INSTALLATION INSTRUCTIONS

Autopilot™ Automated Steering System

Ag Chem Terragator

- **6103**
- **6203**
- **6303**
- **8103**
- **8104**
- **8144**
- **8203**
- **8204**
- **8244**
- **8303**
- **9103**
- **9105**
- **9203**
- **9205**

Version 4.00
Revision A
December 2010
Part Number 54037-44-E04

Trimble

Agriculture Business Area

Trimble Agriculture Division
10355 Westmoor Drive
Suite #100
Westminster, CO 80021
USA
(877) 447-7785 (US toll free)
+1-408-856-6491 (International)
trimble_support@trimble.com
www.trimble.com

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This is the December 2010 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54037-44-E04. It applies to version 4.00 of the 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.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to: www.trimble.com/ev.shtml



Recycling in Europe: To recycle Trimble WEEE, Call

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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

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

This manual describes how to install the Trimble® 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 & Training** link at the top of the screen, select *Support* and then select *Support A–Z list of products*.
3. Scroll to the bottom of the list.
4. Click the *submit an inquiry* link. A form appears.
5. Complete the form and then click **Send**.

Your comments

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

Manual system upgrade to Autopilot

FmX integrated display

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

Required components

Kits required	Special tools
Platform kit: P/N 54037-44 Hydraulic hose kit: • Terragator 81x4, JIC P/N 63566 • Terragator 6203, 8203, 82x4, JIC P/N 63568 • Terragator 6103, 8103, 9X03, 9X05, JIC P/N 66456 • Terragator 6203, 8203, 82x4, ORS P/N 77022 • Terragator 6303, 8303, ORS P/N 82739	¾" and 1-5/8" hole saw 5/16" drill bit 5000 psi hydraulic gauge and extension hose Allen wrench set (Metric and SAE)

Antenna mounting kits

Antenna options
Antenna spar mount P/N 55348
Antenna V plate mount and *Ag*GPS 252 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the *Ag*GPS 262 receiver – see Chapter 4, Antenna/Receiver Installation).

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit **(P/N 54037-44)**	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 switch	Chapter 6
	Bolt kit controller	Chapter 8
Common parts	Controller	Chapter 8
	Controller mounting bracket	Chapter 1
	Cable kit: • Main wiring harness • Power bus auxiliary wiring harness • Sonalert alarm	Chapter 8
GPS receiver	GPS receiver	Chapter 4
	GPS antenna	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 63566, 63568, 66456, 82739, or 77027)	Hydraulic hoses	Chapter 2
	Hydraulic adaptors	Chapter 2
Roof bracket kit (P/N 55348)	Roof brackets	Chapter 4
	Bolt kit, roof bracket	Chapter 4

Preparing the vehicle for installation

Step 1

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

Step 2

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

Step 3

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

Step 4

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

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

CHAPTER

2

Hydraulic Control Valve Installation

In this chapter:

- Preparing the Autopilot manifold and hydraulic control valve
- Hydraulic control valve components: Models 9103, 9105, 9203, 9205 with JIC adapters
- Hydraulic control valve components: Models 6303 and 8303 with ORS adapters
  - Installing the adapter: Models 6303 and 8303
  - Mounting the hydraulic manifold: Models 6303 and 8303
  - Installing the hydraulic hoses: Models 6303 and 8303
- Hydraulic control valve components: Models 6203, 8203, and 82x4 with ORS adapters
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  - Mounting the hydraulic manifold: Models 6203, 8203, and 82x4
  - Installing the hydraulic hoses: Models 6203, 8203, and 82x4
- Hydraulic control valve components: Models 6203, 8203, and 82x4 with JIC adapters
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  - Installing the adapter: Models 6103, 8103, 9103, 9105, 9203, and 9205
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  - Installing the hydraulic hoses: Models: 6103, 8103, 9103, 9105, 9203, and 9205
- Hydraulic control valve components: Models: 81x4 with JIC
  - Installing the adapter: Model 81x4
  - Mounting the hydraulic manifold: Models 81x4
  - Installing the hydraulic hoses: 81x4 models

This chapter describes the configuration and installation of the valve, manifold, and hydraulic hose kit.

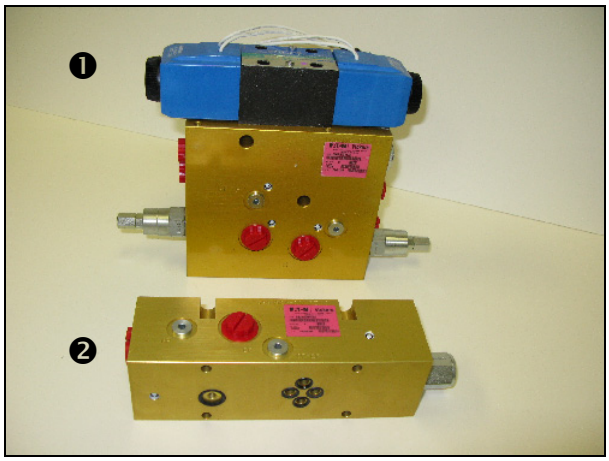
Preparing the Autopilot manifold and hydraulic control valve

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 – *Place the components on a clean work surface and make sure that they remain very clean: Any small particles introduced into the system can cause an obstruction.*

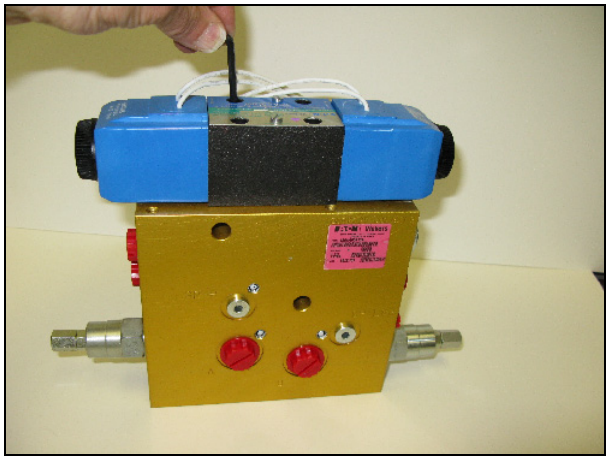
Step 1

Locate the main manifold ❶ and the bypass sandwich block ❷.



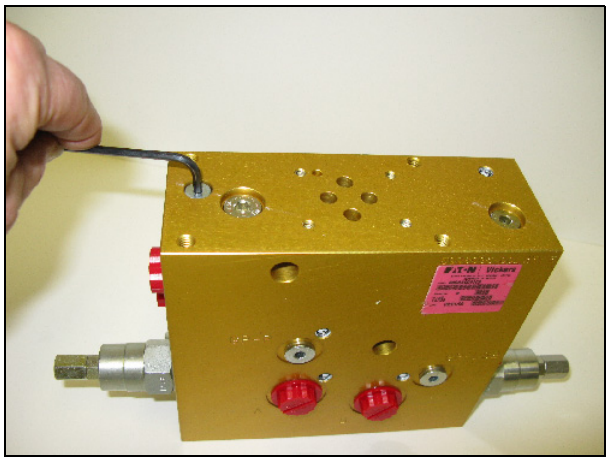
Step 2

Remove the four bolts and then detach the valve from the manifold.



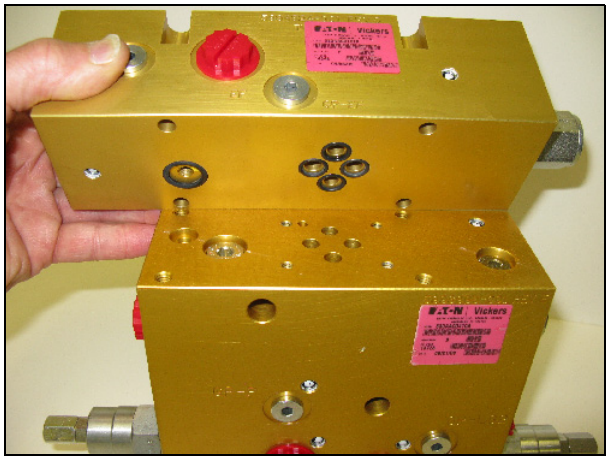
Step 3

Remove the -2 O-ring plug, as shown.



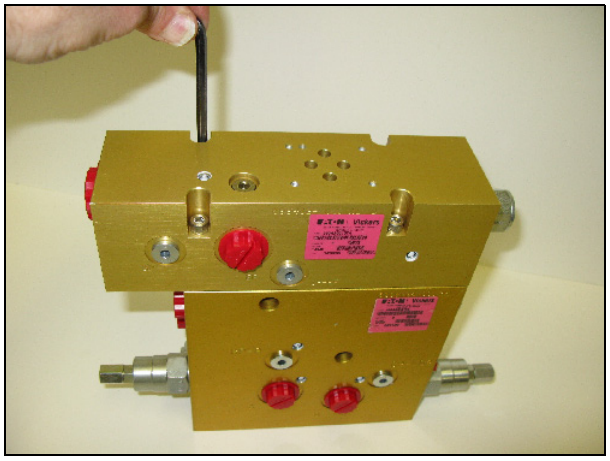
Step 4

Place the sandwich valve so that the port at the left end aligns with the port from Step 3. Make sure that the o-rings on the sandwich block are correctly seated.



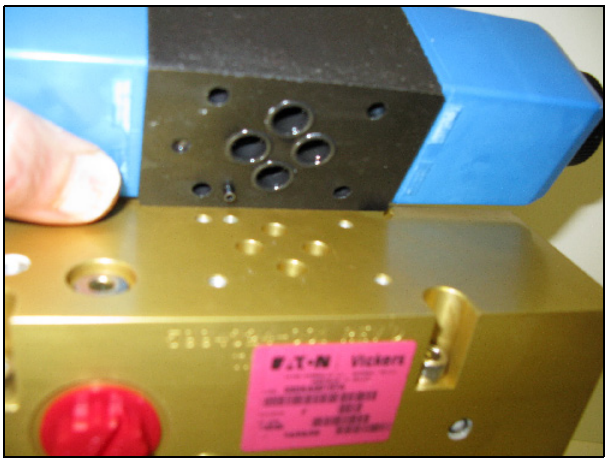
Step 5

Use the four ¼" x 2¼" long socket head cap screws to bolt the sandwich valve to the manifold.



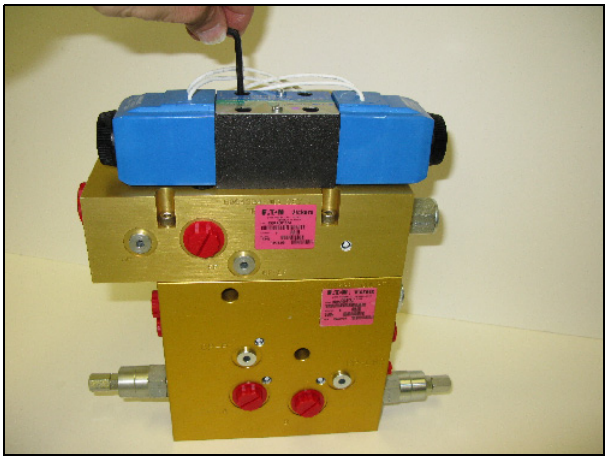
Step 6

Attach the valve to the sandwich block by aligning the pin guide. Make sure that that the four o-rings are seated correct



Step 7

Use the original four socket head cap screws to tighten the valve.



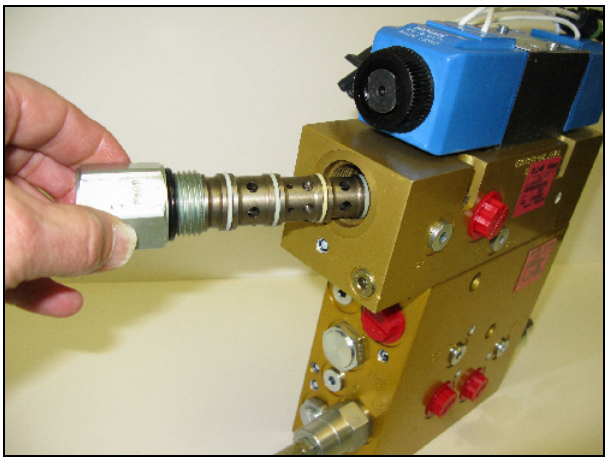
Step 8

Locate the bypass valve. It is labeled **PFRD-12-U-0-000-110-00**.



Step 9

Insert the bypass valve into the port on the sandwich valve.



Step 10

Locate the cavity plug stamped **2186484**, **C- 10-3S**, or **CPLG-10-N-25-0L2**.



2186484 or C-10-3S

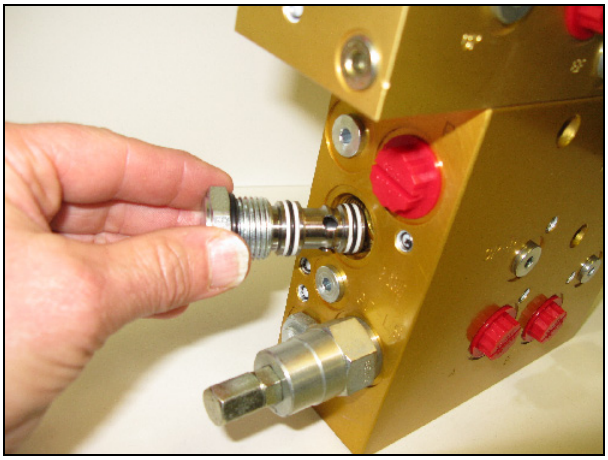
Note **–** The cartridges function identically.



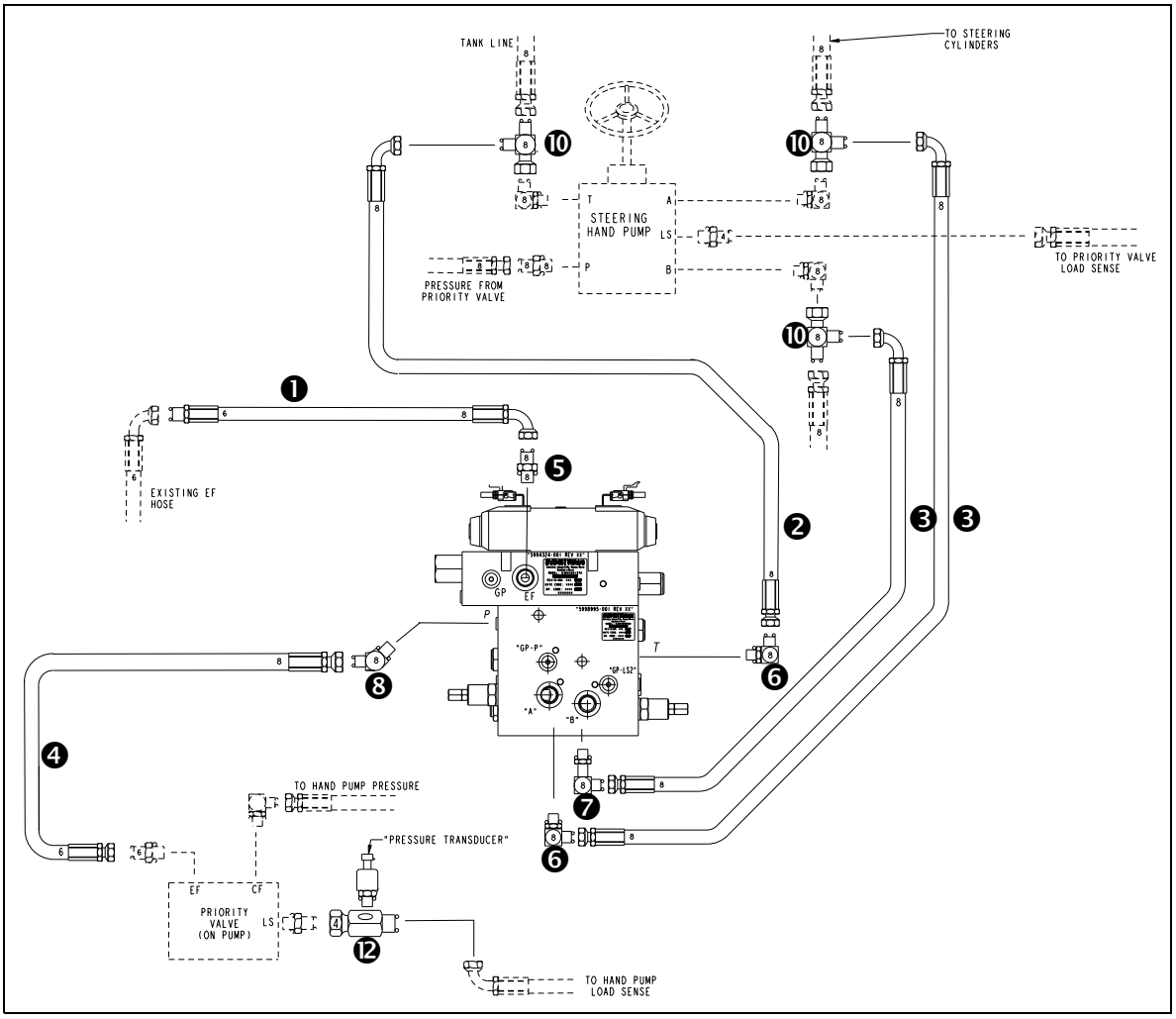
CPLG-10-N-25-012

Step 11

Insert the cavity plug into the pressure compensation port labeled **P COMP**.



