*Ag*GPS® Autopilot™ Automated Steering System

Installation Instructions

Case IH

- **FLX 3010 Floater**
- **FLX 3510 Floater**
- **FLX 4010 Floater**
- **FLX 4510 Floater**

Version 3.00
Revision B
Part Number 54037-62-E03
December 2010

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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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 54037-62	5/16", 3/8", and 7/16" drill bits
Hydraulic Hose Kits: P/N 57096 (3010 and 3510)	Allen wrench set (metric and SAE)
P/N 55907 (4010 and 4510)	Open end wrench set (metric and SAE)
Roof bracket kit: P/N 53676	

Autopilot Hardware Organization - as Shipped

Platform kit (P/N 54037-62)	Common parts	GPS receiver	Display	Hyd. hose kit (P/N 57096 and P/N 55907)	Roof bracket kit (P/N 53676)
(2) Hydraulic valve and manifold (2) Transducer, flow switch (2) Manual override cable (2) Bolt kit - hydraulics (2) Hydraulic valve cable (3) Steering angle cable (3) Steering sensor, mounting brackets, and hardware (6) Power cable (7) Bolt kit, controller	(7) Controller (7) 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, pressure transducer • Hydraulic valve cable • Manual override cable	• Steering 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 and switch	• Controller • Mounting plate • Bolt kit - controller • Main wiring harness • Aux. wiring harness • Sonalert alarm

Pre-installation Vehicle Preparation

Step 1

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

Step 2

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

Step 3

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

Step 4

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

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

CHAPTER

2

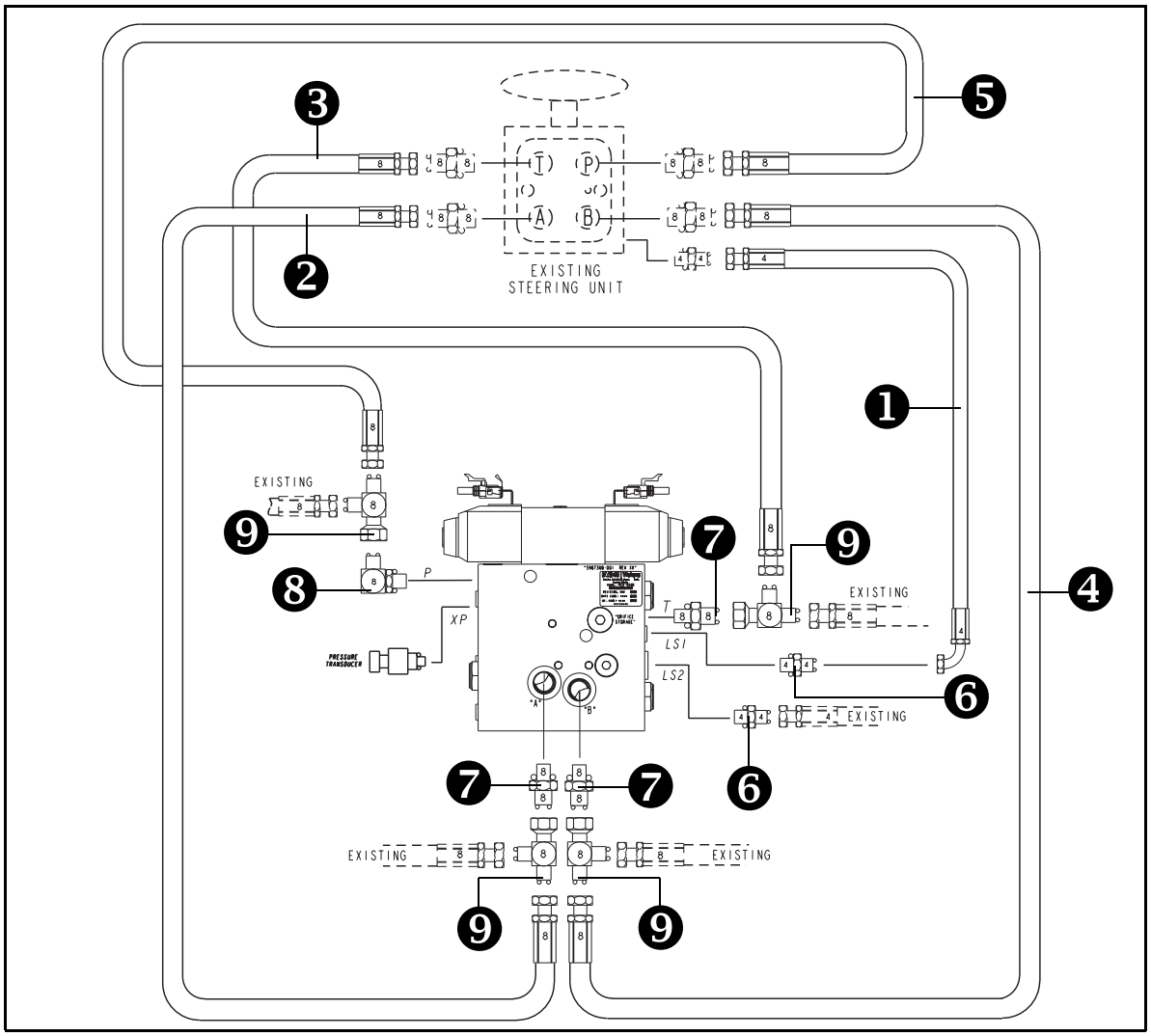
Hydraulic Control Valve Installation

In this chapter:

- FLX 3010 and 3510 Hydraulic Control Valve Components
- FLX 4010 and 4510 Hydraulic Control Valve Components
- Prepare the Manifold, Hydraulic Control Valve, and the Flow Switch Assembly
- Mounting the Hydraulic Manifold (3010 and 3510 Models)
- Mounting the Hydraulic Manifold (4010 and 4510 Models)
- Install the Hydraulic Hoses (3010 and 3510 Models)
- Install the Hydraulic Hoses (4010 and 4510 Models)
- Secure the Electrical Connectors

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

FLX 3010 and 3510 Hydraulic Control Valve Components

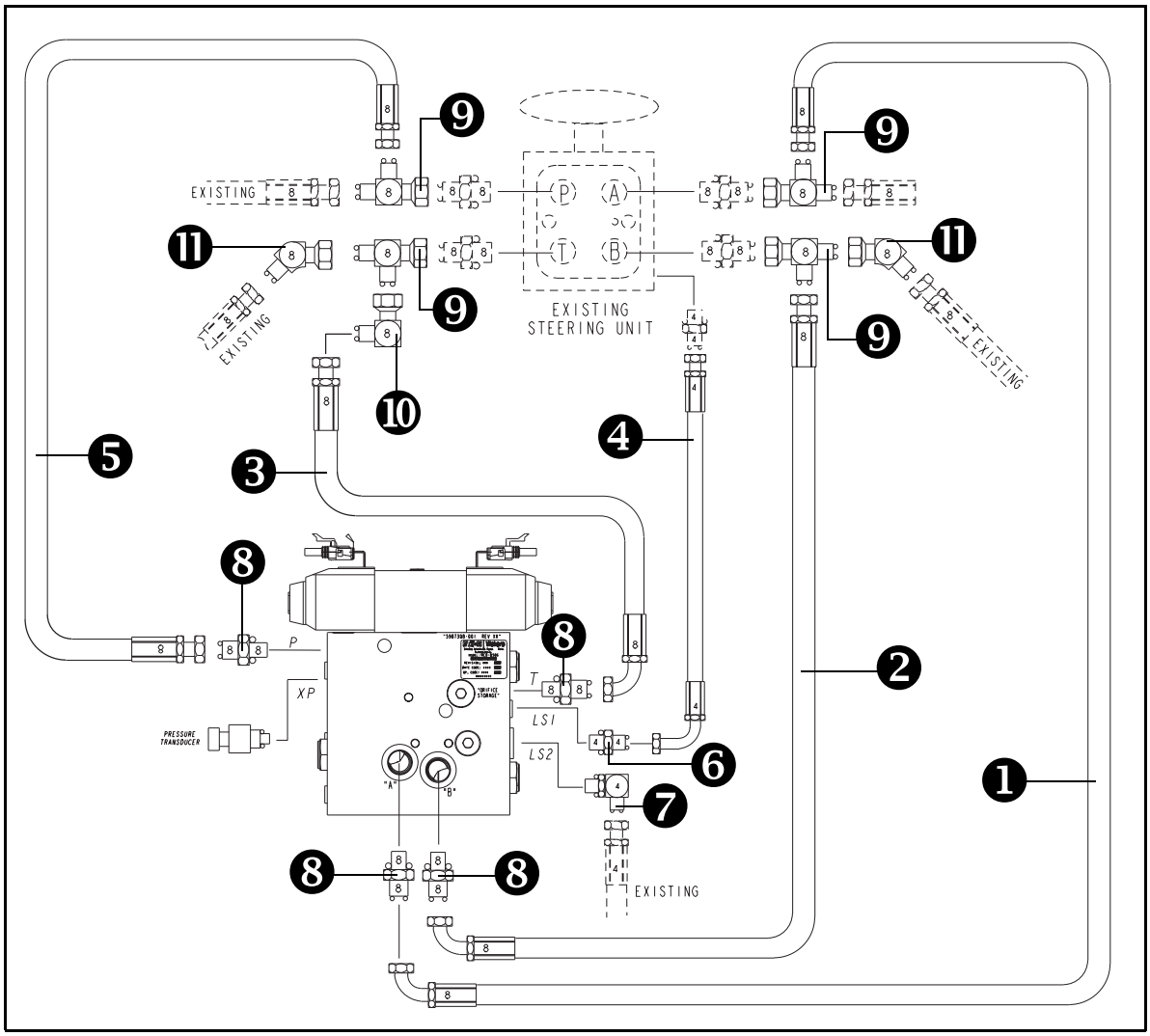


Item	Description	Part number
❶	48 inch hose	F451TC J9JS-04-04-04-48
❷	39 inch hose	F451TC JSJS-08-08-08-39
❸	38 inch hose	F451TC JSJS-08-08-08-38
❹	38 inch hose	F451TC JSJS-08-08-08-38
❺	37 inch hose	F451TC JSJS-08-08-08-37

Item	Description	Part number
❻	Fitting (x2)	4 F5OLO-S
❼	Fitting (x3)	8 F5OLO-S
❽	Fitting	8 C5OLO-S
❾	Fitting (x4)	8 R6OLO-S

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

FLX 4010 and 4510 Hydraulic Control Valve Components



Item	Description	Part number
❶	32 inch hose	F451TC J9JS-08-08-08-32
❷	32 inch hose	F451TC J9JS-08-08-08-32
❸	27 inch hose	F451TC J9JS-08-08-08-27
❹	24 inch hose	F451TC J1JS-04-04-04-24
❺	24 inch hose	F451TC JSJS-08-08-08-24
❻	Fitting	4 F5OLO-S

Item	Description	Part number
❼	Fitting	4 C5OLO-S
❽	Fitting (x4)	8 F5OLO-S
❾	Fitting (x4)	8 R6LO-S
❿	Fitting	8 C6LO-S
⓫	Fitting (x2)	8 V6LO-S

Part numbers are Parker numbers and are for reference only.

Prepare the Manifold, Hydraulic Control Valve, and the Flow Switch Assembly

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

Step 1

Locate the pilot-to-shift cartridge, cavity plug, and *Ag*GPS Autopilot manifold.

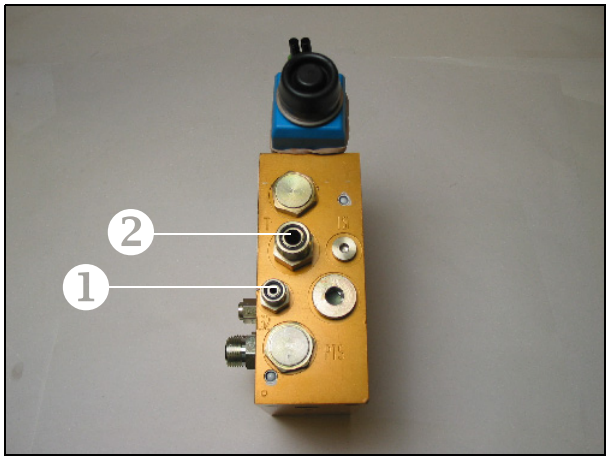


Step 2 3000 Series

Insert the following fittings in the ports as shown:

❶ -4 ORFS straight in the LS2 port

❷ -8 ORFS straight in the T port

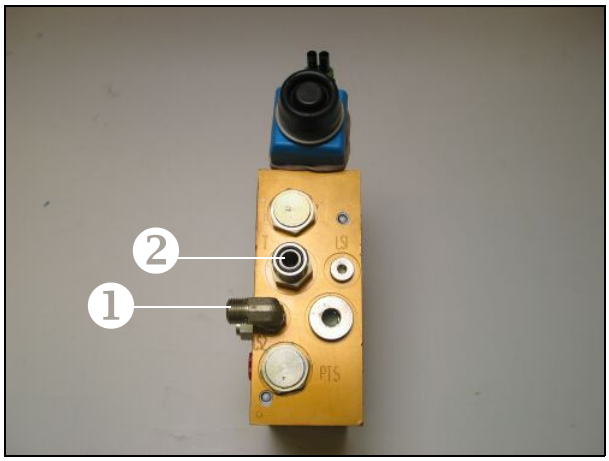


4000 Series

Insert the following fittings in the ports as shown:

❶ -4 ORFS 90 in the LS2 port

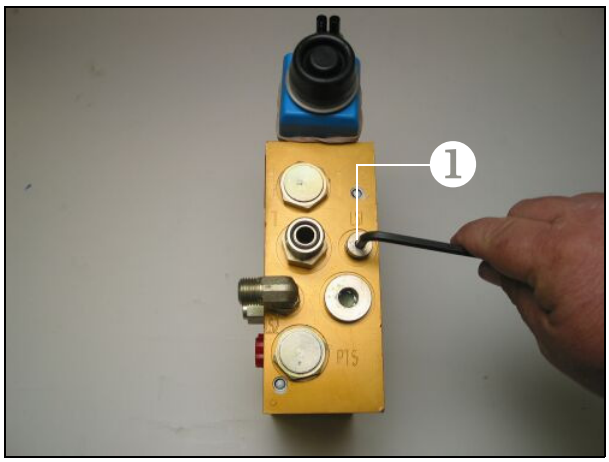
❷ -8 ORFS straight in the T port



Step 3

Remove the -4 ORB plug from the LS1 port ❶. Save the plug.

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



4000 SERIES SHOWN

Step 4

Install a -4 ORFS straight fitting in the LS1 port ❶.



4000 SERIES SHOWN

Step 5

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



Step 6

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.*



4000 SERIES SHOWN

Step 7

Insert the PTS cartridge in the cavity as shown. The cartridge should match the cavity dimensions.

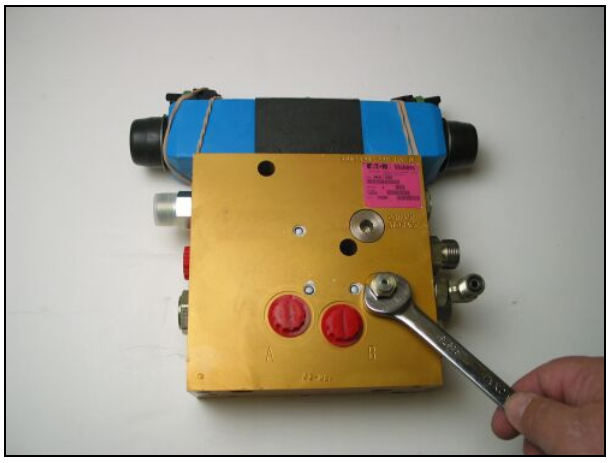
Note – *The o-rings and backup rings must be clean and in place to seal the cavity correctly.*



4000 SERIES SHOWN

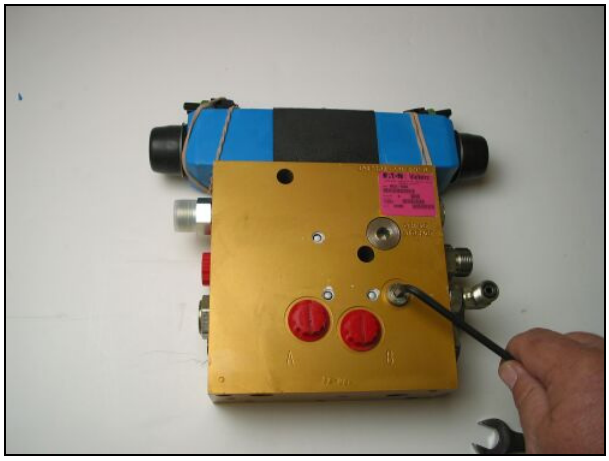
Step 8

Remove the check valve as shown.



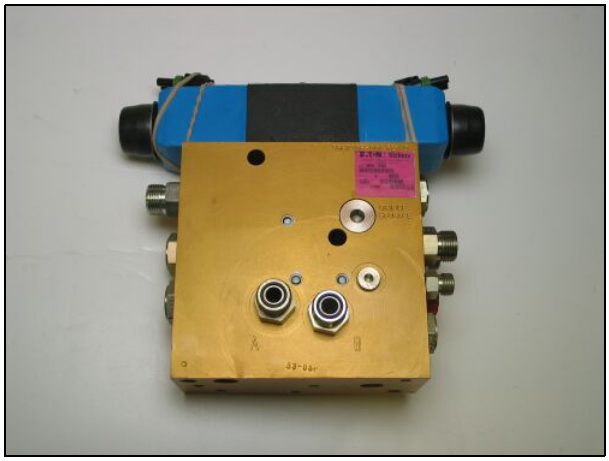
Step 9

Insert the -4 plug from Step 3 in place of the check valve.



Step 10

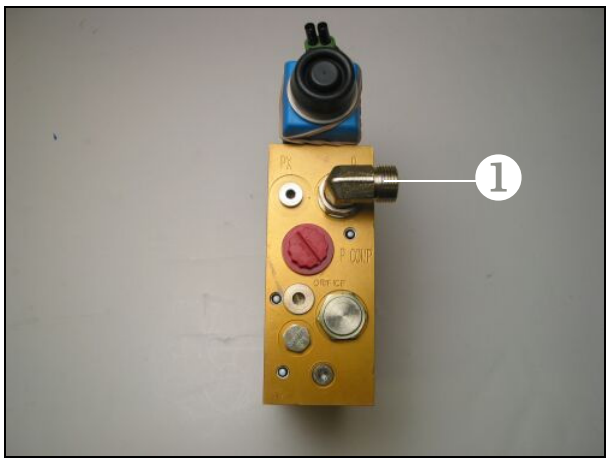
Install two -8 ORFS straight fittings in the A and B ports.



4000 SERIES SHOWN

Step 11 3000 Series Only

Install a -8 ORFS 90 fitting in the P port ❶.



4000 Series Only

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



Step 12

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



Step 13

Remove the plastic plug from the port labeled "P-COMP" ❶.



4000 SERIES SHOWN

Step 14

Install the P-Comp cartridge plug.

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



4000 SERIES SHOWN

Step 15

Remove the -4 plug from the pressure transducer PX port.



