve and mark the line "PS" ❶.



Step 4

Remove the outer hose ❷ to gain access to the “PS” line.



Step 5

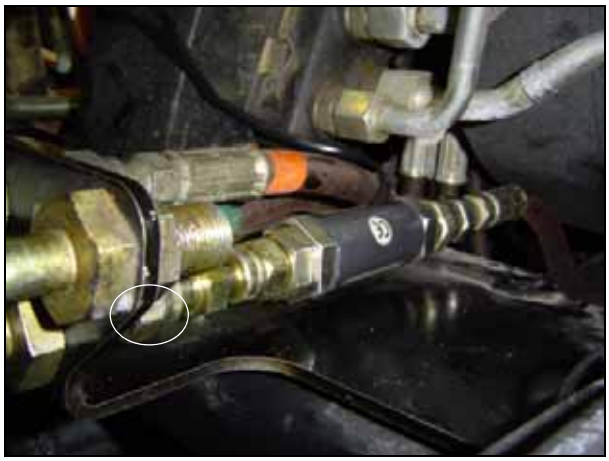
Remove the “PS” hose connection at the bulk head and reconnect the hose to the downstream end of the flow switch.

Note – *The arrow should point to the hand pump.*



Step 6

Connect the upstream end of the flow switch to the “PS” steel line.



Step 7

Reconnect the outside hose to the steel line.

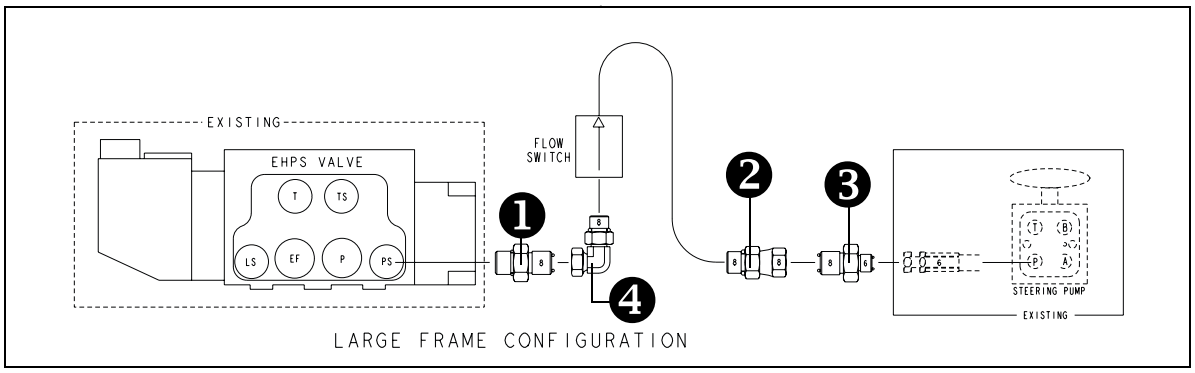


Step 8

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



380 – 530 Model Components



Item	Description	Part number
❶	Fitting	8-M18 F87OMLO-S
❷	Fitting	8 F6OL-S
❸	Fitting	8-6 HLO-S
❹	Fitting	8 AOEL6-S

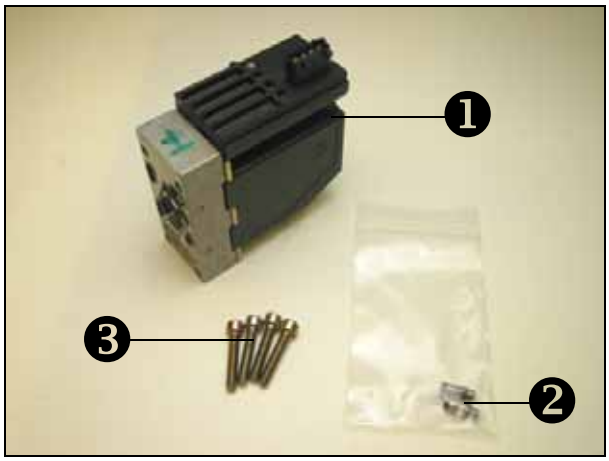
Note – *Part numbers are Parker numbers and are for reference only.*

380 – 530 Models: Install the Hydraulic Valve Actuation Module

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

Step 1

Locate the electrical actuation module, shuttle valves, and screws provided in the kit.



1. Electrical actuation module
2. 2 x shuttle valves
3. Socket head cap screws

Step2

Locate the steering control valve on the tractor inside the right frame rail and behind the front axle.



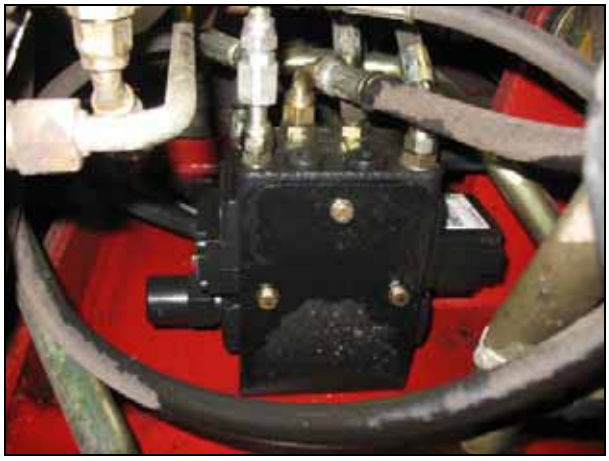
Step3

Access the valve from underneath the tractor frame.



Step 4

The steering control valve is approximately 20" long and 8" wide.



Step 5

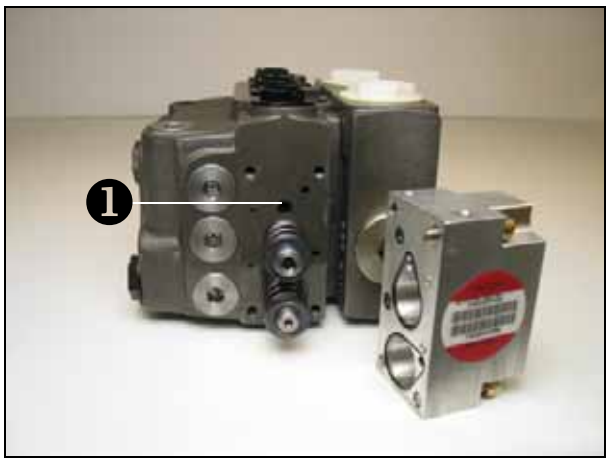
Remove the cover at the rear of the valve. Retain the end plate and bolts.

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 6

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



Step 7

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



Step 8

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

Note – *Do not replace the cover until the electronic actuation module is installed in the following steps.*



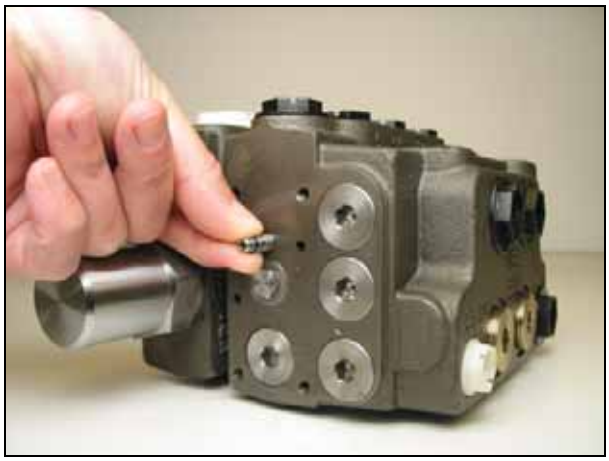
Step 9

Remove the end plate at the front of the valve. The plate will be replaced by the electronic actuation module provided in the kit.



Step 10

Insert the second shuttle valve into the electronic module end of the valve body with the cone end facing out.



Step 11

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 12

Install the module to the front of the valve using the kit provided metric socket head cap screws.

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



Step 13

Inspect the O-rings in the cover removed in Step 5.



Step 14

Reinstall the cover at the rear of the valve.

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



Step 15

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

380 – 530 Models: Install the Flow Switch

Step 1

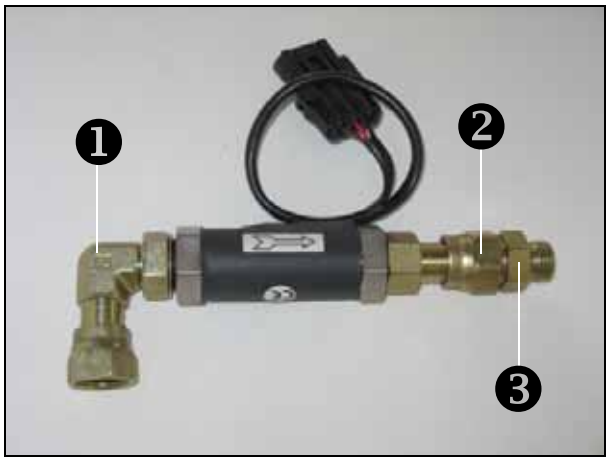
Locate the flow switch and install the following adaptors:

❶ -8 ORB male by -8 ORS female 90 to the upstream end

❷ -8 ORB male by -8 ORS female straight to the downstream end

❸ -8 ORS male by -6 ORS male reducer

Note – *The arrow must point away from the 90 degree fitting.*



Step 2

Locate the port labeled "PS" (pilot supply) on the valve. Verify this line by following it to the hand pump.



Step 3

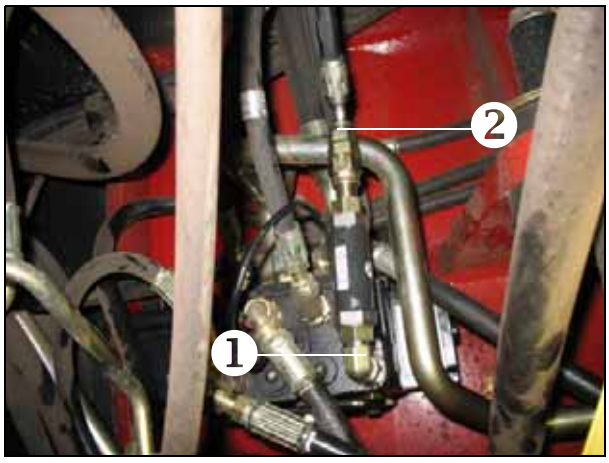
Remove the pilot supply line at the steering valve and replace the fitting with an M18 ORB by -8 ORS male adaptor fitting. The M18 end is installed into the valve body.



Step 4

Connect the -8 ORS 90 end of the flow switch (upstream end) to the adaptor in the valve body ❶. Connect the existing hose to the -6 ORS end of the flow switch ❷.

Note – *The arrow on the flow switch must point to the hand pump.*



Step 5

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



CHAPTER

3

AutoSense Steering Device Installation

In this chapter:

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

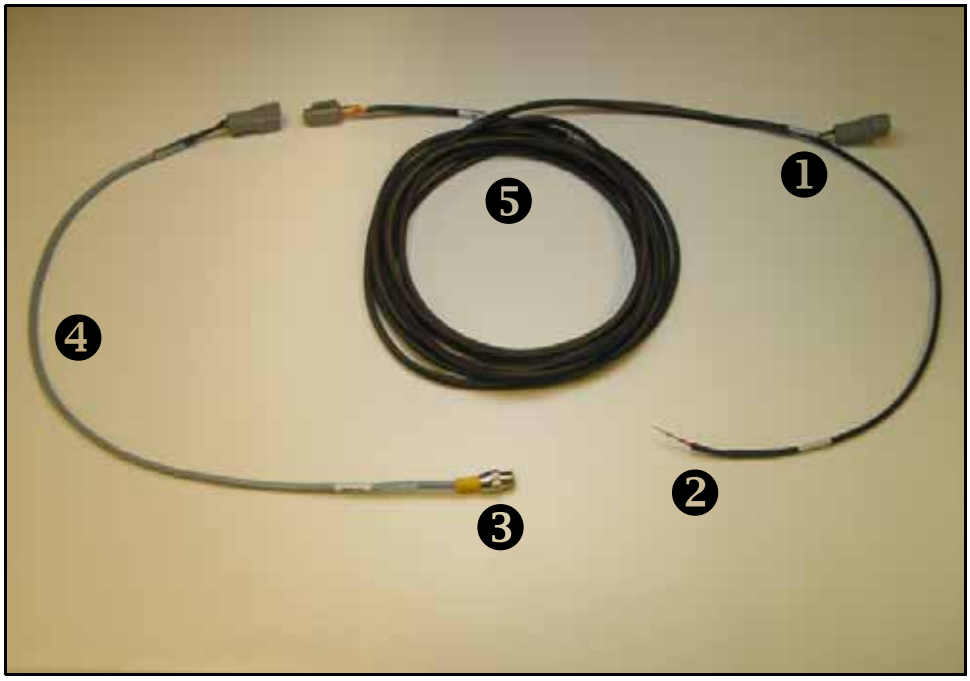
This chapter describes how to install the AutoSense steering device.