Hydraulic control valve components: Models 6303 and 8303 with ORS adapters



Item	Description	Part number
❶	80 inch hose	F451TCJOJ9-06-08-06-80
❷	50 inch hose	F451TCJSJ9-08-08-08-50
❸	60 inch hose (x2)	F451TCJSJ9-08-08-08-60
❹	75 inch hose	F451TCJSJS-06-08-08-75
❺	Fitting	8 F5OLO-S

Item	Description	Part number
❻	Fitting (x2)	8 C50LO-S
❼	Fitting	8 CC50LO-S
❽	Fitting	8 V50LO-S
❿	Fitting (x3)	8 R6LO-S
⓬	Fitting	4-4 LOHL6GP5TP

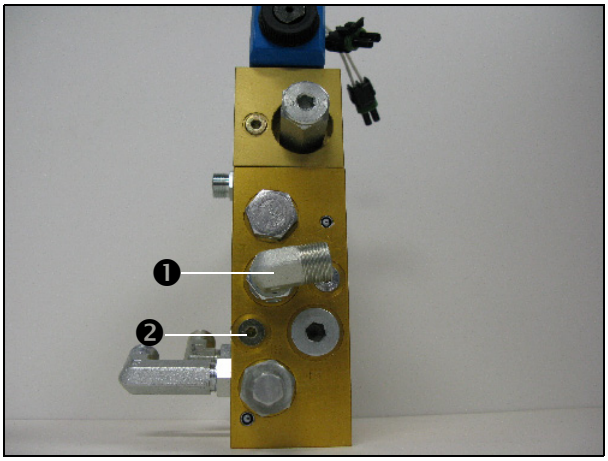
Note – *Part numbers are Parker numbers and are for reference only*

Installing the adapter: Models 6303 and 8303

Step 1

Install the following fittings:

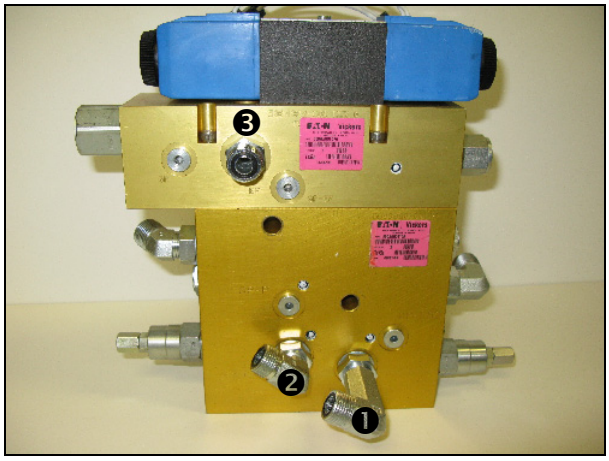
- ❶ -8 ORS 90° x -8 ORB in the T port
- ❷ -4 ORB plug in the LS2 port



Step 2

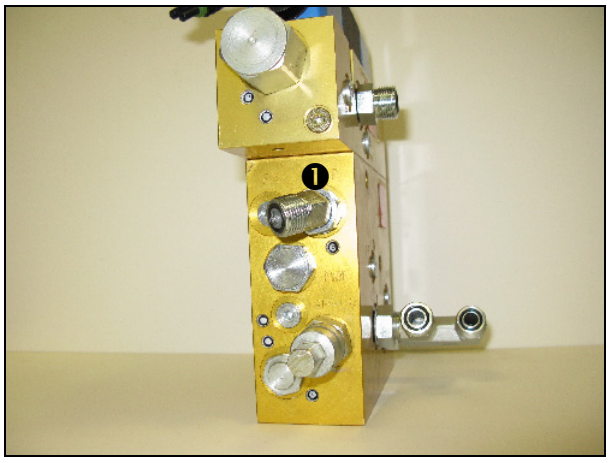
Install the following fittings:

- ❶ -8 ORS ext. 90° x -8 ORB into the B port
- ❷ -8 ORS 90° x -8 ORB into the A port
- ❸ -8 ORS x -8 ORB into the EF port



Step 3

❶ Insert a -8 ORS 45° x -8 ORB fitting into the P port.



Mounting the hydraulic manifold: Models 6303 and 8303

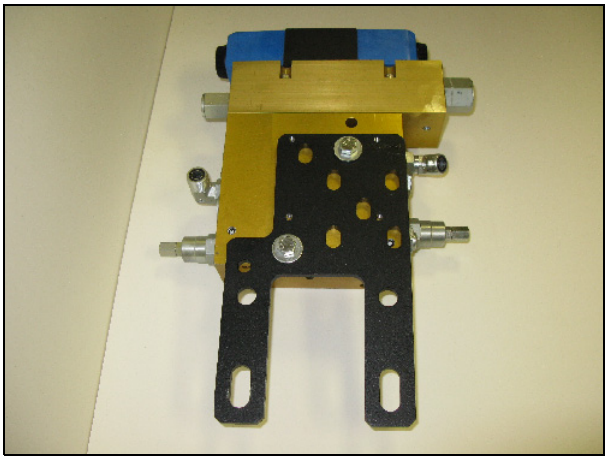
Step 1

Locate the hydraulic mounting bracket and bolt kit.



Step 2

Bolt the hydraulic manifold to the bracket as shown using the blind tapped holes in the manifold and 3/8" x 1" long cap screws and lock washers. Use the slots in the bracket to adjust the height of the valve.



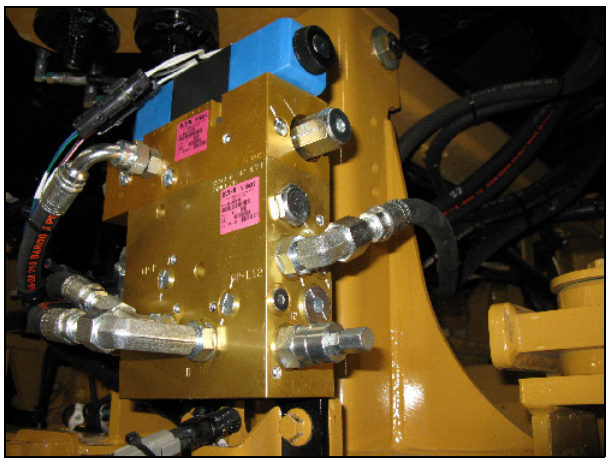
Step 3

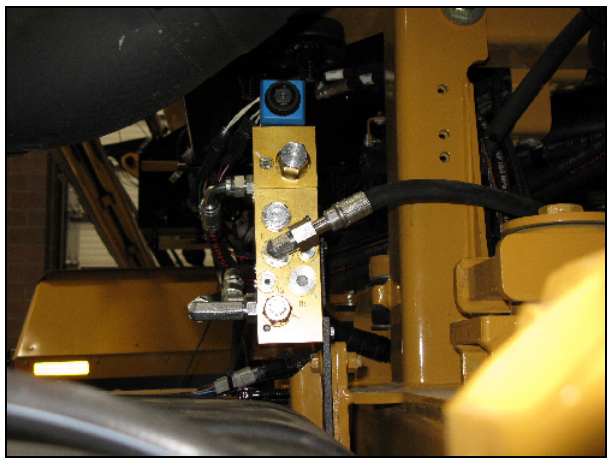
Locate the U-shaped frame rail under the right front corner of the cab.



Step 4

Bolt the bracket to the frame using the existing bolts as shown.





Installing the hydraulic hoses: Models 6303 and 8303

Step 1

Remove the rear portion of the hood to access the hand pump.

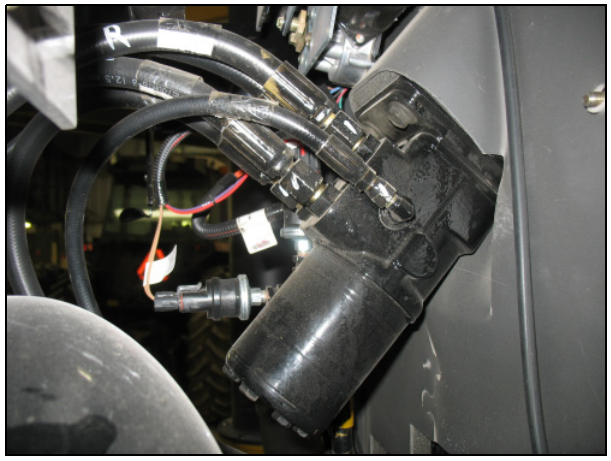


Step 2

This view shows the steering valve from the left of the vehicle.

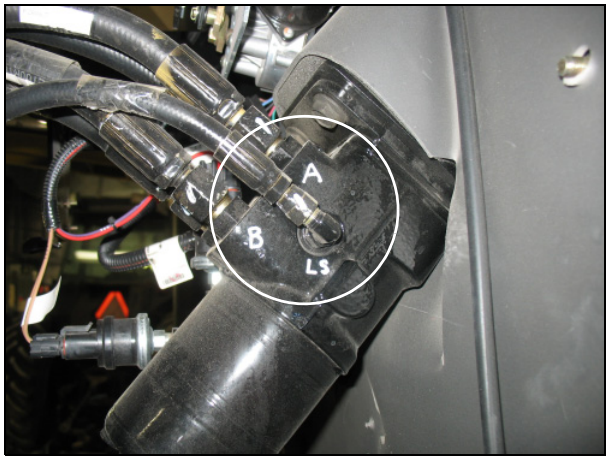
The steering hand pump will have ports labeled:

- P: Pressure port
- T: Tank port
- L: Cylinder port L
- R: Cylinder port R



Step 3

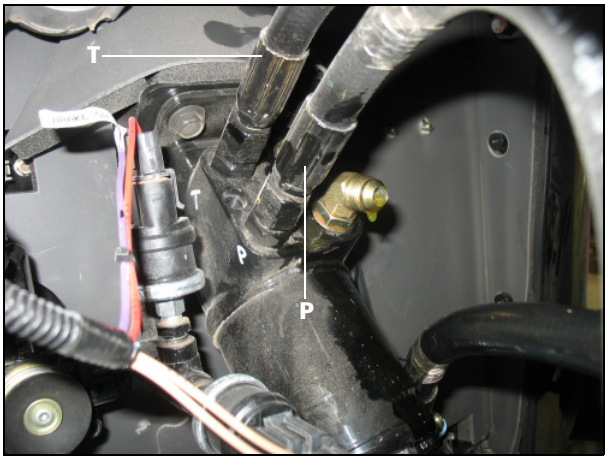
Label the upper hose “A” and the lower hose “B”. Label the small line on the side of the hand pump “LS” for load sense. Disconnect the A and B hose assemblies.



Step 4

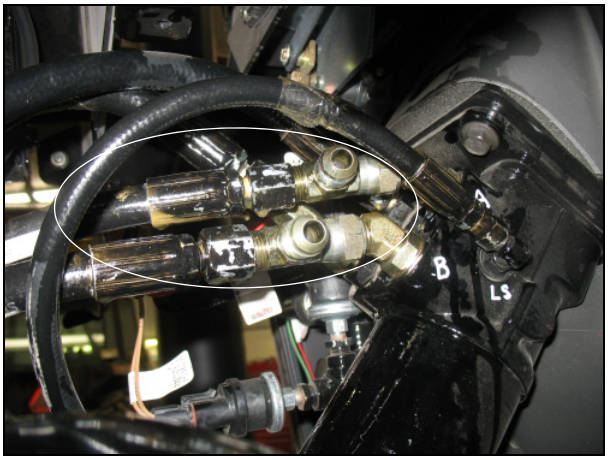
This view shows the steering valve from the right side of the vehicle.

Label the upper hose “T” and the lower hose “P”. Disconnect the “T” hose assembly.



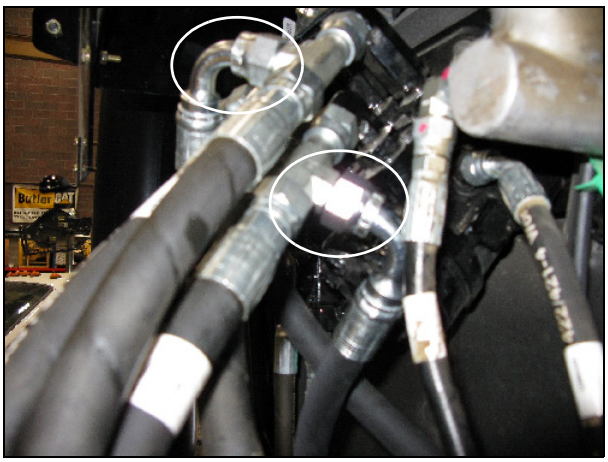
Step 5

Install -8 run tees to the A, B, and T ports and then reconnect the existing lines.



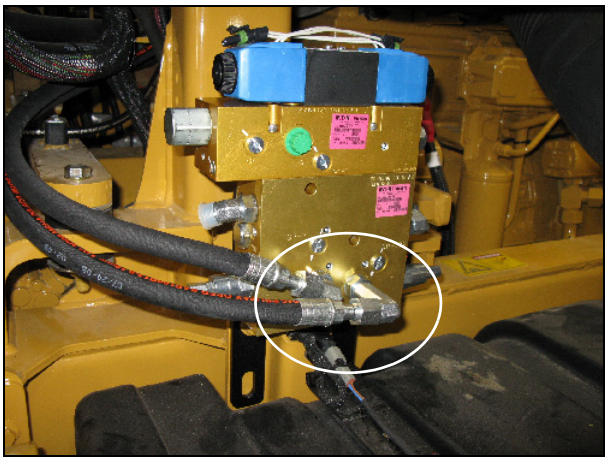
Step 6

Connect the 90° end of the 60" A hose and 60" B hose to the tees at the hand pump. Route the hoses to the Autopilot manifold.



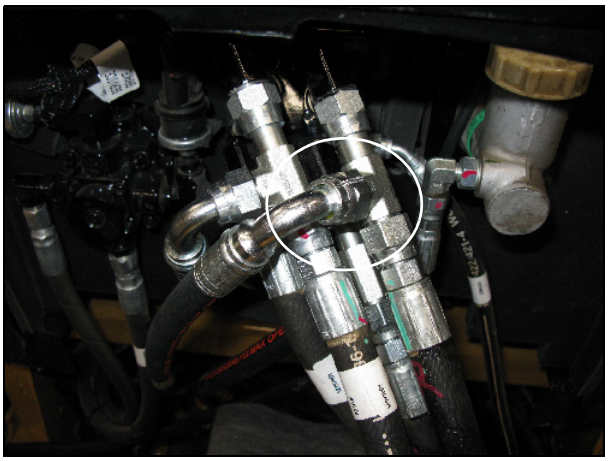
Step 7

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



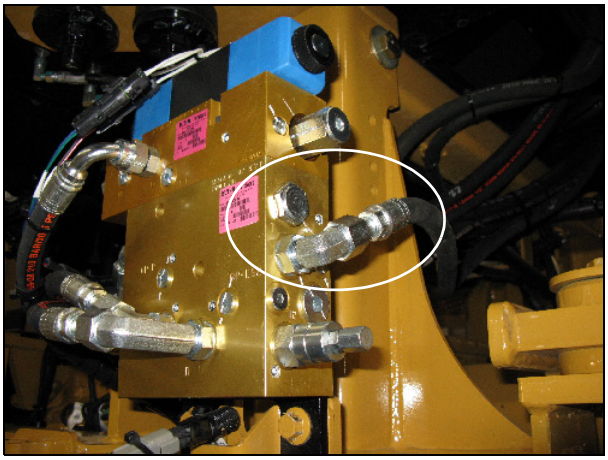
Step 8

Connect the 90° end of the 50" tank hose to the tee in the tank line. Route the line to the manifold.



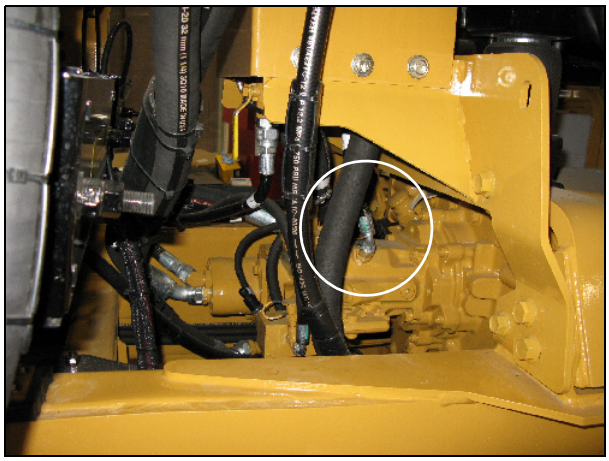
Step 9

Connect the straight end of the tank hose to the manifold.