4000 SERIES SHOWN

Step 16

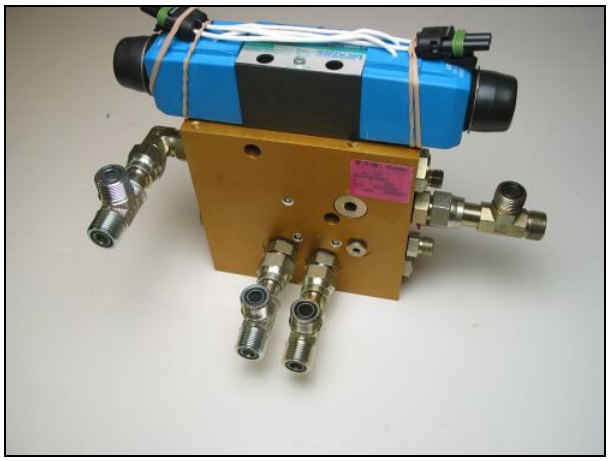
Install the pressure transducer in the PX port.



4000 SERIES SHOWN

Step 17 3000 Series Only

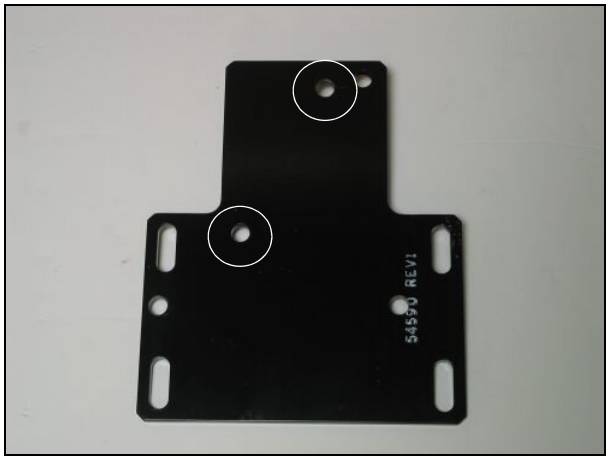
Attach -8 swivel tees to the P, T, A, and B port fittings. Leave the fittings loose in the orientation shown.



Mounting the Hydraulic Manifold (3010 and 3510 Models)

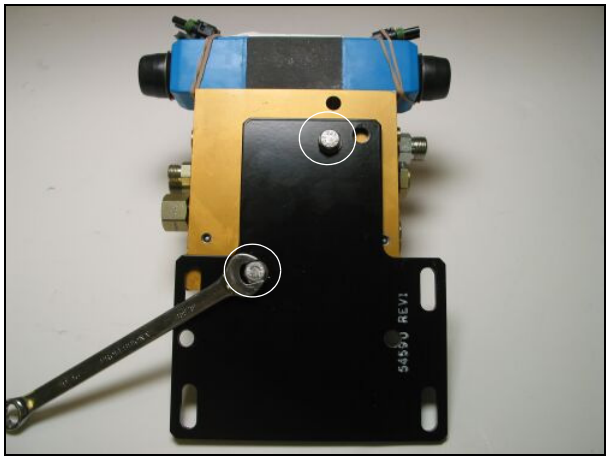
Step 1

Use the holes shown to mount the valve to the valve mounting bracket.



Step 2

Use the two 3/8" x ¾" long bolts and lock washers to fasten the bracket to the manifold. Use the blind tapped 3/8" holes in the manifold body.



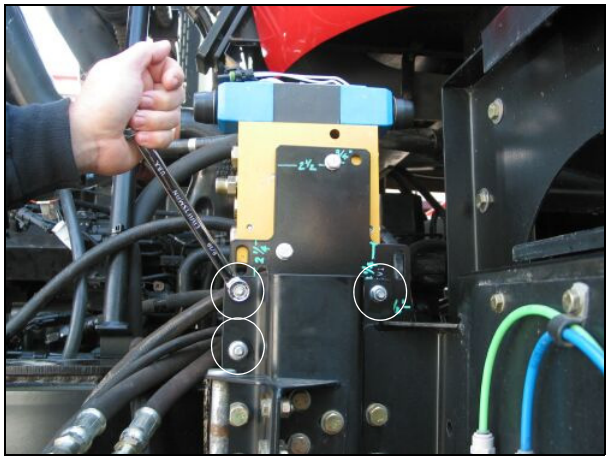
Step 3

Swing the cab stairs away from the vehicle and position the valve on the fame rail as shown.



Step 4

Use three 3/8" x 1" bolts and locking nuts (supplied in the manifold bolt kit) to secure the manifold.



Mounting the Hydraulic Manifold (4010 and 4510 Models)

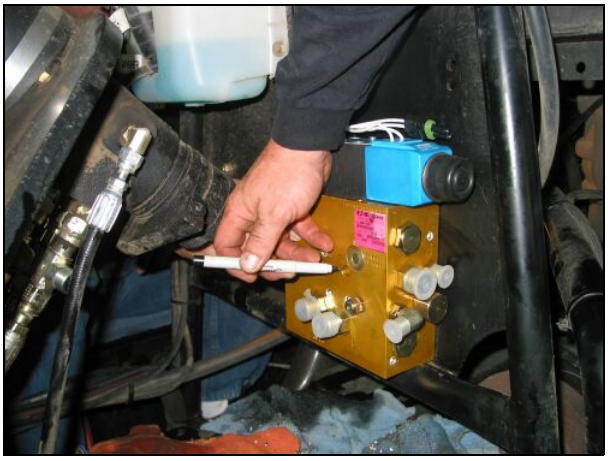
Step 1

Install the valve to the vertical sheet metal in front of the hand pump.



Step 2

Place the valve in location and use a punch or marker to mark the two through holes on the manifold.



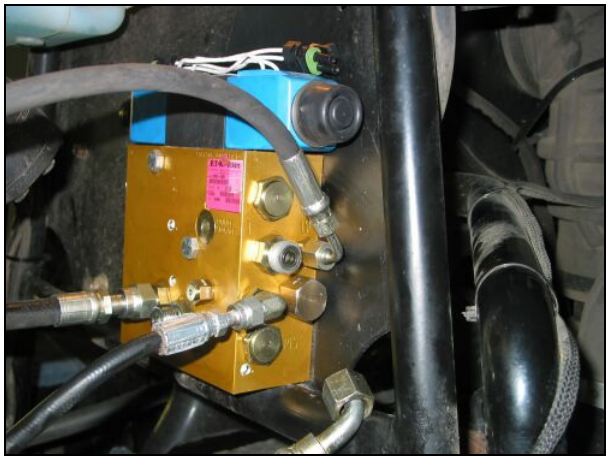
Step 3

Drill two 7/16" holes as marked.



Step 4

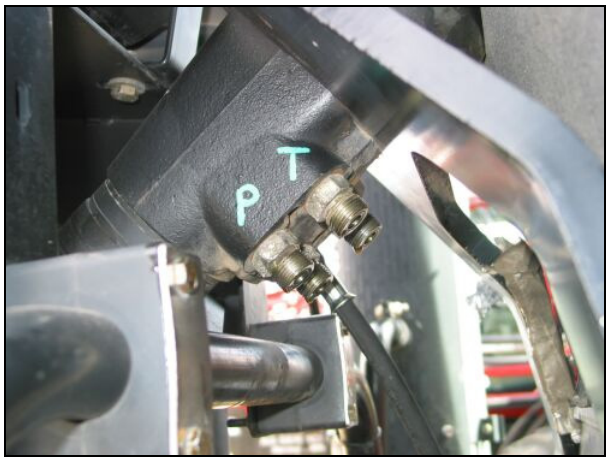
Use the two 3/8" x 3-½" bolts (supplied in the manifold bolts kit) to secure the manifold and hardware.



Install the Hydraulic Hoses (3010 and 3510 Models)

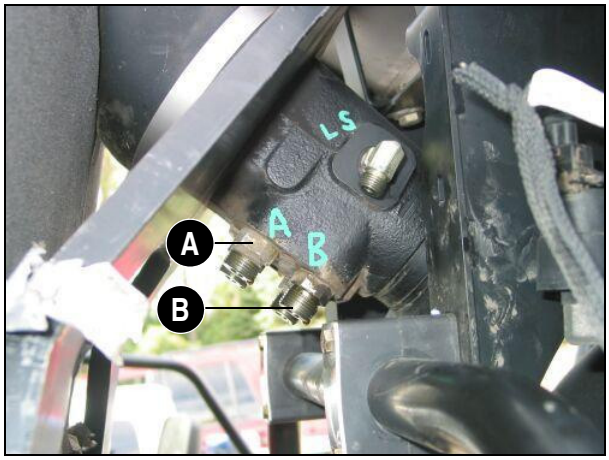
Step 1

Mark the load sense, pressure, and tank hoses and connections as shown. P and T are marked on the hand pump.



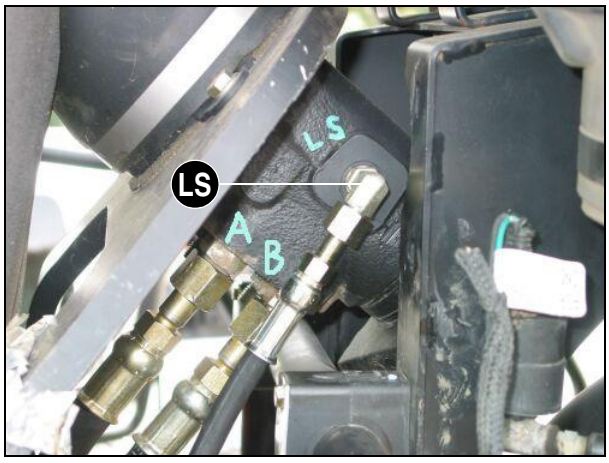
Step 2

Mark the Left/A and Right/B lines as shown. L and R are marked on the hand pump.



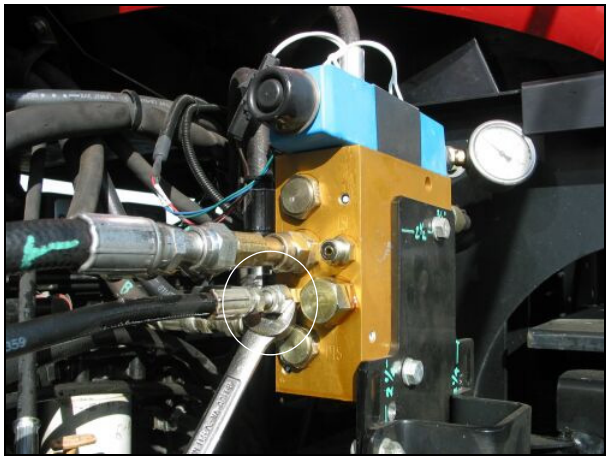
Step 3

Remove the existing load sense line at the hand pump.



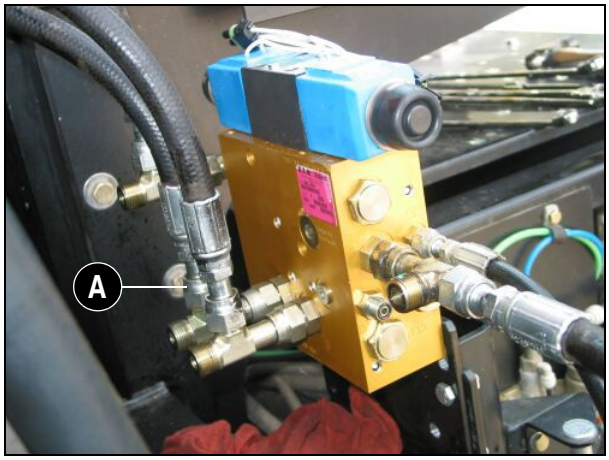
Step 4

Connect the existing Load Sense line to the LS2 port ❶ on the manifold.



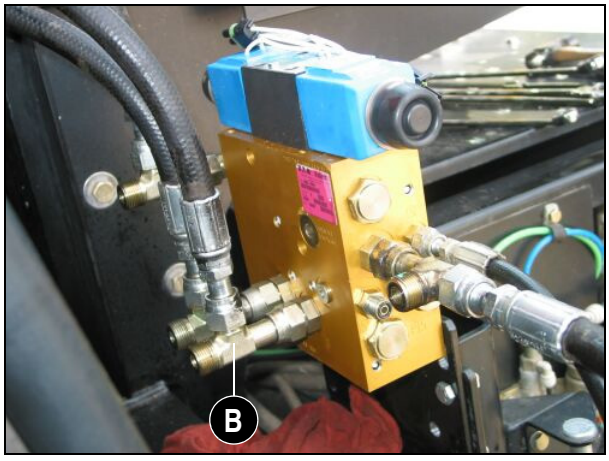
Step 5

Remove the Left/A hose from the hand pump and connect it to the A port on the *Ag*GPS Autopilot manifold.



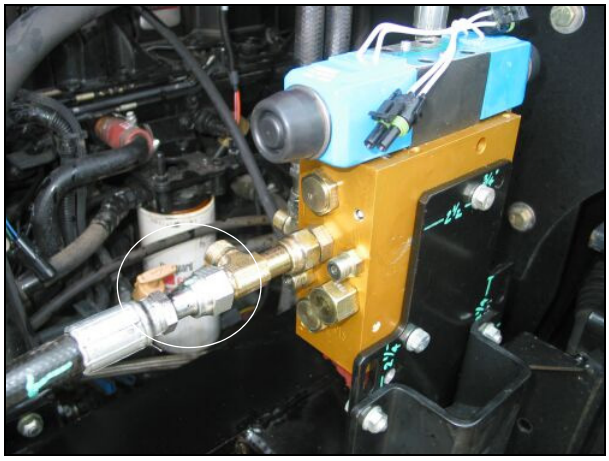
Step 6

Remove the Right/B hose from the hand pump and connect to the B port on the *Ag*GPS Autopilot manifold.



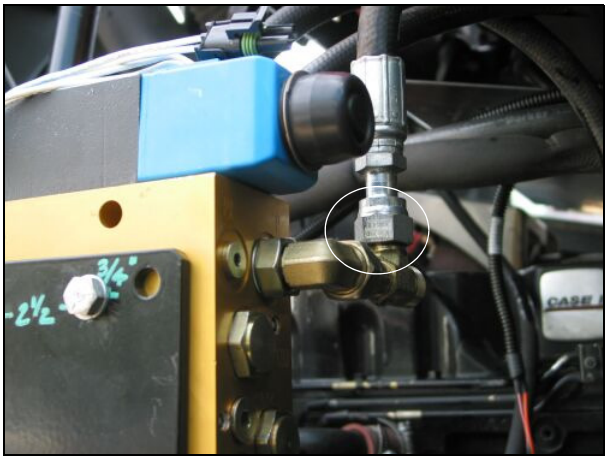
Step 7

Remove the Tank hose from the hand pump and connect it to the T port on the manifold.



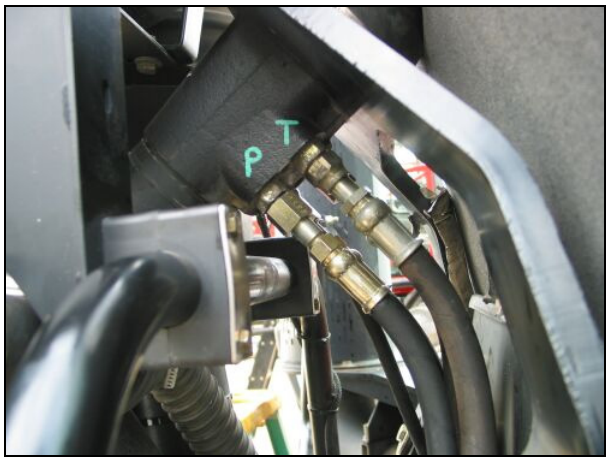
Step 8

Remove the pressure hose from the hand pump and connect it to the P port on the manifold.



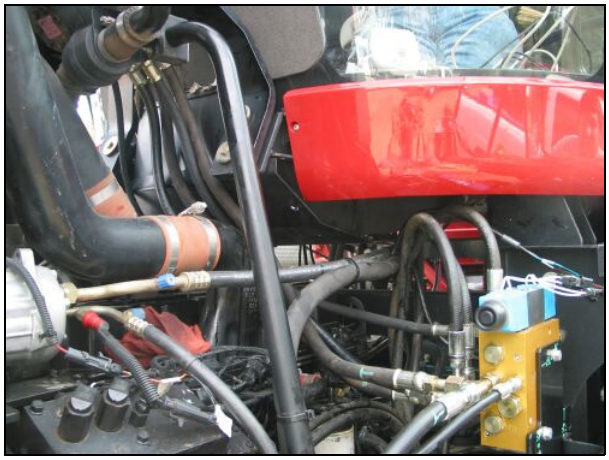
Step 9

Attach the -8 straight ends of the left, right, pressure, and tank hoses (kit supplied) to the hand pump fittings.



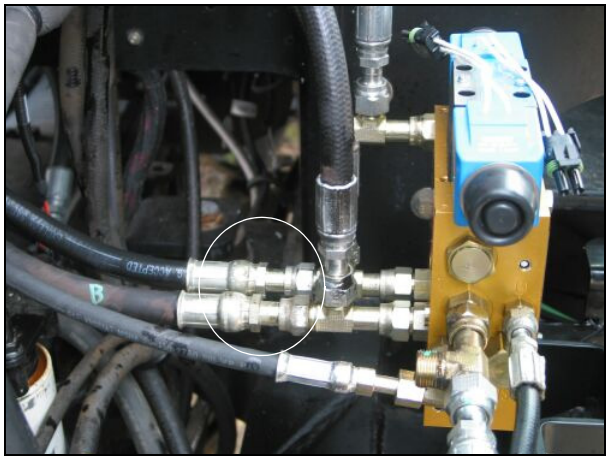
Step 10

Route the hoses to the manifold.



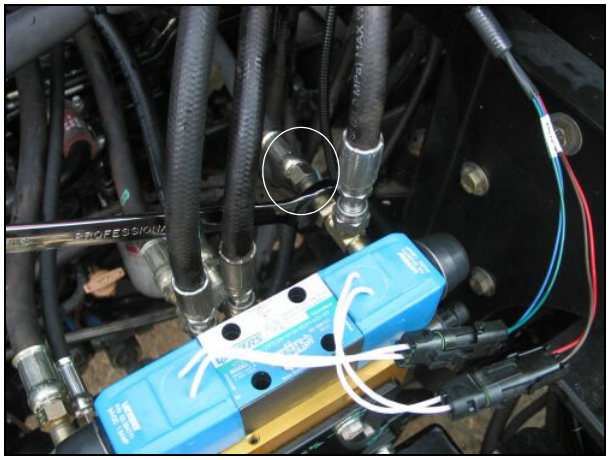
Step 11

Connect the A and B hoses to the A and B ports on the manifold.



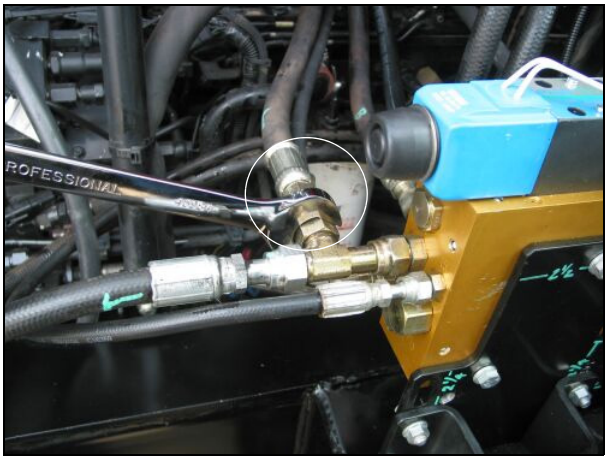
Step 12

Connect the pressure hose to the P port on the manifold.