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.

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 Steering Device Components



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

Install the AutoSense Steering Device

Step 1

Locate the mounting location on the rear of the frame.



Step 2

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



Step 3

Remove the protective plastic from the VHB (very high bond) tape.

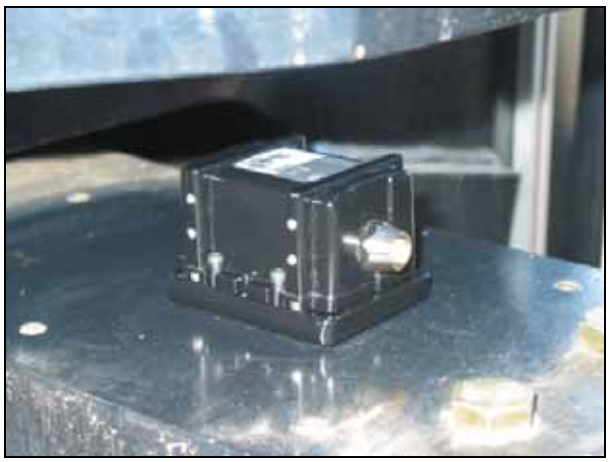
Note – *Dust will rapidly reduce the adhesive strength of the VHB tape. If the adhesive becomes contaminated, apply new tape.*



Step 4

Attach the *Ag*GPS AutoSense device and bracket to the center of the steering member with the connector pointed forward. Apply firm pressure.

Note – *Once applied, the bracket cannot be reapplied.*



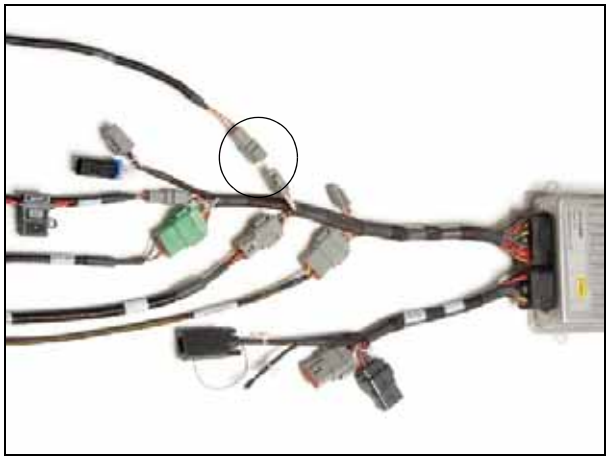
Step 5

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



Step 6

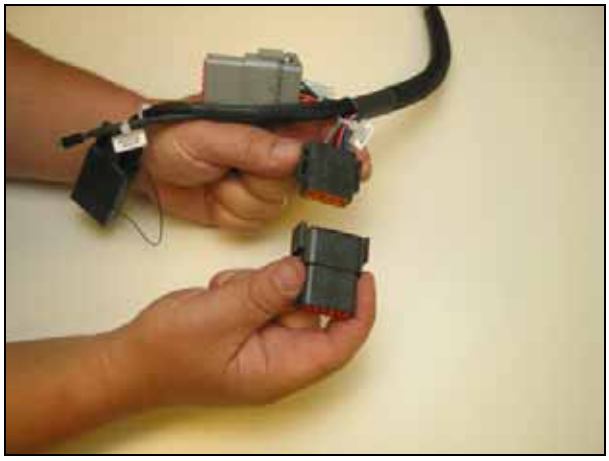
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Harness Preparation (P/N 54602 Rev C)

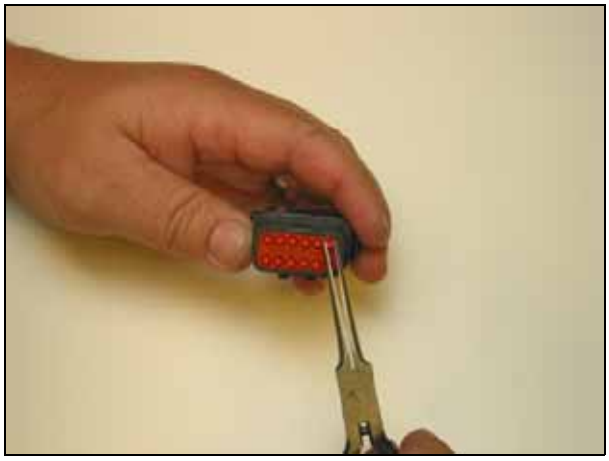
Step 1

Remove the black Deutsch DTM receptacle from the P-13 sensors leg of the auxiliary harness. See Chapter 8, Controller Connections.



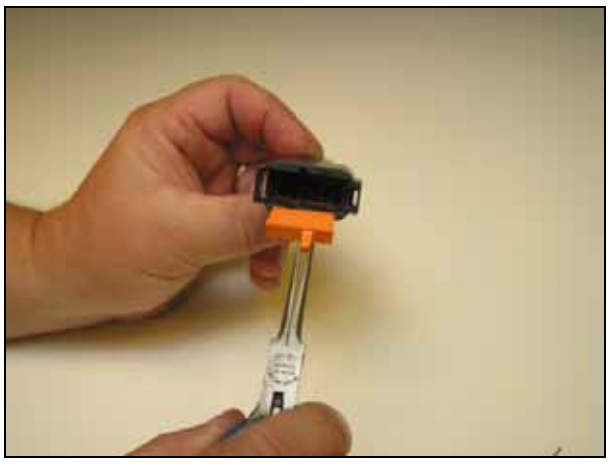
Step 2

Remove the plug from cavity number 1.



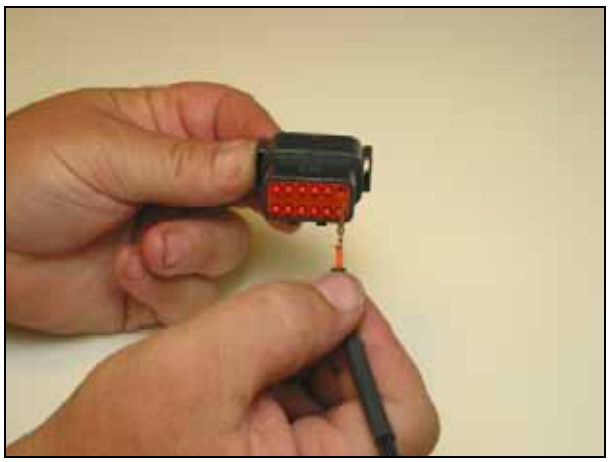
Step 3

Remove the wedge from the connector.



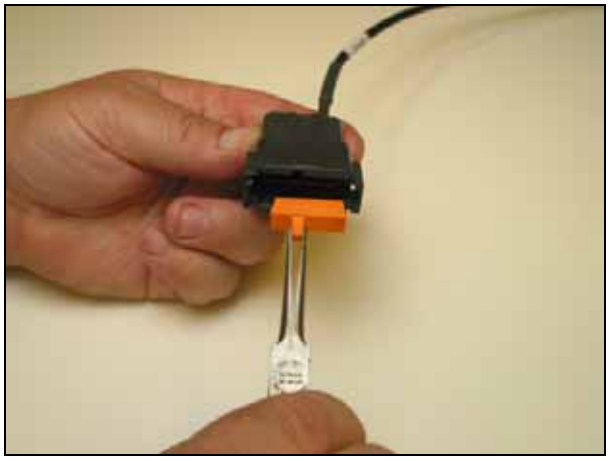
Step 4

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

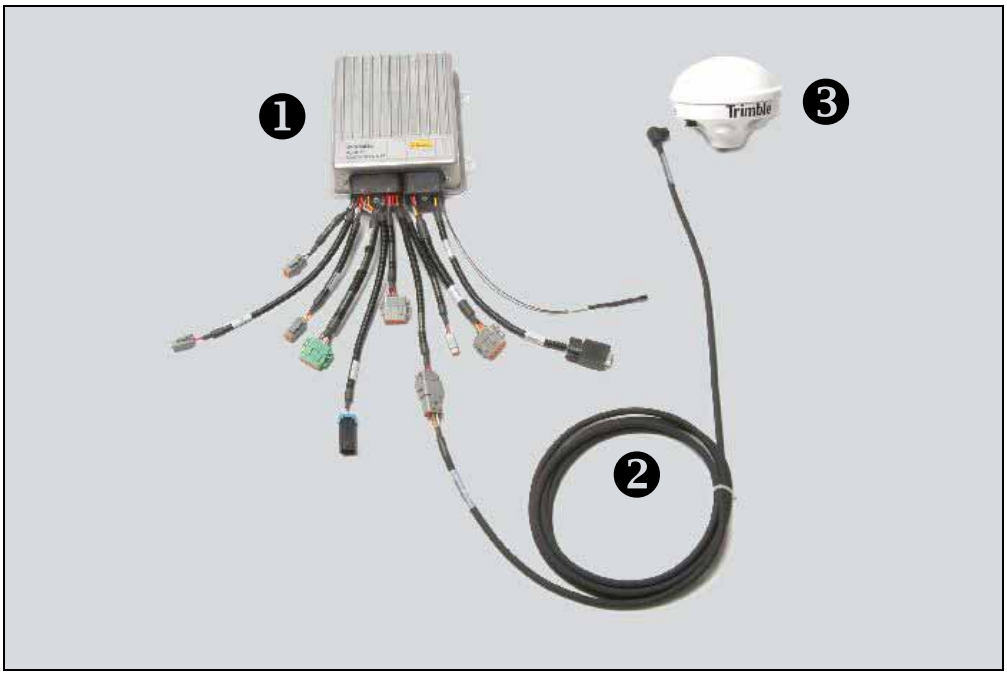
Antenna/Receiver Installation

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

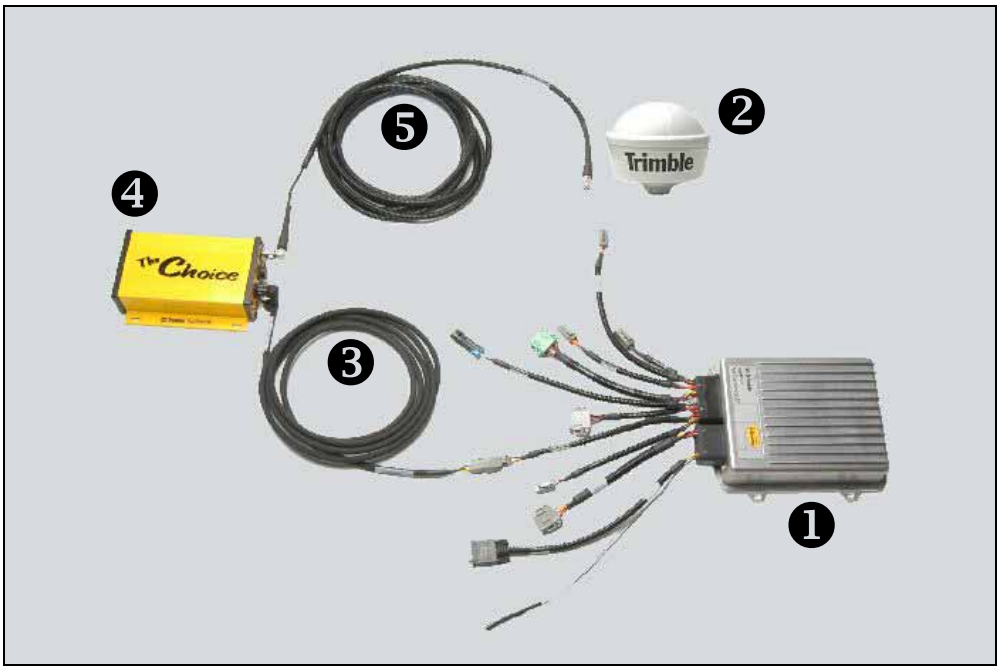
This chapter describes how to install an *Ag*GPS 114 antenna/receiver, an *Ag*GPS 132 receiver and antenna, an *Ag*GPS 252 receiver and SiteNet™ radio, or an *Ag*GPS 252 receiver and *Ag*GPS 900 radio module.