Step 10

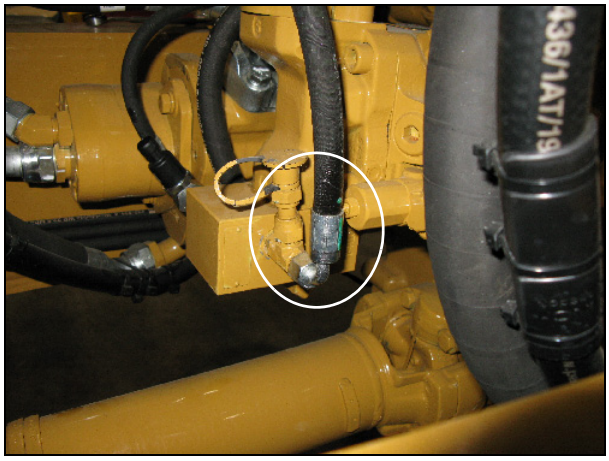
Locate the priority valve and hydraulic pump assembly under the back side of the cab.



Step 11

Identify the EF excess flow port on the right side of the priority valve.

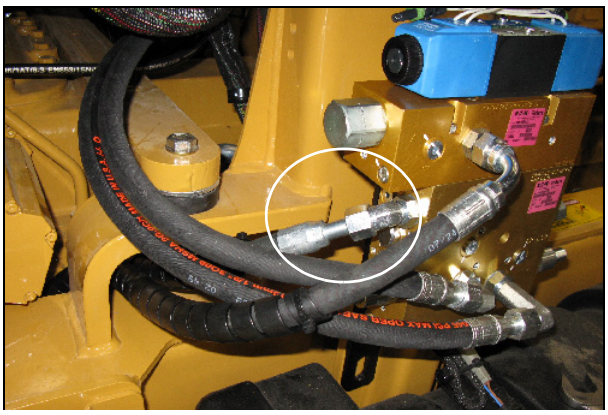
Remove the hose from the tee that has the diagnostic connector.



Step 12

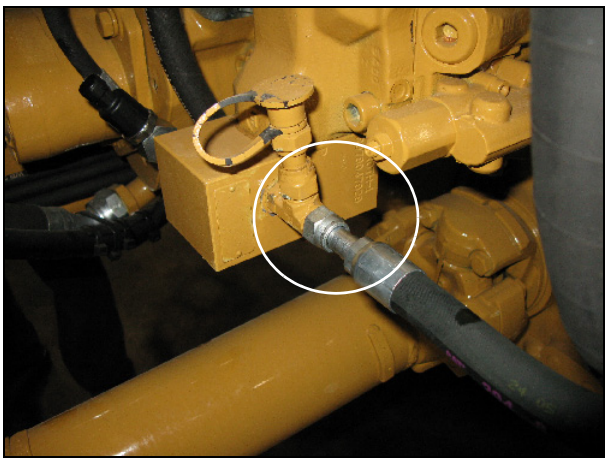
Wrap the -8 end of the 75″ pressure hose with 3 ft of hose guard.

Connect the -8 end of the pressure hose to the P port.



Step 13

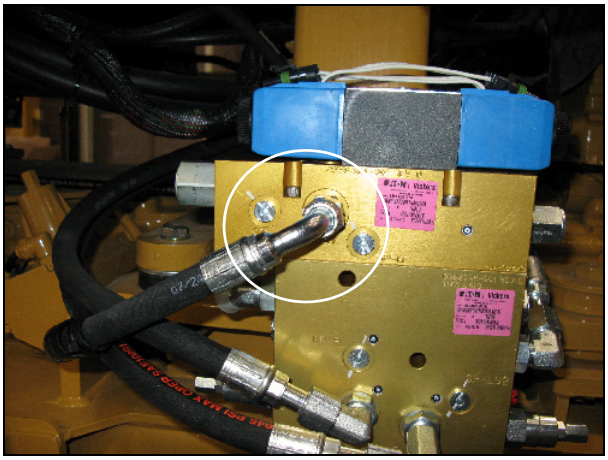
Connect the -6 end of the pressure hose to the original EF port on the priority valve.



Step 14

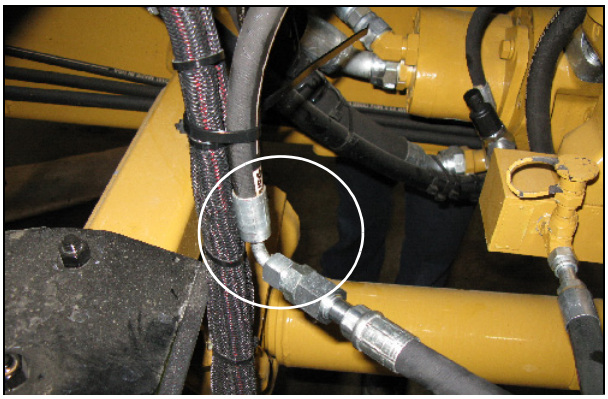
Wrap the -8 90° end of the 80" EF hose with 3 ft of hose guard.

Connect the 90° end of the EF hose to the EF port.



Step 15

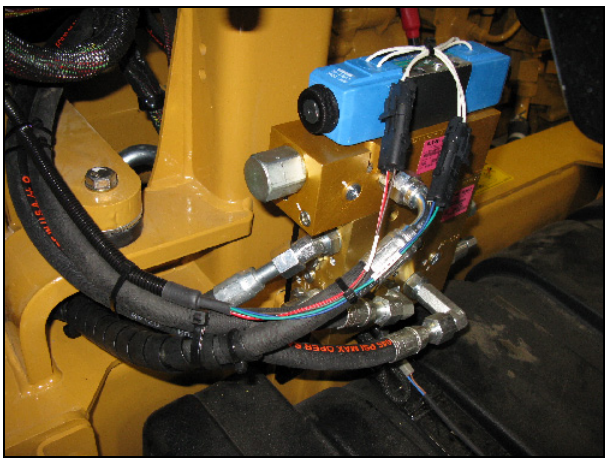
Connect the straight male end of the EF hose to the original EF hose.



Step 16

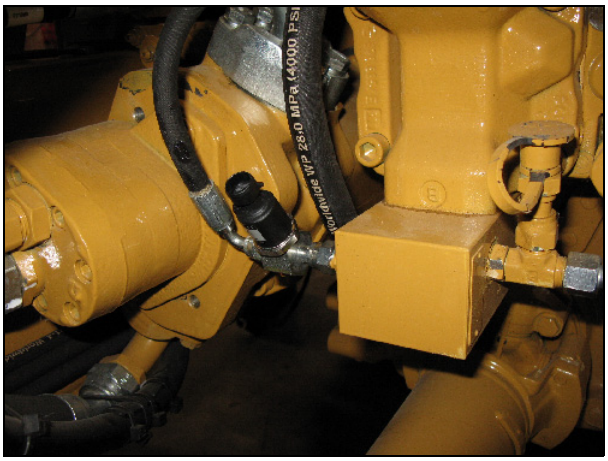
Use the hose guard provided to secure all hoses.

Route the hoses clear of all drivelines and exhaust pipes.

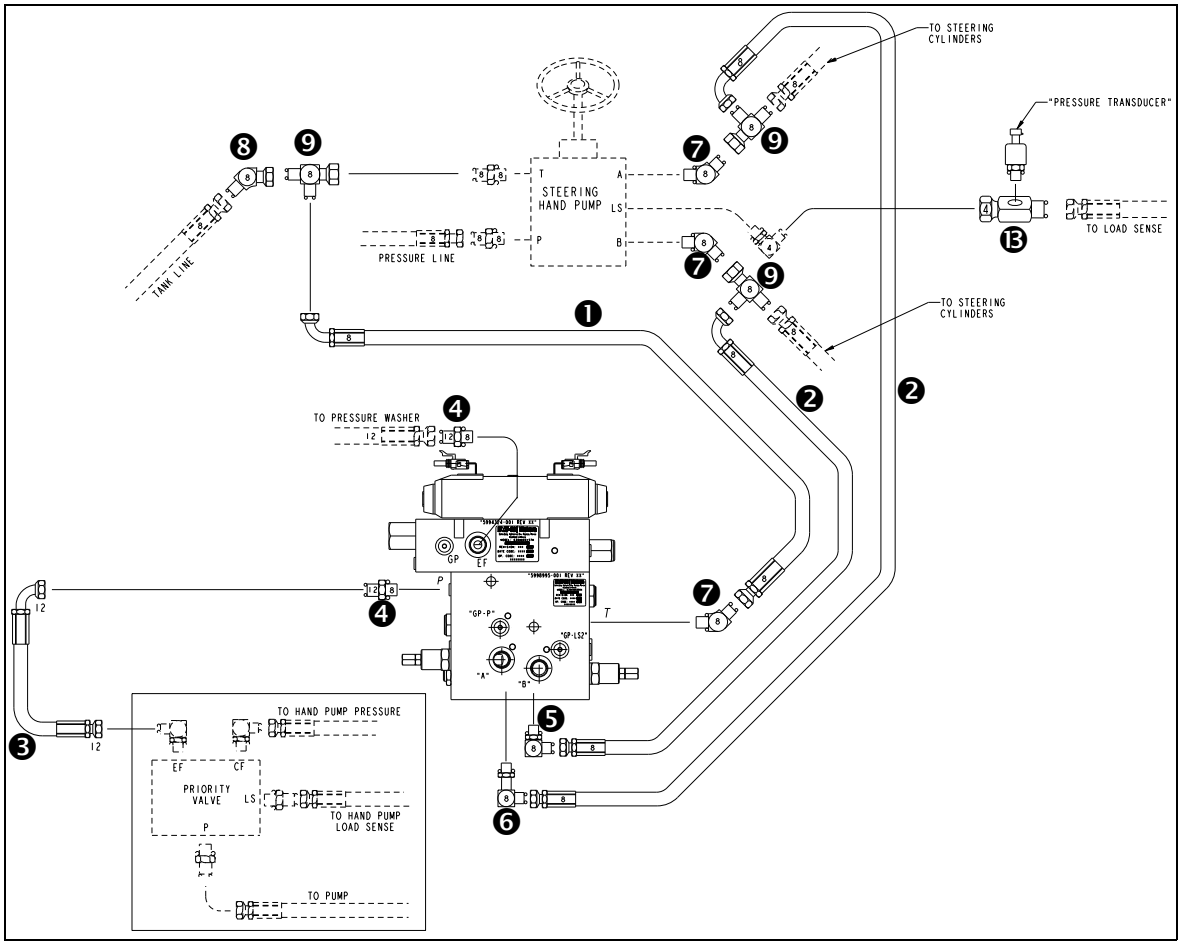


Step 17

Install the diagnostic tee and pressure transducer in the load sense line at the priority valve on the hydraulic pump.



Hydraulic control valve components: Models 6203, 8203, and 82x4 with ORS adapters



Item	Description	Part number
❶	81 inch hose	F451TCJSJ9-08-08-08-81
❷	60 inch hose	F451TCJSJ9-08-08-08-60
❸	38 inch hose	F451TCJSJ9-12-12-12-38
❹	Fitting (x2)	12-8 F50LO-S
❺	Fitting (x1)	8 C50LO-S
❻	Fitting (x1)	8 CC50LO-S
❼	Fitting (x3)	8 V50LO-S
❽	Fitting (x1)	8 V6LO-S

Item	Description	Part number
❾	Fitting (x3)	8 R6LO-S
❿	Fitting (x2)	4 HP50N-S
⓫	Fitting (x1)	12-FNL-S
⓬	Fitting (x1)	12-PNLO-S
⓭	Fitting (x1)	4-4 LOHL6GP5TP
⓮	Fitting (x1)	4 V50LO-S
⓯	Fitting (x1)	PD34BTL

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

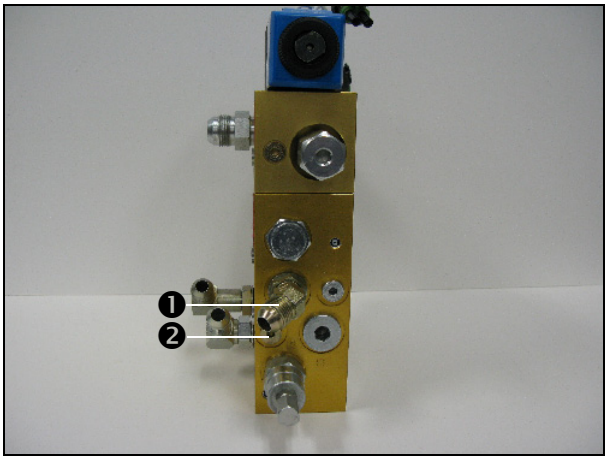
Installing the adapter: Models 6203, 8203, and 82x4

The following figures show the JIC adapter. Where required, substitute ORS for JIC.

Step 1

Install the following fittings:

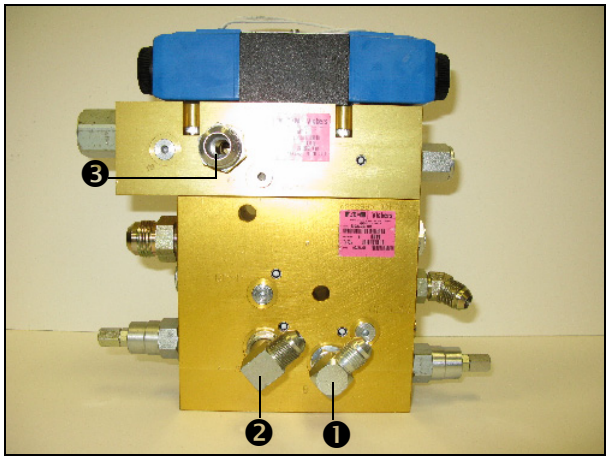
- ❶ -8 JIC 45° x -8 ORB in the T port
- ❷ -4 ORB plug in the LS2 port



Step 2

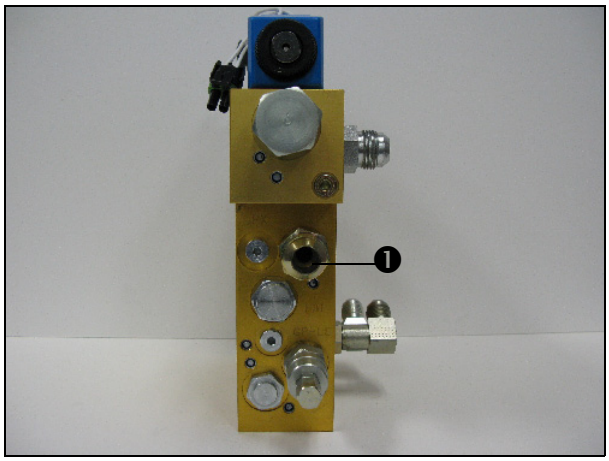
Install the following fittings:

- ❶ -8 JIC 90° x -8 ORB into the B port
- ❷ -8 JIC ext. 90° x -8 ORB into the A port
- ❸ -12 JIC x -8 ORB into the EF port



Step 3

❶ Insert a 12 JIC x -8 ORB fitting into the P port.



Mounting the hydraulic manifold: Models 6203, 8203, and 82x4

Step 1

Locate the hydraulic mounting bracket and bolt kit.



Step 2

Locate the U-shaped frame rail under the left rear corner of the cab.



Step 3

Bolt the bracket to the frame using the existing bolts as shown.



Step 4

Bolt the hydraulic manifold to the bracket as shown using the blind tapped holes in the manifold and 3/8" x 1" long cap screws and lock washers. Use the slots in the bracket to adjust the height of the valve.



Installing the hydraulic hoses: Models 6203, 8203, and 82x4

Step 1

Remove the rear portion of the hood to access the hand pump.

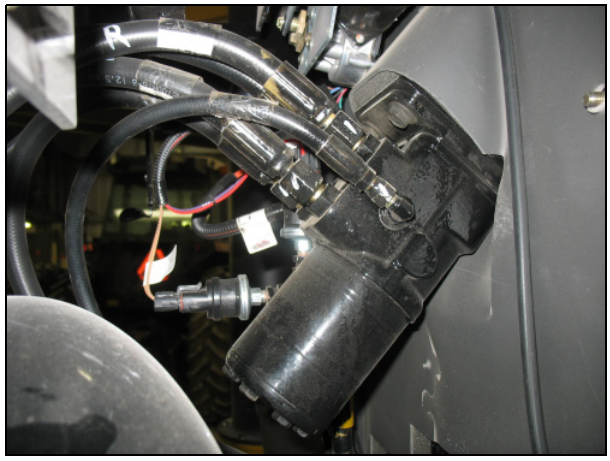


Step 2

This view shows the steering valve from the left of the vehicle.

