Installation Instructions

# *Ag*GPS® Autopilot™ Automated Steering System

**Case IH**

- **STX 275 Steiger**
- **STX 325 Steiger**
- **STX 375 Steiger**
- **STX 425 Steiger**
- **STX 440 Steiger**
- **STX 450 Steiger**
- **STX 500 Steiger**

**New Holland**

- **TJ 275**
- **TJ 325**
- **TJ 375**
- **TJ 425**
- **TJ 440**
- **TJ 450**
- **TJ 500**

Version 4.00
Revision A
August 2009
Part Number 54036-15-E04

Trimble®

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This is the August 2009 release (Revision A) of the *Ag*GPS *Autopilot Automated Steering System Installation Instructions*, part number 54036-15-E04. It applies to version 4.00 of the *Ag*GPS Autopilot automated steering system.

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### Notices

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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Or

**Mail a request for recycling instructions to:**

Trimble Europe BV
c/o Menlo Worldwide Logistics
Meerheide 45
5521 DZ Eersel, NL



# Safety Information

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.

**WARNING –** Vehicle cabs can be quite high in the air. To avoid potentially serious injury through falling from this height, always use the steps and handrails, and face the vehicle, when you enter or exit it.

## Cautions

**CAUTION –** When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot and 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, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

**CAUTION –** Battery posts, terminals, and related accessories contain lead and lead compounds, which can cause serious illness. To avoid ingesting lead, wash your hands thoroughly after touching the battery.

**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 correct protective welder's clothing when 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 sprayed 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

**In this chapter:**


- Technical assistance
- Your comments
- Manual system upgrade to the Autopilot system
- Required components
- Autopilot hardware organization - as shipped
- Autopilot hardware organization - as installed
- Preparing the vehicle for installation


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. E-mail your comments to ReaderFeedback@trimble.com.

# Manual system upgrade to the Autopilot system

## EZ-Guide 500 manual guidance upgrade

| Retain | Remove |
|---|---|
| *Ag*GPS® EZ-Guide® 500 lightbar P/N 66100-xx<br>Antenna for EZ-Guide 500 lightbar: P/N 60600-xx (DGPS) or 57200-00 (OmniStar/RTK)<br>Antenna to receiver cable: P/N 50449<br>Power cable: P/N 62817<br>*Optional.* Remote keypad | Power connection cable: P/N 62818 |

## FmX integrated display

| Retain | Remove |
|---|---|
| Trimble® FmX™ integrated display: P/N 93100-xx<br>Antenna for FmX integrated display: P/N 60600-02 (DGPS) or 57970-00 (OmniStar/RTK)<br>Antenna to receiver cable: P/N 50449<br>Power cable: P/N 67258 & 66694 | |

# Required components

| Kits required | Special tools required |
|---|---|
| Platform kit: P/N 54036-15<br>Hydraulic hose kit: STX 275 – 325: P/N 49771<br>STX 375 – 500: P/N 49917<br>Roof bracket kit: P/N 55345 | 49317-TL template<br>#7 drill bit<br>¼" drill bit<br>¼"–20mm UNC tap<br>Tap handle<br>Open end wrench set (metric and SAE)<br>Allen wrench set (metric and inch sizes) |

## Antenna mounting kits

| Antenna options |
|---|
| Antenna spar mount: P/N 55345 |
| Antenna V plate mount and *Ag*GPS 262 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the *Ag*GPS 262 receiver – see Chapter 4, Antenna/Receiver Installation). |

## Accessory kits

| Accessory options |
|---|
| Remote engage switch assembly – standard Euro: P/N 57227-10 |
| Remote engage switch assembly – full Euro: P/N 57227-20 |
| Remote engage foot pedal: P/N 57259 |

# Autopilot hardware organization - as shipped

| Hardware | Component | See... |
|---|---|---|
| Platform kit **(P/N 54036-15)** | Hydraulic valve | Chapter 2 |
| | Hydraulic manifold | Chapter 2 |
| | Transducer flow switch | Chapter 2 |
| | Manual override cable | Chapter 2 |
| | Hydraulic brackets and bolt kits | Chapter 2 |
| | Hydraulic valve cable | Chapter 2 |
| | AutoSense™ steering device and cabling | Chapter 3 |
| | AutoSense mounting bracket and hardware | Chapter 3 |
| | Power cable and switch | Chapter 6 |
| | Bolt kit controller | Chapter 8 |
| Common parts | Controller | Chapter 8 |
| | Controller mounting bracket | Chapter 8 |
| | Cable kit:<br>• Main wiring harness<br>• Auxiliary wiring harness<br>• Sonalert alarm | Chapter 8 |
| GPS receiver | GPS receiver | Chapter 4 |
| | GPS antenna | Chapter 4 |
| | GPS receiver mounting bracket | Chapter 4 |
| | GPS receiver power/data cable | Chapter 4 |
| | RTK radio, cable, and radio antenna | Chapter 4 |
| Display | EZ-Guide 500 lightbar | Chapter 5 |
| | FmX integrated display | Chapter 5 |
| | Display cable | Chapter 5 |
| | Mounting bracket | Chapter 5 |
| Hydraulic hose kit **(P/N 49771 or P/N 49917)** | Hydraulic hoses | Chapter 2 |
| | Hydraulic adaptors | Chapter 2 |
| Roof bracket kit **(P/N 55345)** | Roof brackets | Chapter 4 |
| | Bolt kit, roof bracket | Chapter 4 |

## Autopilot hardware organization - as installed

| Hardware | Component | See... |
|---|---|---|
| Hydraulics | • Hydraulic valve, manifold, pressure transducer, or flow switch<br>• Hydraulic valve cable<br>• Manual override cable<br>• Hydraulic brackets and bolt kits | Chapter 2 |
| AutoSense steering device | • AutoSense steering device and cabling<br>• AutoSense mounting brackets and hardware | Chapter 3 |
| GPS receiver | • GPS receiver<br>• GPS antenna<br>• GPS receiver mounting bracket<br>• GPS receiver power/data cable<br>• Roof brackets | Chapter 4 |
| Display | • *Ag*GPS EZ-Guide 500 lightbar<br>• FmX integrated display<br>• Display cable(s)<br>• Mounting bracket | Chapter 5 |
| Power | • Power bus and switch | Chapter 6 |
| Controller | • Controller<br>• Mounting plate<br>• Bolt kit - controller<br>• Main wiring harness<br>• Aux. wiring harness<br>• Sonalert alarm | Chapter 8 |

## Preparing the vehicle for installation

### Step 1

Park the vehicle on a level, hard 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 parts out on a clean work bench.

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

CHAPTER

2

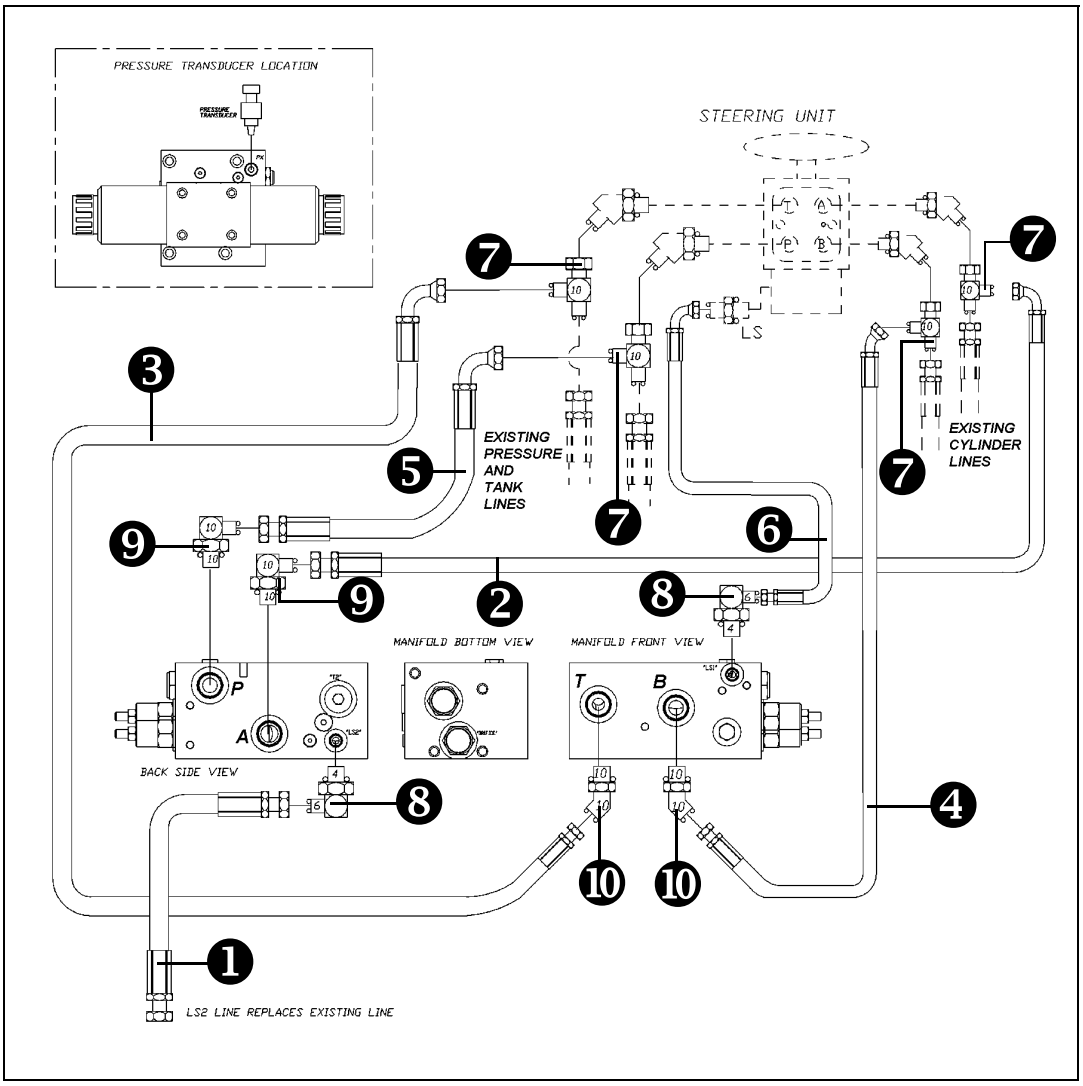
# Hydraulic Control Valve Installation

**In this chapter:**


- 275 / 325 models components
- Preparing the hydraulic valve: 275 / 325 models
- Intalling the hydraulic hoses: 275 / 325 models
- 375 to 500 models components
- Preparing the hydraulic valve: 375 to 500 models
- Installing the hydraulic hoses: 375 to 500 models


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

## 275 / 325 models components




| Item | Description | Part number |
|---|---|---|
| ❶ | 78" hose | F451TCJSJS-6-6-6-78 |
| ❷ | 26" hose | F5451TCJSJ9-10-10-10-26 |
| ❸ | 22" hose | F451TCJSJ9-10-10-10-22 |
| ❹ | 18" hose | F451TCJSJ7-10-10-10-18 |
| ❺ | 17" hose | F451TCJSJ9-10-10-10-17 |

| Item | Description | Part number |
|---|---|---|
| ❻ | 14" hose | F451TCJSJ9-6-6-6-14 |
| ❼ | Fitting (x4) | 10 R6L0-S |
| ❽ | Fitting (x2) | 6-4 C50L0-S |
| ❾ | Fitting (x2) | 10 C50L0-S |
| ❿ | Fitting (x2) | 10 V50L0-S |

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

# Preparing the hydraulic valve: 275 / 325 models

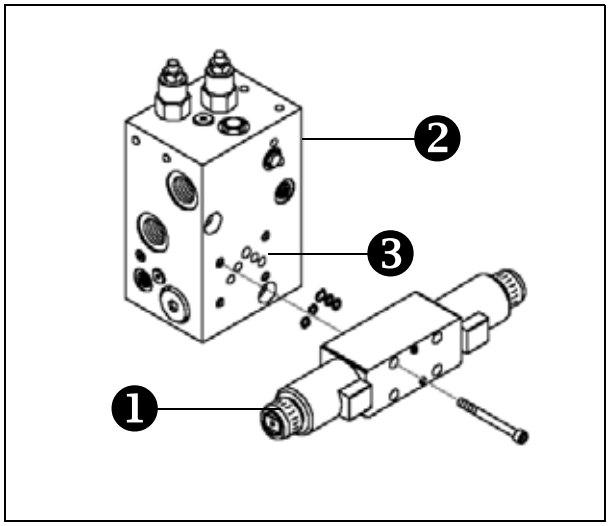
***Note –*** *Place the hydraulic components from the kit on a clean work surface.*

## Step 1

Lubricate the O-rings and connect the control valve ❶ to the manifold ❷ with four M6 x 40 socket head bolts. Tighten the bolts to 14 –16 Nm (10 – 12 ft. lbs.).

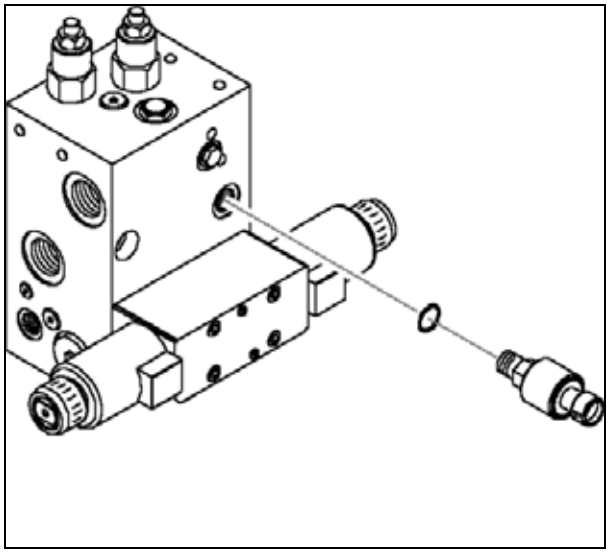
***Note –*** *Match the V pattern of the oil passages ❸ between the manifold ❷ and control valve ❶.*

***Note –*** *You require a 5mm Allen wrench.*




## Step 2

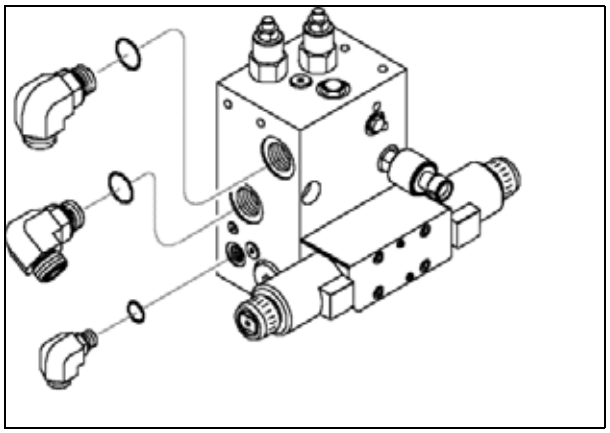
Install and tighten the pressure sensor in the manifold.



## Step 3

With the manifold positioned as shown, install and tighten the fittings and orientate them as shown:

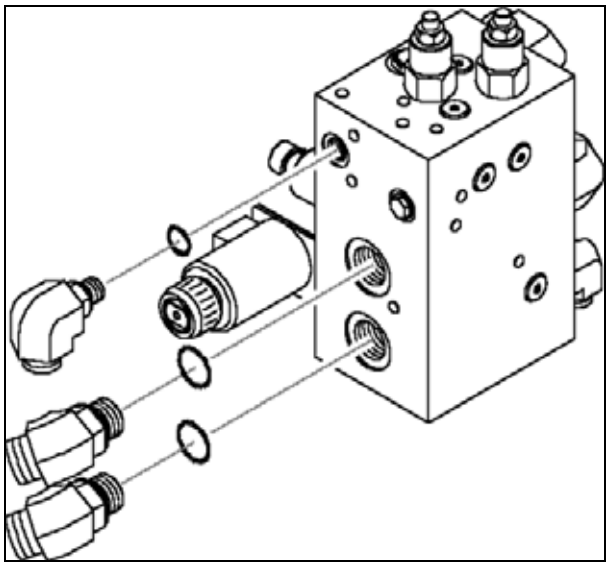
- Elbow, 90° adjustable -10 ORFS-ORB in top port facing down
- Elbow, 90° adjustable -10 ORFS-ORB in middle port 10 degrees forward from down position toward the valve
- Elbow, 90° adjustable -6 ORFS-ORB in lower port facing down



## Step 4

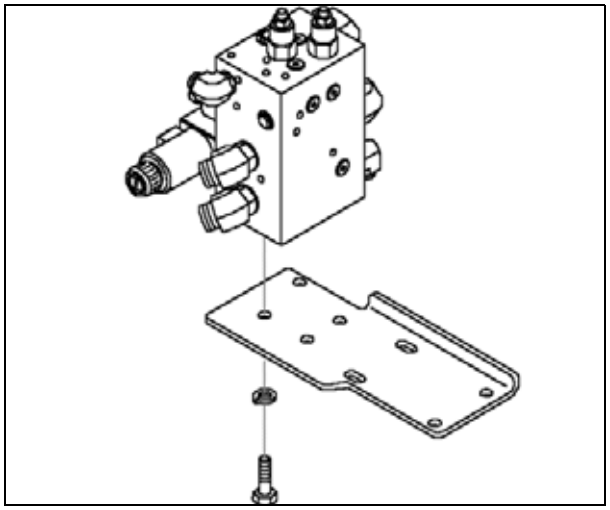
With the manifold positioned as shown, install and tighten the fittings and orientate them as shown:

- Elbow, 90° adjustable -6 ORFS-ORB in top port.
- Elbow, 45° adjustable -10 ORFS-ORB in middle port 30 degrees from down position toward valve.
- Elbow, 45° adjustable -10 ORFS-ORB in lower port 30 degrees from down position toward valve.



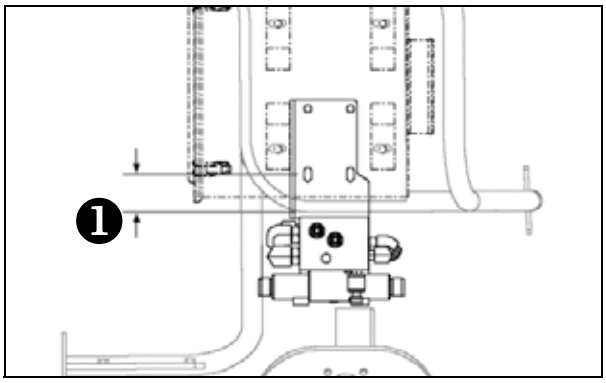
## Step 5

Install the mounting plate to the bottom of the control valve/manifold assembly with four M10 x 30 bolts and M10 spring lock washers. Tighten the bolts to 54 Nm – 61 Nm (40 – 45 ft/lbs).



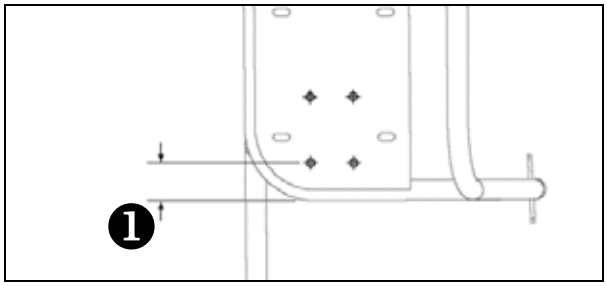
## Step 6

Position the mounting plate with the valve assembly facing toward the cab. Set the bracket on the air cleaner mounting plate, against the left rear air cleaner leg so the centerline of the first mounting hole is approximately 63 mm (2.5") ❶ from the outer tube of the air cleaner mounting frame. Mark the location of the four mounting holes onto the air cleaner mounting plate.



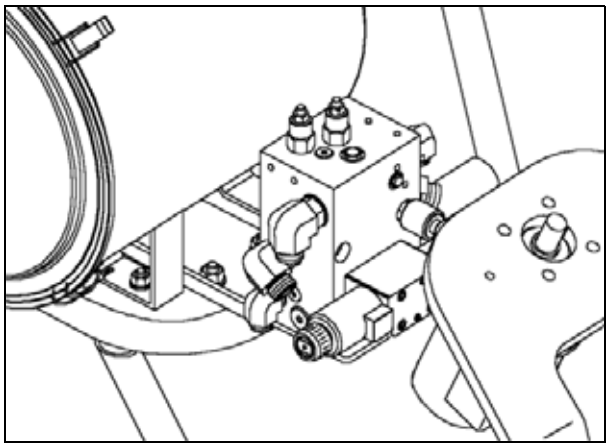

## Step 7

Remove the air cleaner canister and drill four 12 mm (½") mounting holes.




## Step 8

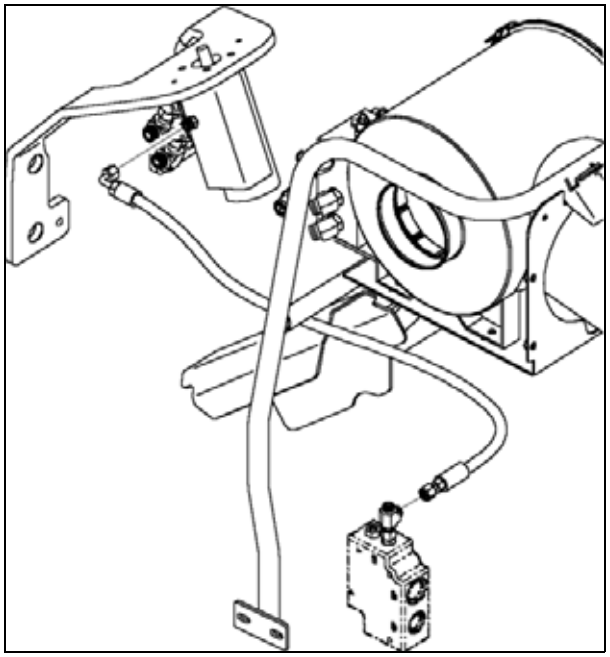
Reinstall the air cleaner canister. Mount the bracket with the valve to the air cleaner mounting plate with four M10 x 30 bolts and prevailing torque nuts.



# Intalling the hydraulic hoses: 275 / 325 models

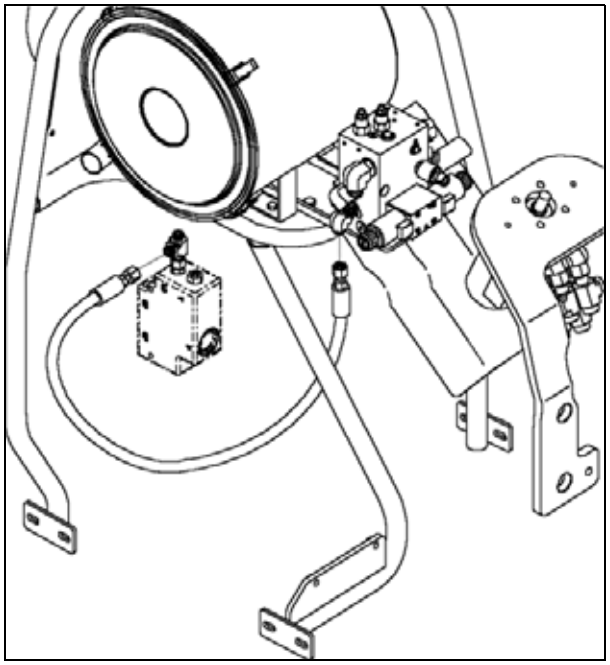
## Step 1

Remove the load sense hose from the right side of the steering pump and the priority valve.



