*Ag*GPS® Autopilot™ Automated Steering System

Installation Instructions

Fendt

- **916 Vario**
- **920 Vario**
- **924 Vario**
- **926 Vario**
- **930 Vario**

Version 3.00
Revision C
Part Number 54035-29-E03
December 2010

Trimble®

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This is the December 2010 release (Revision C) of the *AgGPS Autopilot Automated Steering System Installation Instructions*, part number 54035-29-E03. It applies to version 3.00 of the *Ag*GPS Autopilot automated steering system.

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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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Recycling in Europe: To recycle Trimble WEEE, Call +31 497 53 2430, and ask for the "WEEE Associate"
Or
Mail a request for recycling instructions to:
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c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL



Safety Information

In this chapter:

- Warnings
- Cautions

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



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



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

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

Warnings



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



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



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

Cautions



CAUTION – When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot. These hot parts can cause serious burns. To avoid burns, allow hot machine parts to cool before you begin working on them.



CAUTION – The system installation may bring you into contact with chemical substances, such as oil. These can cause poisoning. Ensure that you wash you hands thoroughly after you have finished working on the system.



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



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



CAUTION – Always wear protective equipment appropriate to the job conditions and the nature of the vehicle. This includes wearing protective glasses when you use pressurized air or water, and proper protective welders clothing if you want to complete any welding. Avoid wearing loose clothing or jewelry that can catch on machine parts or tools.



CAUTION – Parts of the vehicle may be under pressure. To avoid injury from pressurized parts, relieve all pressure in oil, air, and water systems before you disconnect any lines, fittings, or related items. To avoid being sprayer by pressurized liquids, hold a rag over fill caps, breathers, or hose connections when you remove them. Do not use your bare hands to check for hydraulic leaks. Use a board or cardboard instead.

CAUTION – When you remove the wheel from the vehicle, be sure to follow the manufacturer's procedures. Failure to do so could result in injury, or damage to the vehicle.

CAUTION – Before you drill holes in the seat base, ensure that you are not drilling into the existing hoses that are under the seat. This can damage vehicle operation.

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CHAPTER

1

Introduction

This manual describes how to install the Trimble® *Ag*GPS® Autopilot™ automated steering system.

Even if you have used other Global Positioning System (GPS) products before, Trimble recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GPS, visit the Trimble website (www.trimble.com) for an interactive look at Trimble and GPS.

Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, contact Trimble technical support:

1. Go to the Trimble website (www.trimble.com).
2. Click the **Support** button at the top of the screen. The Support A–Z list of products appears.
3. Scroll to the bottom of the list.
4. Click the **submit an inquiry** link. A form appears.
5. Complete the form and then click **Send**.

Your Comments

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

Manual System Upgrade to Autopilot

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

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

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

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

*Ag*GPS 150 EZ-Guide Plus lightbar

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

Required Components

Kits required	Special tools
Platform kit: P/N 54035-29	3/8" drill bit
Hydraulic hose kit: P/N 60193	Allen wrench set (metric and SAE)
Roof bracket kit: P/N 59786	Open end wrench set (metric and SAE)
Mag mount kit: P/N 55685-00	

Autopilot Hardware Organization - as Shipped

Platform kit (P/N 54035-29)	Common parts	GPS receiver	Display	Hyd. hose kit (P/N 60193)	Roof bracket kit (P/N 59786)
(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 (8) Controller mounting bracket (8) Bolt kit, controller	(8) Controller (8) Cable kit • Main wiring harness • Auxiliary wiring harness • Sonalert alarm	(4) GPS receiver (4) GPS antenna (4) GPS receiver mounting bracket (4) GPS receiver power/data cable (4) RTK radio, cable and mounting bracket kit (supplied separately)	(5) Lightbar (5) *Ag*GPS 170 (5) *Ag*GPS 170 cable (5) *Ag*GPS 170 mounting bracket (5) *Ag*GPS 50 lightbar (5) *Ag*GPS 150 lightbar	(2) Hyd. hoses (2) Hyd. adaptors	(4) Roof brackets (4) Bolt kit, roof bracket

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

Autopilot Hardware Organization - as Installed

Hydraulics (2)	Steering sensor (3)	GPS receiver (4)	Display (5)	Power (6)	Controller (8)
• Hydraulic valve, manifold, flow switch, 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 Field Computer • 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

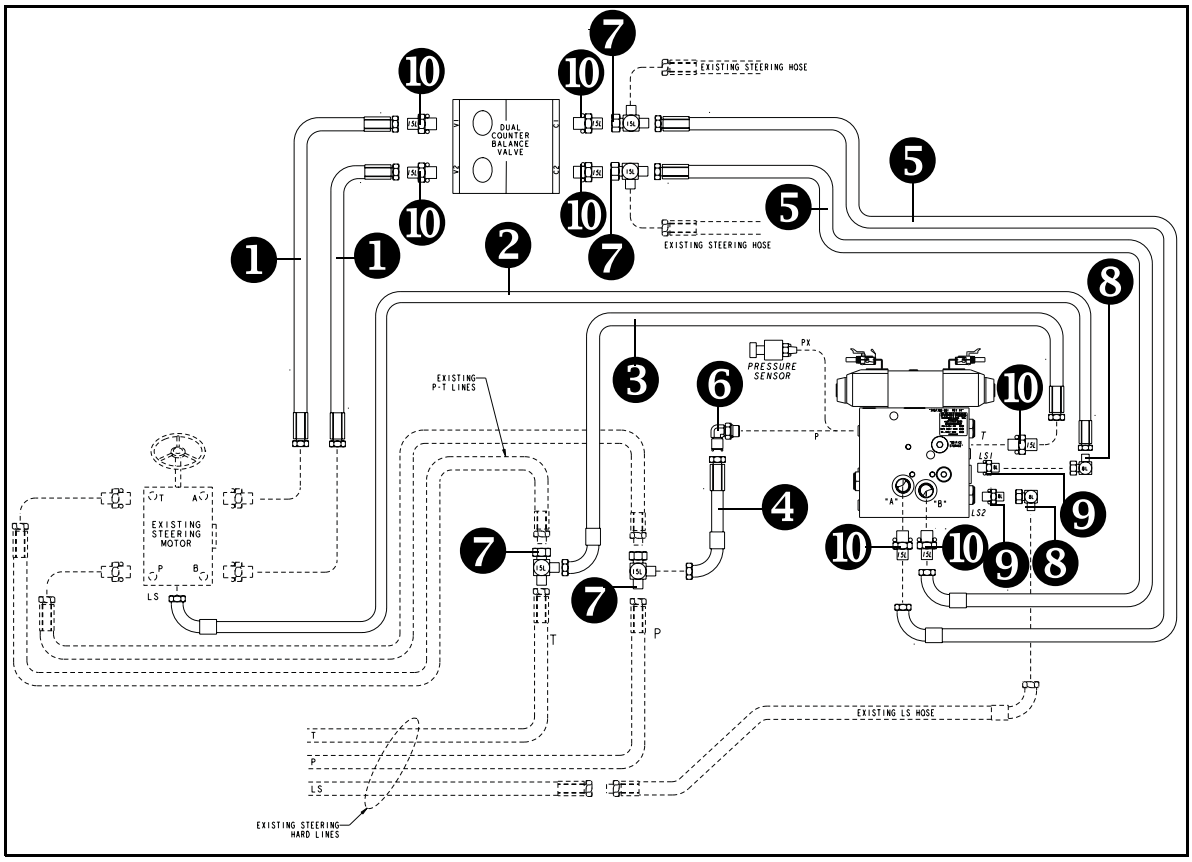
Hydraulic Control Valve Installation

In this chapter:

- Hydraulic Control Valve Components
- Prepare the Hydraulic Control Valve and the Counter Balance Assembly
- Install the Hydraulic Control Valve
- Installing the Hydraulic Hoses

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

Hydraulic Control Valve Components



Item	Description	Part number
❶	75 inch hose (x2)	F451TCC3C3-15-15-8-75
❷	75 inch hose	F451TCC3C5-8-8-4-75
❸	75 inch hose	F451TCC3C5-15-15-8-75
❹	51 inch hose	F451TCC3C5-15-15-8-51
❺	18 inch hose (x2)	F451TCC3C5-15-15-8-18

Item	Description	Part number
❻	Fitting	WEE15L3/ 4UNFOMDA3C
❼	Fitting (x4)	EL15LOMDA3C
❽	Fitting (x2)	EW8LOMDA3C
❾	Fitting (x2)	GEO8L7/ 16UNFOMDA3C
❿	Fitting (x7)	GE15L3/ 4UNFOMDA3C

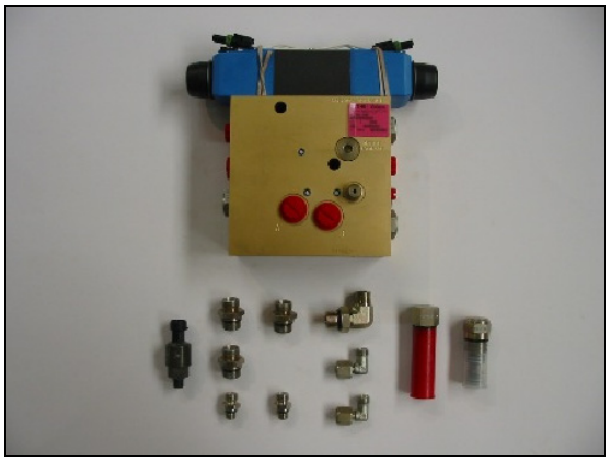
Note – *Part numbers are Parker numbers and are for reference only.*

Prepare the Hydraulic Control Valve and the Counter Balance Assembly

Note – *Place the hydraulic control valve and manifold on a clean work surface. Ensure the cartridge and orifice remain very clean. Any small particles introduced into the system can cause obstruction.*

Step 1

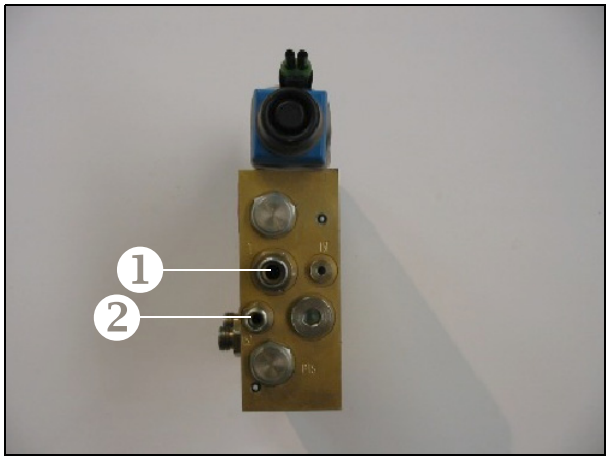
Locate the hydraulic manifold and attachments.



Step 2

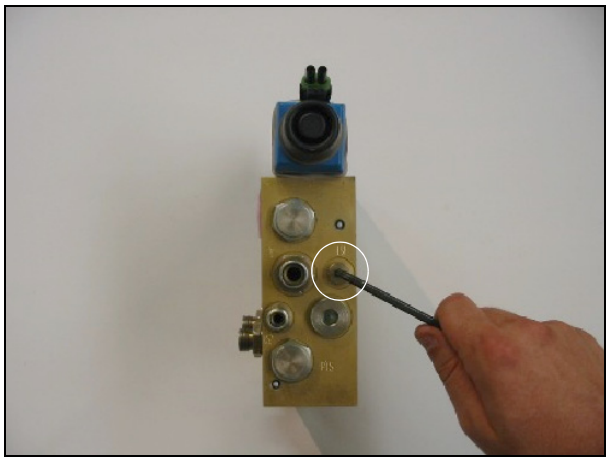
Install a DIN 15L straight in the T port ❶.

Install a DIN 8L straight in the LS2 port ❷.



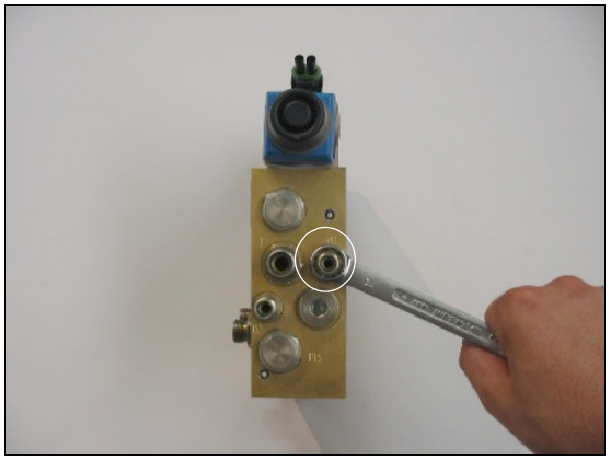
Step 3

Remove the SAE 4 plug from the LS1 port. Keep it for the next step.



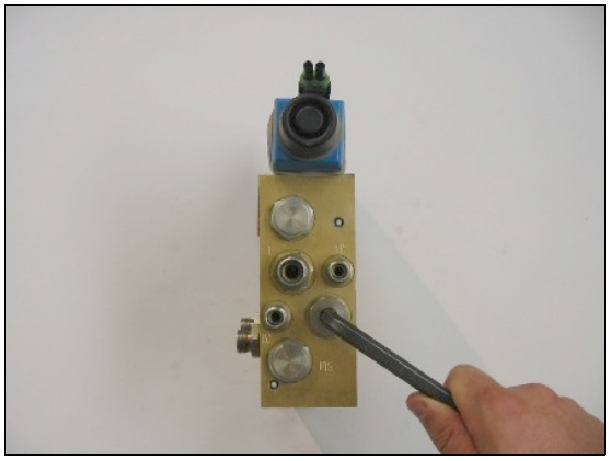
Step 4

Install a DIN 8L straight fitting in the LS1 port.



Step 5

Remove the plug from the PTS port.



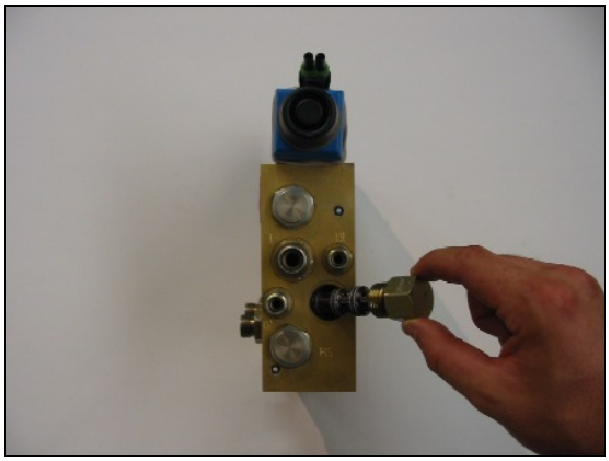
Step 6

Locate the 40 PSI pilot-to-shift valve stamped PTS3-10-0-40 on the hexagonal head.



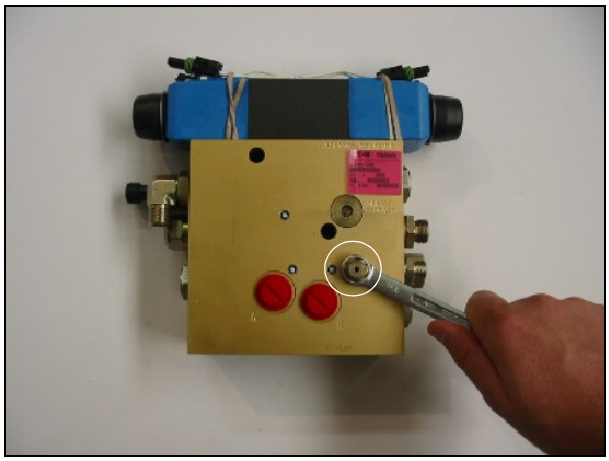
Step 7

Install the 40 PSI pilot-to-shift valve in the PTS port.



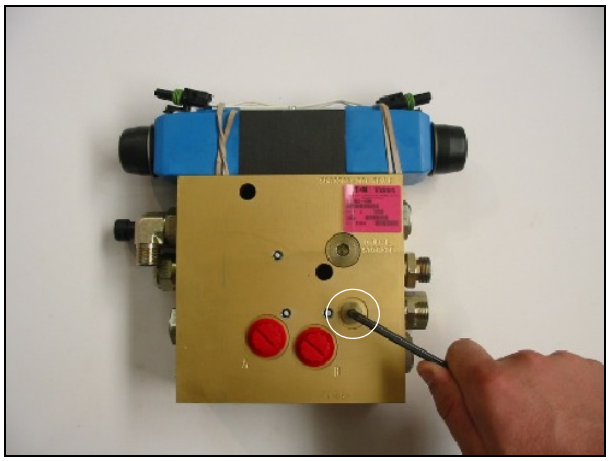
Step 8

Remove the check valve, if installed.



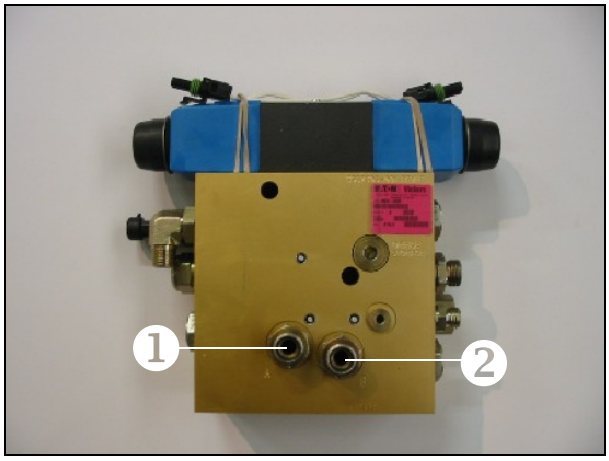
Step 9

Install an SAE 4 plug in place of the check valve.



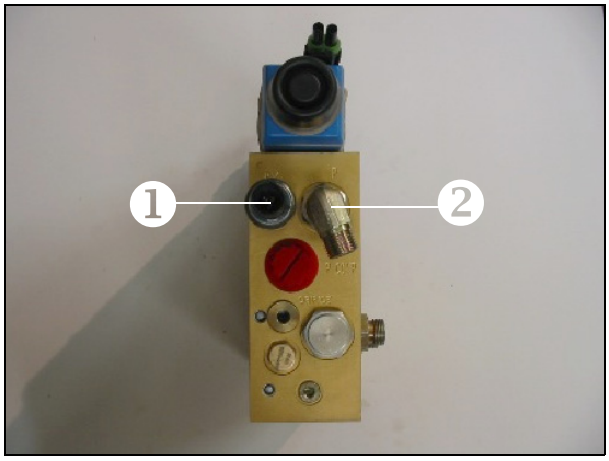
Step 10

Install a DIN 15L straight fitting in each of the A and B ports.



Step 11

Install a pressure sensor in the Px port ❶. Install a DIN 15L 90 degree fitting in the P port ❷.