*Ag*GPS 114 Components



Item	Description
1	Controller
2	Antenna/receiver cable
3	*Ag*GPS 114 antenna/receiver

*Ag*GPS 132 Components



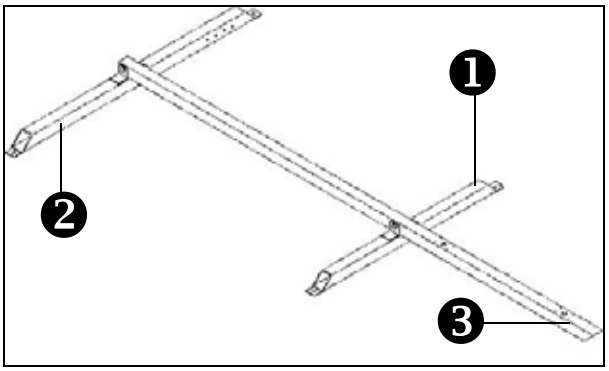
Item	Description
❶	Controller
❷	*Ag*GPS 132 antenna
❸	Receiver cable
❹	*Ag*GPS 132 receiver
❺	Antenna cable

*Ag*GPS 114/132 Installation Process

Note – *Perform the brace installation step by step on the cab roof.*

Step 1

Remove the four bolts and washers from the cab roof. Place the short brace ❶ at the front of the cab. Place the long brace ❷ at the rear of the cab. Loosely reinstall the four cab roof bolts. Place the antenna mounting bar ❸ in the channels as shown.



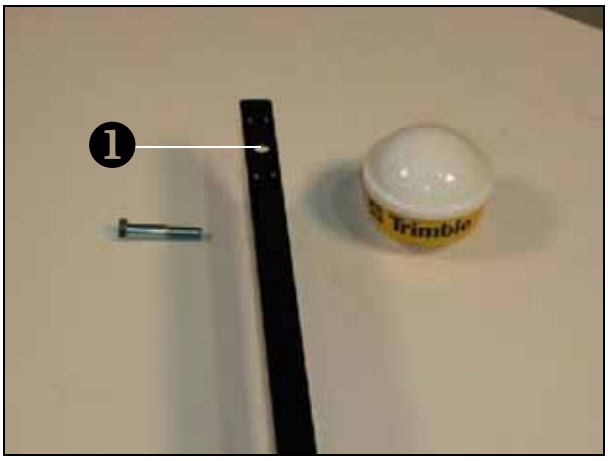
Step 2

Align the side holes in the mounting bar and brace channels. Place a flat washer onto the bolt. Insert the bolt and washer through the brackets. Install another washer and then tighten the nut on the bolt. Repeat this step for each channel point. Tighten the four cab roof bolts.



Step 3

Insert the antenna bolt up through the hole ❶ in the antenna brace.



Step 4

Place the antenna onto the bolt and tighten.



AgGPS 114 Only

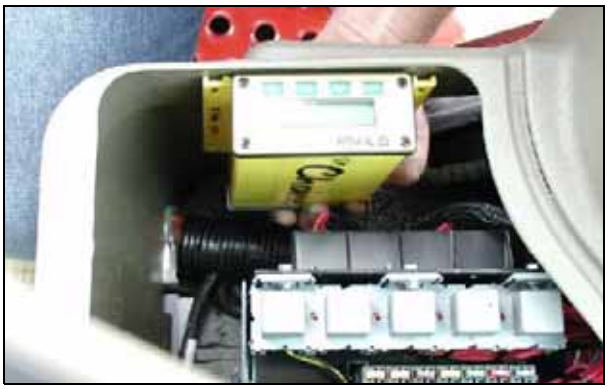
Attach the antenna/receiver cable and route it toward the "C" post at the right rear of the cab. Secure the cable as needed with ties. Route the cable into the cab electronics bay through the access hole in the cab floor. The access hole is insulated with foam. Route the remaining cable toward the trainer seat.



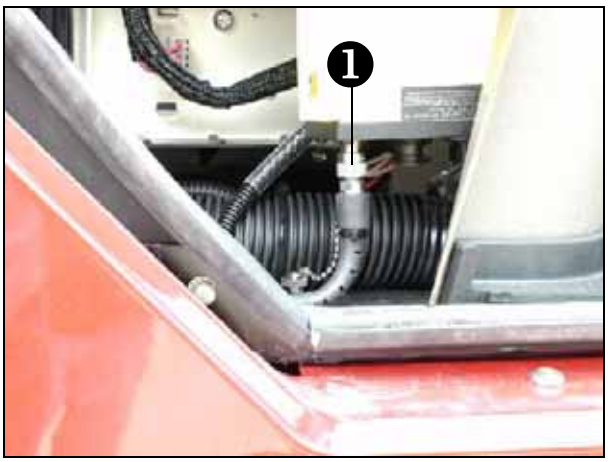
AgGPS 132 Only

Attach the antenna cable to the antenna and route it toward the "C" post at the right rear of the cab. Secure the cable as needed with ties. Route the cable into the cab electronics bay through the access hole in the cab floor. The access hole is insulated with foam.

The *Ag*GPS 132 receiver may be mounted in the electronics bay next to the operator's seat. Place the receiver in the electronics bay as shown. Use the receiver as a template and mark the top two holes. Drill holes in the electronics bay and then install the receiver with bolts and nuts.

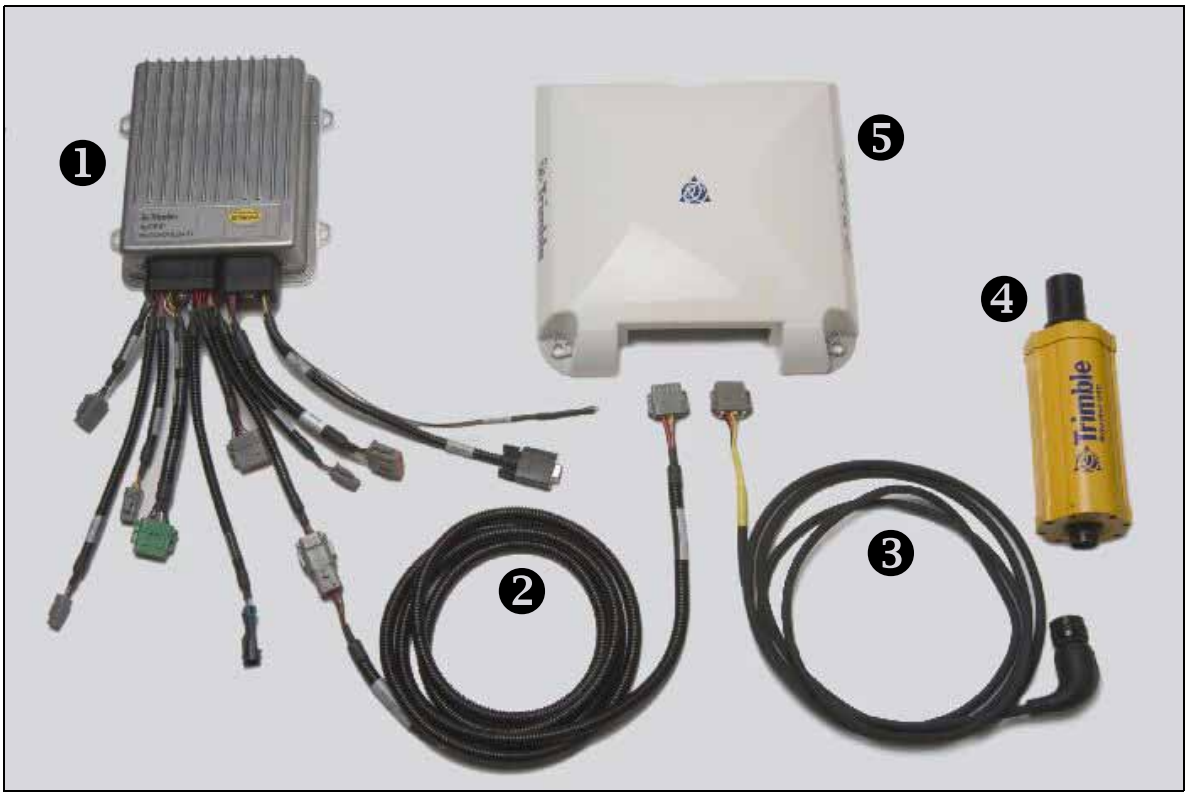


Route the antenna cable ❶ to the receiver, which is mounted in the electronics bay. Connect the controller cable to cavity "A" of the receiver. Leave the power/ground connections in electronics bay. Route the remaining cable toward the operator's seat base.



RIGHT SIDE SHOWN

AgGPS 252 GPS Receiver with SiteNet Radio (If Equipped) Components



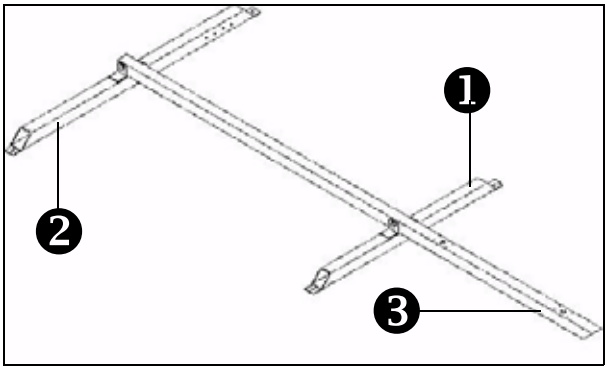
Item	Description
1	Controller
2	Antenna/receiver cable
3	SiteNet radio cable (if equipped)
4	SiteNet radio (if equipped)
5	*Ag*GPS 252 antenna/receiver

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

Note – *Perform the brace installation step by step on the cab roof.*

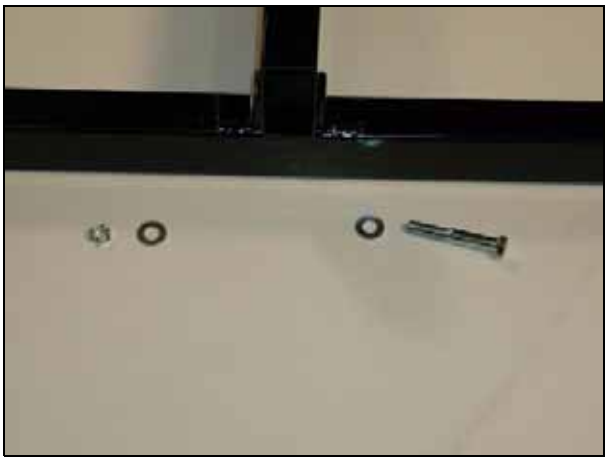
Step 1

Remove the four bolts and washers from the cab roof. Place the short brace ❶ at the front of the cab. Place the long brace ❷ at the rear of the cab. Loosely reinstall the four cab roof bolts. Place the antenna mounting bar ❸ in the channels as shown.



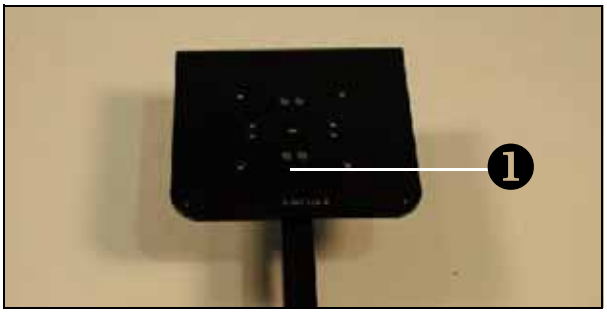
Step 2

Align the side holes in the mounting bar and brace channels. Place a flat washer onto the bolt. Insert the bolt and washer through the brackets. Install another washer and then tighten the nut on the bolt. Repeat this step for each channel point. Tighten four cab roof bolts.



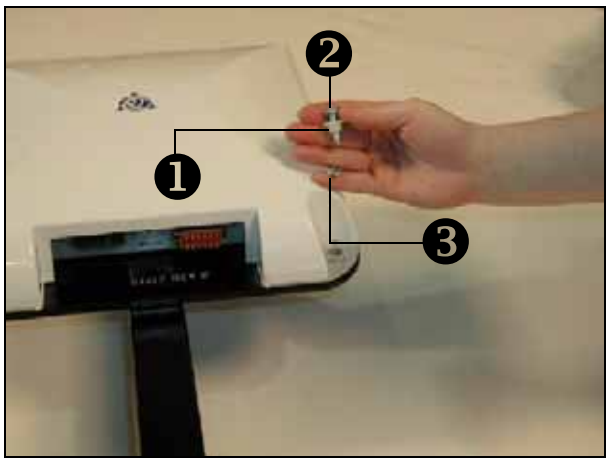
Step 3

Place the *Ag*GPS mount plate onto the receiver bracket at the angled end as shown. Install the four 1/4-20 x 1/2 flat head screws ❶.