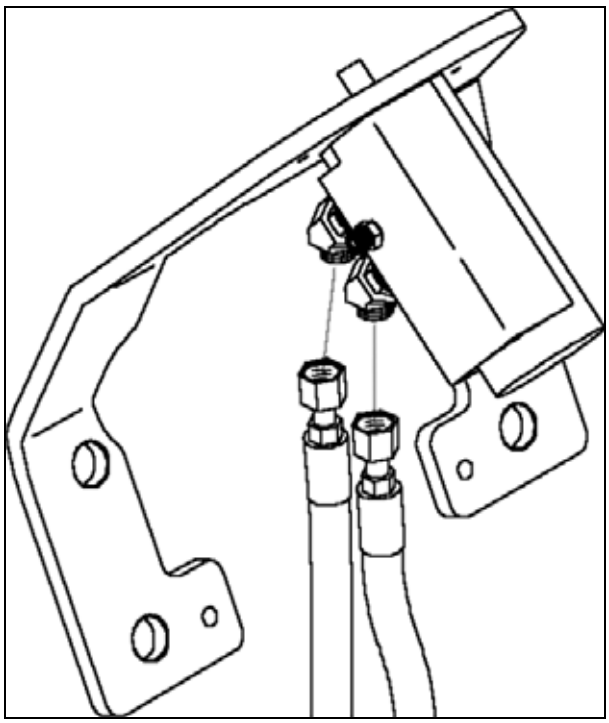
## Step 2

Install the 78" long hydraulic hose from the kit to the priority valve and route it to the left side of the *Ag*GPS Autopilot manifold. Connect it to the lower port, which is labeled “LS2”.



## Step 3

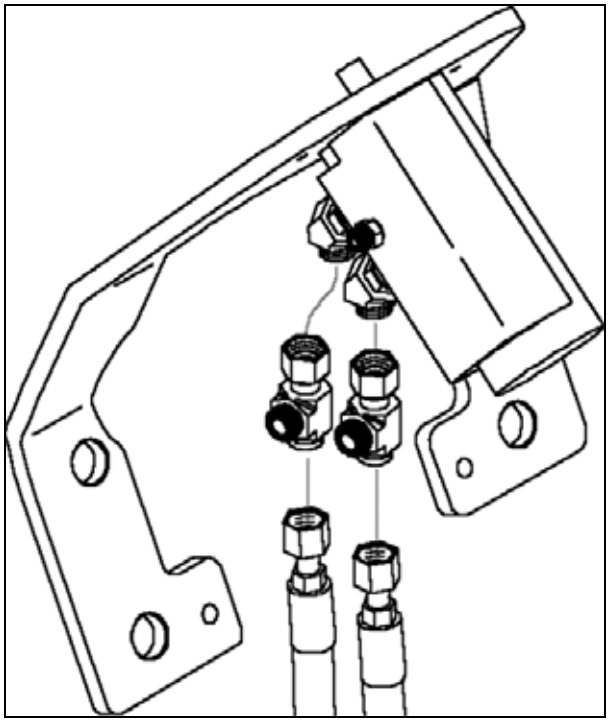
Remove the left steer hose ❶ and right steer hose ❷ from the right side of the steering pump. Mark both hoses for proper identification.



## Step 4

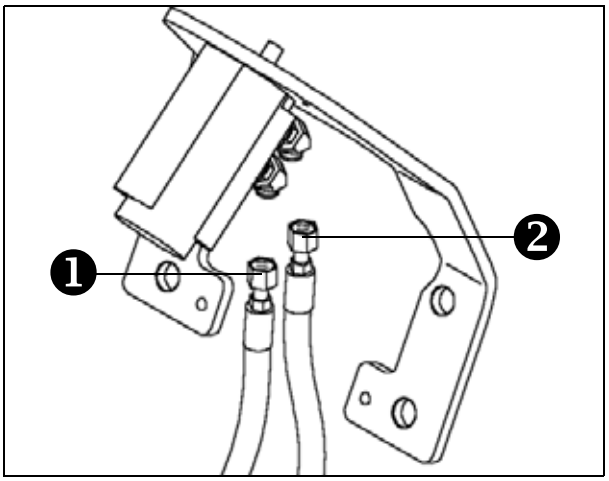
Install two ORFS swivel run -10 tees onto the fittings on the left and right steer ports. Reinstall the original hoses to the tees.

***Note –*** *Leave all fittings and hose connections loose until all hose routings are complete.*



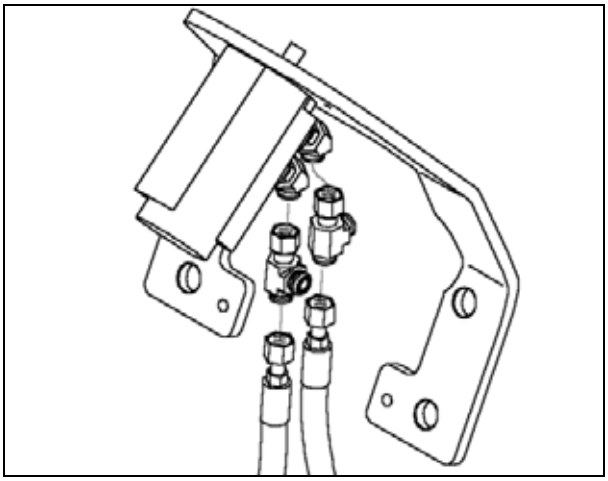
## Step 5

Remove the pressure hose ❶ and tank hose ❷ from the left side of the steering pump. Mark both hoses for proper identification.



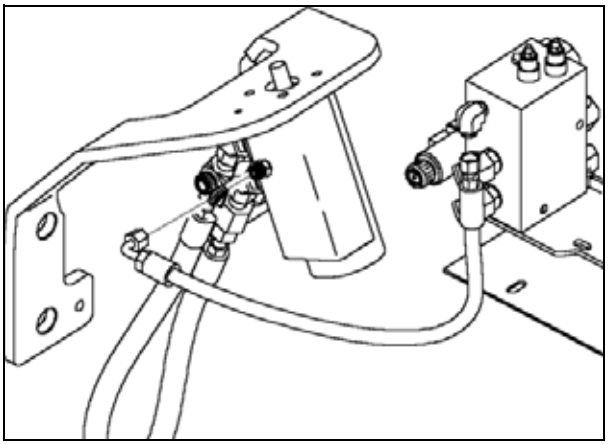

## Step 6

Install two ORFS swivel run -10 tees onto the fittings on the pressure and tank ports. Reinstall the original hoses to the tees.



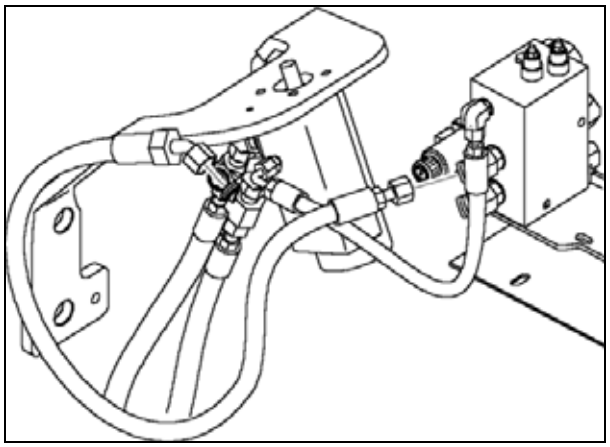
## Step 7

Connect the 14" hydraulic hose to the Load Sense port at the steering pump and then route the hose over to and connect to the right top port, which is labeled "LS1" on the *Ag*GPS Autopilot manifold.



## Step 8

Connect the 18" hydraulic hose to the right steer tee at the steering pump and then route the hose over to and connect to the right center port, which is labeled "B" on the *Ag*GPS Autopilot manifold.

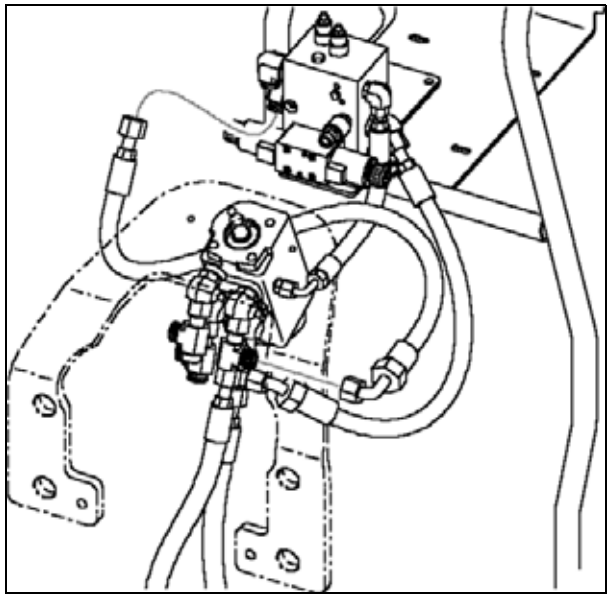


## Step 9

Connect the 26" hydraulic hose to the left steer tee at the steering pump and then route the hose over to and connect to the left center port, which is labeled "A" on the *Ag*GPS Autopilot manifold.

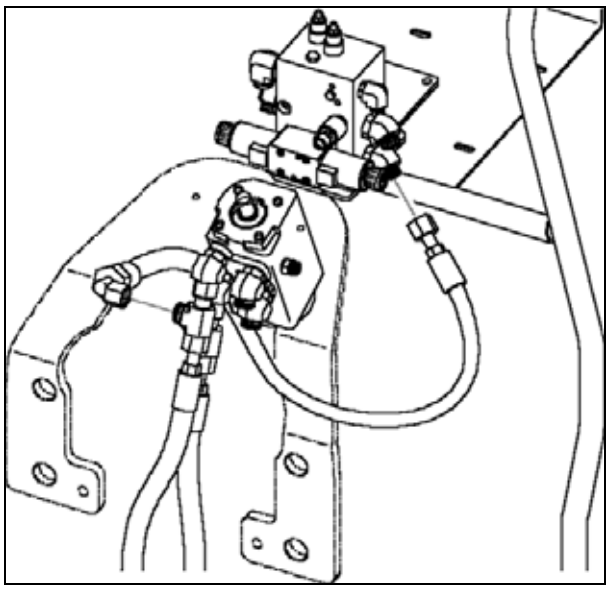
## Step 10

Connect the 18" hydraulic hose to the pressure port tee at the steering pump and then route the hose over to and connect to the left top port, which is labeled "P" on the *Ag*GPS Autopilot manifold.



## Step 11

Connect the 22" hydraulic hose to the tank port tee at the steering pump and then route the hose over to and connect to the right lower port, which is labeled "T" on the *Ag*GPS Autopilot manifold.



## Step 12

Ensure that all hose routings are unobstructed and clear of pinch points. Individually tighten each fitting and hose and try to avoid any hose contact with other hoses.

## Step 13

Double check all hydraulic connections to be sure they are tightened.

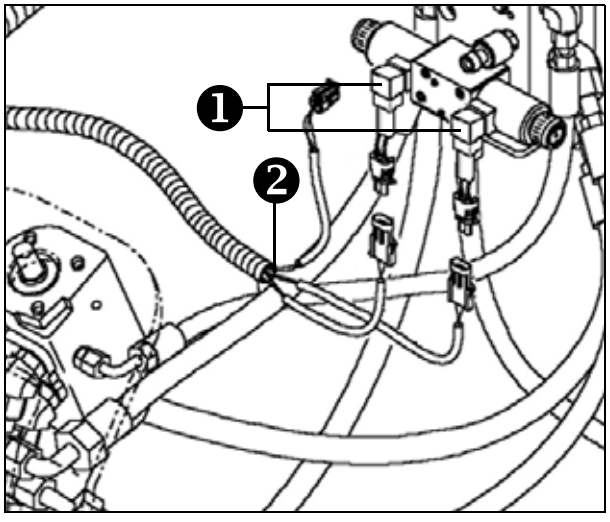
Check the machine hydraulic oil level and add oil as needed.

Re-connect the battery and start the machine to check for hydraulic leaks. Disconnect the battery after the leak check has been performed.

## Step 14

Plug the DIN connectors onto the valve ❶ and secure them using the supplied screws.

Use tie straps to secure the excess Autopilot harness to the load sense hose ❷.



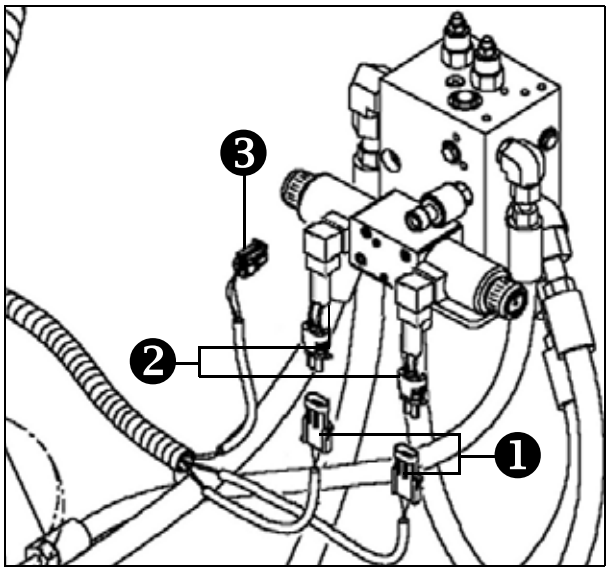
## Step 15

Plug the connectors from the *Ag*GPS Autopilot hydraulic valve cable ❶ into the mating connectors ❷ on the jumper cable. Plug the pressure sensor connector ❸ into the pressure sensor.

The connectors on the Autopilot harness are labeled "A" and "B". The name plate on the steering solenoid valve is stamped "A" and "B" next to the respective solenoid.

Use the jumper cable labeled "Right" to connect solenoid "A" to harness connector "A".

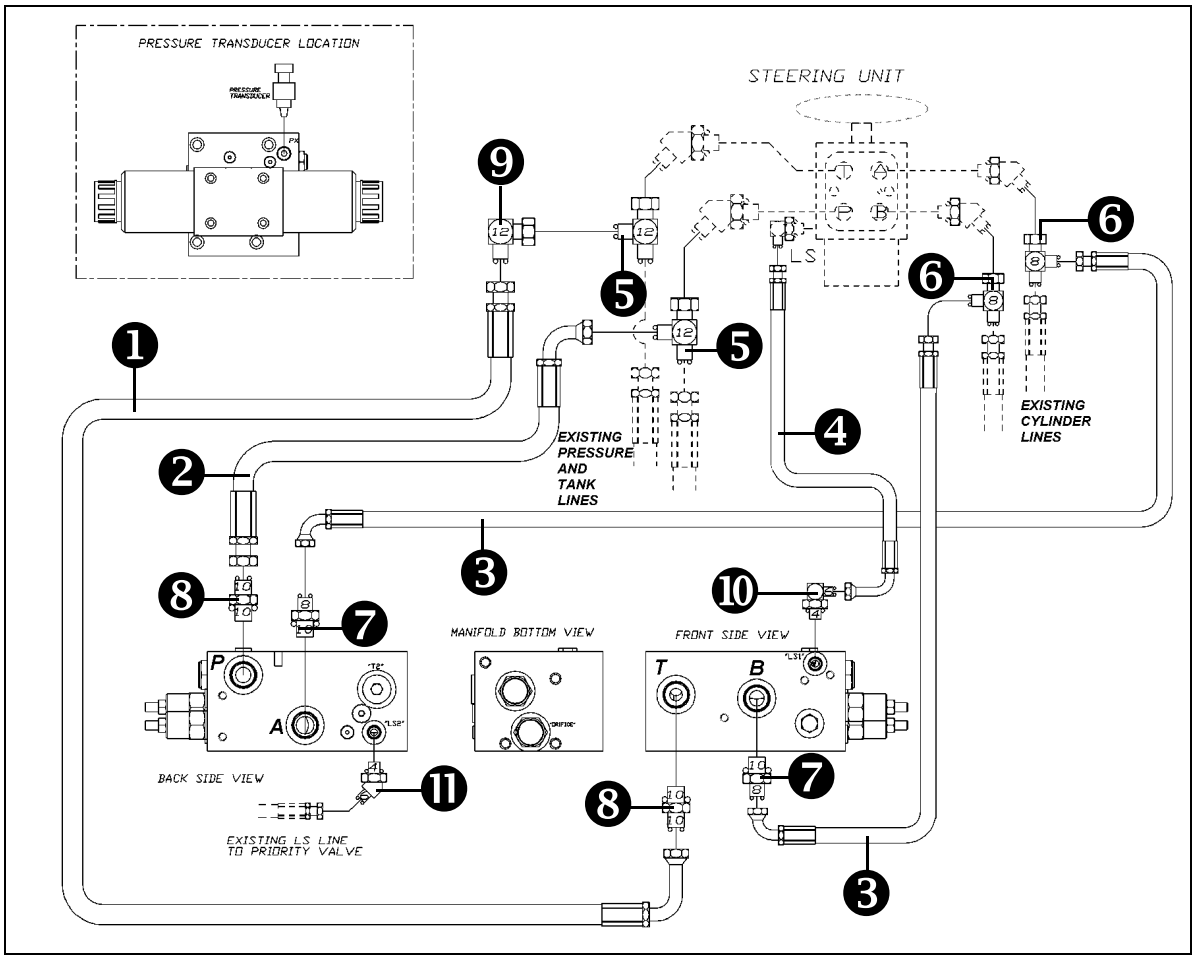
Use the jumper cable labeled "Left" to connect solenoid "B" to harness connector "B".




## Step 16

Route the cables under the cab along the top of the transmission. Leave the three pin connector at the articulation joint. Route the remaining cable end into the cab through the access hole at the right rear corner of the cab. Route the cable into the electronics bay and to the trainer seat. The connections will be established later.

## 375 to 500 models components




| Item | Description | Part number |
|---|---|---|
| ❶ | 36" hose | F451TCJSJ1-12-10-10-36 |
| ❷ | 36" hose | F451TCJSJ9-10-12-10-36 |
| ❸ | 36" hose (x2) | F451TCJSJ9-8-8-8-36 |
| ❹ | 14.5" hose | F451TCJSJ1-6-6-6-14.5 |
| ❺ | Fitting (x2) | 12 R6L0-S |
| ❻ | Fitting (x2) | 8 R6L0-S |

| Item | Description | Part number |
|---|---|---|
| ❼ | Fitting (x2) | 8-10 F50L0-S |
| ❽ | Fitting (x2) | 10 F50L0-S |
| ❾ | Fitting | 12 C6L0-S |
| ❿ | Fitting | 6-4 C50L0-S |
| ⓫ | Fitting | 6-4 V50L0-S |

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

# Preparing the hydraulic valve: 375 to 500 models

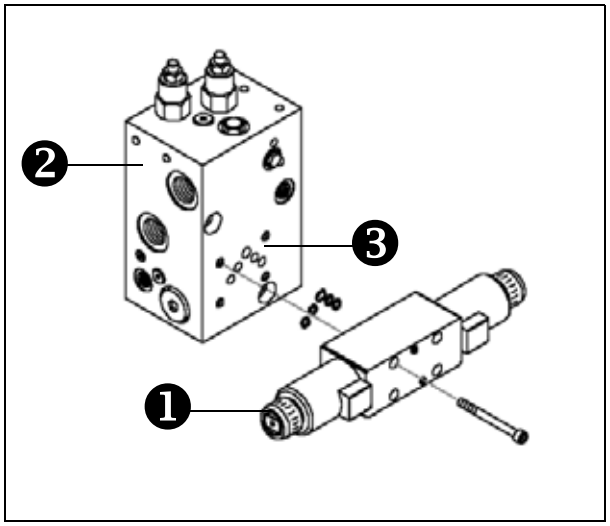
***Note –*** *Place the hydraulic components from the kit on a clean work surface.*

## Step 1

Lubricate the O-rings and then install the steering valve ❶ to the manifold ❷ with four M6 x 40 socket head bolts. Tighten the bolts to 14 – 16 Nm (10 – 12 ft/lbs).

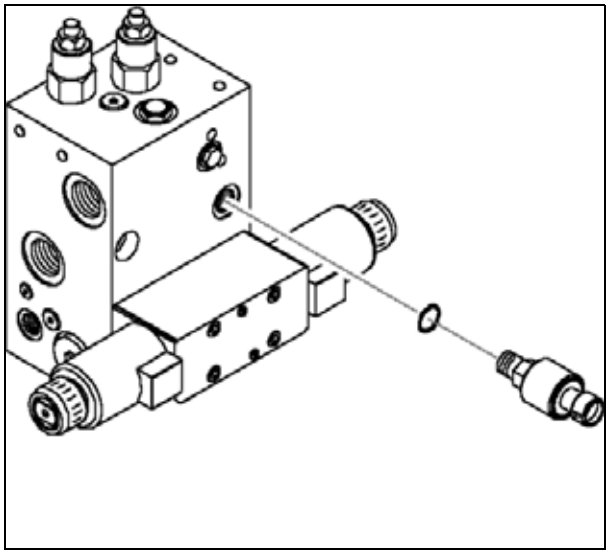
***Note –*** *Match the V pattern of the oil passages ❸ between the manifold ❷ and the steering valve ❶.*

***Note –*** *This requires a 5 mm Allen wrench.*




## Step 2

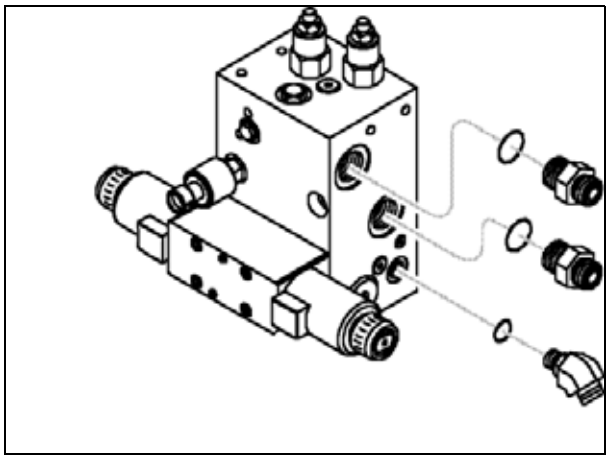
Install and tighten the pressure sensor in the manifold.



## Step 3

With the manifold positioned as shown, install and tighten the fittings and orientate as follows:

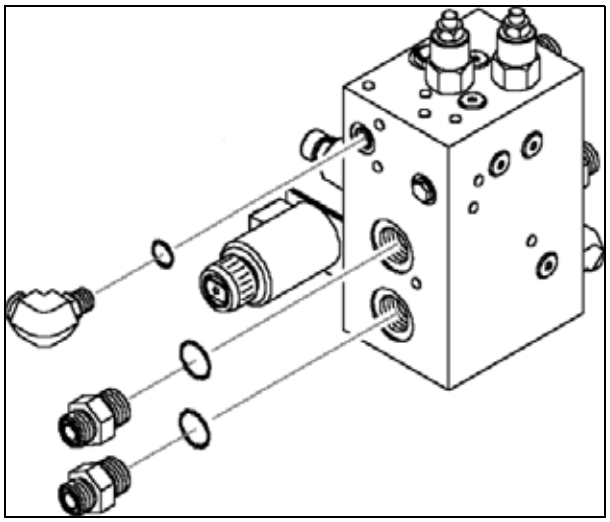
- Connector -10 ORFS-ORB in top port
- Connector -8 ORFS-ORB in middle port
- Elbow, 45° Adjustable -6 ORFS-ORB in lower port facing down



## Step 4

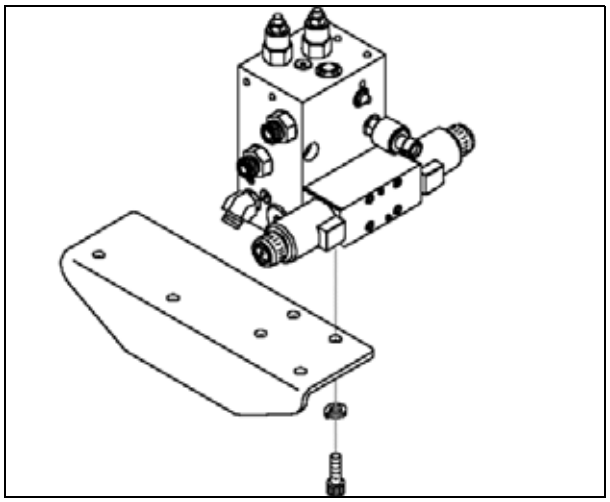
With the manifold positioned as shown, install and tighten the fittings and orientate as follows:

- Elbow, 90° adjustable -6 ORFS-ORB in top port facing forward toward valve
- Connector -8 ORFS-ORB in middle port
- Connector -10 ORFS-ORB in lower port



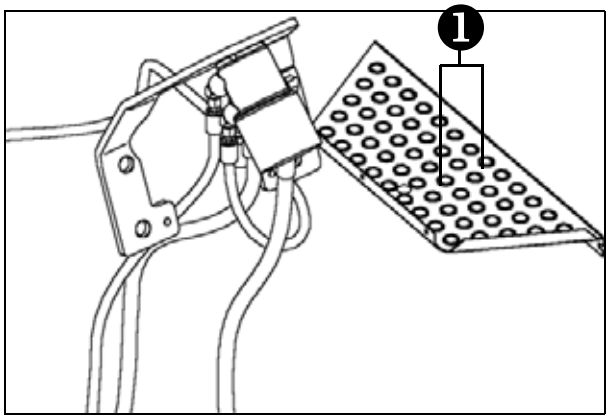
## Step 5

Install the mounting plate to the bottom of the steering valve/manifold assembly with four M10 x 30 bolts and M10 spring lock washers. Tighten the bolts to 54 – 61 Nm (40 – 45 ft/lbs).