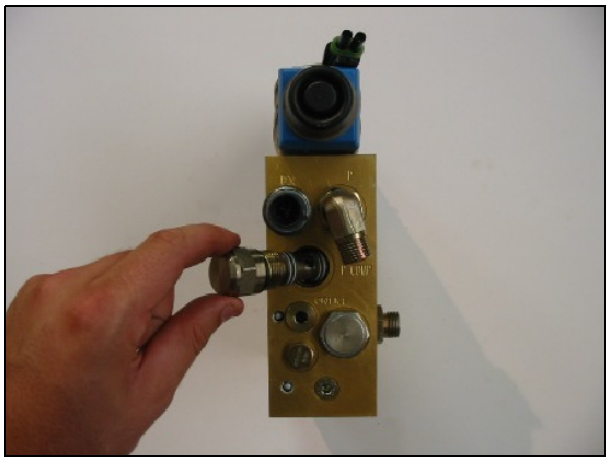
Step 12

Locate the 160 PSI P-COMP plug stamped DPS2-10-F-F-0-160 on the hexagonal head.



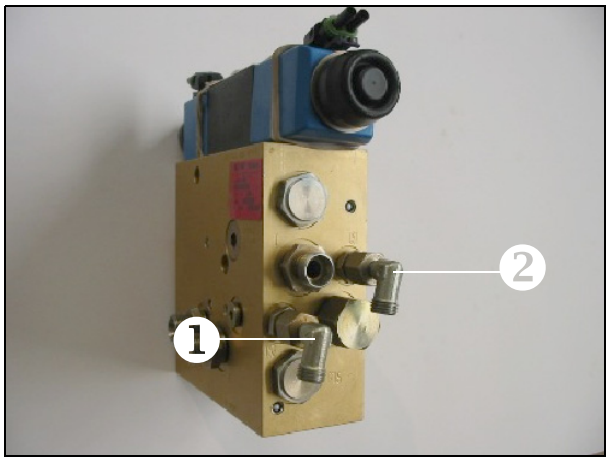
Step 13

Install the 160 PSI P-COMP plug in the P-COMP cavity.



Step 14

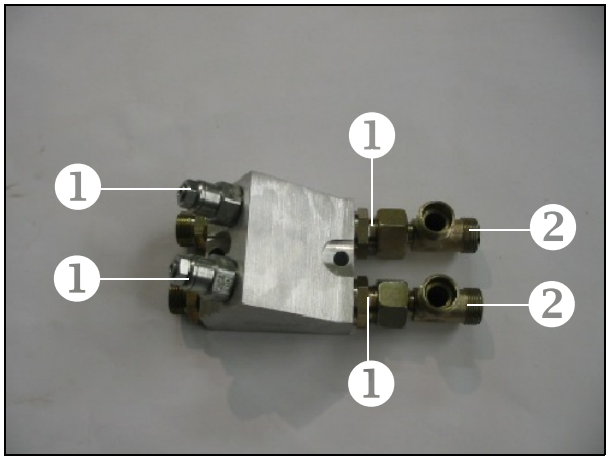
Install a DIN 8L 90 degree fitting in each of the LS1 ❶ and LS2 ❷ ports.



Step 15

On the counter balance valve, install:

- Four DIN 15L straights to the four ports ❶
- Two DIN 15L tees to the C1 and C2 ports ❷



Install the Hydraulic Control Valve

Note – *The manifold will be mounted at the rear of the tractor, above the three point hitch.*

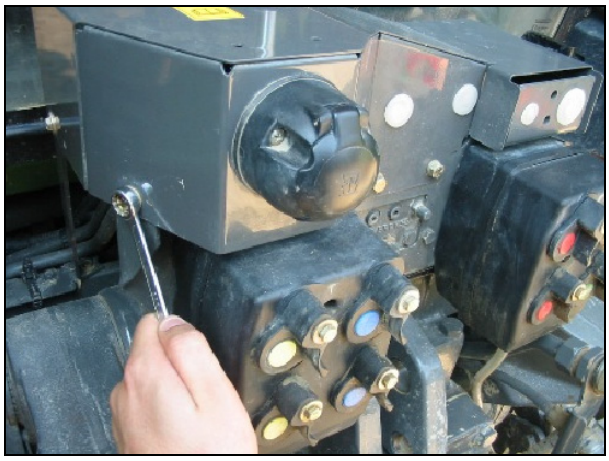
Step 1

Remove the handle.



Step 2

Remove all of the bolts that hold the steel cover on.



Step 3

Remove the steel cover.



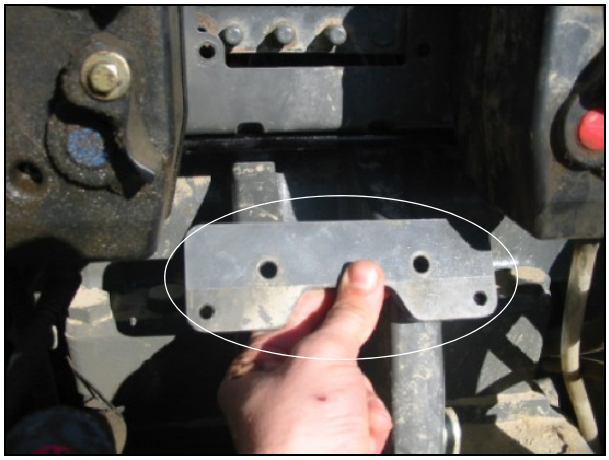
Step 4

Remove the four M8 bolts that hold the existing spacer.



Step 5

Remove the spacer.



Step 6

Mount the lower part of the hydraulic control valve bracket, in place of the spacer.



Step 7

Secure the lower part of the hydraulic valve bracket with the four existing bolts.



Step 8

Re-attach the steel cover.



Step 9

Re-attach the handle.



Step 10

Clamp the vertical part of the lower bracket to the steel cover. Use the 3/4 x 3/8 spacer, the M8 x 35 bolt, and the washer from the manifold bracket kit.



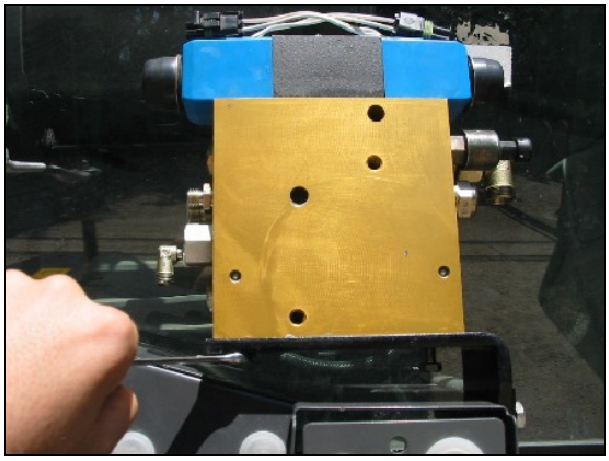
Step 11

Install the upper part of the H2 bracket. Use the two 3/8" x 1½" bolts, and the two 3/8" nuts from the hydraulic control valve manifold bolt kit.



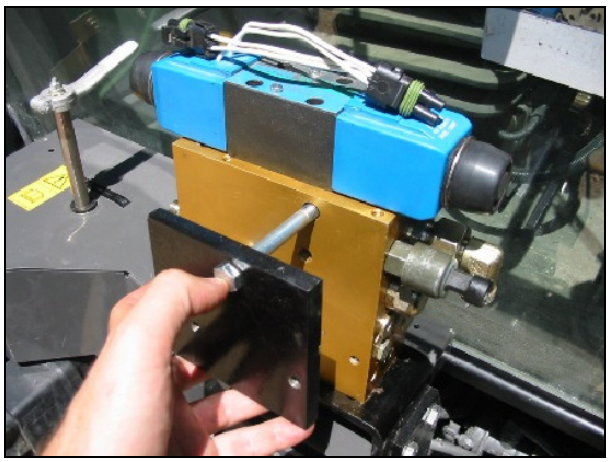
Step 12

Install the hydraulic control valve with the A and B ports pointing forward. Use two 3/8" x 1" bolts from the hydraulic control valve bolt kit.



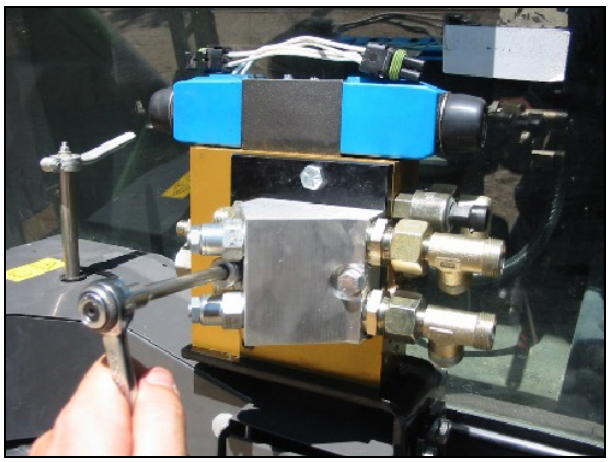
Step 13

Install the counter balance bracket. Use two 3/8" x 3½" bolts from the hydraulic control valve bolt kit and secure them with 3/8" nylock nuts.



Step 14

Mount the counter balance. Use two M8 x 45 bolts and two M8 washers from the counter balance bracket kit. Secure the bolts.



Installing the Hydraulic Hoses

Step 1

CAUTION – When you remove the wheel from the vehicle, be sure to follow the manufacturer's procedures. Failure to do so could result in injury, or damage to the vehicle.

Remove the right rear wheel from the vehicle.



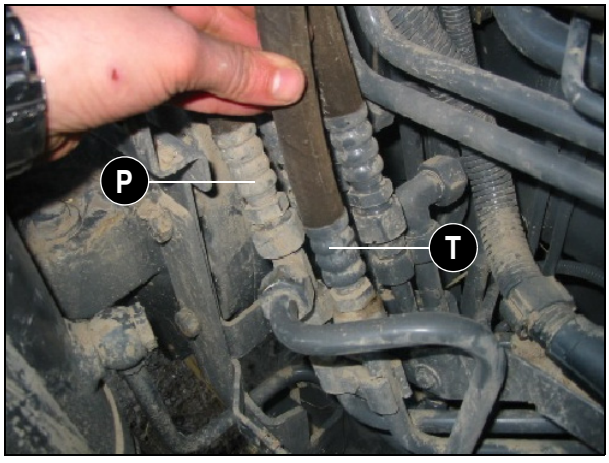
Step 2

Remove the steel cover.



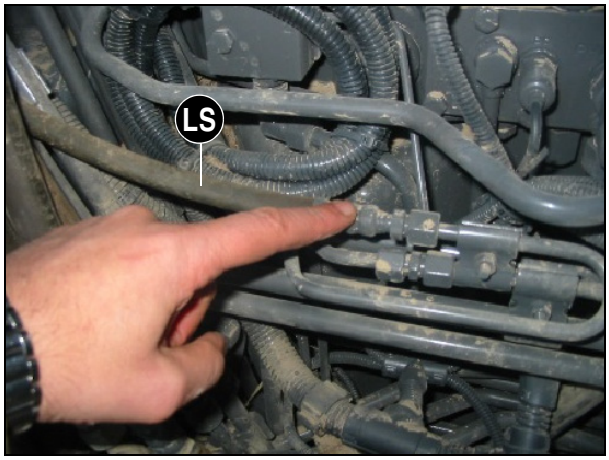
Step 3

Locate the existing P and T hoses.



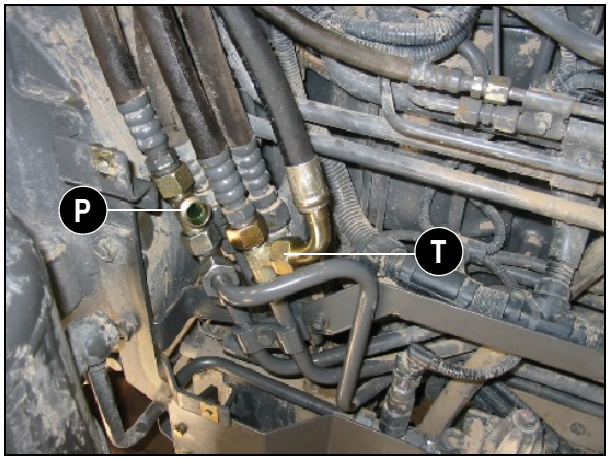
Step 4

Locate the existing LS line.



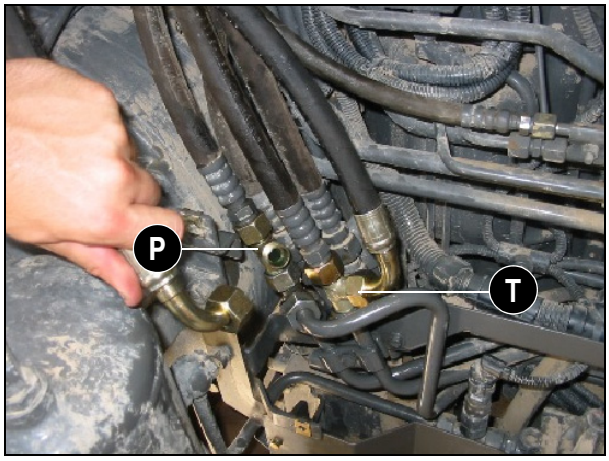
Step 5

Install DIN 15L tee on the P and T lines.



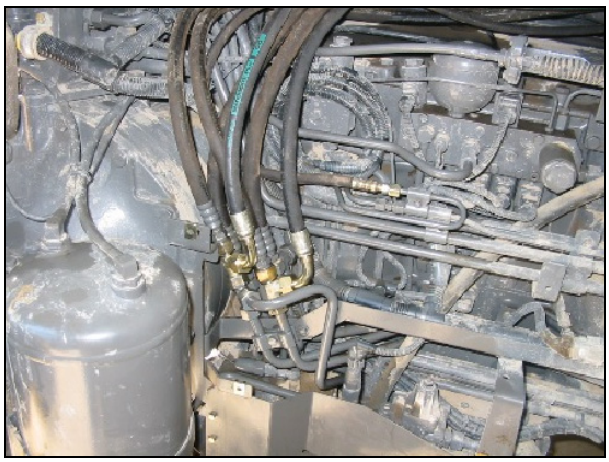
Step 6

Connect the 90 ends of the 51" P and 75" T hoses to the tees.



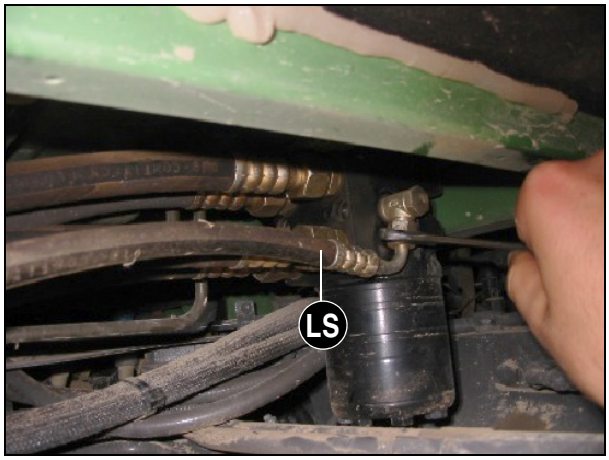
Step 7

Route the other end of the P and T hoses to the back, towards the hydraulic control valve manifold.



Step 8

Remove the existing LS hose from the steering unit.



Step 9

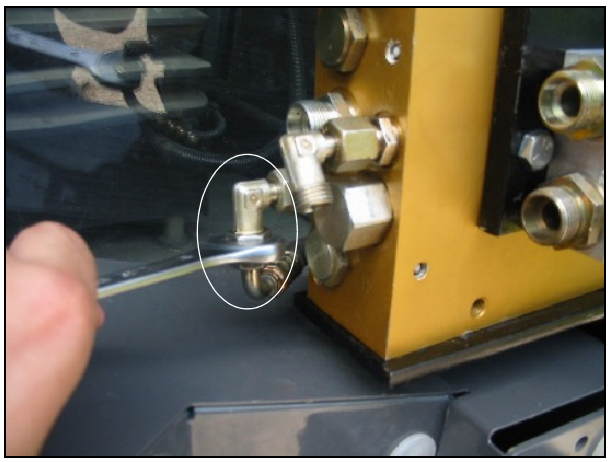
Move both the existing LS, P, and T hoses to the back (towards the hydraulic control valve manifold).

Route the 90 degree end of the existing LS line together with the P and T hoses towards the hydraulic control valve manifold.



Step 10

Connect the existing LS hose to the LS2 port.



Step 11

Connect the straight end of the kit supplied 75" LS1 hose to the LS1 port, and route it under the cab to the hand pump. Keep it loose for now.



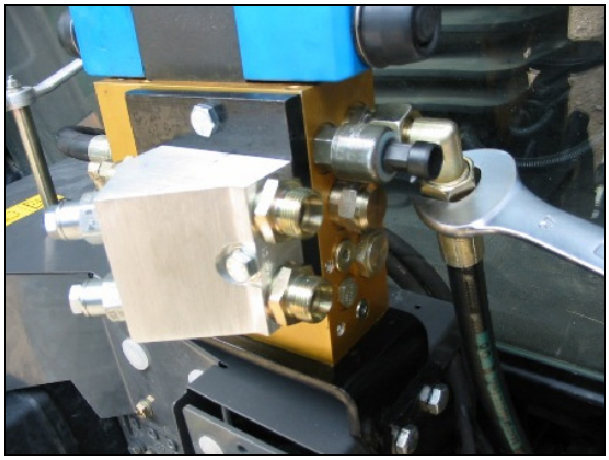
Step 12

Connect the kit supplied 75" T hose to the T port.



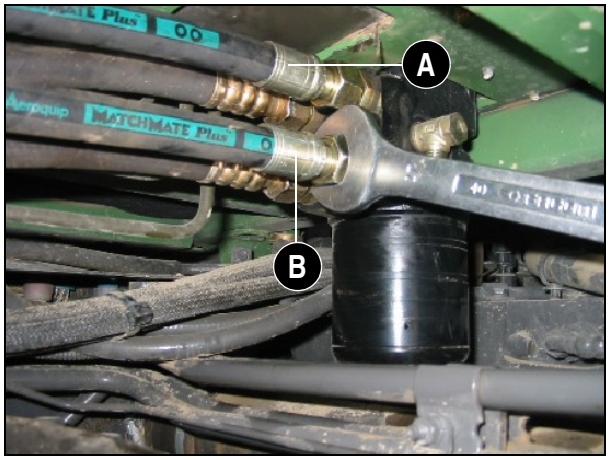
Step 13

Connect the kit supplied 51" P hose to the P port.



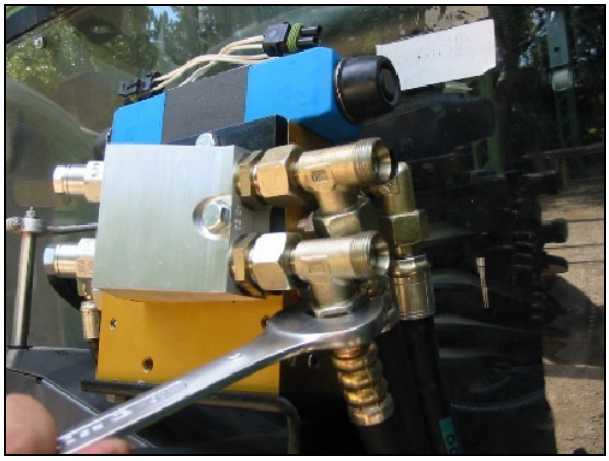
Step 14

Mark A and B on the existing hoses as show. Remove them from the steering hand pump and route them to the counter balance valve.