Step 4

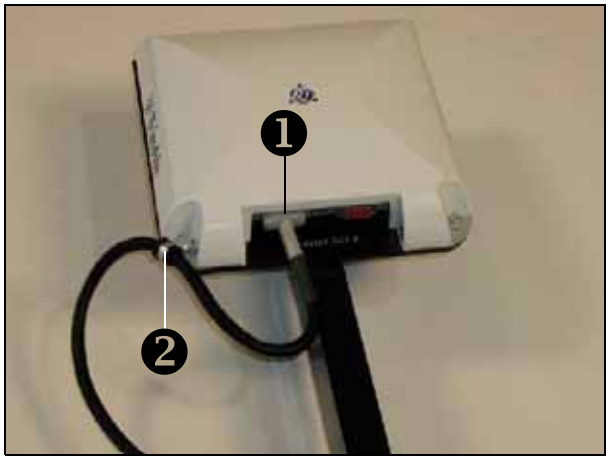
Position the *Ag*GPS 252 receiver on the bracket with the connector ports at the rear of the cab. Install the nylon shoulder washers ❶, 1/4 x 7/8 hex bolts ❷, and 1/4 lock nuts ❸ in the receiver.



Step 5

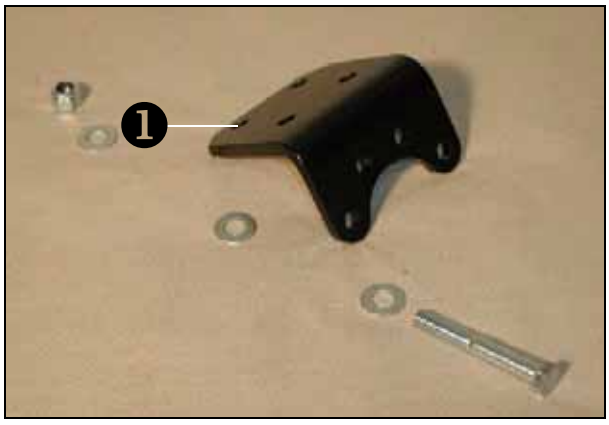
Connect the cable from the cab controller into cavity "A" ❶. Use the existing bolt to secure the cable clamp ❷ to the left side of the receiver.

Route the cable along the roof bracket, toward the right side of the cab. Place cable along the “C” post of the cab through the opening in the bottom of the electronics console. Secure the cable as needed with ties. Route the remaining cable toward the trainer seat.

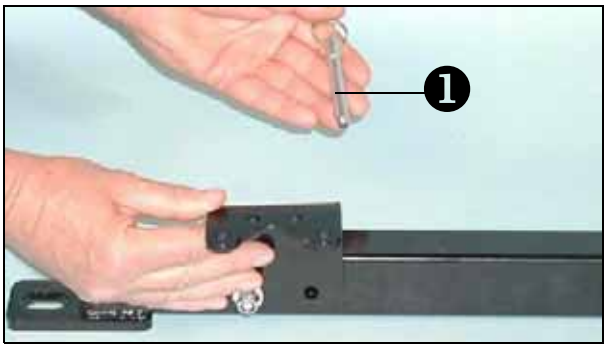


If Equipped With SiteNet Radio

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 rear mounting bar in the third hole from your left. Install another washer. Place the radio mounting bracket on the bolt through the hole shown ❶. Install another washer and lock nut.

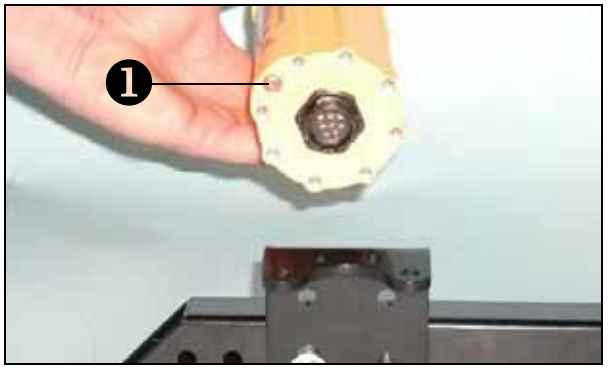


Install a ring grip retaining pin ❶ through the back side of the bracket, next to the bolt.

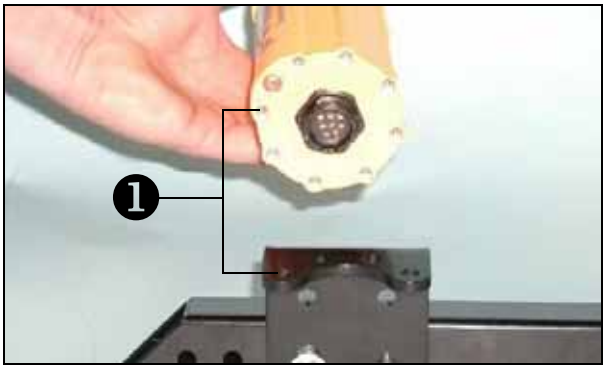


Install the radio on the mount bracket, with the connector cavity on the bottom.

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



Align the hole on the radio with the hole on the bracket as shown ❶.

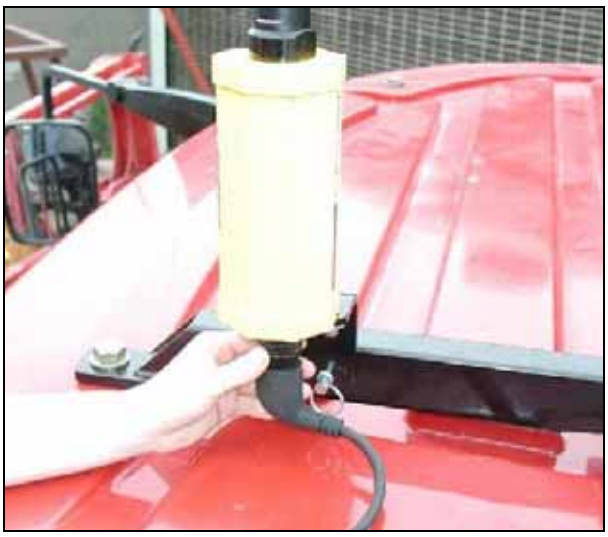


Install two 5/16 x 5/8 socket head bolts and washers into the mount bracket and radio.

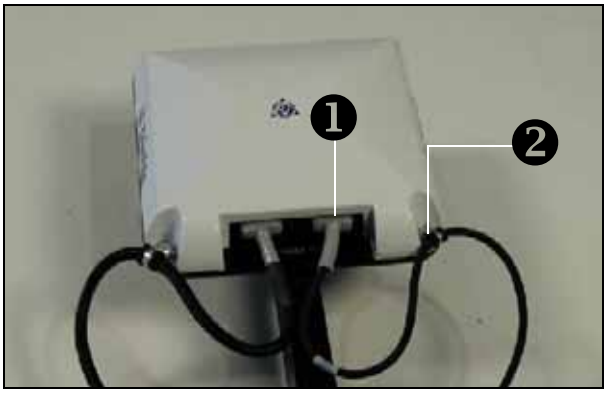
Note – *Not all bolts provided for the radio will be used.*



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



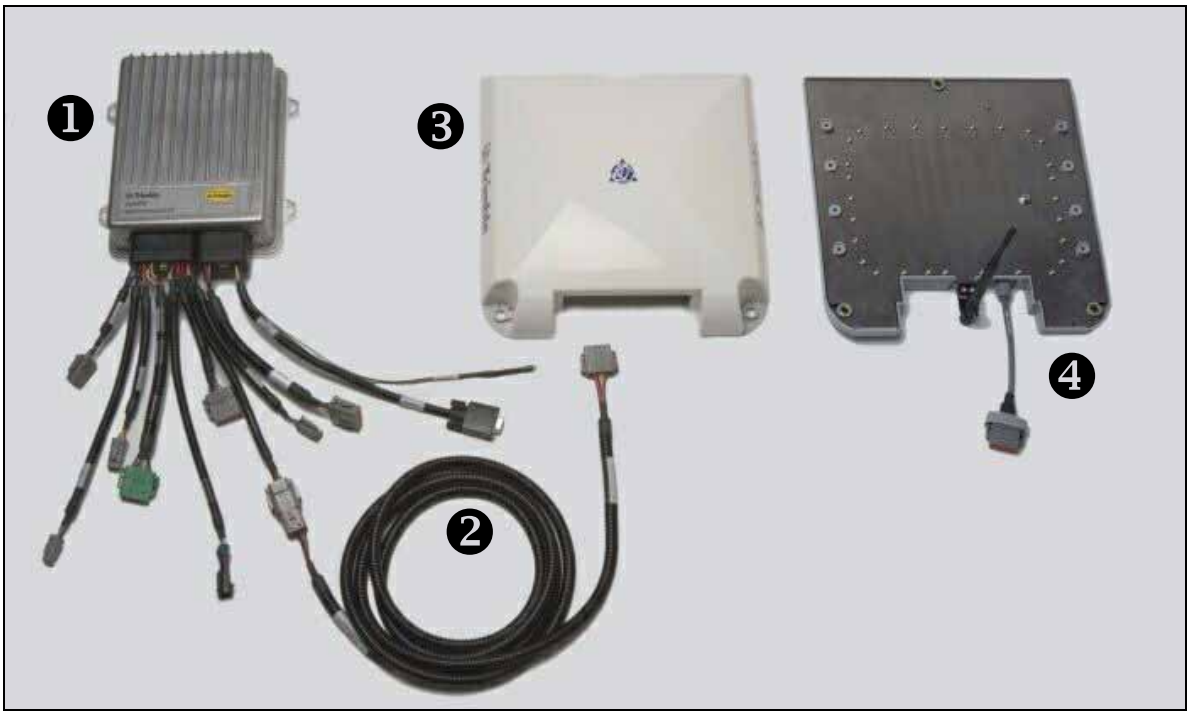
Place the opposite connector end of the radio cable into cavity "B" ❶. Remove the plug from cavity "B" and then install the connector. Use the existing bolt to bolt the cable clamp ❷ to the receiver.



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



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



Item	Description
1	Controller
2	Antenna/receiver cable
3	*Ag*GPS 252 antenna/receiver
4	*Ag*GPS 900 radio module (if equipped)

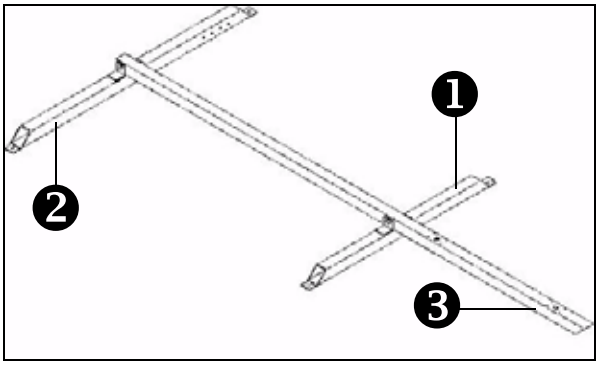
*Ag*GPS 252 GPS Receiver with *Ag*GPS 900 Radio Module (If Equipped) Installation Process

Note –

- *During disassembly, make note of where any wire harness and hose tie straps are removed from so they can be properly installed during assembly.*
- *Perform the brace installation step by step on the cab roof.*

Step 1

Remove the four bolts and washers from the cab roof. Place the short brace ❶ at the front of the cab. Place the long brace ❷ at the rear of the cab. Loosely reinstall the four cab roof bolts. Place the antenna mounting bar ❸ in channels as shown.



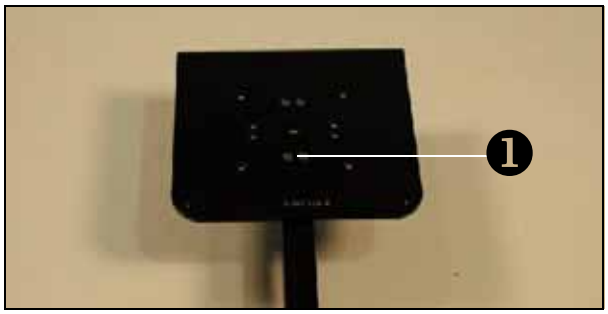
Step 2

Align the side holes in the mounting bar and brace channels. Place a flat washer onto the bolt. Insert the bolt and washer through the brackets. Install another washer and tighten the nut on the bolt. Repeat this step for each channel point. Tighten all the cab roof bolts.