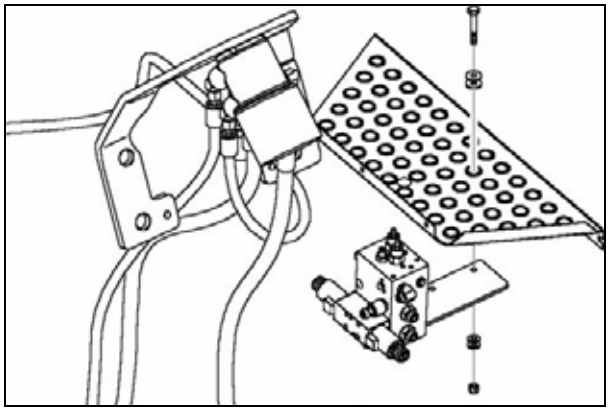
## Step 6

The valve will be mounted on the left engine compartment walkway. The mounting bolts will be positioned in the holes shown ❶.



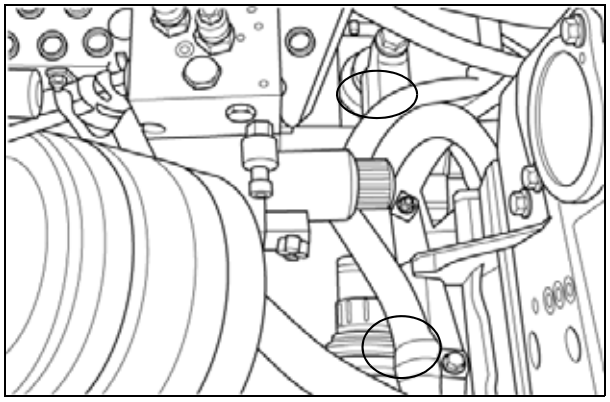

## Step 7

Install the steering valve/manifold assembly to the bottom of the walkway. Install them with two M10 x 30 bolts, with a M11 x 30 washer and then a M11 x 21 washer on the top side of the step, and a M11 x 21 washer and M10 nylon lock nut under the mounting bracket.



## Step 8

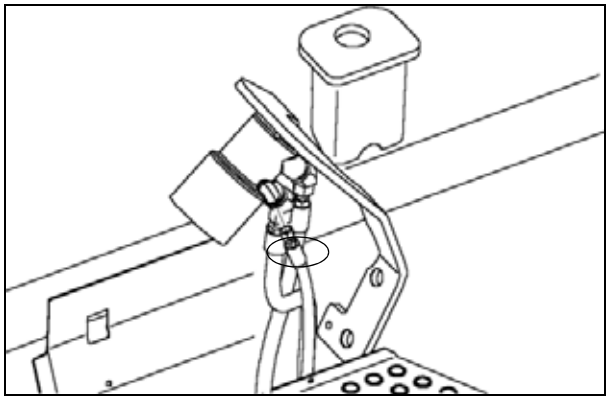
It may be necessary to reposition the main engine harness to obtain clearance for the steering valve/manifold assembly.



# Installing the hydraulic hoses: 375 to 500 models

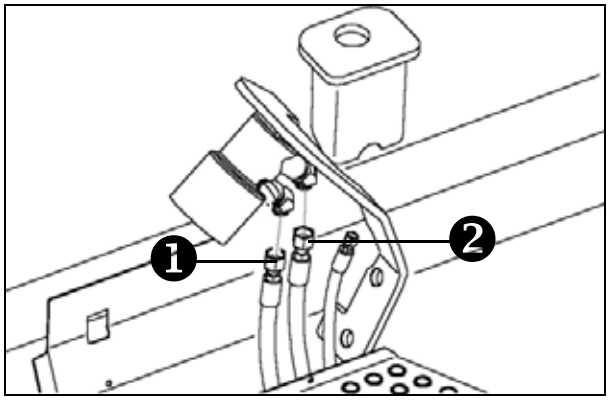
## Step 1

Remove the load sense hose from the left side of the steering pump. Mark the hose for proper identification.



## Step 2

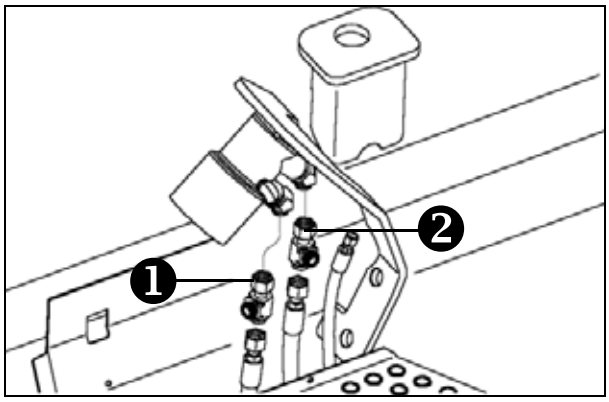
Remove the pressure hose ❶ and tank hose ❷ from the left side of the steering pump. Mark both hoses for proper identification.




## Step 3

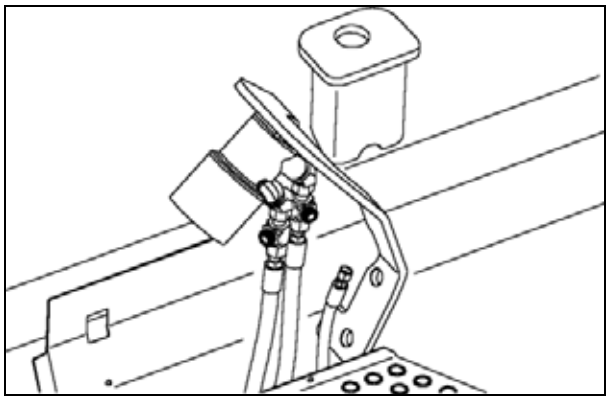
Install two ORFS swivel run -12 tees onto the fittings on the pressure ❶ and tank ❷ ports.

***Note –*** *Leave all fittings and hose connections loose until all hose routings are complete.*



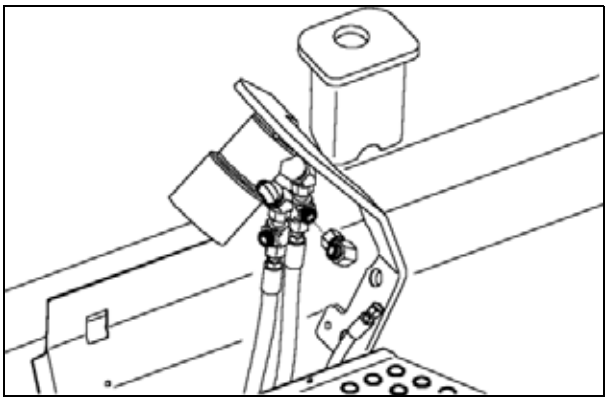
## Step 4

Reinstall the original hoses to the tees.



## Step 5

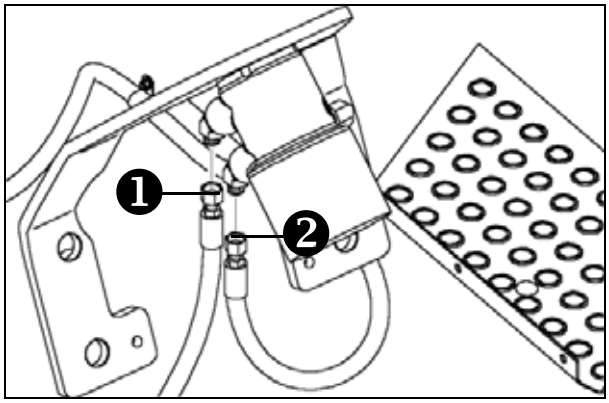
Install the swivel elbow into the tee going to the tank port.



## Step 6

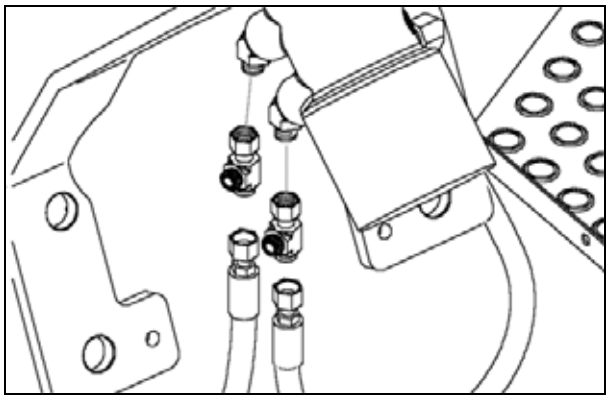
Remove the left steer hose ❶ and right steer hose ❷ from the right side of the steering pump. Mark both hoses for proper identification.

***Note –*** *Be careful to route the hoses and position fittings so the hoses or the hose ends do not contact any frame or valve components.*



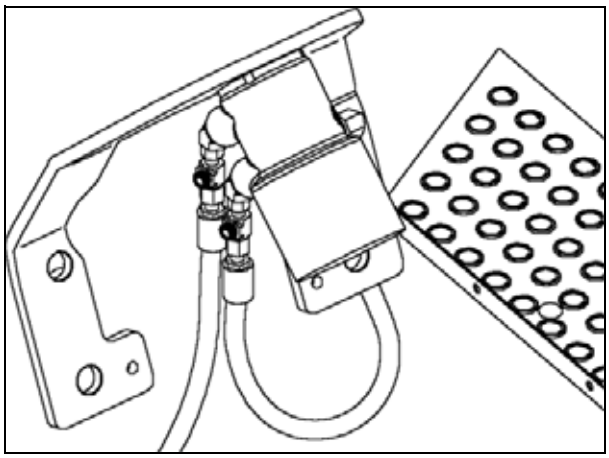

## Step 7

Install two ORFS swivel run -8 tees onto the fittings on the left and right steer ports.



## Step 8

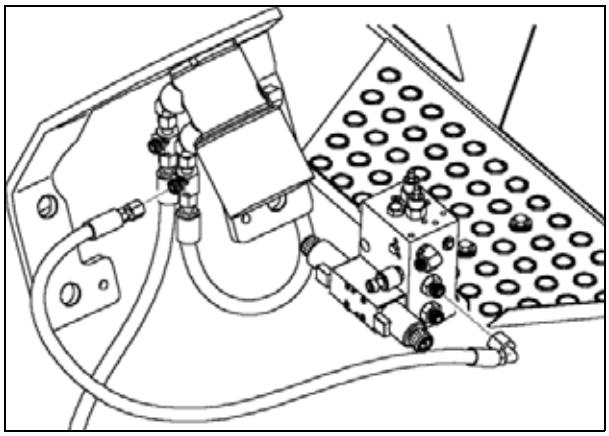
Reinstall the original hoses to the tees.



## Step 9

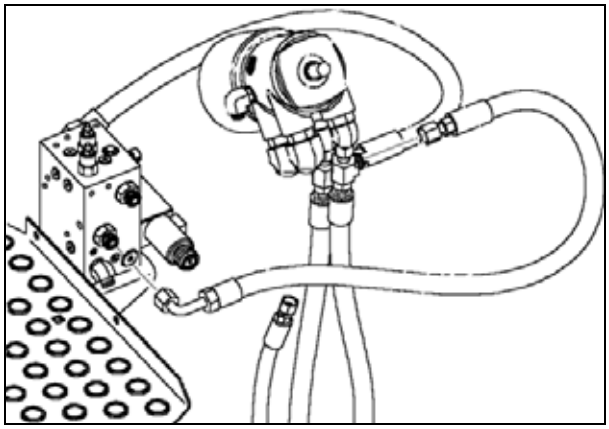
Connect the hose to the right steer tee at the steering pump and route the hose over to and connect to the front center port, which is labeled "B" on the *Ag*GPS Autopilot manifold.

***Note –*** *The hose routes over the AgGPS Autopilot steering valve.*



## Step 10

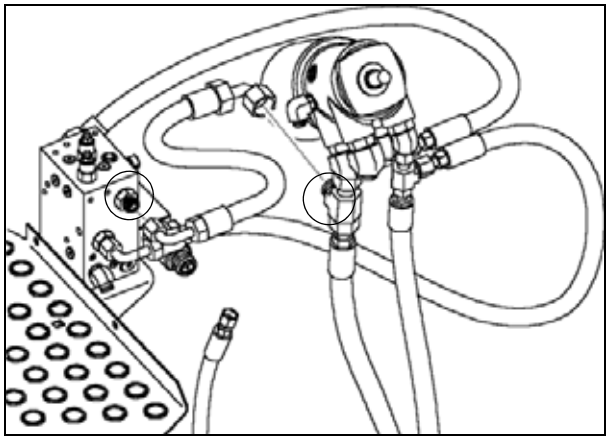
Connect the hose to the left steer tee at the steering pump and route the hose over to and connect to the rear center port, which is labeled "A" on the *Ag*GPS Autopilot manifold.



## Step 11

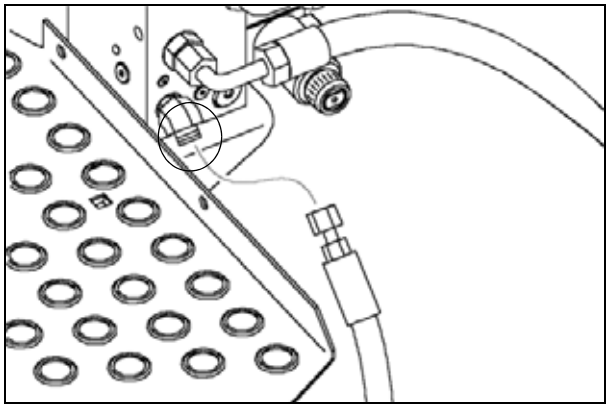
Connect the hose to the pressure port tee at the steering pump and then route the hose over to and connect to the rear top port, which is labeled "P" on the *Ag*GPS Autopilot manifold.

***Note –*** *The hose routes under the AgGPS Autopilot steering valve.*



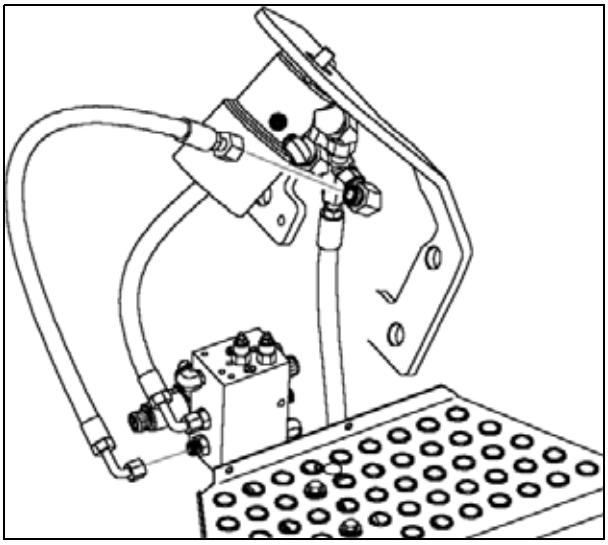
## Step 12

Route the original load sense hose over to and connect to the rear lower port, which is labeled "LS2" on the *Ag*GPS Autopilot manifold.



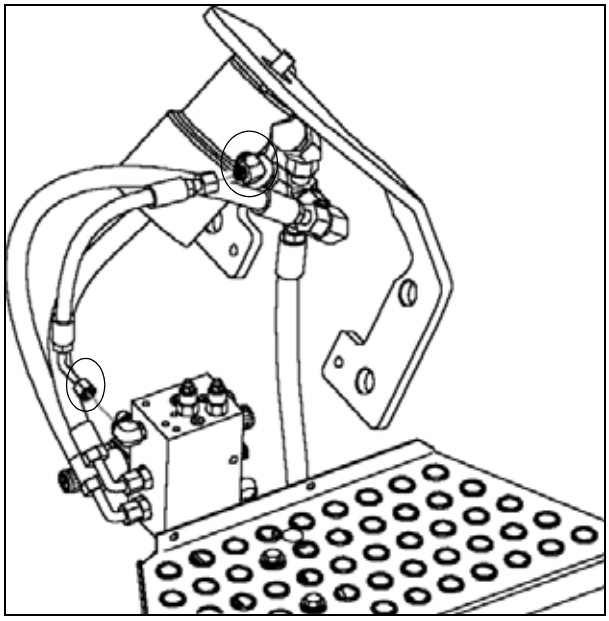
## Step 13

Connect hose to the tank port tee at the steering pump and then route the hose over to and connect to the front lower port, which is labeled "T" on the *Ag*GPS Autopilot manifold.



## Step 14

Connect the hose to the pressure sense port at the steering pump and then route the hose over to and connect to the front top port, which is labeled "LS1" on the *Ag*GPS Autopilot manifold.



## Step 15

Ensure all hose routings are unobstructed and clear of pinch points. Individually tighten each fitting and hose and try to avoid any hose contact with other hoses.

## Step 16

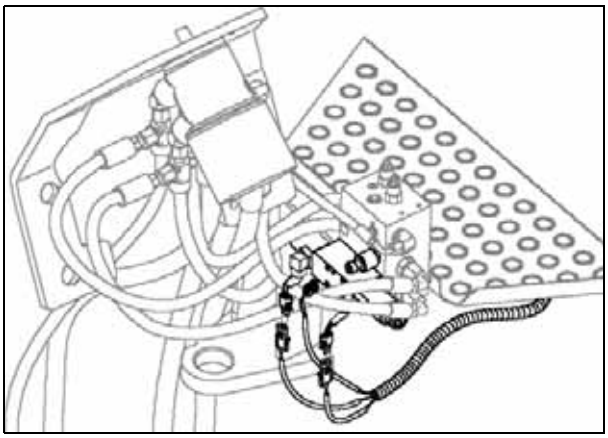
Double check all hydraulic connections to ensure they are tightened.

Check the machine hydraulic oil level and add oil as needed.

Re-connect the battery and start the machine to check for hydraulic leaks. Disconnect the battery after the leak check has been performed.

## Step 17

Plug the connectors from the *Ag*GPS Autopilot hydraulic valve cable into the mating connectors on the steering valve. Plug the pressure sensor connector into the pressure sensor.



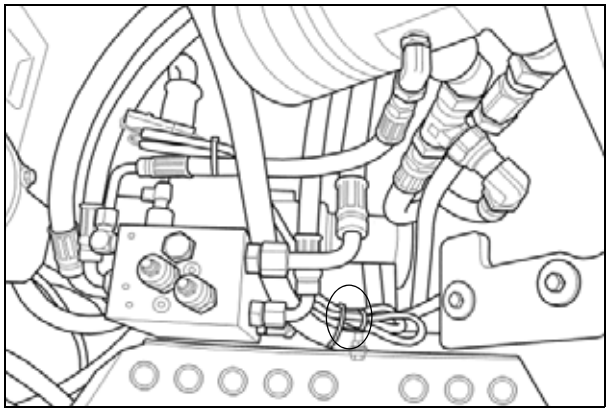
The connectors on the Autopilot harness are labeled "A" and "B". The name plate on the steering solenoid valve is stamped "A" and "B" next to the respective solenoid.

Use the jumper cable labeled "Right" to connect solenoid "A" to harness connector "A".

Use the jumper cable labeled “Left” to connect solenoid “B” to harness connector “B”.

## Step 18

Use tie straps to secure the excess *Ag*GPS Autopilot cables to the hoses as shown. Route the opposite end of the cables under the cab along the top of the transmission. Leave the three pin connector at the articulation joint. Route the remaining cable end into the cab through the access hole at the right rear corner of cab into the electronics bay and to the trainer seat. The connections will be established later.



CHAPTER

3

# AutoSense Steering Device Installation

**In this chapter:**


- AutoSense steering device components
- AutoSense steering device components
- Harness preparation (P/N 54602 Rev C)


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

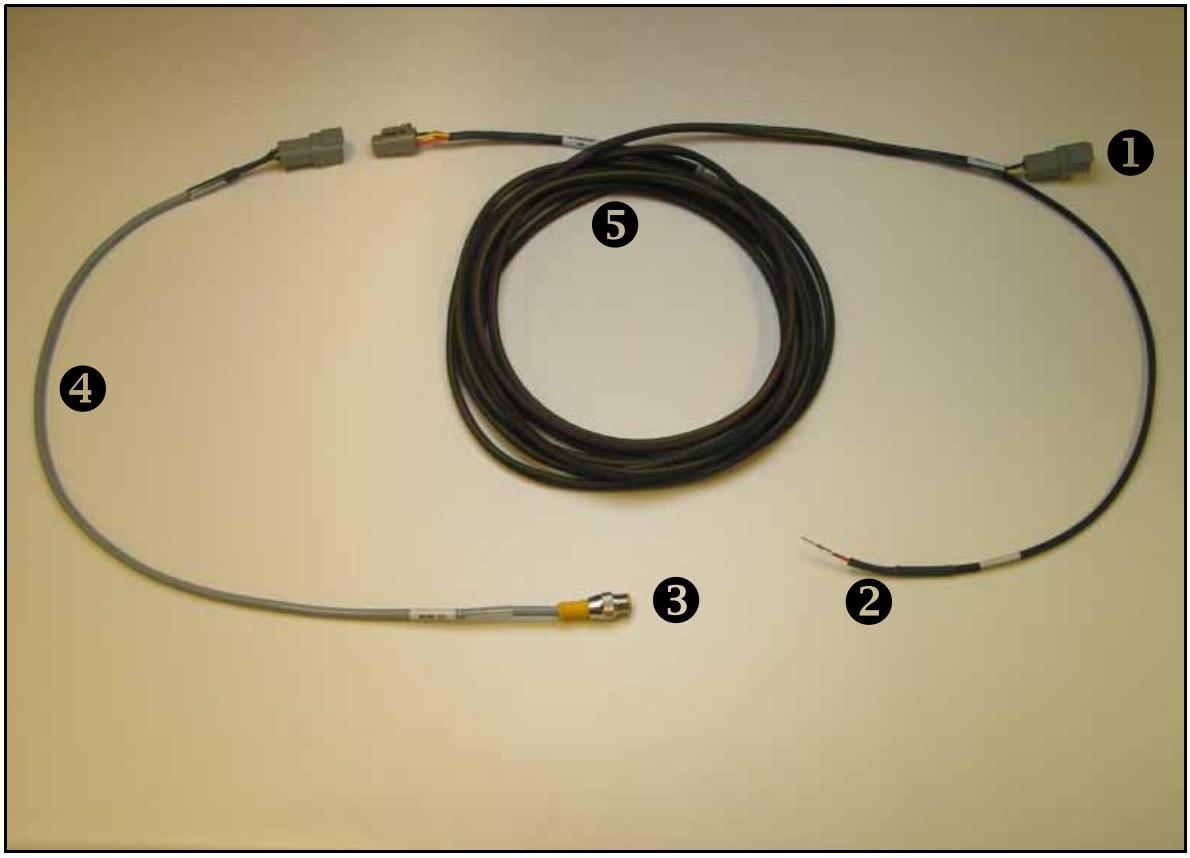
If the described mounting location is not accessible, chose an alternate location. To ensure proper function, the AutoSense device must be located in a position that is free of obstructions and allows it to rotate with the wheels when they turn.

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 | Trimble part number |
|---|---|---|
| 1 | P-6 connector | |
| 2 | Power connector | |
| 3 | AutoSense connector | |
| 4 | Jumper cable | 57560 |
| 5 | AutoSense steering cable | 57885 |

# Install the AutoSense steering device

## Step 1

Locate the mounting location on the rear of the frame.