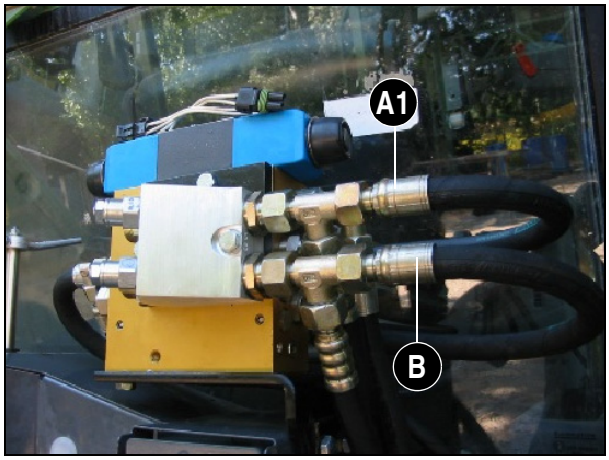
Step 15

Connect the existing A hose to the counter balance valve tee connected to C1 port. Connect the existing B hose to the counter balance tee connected to the C2 port.



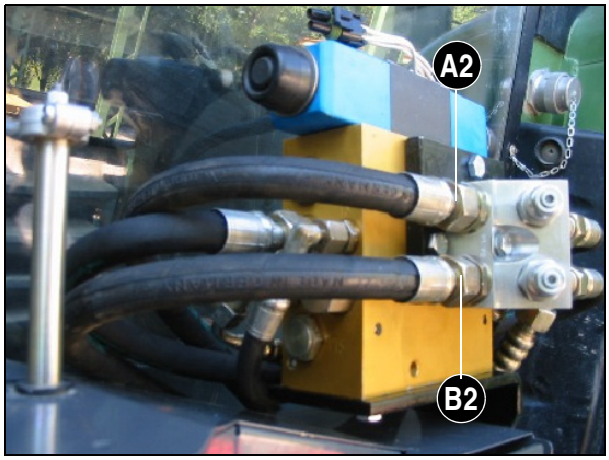
Step 16

Connect the kit supplied 18" A1 hose to the tee connected to the counter balance C1 port. Connect the kit supplied 18" B1 hose to the tee connected to the counter balance C2 port.



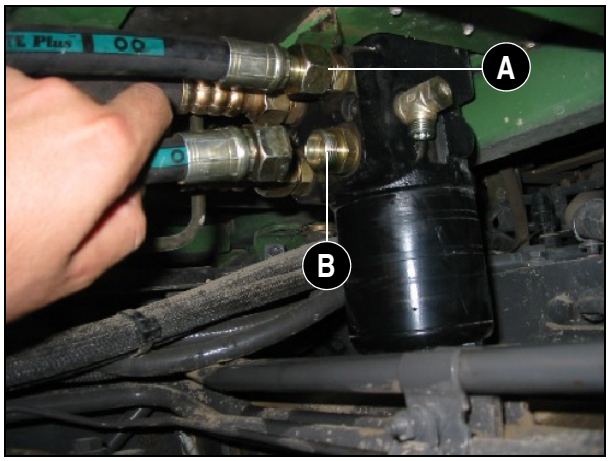
Step 17

Connect the kit supplied 75" A2 hose to the counter balance V1 port. Connect the kit supplied 75" B2 hose to the counter balance V2 port.



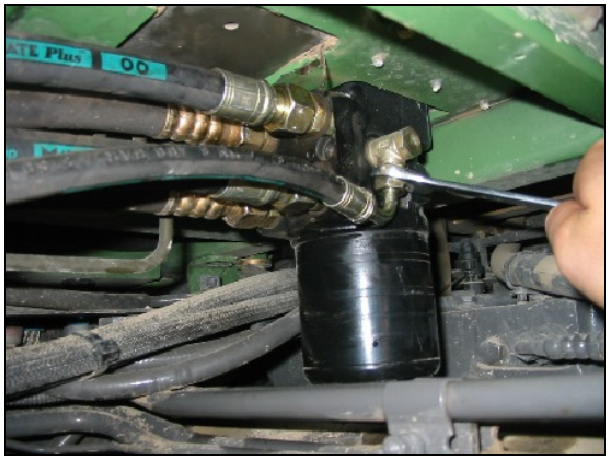
Step 18

Connect the other ends of the A2 hose to port A of the steering hand pump and the other end of the B2 hoses to port B of the steering hand pump.



Step 19

Connect the other end of the kit supplied 75" LS1 hose to the LS port of the steering unit.



Step 20

Tighten the fittings in the LS1 port.



Step 21

Re-attach the steel cover.



CHAPTER

3

AutoSense Device Installation

In this chapter:

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

This chapter describes how to install the AutoSense device.

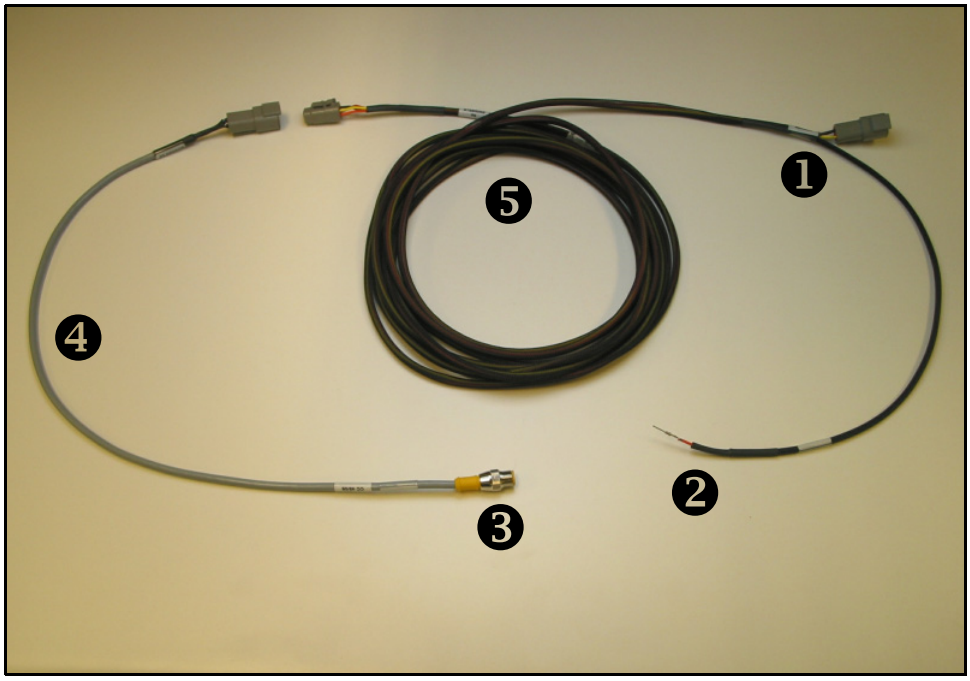
If the described mounting location is not accessible, chose an alternate location. To ensure proper function, the AutoSense device must be located in a position that is free of obstructions and allows it to rotate with the wheels when they turn.

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 Device Components



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

Install the AutoSense Device

Step 1

Locate the left wheel of the front axle and then remove the two existing bolts from the fender mounting.



Step 2

Mount the AutoSense bracket as shown. Use the existing bolts.



Step 3

Mount the AutoSense device on the bracket with the connector pointing toward the center of the vehicle. Use four provided #6 x ½" socket head screws.



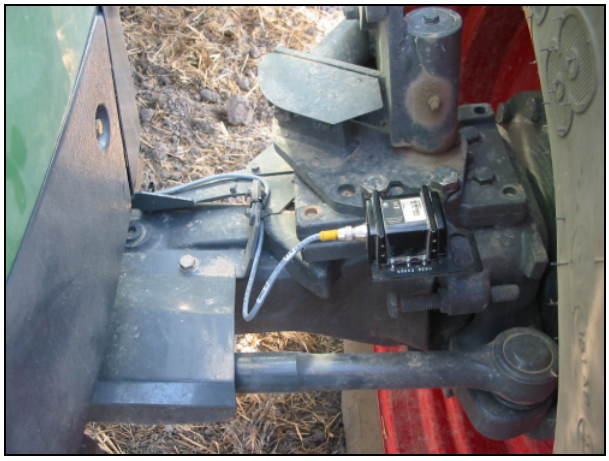
Step 4

Connect the AutoSense cable to the device.



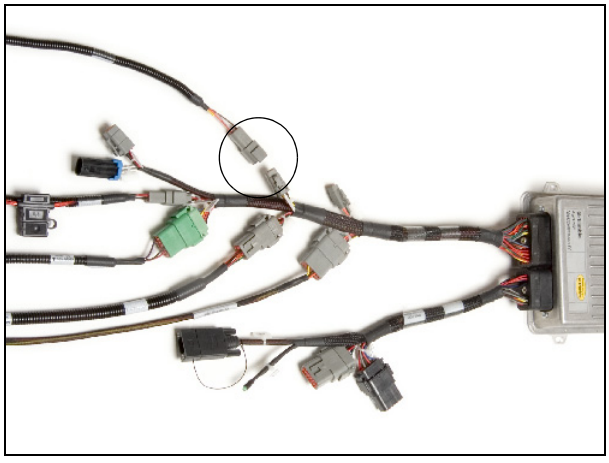
Step 5

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



Step 6

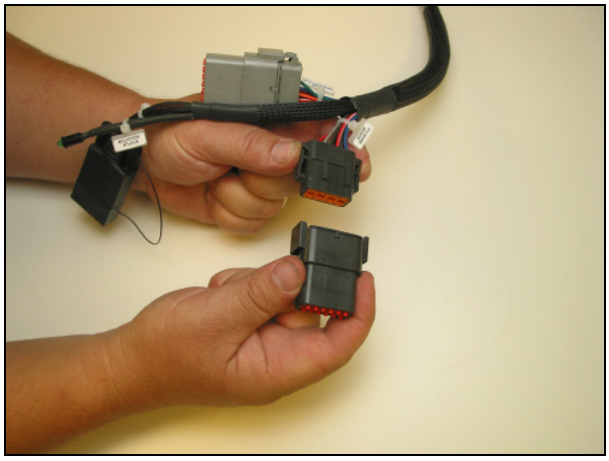
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Harness Preparation (P/N 54602 Rev C)

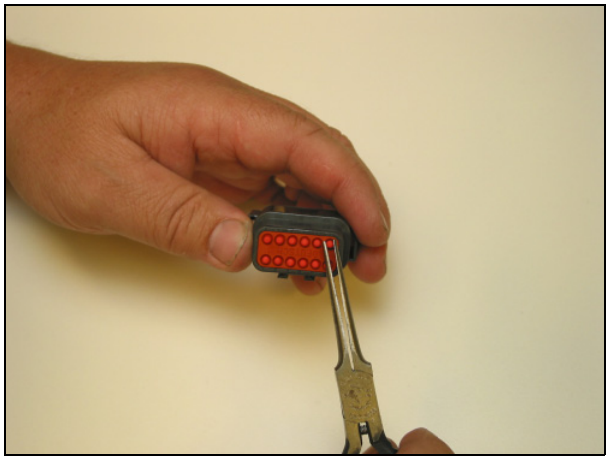
Step 1

Remove the black Deutsch DTM receptacle from the P-13 sensors leg of the auxiliary harness. See Controller Connections, page 96.



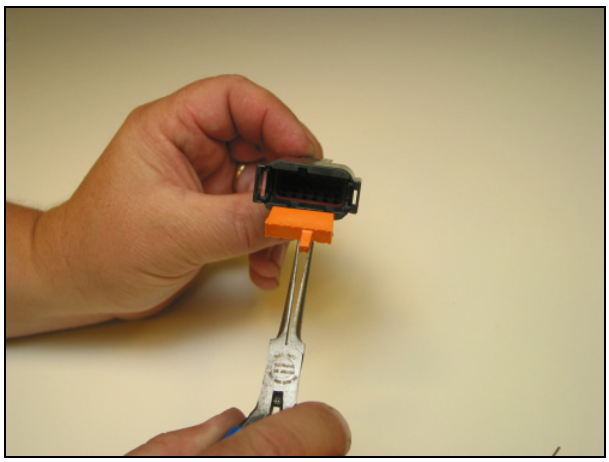
Step 2

Remove the plug from cavity number 1.



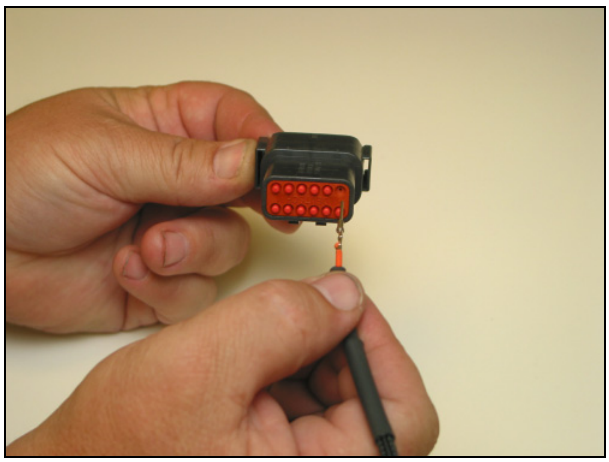
Step 3

Remove the wedge from the connector.



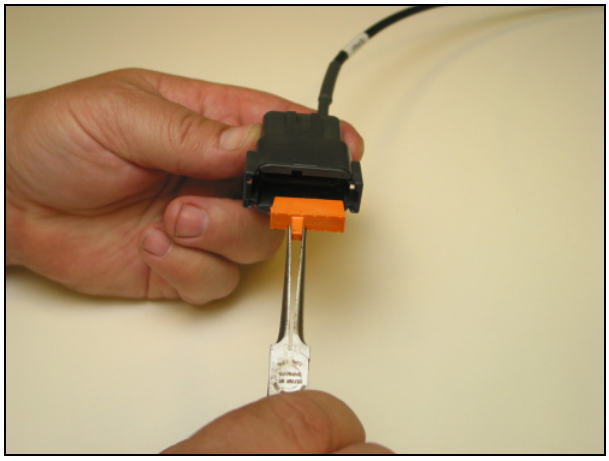
Step 4

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

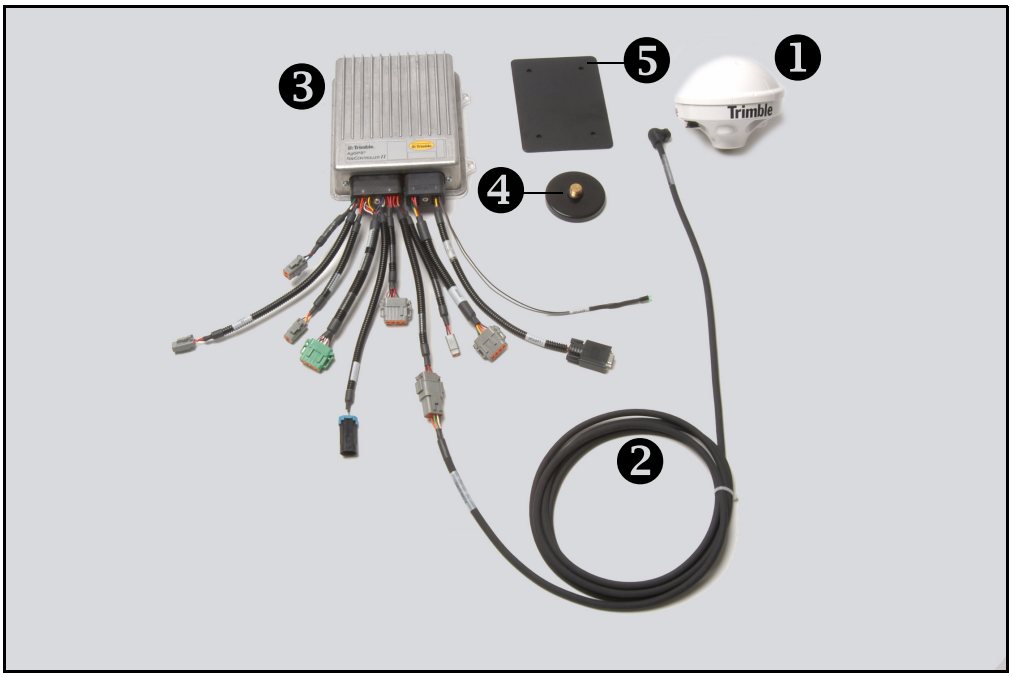
Antenna/Receiver Installation

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 Radio Module (if Equipped) Components
- AgGPS 252 GPS Receiver with AgGPS Radio Module (If Equipped) Installation Process

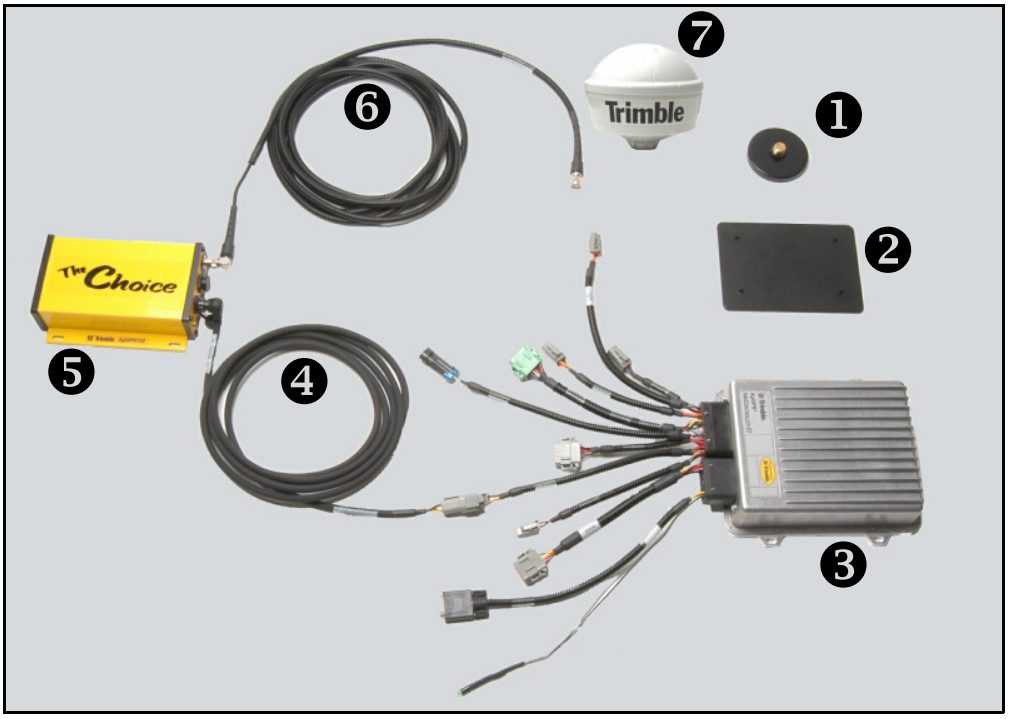
This chapter describes how to install an *Ag*GPS 114 antenna/receiver, an *Ag*GPS 132 receiver and antenna, an *Ag*GPS 252 receiver and SiteNet™ radio, or an *Ag*GPS 252 receiver and *Ag*GPS radio module.