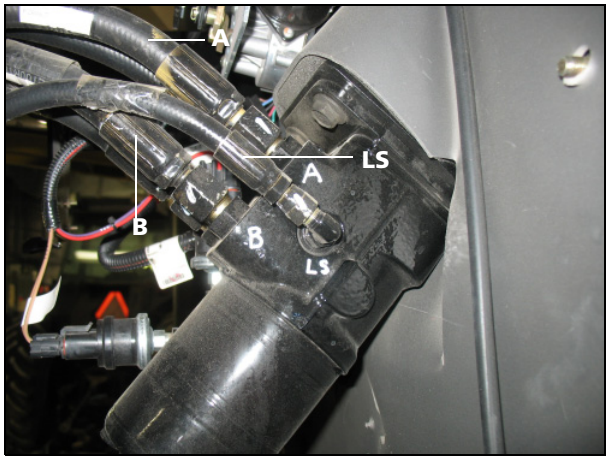
The steering hand pump will have ports labeled:

- P: Pressure port
- T: Tank port
- L: Cylinder port L
- R: Cylinder port R



Step 3

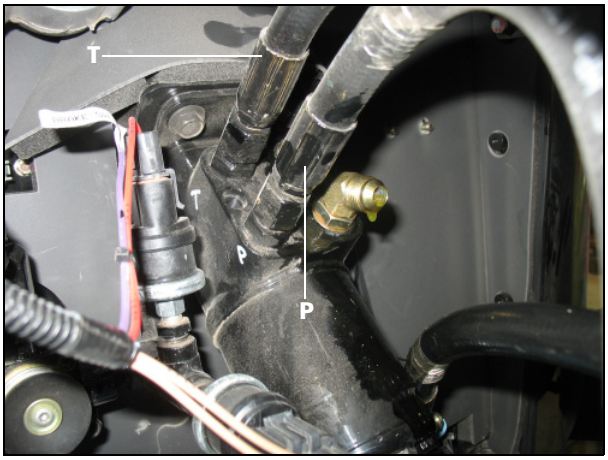
Label the upper hose “A” and the lower hose “B”. Label the small line on the side of the hand pump “LS” for load sense. Disconnect the hose assemblies.



Step 4

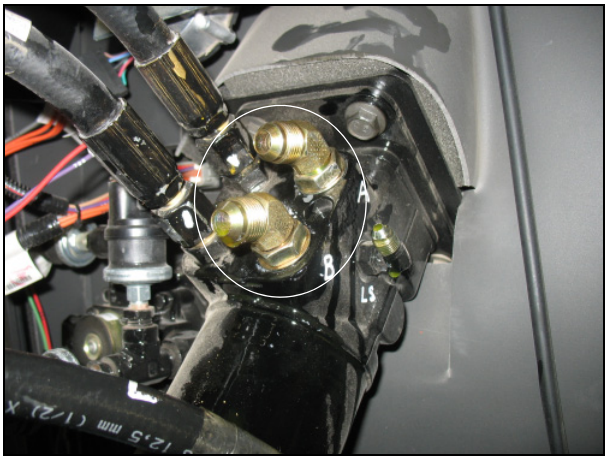
This view shows the steering valve from the right side of the vehicle.

Label the upper hose “T” and the lower hose “P”. Disconnect the hose assemblies.



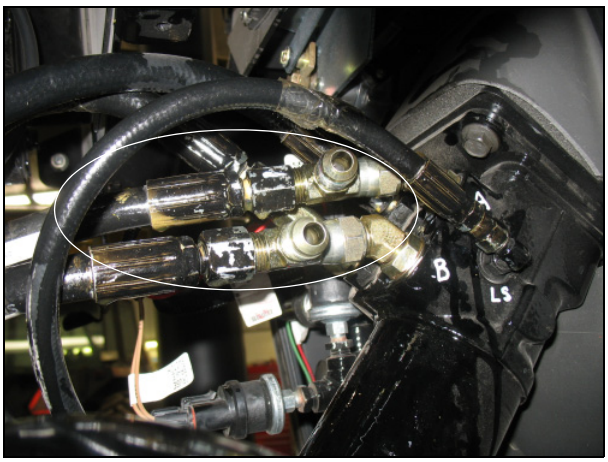
Step 5

Remove the A and B port fittings and then replace them with -8 JIC 45° x -8 ORB fittings.



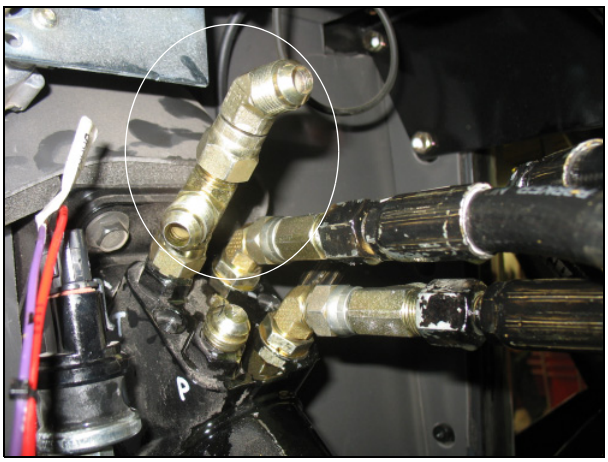
Step 6

Install -8 run tees to the A and B ports and then reconnect the existing lines.



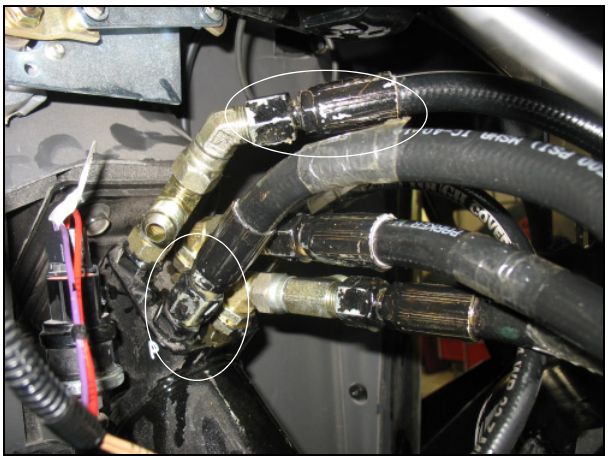
Step 7

Install a -8 run tee and swivel 45° to the tank port.



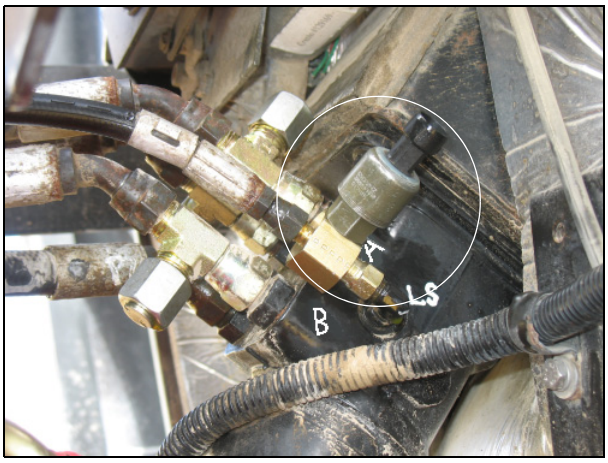
Step 8

Reconnect the existing tank and pressure lines.



Step 9

Install the diagnostic tee and pressure transducer in the load sense line. To make room for hose routing, position the transducer close to the hand pump.



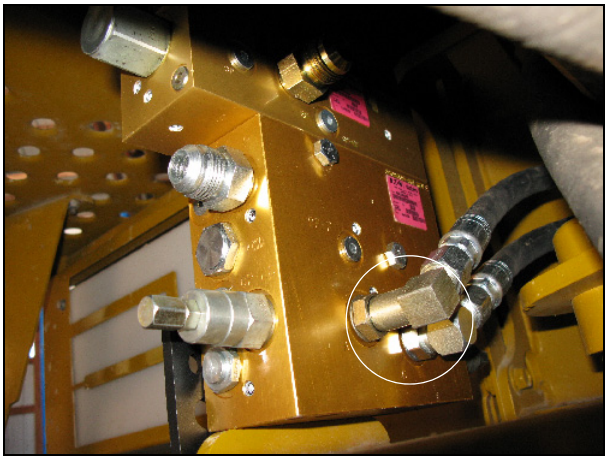
Step 10

Connect the 90° end of the 60" A hose and 59" B hose to the tees at the hand pump. Route the hoses to the Autopilot manifold.



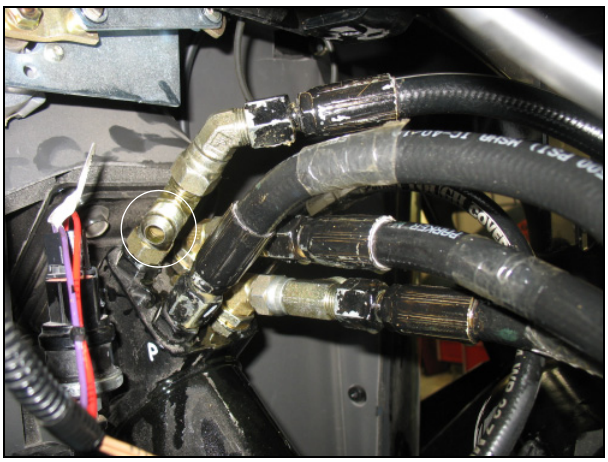
Step 11

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



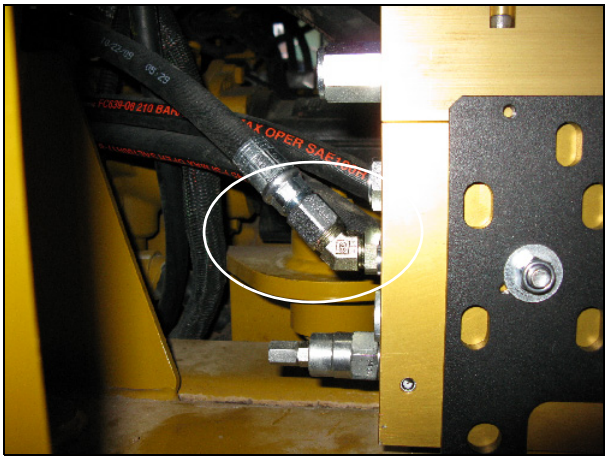
Step 12

Connect the 90° end of the 81" tank hose to the tee in the tank line. Route the line to the manifold.



Step 13

Connect the straight end of the tank hose to the manifold. Secure the A, B, and T hoses with hose guard.



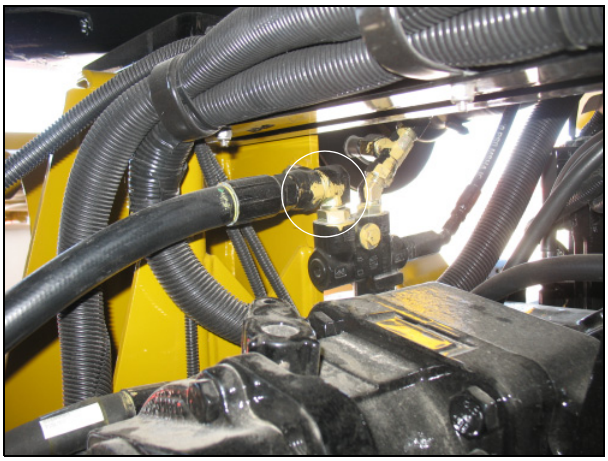
Step 14

Locate the priority valve under the front left corner of the cab.



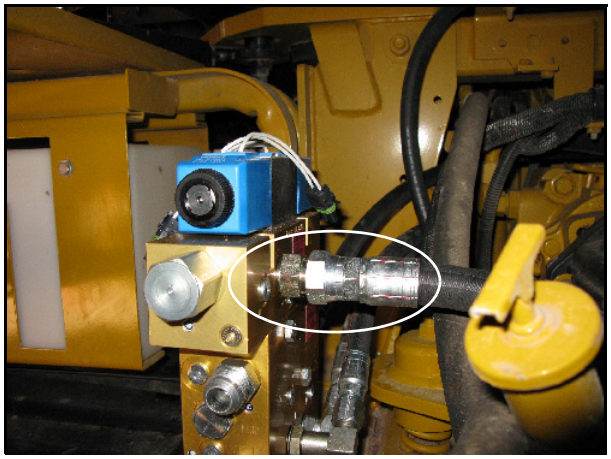
Step 15

Identify the EF excess flow port and disconnect the hose.



Step 16

Reroute the existing EF hose to the Autopilot manifold EF port.



Step 17

Connect the 90° end of the 38" -12 kit provided hose to the P port.



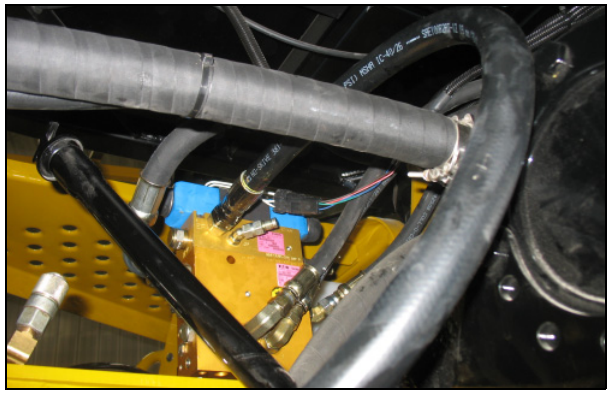
Step 18

Connect the straight end of the -12 hose to the original EF port on the priority valve.

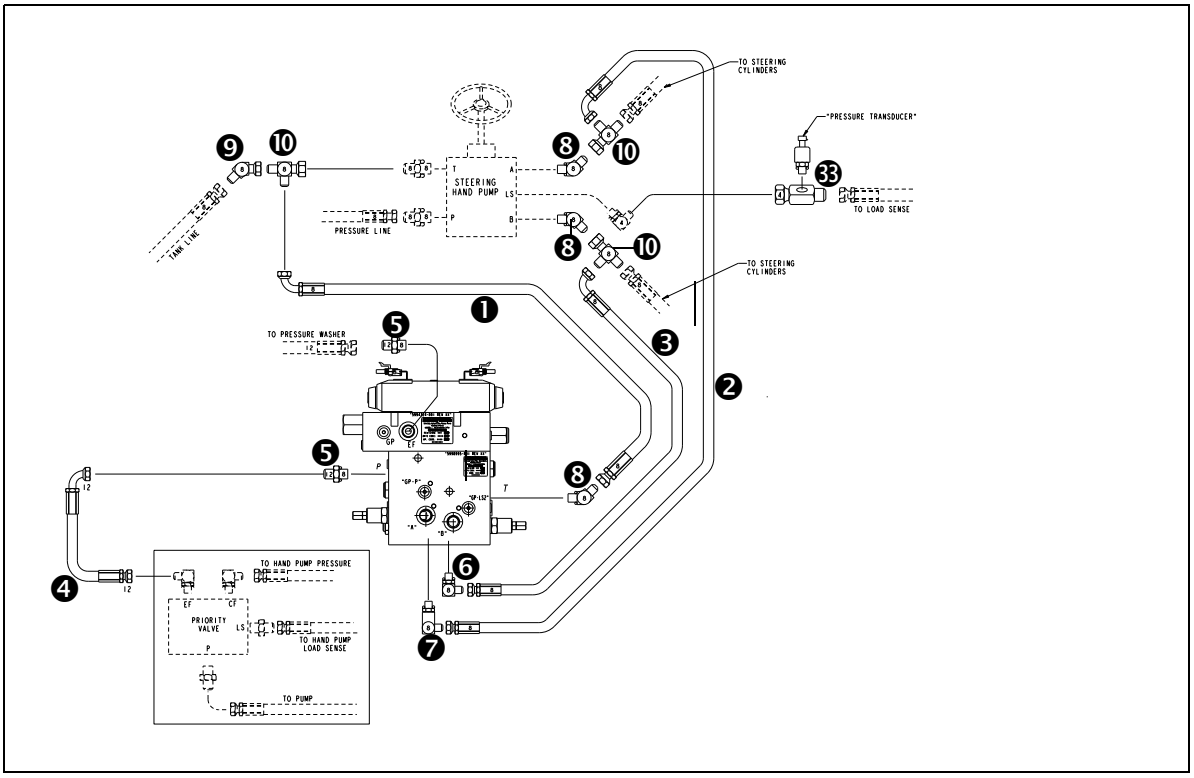


Step 19

Use the hose guard provided to secure all hoses. Route the hoses clear of all drivelines and exhaust pipes.