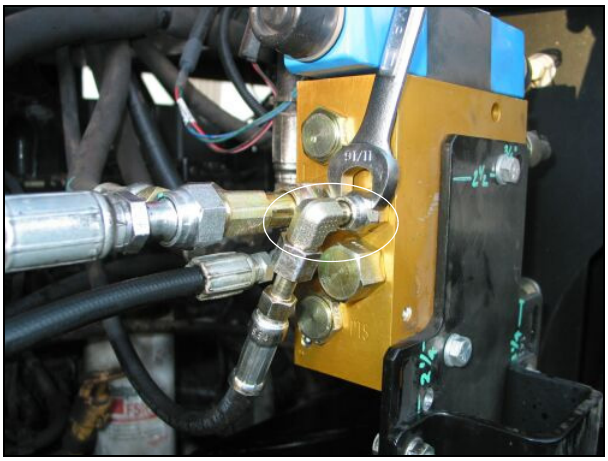
Step 13

Connect the tank hose to the T port on the manifold.



Step 14

Connect the -4 long 90 end of the kit supplied load sense line to the LS1 port on the manifold.



Step 15

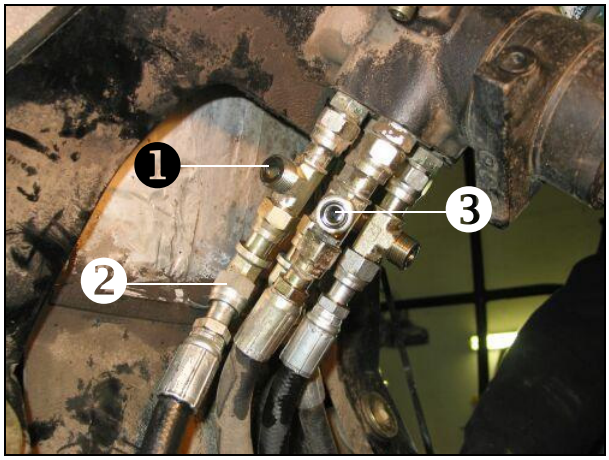
Connect the other end of the LS line to the hand pump.



Install the Hydraulic Hoses (4010 and 4510 Models)

Step 1

Install a -8 ORFS swivel tee ❶ and -8 ORFS 45 Swivel ❷ in line with the B/Right port. Install a -8 ORFS swivel tee ❸ in line with the A/Left port.



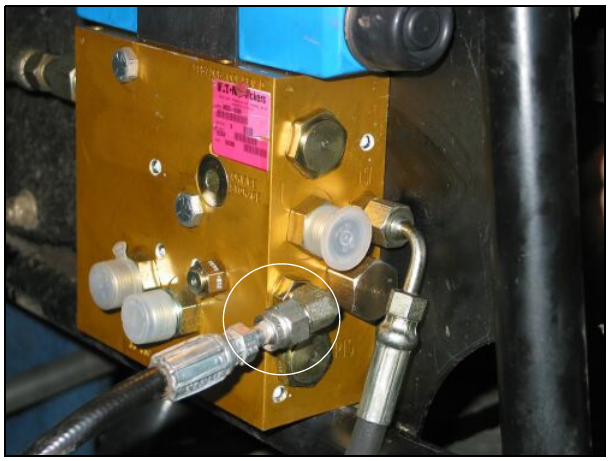
Step 2

Remove the existing -4 load sense line at the hand pump and route it to the manifold.



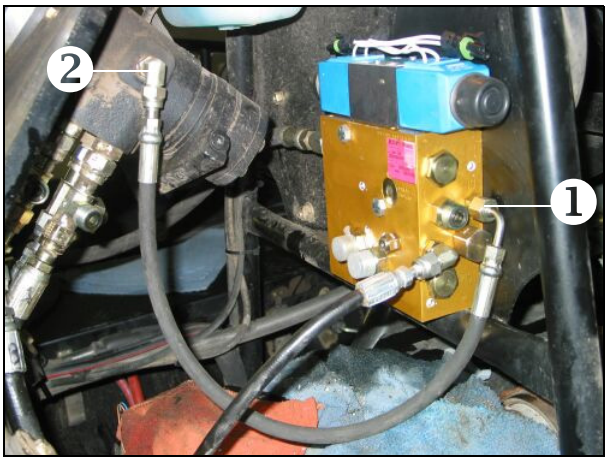
Step 3

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



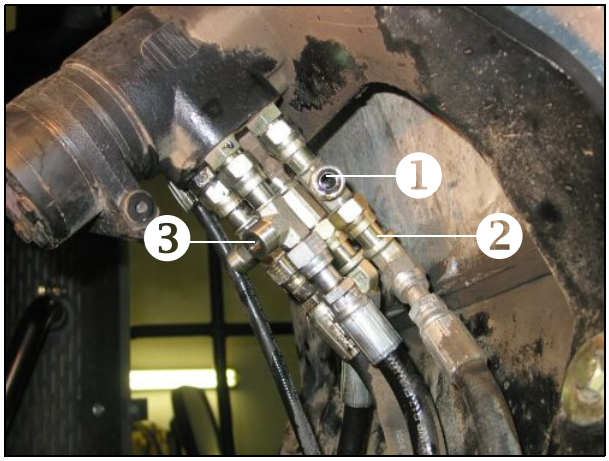
Step 4

Connect the -4 long 90 end of the kit supplied LS hose to the manifold LS1 port ❶. Connect the other end to the hand pump load sense fitting ❷.



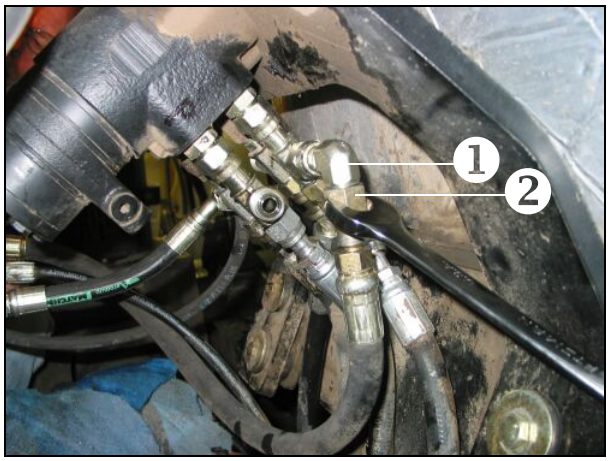
Step 5

Install a -8 ORFS swivel tee ❶ and -8 ORFS 45 swivel ❷ in line with the T (tank) port. Install a -8 ORFS swivel tee ❸ in line with the P (pressure) port.



Step 6

Install a -8 ORFS 90 swivel ❶ to the T line. Then connect the -8 straight end of the kit supplied tank hose to the fitting ❷.



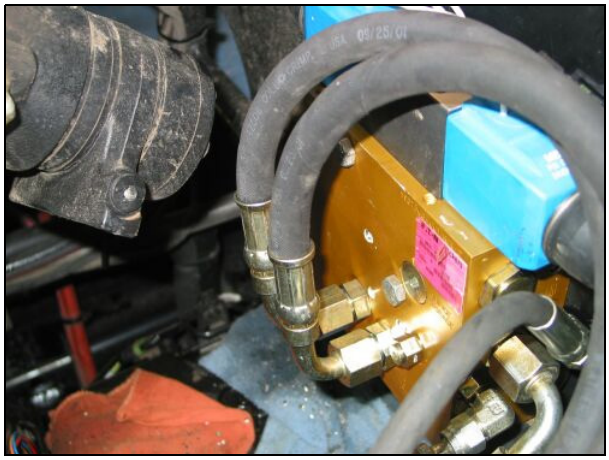
Step 7

Connect the -8 ORFS 90 end of the tank hose to the manifold T port.



Step 8

Connect the -8 ORFS 90 end of the kit supplied left hose to the A port and the -8 ORFS 90 end of the kit supplied right hose to the B port on the manifold.



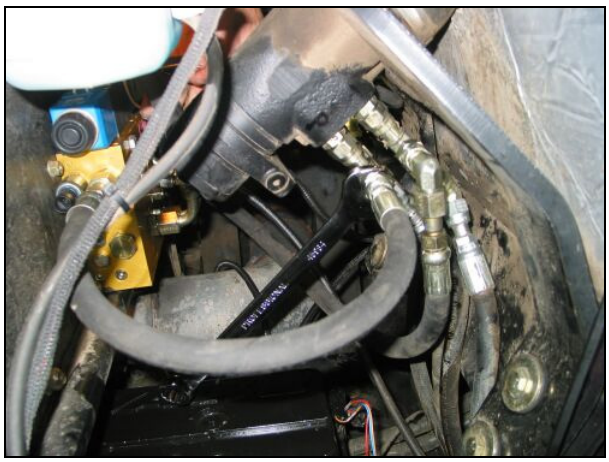
Step 9

Attach the -8 straight end of the left/A hose to the previously installed tee on the hand pump left port and the -8 straight end of the right/B hose to the tee on the hand pump left port.



Step 10

Install the -8 ORFS 90 end of the kit supplied pressure hose to the previously installed tee at the hand pump P line.



Step 11

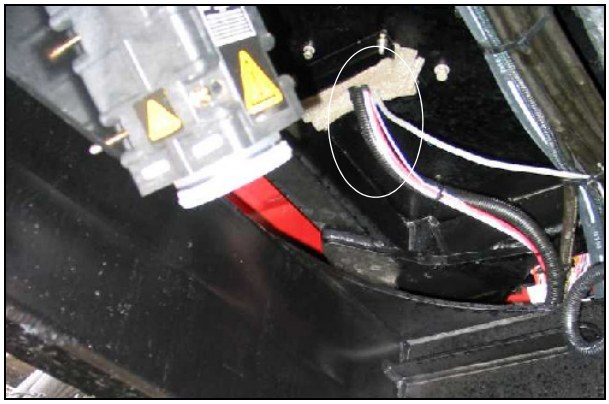
Connect the other end of the pressure hose to the P port on the manifold.



Secure the Electrical Connectors

Step 1

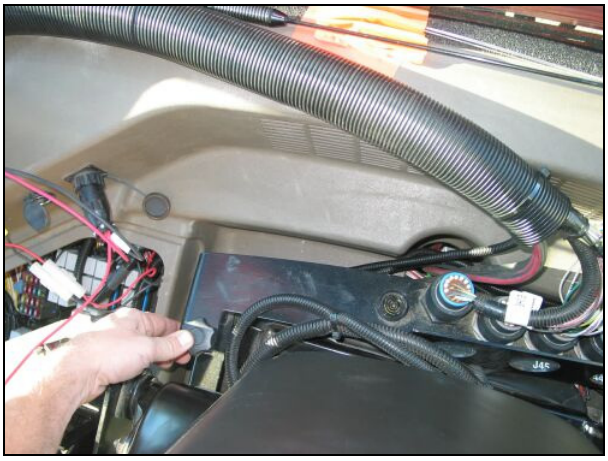
Route the controller end of the steering valve, steering sensor, and manual override cables up through the exterior right rear corner of the cab and into the electronic console. The electronic console has an opening through the floor for cable routings.



Step 2

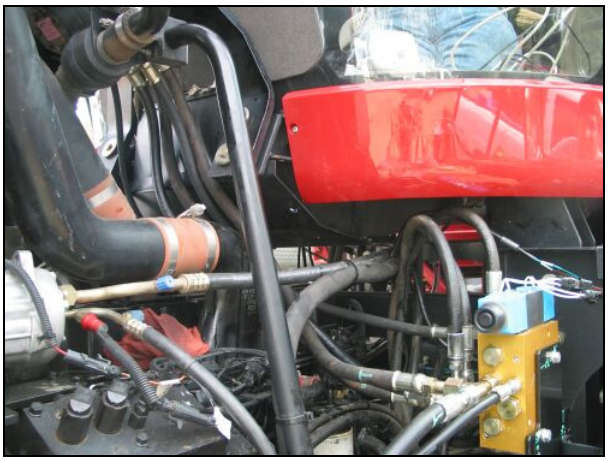
Route the controller connections out of the electronic console toward the buddy seat. Remove the bracket behind the seat for ease of routing.

Note – *Connections will be made later.*



Step 3

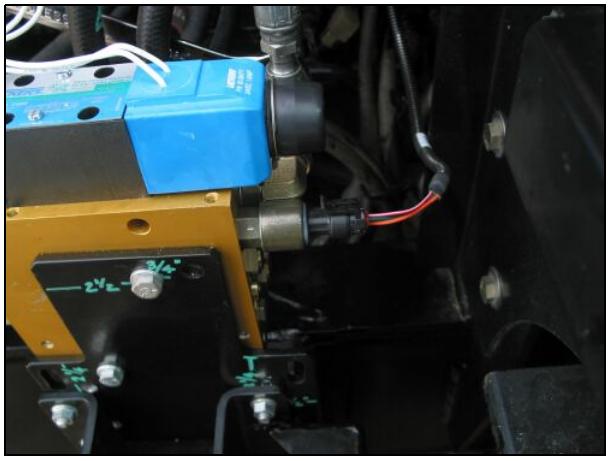
Route the steering valve and manual override connections under the cab toward the manifold.



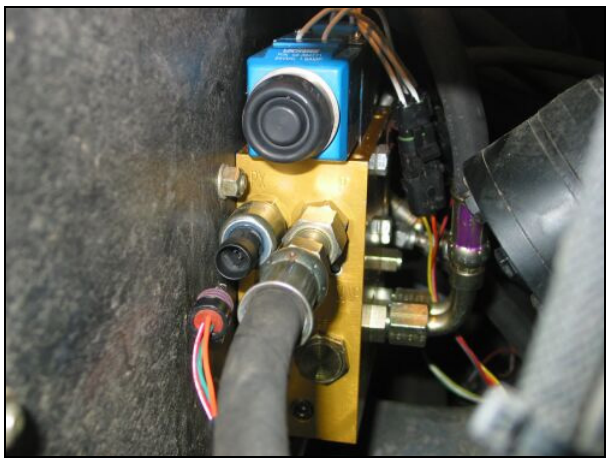
3000 SERIES SHOWN

Step 4

Connect the manual override cable to the pressure transducer.



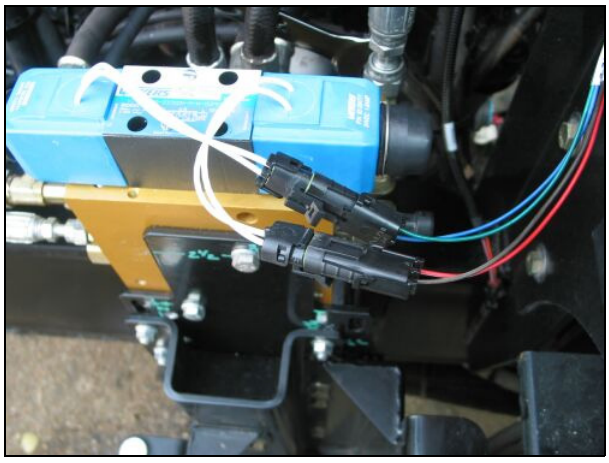
3000 SERIES SHOWN



4000 SERIES SHOWN

Step 5

Plug the A and B steering valve connectors into the connectors on the steering valve harness. Secure all harnesses and connectors with tie straps.



3000 SERIES SHOWN

CHAPTER

3

*Ag*GPS AutoSense Steering Device Installation

In this chapter:

- AutoSense Steering Device Components
- Install the AutoSense Steering Device: FLX 3010 and 3510 Models
- Install the AutoSense Steering Device: FLX 4010 and 4510 Models
- Harness Preparation (P/N 54602 Rev C)

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

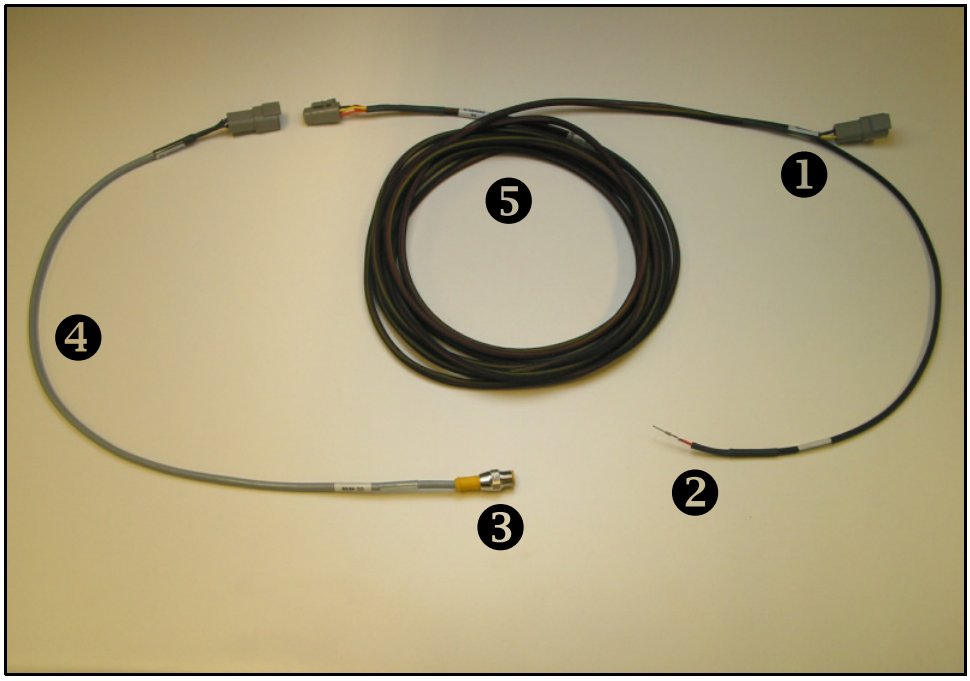
If the described mounting location is not accessible, chose an alternate location. To ensure proper function, the AutoSense device must be located in a position that is free of obstructions and allows it to rotate with the wheels when they turn.

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

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

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

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: FLX 3010 and 3510 Models

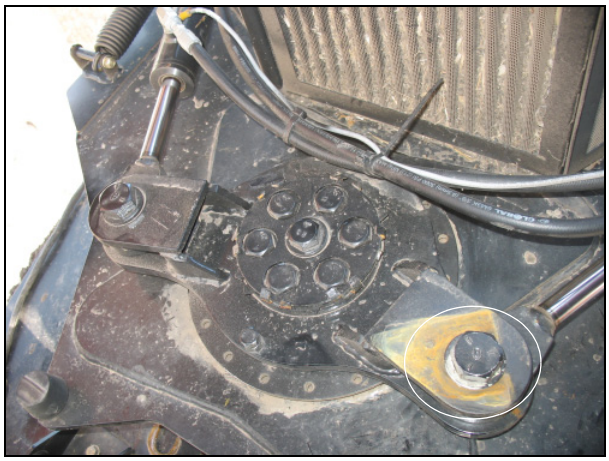
Step 1

Lift the hood to access the steering cylinders.