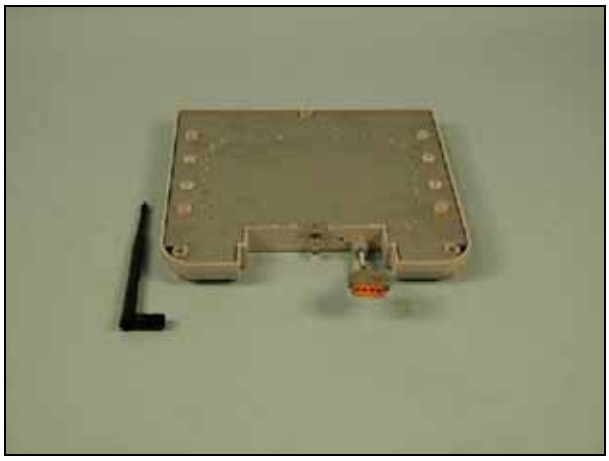
Step 3

Place the *Ag*GPS 252 mount plate onto the antenna bracket at the angled end, as shown. Install screws ❶.



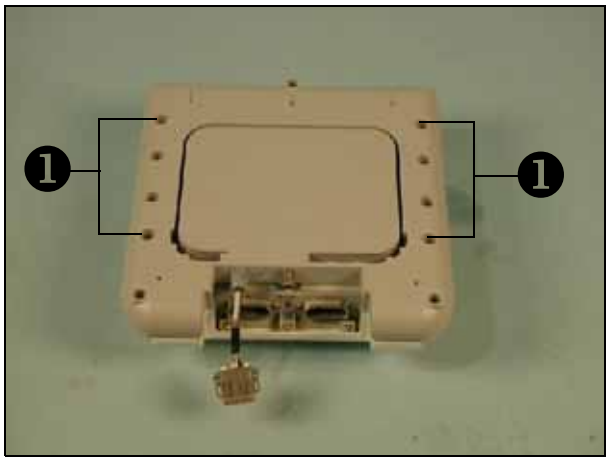
Step 4

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



Step 5

Place the radio module on the *Ag*GPS 252 receiver. Install eight screws in the holes ❶ as shown. Position the receiver and radio on the mount plate with the connector ports at the rear of the cab.



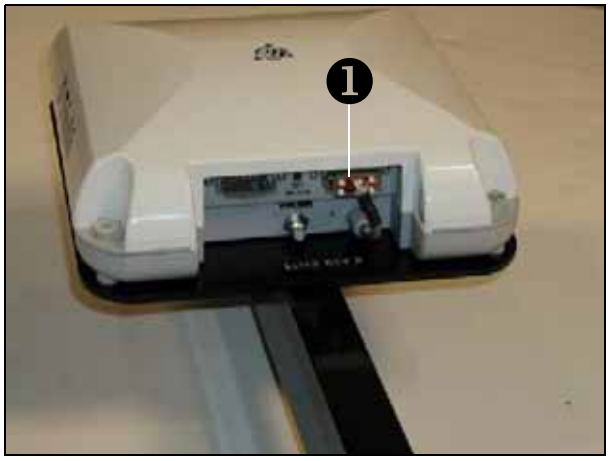
Step 6

Install the bolts and nylon bushings through the receiver. Install nuts and then tighten.



Step 7

Remove the connector plug from port B ❶ and install the radio module connector in its place.

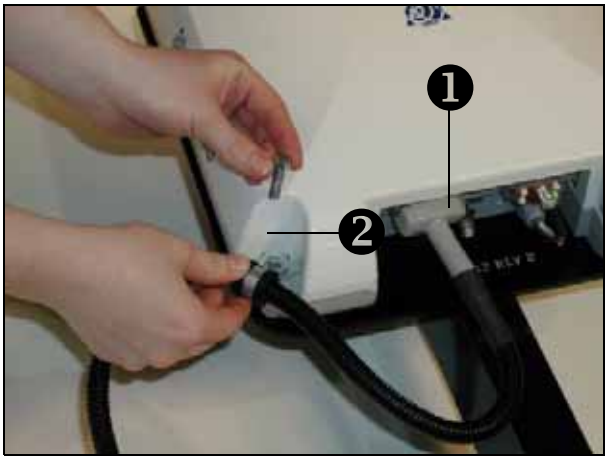


Step 8

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 receiver.

Step 9

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 console. Continue to route the cable toward the trainer seat. Place ties along the cable to secure it.



CHAPTER

5

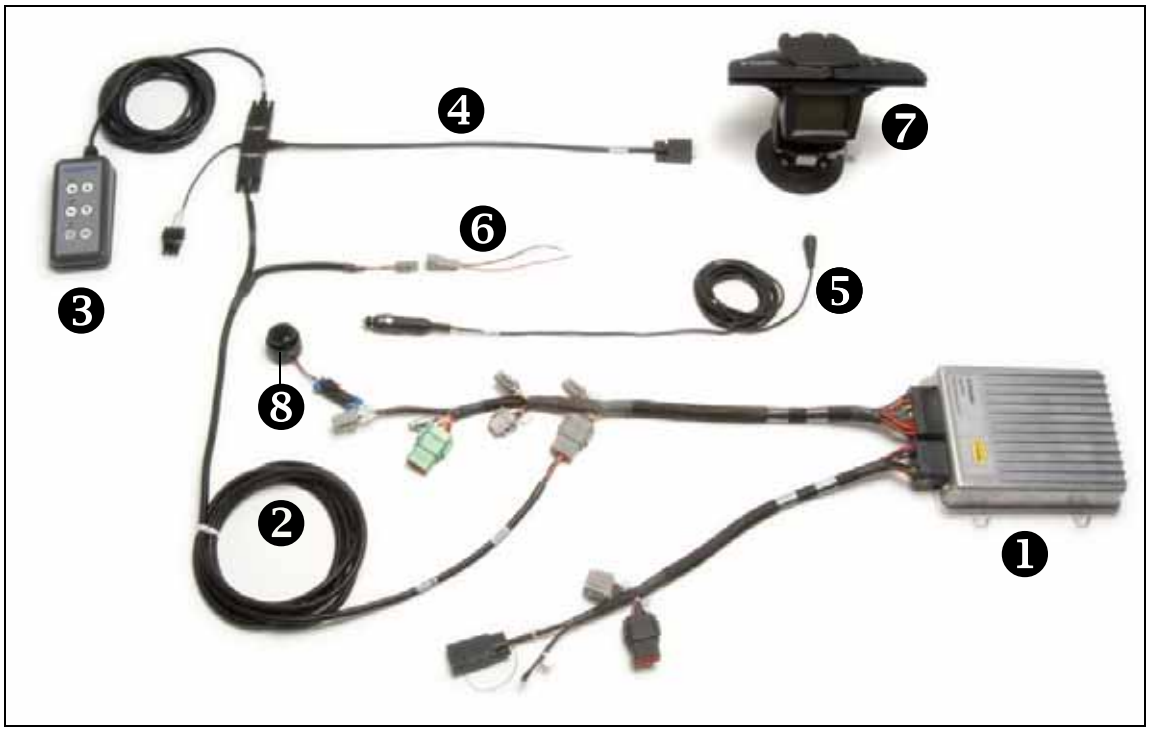
Display Installation

In this chapter:

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

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

EZ-Guide Plus Lightbar Components



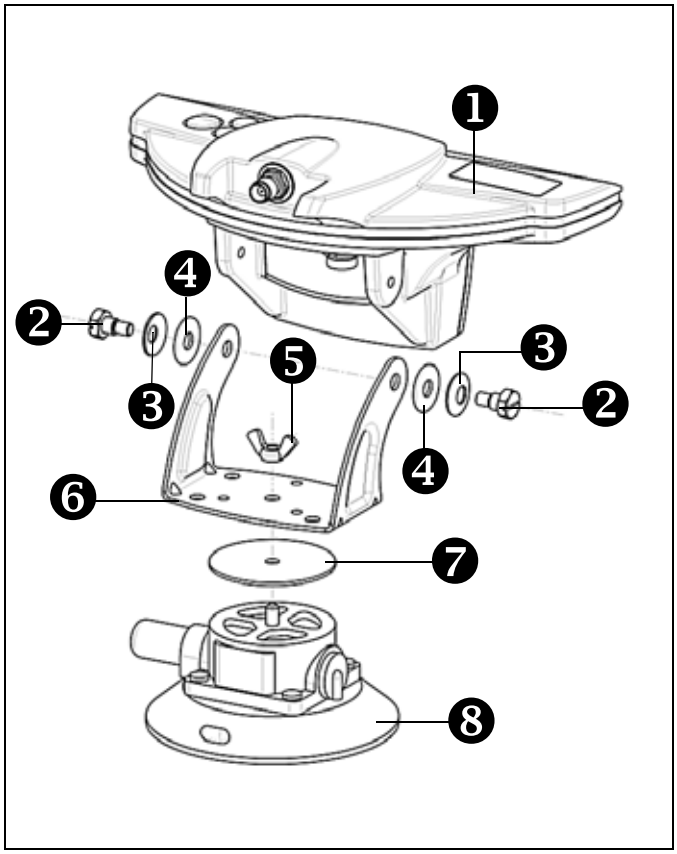
Item	Description
❶	Controller
❷	Display cable
❸	Optional remote keypad
❹	External interface cable

Item	Description
❺	Power harness
❻	Alternative power supply
❼	EZ-Guide Plus lightbar
❽	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. The screws require liquid thread-locking compound for optimum performance.

Note – *Check the orientation of the bracket before you insert the screws.*

Mounting the Lightbar

There are two ways to mount 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

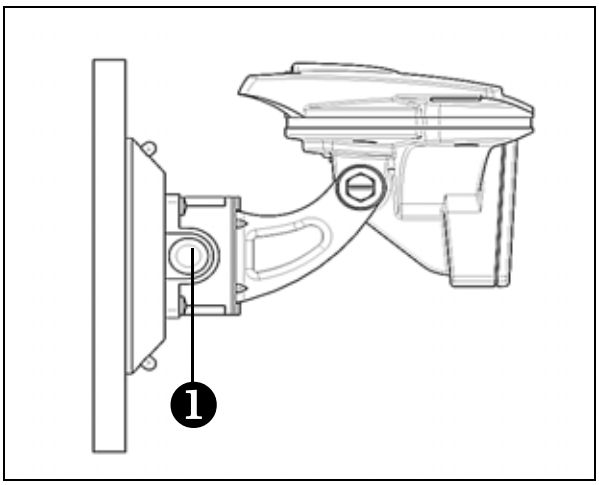
Use the hardware provided to secure the vacuum mount to the mounting bracket.

Step 2

Dampen the rubber seal on the suction cup.

Step 3

To secure the lightbar in the desired location, press the suction cup against a flat surface and then pump 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.

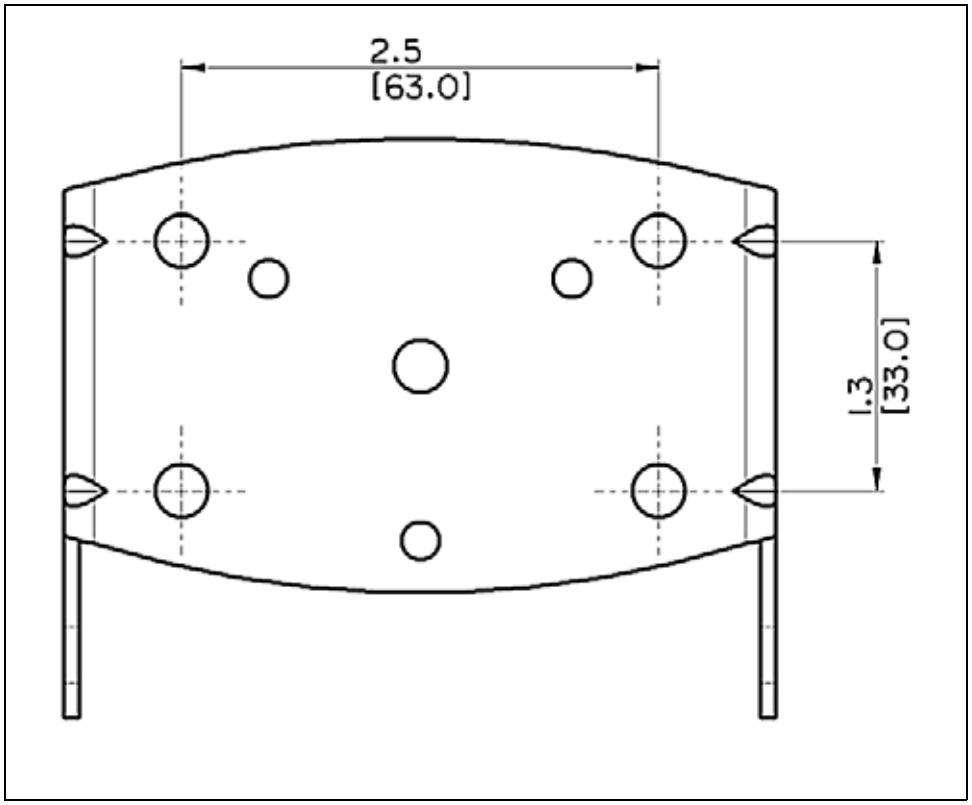


Figure 5.1 Bracket drilling template

Step 3

Screw the mount bracket to the horizontal surface.