Hydraulic control valve components: Models 6203, 8203, and 82x4 with JIC adapters

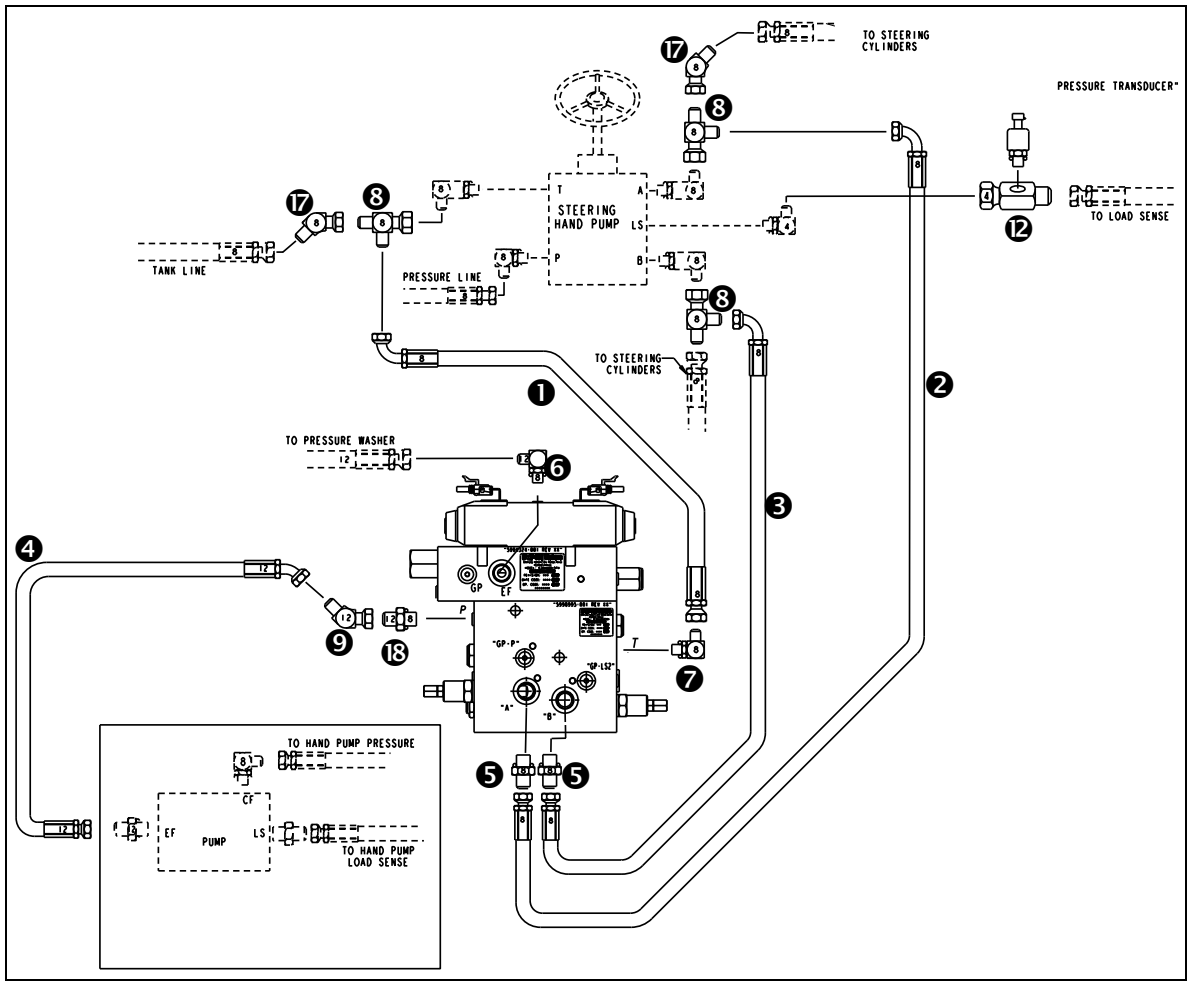


Item	Description	Part number
❶	81 inch hose	F451TC0639-08-08-08-81
❷	60 inch hose	F451TC0639-08-08-08-60
❸	59 inch hose	F451TC0639-08-08-08-59
❹	38 inch hose	F451TC0639-12-12-12-38
❺	Fitting (x2)	12-8 F5OX-S
❻	Fitting	8 C5OX-S
❼	Fitting	8 CC5OX-S
❽	Fitting (x3)	8 V5OX-S

Item	Description	Part number
❾	Fitting	8 V6X-S
❿	Fitting (x3)	8R6X-5
㉚	Fitting (x2)	4 HP 5ON-S
㉛	Fitting	12 FNTX-S
㉜	Fitting	12 PNTX-S
㉝	Fitting	4 XHX6G5TP
㉞	Fitting	4 V50X-S
㉟	Fitting	PD34BTX

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

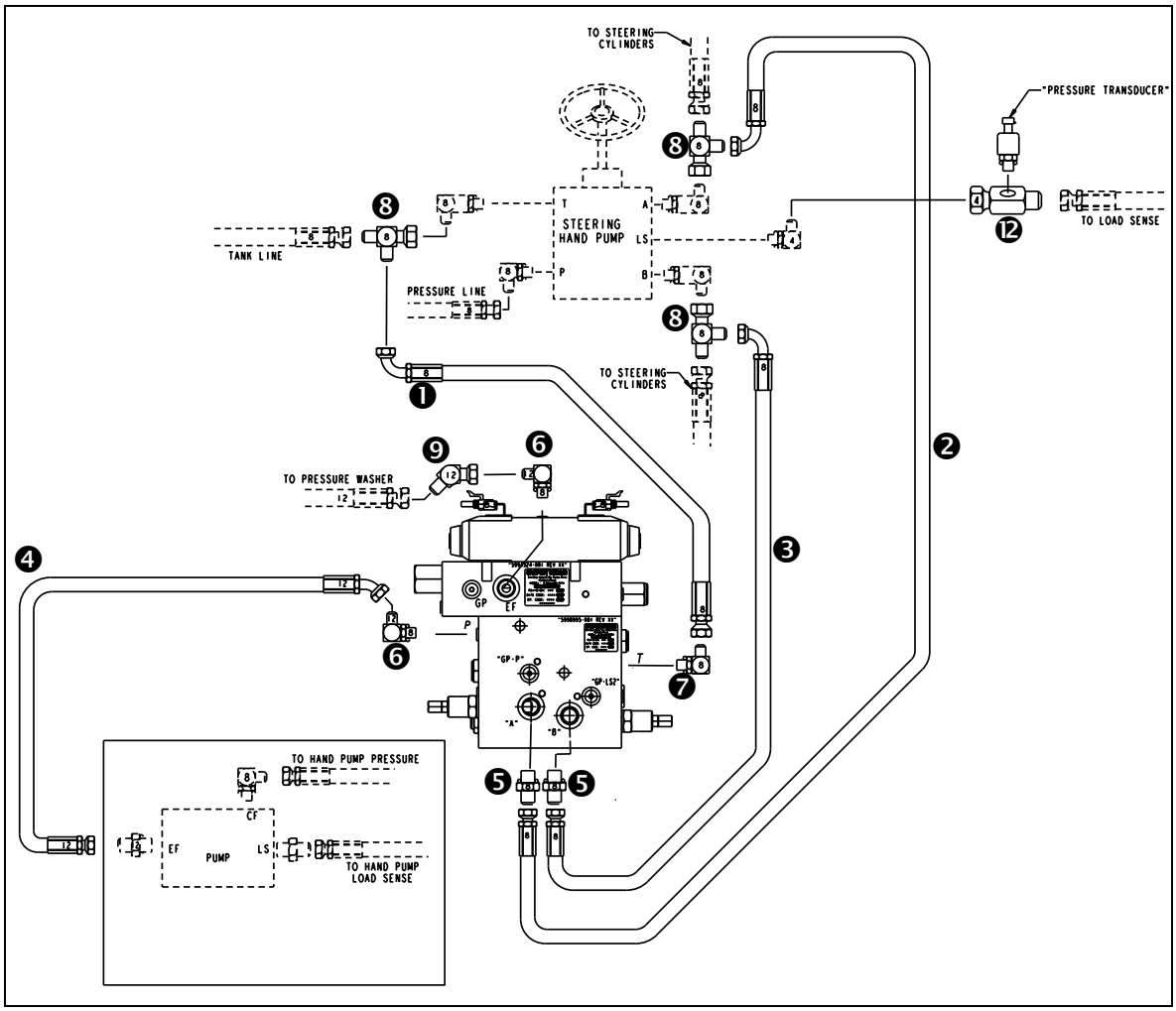
Hydraulic control valve components: Models 6103 and 8103 with JIC adapters



Item	Description	Part number
❶	55" hose (x1)	F451TC0639-08-08-08-55
❷	53" hose (x1)	F451TC0639-08-08-08-53
❸	53" hose (x1)	F451TC0639-08-08-08-53
❹	37" hose (x1)	F451TC0637-12-12-12-37
❺	Fitting (x2)	8 F50X-S
❻	Fitting (x2)	12-8 C50X-S
❼	Fitting (x1)	8 C50X-S
❽	Fitting (x3)	8 R6X-S
❾	Fitting (x1)	12 V6X-S

Item	Description	Part number
❿	Fitting (x1)	12 FNTX-S
⓫	Fitting (x1)	12 PNTX-S
⓬	Fitting (x1)	4 XHX6G5TP
⓭	Fitting (x2)	4 HP5ON-S
⓮	Fitting (x1)	4 F50X-S
⓯	Fitting (x1)	PD34BTX
⓰	Fitting (x1)	4 V6X-S
⓱	Fitting (x2)	8V6X-S
⓲	Fitting (x1)	12-8 F50X-S

Hydraulic control valve components: Models 9103, 9105, 9203, 9205 with JIC adapters



Item	Description	Part number
❶	55" hose (x1)	F451TC0639-08-08-08-55
❷	53" hose (x1)	F451TC0639-08-08-08-53
❸	53" hose (x1)	F451TC0639-08-08-08-53
❹	37" hose (x1)	F451TC0637-12-12-12-37
❺	Fitting (x2)	8 F50X-S
❻	Fitting (x2)	12-8 C50X-S
❼	Fitting (x1)	8 C50X-S
❽	Fitting (x3)	8 R6X-S

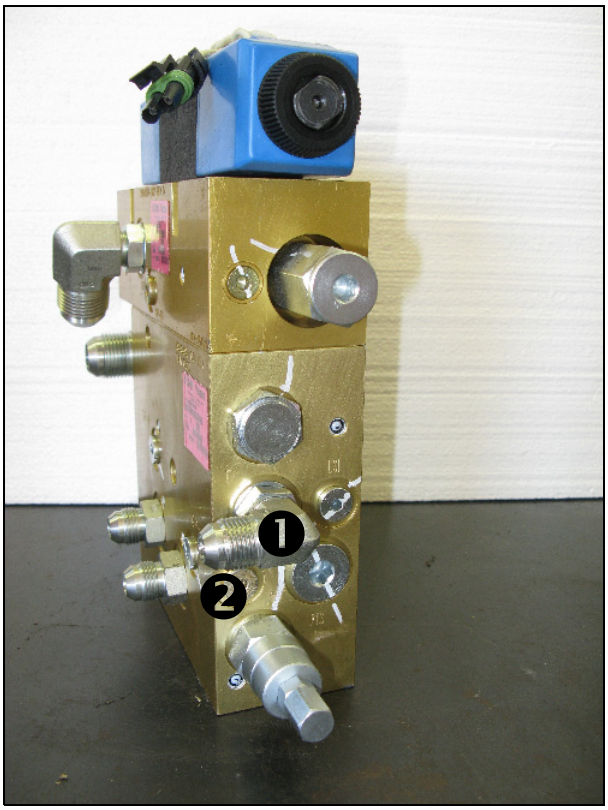
Item	Description	Part number
❾	Fitting (x1)	12 V6X-S
❿	Fitting (x1)	12 FNTX-S
⓫	Fitting (x1)	12 PNTX-S
⓬	Fitting (x1)	4 XHX6G5TP
⓭	Fitting (x2)	4 HP5ON-S
⓮	Fitting (x1)	4 F50X-S
⓯	Fitting (x1)	PD34BTX
⓰	Fitting (x1)	4 V6X-S

Installing the adapter: Models 6103, 8103, 9103, 9105, 9203, and 9205

Step 1

Install the following fittings:

- ❶ -8 JIC 90° x -8 ORB in the T port
- ❷ -4 ORB plug in rhe LS2 port

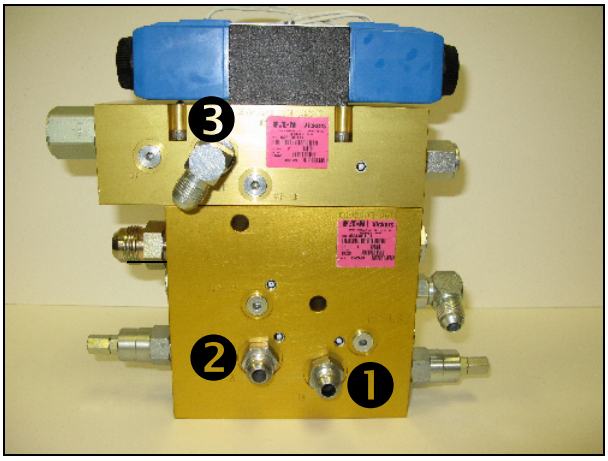


Step 2

Install the following fittings:

- ❶ -8 JIC x -8 ORB into the B port
- ❷ -8 JIC x -8 ORB into the A port
- ❸ -12 JIC 90° x -8 ORB into the EF port

Note – *Temporarily remove the top sandwich block to install the* 90° ❶ *fitting.*



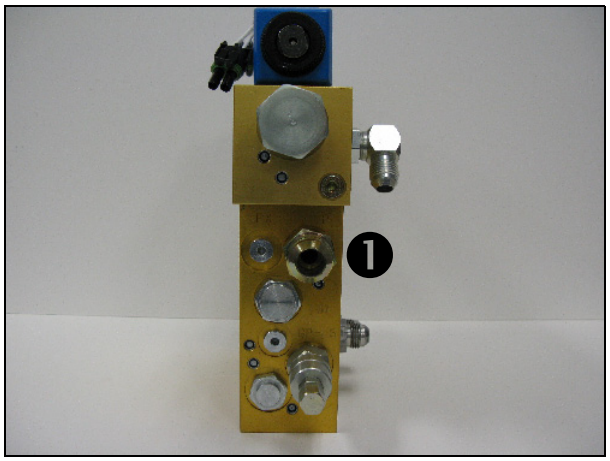
Step 3

Do one of the following:

Models: 6103 and 8103

Install the following fitting:

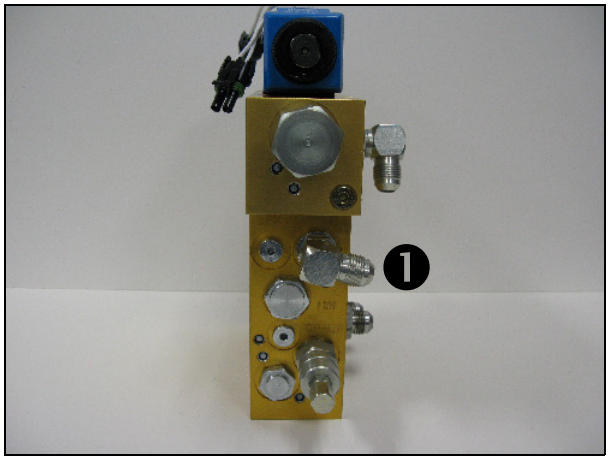
- ❶ -12 JIC x -8 ORB into the P port



Models: 9103, 9105, 9203, and 9205

Install the following fitting:

- ❶ -12 JIC 90° x -8 ORB into the P port



Mounting the hydraulic manifold: Models 6103, 8103, 9103, 9105, 9203, and 9205

Step 1

Locate the hydraulic mounting bracket and bolt kit.



Step 2

Locate the U-shaped frame rail infront of the left side of the cab



Step 3

Place the valve mounting bracket in a vice and then bend the mounting tabs 15°. This provides additional clearance from the exhaust system.

Note – *This bend in the bracket is required to provide easy access to the engine filters and to keep the Autopilot valve as far away as possible from the engine exhaust.*



Note – *This figure shows an optional bending method in a machine press.*



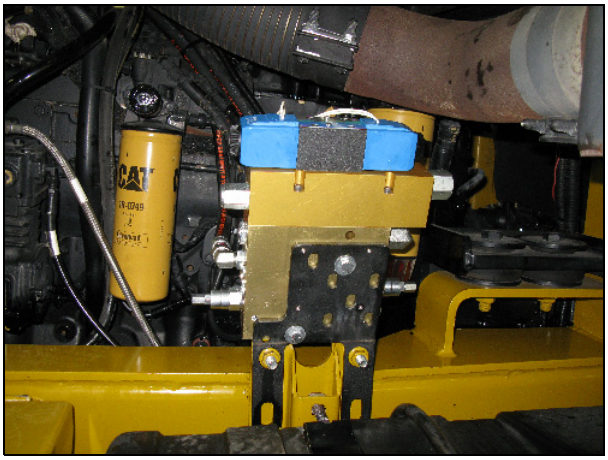
Step 4

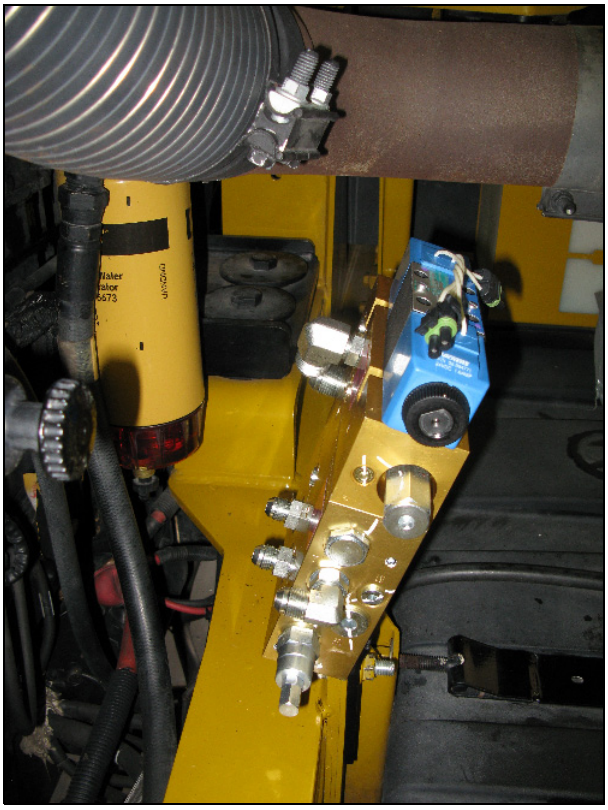
Bolt the bracket to the frame using the supplied 1/2" x 2" bolts. Reuse the existing flange nuts.