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



Step 2

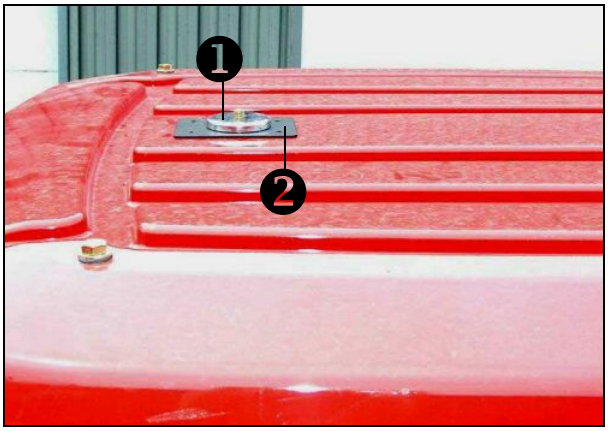
Remove the backing on the mounting plate's adhesive strips. Mount the plate on the center point mark.

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



Step 3

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



Step 4

Install the antenna on the magnetic mount.



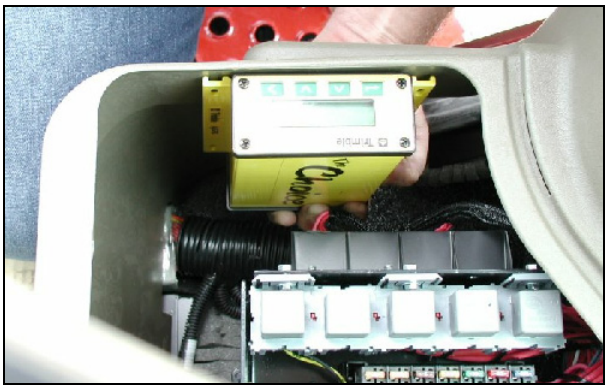
Step 5 *Ag*GPS 114 Only

Attach the antenna/receiver cable and 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 trainer seat.



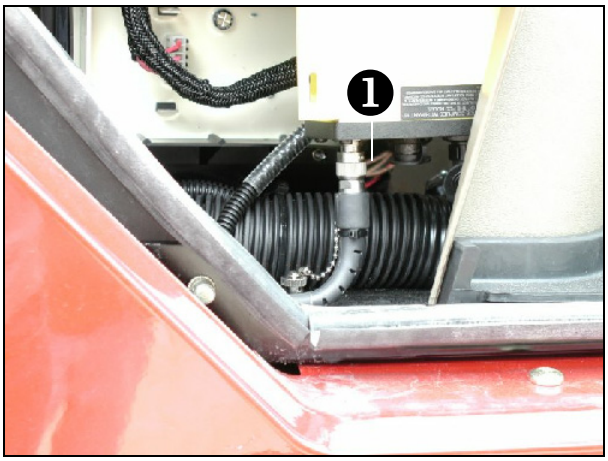
*Ag*GPS 132 Only

Attach the antenna/receiver cable and 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. The connections will be established later.



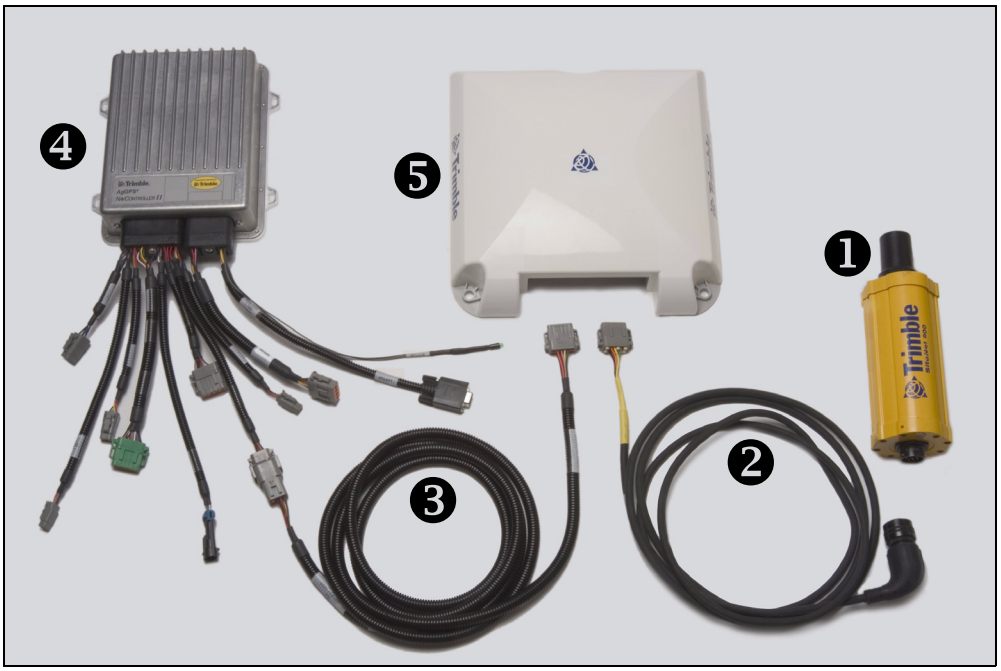
The *Ag*GPS 132 receiver can be mounted in the electronics bay next to the operator's seat. Place the receiver in the electronics bay as shown. Use the receiver as a template to mark the top two holes. Drill holes in the electronics bay and then install the receiver with nuts and bolts.

Route the antenna cable ❶ and connect it to the receiver, which is mounted 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 trainer seat. The connections will be established later.



RIGHT SIDE SHOWN

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



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

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

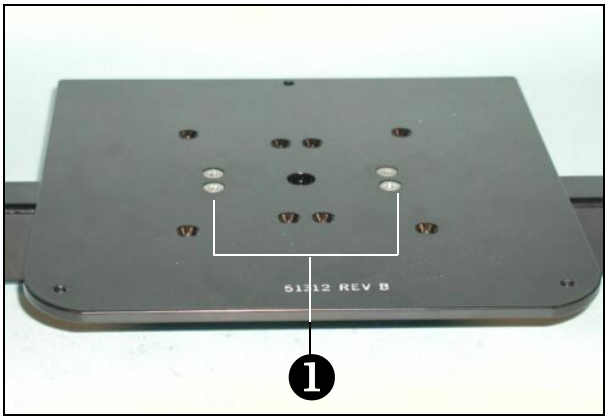
Step 1

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



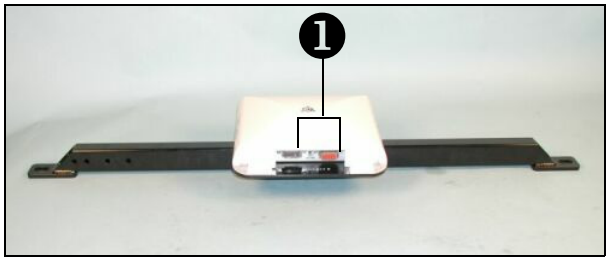
Step 2

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



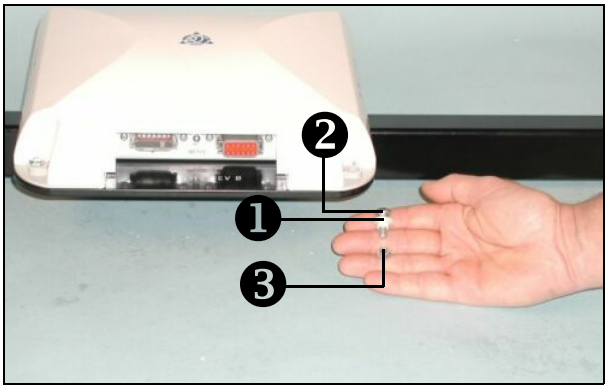
Step 3

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



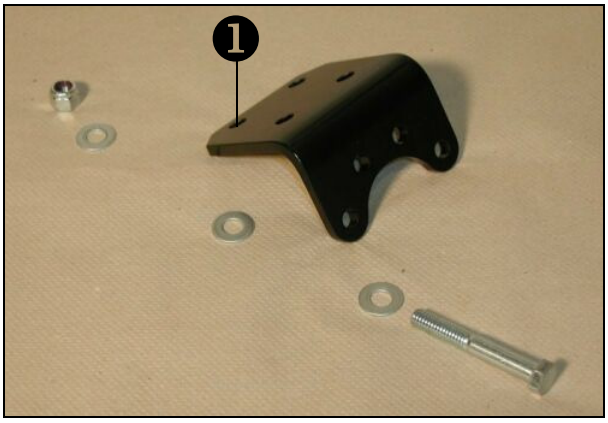
Step 4

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

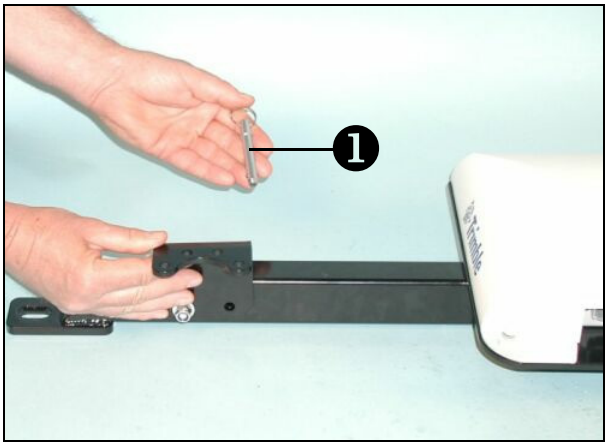


Step 5 If Equipped With SiteNet Radio

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

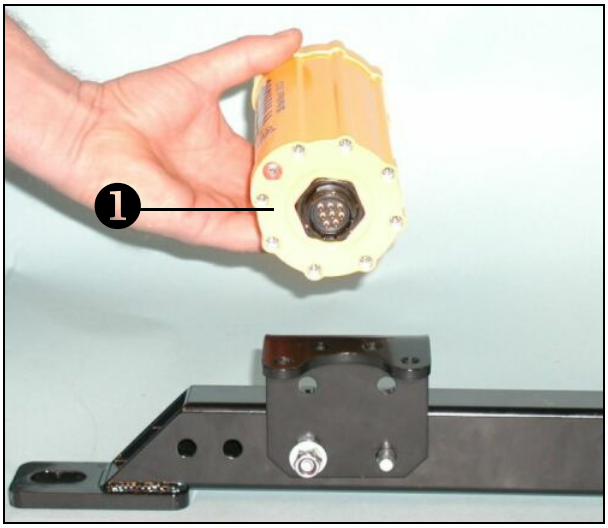


Install the ring grip retaining pin ❶ through the rear of the bracket, beside the bolt.

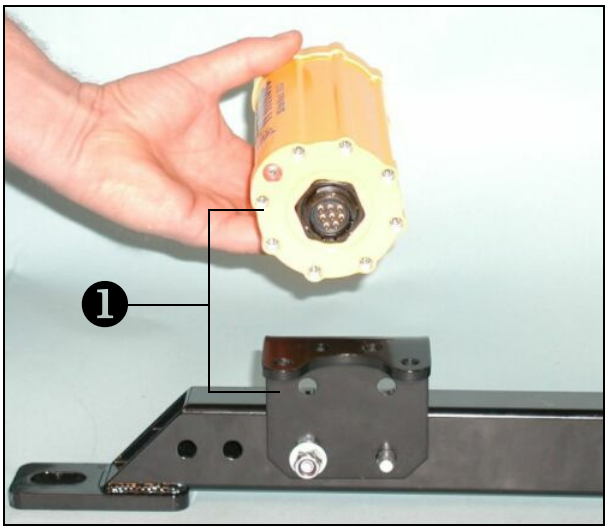


Install the radio on the mount bracket with the connector cavity on the bottom.

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

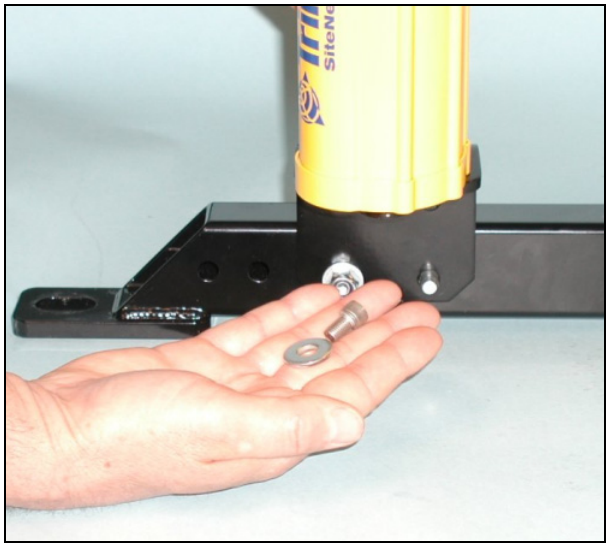


Position the radio so the LED is as close to the mounting bracket as possible without the LED being covered. Align the hole on the radio with the hole on the bracket, as shown ❶.



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

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



Step 6

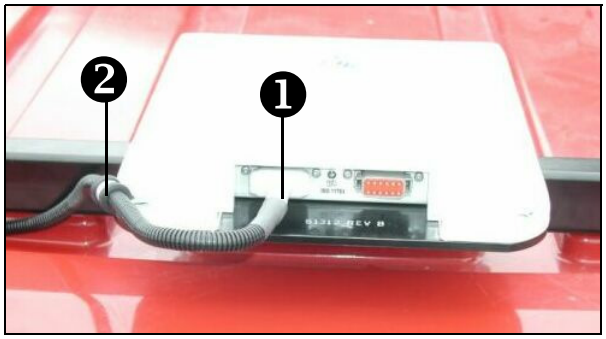
Remove two bolts and washers ❶ at the rear of the cab roof. Place the mount bracket assembly over the existing holes. Re-use the existing cab bolts and install bolts onto the bracket. The connector cavities should face the rear of the cab.

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



Step 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

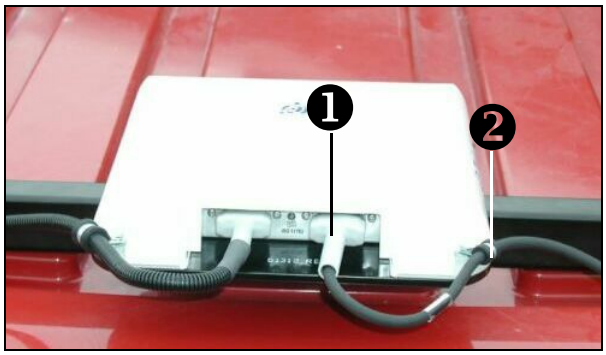
Route the cable toward the trainer seat. The connections will be established later.

Step 9 If Equipped With SiteNet Radio

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



Place the opposite 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.



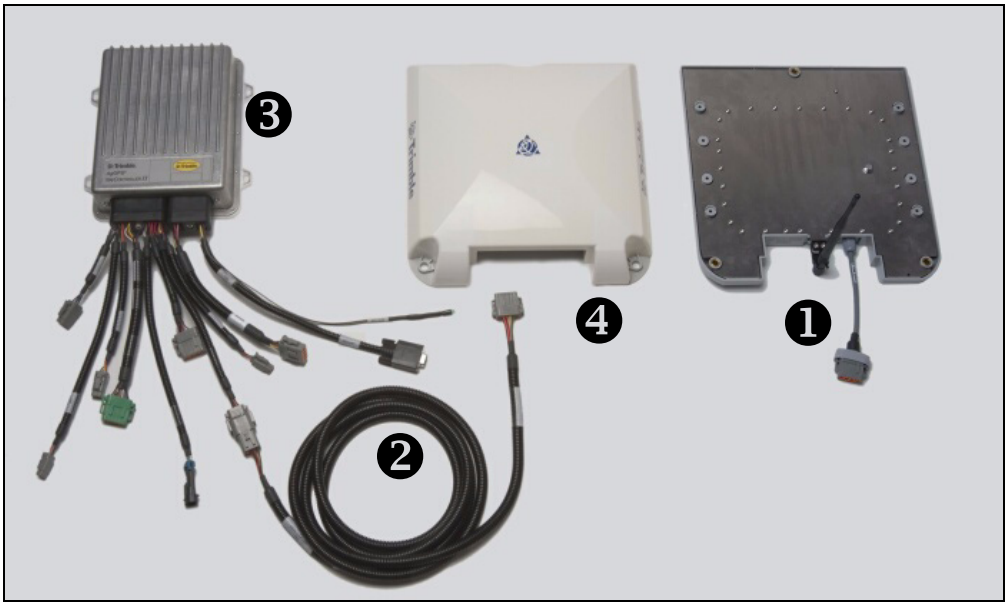
Coil the excess cable, tie the cable together, and then secure it to the cab or the roof bracket.



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



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



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

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

Primary mount

Step 1

At the rear center of the cab roof, position the three magnetic mounting plates with the antenna mounting plate.

Note – *To achieve the best performance, mount the antenna at the rear of the roof.*



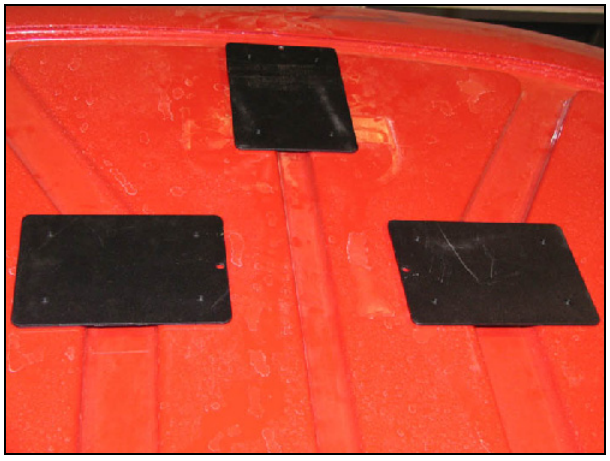
Step 2

Ensure that you have full magnetic contact on the magnetic mounting plates.



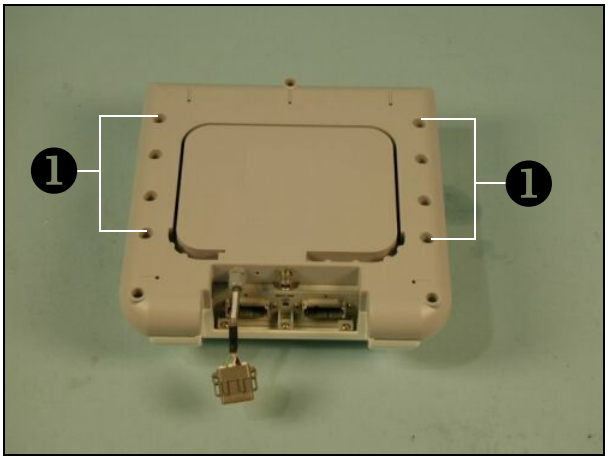
Step 3

Also ensure that you have maximum tape coverage to the cab roof between the roof ribs. Clean the cab roof area where the magnetic mounting pl ates will be adhered. Pull the protective strips from the tape strips and secure the magnetic mounting plates to the cab roof.



Step 4

Place the *Ag*GPS radio module (if equipped) on the *Ag*GPS 252 receiver. Install four screws in the holes ❶ as shown.



Step 5

Install the nylon bushings into the receiver.



Step 6

Position the *Ag*GPS 252 receiver and radio (if equipped) on top of the mounting plate. Align the three bolt holes. Install the magnetic mounts below the mounting plate and secure with a bolt, washer, and nut at each location.