Step 4

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

Step 5

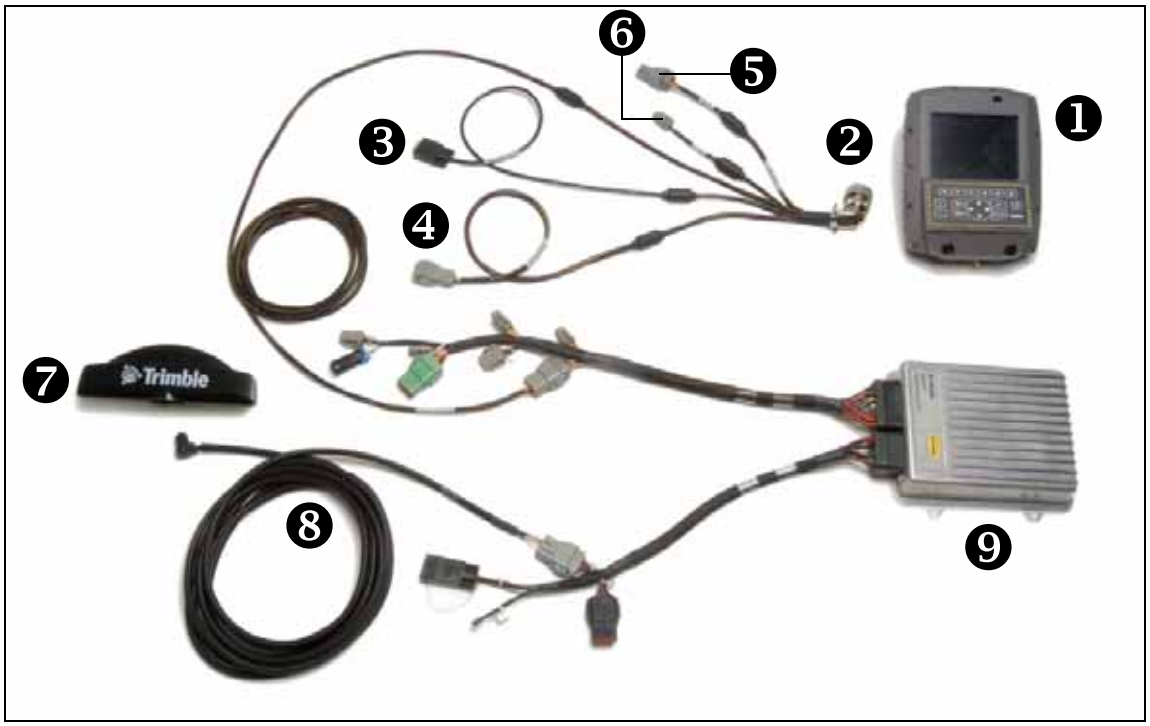
Connect the cable to the EZ-Guide Plus lightbar.

Step 6

Attach the EZ-Guide Plus display cable to the main harness connection, which is 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 Display System Components



Item	Description
1	*Ag*GPS 170 display
2	Display harness
3	Com 1 serial I/O (not used)
4	Switch + *Ag*GPS 170 alarm (not used)
5	*Ag*GPS 170 lightbar (not used)

Item	Description
6	CAN (not used)
7	Lightbar (optional)
8	Lightbar cable (optional)
9	Controller

*Ag*GPS 170 Display System Installation Process

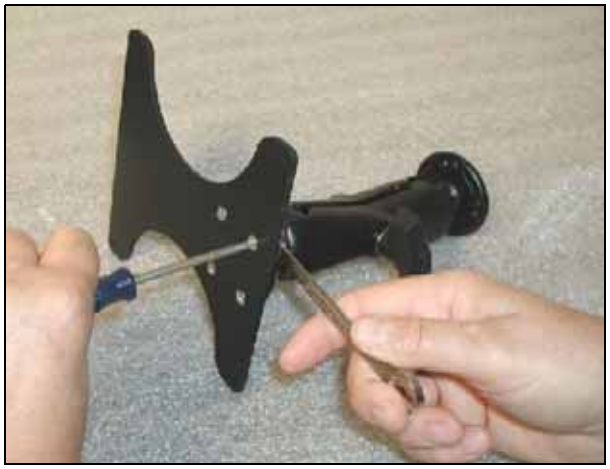
Step 1

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



Step 2

Use the provided hardware to assemble 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 provided hardware.

The mount is being secured so that, with the display toward 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 provided hardware to install 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 then connect it to the connection labeled "Spare".

CHAPTER

6

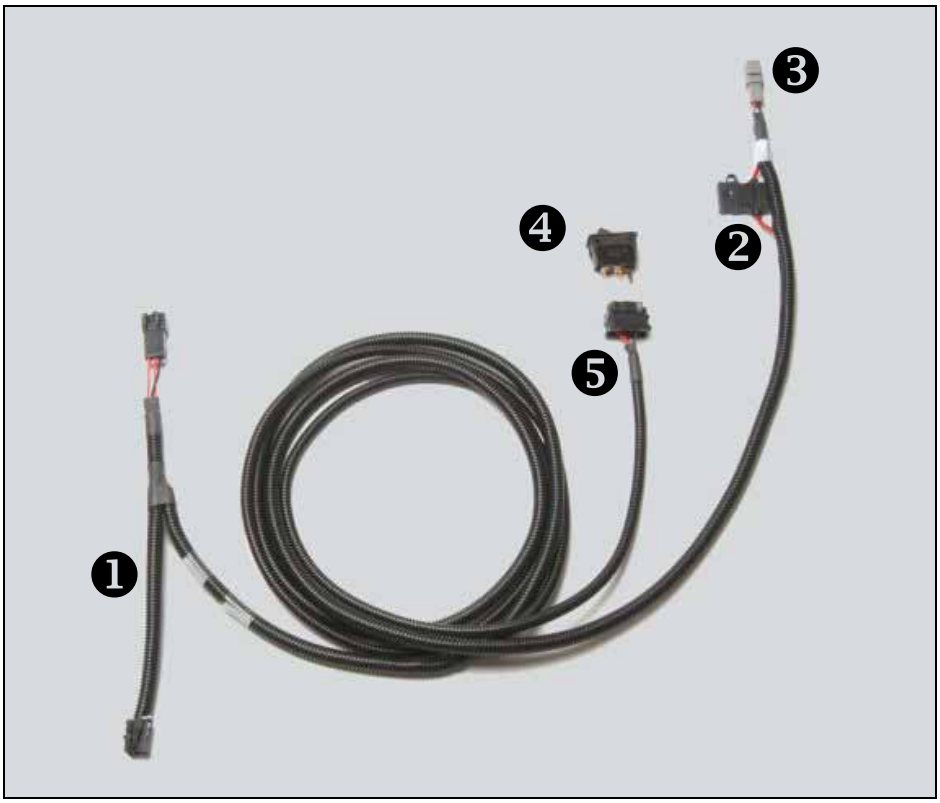
Power Harness Installation

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	Vehicle jumper cable
❷	Fuse holder - Littlefuse 257010, 10 amp
❸	Controller power connection
❹	Switch
❺	Switch receptacle

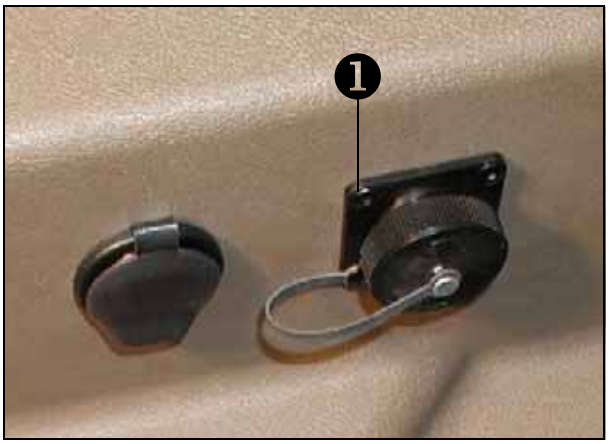
Note –

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

Power Harness Installation Process

Step 1

Locate the accessory outlet ❶ at the right rear of the cab near the electronics bay.



Step 2

Remove the cover of the electronics bay. Reach into the electronics bay up to the back of the accessory outlet. Trace the wire from the accessory outlet until you reach a three pin connector.



Step 3

Pull the connector ❶ out of the electronics bay so it is visible.

Note – *Wire straps may need to be removed to help access connector.*



Step 4

Disconnect the connector and install power cable jumper. Connect the jumper section of the cable to each side of the accessory outlet connections.



Step 5

Determine a location for the power switch in the instrument pillar. Remove the blank from that location.



Step 6

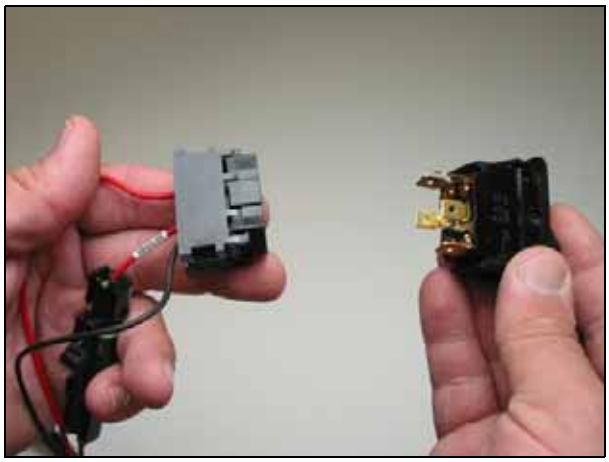
Route the switch connector end of the power cable from the electronics bay up through the bottom of the pillar.

Note – *Switch will light up when Autopilot is turned on if the switch is properly connected.*



Step 7

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



CHAPTER

7

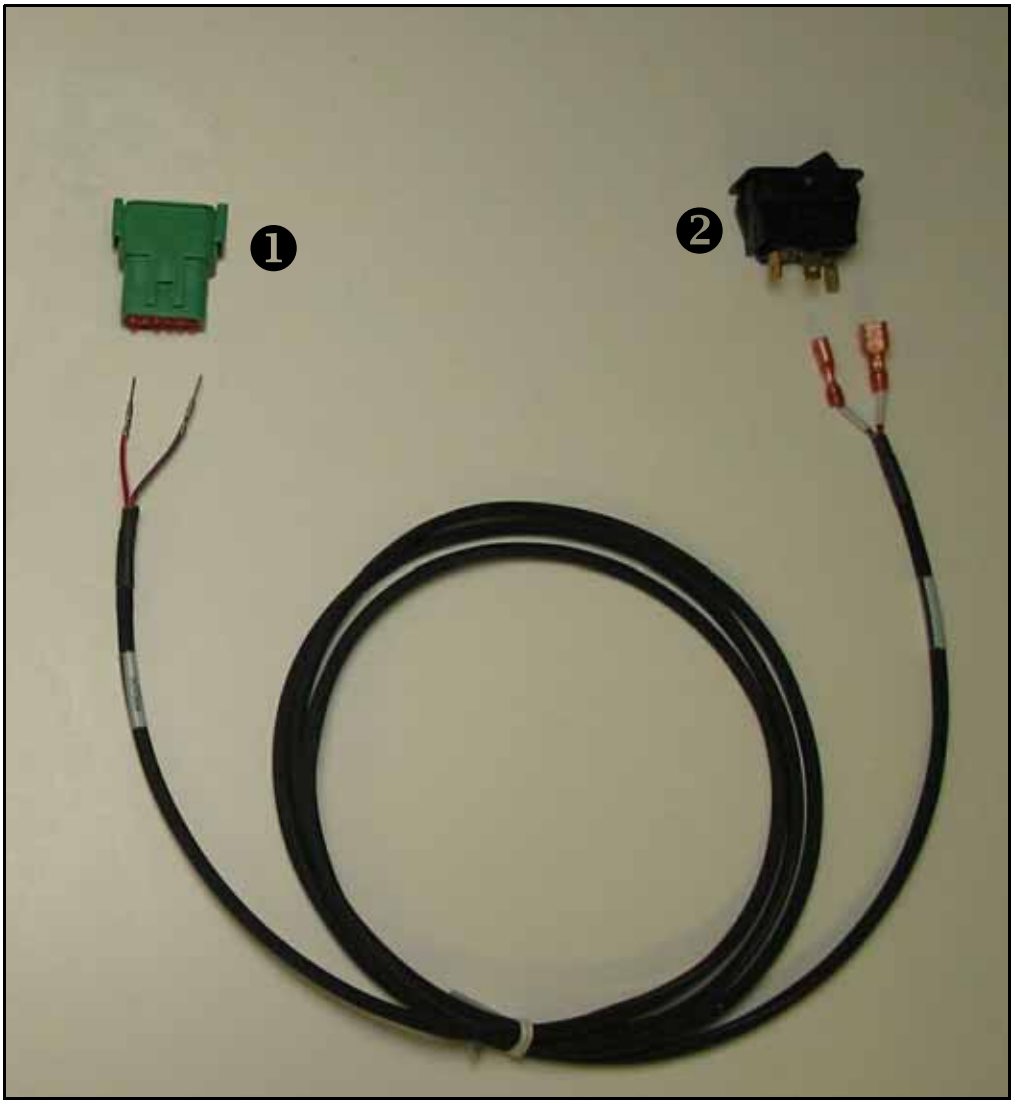
Remote Engage Switch Installation

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.