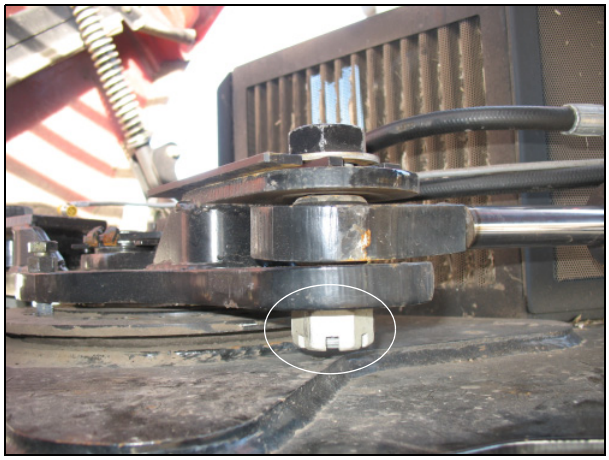
Step 2

Locate the two steering cylinders and steering flange. Loosen the bolt on the left cylinder rod end.



Step 3

Loosen the bolt by removing the lower nut and cotter pin.



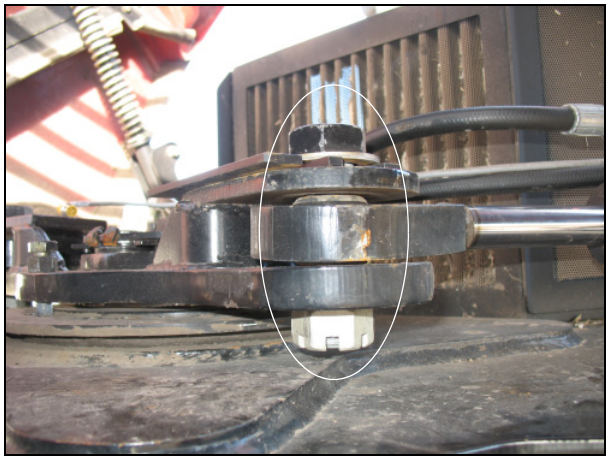
Step 4

Insert the bracket in between the washer and steel steering axle flange, as shown. Adjust the bracket to avoid interference with steering hoses at a full left turn.



Step 5

Tighten the bolt and nut and reinstall the cotter pin. Replace the cotter pin if it becomes bent or broken.



Step 6

Attach the *Ag*GPS AutoSense device to the bracket with the four provided socket head cap screws. Point the connector to the center of the steering flange.



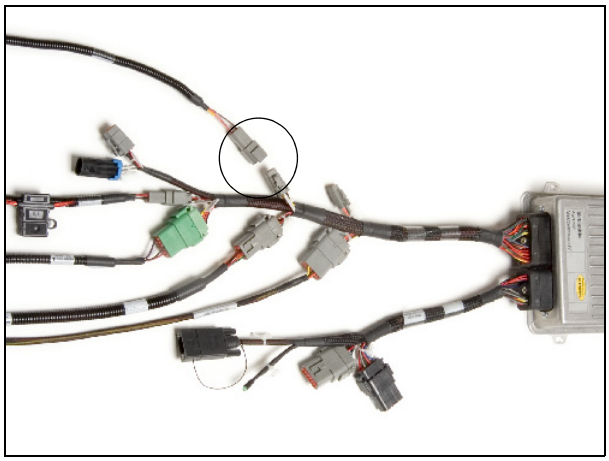
Step 7

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



Step 8

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



Install the AutoSense Steering Device: FLX 4010 and 4510 Models

Step 1

Locate the mounting location.



Step 2

Locate the front steering left king pin. Remove the two bolts shown.



Step 3

Use the existing bolts and provided washer to mount the bracket as shown.



Step 4

Attach the *Ag*GPS AutoSense device to the bracket with the four provided socket head cap screws. Point the connector to the rear.



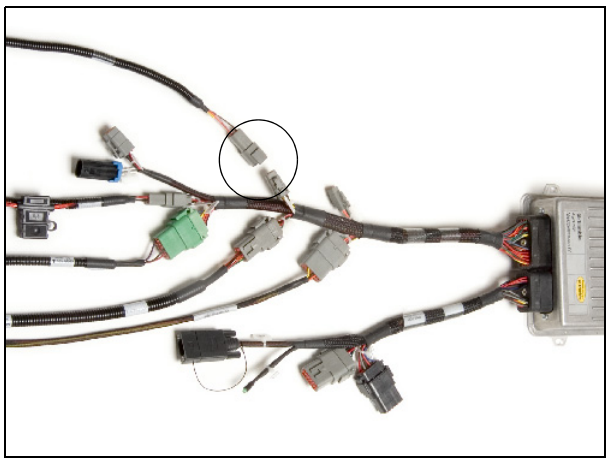
Step 5

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



Step 6

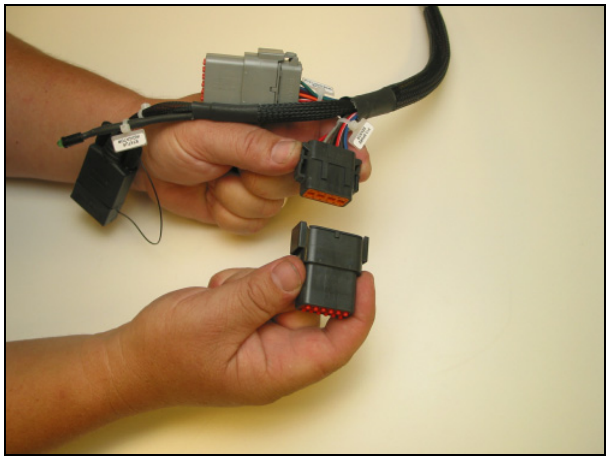
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Harness Preparation (P/N 54602 Rev C)

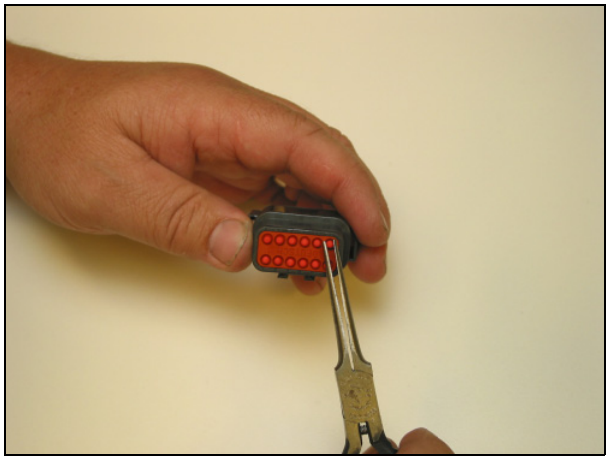
Step 1

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



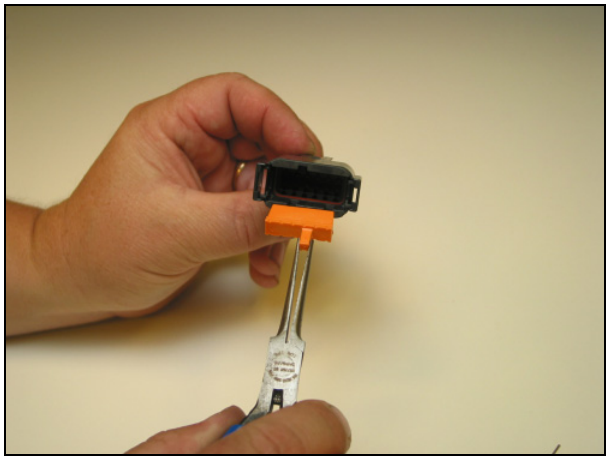
Step 2

Remove the plug from cavity number 1.



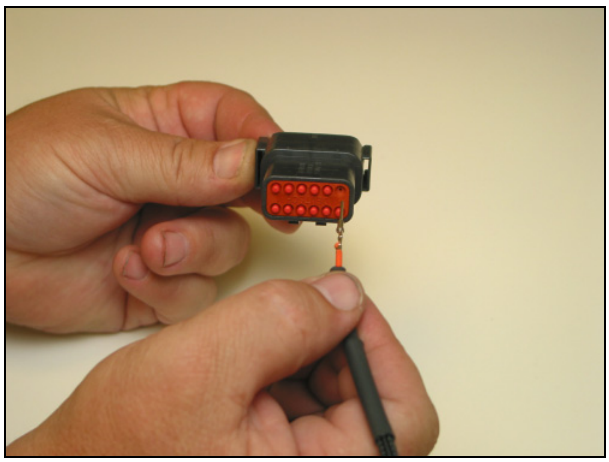
Step 3

Remove the wedge from the connector.



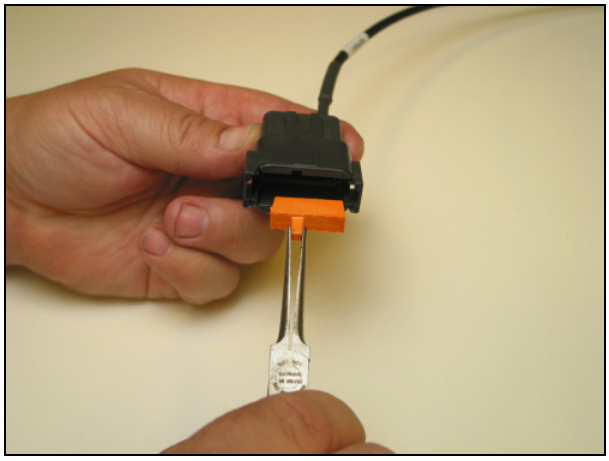
Step 4

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

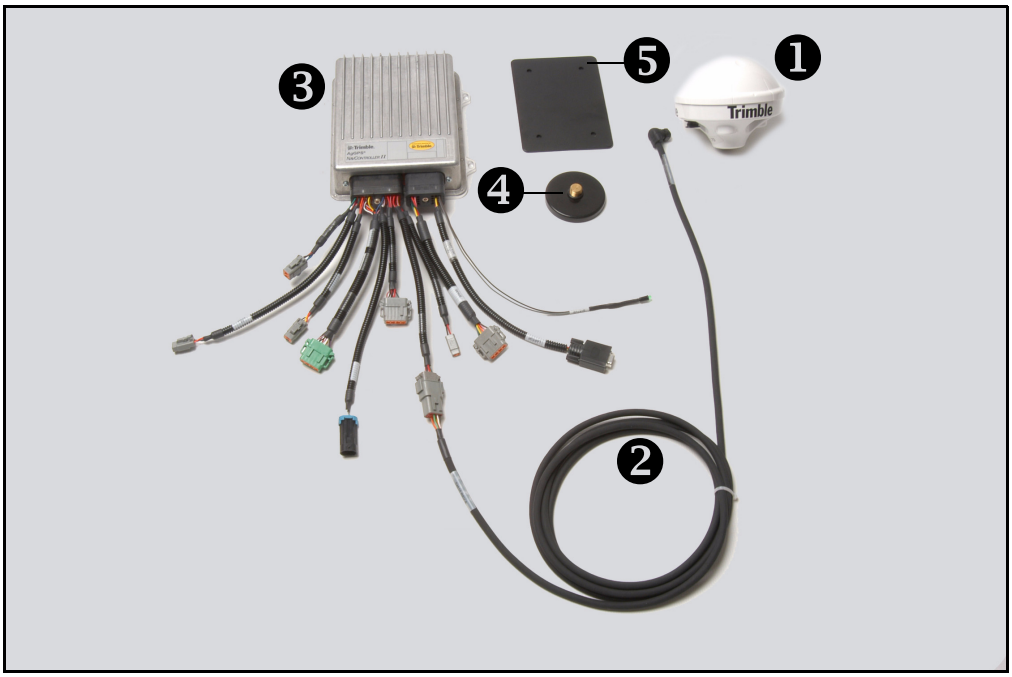
Antenna/Receiver Installation

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

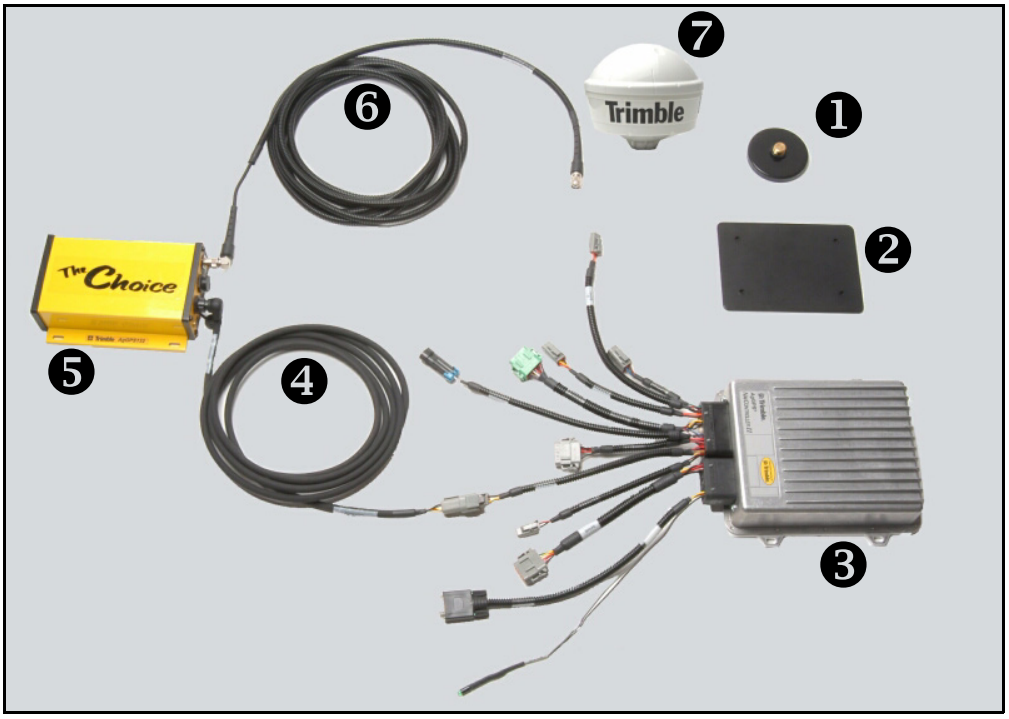
This chapter describes how to install an *Ag*GPS 114 antenna/receiver, an *Ag*GPS 132 receiver and antenna, an *Ag*GPS 252 receiver and SiteNet™ radio, or an *Ag*GPS 252 receiver and *Ag*GPS 900 radio module.

*Ag*GPS 114 Components



Item	Description
1	*Ag*GPS 114 antenna/receiver
2	Antenna/receiver cable
3	Controller
4	Magnetic mount
5	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 left to right on the cab roof. Locate and mark the center point of the cab roof. Clean the area around the center of the cab.



Step 2

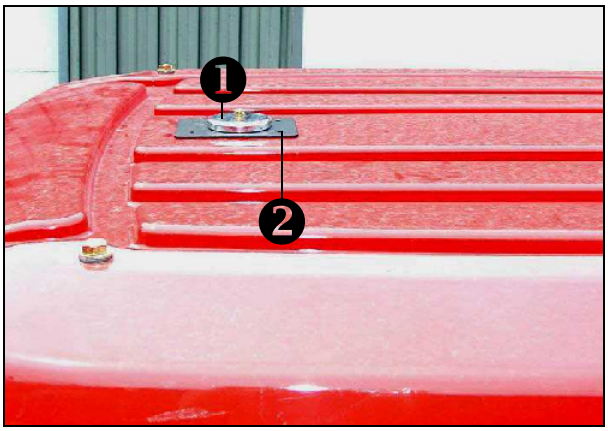
Remove the backing from the adhesive strips on the mounting plate. Mount the plate on the center point mark.

Note – *Place the antenna in an accessible location anywhere between the front and rear of the cab. It must be centered left to right.*



Step 3

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



Step 4

Attach the antenna to the magnetic mount.



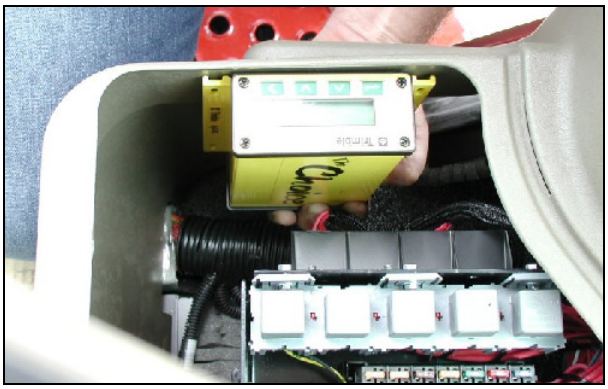
Step 5 *Ag*GPS 114 Only

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 electronics bay, through the access hole in the cab floor. The access hole is insulated with foam. Route the remaining cable toward the instructor seat.



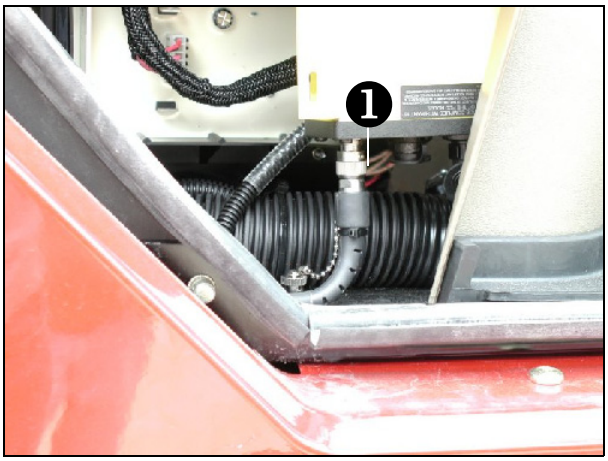
Step 6 *Ag*GPS 132 Only

Attach the antenna/receiver cable and then route the cable toward the C post at the right rear of the cab. Secure the cable to the grab rail 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 front of the operator's seat base. Connections will be established later in the *Installation Instructions*.

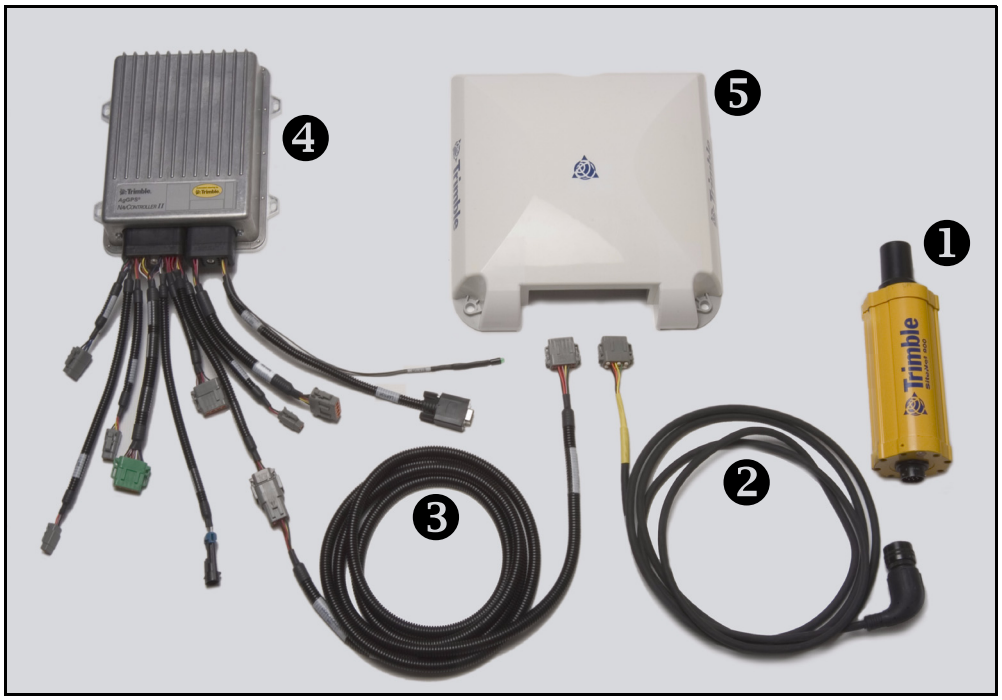


You can mount the *Ag*GPS 132 receiver in the electronics bay next to the operator's seat. Place the receiver in the electronics bay as shown. Use the receiver as a template to mark the top two holes. Drill the holes in the electronics bay and then use bolts and nuts to install the receiver.