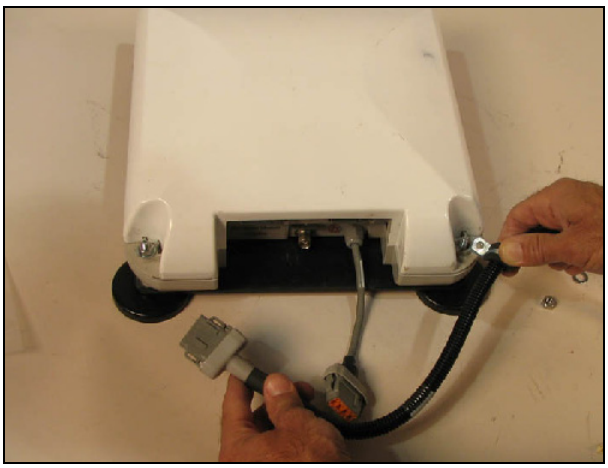
Step 7

Install the magnetic mount pads to the bottom of each magnetic mount.



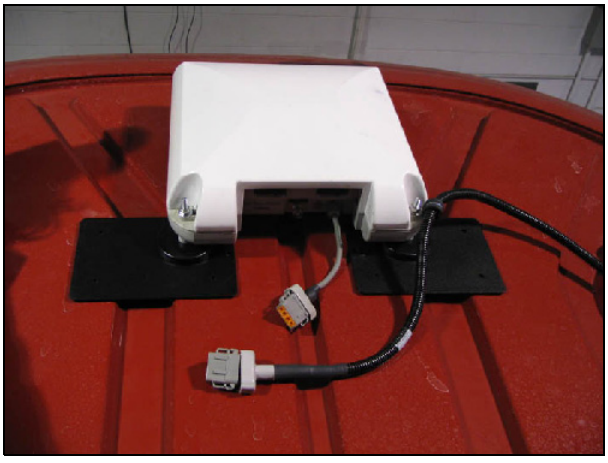
Step 8

Install the antenna cable clamp that is attached to the antenna harness on the right side of the receiver connectors.



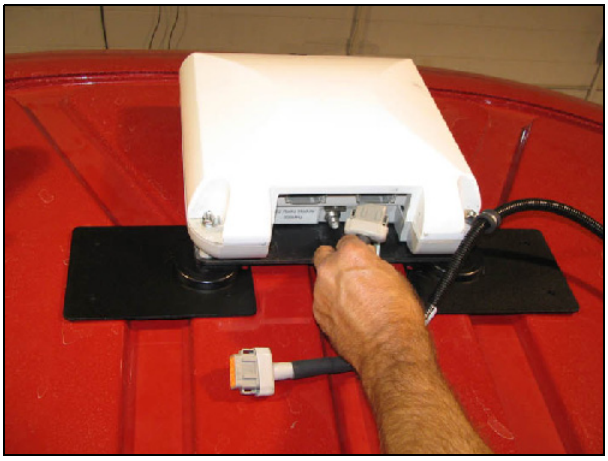
Step 9

Place the receiver assembly onto the magnetic mount plates on the cab roof.



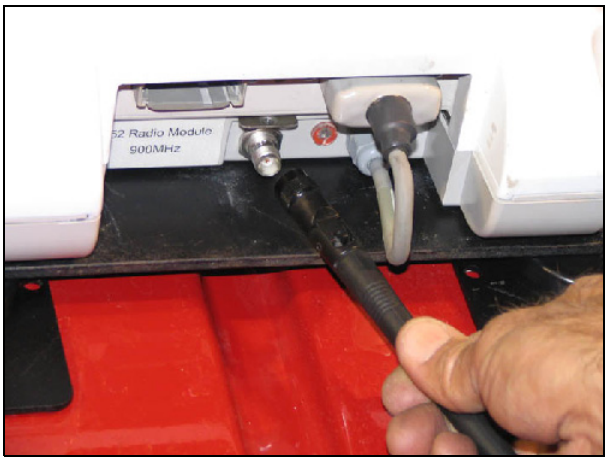
Step 10

Remove the connector plug from port B on the receiver and then plug the connector from the radio (if equipped) into the receiver.



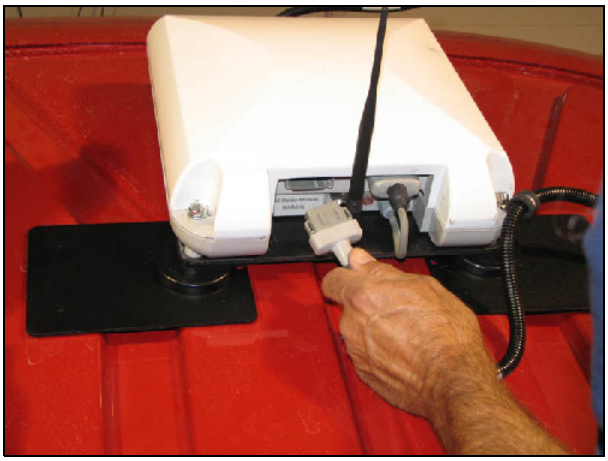
Step 11

Screw the antenna mast onto the radio (if equipped).



Step 12

Plug the antenna/receiver cable into the A port on the receiver. Route the harness over the right mirror, down the right hand grab rail, and then back toward the right hand service door. Secure the cable along the way with tie straps.



Optional mount

Note – *The spars, cross bar, and bolts (P/N 59786) are not included in the platform kit. For dimension drawings, see* *page 103**.*

Step 1

Remove the two screws that hold the padded panel under the sunroof.



Step 2

Remove the padded panel.



Step 3

Use two provided M12 x 20 mm bolts to mount the square cross bar on the roof spars. The spars are not attached to the roof yet.

Adjust the roof bracket until it is located in the middle of the roof.



Step 4

Ensure that the spars are parallel to eachother.



Step 5

Use the spars as a template to drill four holes with a diameter of 6.5 mm.



Step 6

Install the four 1¼" x 0.335" spacers provided.



Step 7

Place the bracket over the spacers.



Step 8

Insert the four provided M6 x 45 bolts up through the holes that you drilled in the sunroof. Pass the bolts through the spacers and the bracket.



Step 9

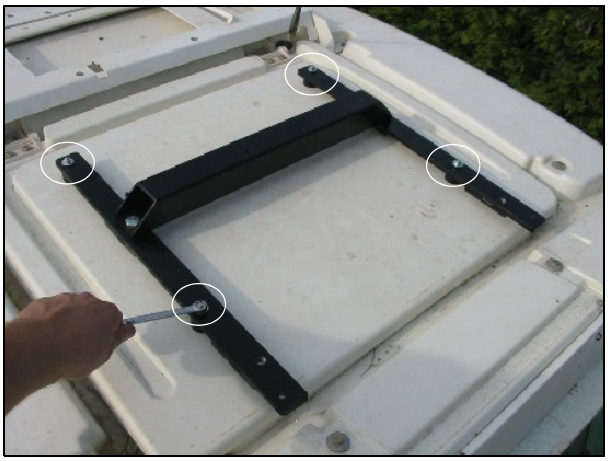
Insert the four rubber washers provided over the ends of the bolts. Then insert the four steel washers and secure them with the four M6 nuts.



Step 10

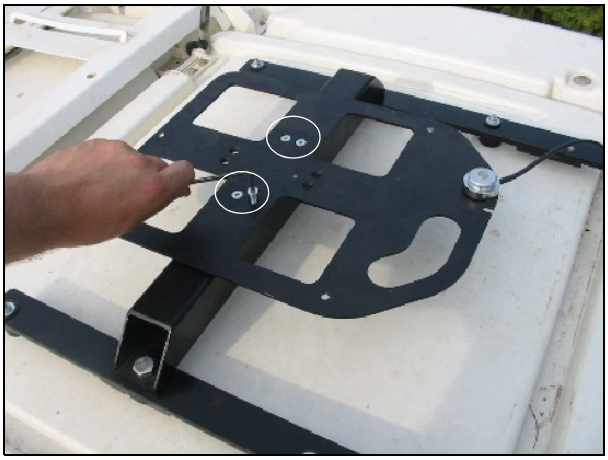
Note – *In this step, be careful that you do not break the rubber washers.*

Tighten the bracket bolts.



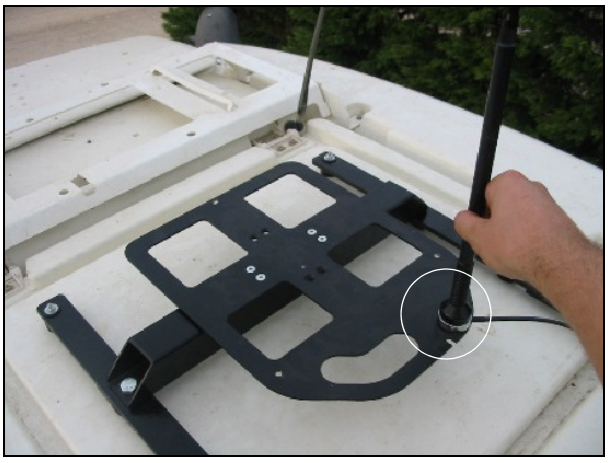
Step 11

Attach the receiver bracket to the roof bracket. Use the four provided ¼" x ½ FH Philips screws.



Step 12

Attach the radio antenna to the receiver bracket.



Step 13

Place the *Ag*GPS radio on the receiver bracket.



Step 14

Place the *Ag*GPS 252 GPS receiver over the radio.



Step 15

Bolt the receiver and radio to the receiver bracket.



Step 16

Plug the *Ag*GPS radio connector into Port B on the *Ag*GPS 252 GPS receiver.



Step 17

Plug the antenna cable into the antenna socket on the receiver.



Step 18

Plug the receiver cable from the navigation controller into Port A on the receiver.



Step 19

Locate the receiver either at the front of the spars, or at the back of the spars for slow speed applications.



FRONT OF SPARS



REAR OF SPARS

CHAPTER

5

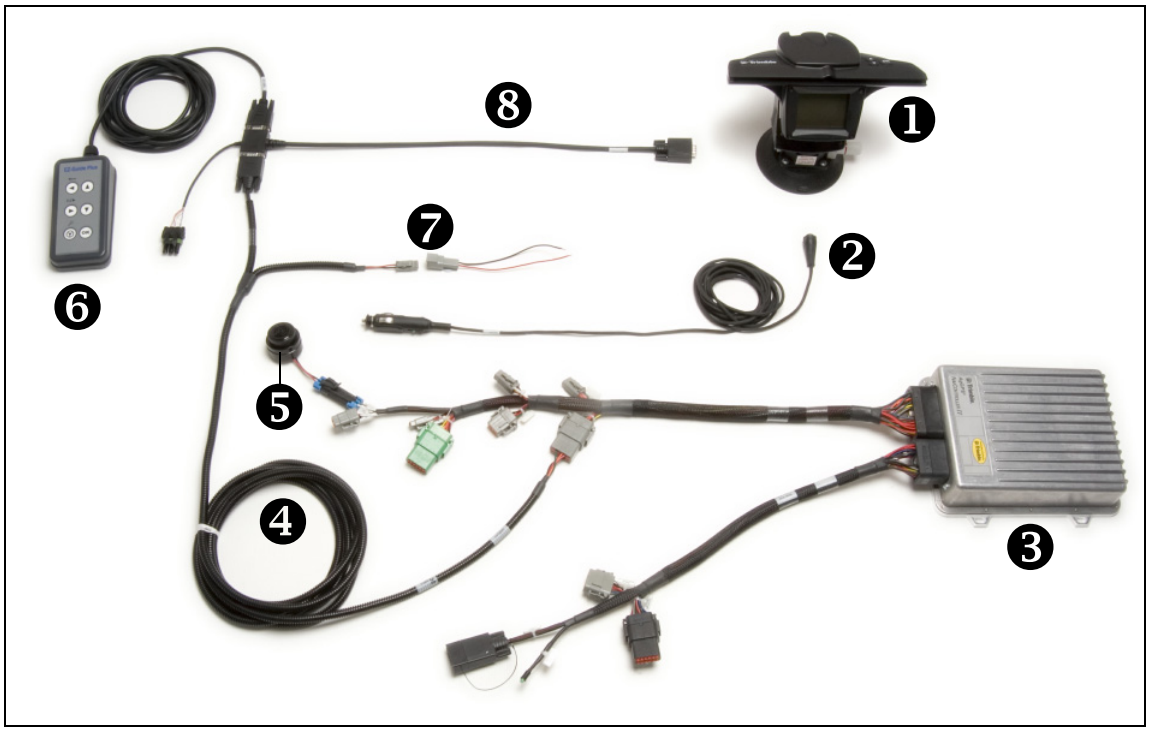
Display Installation

In this chapter:

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

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

EZ-Guide Plus Lightbar Components



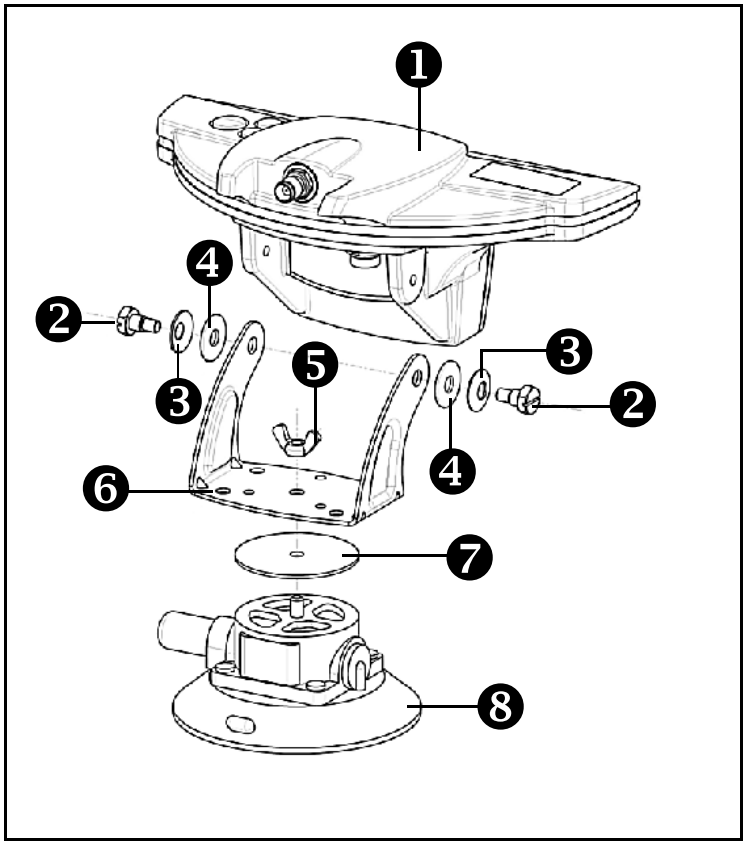
Item	Description
❶	EZ-Guide Plus lightbar
❷	Power harness
❸	Controller
❹	Display cable

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

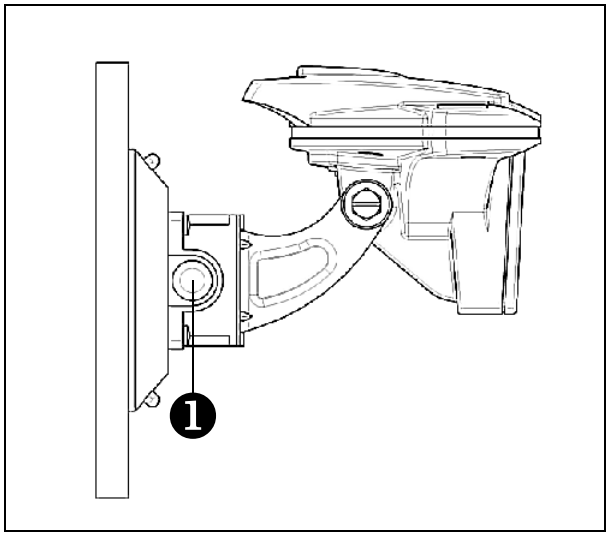
Secure the vacuum mount to the mounting bracket using the hardware provided.

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.

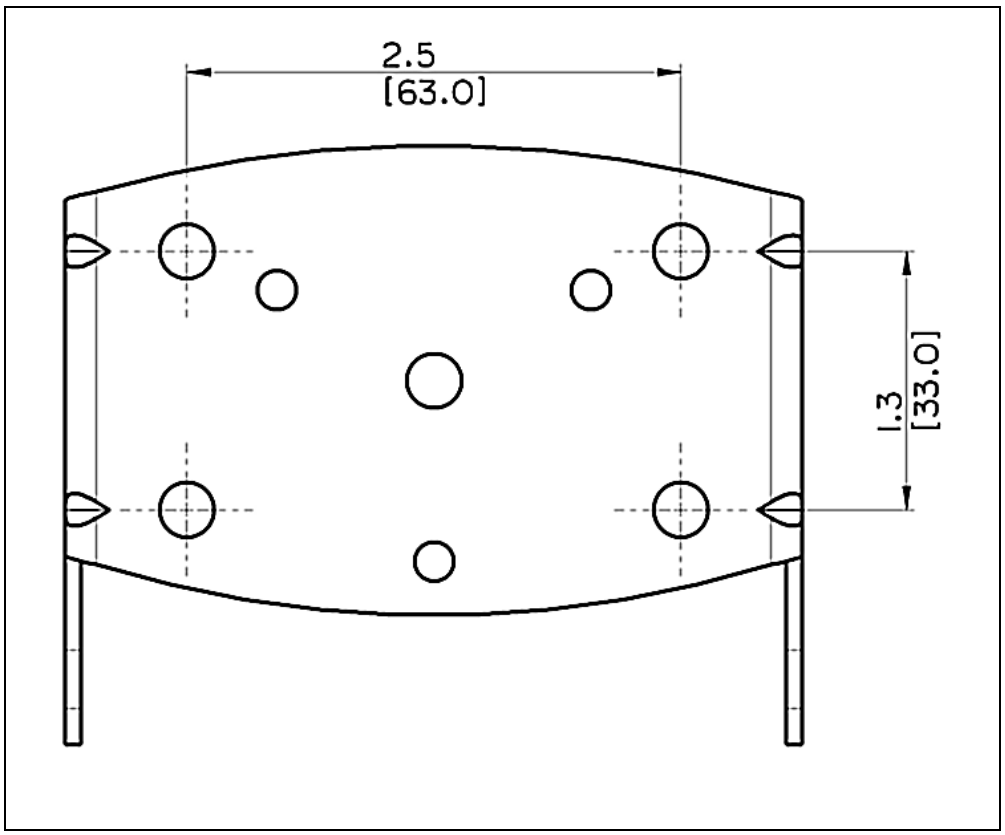


Figure 5.1 Bracket drilling template

Step 3

Screw the mount bracket to the horizontal surface.