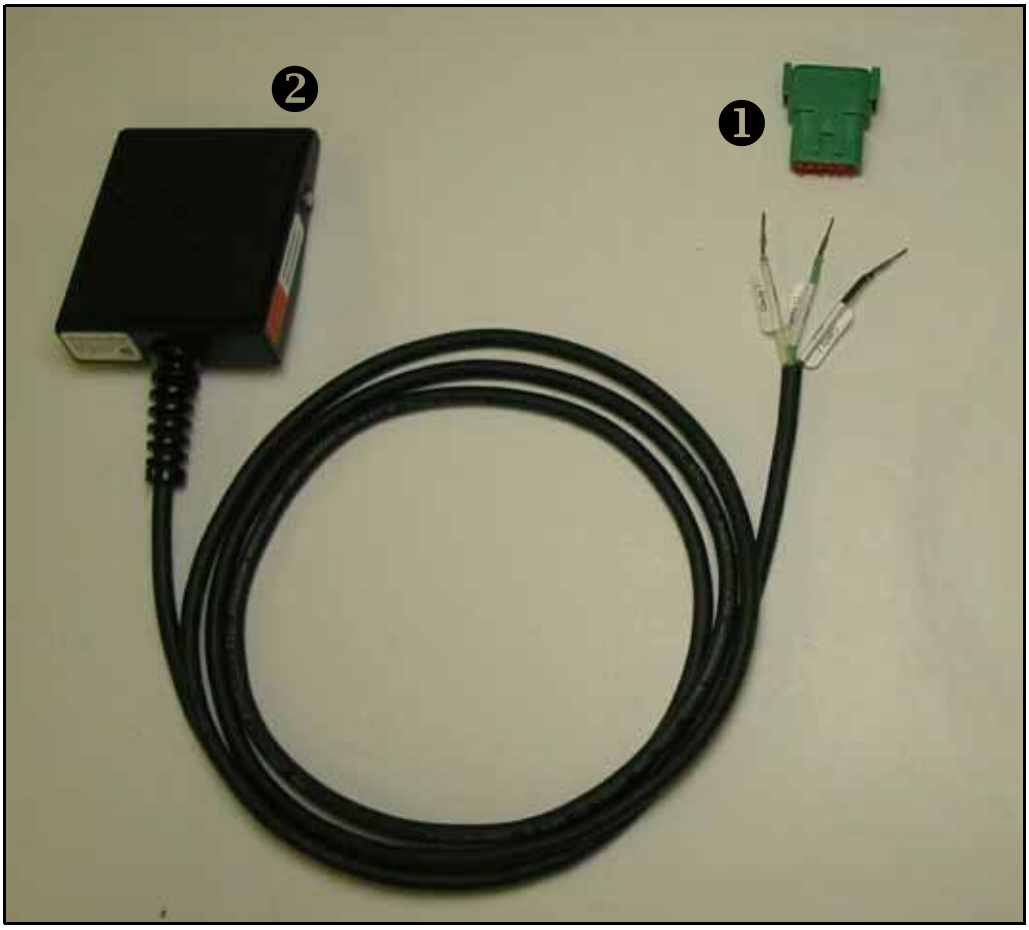
Remote Engage Switch Components: Rocker Switch



Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

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

Remote Engage Switch Components: Foot Switch

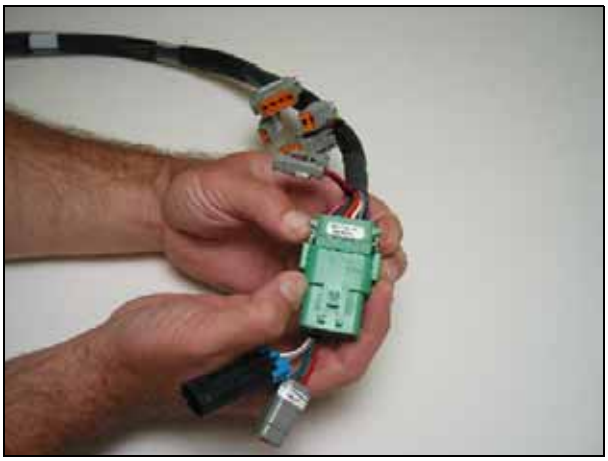


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Prepare the Remote Engage Cable

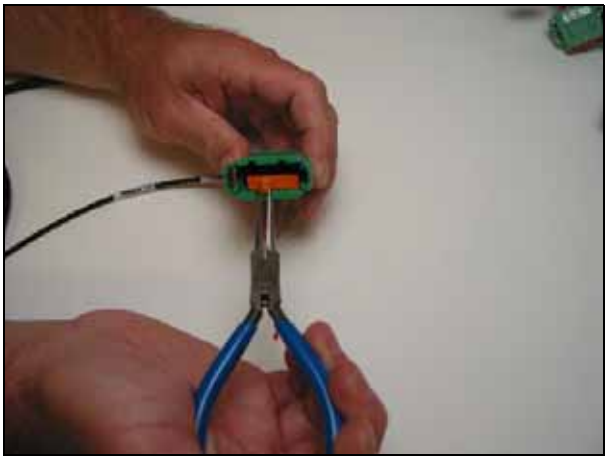
Step 1

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



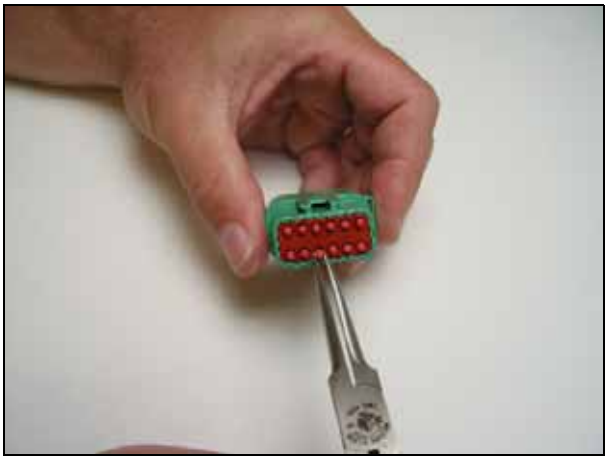
Step 2

Remove the wedge from the connector.



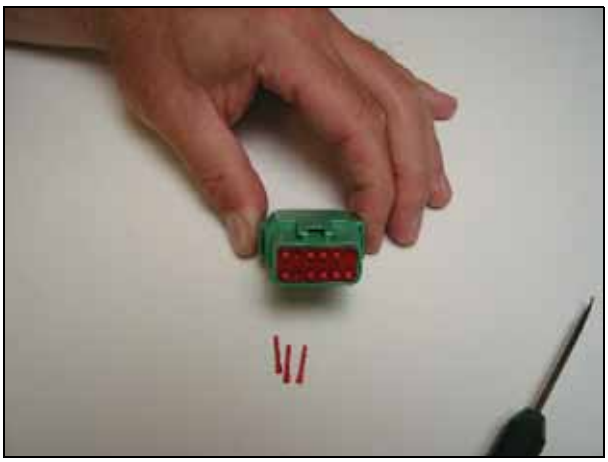
Step 3 Rocker switch only

Remove the plugs from cavity 2 and 7.



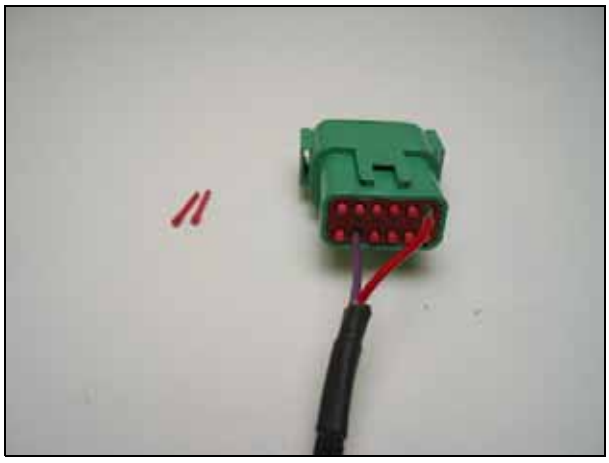
Foot Switch Only

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



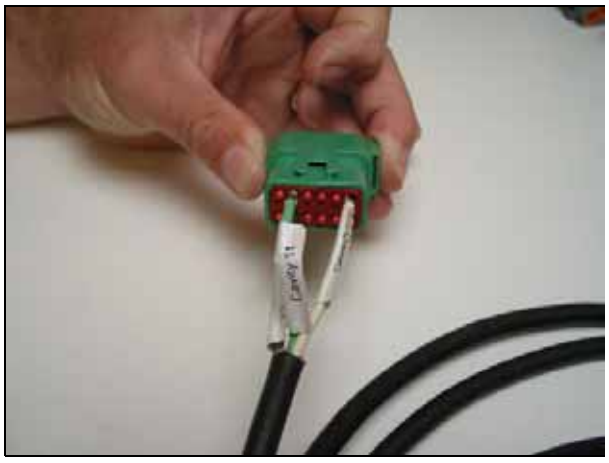
Step 4 Rocker Switch Only

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



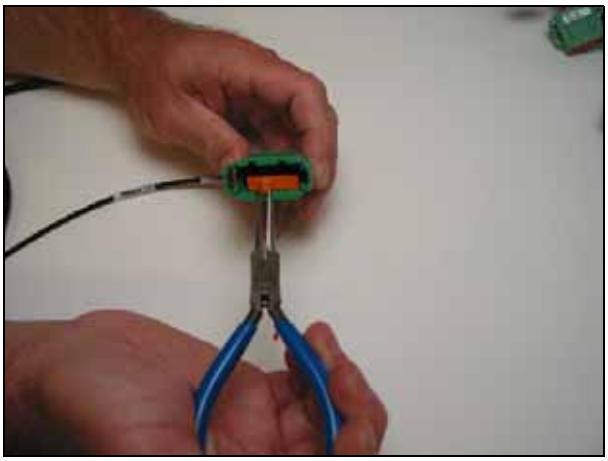
Foot Switch Only

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.



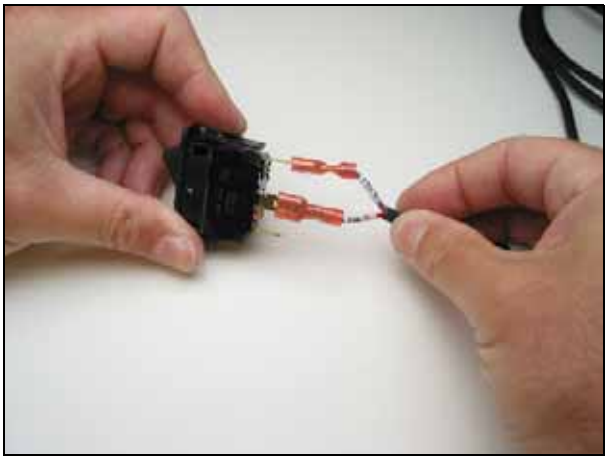
Foot Switch Only

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 matching 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 trainer seat in the cab and lift the seat cushion forward.



Step 2

Remove the plastic insert and the foam pad.



Step 3

Clear the cavity so the controller lies flat on the metal floor. Place the controller inside the cavity with connectors to the right of the machine and flanges down.



Step 4

Note – *On most models, threaded inserts are pre-installed. If they are present, go to Step 8.*

Locate the center of the two mounting ears on the left side 3.0 inches from the left wall of the buddy seat.