Route the antenna cable ❶ and then connect it to the receiver in the electronics bay. Connect the controller cable to cavity "A" on the receiver. Leave the power and ground wires on the controller cable in the cab electronics bay. Route the remaining cable toward the instructor seat. Cable connections will be established later in the *Installation Instructions*.



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



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

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

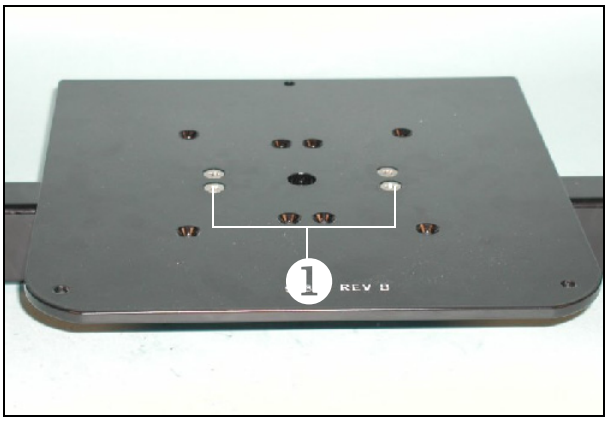
Step 1

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



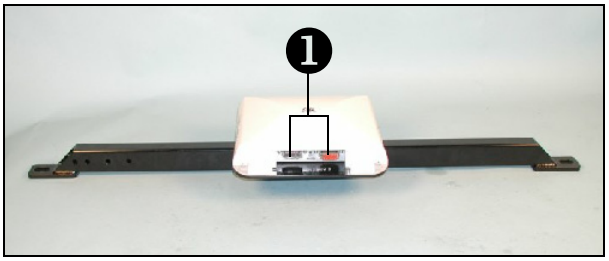
Step 2

Use the four ¼-20 x ½ flat head screws ❶ to attach the receiver mounting bracket to the top of the bar. The curved edge of the mounting bracket faces you.



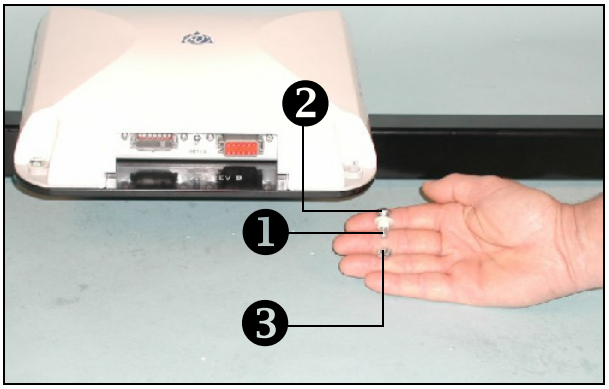
Step 3

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



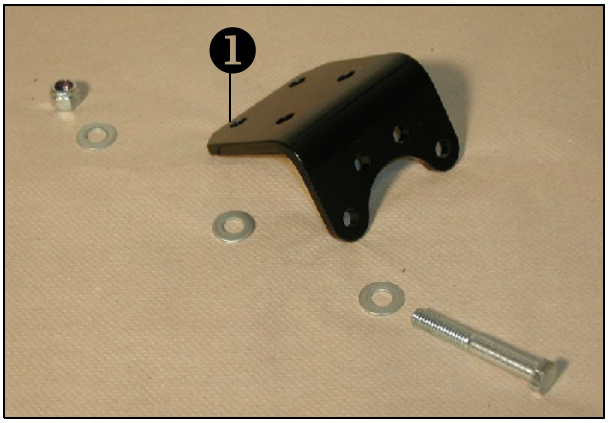
Step 4

Install the nylon shoulder washers ❶, ¼ x 7/8 hex bolts ❷, and ¼ lock nuts ❸ through the receiver and mounting bracket.

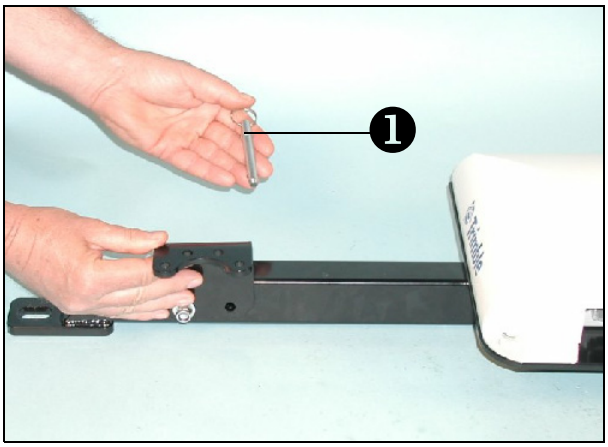


Step 5 If Equipped With SiteNet Radio

Install the SiteNet radio mount bracket. Place a flat washer onto the 3/8 x 2½ 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.

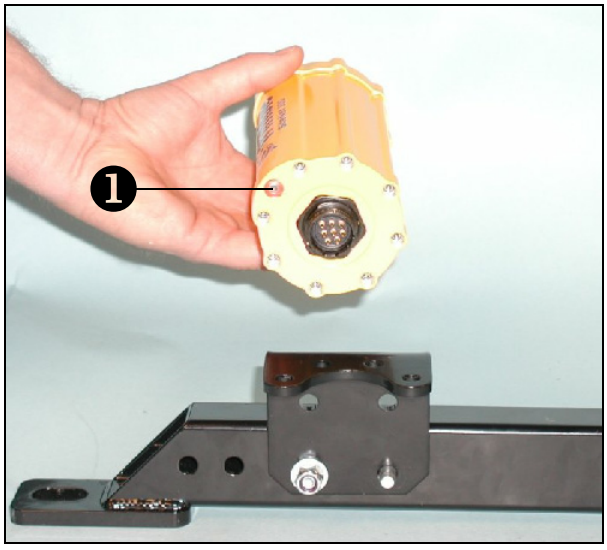


Install the ring grip retaining pin ❶ through the reverse side of the bracket, next to the bolt.

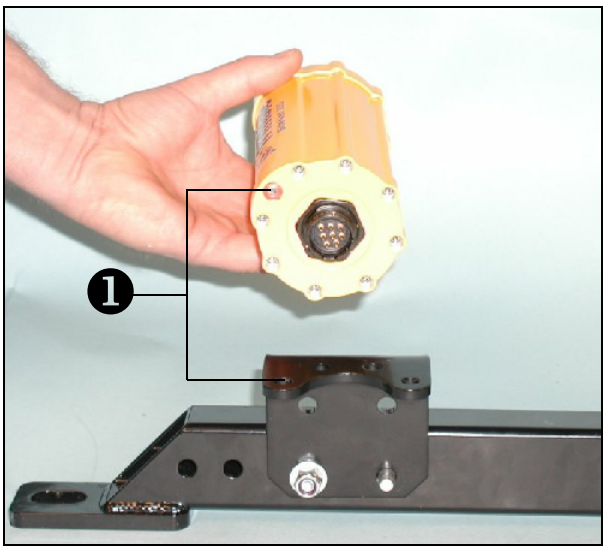


Install the radio on the mount bracket with the connector cavity underneath.

Note – *Mount the radio so the LED* ❶ *on the bottom of the radio is visible.*

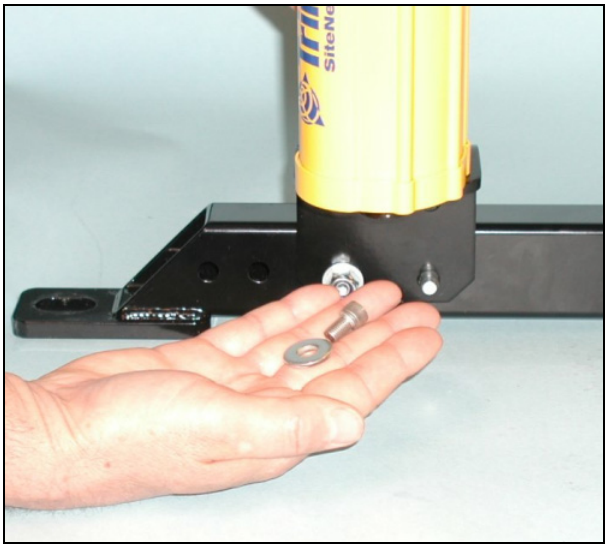


Position the radio so the LED is as close to the mounting bracket as possible without being obscured. Align the hole on the radio with the hole on bracket as shown ❶.



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

Note – *You do not need to use all of the bolts provided for the radio.*



Step 6

Remove the two bolts and washers ❶ at the rear of the cab roof. Place the mount bracket assembly over the existing holes. Re-use the existing cab bolts and install bolts onto the bracket. The connector cavities should face the rear of the cab.

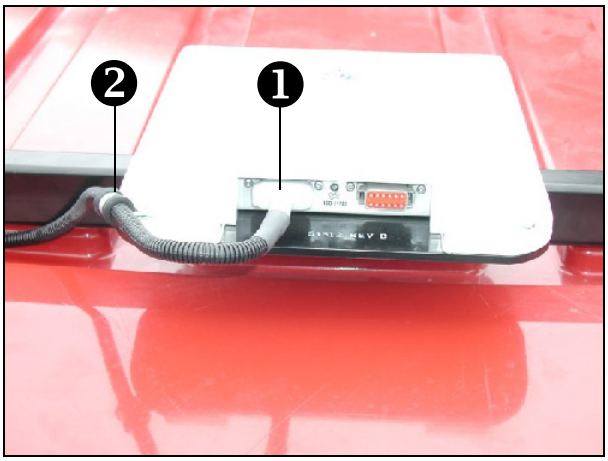
Note – *If the receiver is offset to the left or the right of the vehicle, AgGPS Autopilot system performance can be affected. Before you tighten the cab bolts, ensure that the GPS receiver and bracket are both aligned with the center of the vehicle.*



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 the 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.

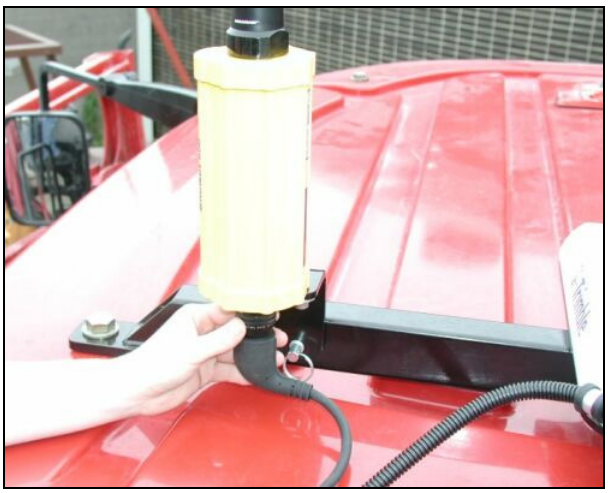


Step 8

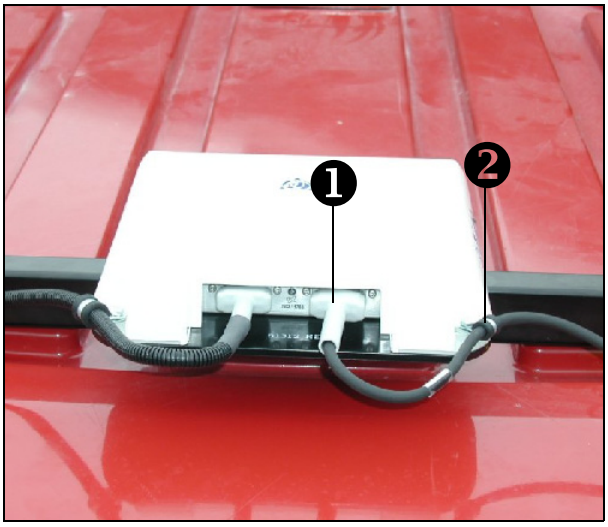
Route the cable toward the instructor seat. Cable connections will be established later in the *Installation Instructions*.

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 the receiver.



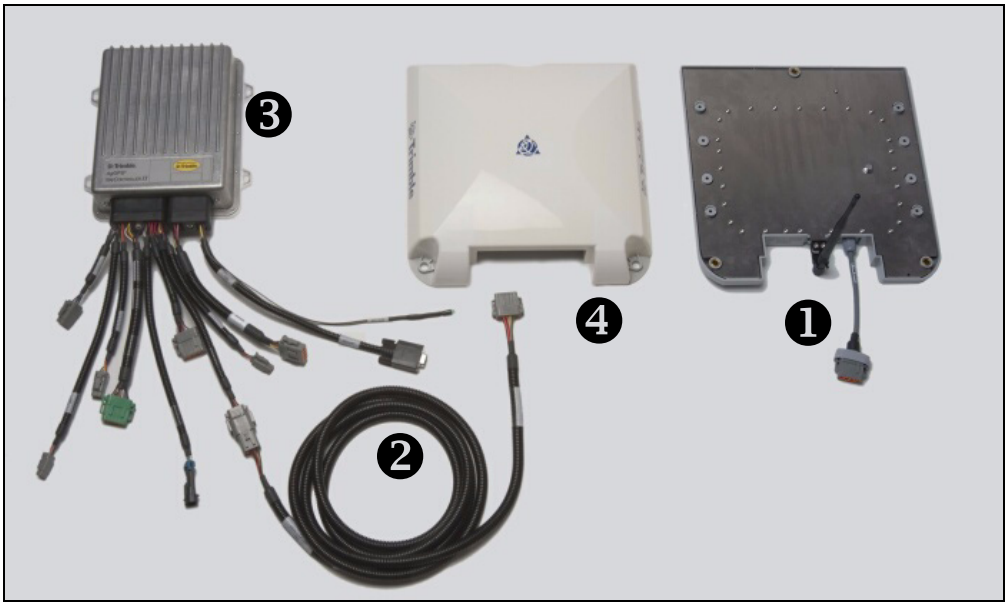
Coil the excess cable and then tie the cable together. Secure the cable to the cab or roof bracket.



You can reposition the radio mount bracket for clearance while the vehicle is traveling. Remove the pin from the mount bracket and then push the radio down toward the left side of the cab. Reinstall the pin through the mount bracket.



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



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

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

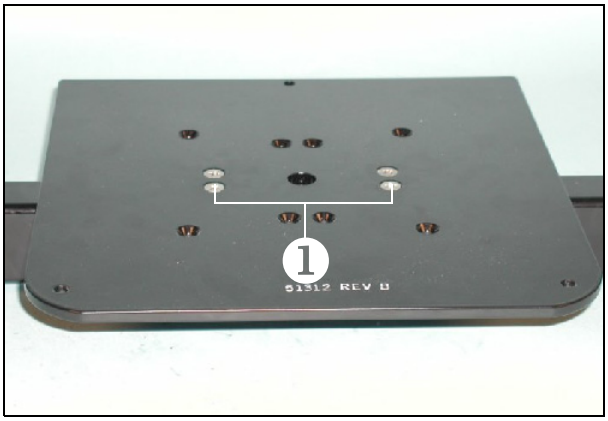
Step 1

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



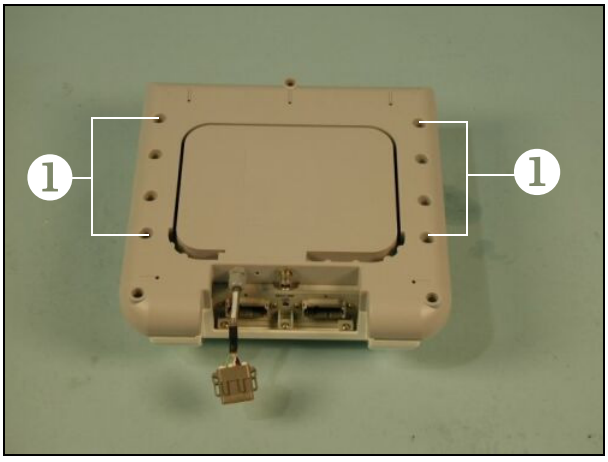
Step 2

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



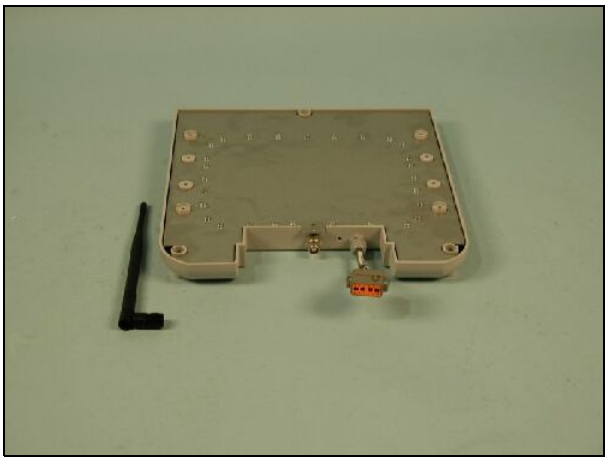
Step 3

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



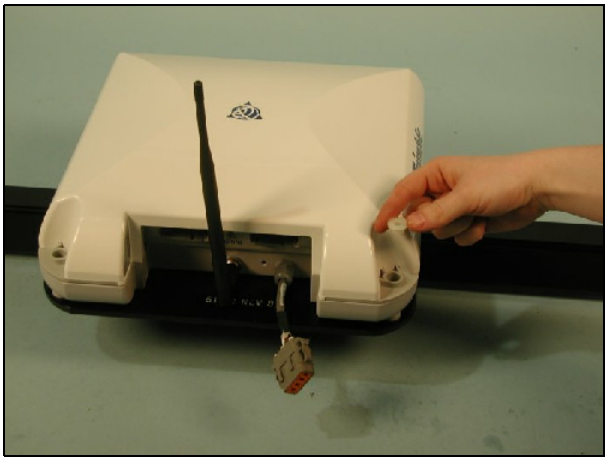
Step 4

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



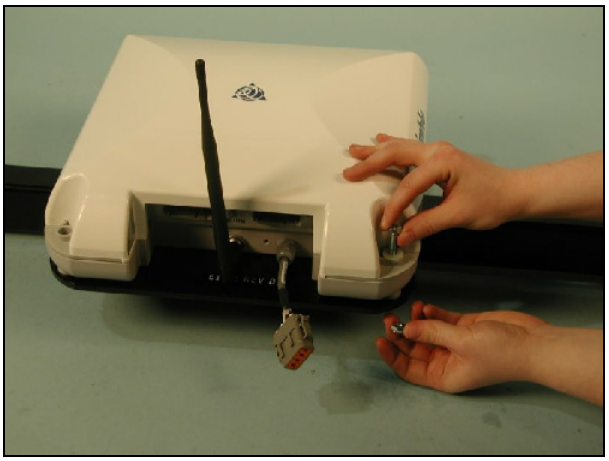
Step 5

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



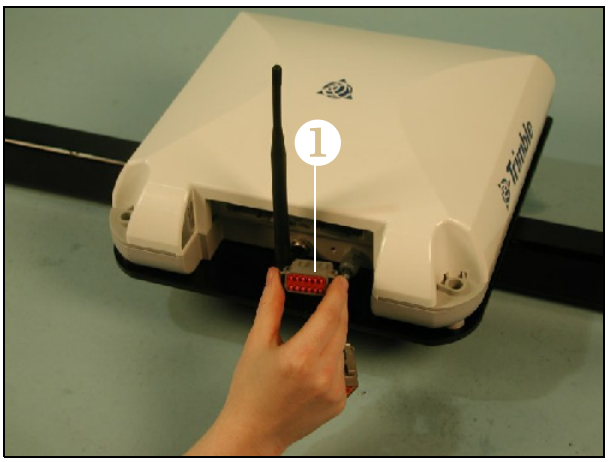
Step 6

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



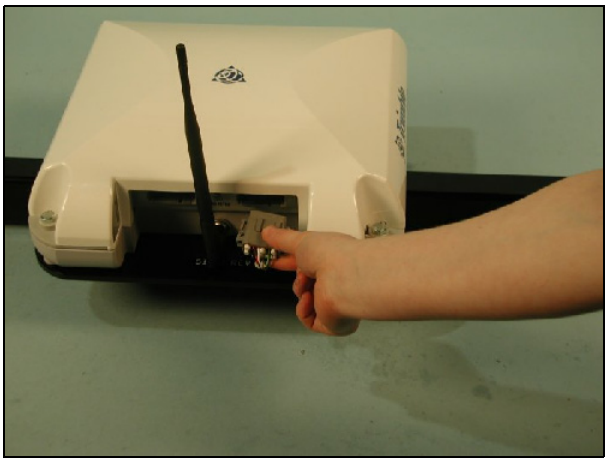
Step 7

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 bolts and washers ❶ at the rear of the cab roof. Place the mount bracket assembly over the existing holes. Re-use the existing cab bolts and install bolts onto the bracket. The connector ports should face the rear of the cab.