Step 4

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

Step 5

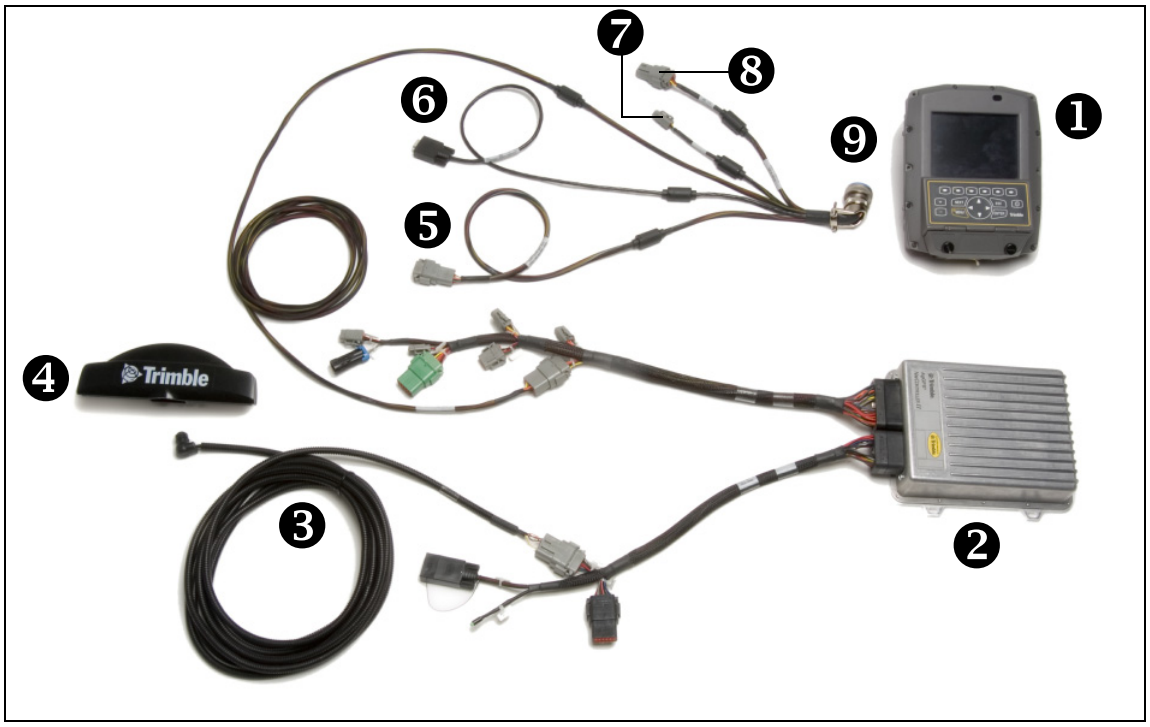
Connect the cable to the EZ-Guide Plus lightbar.

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

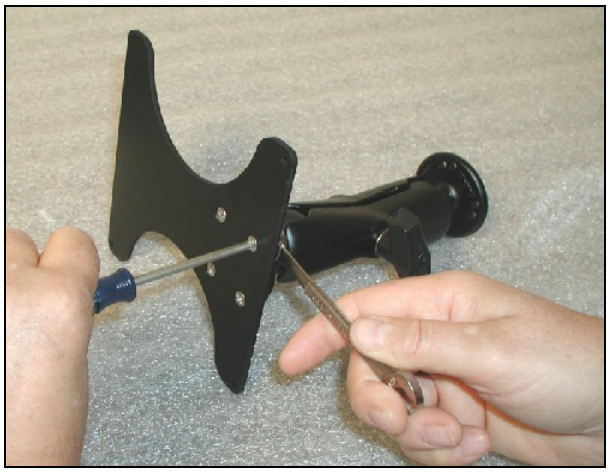
Step 1

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

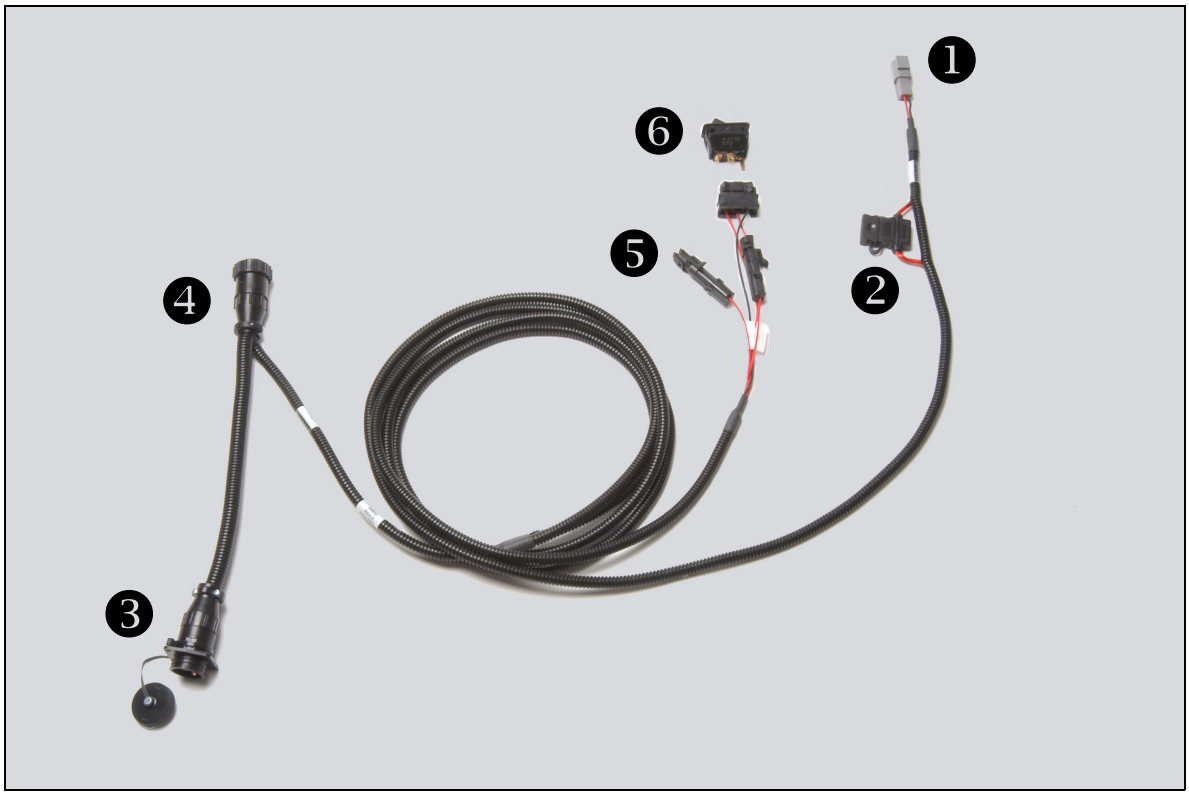
Power Harness Installation

In this chapter:

- Power Harness Components
- Power Switch Installation Process
- Power Harness Installation Process

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

Power Harness Components



Item	Description
❶	Controller power connection
❷	Fuse holder – Littlefuse 257010, 10 amp
❸	Extra accessory outlet
❹	Accessory jumper cable
❺	Switch receptacle
❻	Switch

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

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

Power Switch Installation Process

Step 1

Remove the screws from the lower plastic cover to the right of the driver's seat.



Step 2

Remove the lower plastic cover.



Step 3

Remove the plastic top cover.



Step 4

Remove the screws from the upper section.



Step 5

Remove the plastic shroud.



Step 6

Remove the screw that holds the plastic panel in the column.



Step 7

Remove the plastic panel.



Step 8

Measure up 60 mm from the top of the cavity. With a craft knife, cut a centered slot that is 22 mm across and 44 mm high.



Step 9

Remove the pins from the power switch receptacle.



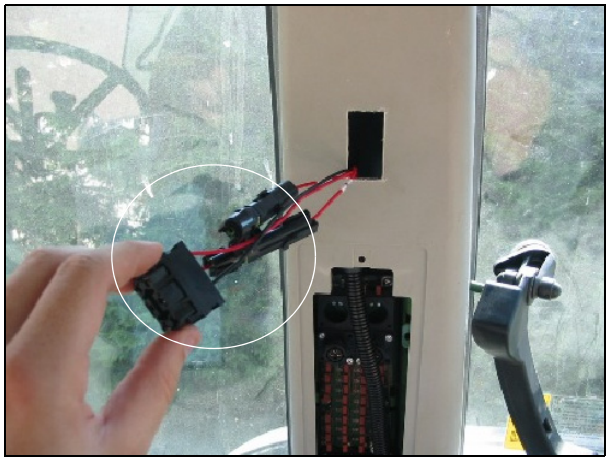
Step 10

Feed the cable behind the plastic cover and then up to the switch cavity.



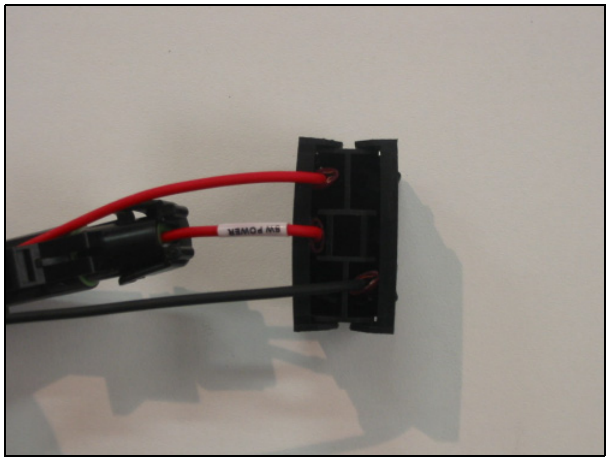
Step 11

Insert the pins back into the switch receptacle.



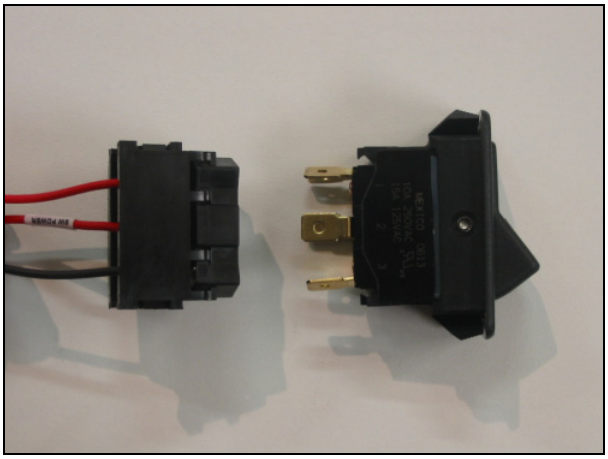
Step 12

Ensure that the pin positions into the switch receptacle are as shown.



Step 13

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 14

Install the switch in its cavity. Reattach the plastic panel.



Power Harness Installation Process

Step 1

Locate the power harness (P/N 54630).

Step 2

Cut the cable before the splitter, as shown.



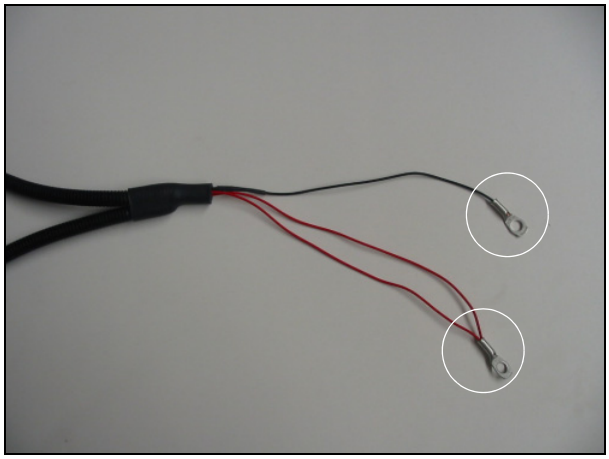
Step 3

Cut the plastic cover back by about 20 cm to expose the wires.



Step 4

Clamp a 6 mm socket end (not provided) to the black (ground) wire, and one 8 mm socket end (not provided) to the two red wires.



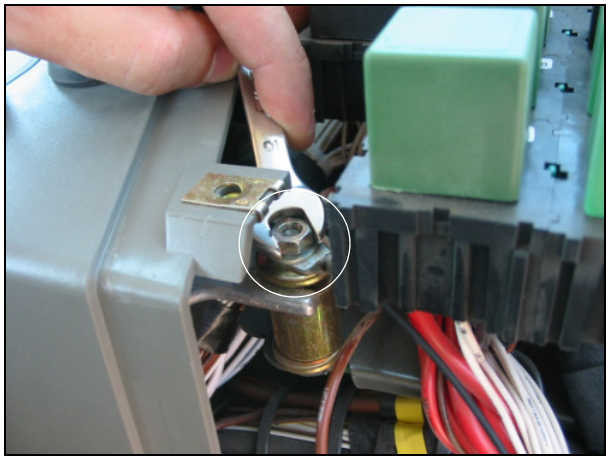
Step 5

Clamp the red wires to the distribution slot +V from the battery power. This distribution slot is located at the right hand side of the seat, straight to the fender.



Step 6

Clamp the black wire to the grounding spot, as shown.



CHAPTER

7

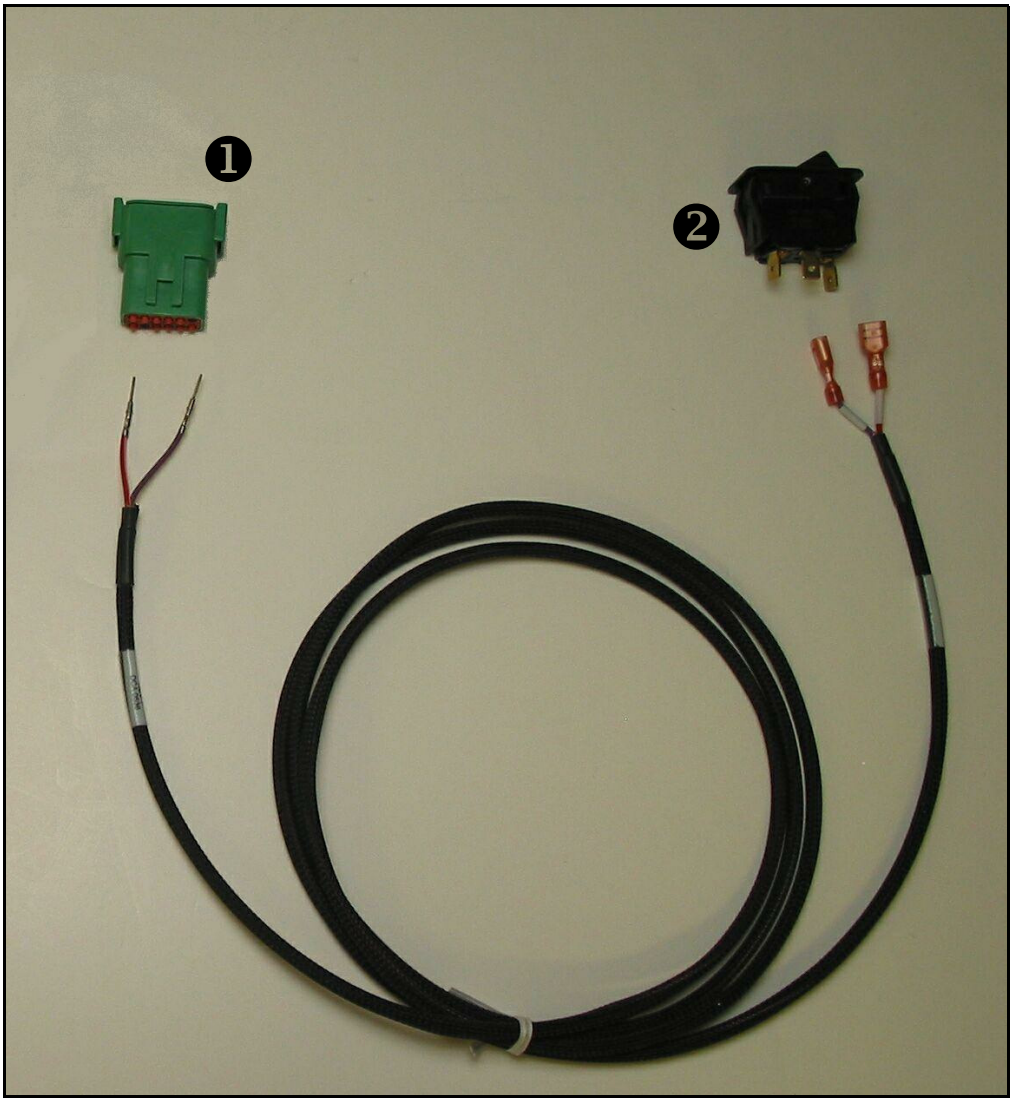
Remote Engage Switch Installation

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.

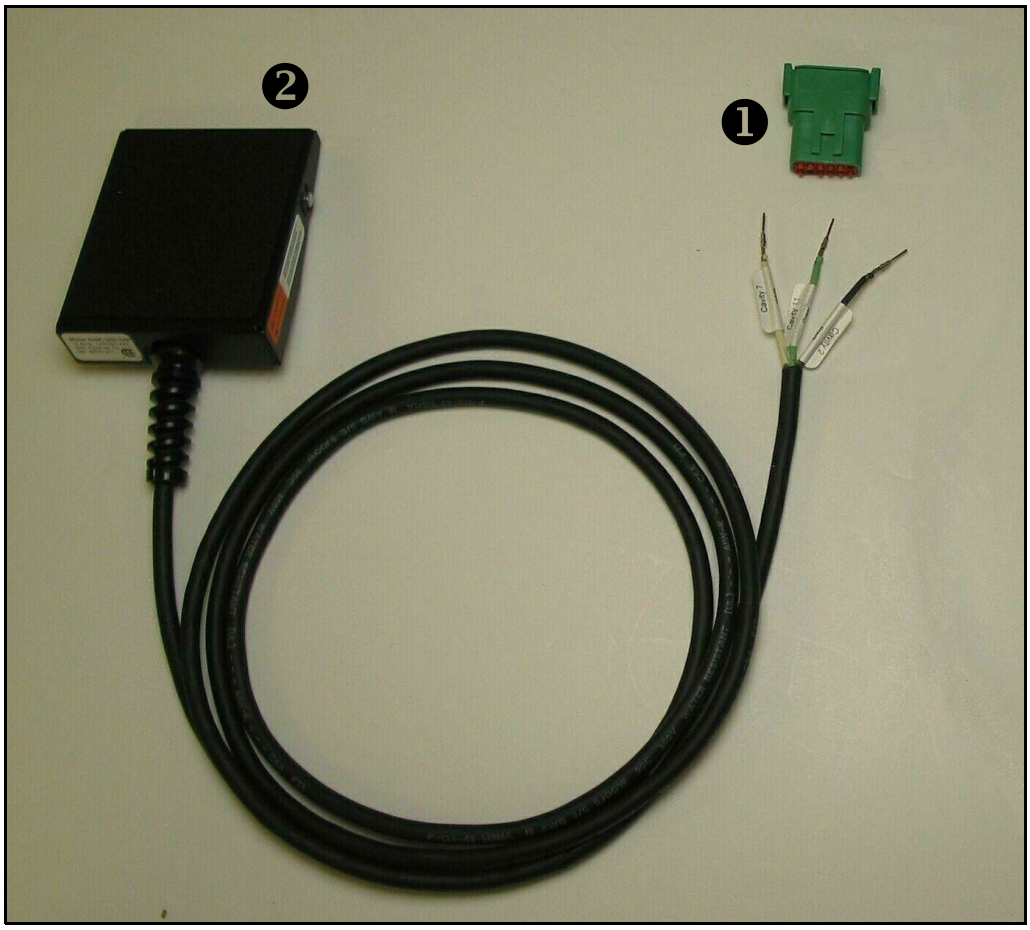
Remote Engage Switch Components: Rocker Switch



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

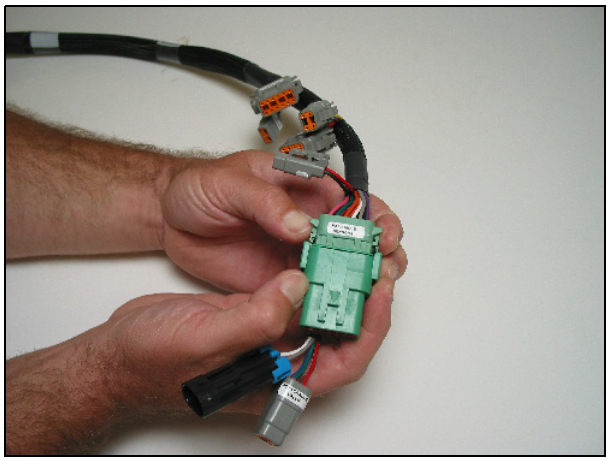


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Prepare the Remote Engage Cable

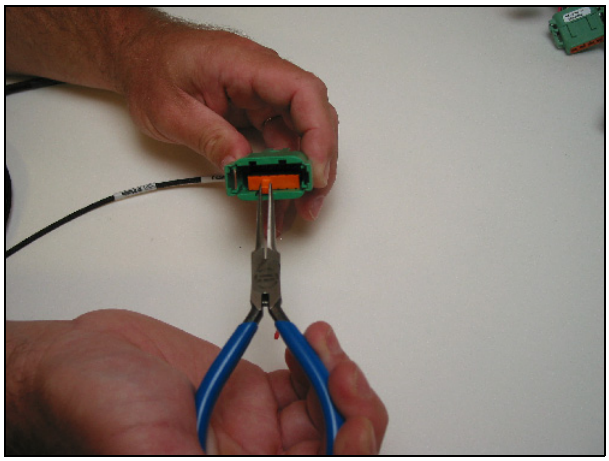
Step 1

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



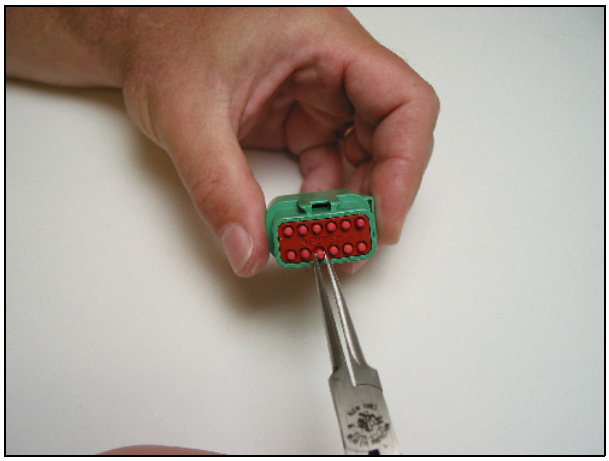
Step 2

Remove the wedge from the connector.