Step 5

Locate the center of the two mounting ears towards the front of the buddy seat compartment 2.5 inches from the front steel lip.



Step 6

Using the controller as a template, mark the center of the four slots to be drilled. The controller must be square to the direction of travel. The straight edges of the controller should be parallel to the walls of the compartment.



Step 7

Drill four holes at the positions marked in Step 5. Prior to drilling verify wires and hoses are not underneath the floor in the way of the drilled holes. Drill the holes to match the 10-32 x 1" fasteners supplied.



Step 8

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



Step 9

Insert the four fasteners and secure controller to floor. Verify the controller is square and parallel to the steel walls of the compartment. If you use the pre-threaded inserts, use 6 mm screws (not provided in the kit).



Step 10

Access the fasteners on the underside of the cab to tighten.



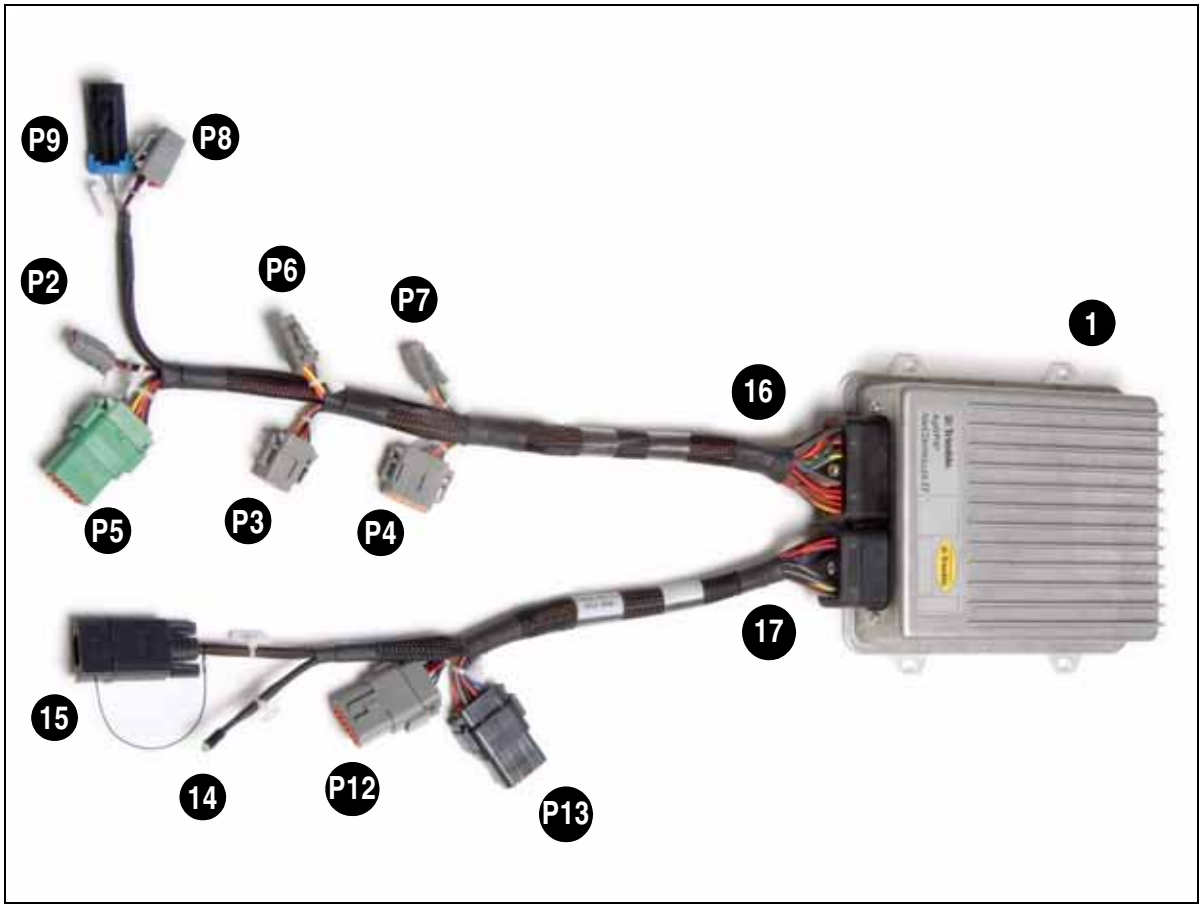
Step 11

Route all cables into controller compartment and coil excess cable. Make all connections to main harness.

Note – *The cables can be routed through an access hole in the rear corner of the trainer seat cavity.*



Controller Connections



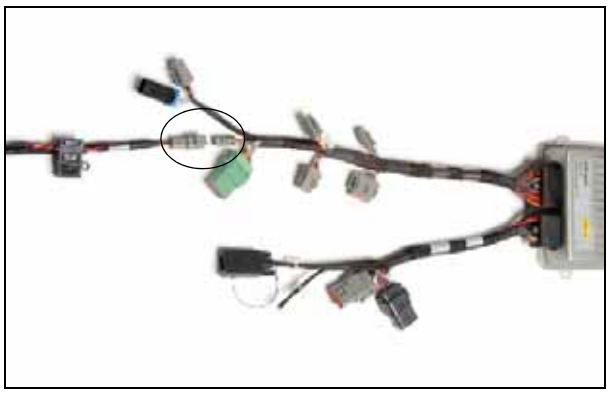
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

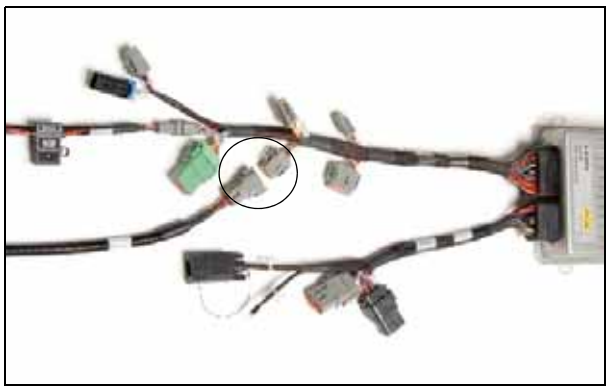
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

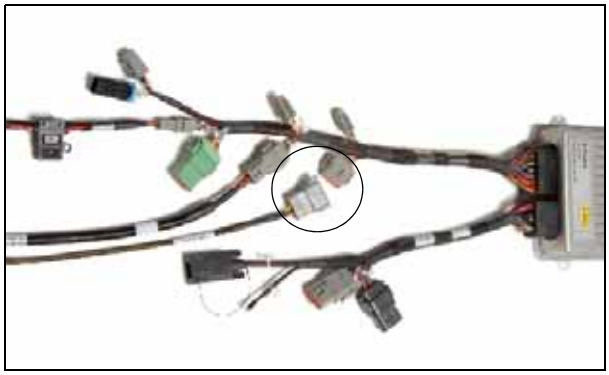
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

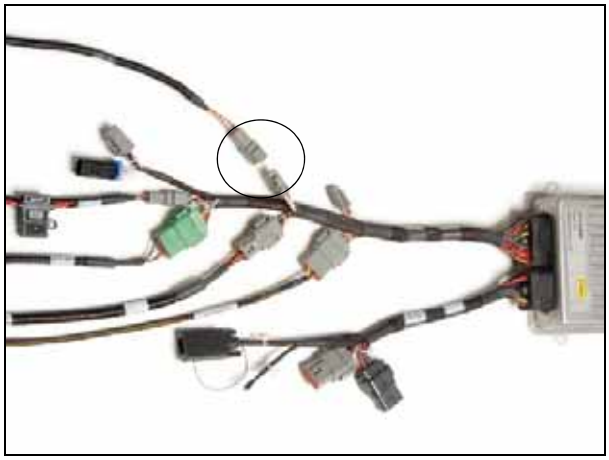
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

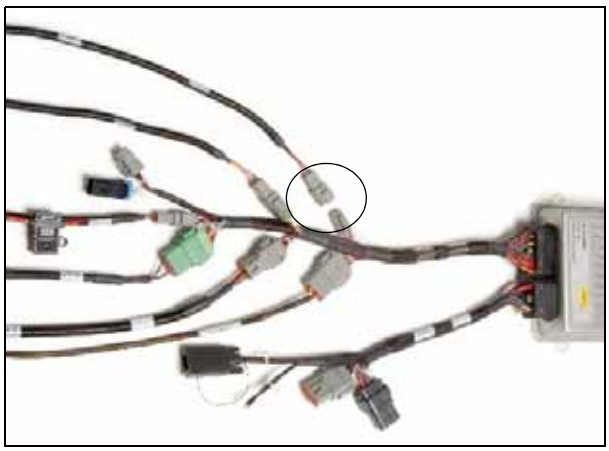
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

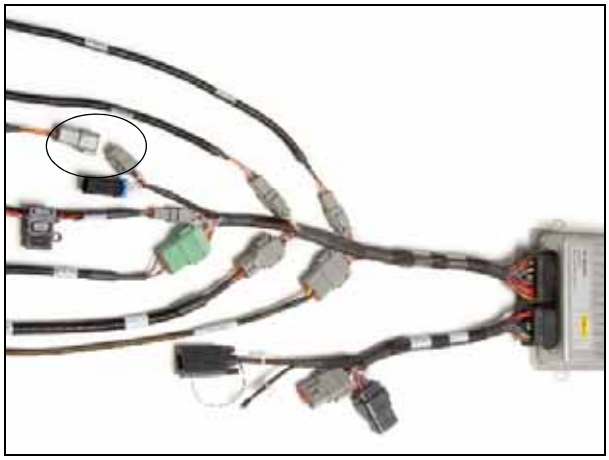
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 6

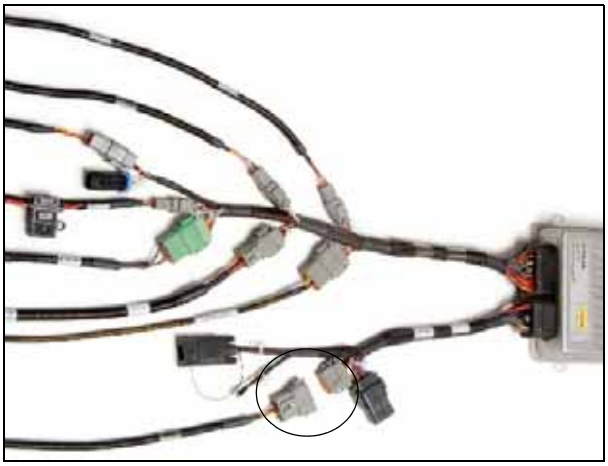
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 7

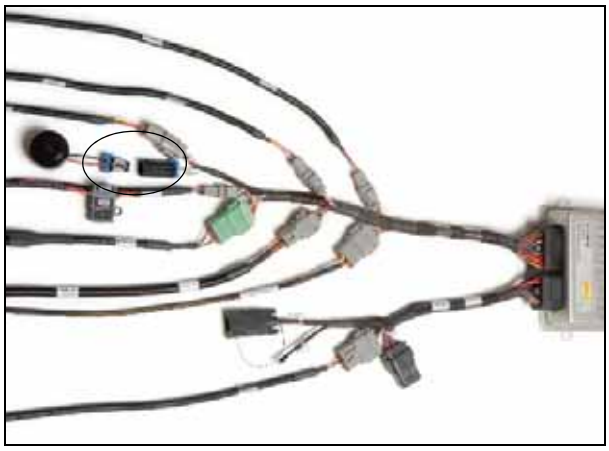
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



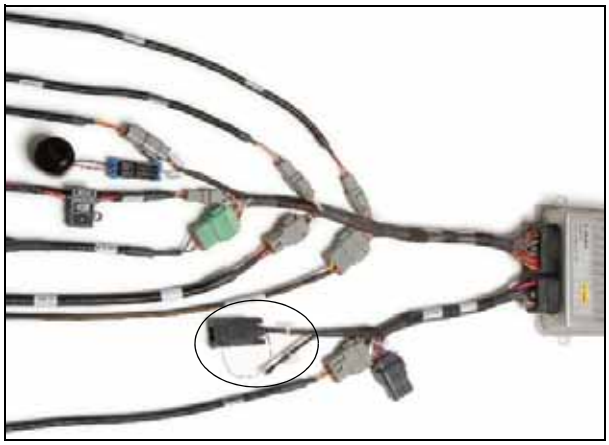
Step 8

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

Carefully turn the machine fully left and right and check for clearance on the angle sensor assembly. There should be no interference or binding of any of the linkage.

Step 4

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*.