## Step 2

Use the hardware provided to mount the bracket.



## Step 3

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



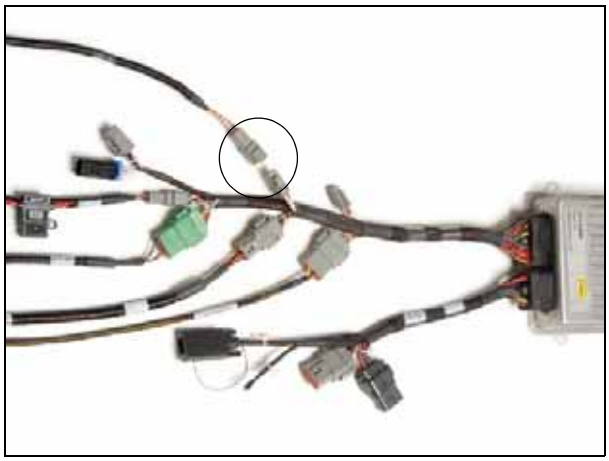
## Step 4

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



## Step 5

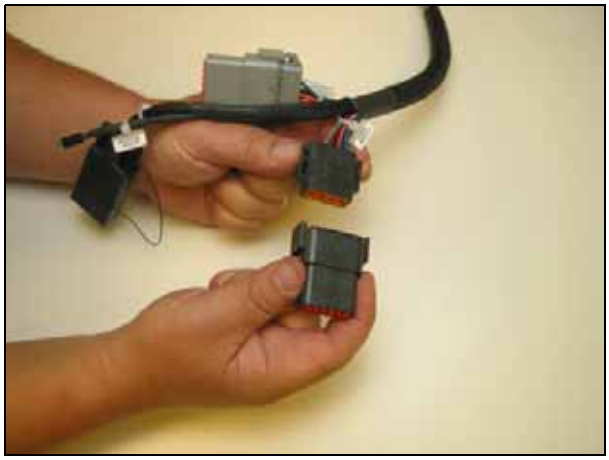
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



# Harness preparation (P/N 54602 Rev C)

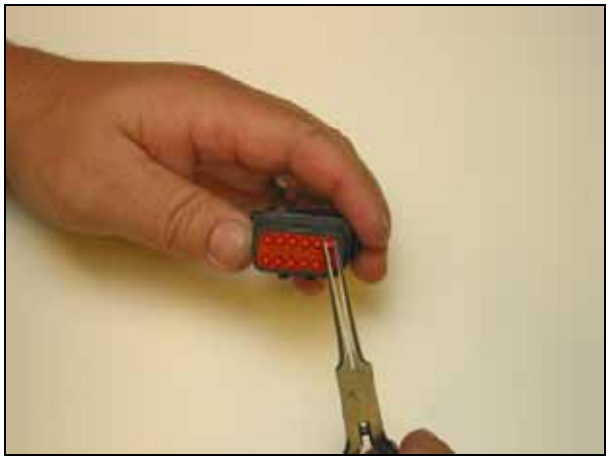
## Step 1

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



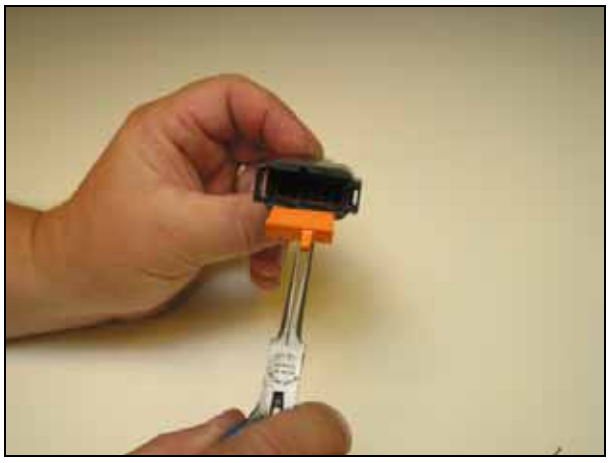
## Step 2

Remove the plug from cavity number 1.



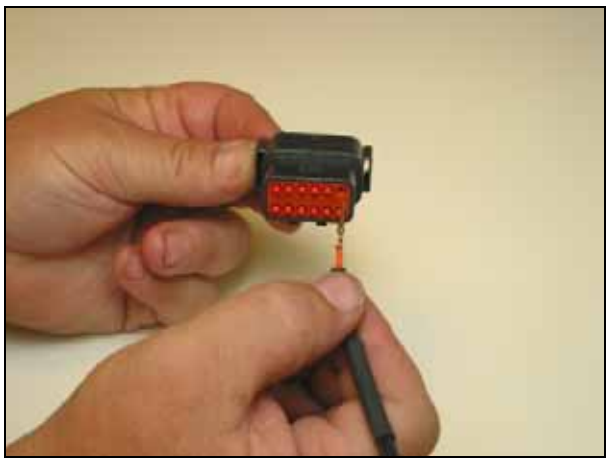
## Step 3

Remove the wedge from the connector.



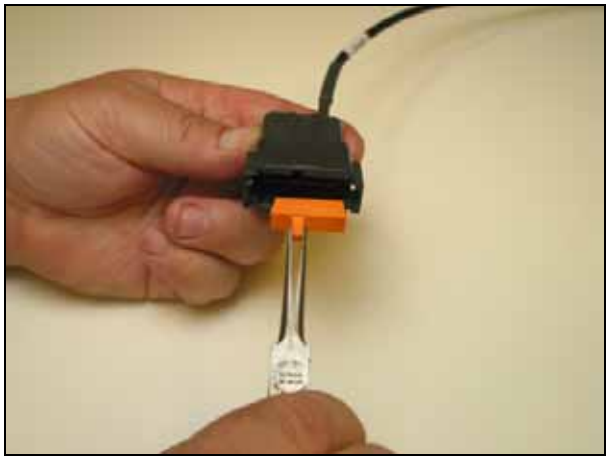
## Step 4

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:**


- Antenna and receiver installation options
- AgGPS 262 GPS receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AgGPS 262 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AgGPS 262 receiver with magnetic feet
- AgGPS 432/442 receiver components
- Installing the AgGPS 432/442 receiver
- Installing a PDL radio modem


This chapter describes how to install an *Ag*GPS 262 receiver and *Ag*GPS radio module, or an *Ag*GPS 432/442 receiver and antenna.

***Note –*** *To install the antenna for an EZ-Guide 500 system, see Chapter 5, Display Installation.*

# Antenna and receiver installation options

There are several options for mounting components (the antenna, radio module, or GPS receiver) on the cab roof depending on the accuracy required and the antenna type:

- **Spar mount** – This bracket mounts directly to the roof bolts and is required for all high accuracy applications such as RTK and OmniSTAR. Trimble recommends this method for mounting an *Ag*GPS 262 receiver. Bolt a metal spar to the roof or to a light bracket and then attach either a V plate for magnetic mounting or an *Ag*GPS 262 receiver plate for permanent mounting.
- **VHB mount** – Attach a 4" x 6" plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 46.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting:

## Possible mounting methods

| GPS receiver | V plate on spar (removable) | VHB plate on roof (removable) | Standard *Ag*GPS 262 plate bolted to spar (permanent) |
|---|---|---|---|
| *Ag*GPS 262 receiver | ✓ | X | ✓ |
| *Ag*GPS 432/442 receiver | ✓ | X | X |
| EZ-Guide 500 lightbar | ✓ | ✓ | X |
| FmX integrated display | ✓ | ✓ | ✓ |

***Notes:***

– *For quick release magnetic mounting with an AgGPS 262 receiver, order the kit listed in Antenna mounting kits, page 9 and bolt the V plate to the spar. When spar mounting is not available and high accuracy is required, see Installing an AgGPS 262 receiver with magnetic feet, page 54.*

– *With all other antennas, bolt the V plate to the spar for high accuracy and repeatability.*

– *For WAAS, EGNOS, OmniSTAR VBS, Beacon, and DGPS applications, place either of the plates in a firm location using the VHB.*

## Mounting an adjustable spar to roof bolts

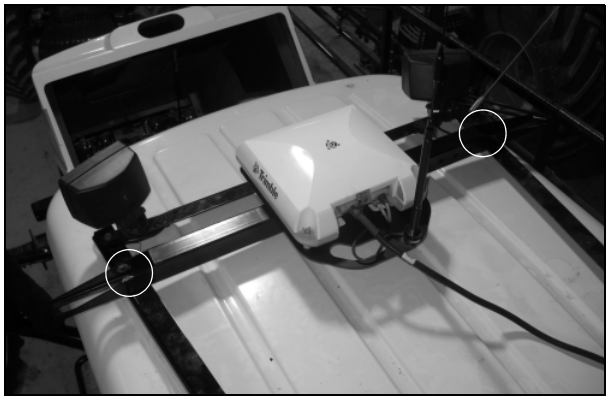
**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

### Step 1

Position the cab bolts on the roof of the vehicle.

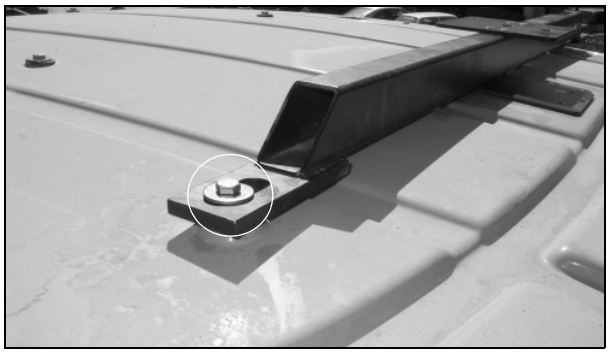


If a light bracket already occupies the roof studs, mount the spar directly onto the light bracket.



### Step 2

If required, replace the existing bolts with longer bolts.



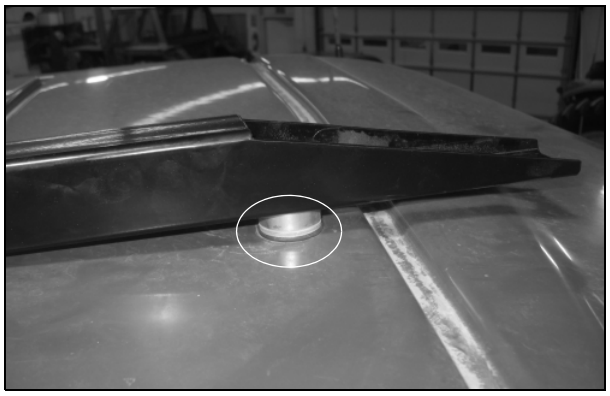
If you use the light bracket, drill two holes to match the spar width.



## Step 3

Use the slotted holes to center the spar and then tighten the bolts. If required, use the spacers and flat washers provided to secure the spar.

***Note –*** *If the receiver is offset to the left or the right of the vehicle, AgGPS Autopilot system performance may be affected. Before you tighten the cab bolts, make sure that the GPS antenna is aligned with the center of the vehicle.*



## Step 4

For either of the following applications:

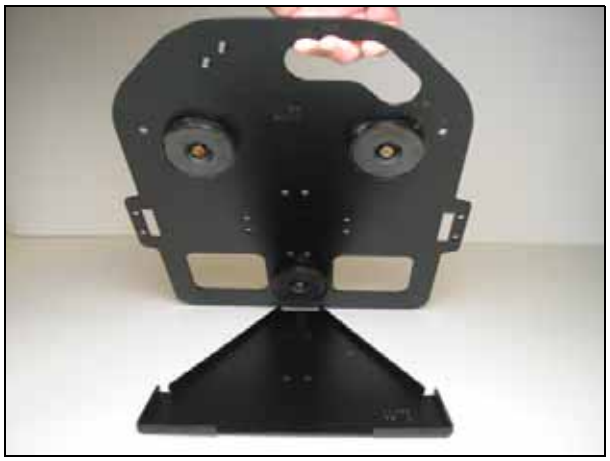
- A single magnet antenna mount
- An *Ag*GPS 262 receiver with magnetic option for quick removal

Attach a V plate with four ¼" flathead screws.

The narrow end points to the front of the vehicle.



V plate on the spar



Magnetic mount on the V plate

If you use a standard *Ag*GPS 262 plate for permanent mounting, install the radio antenna first. Use four ¼" flathead screws to attach the plate, with the handle toward the back of the vehicle.

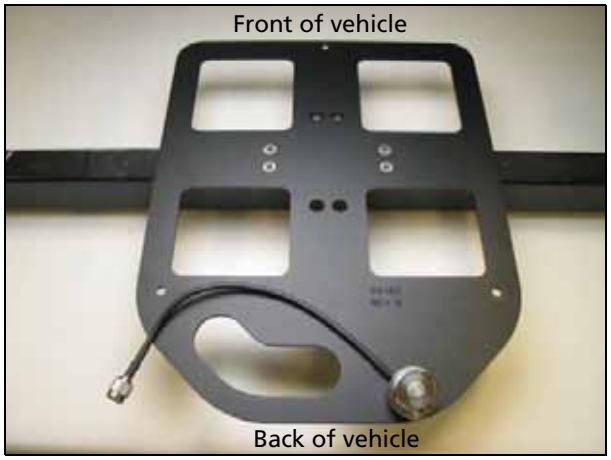



Plate on the spar

## Attaching the plate with VHB adhesive

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Standard 4" x 6" plates are provided in most kits. You can use the VHB mounting method to attach either a 4" x 6" plate or a V plate.

- **L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)** – To use this method for high accuracy, the surface must be rigid and free of "oil panning". For RTK or OmniSTAR HP corrections, the spar method is recommended. The V plate provides repeatable positioning of the antenna.
- **L1 single band antenna (WAAS, EGNOS, OmniSTAR VBS, Beacon)** – Use a 4" x 6" plate for simplified installation in applications where high accuracy is not critical.

### Step 1

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

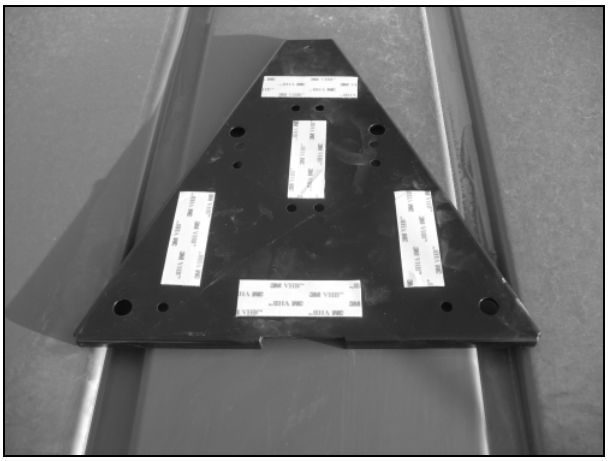


### Step 2

***V plate only***

Remove the backing from one side of the VHB strips provided and then apply the strips to the plate.

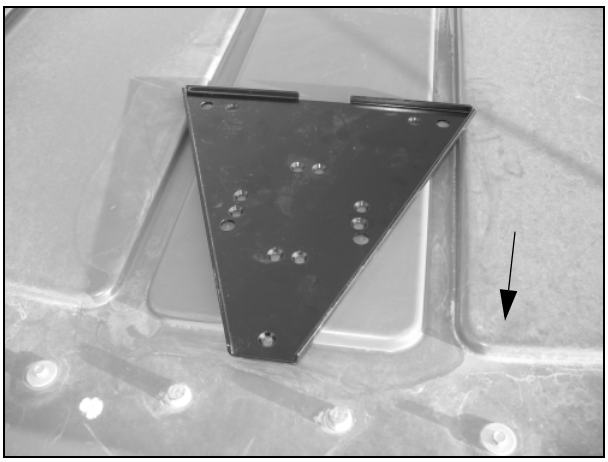
***Note –*** *The VHB strips are pre-applied to the 4" x 6" plate.*



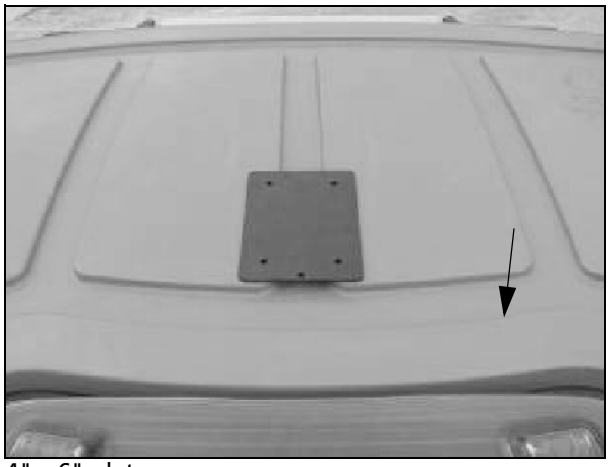
## Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end of the plate points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure and then leave for approximately 30 minutes to adhere.

***Note –*** *The arrow points to the front of the vehicle.*

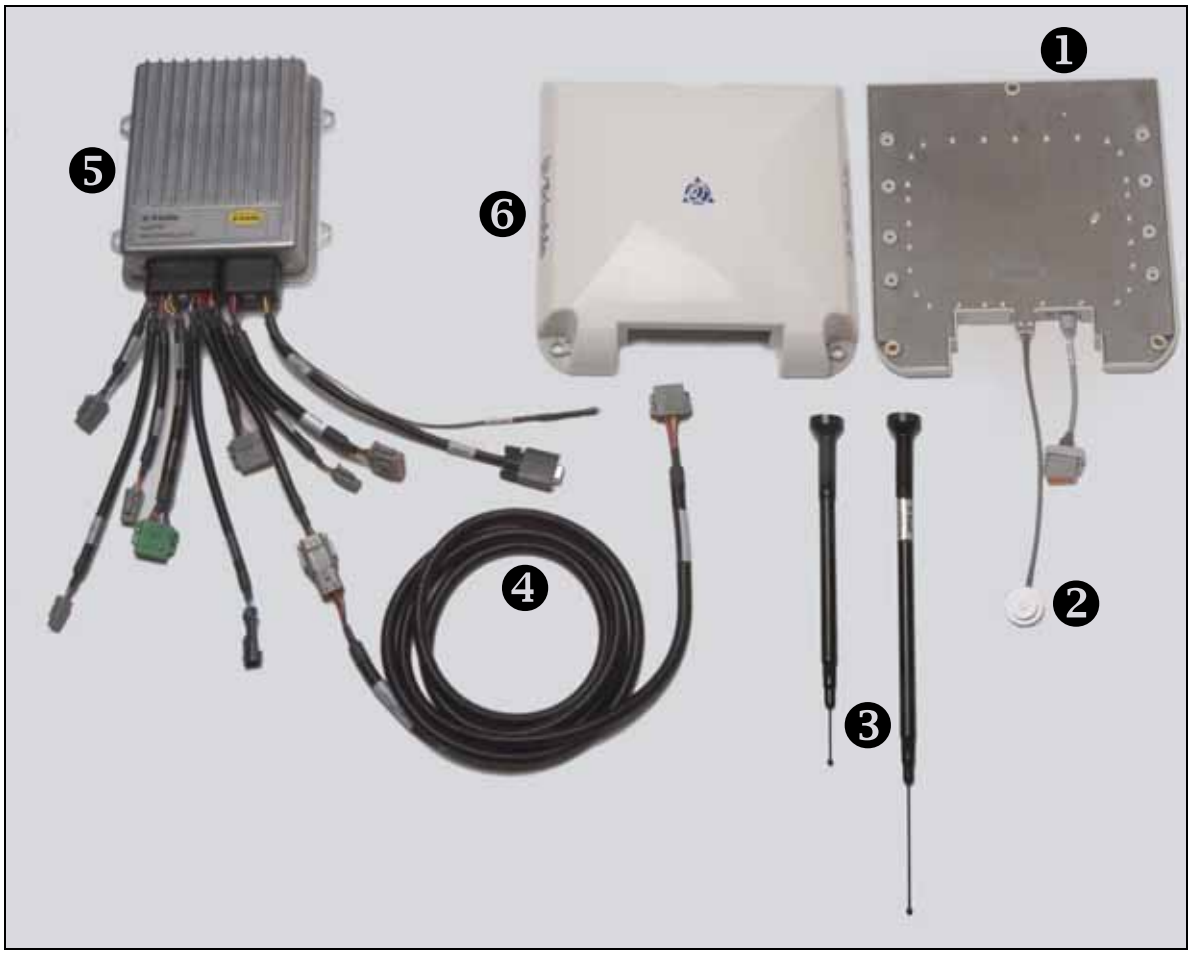


V plate



4" x 6" plate

## *Ag*GPS 262 GPS receiver with *Ag*GPS 450/900 radio module (if equipped) components




| Item | Description | Trimble part number |
|---|---|---|
| ❶ | *Ag*GPS 450 or 900 radio (if equipped) | |
| ❷ | Radio antenna cable and magnetic mount | |
| ❸ | *Ag*GPS 450 or 900 radio antenna | |
| ❹ | Antenna/receiver cable | 54608 |
| ❺ | *Ag*GPS Autopilot controller | |
| ❻ | *Ag*GPS 262 antenna/receiver | |

# Installing the *Ag*GPS 262 GPS receiver with *Ag*GPS 450/900 radio module (if equipped)

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

To attach the *Ag*GPS 262 receiver plate to the cab roof, do one of the following:

- For a removable installation, attach a V plate to a spar and then stick the receiver plate to the V plate with magnets.
- For a permanent installation, bolt the receiver plate to a spar.

## Removable installation

### Step 1

***V plate***

Attach the V plate to the spar using the ¼" flathead screws provided in the V plate bolt kit. Ensure that the narrow end points forward.

For spar mounting instructions, see page 43.



***Mounting plate***

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



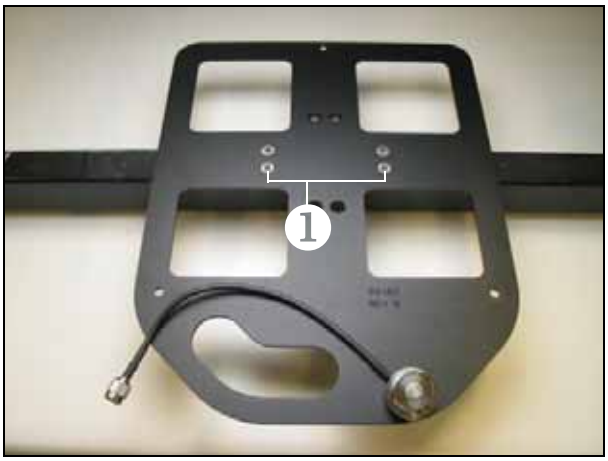
Underside of plate

## Permanent installation

### Step 1

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

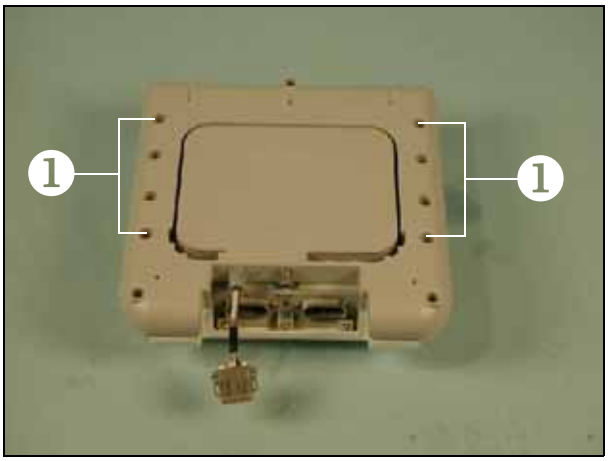
For spar mounting instructions, see page 43.




### Step 2

***Both installation methods***

Place the radio module on the *Ag*GPS 262 receiver. Secure it with the eight screws in the positions shown ❶.



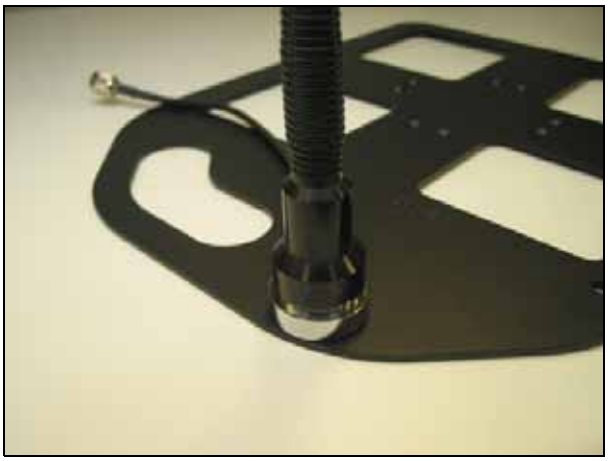

### Step 3

Attach the antenna base to the rear of the plate with the two flathead screws provided.