Step 5

Bolt the hydraulic manifold to the bracket as shown, using the blind tapped holes in the manifold and $^{3}/_{8}$" x 1" long cap screws and lockwashers. Use the slots in the bracket to adjust the height of the valve.





Installing the hydraulic hoses: Models: 6103, 8103, 9103, 9105, 9203, and 9205

Step 1

Remove the rear portion of the hood to access the hand pump.



Step 2

The steering hand pump will have ports labeled:

- P: Pressure port
- T: Tank port
- L: Cylinder port L
- R: Cylinder port R

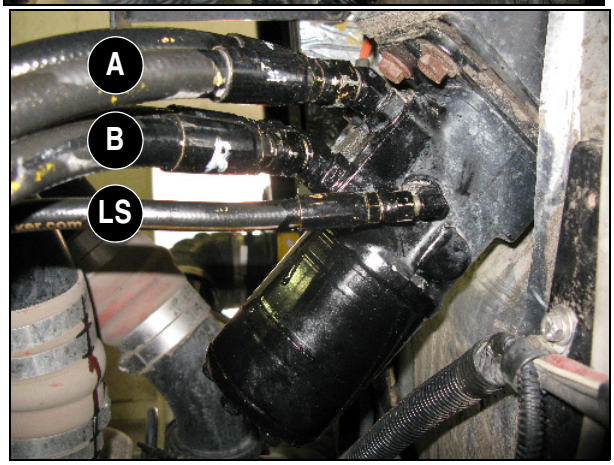
Note – *Peel paint off of the bottom of the hand pump to see each port's label.*



Step 3

This view shows the steering valve from the left of the vehicle.

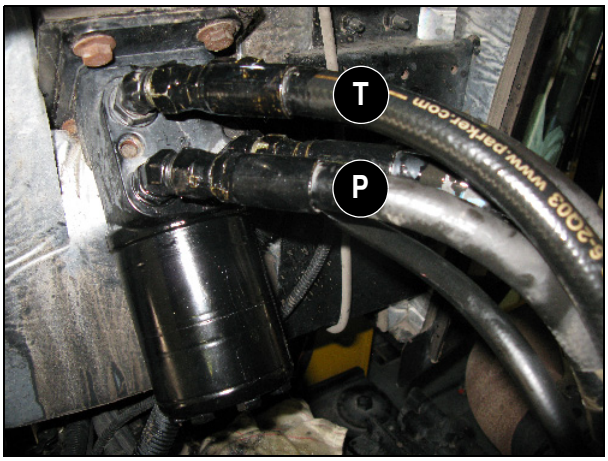
Label the upper hose "A" and the lower hose "B". Label the small line on the side of the hand pump "LS" for load sense.



Step 4

This view shows the steering valve from the right side of the vehicle.

Label the upper hose “T” and the lower hose “P”.



Step 5

Install -8 JIC run tees to the L, R and T ports. Reconnect the existing lines.

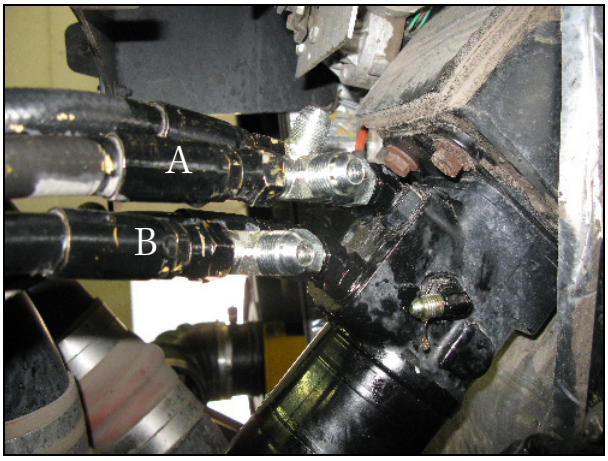


Hoses removed

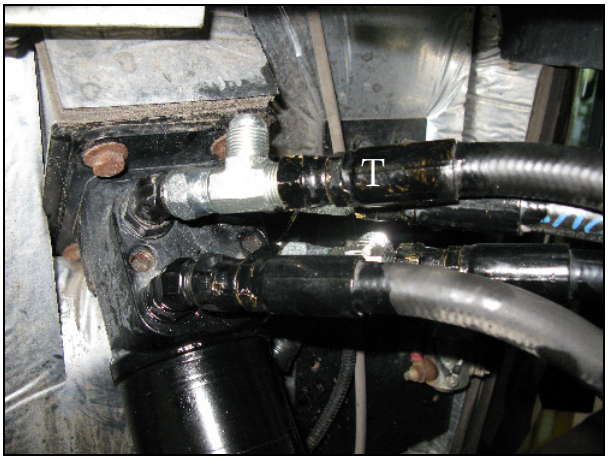
,



Tees installed



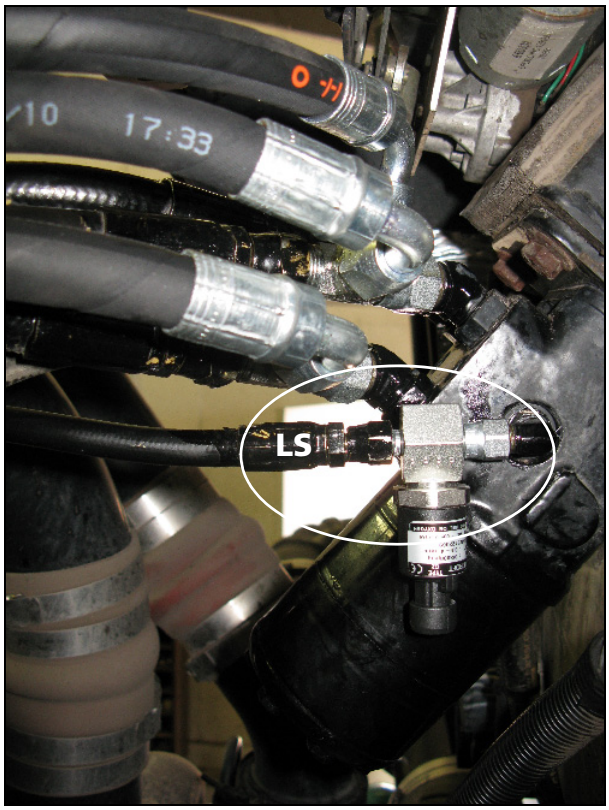
A and B hoses reconnected



T hose reconnected

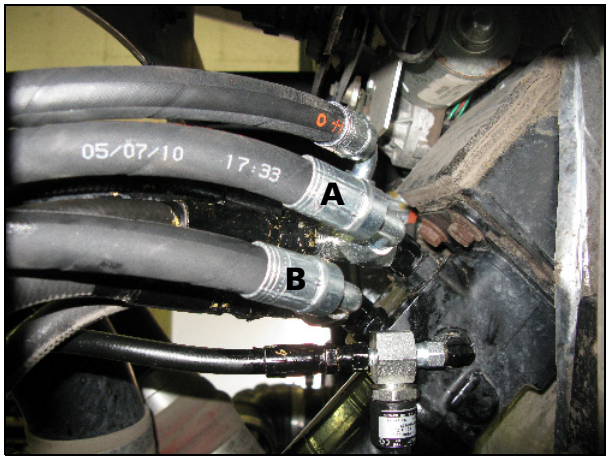
Step 6

Install the diagnostic tee and pressure transducer in the load sense line. To make room for hose routing, position the transducer close to the hand pump.



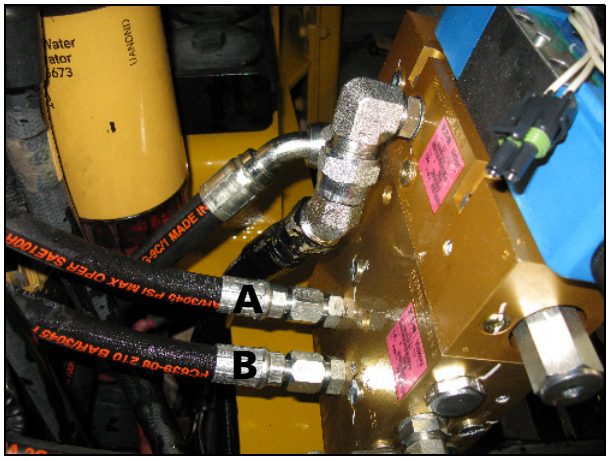
Step 7

Connect the 90° end of the 53" A hose and 53" B hose to the tees at the hand pump. Route the hoses to the Autopilot manifold.



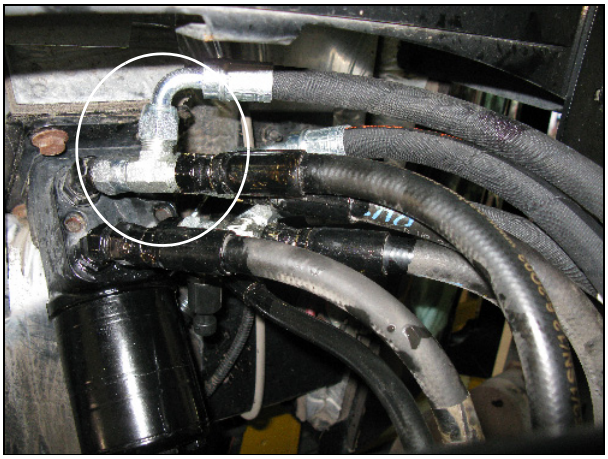
Step 8

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



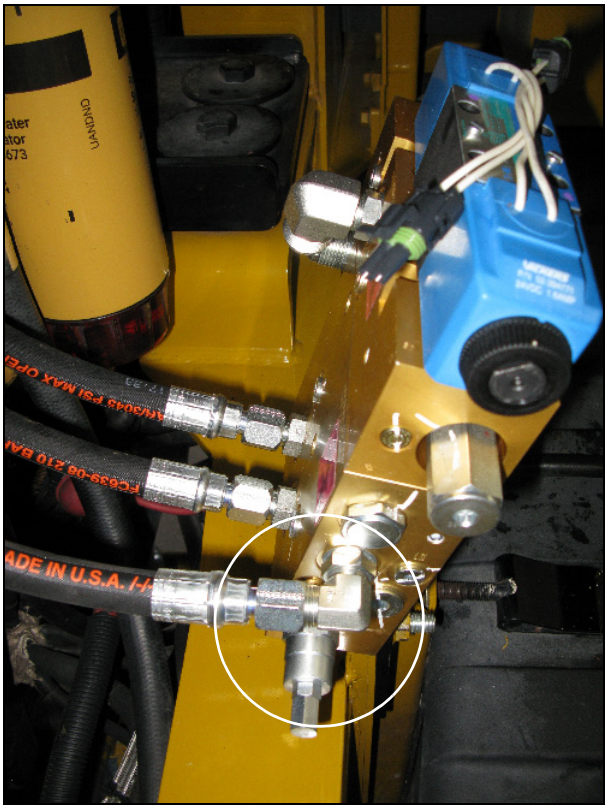
Step 9

Connect the 90° end of the 55" tank hose to the tee in the tank line. Route the line to the manifold.



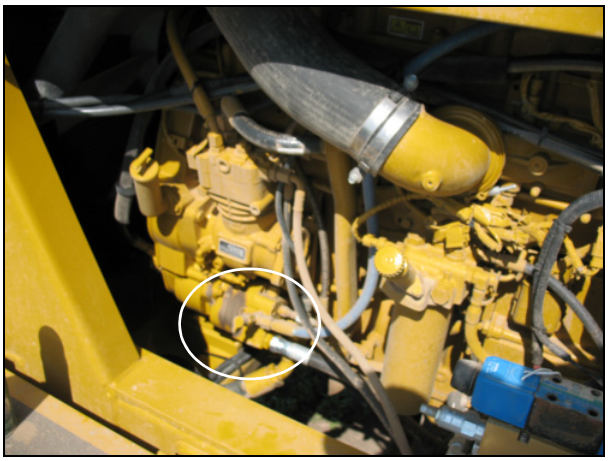
Step 10

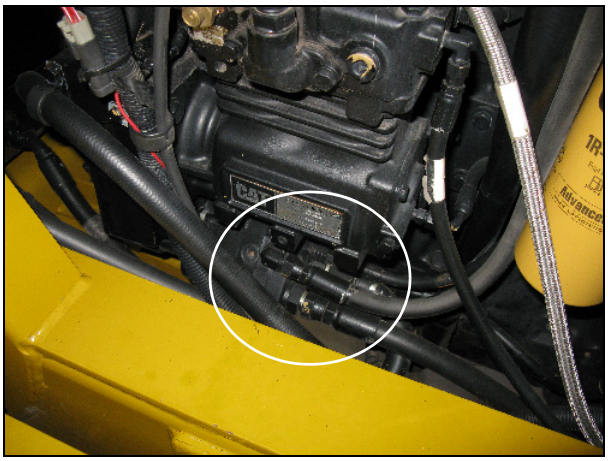
Connect the straight end of the tank hose to the T port on the Autopilot manifold.



Step 11

Locate the hydraulic pump at the front lower left auxiliary drive on the engine.

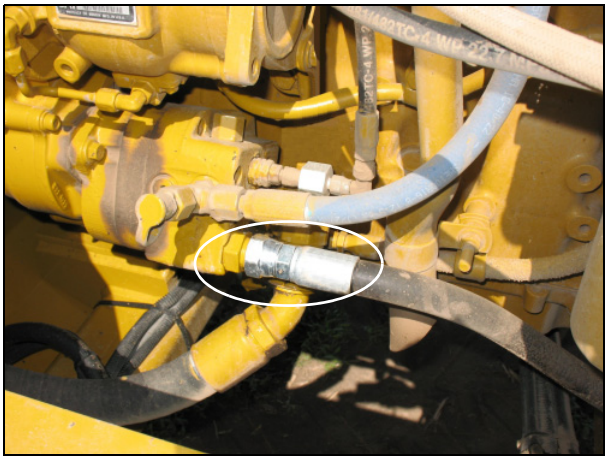




9103 pump

Step 12

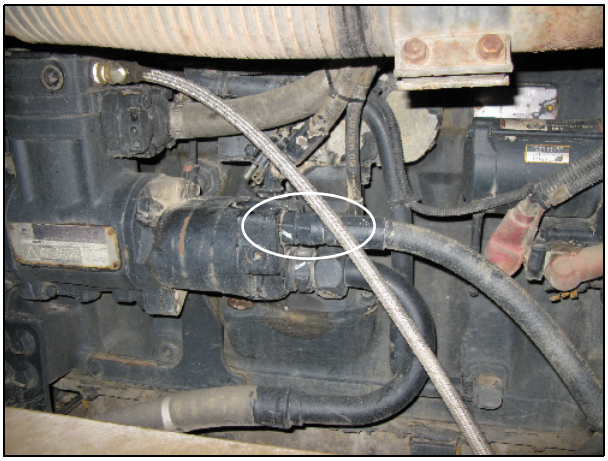
Identify the -12 JIC EF excess flow port and then disconnect the hose.



9203 pump



9103 pump



6103 / 8103 pump

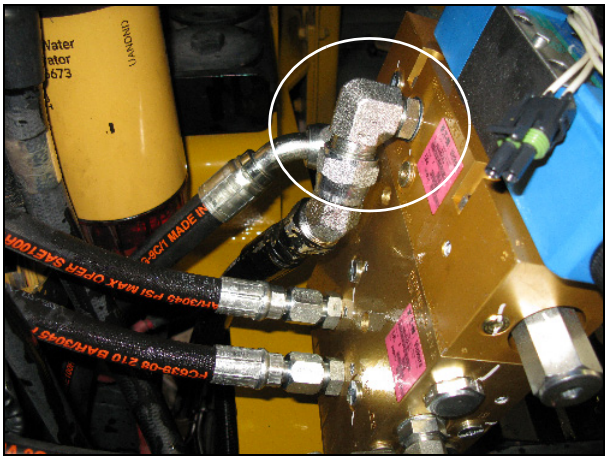
Step 13

Reroute the existing EF hose to the Autopilot manifold EF port.

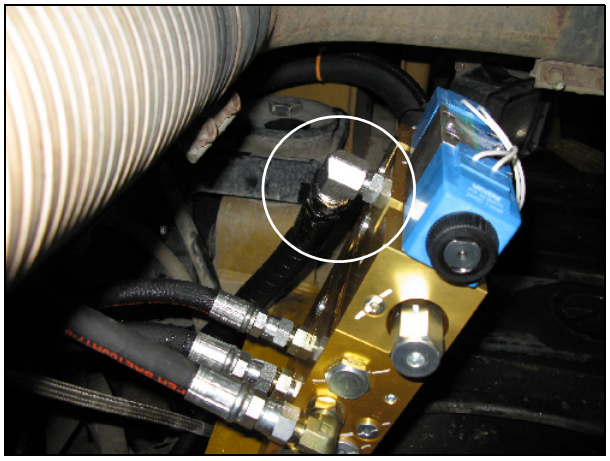
Use a swivel 45 for better hose routing on the 9x0x series machines.