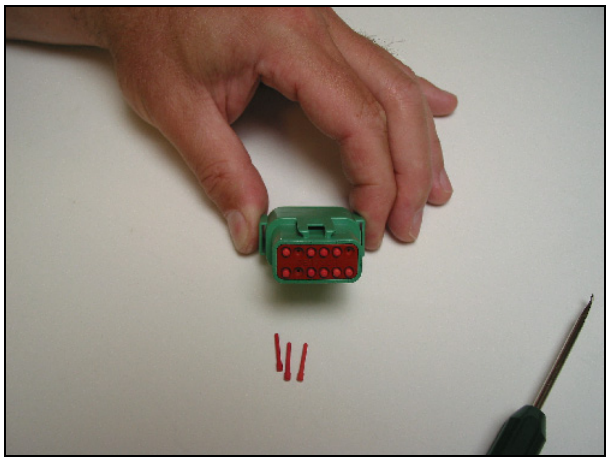
Step 3 Rocker switch only

Remove the plugs from cavity 2 and 7.



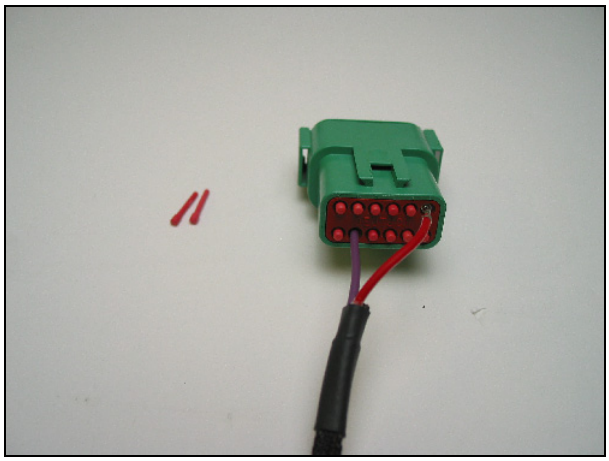
Foot Switch Only

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



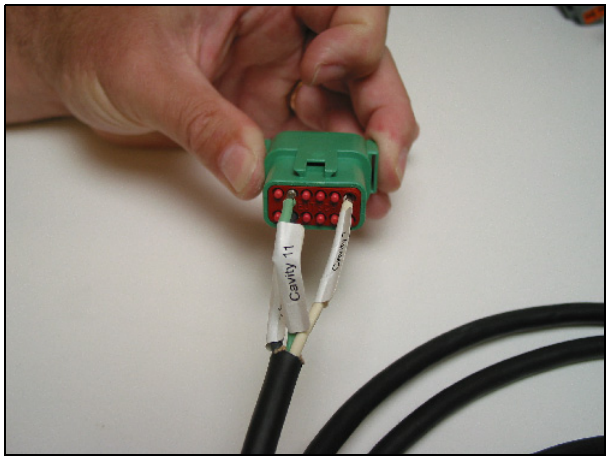
Step 4 Rocker Switch Only

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



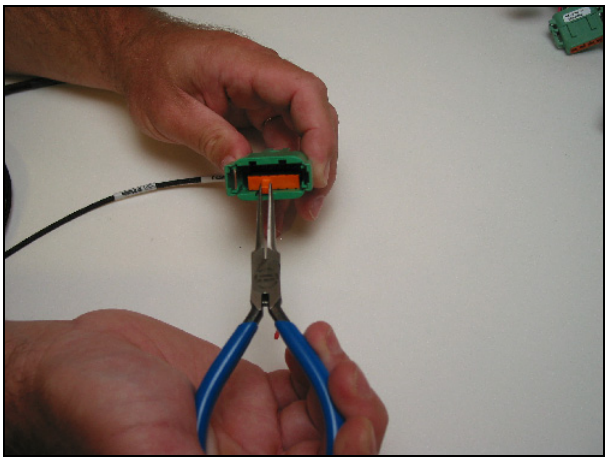
Foot Switch Only

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.



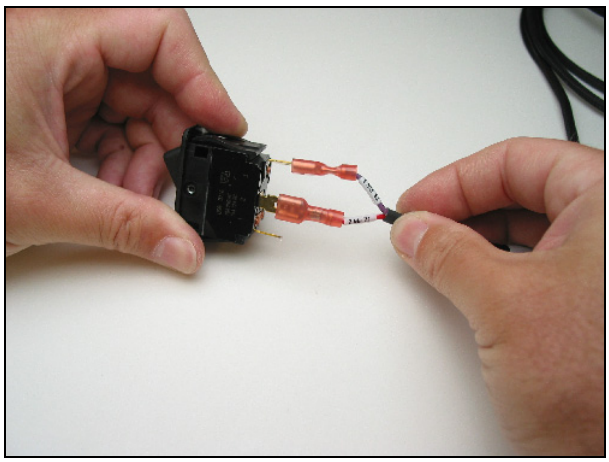
Foot Switch Only

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: Primary Method
- Controller Installation: Alternate Method
- Cable Installation
- Controller Connections

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

Controller Installation: Primary Method

Step 1

From the outside of the vehicle, remove the cover shown.



Step 2

Inside the vehicle, remove the screws and plastic cover at the right hand side of the seat.



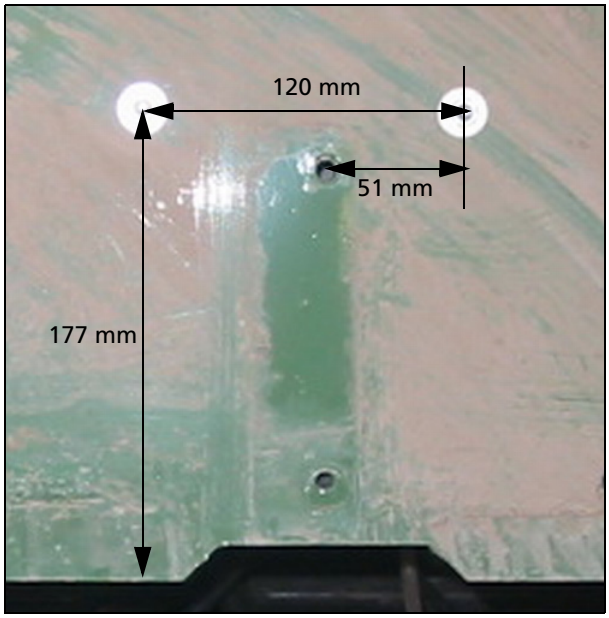
Step 3

Remove the screws and the black cover at the base.

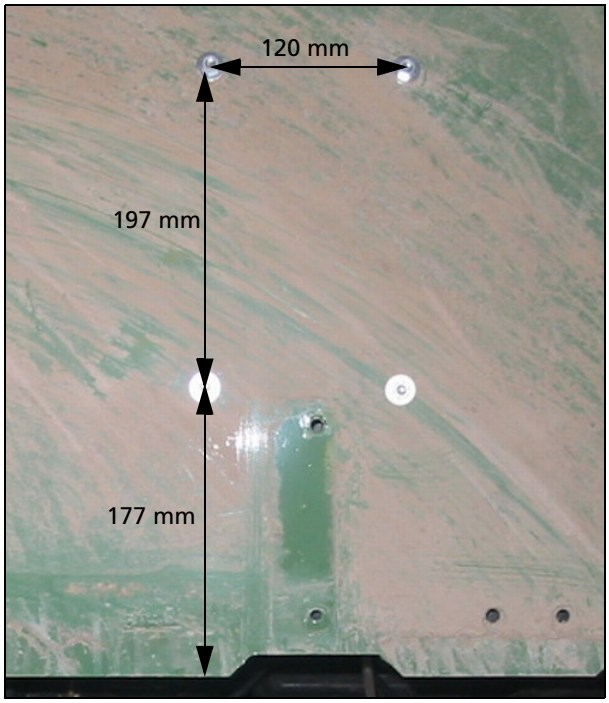


Step 4

From the outside of the vehicle, mark the location of the four mounting holes, as shown.



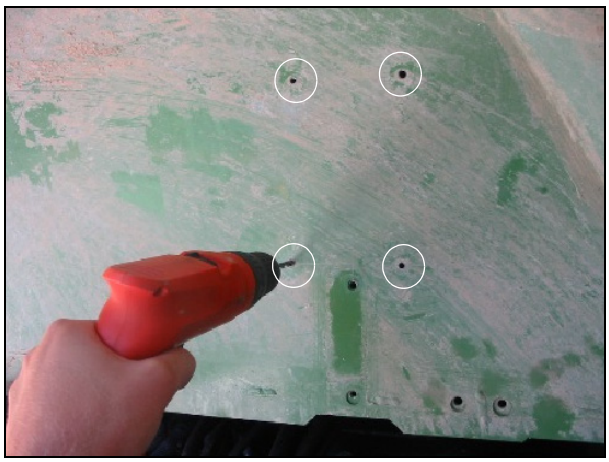
LOWER HOLES



UPPER HOLES

Step 5

Drill the four holes with a diameter of 6.5 mm.





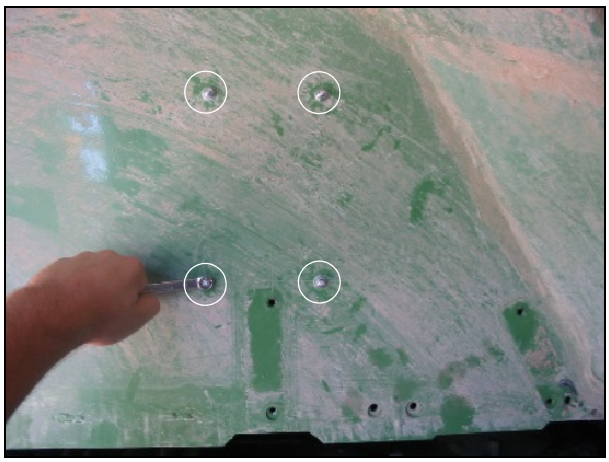
Step 6

Attach the controller in the cab. Use four provided 10-32 x 5/8 screws, four nuts, and four washers. The bolt heads should be on the inside of the cab and the nuts and washers on the outside.



Step 7

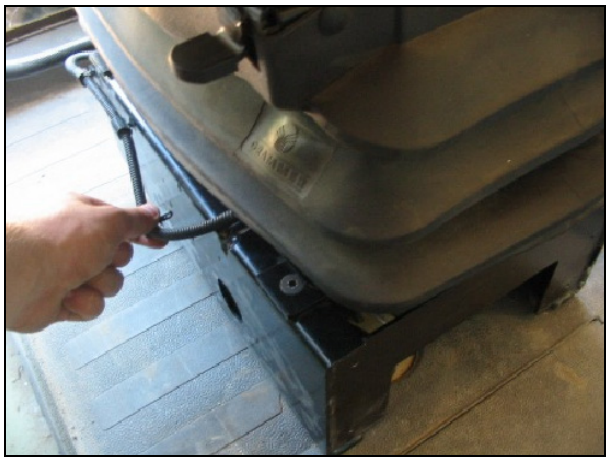
Tighten the nuts to secure the controller.



Controller Installation: Alternate Method

Step 1

Remove the clamp that holds the cable to the seat base.



Step 2

Remove the four seat bolts.



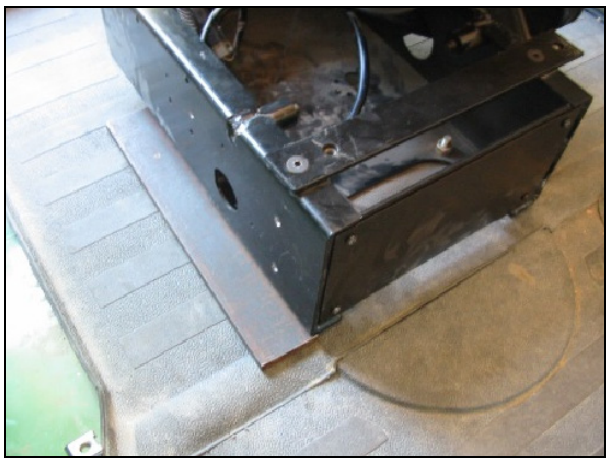
Step 3

Move the seat to the left to reveal the hoses located under the seat. Make sure that you do not damage the hoses when you drill the controller mounting holes.



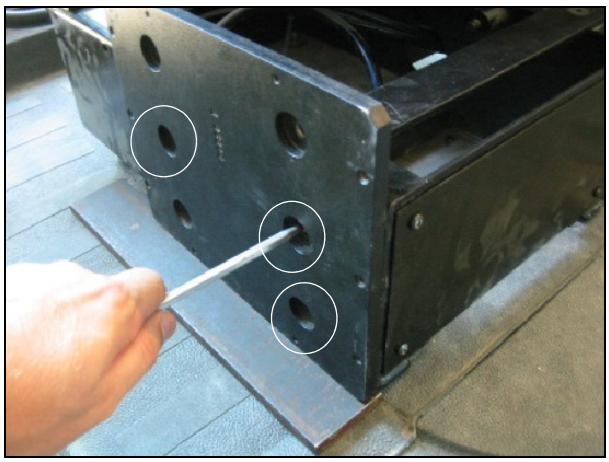
Step 4

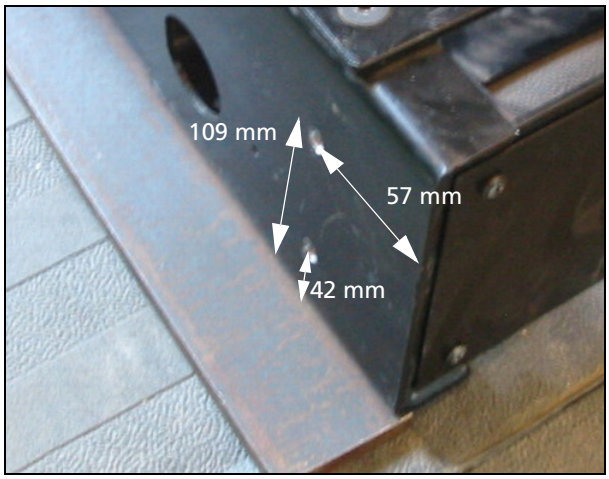
Put a 12 mm thick plate on the mat beside the seat, as shown.



Step 5

Sit the controller mounting plate against the seat on the plate. Mark the position of the three holes shown.

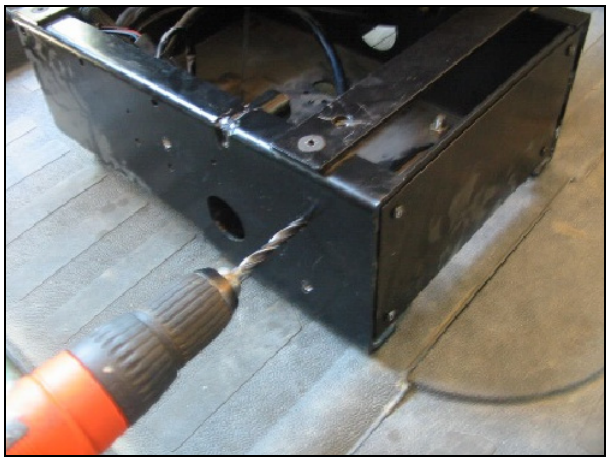




Step 7

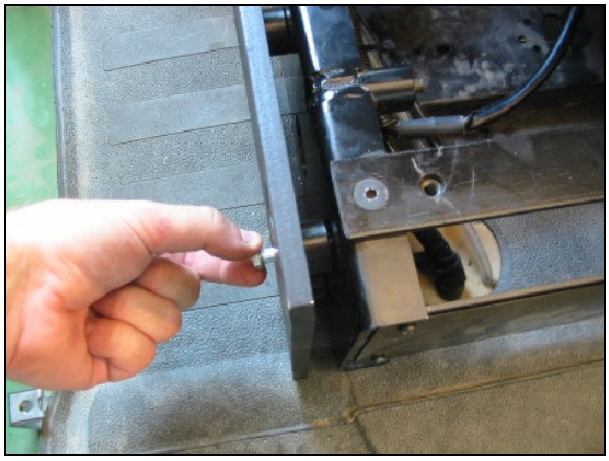
CAUTION – Before you drill holes in the seat base, ensure that you are not drilling into the existing hoses that are under the seat. This can damage vehicle operation.

Drill the three holes with a diameter of 9 mm.