## Step 4

Attach the radio antenna to the antenna base.



## Step 5

Position the *Ag*GPS 262 receiver and radio on the mounting plate with the connector ports facing the radio antenna. Align the three bolt holes with the receiver, radio, and mounting plate.




## Step 6

Insert the nylon bushings provided.



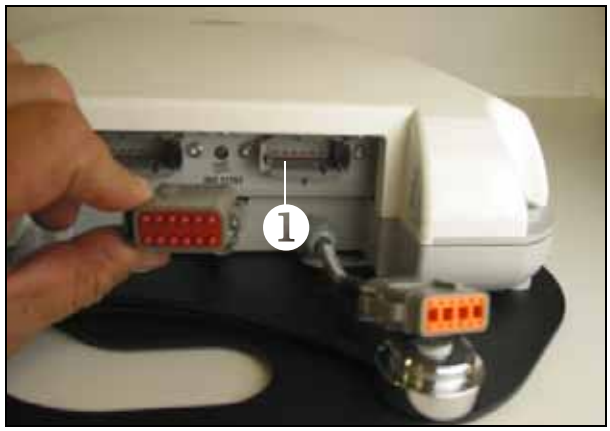
### Step 7

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



### Step 8

Remove the connector plug from port B ❶.




### Step 9

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



### Step 10

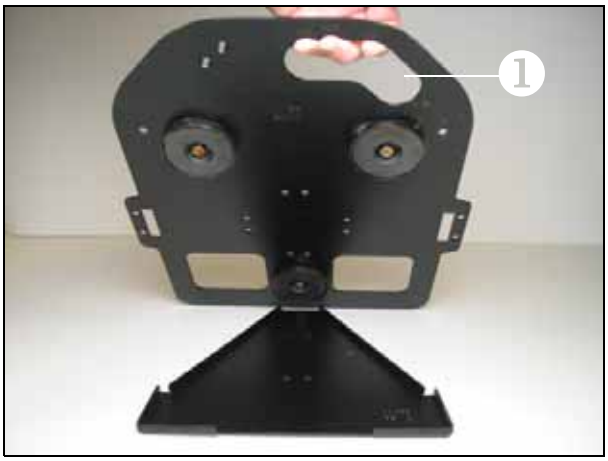
Connect the radio antenna to the antenna port.



## Step 11

***Magnet method***

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

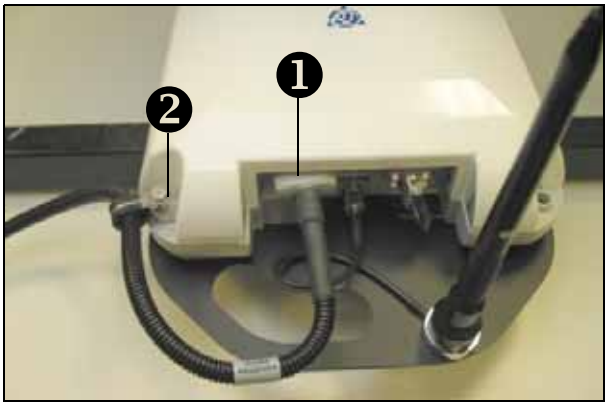



## Step 12

***Both methods***

Connect the cable from the cab controller into port A ❶ of the *Ag*GPS 262 receiver. Bolt the cable clamp ❷ to the left side of the receiver.

Route the cable into the cab and into the controller.



# Installing an *Ag*GPS 262 receiver with magnetic feet

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Use this option only when all other options are unavailable. It requires a firm surface for mounting to avoid vertical vibration and is not an easily repeatable location when moving receivers. Many cabs do not offer roof bolts; you may need to drill or to construct a firm location.

## Step 1

Attach the magnets to the receiver mounting plate. Mount the *Ag*GPS 262 GPS receiver using the three ¼" bolts.

Place the nuts on the receiver side.



## Step 2

Turn the mounting plate upside down. Stick the covers onto the magnets as shown.

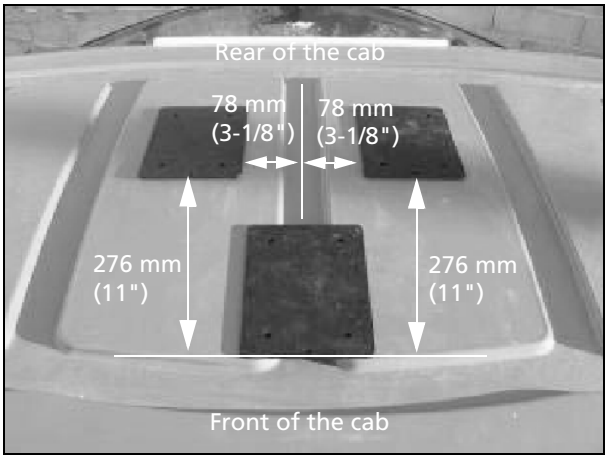


## Step 3

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

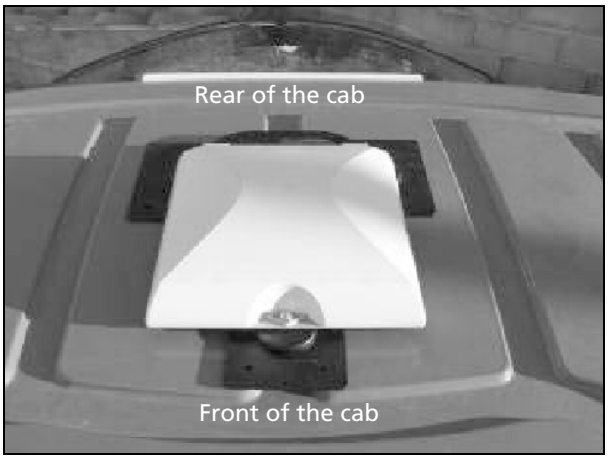
Remove the backing from the VHB strips and then apply the plates to the cab roof.

***Attach the three mounting plates so that the receiver is as firm as possible.***




## Step 4

Stick the antenna magnetic mounts at the center of the mounting plates.

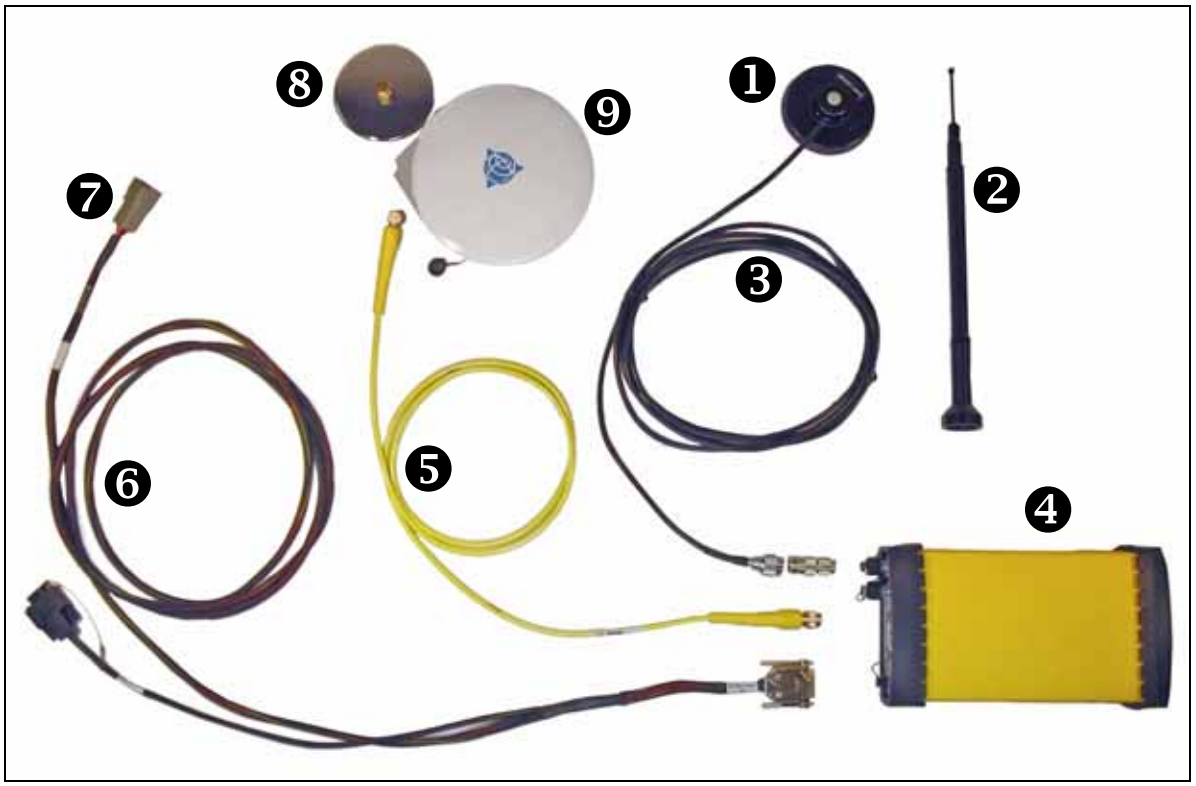



## Step 5

Connect the antenna cable to port A of the *Ag*GPS 262 GPS receiver and then route the cable toward the NavController II harness.



## *Ag*GPS 432/442 receiver components




| Item | Description | Trimble part number |
|---|---|---|
| ❶ | Radio antenna magnetic base | |
| ❷ | Radio antenna | |
| ❸ | Radio antenna cable | |
| ❹ | *Ag*GPS 432/442 GPS receiver | |
| ❺ | Antenna cable | |
| ❻ | Receiver cable | 62037 |
| ❼ | To controller "P3 GPS" | |
| ❽ | Antenna magnetic mount | |
| ❾ | *Ag*GPS 432/442 antenna | |

# Installing the *Ag*GPS 432/442 receiver

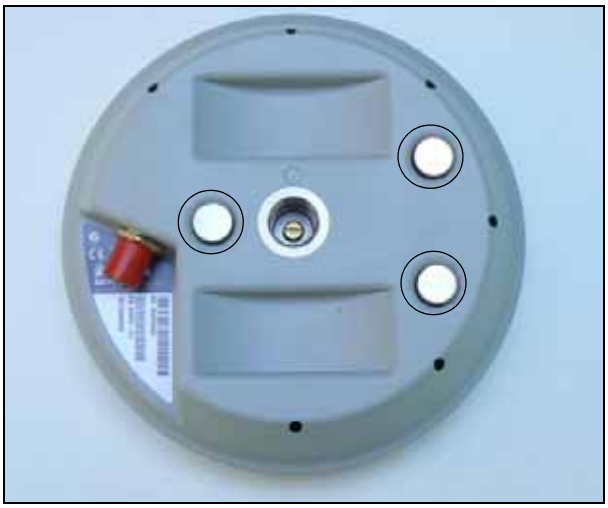
**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

## Step 1

Attach the large magnet with a $^{5}/_{8}$" stud to the GPS antenna.



If the antenna has magnets built in, skip this step.



## Step 2

***L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)***

For repeatable positioning, place the antenna against the lip at the narrow end of the V plate.



## Step 3

Attach the antenna/receiver cable to the antenna and then route the cable into the cab through the rubber grommet at the base of the rear window. Secure the cable along the way.



## Step 4

Mount the receiver in a convenient location in the cab. Route the antenna cable to the receiver and then connect it.

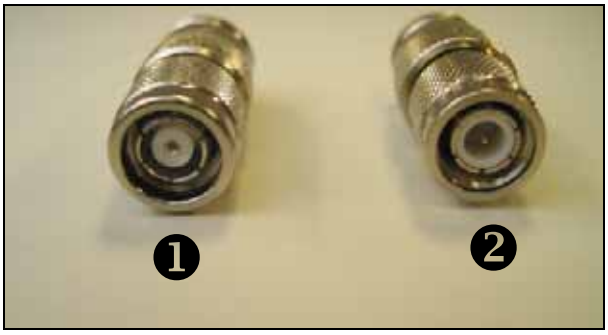


## Step 5

Identify the correct adaptor for the radio connection:

❶ Reverse polarity TNC-to-N for 900 MHz radios

❷ Normal polarity TNC-to-N for 400 MHz radios




## Step 6

Attach the adaptor to the radio port.



## Step 7

Connect the radio antenna cable to the radio port adaptor.



## Step 8

Connect the controller cable to the 26-pin connector of the receiver. Controller cable connections will be completed later in the Controller Installation chapter.



## Step 9

Connect the radio antenna to the magnetic antenna base.



## Step 10

Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the 4" x 6" plate with the VHB provided to relocate the antenna.



# Installing a PDL radio modem

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

## Step 1

Position the radio where it is accessible for the operator to select a new radio channel ID.




***Permanent mount***

For a permanent mount, bolt the radio onto a bracket with a $^{5}/_{8}$" UNC screw.



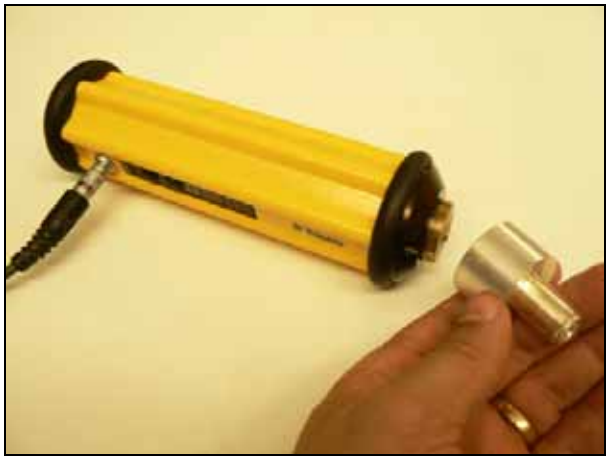
***Temporary mount***

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



## Step 2

Connect the radio antenna cable adaptor to the radio.



## Step 3

Connect the radio cable to the adaptor.



CHAPTER

5

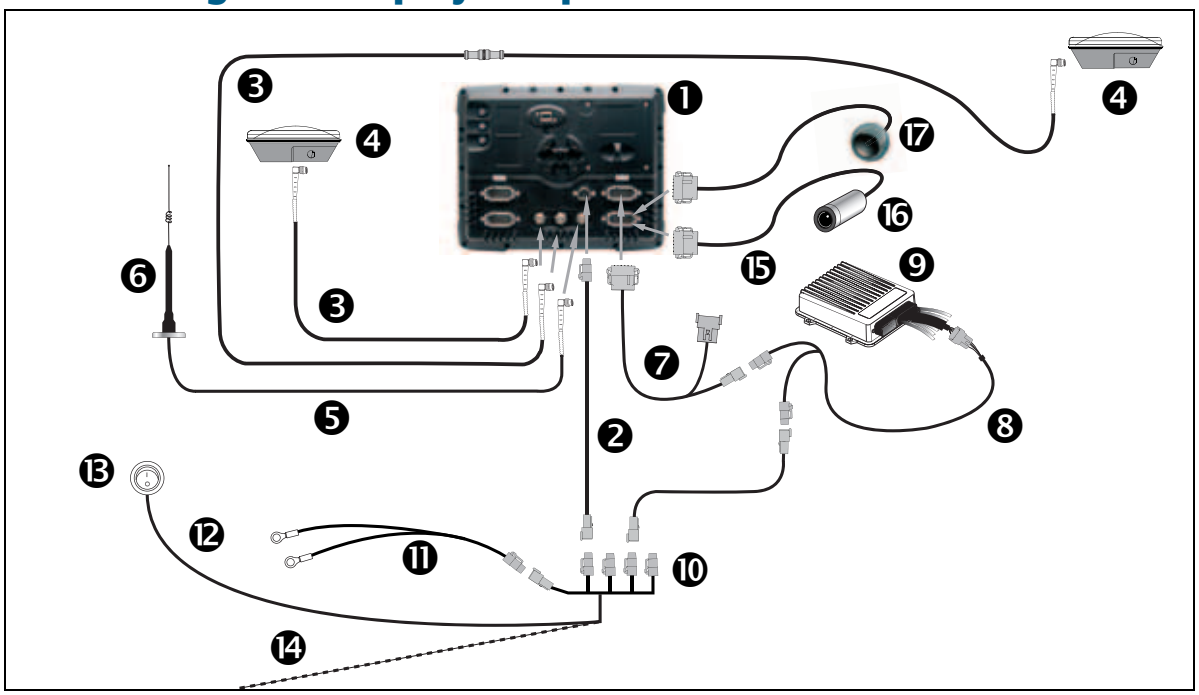
# Display Installation

**In this chapter:**


- FmX integrated display components
- EZ-Guide 500 lightbar components
- Preparing the FmX integrated display
- Installing the FmX integrated display
- FmX integrated display: Installing the wiring harness
- FmX integrated display: Connecting accessory options
- Preparing the EZ-Guide 500 lightbar
- Connecting the EZ-Guide 500 lightbar cables
- Installing the EZ-Guide 500 lightbar
- EZ-Guide 500 lightbar and FmX integrated display: Installing the GPS antenna and plate
- FmX integrated display: Installing the RTK radio antenna
- EZ-Guide 500 lightbar: Installing a PDL radio modem


This chapter describes and how to install and connect the FmX integrated display, the EZ-Guide 500 lightbar in the vehicle.

## FmX integrated display components

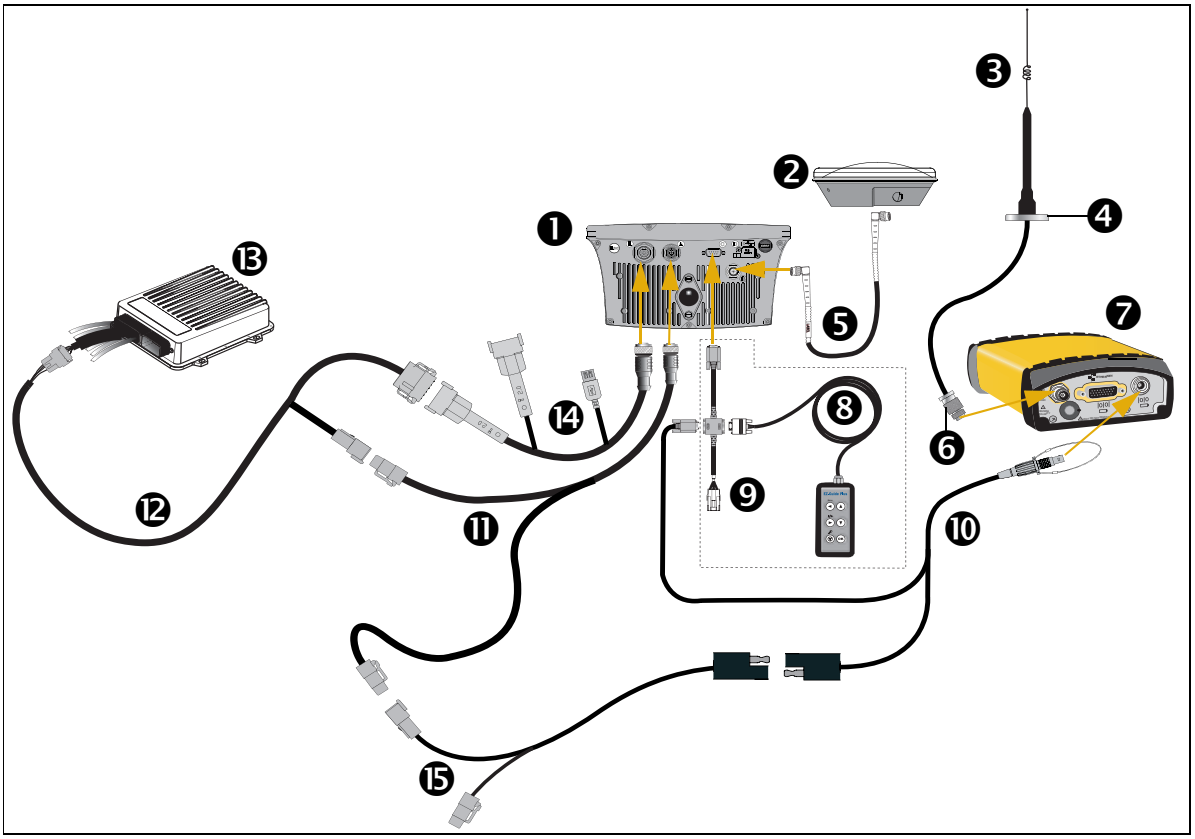



| Item | Description |
|---|---|
| ❶ | FmX integrated display: P/N 93100-02 |
| ❷ | FmX power cable: P/N 66694 |
| ❸ | GPS, 5M, TNC/TNC RT angle cable: P/N 50449 |
| ❹ | GPS antenna: P/N 57200-00 |
| ❺ | Antenna cable and base: P/N 62120 |
| ❻ | SNB900 radio antenna kit: P/N 28822-10 |
| ❼ | FmX to NavController II cable w/ port replicator: P/N 65522 |
| ❽ | NavController II main cable: P/N 54601 |
| ❾ | NavController II: 55563-00 |

| Item | Description |
|---|---|
| ❿ | FmX power cable w/ relay and switch: P/N 67259 |
| ⓫ | FmX basic power cable: P/N 67258 |
| ⓬ | Switch cable:Incl with P/N 67259 |
| ⓭ | Switch - optional: Incl with P/N 67259 (illuminated switch sold separately) |
| ⓮ | Ignition sense cable: Incl with P/N 67259 |
| ⓯ | FmX to camera cable: P/N 67090 |
| ⓰ | AgCam (purchased separately) |
| ⓱ | External speaker |

# EZ-Guide 500 lightbar components

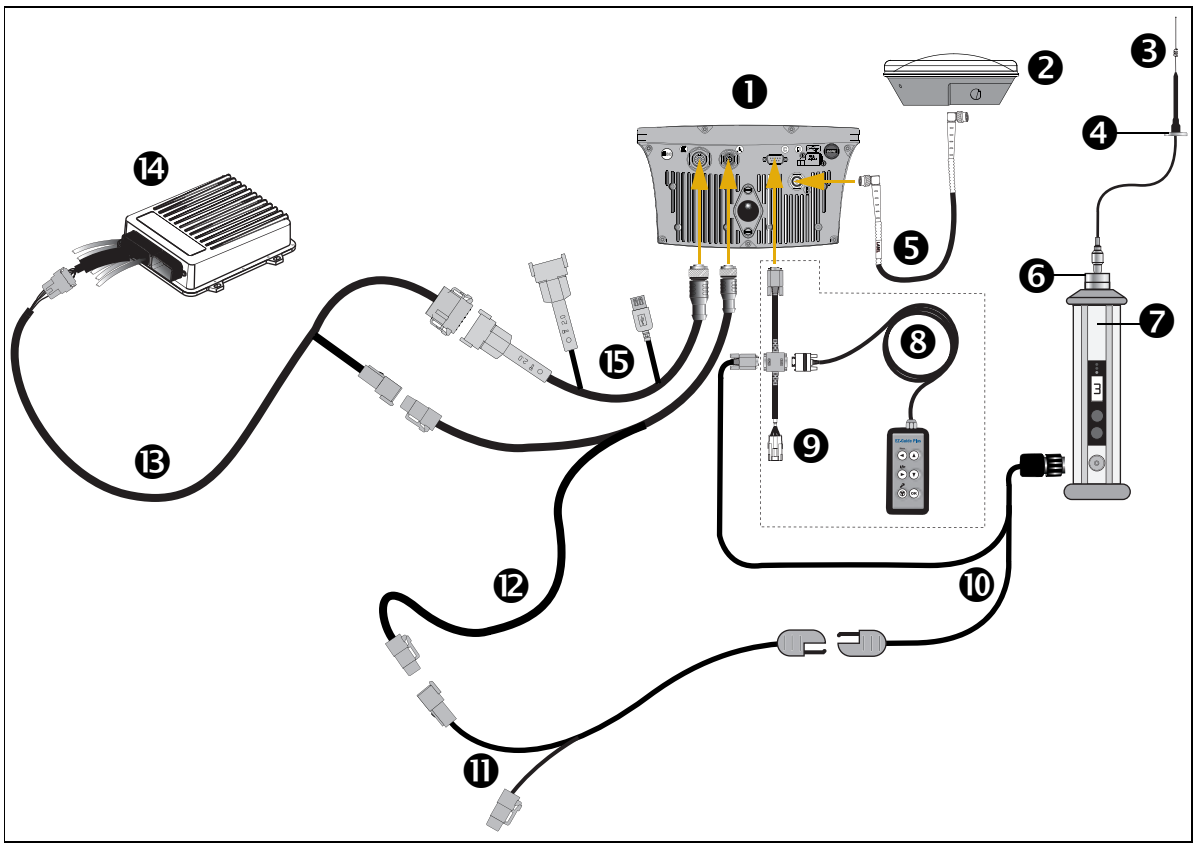
## With SNB900 radio for 900 MHz RTK corrections (if equipped)




| Item | Description |
|---|---|
| ❶ | EZ-Guide 500 lightbar |
| ❷ | GPS antenna: P/N 57200-00 |
| ❸ | SNB900 radio antenna: P/N 22882-00 |
| ❹ | SNB900 radio antenna magnetic mount: P/N 62109 |
| ❺ | GPS antenna cable: P/N 50449 |
| ❻ | N Female to REV. POL TNC Male: P/N 62114 |
| ❼ | SNB900 radio: P/N X8480-X0 |
| ❽ | Remote keypad (optional): P/N 66030-00) |

| Item | Description |
|---|---|
| ❾ | External interface cable: P/N 62749 |
| ❿ | Radio power/data cable: P/N 61158 |
| ⓫ | EZ-Guide 500 power cable: P/N 62817 |
| ⓬ | EZ-Guide 500-to-Autopilot cable: P/N 62754 |
| ⓭ | NavController II: P/N 55563-00 |
| ⓮ | Port expansion cable: P/N 62609 |
| ⓯ | Power tap to PDL radio: P/N 63185 |
| | |

## With a PDL 450 radio for 450 MHz RTK corrections (if equipped)




| Item | Description |
|---|---|
| ❶ | EZ-Guide 500 lightbar |
| ❷ | GPS antenna: P/N 57200-00) |
| ❸ | PDL 450 radio antenna: P/N 5187-x0-x0 |
| ❹ | Radio antenna magnetic mount: P/N 62109 |
| ❺ | GPS antenna cable: P/N 50449 |
| ❻ | Radio antenna connector: P/N 63278 |
| ❼ | PDL 450 radio: P/N 62550-4x-xx |
| ❽ | Remote keypad (optional): P/N 66030-00 |

| Item | Description |
|---|---|
| ❾ | External interface cable: P/N 62749 |
| ❿ | PDL radio power/data cable: P/N 51861-00 |
| ⓫ | Power tap to PDL radio: P/N 63185 |
| ⓬ | EZ-Guide 500 power cable: P/N 62817 |
| ⓭ | EZ-Guide 500-to-Autopilot cable: P/N 62754 |
| ⓮ | NavController II: P/N 55563-00 |
| ⓯ | Port expansion cable: P/N 62609 |

# Preparing the FmX integrated display

## Step 1

Locate the FmX integrated display, the RAM mount, and the RAM mount clamp.