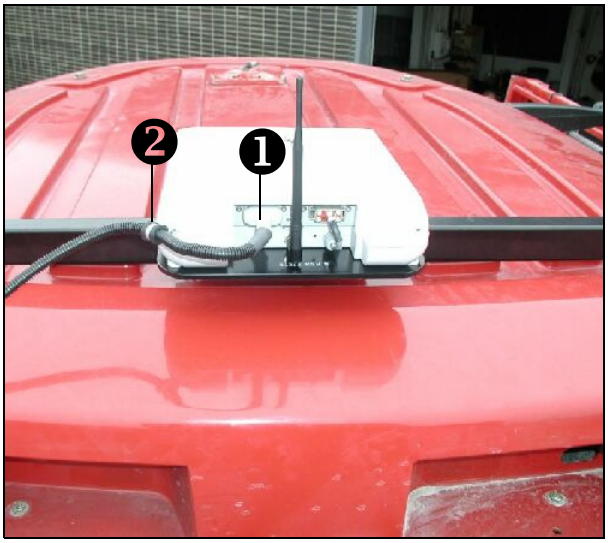
Note – *If the receiver is offset to the left or the right of the vehicle, AgGPS Autopilot system performance can be affected. Before you tighten the cab bolts, ensure that the GPS receiver and bracket are both aligned with the center of the vehicle.*



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 the left side of the receiver.

Route the cable under the receiver, 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 instructor seat. Place ties along cable to secure it.



CHAPTER

5

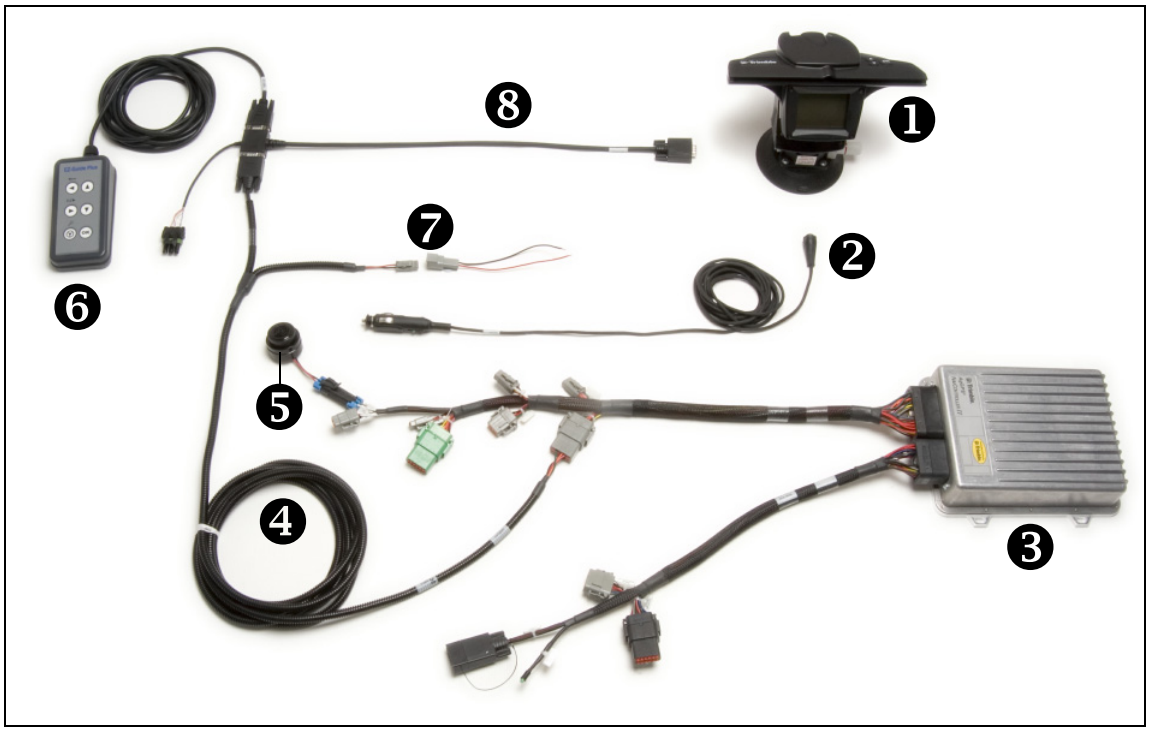
Display Installation

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 display in the vehicle.

EZ-Guide Plus Lightbar Components



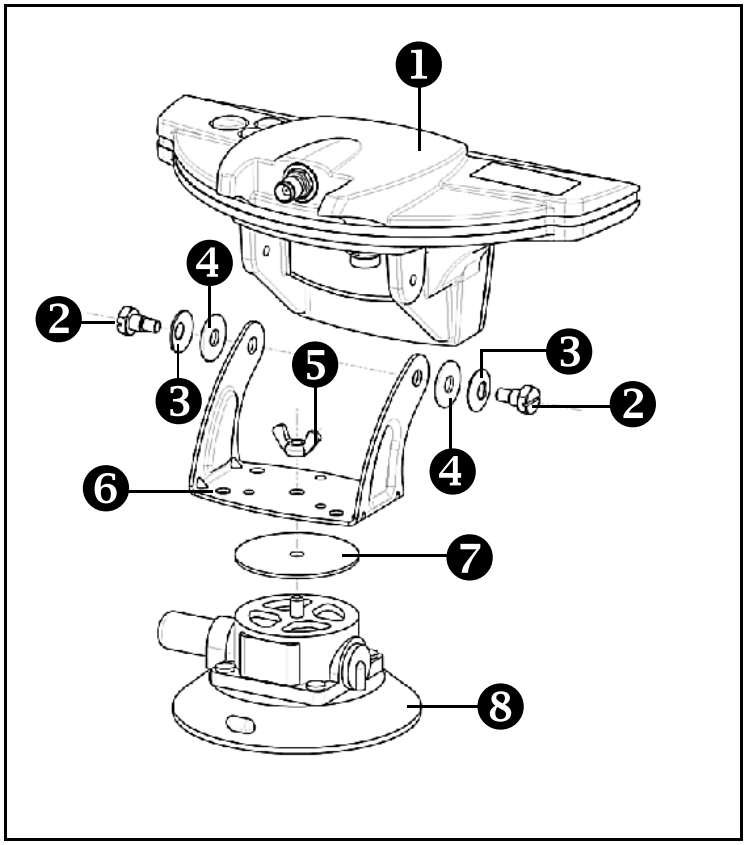
Item	Description
❶	EZ-Guide Plus lightbar
❷	Power harness
❸	Controller
❹	Display cable

Item	Description
❺	Sonalert alarm (if connected)
❻	Optional remote keypad
❼	Alternative power supply
❽	External interface cable

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

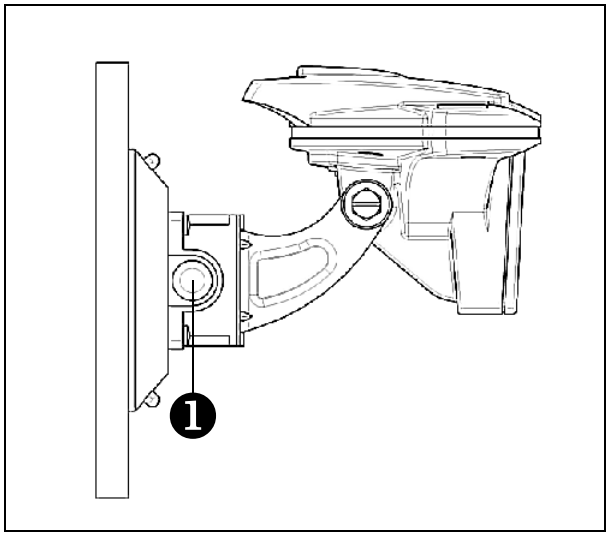
Secure the vacuum mount to the mounting bracket using the hardware provided.

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.

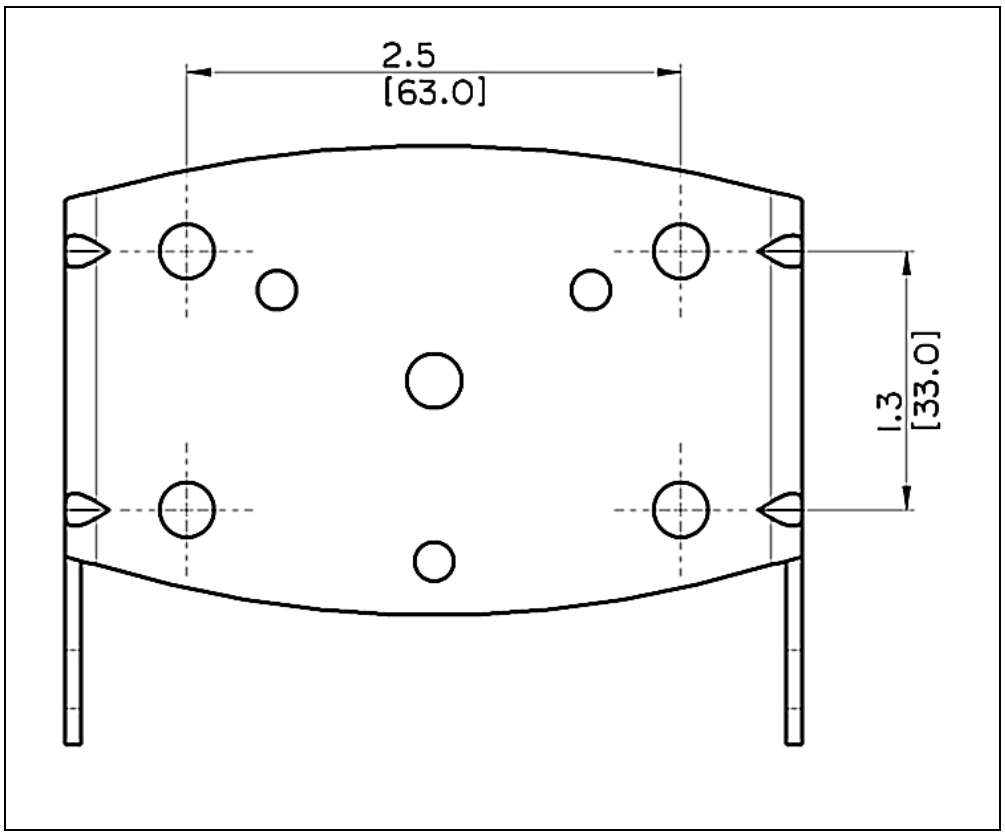


Figure 5.1 Bracket drilling template

Step 3

Screw the mount bracket to the horizontal surface.

Step 4

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

Step 5

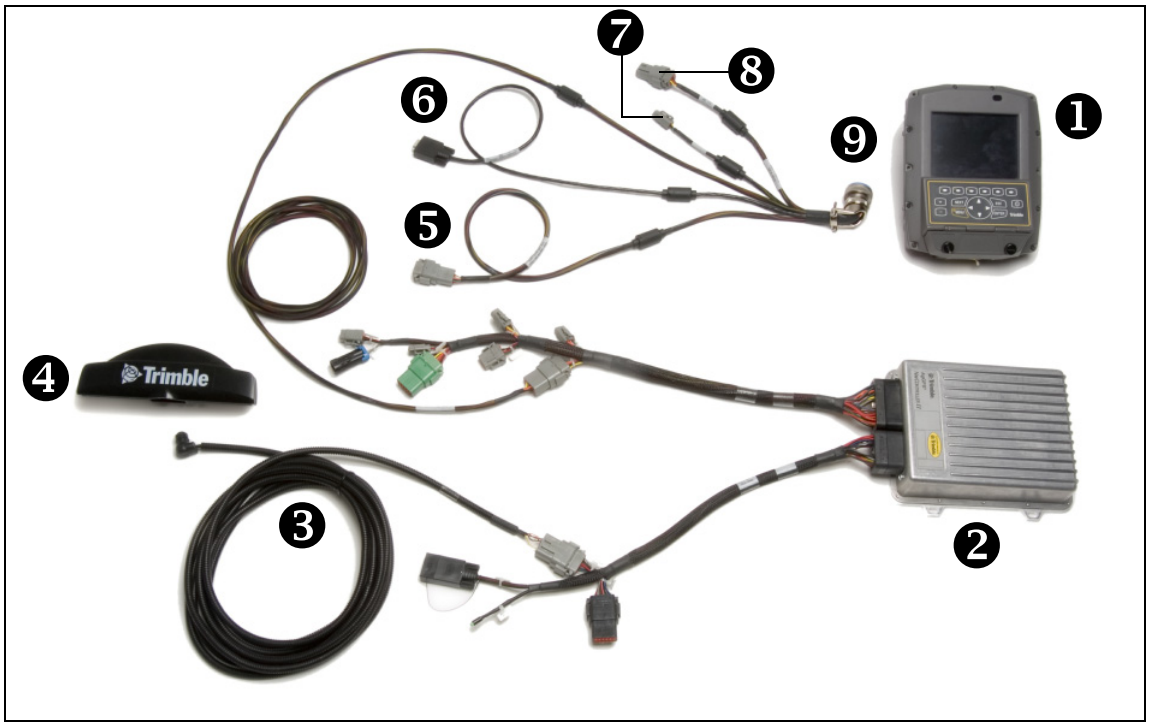
Connect the cable to the EZ-Guide Plus lightbar.

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
1	*Ag*GPS 170 field computer
2	Controller
3	Lightbar cable (optional)
4	Lightbar (optional)
5	Switch + *Ag*GPS 170 alarm (not used)

Item	Description
6	Com 1 serial I/O (not used)
7	CAN (not used)
8	*Ag*GPS 170 lightbar (not used)
9	Display harness

*Ag*GPS 170 Field Computer System Installation Process

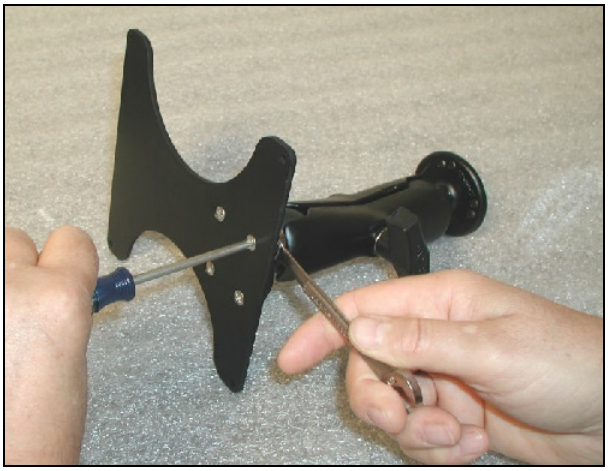
Step 1

The *Ag*GPS 170 field computer 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 field computer 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

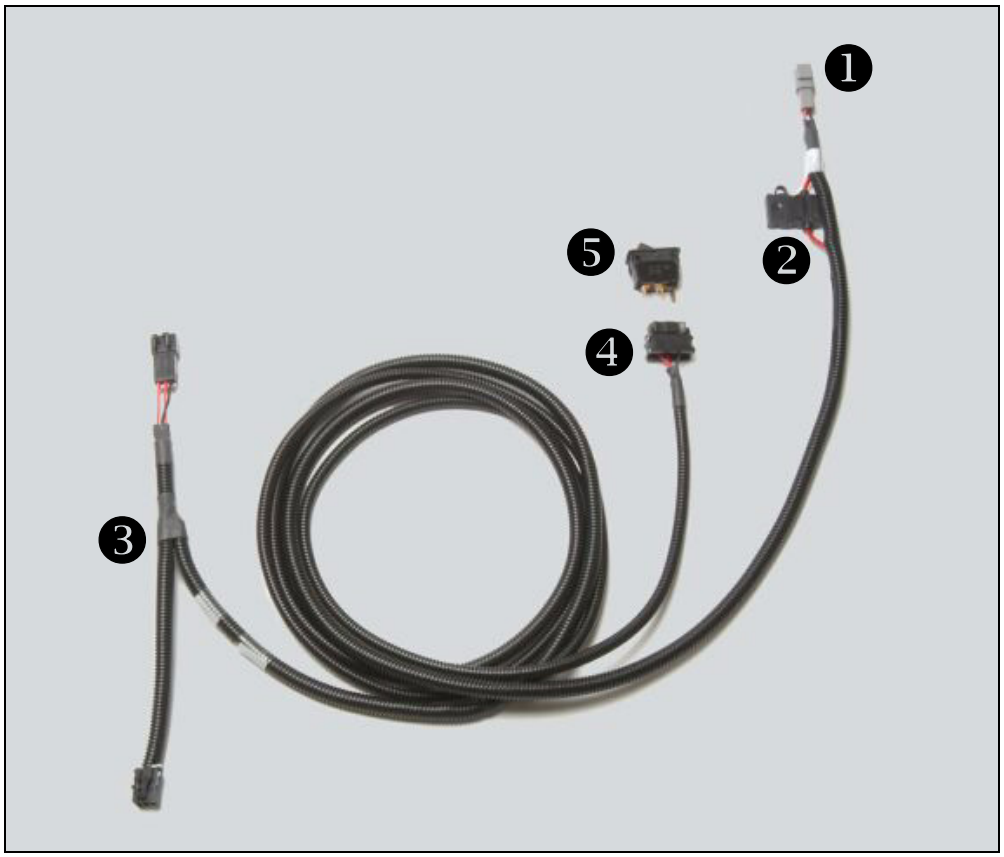
Power Harness Installation

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
1	Controller power connection
2	Fuse holder - Littlefuse 257010, 10 amp
3	Vehicle jumper cable
4	Switch receptacle
5	Switch

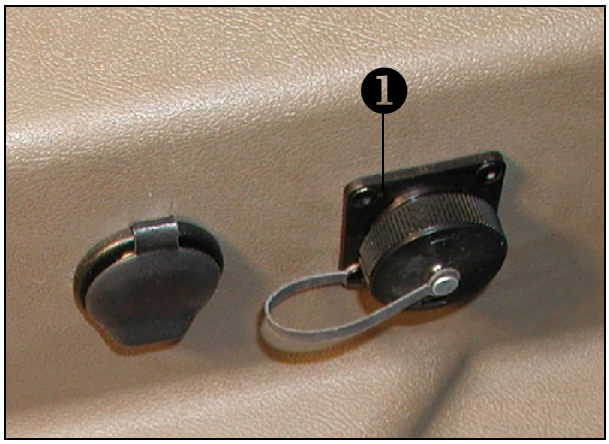
Note – *Route all harnesses, wires, and cables along routes that are free of obstructions and pinch points. Use wire ties where necessary. For ease of installation, the connectors on all harnesses are identified by component. The following instructions will only give you the general direction to route 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 right rear of the cab near the electronics bay.