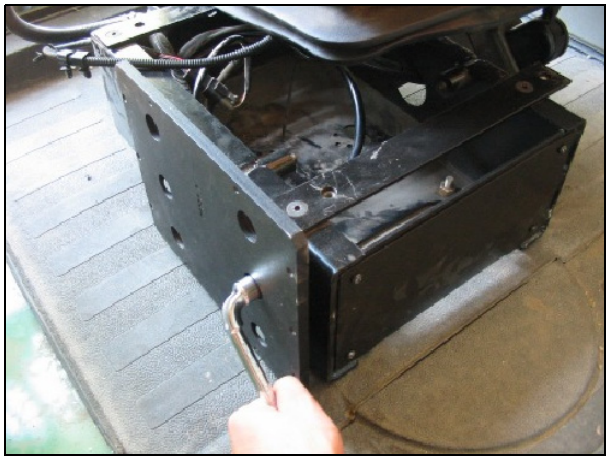
Step 8

Insert each of the three provided 5/16 x 1.5 bolts through the mounting plate, through a provided 3/4 x 3/4 x 3/8 spacer, and then through one of the holes that you drilled. Secure each bolt with a provided 5/16 nut.



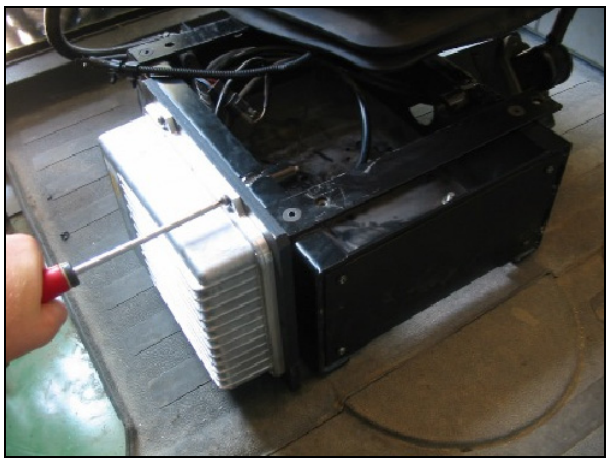
Step 9

Tighten the three bolts.



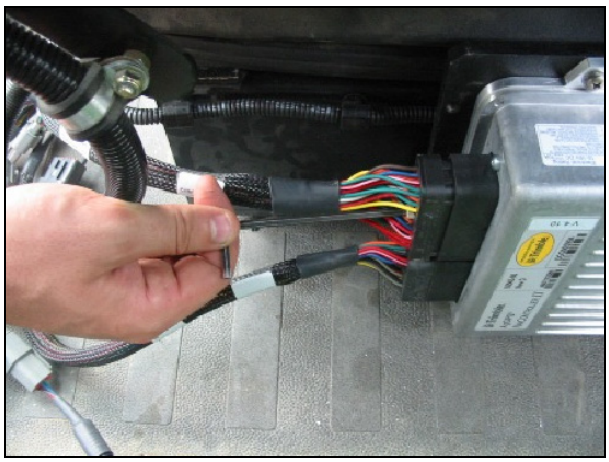
Step 10

Attach the controller to the mounting plate. Use the four 10-32 x 5/8 screws provided.



Step 11

Attach the main and auxiliary harnesses to the controller and then use a hex key to secure them.



Step 12

Wrap the two harnesses with the protective shroud provided.



Cable Installation

Step 1

Remove the screws from the black cover plate.



Step 2

Remove the screws from the black cavity protector.



Step 3

Install a 42 mm pass-through in the cavity. The pass-through is not included in the kit.



Step 4

Feed the cables through the pass-through.

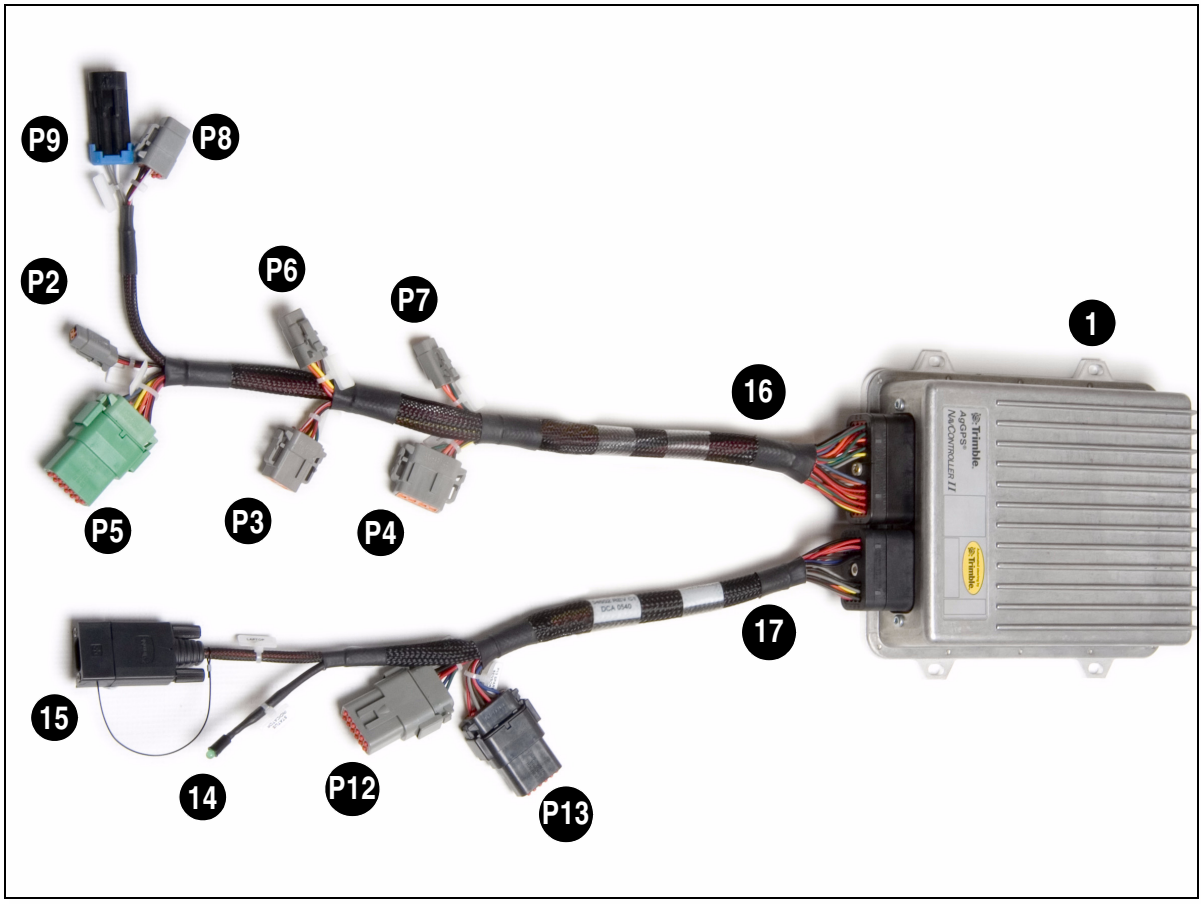


Step 5

Replace the black cover plate.



Controller Connections



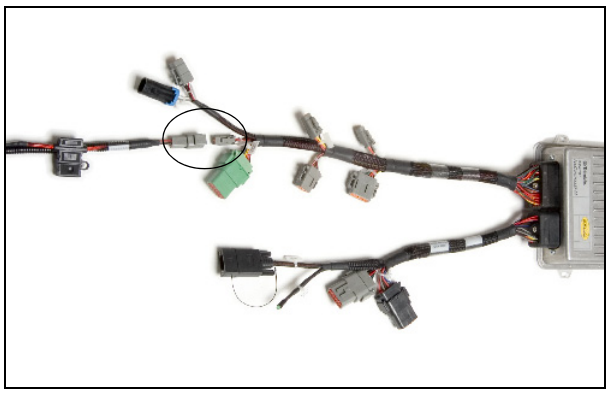
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

Item	Description
P9	Sonalert connector
P12	Lightbar/spare connector
P13	Spare sensors connector
14	Status indicator
15	Laptop connector
16	Main harness
17	Auxiliary harness

Step 1

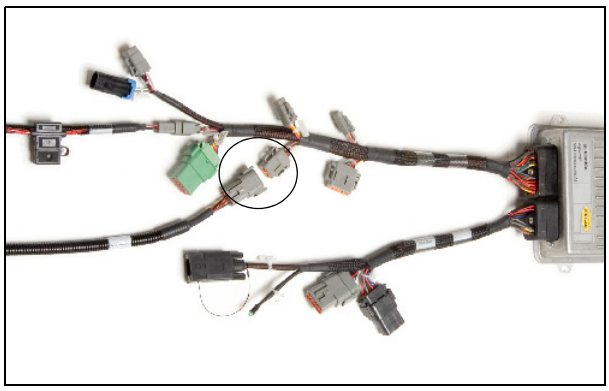
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

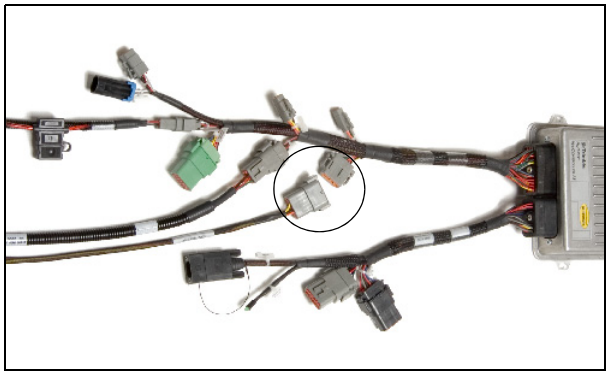
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

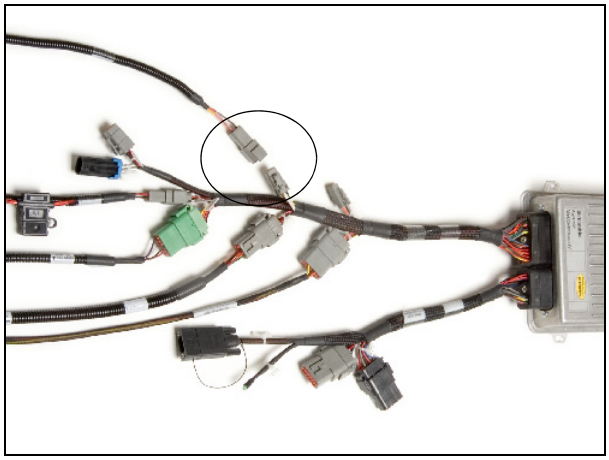
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

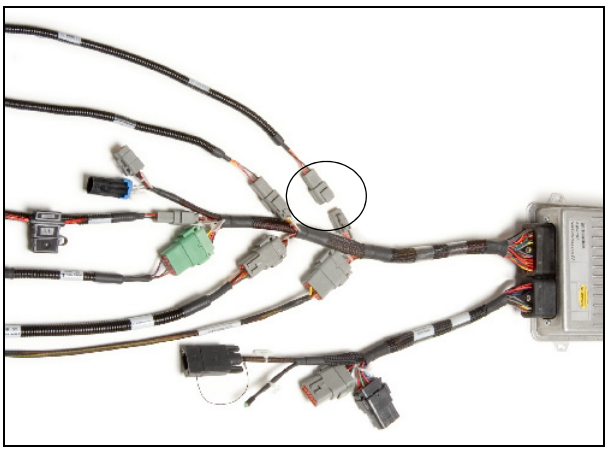
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

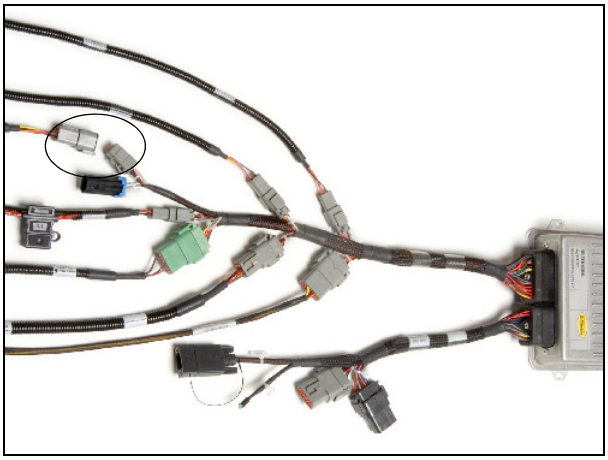
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 6

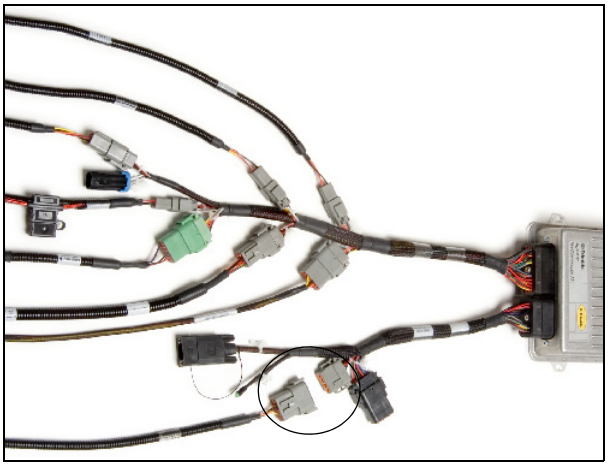
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 7

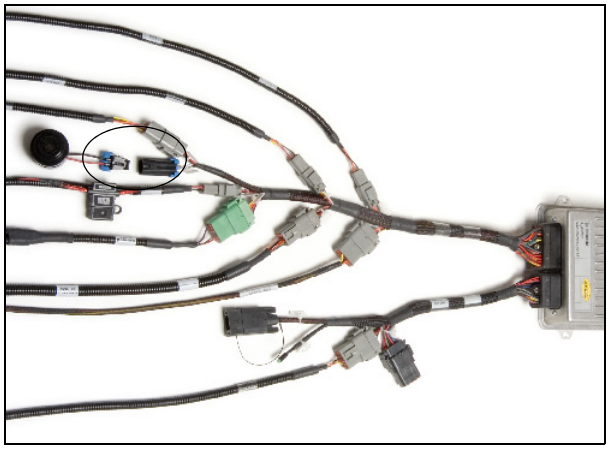
When using a lightbar as a secondary display to an *Ag*GPS 170 Field Computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



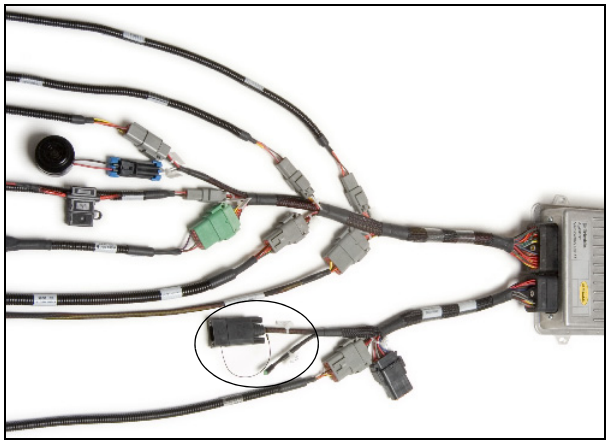
Step 8

Connect the Sonalert P-9 to the two pin Delphi connector on the main wiring harness. Route the cable so the Sonalert warning device is in a position that is audible to the operator.



Step 9

Route the LED and laptop lead, which is located on the auxiliary wiring harness, to a location that allows the operator to determine the controller status. See controller LED status for status determination. Six flashes per second indicates a correctly functioning controller.



Step 10

Use the provided sleeving to secure the harness cables with tie wraps. Cover and route the cable bundle to avoid damage to connectors and strain on wire connections.

CHAPTER

9

Final Machine Check

In this chapter:

- Final Machine Check
- AgGPS 252 Receiver Cross Bar Dimensions
- AgGPS 252 Receiver Spar Dimensions (Two are Required)

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.

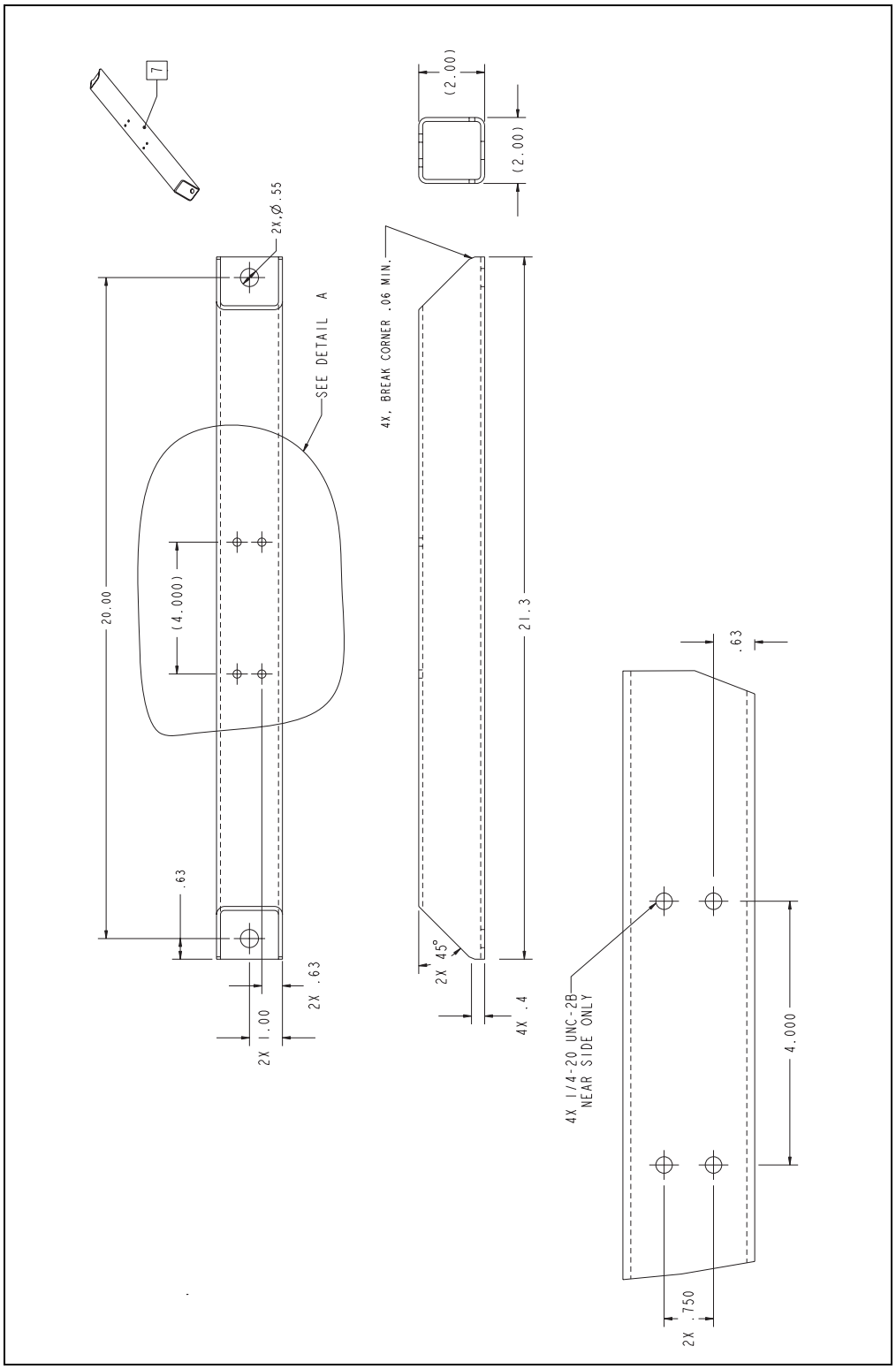
Step 3

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.

*Ag*GPS 252 Receiver Cross Bar Dimensions



*Ag*GPS 252 Receiver Spar Dimensions (Two are Required)