## Step 2

Use the provided metric hardware to attach the RAM mount to the rear of the display.



## Step 3

Attach the RAM mount to the rear of the display.



# Installing the FmX integrated display

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

## Step 1

Decide where you will mount the display in the vehicle cab. Use the provided bolts to attach the bar mount to the rail

## Step 2

Attach the free end of the RAM mount to the bar mount. Tighten the clamp on the RAM mount so that the display is secure.

# FmX integrated display: Installing the wiring harness

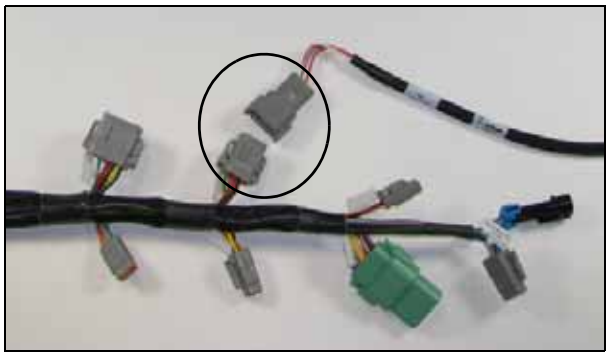
## Step 1

Locate the cable that connects the FmX integrated display to the *Ag*GPS NavController II ❶.




## Step 2

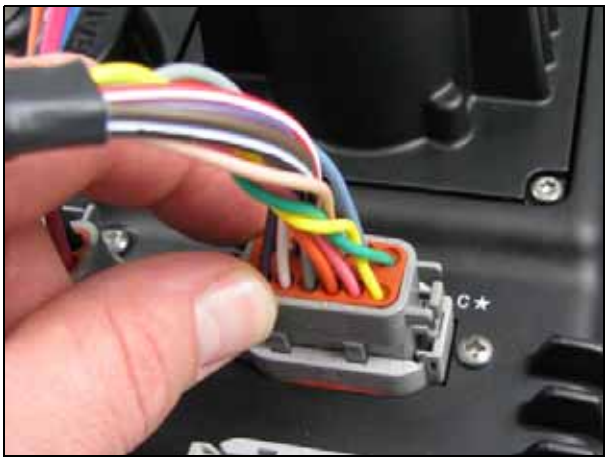
Connect the cable to the P3 connector on the NavController II main harness, and then route the cable from the NavController II to the mounting location on the FmX integrated display.



## Step 3

Connect the cable to the C port of the FmX integrated display.

***Note –*** *To connect power to the FmX integrated display, see Chapter 6, Power Harness Installation.*



# FmX integrated display: Connecting accessory options

## AgCam

The AgCam and AgCam cable are accessory items that you can purchase separately from the FmX integrated display. The FmX integrated display will allow for up to four video inputs.

### Step 1

Locate the AgCam and AgCam cable.



### Step 2

Mount the AgCam in a secure location and then route the cable towards the FmX integrated display.

### Step 3

Connect the AgCam cable to the FmX integrated display adaptor cable.



### Step 4

Connect the FmX integrated display to AgCam adaptor cable to one of the open 12 pin connectors on the back of the display.



## Speaker

### Step 1

Locate the speaker and cable assembly that connects to the FmX integrated display.



### Step 2

Mount the speaker in the required location and then route the cable to the FmX integrated display.

### Step 3

Connect the speaker cable to one of the open 12 pin connectors on the back of the display.



# Preparing the EZ-Guide 500 lightbar

***Note –*** *Before you attach the lightbar to the RAM mount, connect the EZ-Guide 500 cables to the back of the lightbar.*

## Step 1

Locate the EZ-Guide 500 lightbar, the RAM mount and hardware, and the RAM mount clamp.



## Step 2

Attach the RAM mount diamond base to the display using the hardware provided.



## Connecting the EZ-Guide 500 lightbar cables

***Note –*** *Before you attach the lightbar to the RAM mount, connect the EZ-Guide 500 cables to the back of the lightbar.*

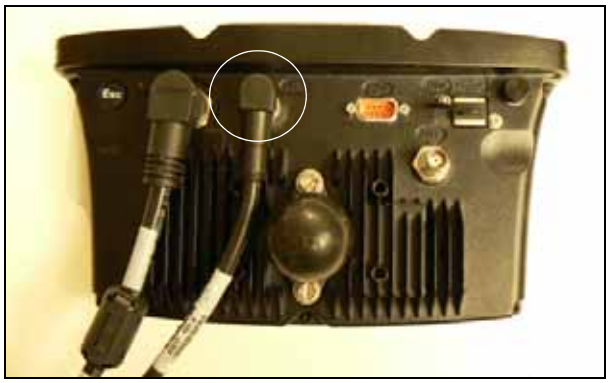
### Step 1

Connect the port expansion cable (P/N 62609) to the AUX port on the back of the lightbar.



### Step 2

Connect the EZ-Guide 500 power cable (P/N 62817) to the PWR port on the back of the lightbar.



### Step 3

Connect the 2-pin connector on the port expansion cable and the 12-pin connector on the power cable to the matching connectors on the EZ-Guide 500-to-Autopilot cable (P/N 62754).

### Step 4

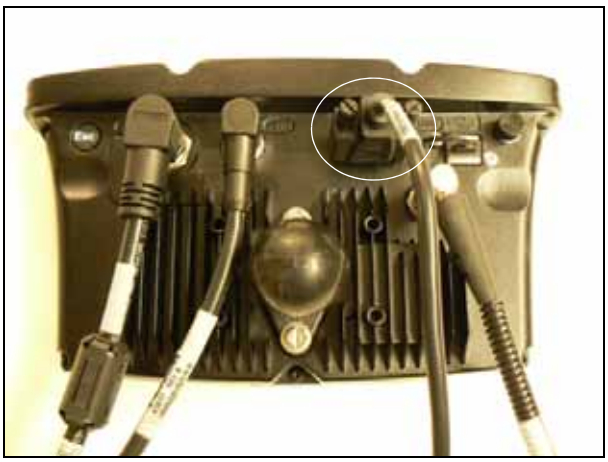
Feed the GPS antenna cable into the cab and then connect it to the antenna port on the back of the lightbar.



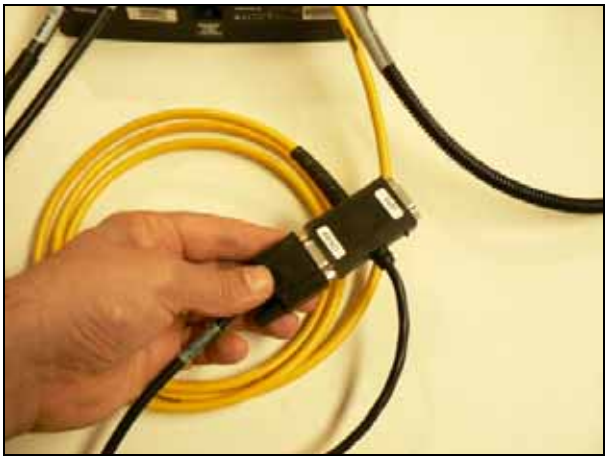
## Step 5

***With keypad***

Connect the external interface cable (P/N 66030-00) to the serial port on the back of the lightbar.

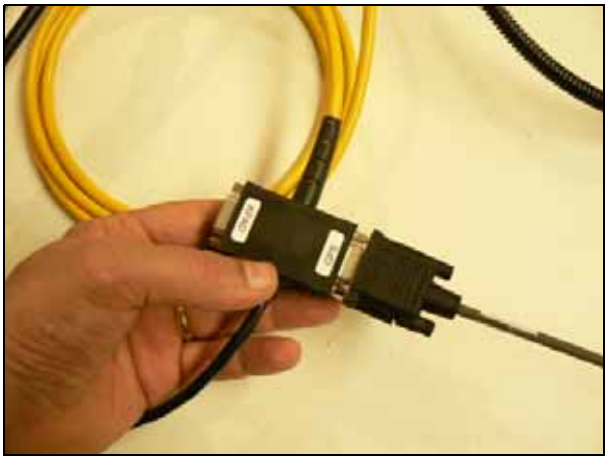


Connect the remote keypad to the KPAD serial port on the external interface cable.



Connect the appropriate cable to the GPS serial port on the interface cable:

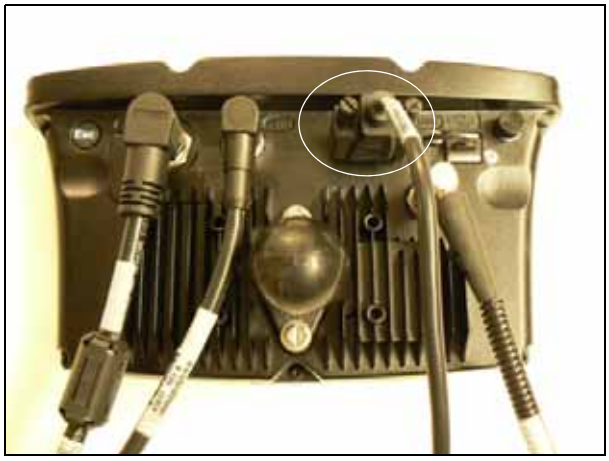
| Radio type | Cable to connect |
|---|---|
| SNB900 radio | EZ-Guide 500-to-radio cable (P/N 61158) |
| PDL 450 radio | PDL radio power/data cable (P/N 51861-00) |



***Without keypad***

Connect the appropriate cable to the serial port on the back of the lightbar:

| Radio type | Cable to connect |
|---|---|
| SNB900 radio | EZ-Guide 500-to-radio cable (P/N 61158) |
| PDL 450 radio | PDL radio power/data cable (P/N 51861-00) |



## Step 6

Connect the other end of the radio cable to the radio.

## Step 7

Connect the remaining connector on the PDL radio power/data cable to the matching connector on the power tap cable (P/N 63185).

Connect the connector at the other end of the power tap cable to the EZ-Guide 500 power cable.

# Installing the EZ-Guide 500 lightbar

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

## Step 1

Select the location for the lightbar in the cab. There must be a bar that the RAM mount can be attached to.



## Step 2

Sit in the driver's seat and hold the lightbar in place. Ensure that it allows comfortable access to the display buttons and does not obstruct instruments.



## Step 3

Attach the RAM mount to the ball on the rear of the lightbar.



## Step 4

Attach the free end of the RAM mount to the bar mount. Tighten the clamp on the RAM mount so that the lightbar is held securely in place.



## Step 5

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



# EZ-Guide 500 lightbar and FmX integrated display: Installing the GPS antenna and plate

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

Use one of the following methods:

- Spar mount
- VHB adhesive

## Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations. For more information, see Antenna and receiver installation options, page 42.

Attach the V plate to the spar with the four supplied ¼"-20 flathead screws as shown. The narrow end points forward.



## VHB adhesive method

Standard 4" x 6" plates are provided in most kits. You can use Very High Bond (VHB) to attach either a 4" x 6" plate or a V plate.

- **L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)** – To use this method for high accuracy, the surface must be rigid and free of "oil panning". For RTK or OmniSTAR HP corrections, the spar method is recommended. The V plate provides repeatable positioning of the antenna.
- **L1 single band antenna (WAAS, EGNOS, OmniSTAR VBS, Beacon)** – Use a 4" x 6" plate for simplified installation in applications where high accuracy is not critical.

## Step 1

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

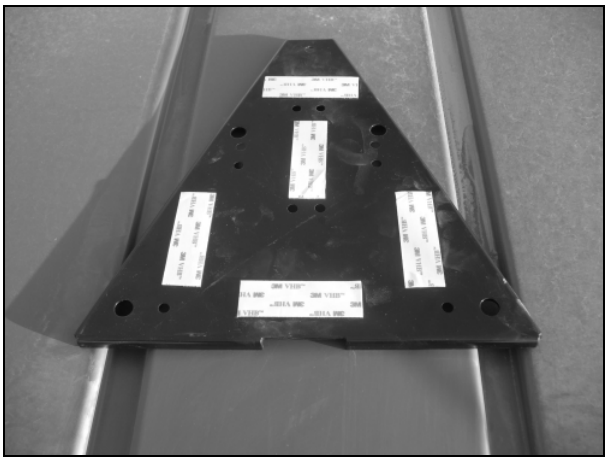


## Step 2

***V plate only***

Remove the backing from one side of the VHB strips provided and then apply the strips to the plate.

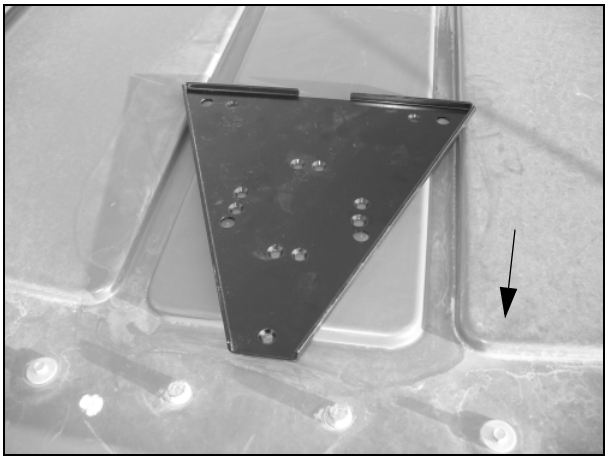
***Note –*** *The VHB strips are pre-applied to the 4" x 6" plate.*



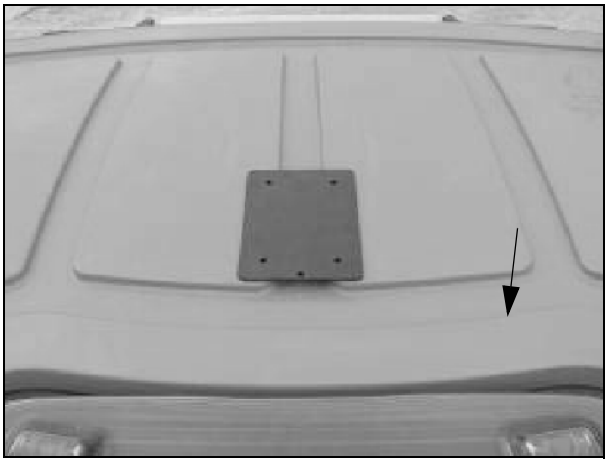
## Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure and then leave for approximately 30 minutes to adhere.

***Note –*** *The arrow in this figure points to the front of the vehicle.*



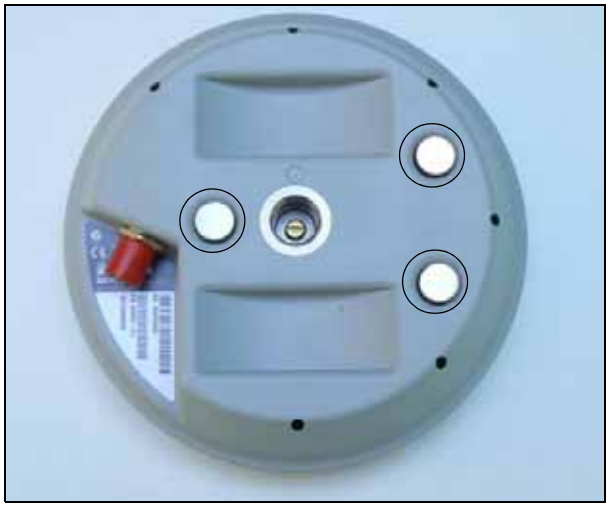
V plate



4" x 6" plate

## Step 4

If the antenna has magnets built in, omit this step.



Otherwise, attach the large magnet with a $^{5}/_{8}$" stud to the GPS antenna.



## Step 5

***L1/L2 dual band antenna (RTK, OmniSTAR, DGPS)***

For repeatable positioning, place the antenna against the lip at the narrow end of the V plate.



***L1 single band antenna (WAAS, EGNOS, VBS, Beacon)***

Attach the antenna to the center of the 4" x 6" plate.



## Step 6

***Both models***

Attach the antenna/receiver cable to the antenna and then route the cable into the cab through the rubber grommet at the base of the rear window. Secure the cable along the way.



# FmX integrated display: Installing the RTK radio antenna

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

## Step 1

Connect the radio antenna to the magnetic antenna base



## Step 2

Attach the magnetic radio antenna base to the rear f the V plate on the roof. If the cable does not reach the V plate, use the 4" x 6" plate with the VHB provided to relocate the antenna.



## Step 3

Route cable from the vehicle roof into the cab, and connect the radio cable to the FmX integrated display.

# EZ-Guide 500 lightbar: Installing a PDL radio modem

## Step 1

Position the radio where it is accessible for the operator to select a new radio channel ID.




***Permanent mount***

For a permanent mount, bolt the radio onto a bracket with a $^{5}/_{8}$" UNC screw.



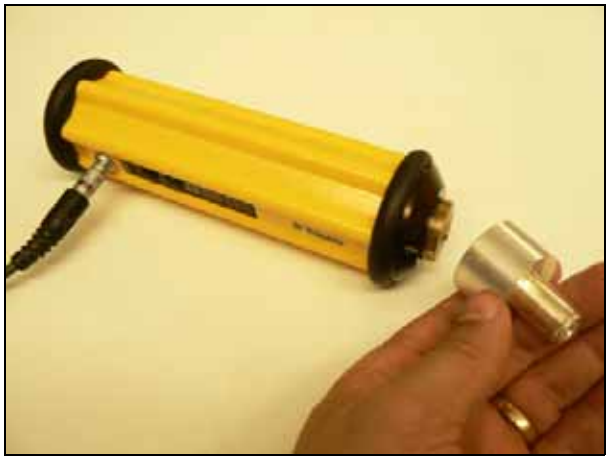
***Temporary mount***

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



## Step 2

Connect the radio antenna cable adaptor to the radio.



## Step 3

Connect the radio cable to the adaptor.



CHAPTER

6

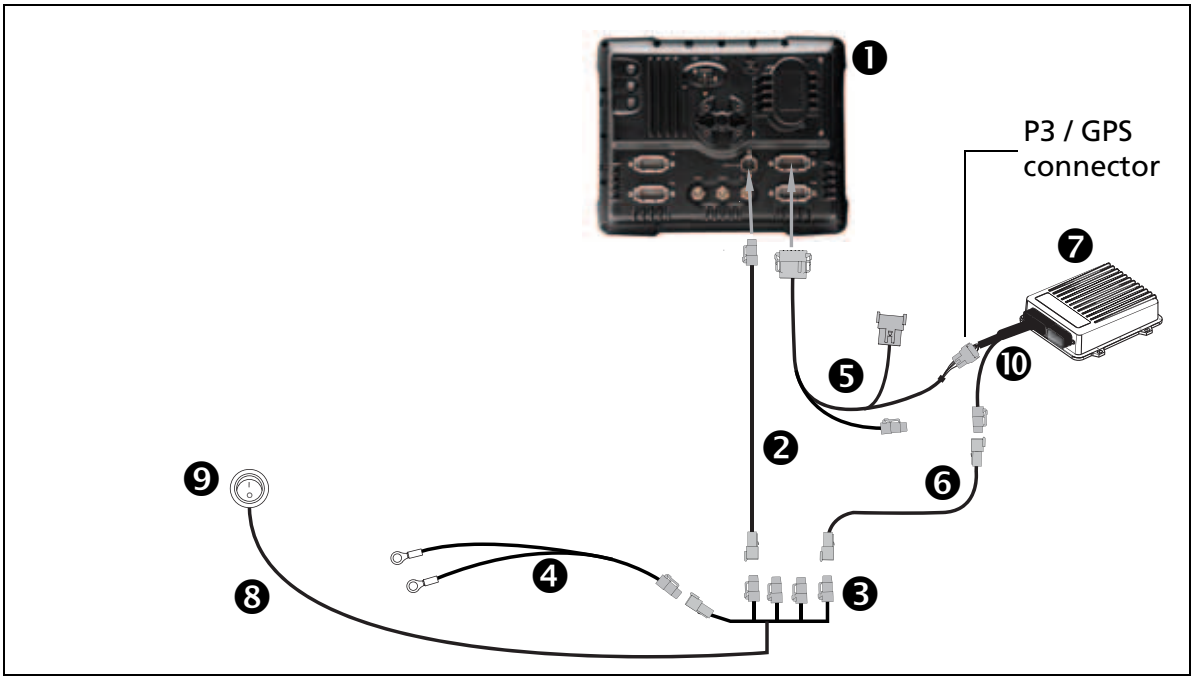
# Power Harness Installation

**In this chapter:**


- FmX integrated display components
- EZ-Guide 500 lightbar components
- Installing the power harness for the FmX integrated display
- Configuring the power bus options for the FmX integrated display
- Configuring the power bus options for the EZ-Guide 500 lightbar

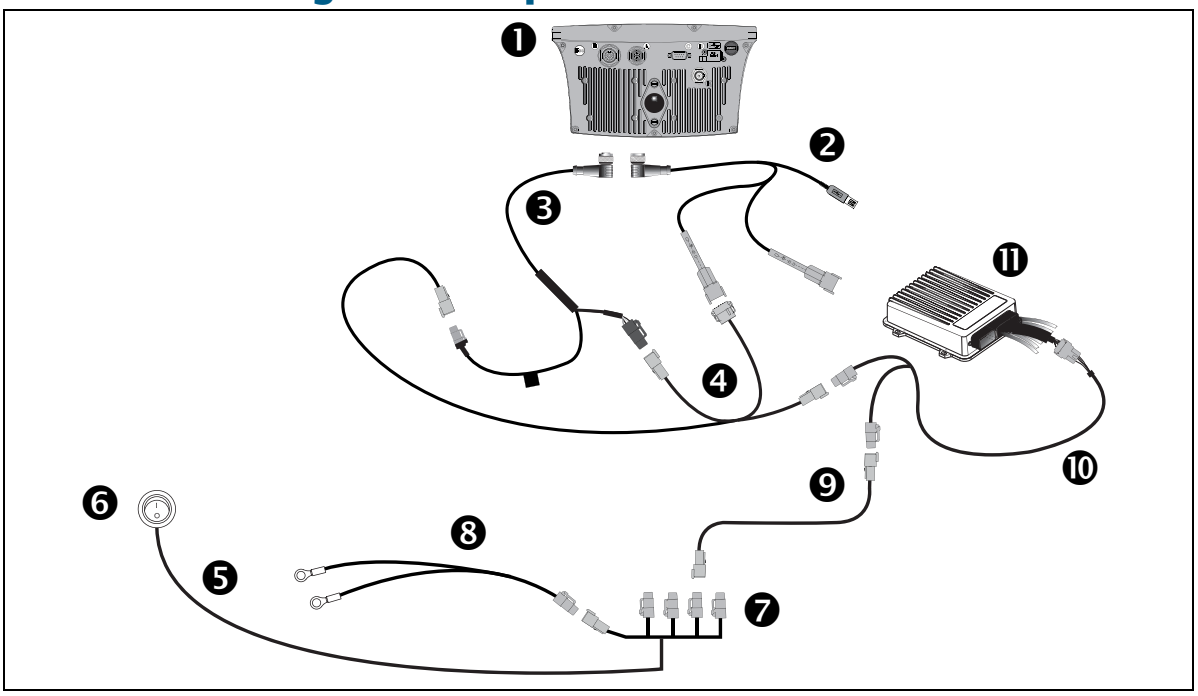

This chapter describes how to install the power harness in the vehicle.