Step 2

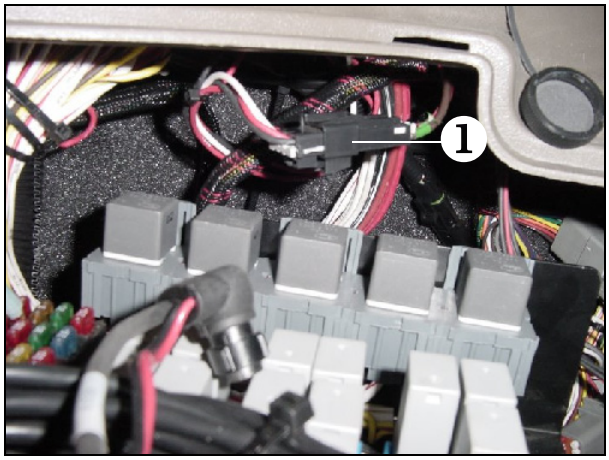
Remove the cover of the electronics bay. Reach into the electronics bay up to the back of the accessory outlet. Trace the wire from the accessory outlet until you reach a three pin connector.



Step 3

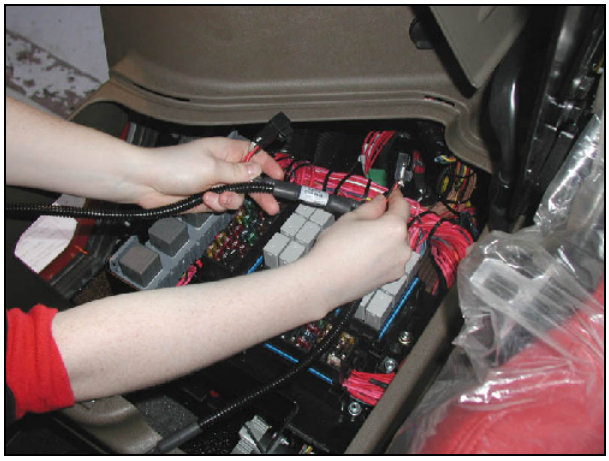
Pull the connector ❶ out of the electronics bay so it is visible.

Note *– You may need to remove wire straps to access the connector.*



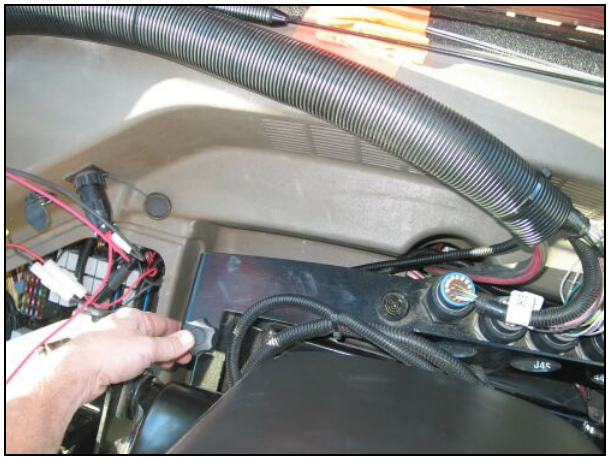
Step 4

Disconnect the connector and install the power cable jumper. Connect the jumper section of the cable (P/N 54603) to each side of the accessory outlet connections.



Step 5

Route the power connection behind the seat to the controller.



Step 6

Determine a location for the power switch in the right hand armrest. Remove the blank from that location.



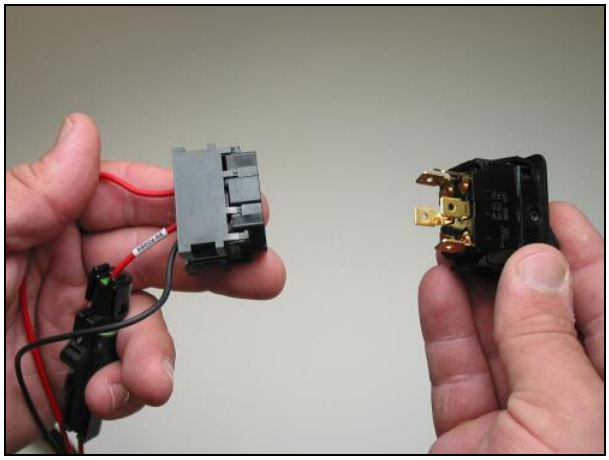
Step 7

Route the switch connector end of the power cable from the electronics bay up through the bottom of the right arm console.



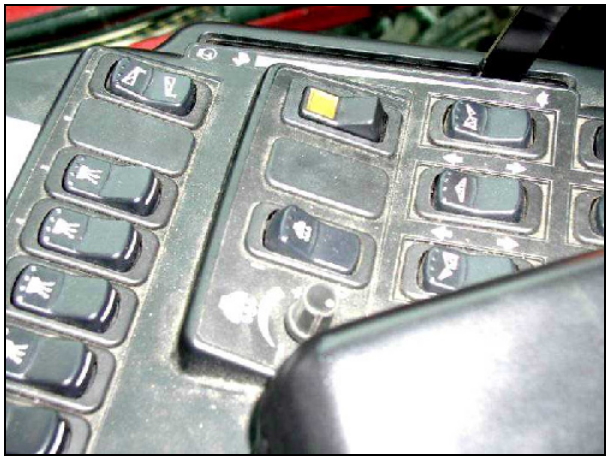
Step 8

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 9

Install the switch in the console.



CHAPTER

7

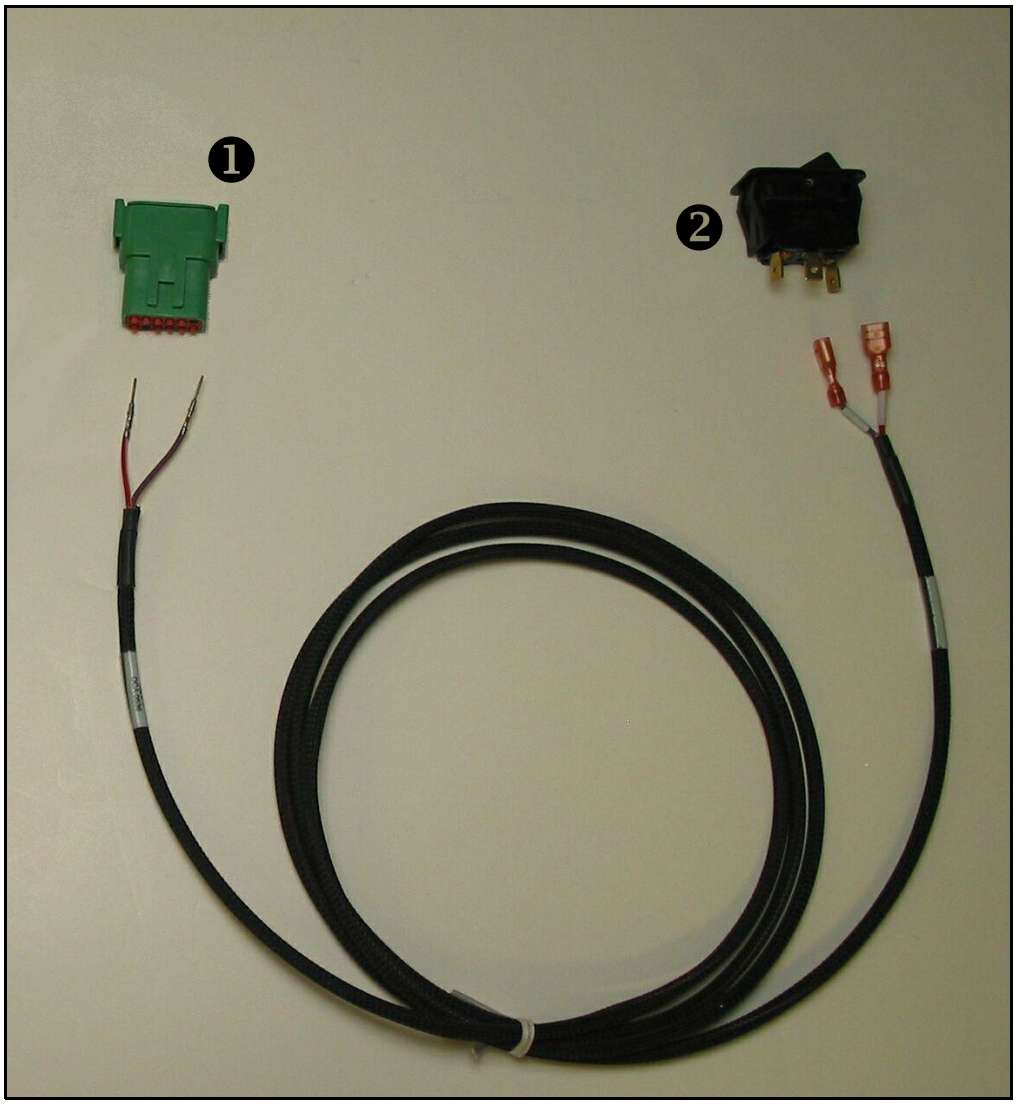
Remote Engage Switch Installation

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.

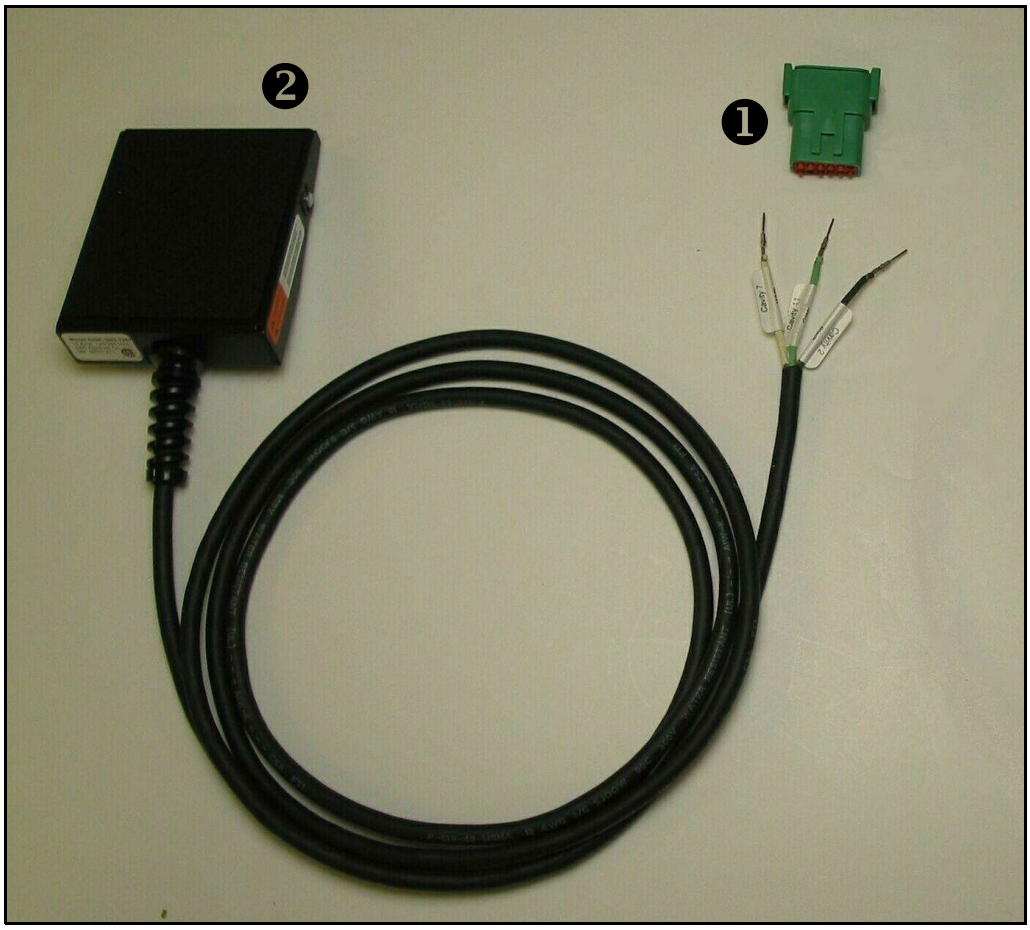
Remote Engage Switch Components: Rocker Switch



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

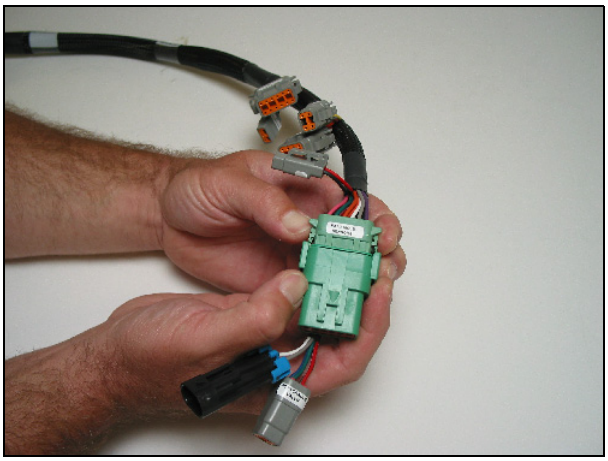


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Prepare the Remote Engage Cable

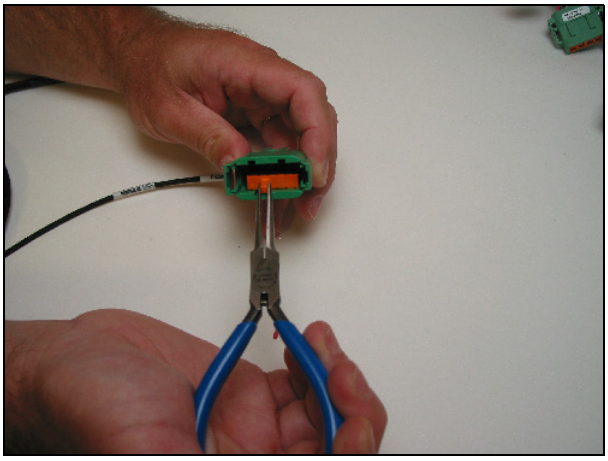
Step 1

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



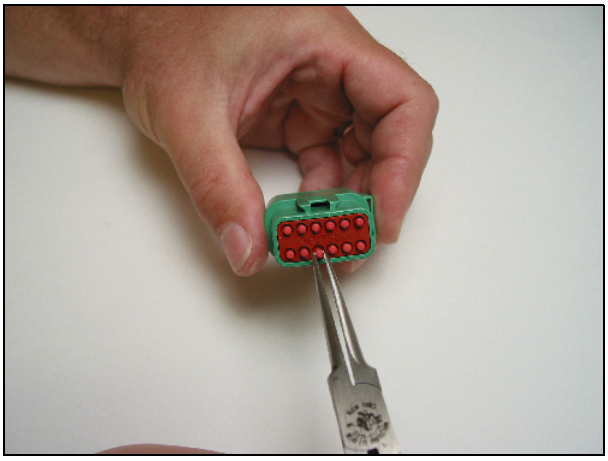
Step 2

Remove the wedge from the connector.



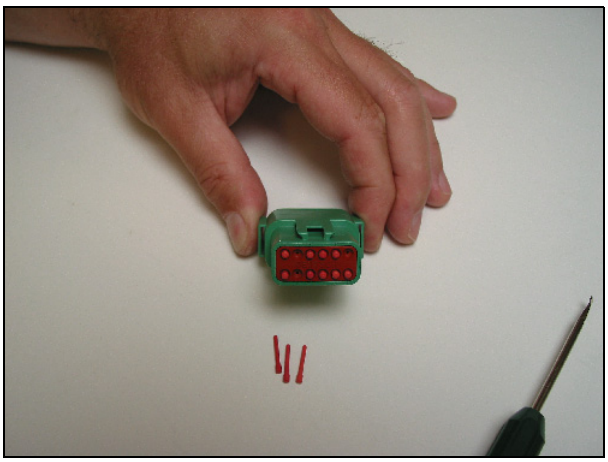
Step 3 Rocker switch only

Remove the plugs from cavity 2 and 7.



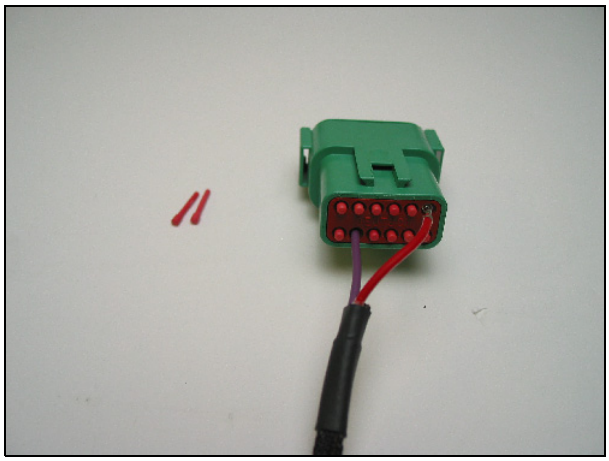
Foot Switch Only

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



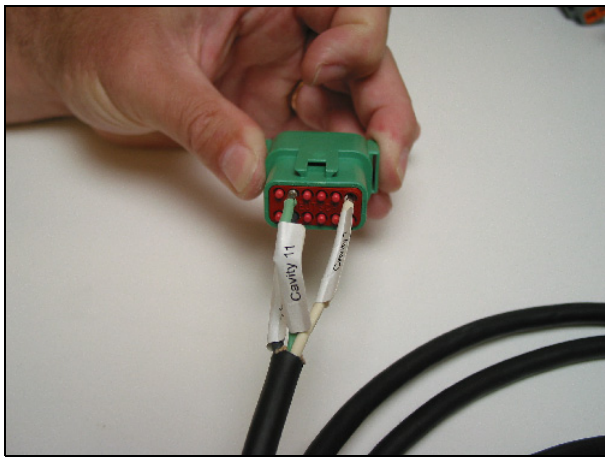
Step 4 Rocker Switch Only

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



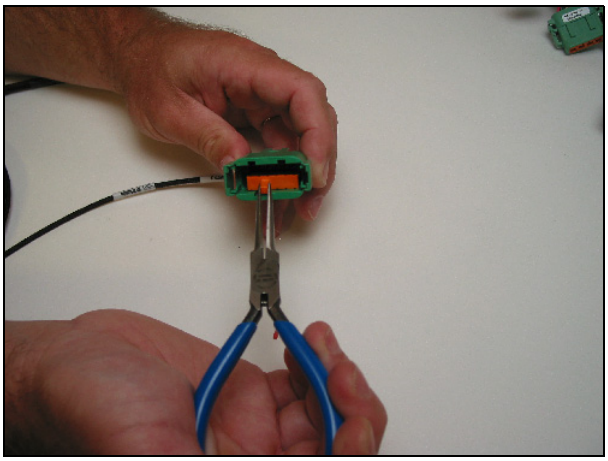
Foot Switch Only

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.