9203



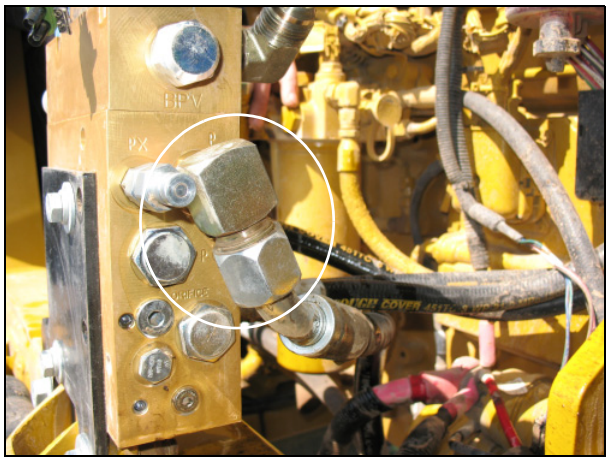
9103



6103 / 8103

Step 14

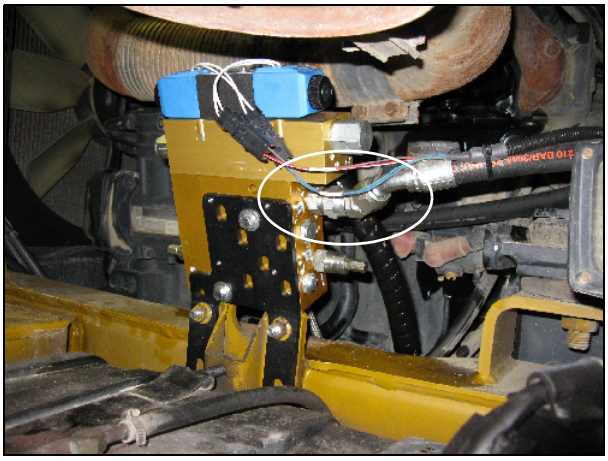
Connect the 45° end of the 37" -12 hose to the P port. Use a swivel 45 for better hose routing on the 6108 / 8103 series machines.



9203



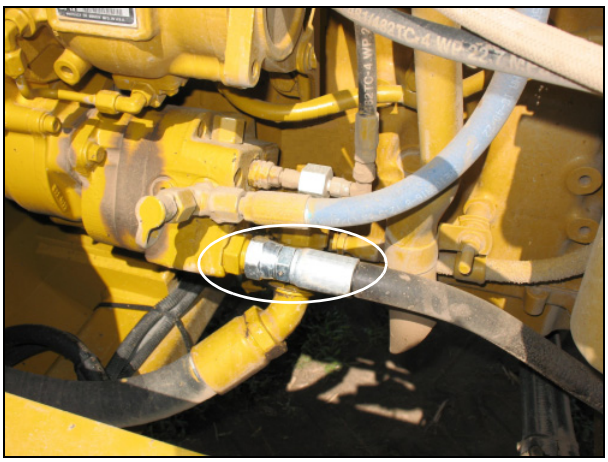
9103



6103 / 8103

Step 15

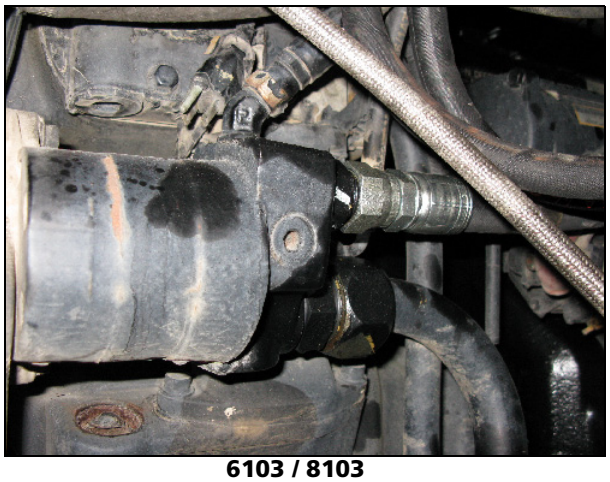
Connect the straight end of the -12 hose to the original EF port on the pump.



9203



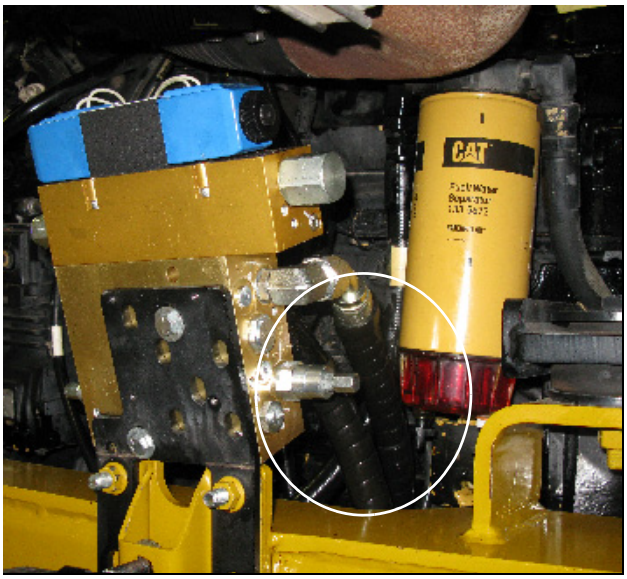
9103



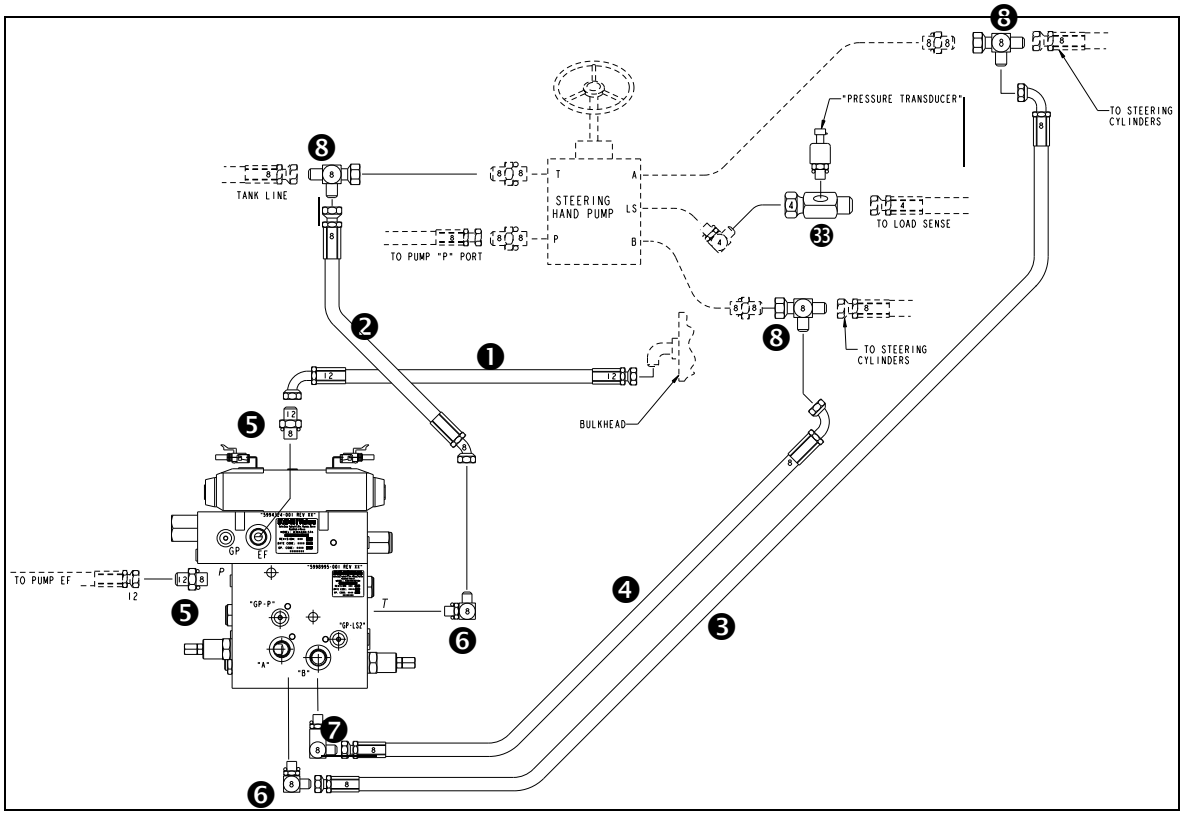
6103 / 8103

Step 16

Use the hose guard provided to secure all hoses. Route the hoses clear of all drivelines and exhaust pipes.



Hydraulic control valve components: Models: 81x4 with JIC



Item	Description	Part number
❶	84 inch hose	F451TC0639-12-12-12-84
❷	43 inch hose	F451TC0637-08-08-08-43
❸	42 inch hose	F451TC0639-08-08-08-42
❹	37 inch hose	F451TC0639-08-08-08-37
❺	Fitting (x2)	12-8 F5OX-S
❻	Fitting (x2)	8 C5OX-S
❼	Fitting	8 CC5OX-S
❽	Fitting (x3)	8 R6X-S

Item	Description	Part number
❾	Fitting	12 V6X-S
❿	Fitting (x2)	4 HP50N-S
㉚	Fitting	4 V50X-S
㉛	Fitting	12 FNTX-S
㉜	Fitting	12 PNTX-S
㉝	Fitting	4 XHX6G5TP
㉞	Fitting	PD34 BTX

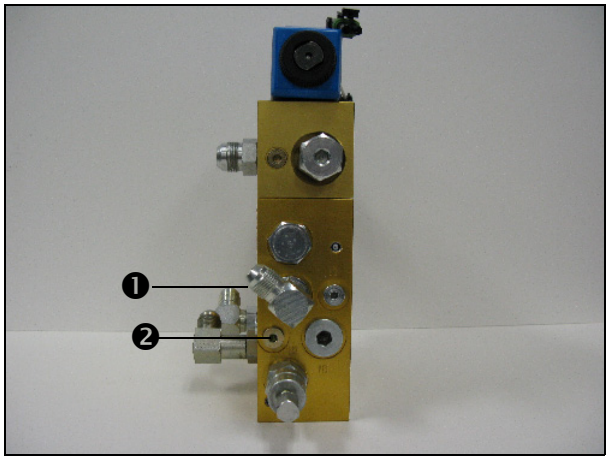
Note – *Part numbers are Parker numbers and are for reference only.*

Installing the adapter: Model 81x4

Step 1

Install the following fittings:

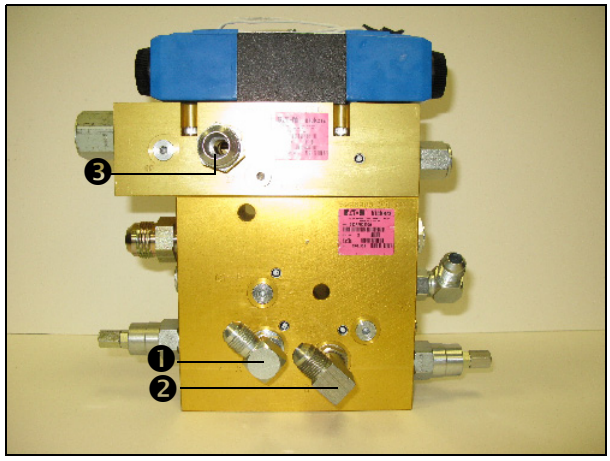
- ❶ -8 JIC 90° x -8 ORB in the T port
- ❷ -4 ORB plug in the LS2 port



Step 2

Install the following fittings:

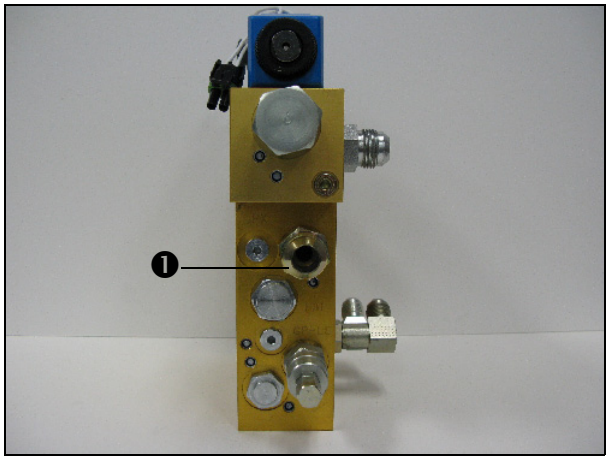
- ❶ -8 JIC 90° x -8 ORB into the A port
- ❷ -8 JIC ext. 90° x -8 ORB into the B port
- ❸ -12 JIC straight x -8 ORB into the EF port



Step 3

Install the following fitting:

- ❶ -12 JIC x -8 ORB into the P port.



Mounting the hydraulic manifold: Models 81x4

Step 1

Locate the hydraulic mounting bracket and bolt kit.



Step 2

Locate the U-shaped frame rail under the right front corner of the cab.



Step 3

Bolt the bracket to the frame so that the upper portion is offset to the front of the vehicle. Use the ¾" hardware provided in the kit to secure it to the frame.



Step 4

Bolt the hydraulic manifold to the bracket as shown using the through holes and 3/8" x 3½" long cap screws, washers, and nuts. Use the slots in the bracket to adjust the height of the valve to allow clearance.

Tighten the bolts that secure the manifold to the frame.





Installing the hydraulic hoses: 81x4 models

Step 1

Remove the rear portion of the hood to access the hand pump.

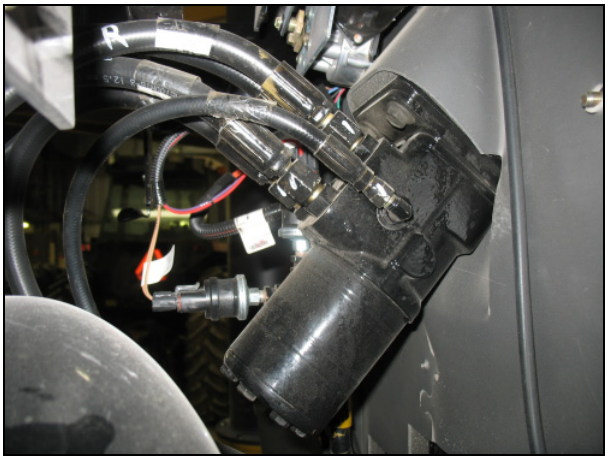


Step 2

This view shows the steering valve from the left of the vehicle.

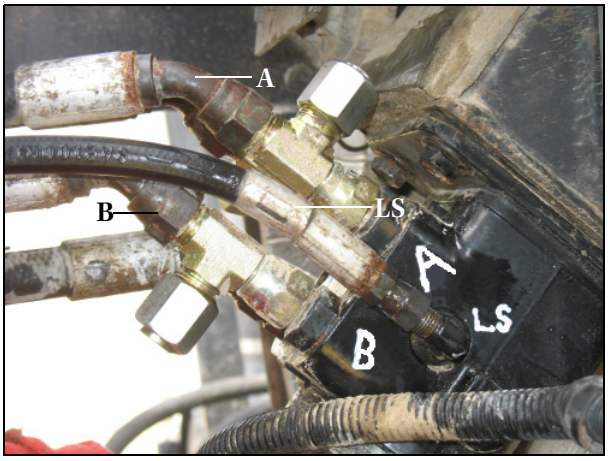
The steering hand pump will have ports labeled:

- P: Pressure port
- T: Tank port
- L: Cylinder port L
- R: Cylinder port R



Step 3

Label the upper hose “A” and the lower hose “B”. Label the small line on the side of the hand pump “LS” for load sense. Disconnect the hose assemblies.



Step 4

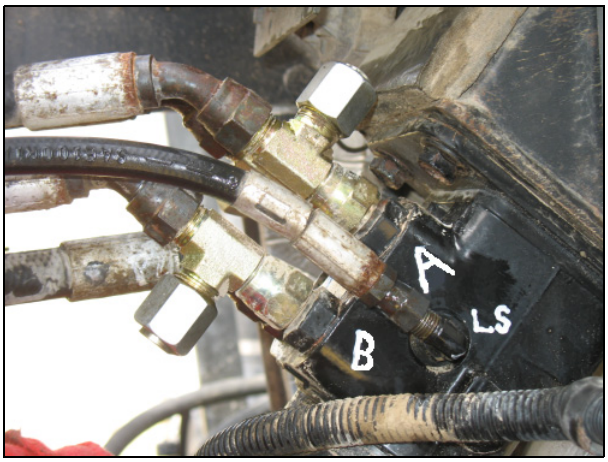
This view shows the steering valve from the right side of the vehicle.

Label the upper hose “T” and the lower hose “P”.