## FmX integrated display components




| Item | Trimble Part No. | Description |
|---|---|---|
| ❶ | 93100-02 | FmX integrated display |
| ❷ | 66694 | FmX power cable |
| ❸ | 67259 | FmX power cable with relay and switch (power bus) |
| ❹ | 67258 | Basic power cable |
| ❺ | 65522 | FmX to NavController II cable with port replicator |
| ❻ | 67095 | 2 pin DTM to 2 pin DT power adaptor |
| ❼ | 55563-00 | NavController II |
| ❽ | Part of P/N 67259 | External switch cable incl with kit |
| ❾ | Part of P/N 67259 | External switch incl with kit |
| ❿ | 54601 | Main NavController II cable |

## EZ-Guide 500 lightbar components




| Item | Trimble Part No. | Description |
|---|---|---|
| ❶ | | *Ag*GPS EZ-Guide 500 lightbar |
| ❷ | 62069 | *Ag*GPS EZ-Guide 500 lightbar 19 pin port expansion cable (P/N 62069) |
| ❸ | 62817 | *Ag*GPS EZ-Guide 500 lightbar/CAN 90° 5 pin connector (P/N 62817) |
| ❹ | 62754 | *Ag*GPS EZ-Guide 500 lightbar port A to NavController II cable (P/N 62754) |
| ❺ | Part of P/N 67259 | Switch cable (included with P/N 67259) |
| ❻ | 67095 | Switch |
| ❼ | 67259 | FmX power cable with relay and switch |
| ❽ | 67258 | FmX basic power cable |
| ❾ | 67095 | 2 pin DTM to 2 pin 2 DT power adaptor |
| ❿ | 54601 | NavController II main cable |
| ⓫ | 55563-00 | NavController II |

# Installing the power harness for the FmX integrated display

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

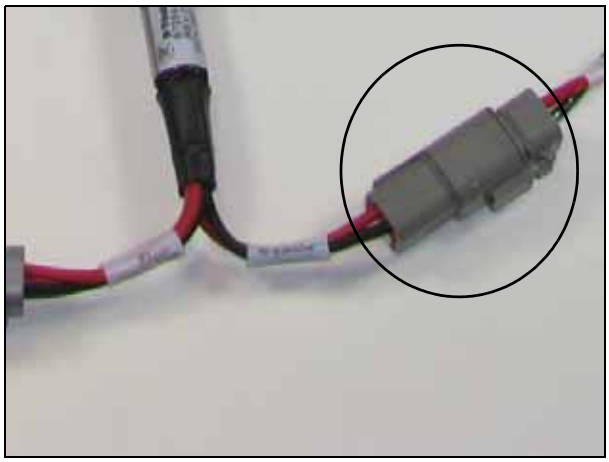
## Step 1

Connect the basic power cable to the vehicle battery and then route the cable into the cab.



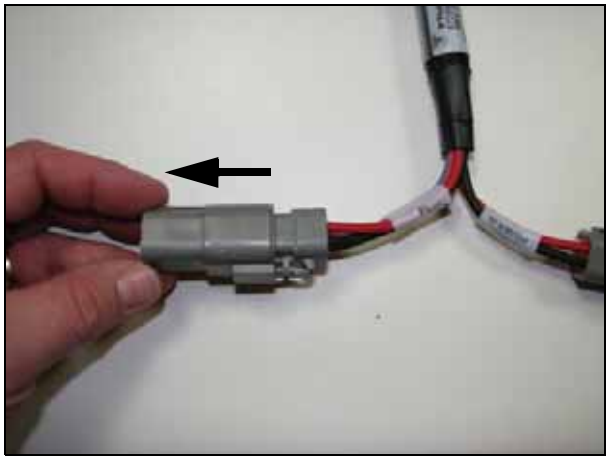
## Step 2

Locate and connect the 4-pin Deutsch DTP receptacle on the power bus to the 4-pin Deutsch DTP plug on the basic power cable.



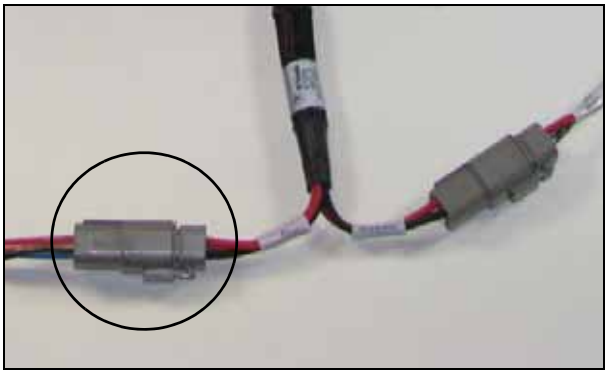
## Step 3

Remove the protective receptacle from the power bus.



## Step 4

Locate and connect the 4-pin Deutsch DTP receptacle on the FmX integrated display power adaptor to the 4-pin Deutsch DTP plug on the power bus.



## Step 5

Route the FmX integrated display power adaptor to the display mounting location and then connect it to the display.



# Configuring the power bus options for the FmX integrated display

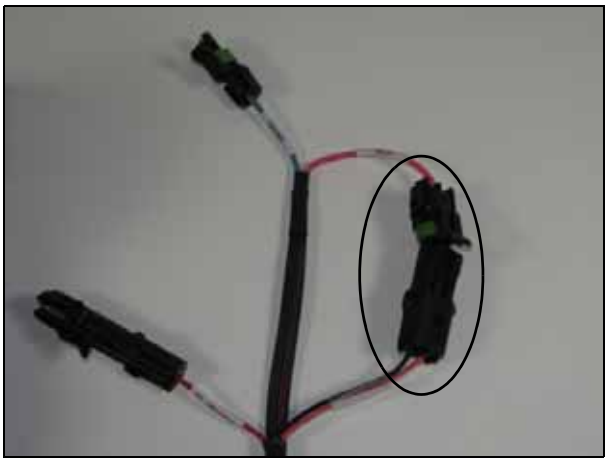
**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

When you use the power bus cable, use one of the following configuration methods to turn on the Autopilot system:

- FmX integrated display power button is used to turn on the Autopilot system
- External switch is used to turn on the Autopilot system
- Ignition is used to turn on the Autopilot system

## FmX integrated display power button is used to turn on the Autopilot system

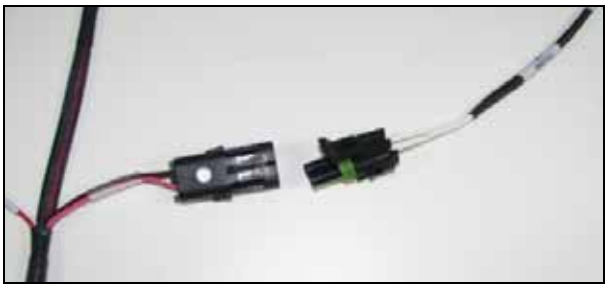
Connect the 2 pin connectors labeled R2 and P2 on the power bus.



## External switch is used to turn on the Autopilot system

### Step 1

Connect the cable labeled R7 switch (included with the power bus) to connector labeled P2 on the power bus.



### Step 2

Route the cable labeled R7 to a switch location.

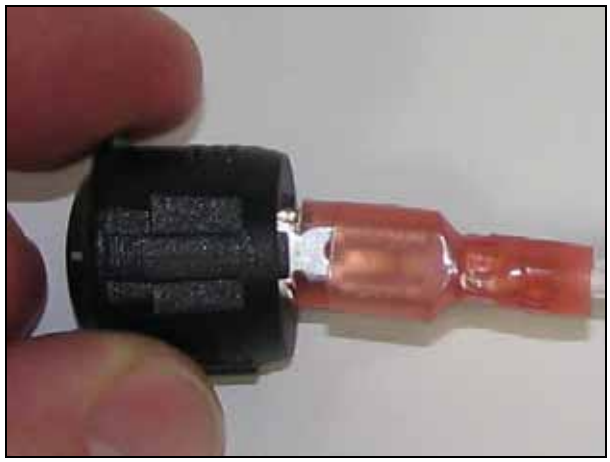
***Note –*** *To install the switch provided, drill a ¾" hole.*



### Step 3

Connect the cable labeled R7 to the switch pins.

***Note –*** *Polarity is not important.*



## Installing the optional illuminated full or standard Euro switch

### Step 1

Find an available knockout location on the vehicle console.

***Note –*** *An alternative location is required for the switch provided.*

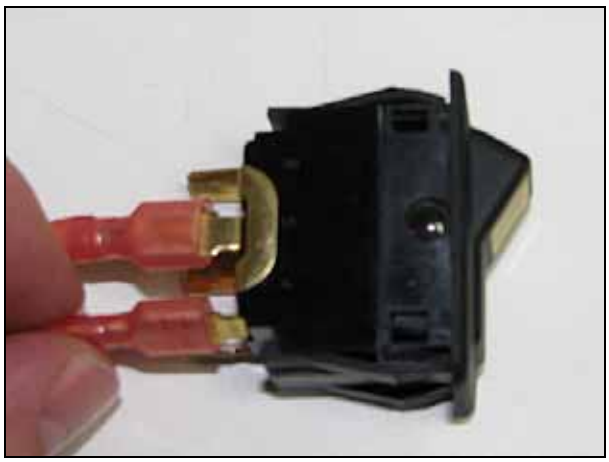


### Step 2

Route the cable labeled R7 to the switch location and then connect the cable to the illuminated switch.

Connect the wire labelled S1 to pin 5 on the switch and then connect the wire labelled S2 to pin 4 on the switch.

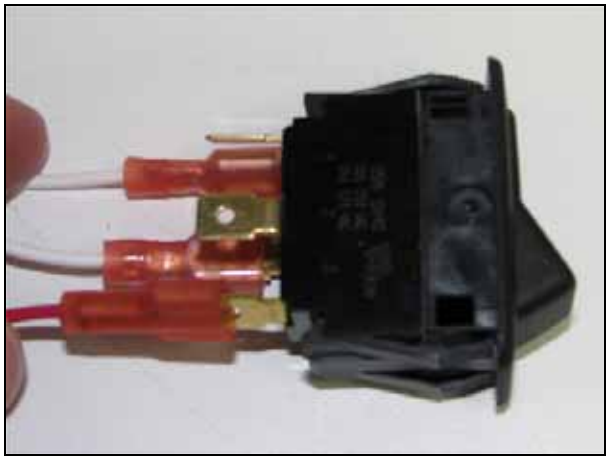
***Note –*** *Polarity is important.*



### Step 3

Connect a separate wire to pin 3 on the switch using a spade connector. Route the wire and then connect it to the vehicle switched power.

***Note –*** *This additional wire is required to allow the switch to illuminate.*

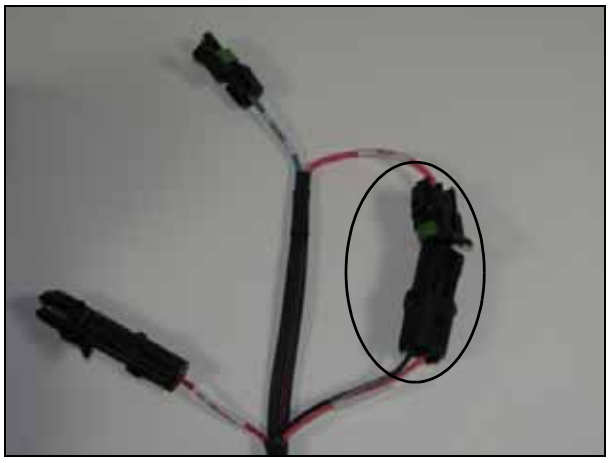


## Ignition is used to turn on the Autopilot system

***Note –*** *For more information on how to use the ignition sensing option, see the FmX Integrated Display User Guide.*

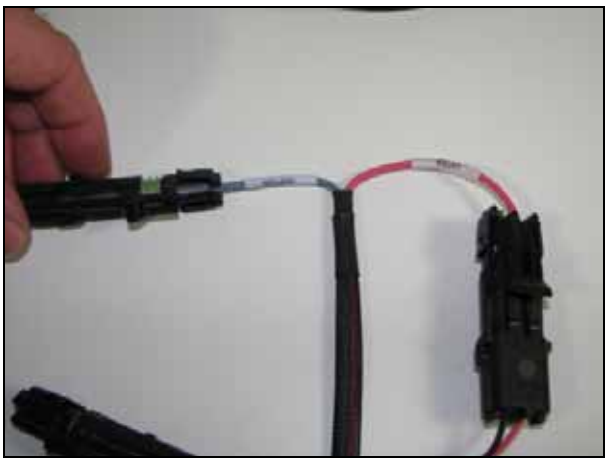
### Step 1

Connect the 2-pin connectors labeled R2 and P2 on the power bus.



## Step 2

Connect the cable labeled R8 Ignition (included with the power bus) to connector P3 Ignition on the power bus.

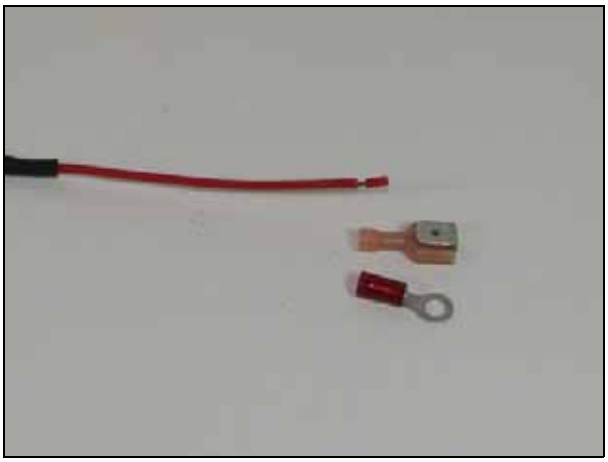


## Step 3

Route the cable to the vehicles ignition.

## Step 4

Connect the red ignition sense wire to the vehicle ignition using the spade or ring terminal provided.



# Configuring the power bus options for the EZ-Guide 500 lightbar

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

***Note –*** *For the AgGPS EZ-Guide 500 lightbar cable install ation instructions see,* *EZ-Guide 500 lightbar components, page 87*

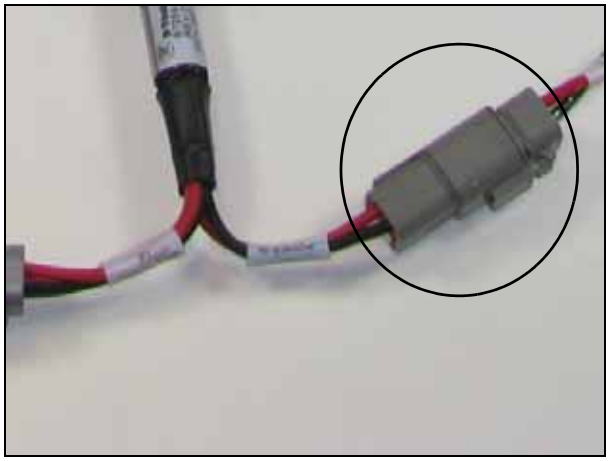
## Step 1

Locate and connect the basic power cable to the vehicle battery and then route the cable into the cab.



## Step 2

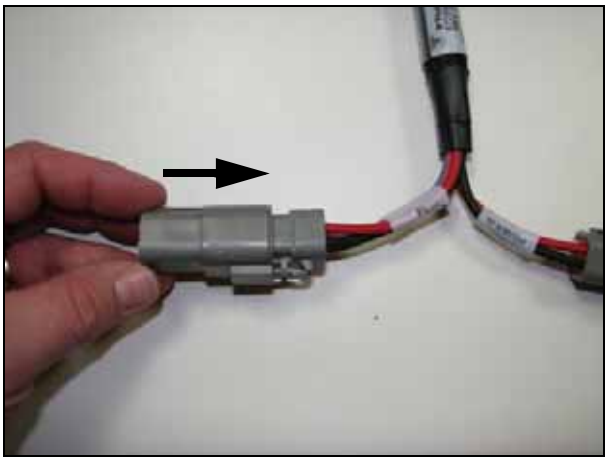
Locate and connect the 4-pin Deutsch DTP receptacle on the power bus to the 4-pin Deutsch DTP plug on the basic power cable.



## Step 3

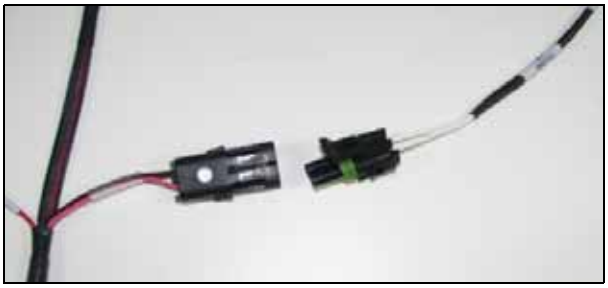
Verify that the protective receptacle is installed on the power bus.

***Note –*** *Damage to the system may result if the protective receptacle is not in place.*



## Step 4

Connect the cable labeled R7 switch (included with the power bus) to the connector labeled P2 on the power bus.



## Step 5

Route cable labeled R7 to a switch location.

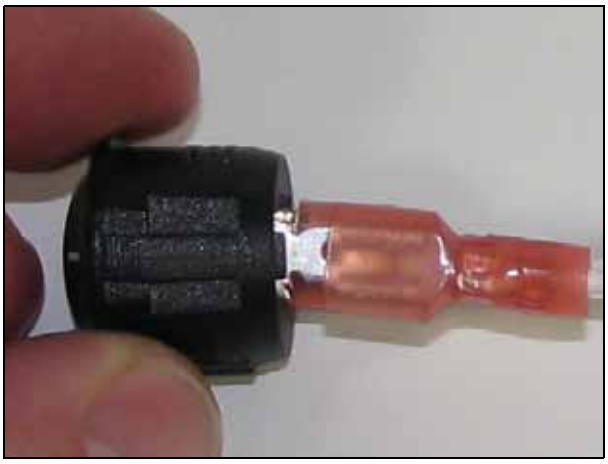
***Note –*** *To install the switch provided, drill a ¾" hole.*



### Step 6

Connect cable labeled R7 to the switch pins

***Note –*** *Polarity is not important.*



## Installing the optional illuminated full or standard Euro switch

### Step 1

Find an available knockout location on the vehicle console.

***Note –*** *An alternative location is required for the switch provided.*

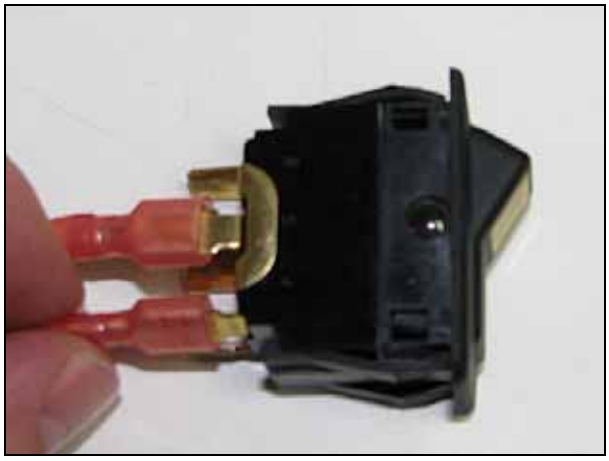


### Step 2

Route the cable labeled R7 to the switch location and then connect the cable to the illuminated switch.

Connect the wire labelled S1 to pin 5 on the switch and then connect the wire labelled S2 to pin 4 on the switch.

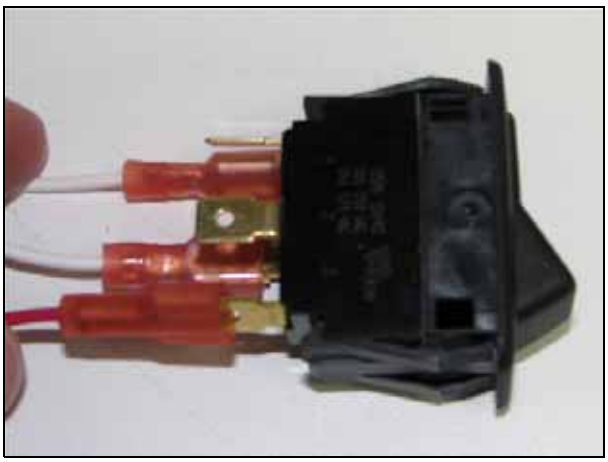
***Note –*** *Polarity is important.*



## Step 3

Connect a separate wire to pin 3 on the switch using a spade connector. Route the wire and then connect it to the vehicles switched power.

***Note –*** *This additional wire is required to allow the switch to illuminate.*



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.