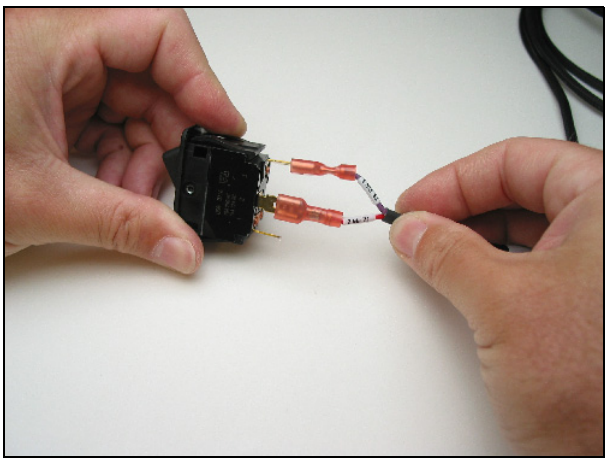
Foot Switch Only

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

Controller Installation

Step 1

Locate the instructor seat in the cab and lift the seat cushion forward.



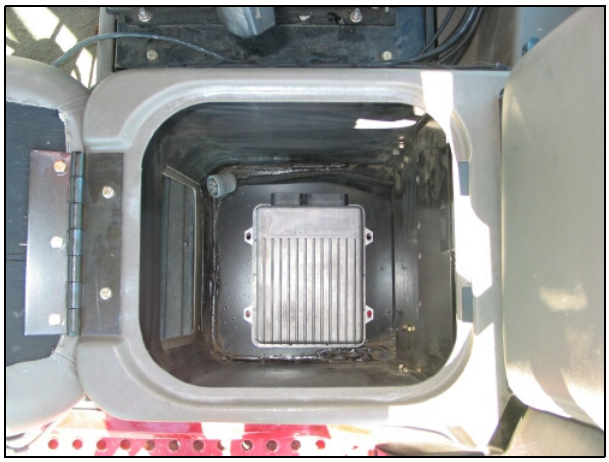
Step 2

Remove the plastic insert and the foam pad.



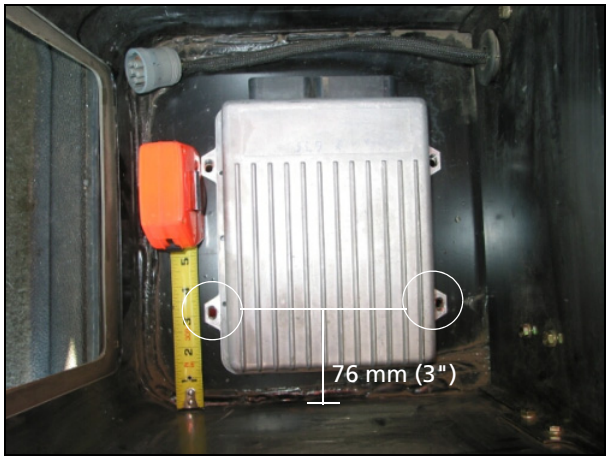
Step 3

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



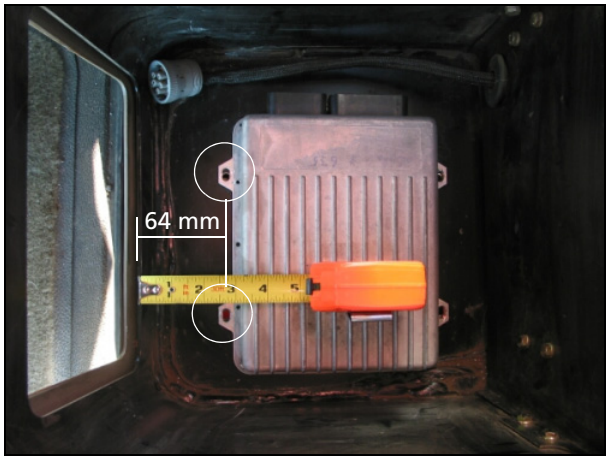
Step 4

Locate the center of the two mounting ears on the left side of the vehicle, 76 mm (3 inches) from the left wall of the instructor seat.



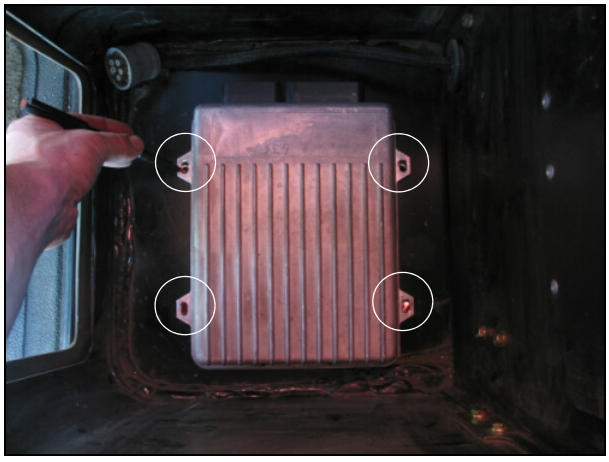
Step 5

Locate the center of the two mounting ears that are toward the front of the instructor seat compartment 64 mm (2.5 inches) from the front steel lip.



Step 6

Use the controller as a template to 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.



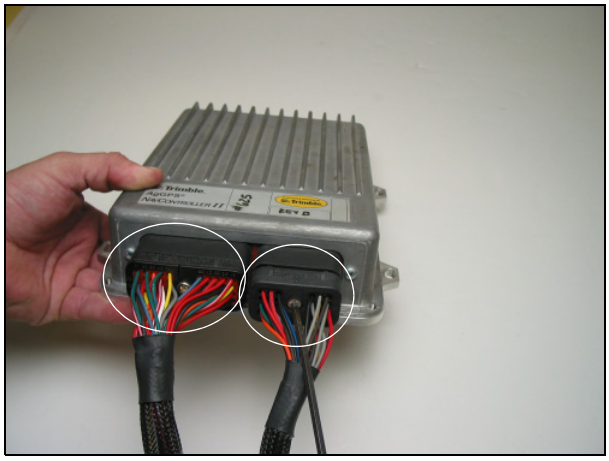
Step 7

Before you drill the holes, ensure that no wires or hoses are underneath the floor in the way of the drilled holes. Drill four holes to match the 10-32 x 1" fasteners at the positions marked in Step 6.



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 socket head fasteners (supplied in the controller bolt kit) and then secure the controller to the floor. Ensure that the controller is square to the direction of travel.



Step 10

Attach the nylock nuts to the fasteners on the underside of the cab. Tighten the nuts.



Step 11

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

Note – *The cable connectors are labeled for proper connection.*

Note – *On later models an access hole for cable routing exists at the rear of the instructor seat compartment.*

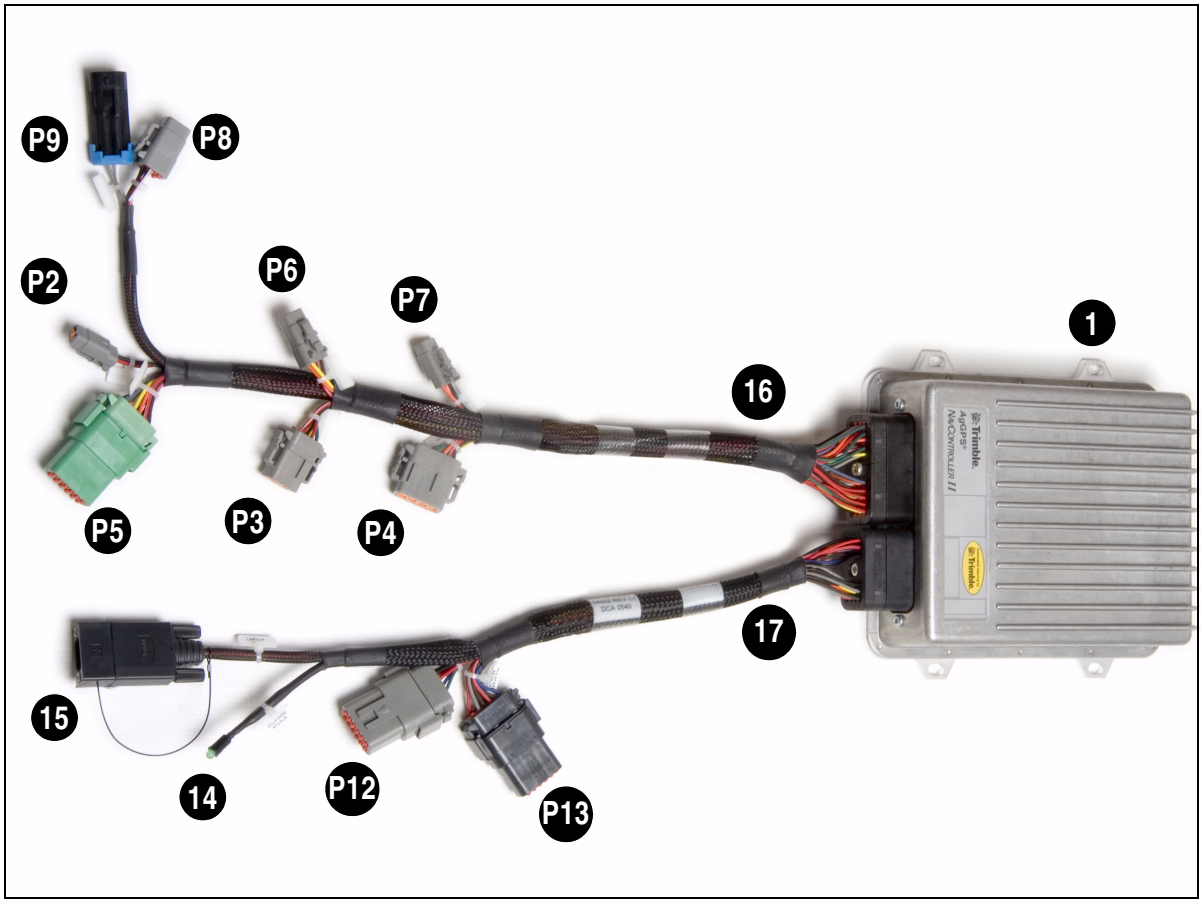


Step 12

Secure the cables with tie wraps and reinstall the plastic insert in the seat.



Controller Connections



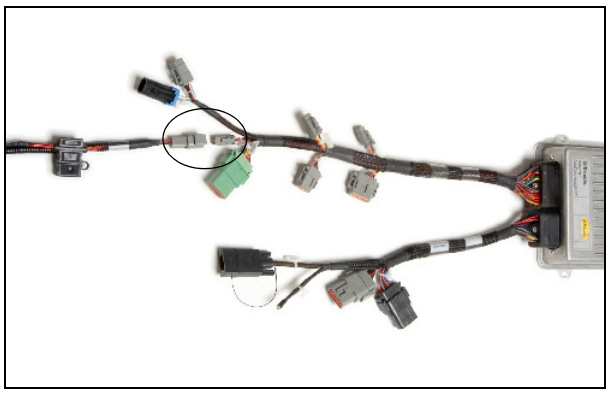
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

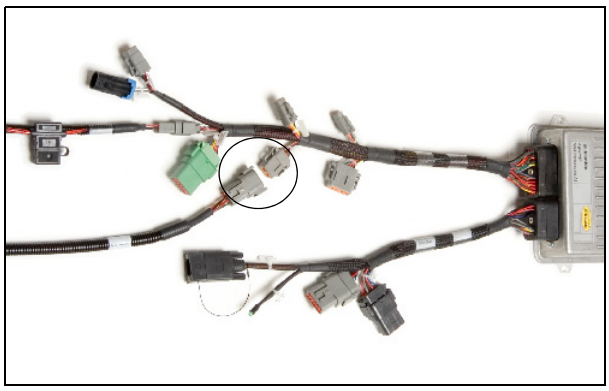
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

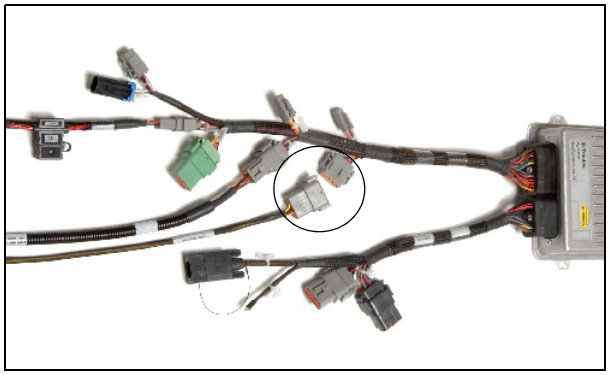
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

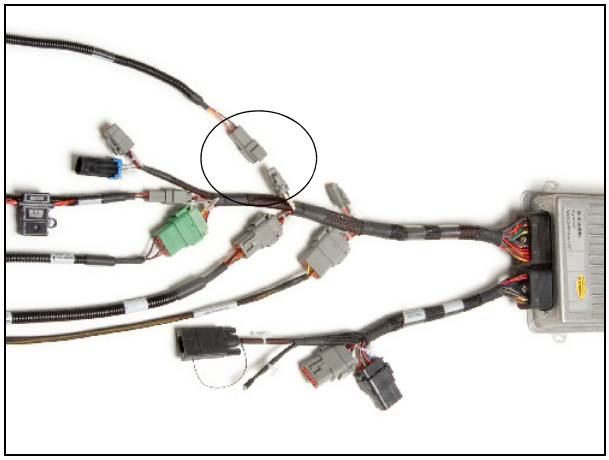
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

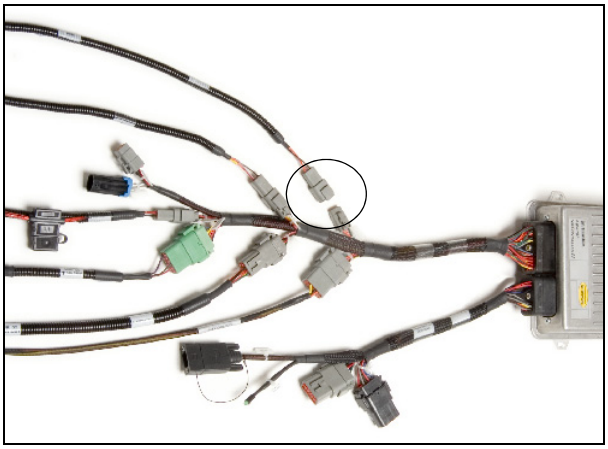
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

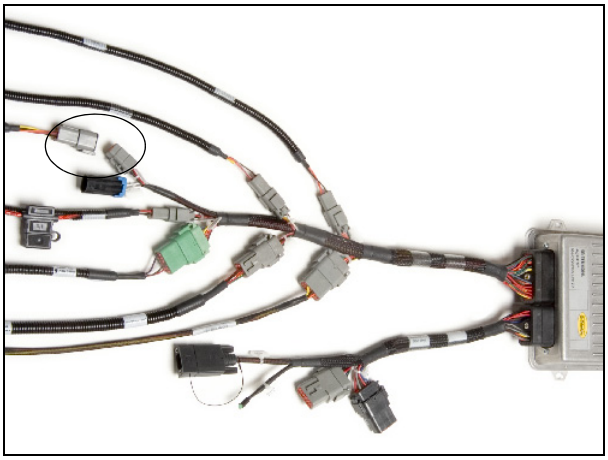
Connect the manual override cable connection to P-7, which is labeled “Manual Override”. P-7 is located on the main wiring harness.

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



Step 6

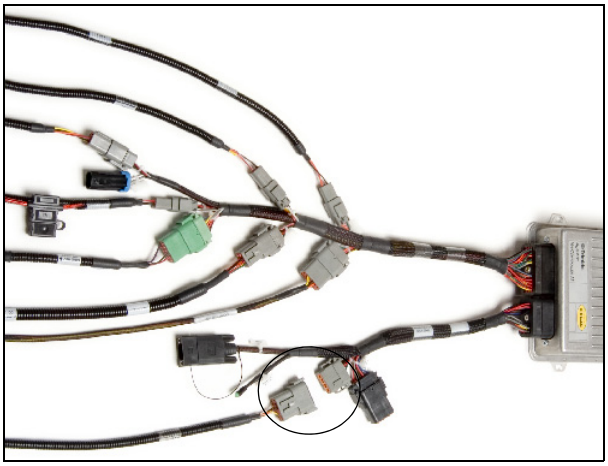
Connect the hydraulic steering valve cable connection to P-8, which is labeled “Hydraulic Valve”. P-8 is located on the main wiring harness.



Step 7

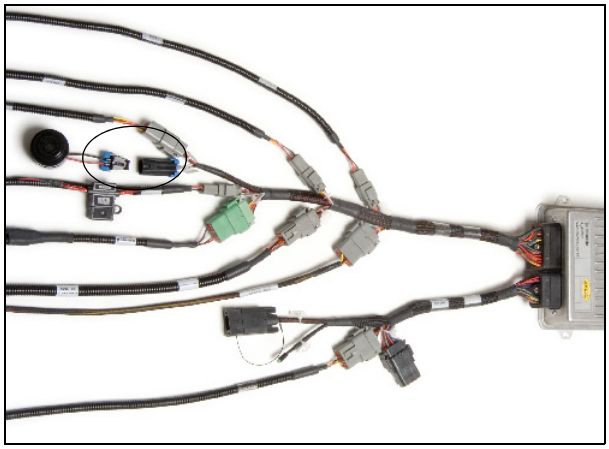
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled “Lightbar/Spare”. P-12 is located on the auxiliary wiring harness.

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



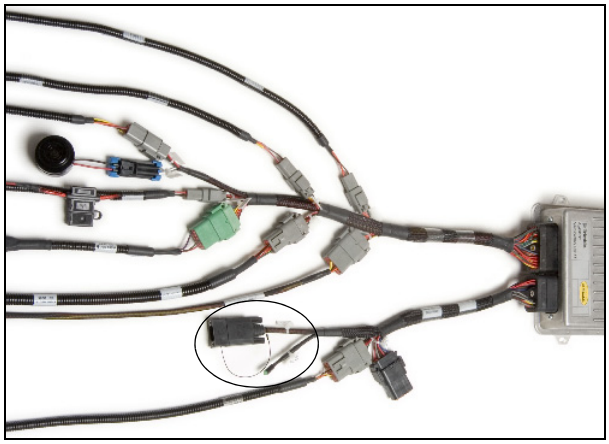
Step 8

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.