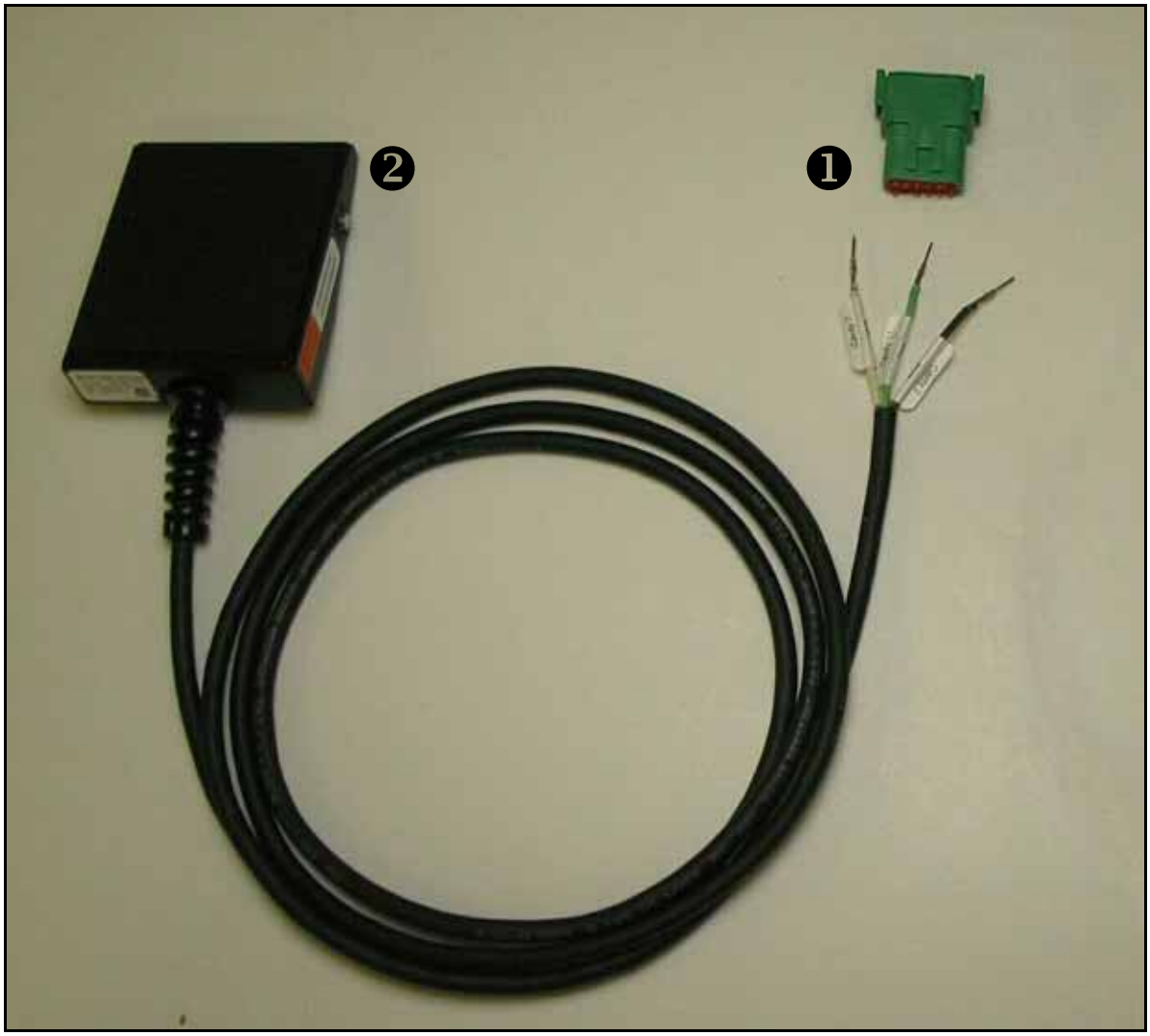
## Remote Engage Switch Components: Rocker Switch




| Item | Description | Trimble part number |
|---|---|---|
| 1 | DTM receptacle | |
| 2 | Remote engage rocker switch | |

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

## Remote Engage Switch Components: Foot Switch

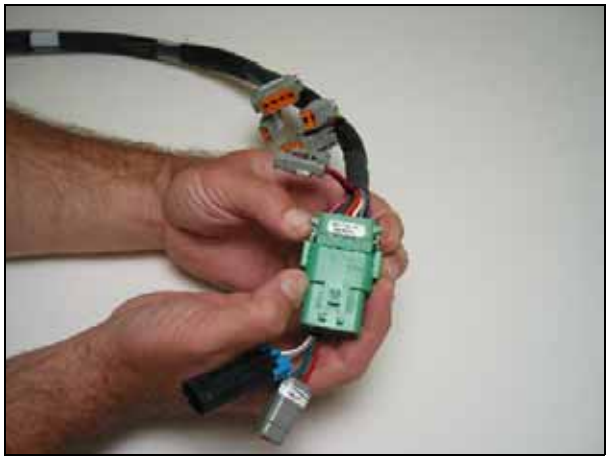



| Item | Description | Trimble part number |
|---|---|---|
| ❶ | DTM receptacle | |
| ❷ | Remote engage foot switch | |

# Prepare the Remote Engage Cable

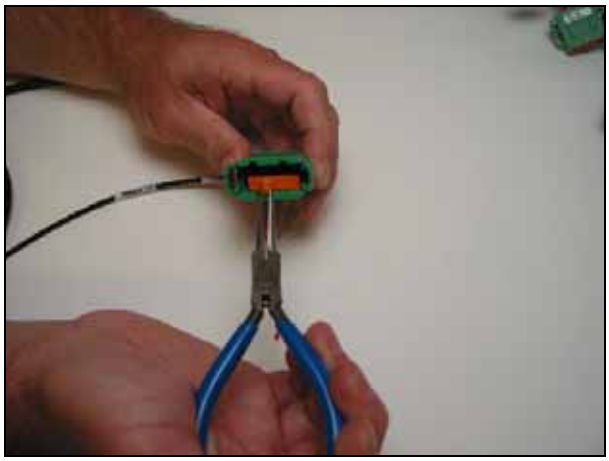
## Step 1

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



## Step 2

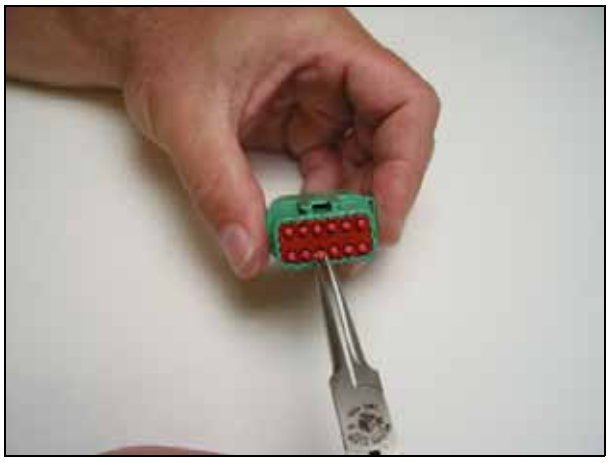
Remove the wedge from the connector.



## Step 3

***Rocker switch only***

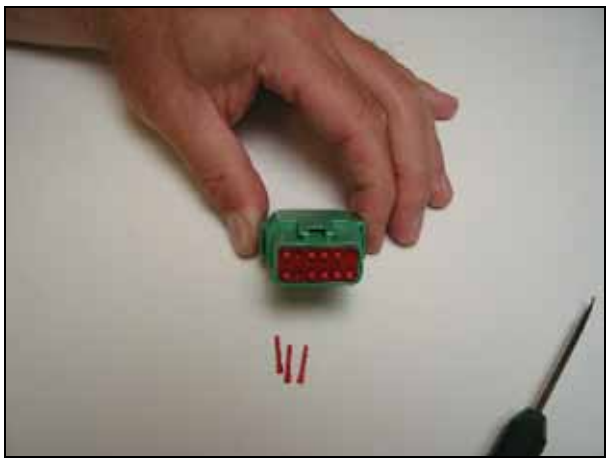
Remove the plugs from cavity 2 and 7.



## Step 4

***Foot Switch Only***

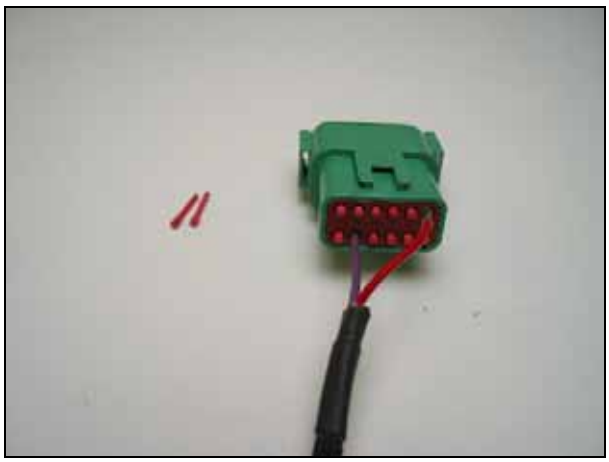
Remove the plugs from cavity 2, 7, and 11.



## Step 5

***Rocker Switch Only***

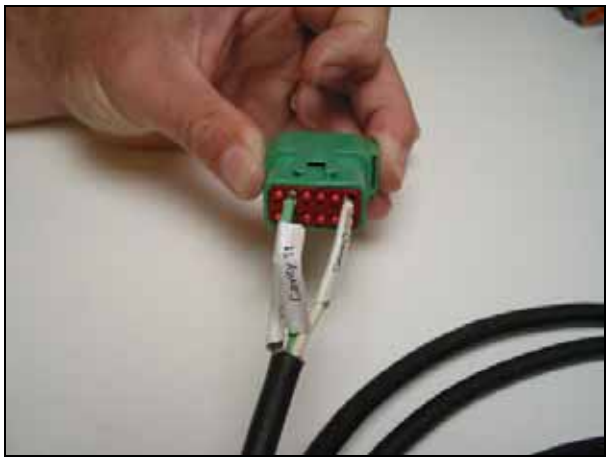
Insert the DTM pins into cavity 2 and 7 according to the labels on the wires.



## Step 6

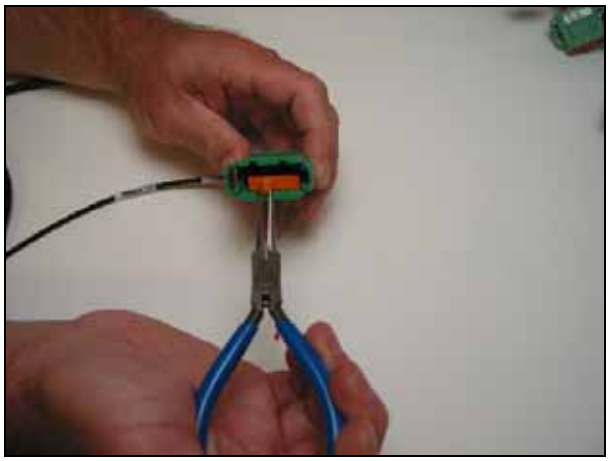
***Foot Switch Only***

Insert the DTM pins into cavity 2, 7, and 11 according to the labels on the wires.



## Step 7

Pull on the wires to seat them in place. Replace the wedge in the connector.



## Step 8

***Rocker Switch Only***

Run the spade ends of the cable to a knockout location in the operator console.



## Step 9

***Foot Switch Only***

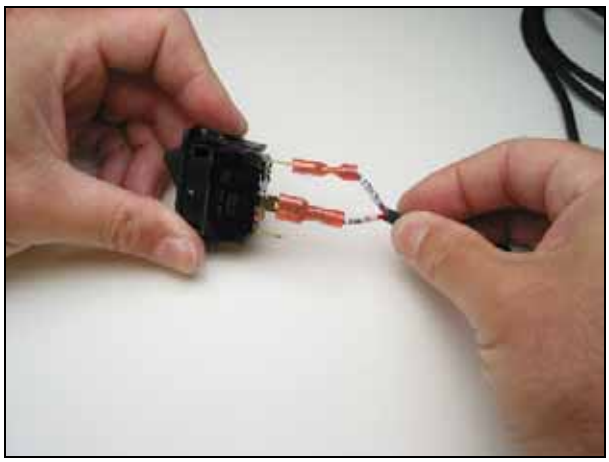
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



### Step 10

***Rocker Switch Only***

Connect the wires to the switch matching the print on the switch body and labels on the wires.



### Step 11

***Rocker Switch Only***

Place the switch in the console.



## Using the Remote Engage Switch

### Step 1

Hold the switch down for at least 0.5 seconds.

***Note –*** *Holding the switch shorter than 0.5 seconds will not engage the system.*

### Step 2

Release the switch between 0.5 and 4.0 seconds. The vehicle will engage when the switch is released.

CHAPTER

8

# Controller Installation

**In this chapter:**


- Controller Installation
- Controller Connections


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

# Controller Installation

## Step 1

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



## Step 2

Remove the plastic insert and the foam pad.



## Step 3

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



## Step 4

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



## Step 5

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



## Step 6

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



## Step 7

Drill four holes at the positions marked in Step 5. Prior to drilling verify no wires or hoses are underneath the floor in the way of the drilled holes. Drill the holes to match the 10-32 x 1" fasteners supplied.



## Step 8

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



## Step 9

Insert the four 10-32 x 1" fasteners and secure controller to floor. Verify the controller is square and parallel to the steel walls of the compartment.



## Step 10

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



## Step 11

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

***Note –*** *Cable connectors are labeled for proper connection.*

***Note –*** *On later models, the cables may be routed through an access hole in the rear corner of the buddy seat cavity.*

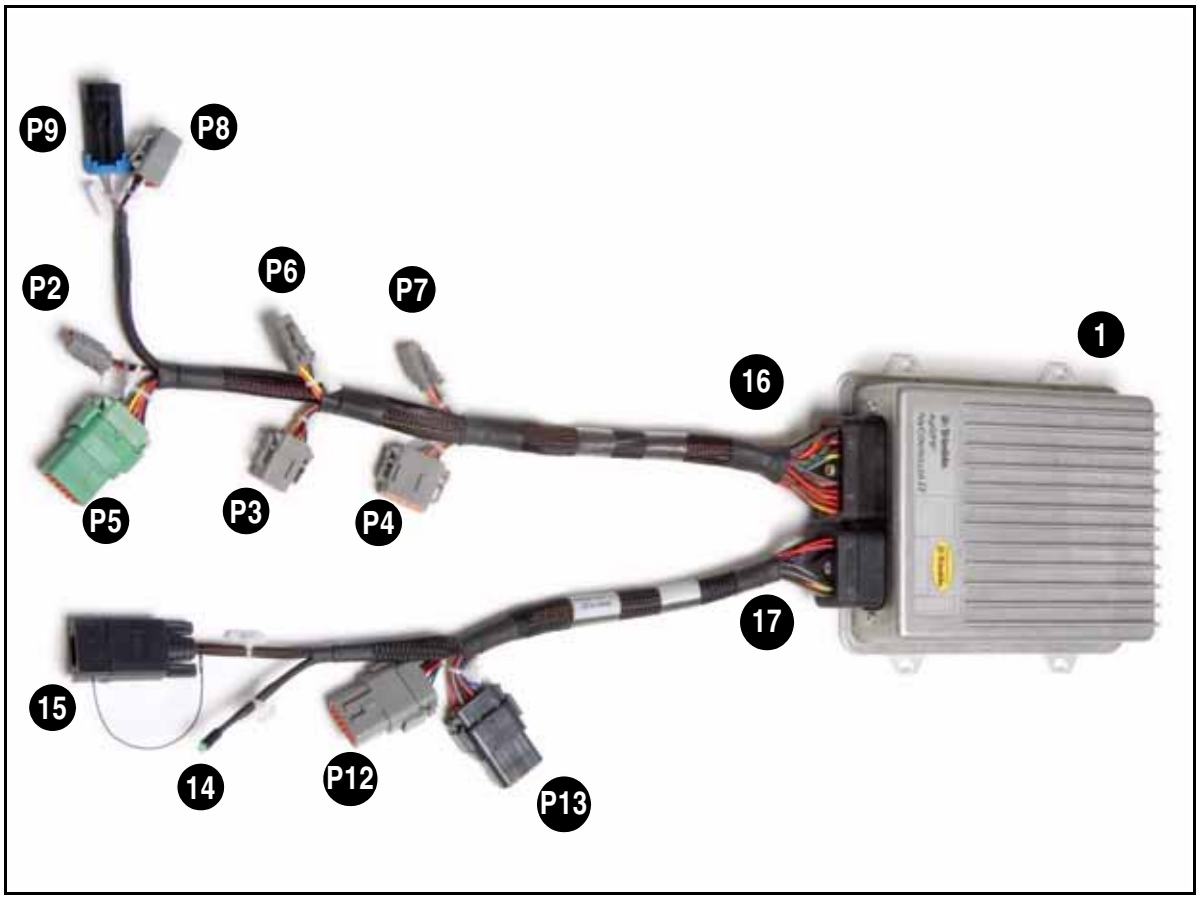


## Step 12

Secure cables with tie wraps and reinstall plastic insert.



## Controller Connections



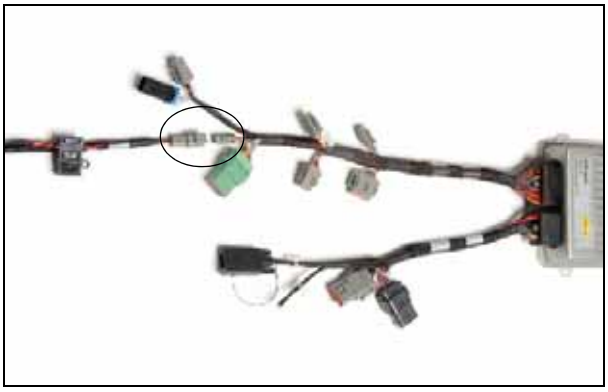

| Item | Description |
|---|---|
| 1 | NavController II controller |
| P2 | Power connector |
| P3 | GPS connector |
| P4 | Display connector |
| P5 | Vehicle sensors connector |
| P6 | Steering sensor connector |
| P7 | Manual override connector |
| P8 | Hydraulic valve connector |

| 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

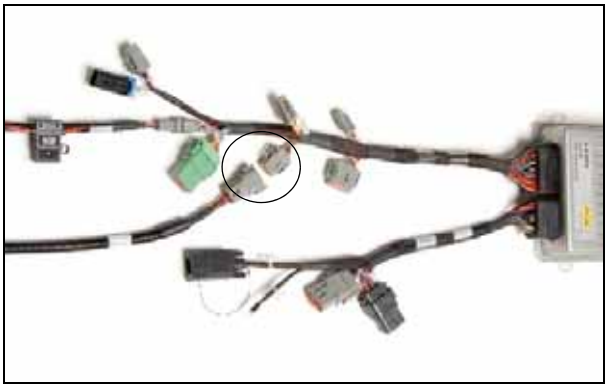
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



## Step 2

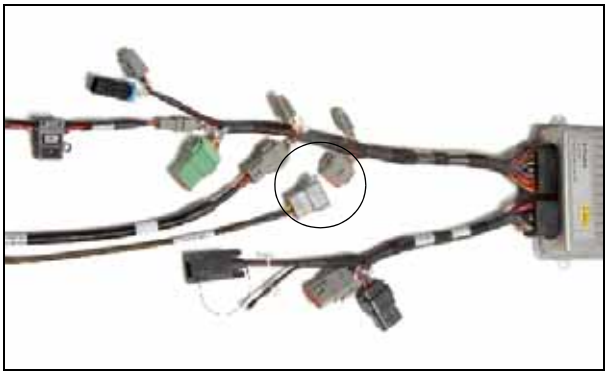
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



## Step 3

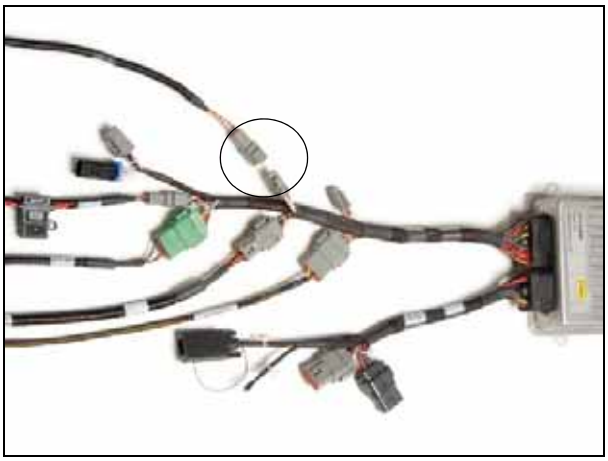
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



## Step 4

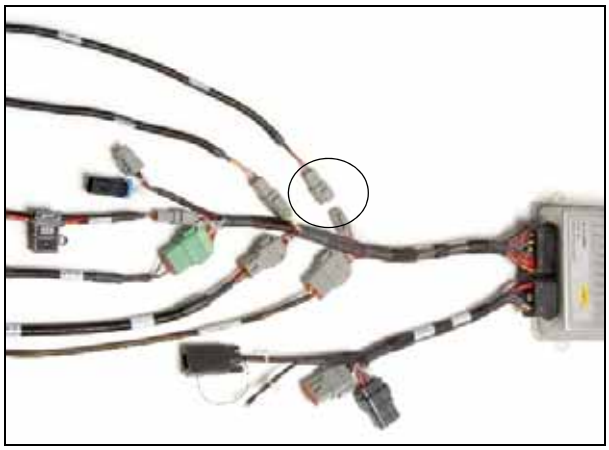
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



## Step 5

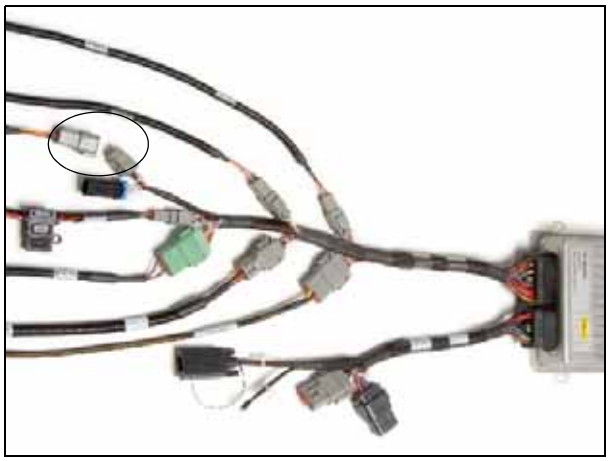
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



## Step 6

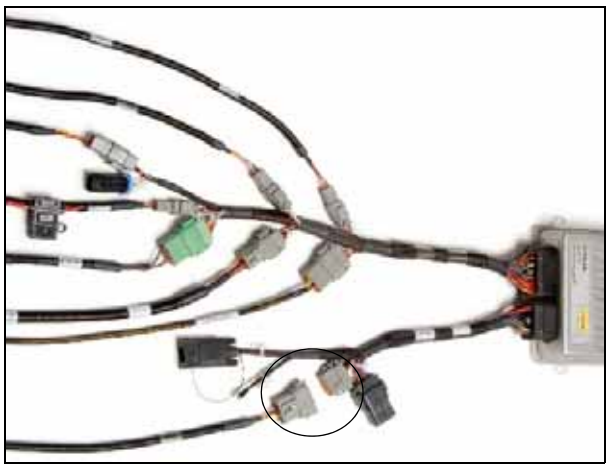
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



## Step 7

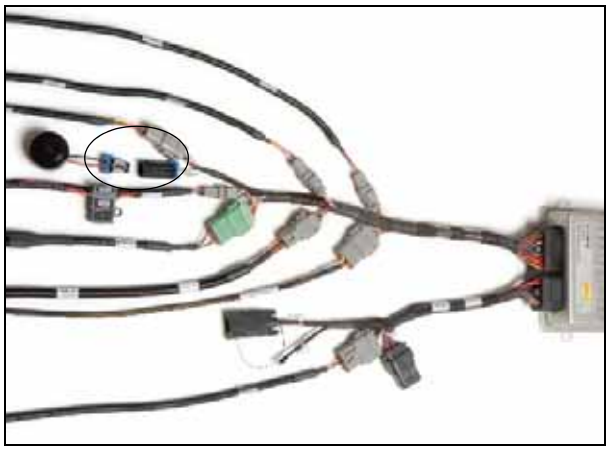
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



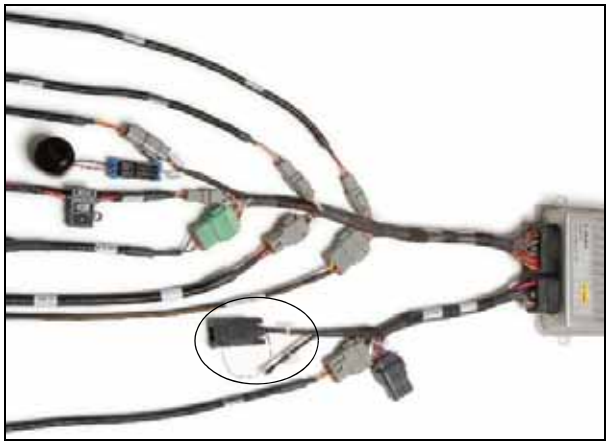
## Step 8

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

**WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

## Step 1

Connect the battery.

## Step 2

Start the machine and check for hydraulic leaks. Correct as needed.

## Step 3

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

## Step 4

Connect and run the *Ag*GPS Autopilot Toolbox II software for system setup and calibration. For more information, refer to the *Ag*GPS *Autopilot Toolbox II Software User Guide*.