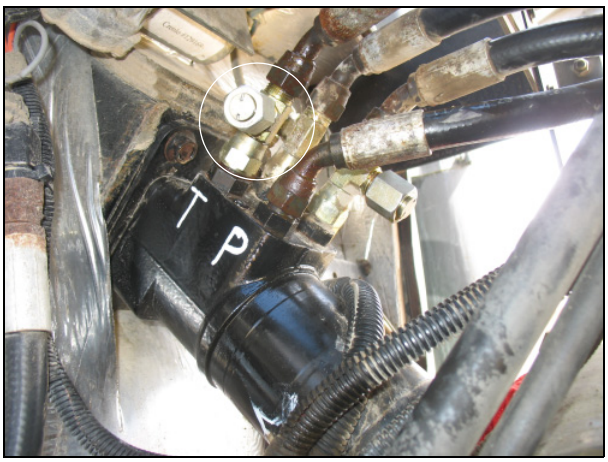
Step 5

Install -8 run tees to the A and B ports and reconnect the existing lines.



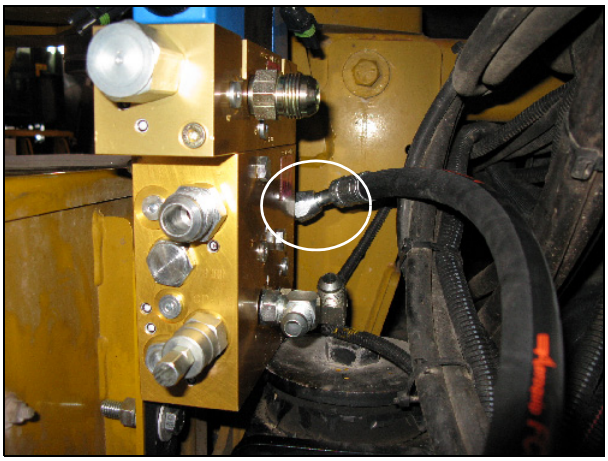
Step 6

Install a -8 run tee to the tank port.



Step 7

Connect the -8 JIC 45° end of the 43" tank hose to the Autopilot manifold T port.



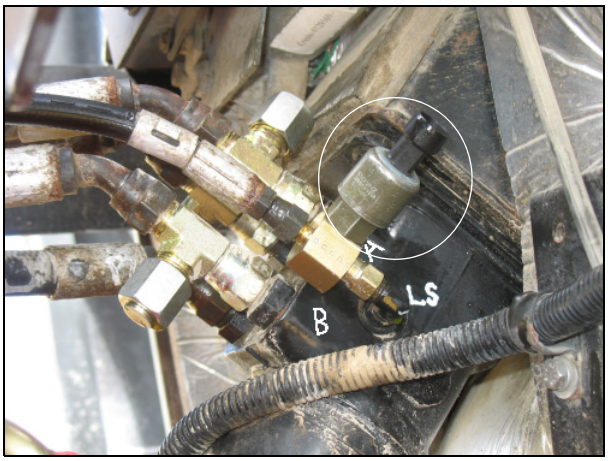
Step 8

Connect the straight end of the tank hose to the run tee at the hand pump.



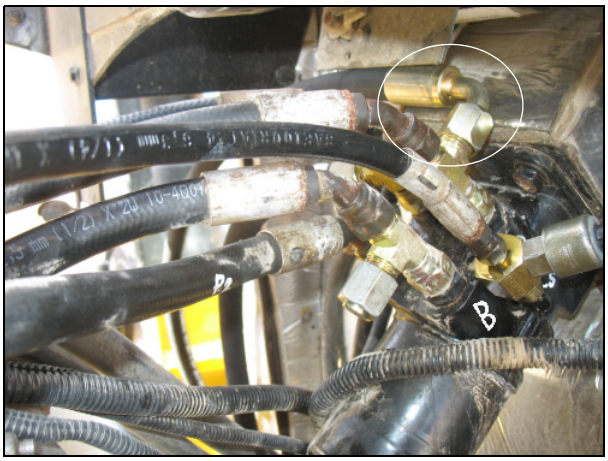
Step 9

Install the diagnostic tee and pressure transducer in the load sense line. Position the transducer close to the hand pump to make room for hose routing.



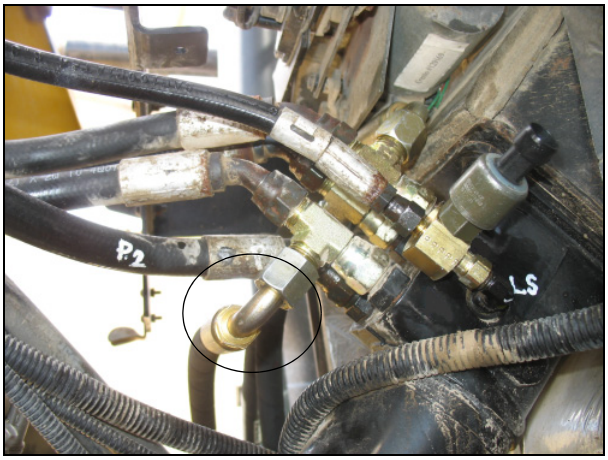
Step 10

Connect the 90° end of the 42" A hose to the upper tee at the hand pump. Route the hose over the hand pump to the manifold.



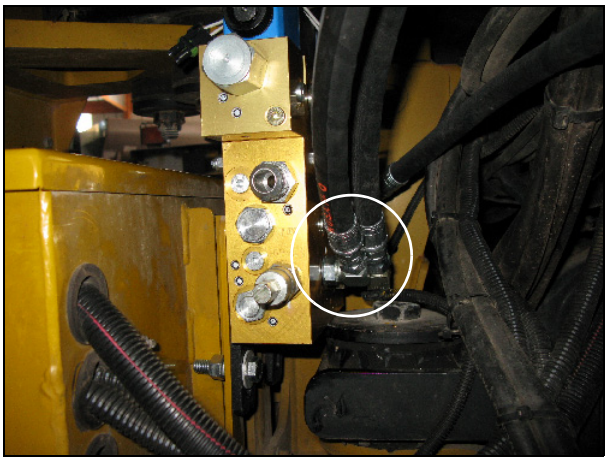
Step 11

Connect the 90° end of the 37" B hose to the lower tee at the hand pump. Route the hose under the hand pump to the manifold.



Step 12

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



Step 13

Locate the pressure washer housing on the right side of the vehicle.

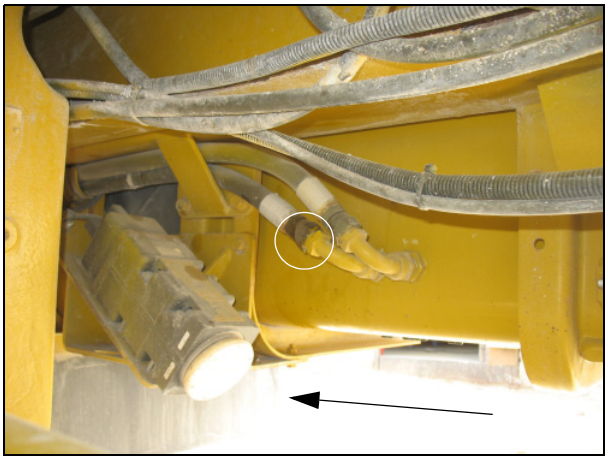


Step 14

Find the bulkheads on the inside of the pressure washer equipment box. Verify the forward hose is the EF line by tracing it to the hydraulic pump on the engine auxiliary drive.

Disconnect the hose and then reroute it to the Autopilot manifold.

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



Step 15

Connect the existing EF line to the Autopilot manifold P port.



Step 16

Connect the 90° end of the 84" -12 hose to the EF port.



Step 17

Route the provided hose from the Autopilot manifold EF port to the existing bulkhead and then connect it where the existing hose was removed.



CHAPTER

3

AutoSense Steering Device Installation

In this chapter:

- AutoSense steering device components
- Installing the AutoSense steering device: Models 81x4 and 82x4
- Installing the AutoSense steering device: Models 6x03, 8x03, and 9x0x
- Preparing the harness (P/N 54602 Rev C)

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

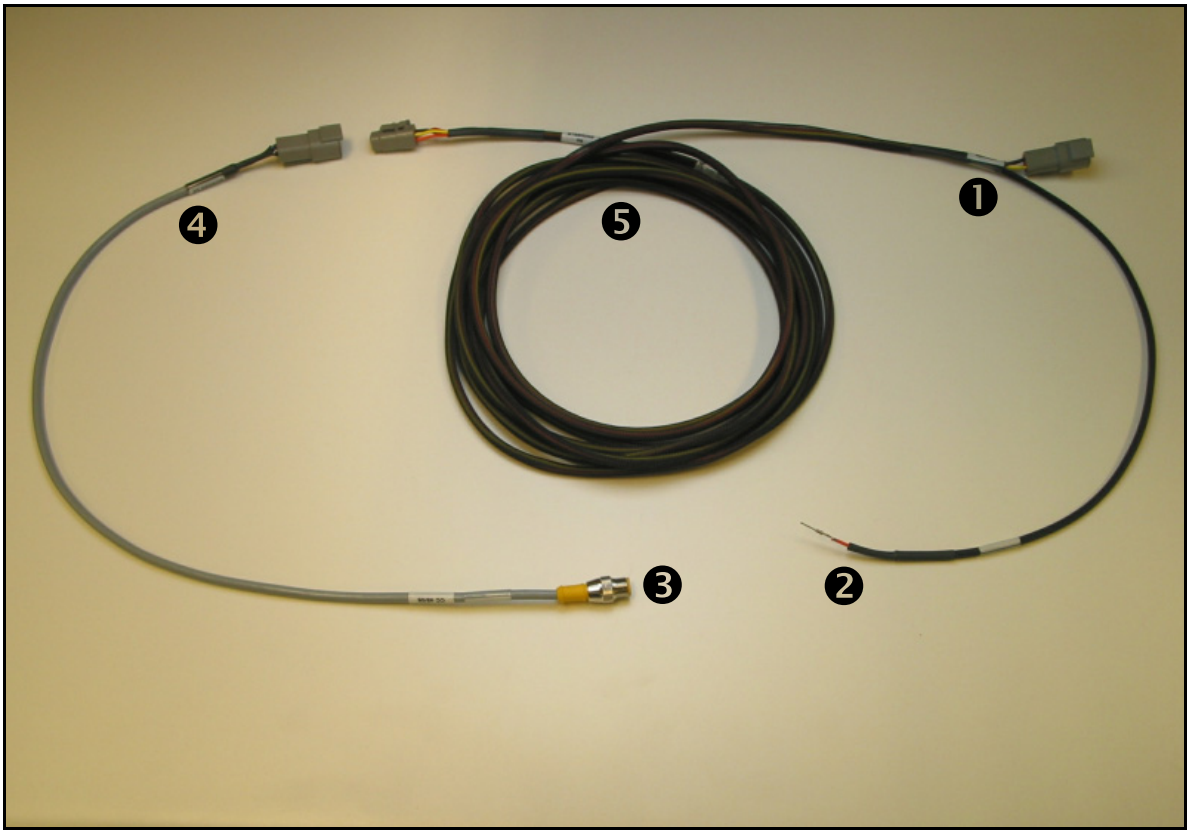
If the required mounting location is not accessible, chose a different place. To ensure proper function, the AutoSense device must be located where it is free of obstructions and can rotate with the wheels when they turn.

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 that it maintains a level orientation. Do not mount it on its side. An angle of up to 10° 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
❶	P-6 connector	
❷	Power connector	
❸	AutoSense connector	
❹	Jumper cable	57560
❺	AutoSense steering cable	57885

Installing the AutoSense steering device: Models 81x4 and 82x4

Step 1

Find the mounting location on the front axle left tie rod end.



Step 2

Remove the cotter pin and castle nut from the tie rod end.



Step 3

Install the adaptor nut and then reinstall the cotter pin.



Step 4

Use the included 3/8" bolt and thread locker provided to attach the AutoSense mount plate to the adaptor nut. Tighten securely.



Step 5

Mount the AutoSense device using the included #6-32 screws with the connector pointing to the rear of the vehicle.



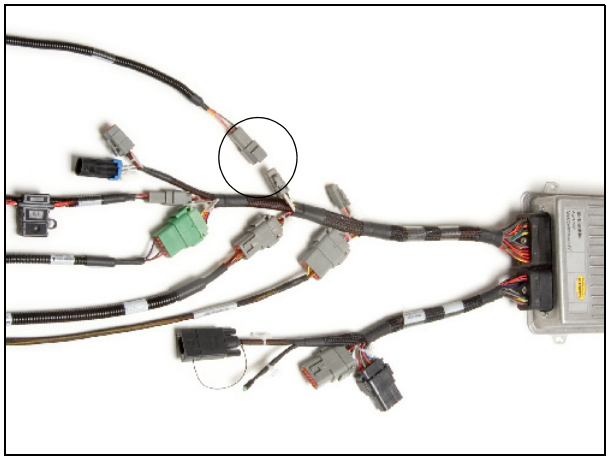
Step 6

Route the steering cable to the steering device behind the rear of the axle to avoid damage from stalks. Connect the cable to the steering device. Leave adequate length on the service loop to avoid stretching the cable.



Step 7

Connect the 57885 AutoSense steering cable connection to P-6 on the main wiring harness. P-6 is labeled “Steering Sensor”.



Installing the AutoSense steering device: Models 6x03, 8x03, and 9x0x

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

Find the mounting location on the front steering fork structure.

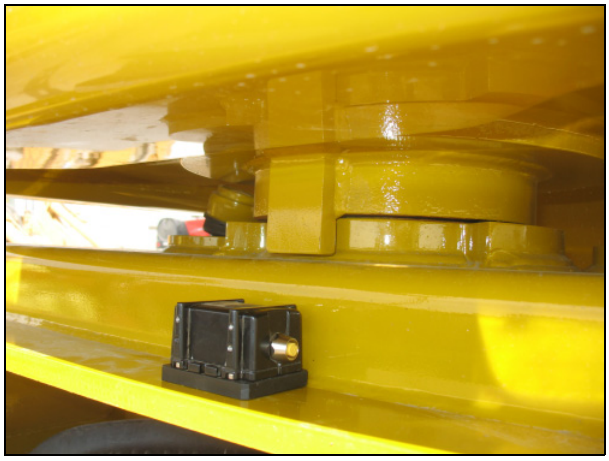
Note – *You can place the device on the front or rear of the fork. Place it in the most protected location.*



Step 2

Use the AutoSense device to estimate the final mounting location.

Note – *The distance from the center of the axle rotation is not critical.*



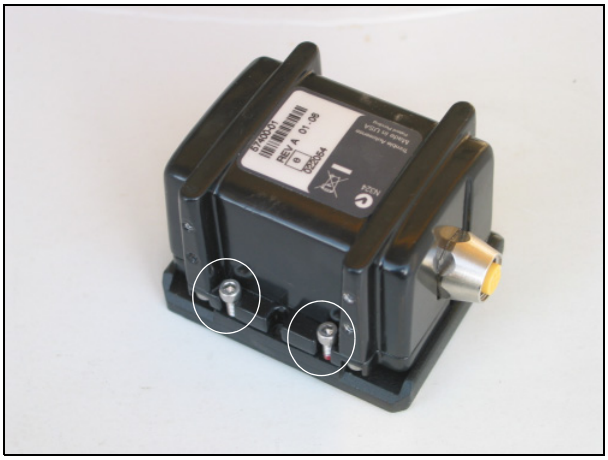
Step 3

Clean the mounting surface with the alcohol swab provided or an equally aggressive cleanser to remove all dust and oil.



Step 4

Use the four #6-32 socket head screws to attach the AutoSense device to the bracket.



Step 5

Remove the protective plastic from the VHB (Very High Bond) adhesive.

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



Step 6

Attach the AutoSense device and bracket to the center of the steering member and then apply firm pressure. The surface must be completely dry. If desired mechanically secure the bracket using the center hole and hardware.

Note – *Once applied, the bracket cannot be reapplied. Allow the VHB several hours to adhere to the surface. If the VHB is contaminated, reapply VHB.*



Step 7

Open the top hood. Route the 57885 AutoSense steering cable toward the AutoSense device by following the existing cabling.

Note – *The arrow points forward.*

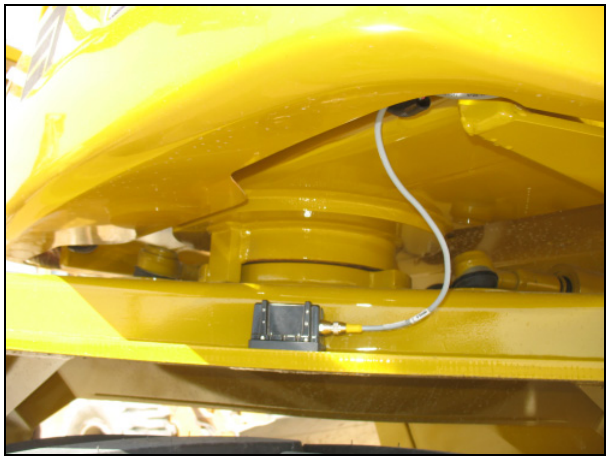


Step 8

Connect the 57560 jumper cable to the AutoSense device.

Connect the opposite end of the jumper cable to the 57886 steering cable.

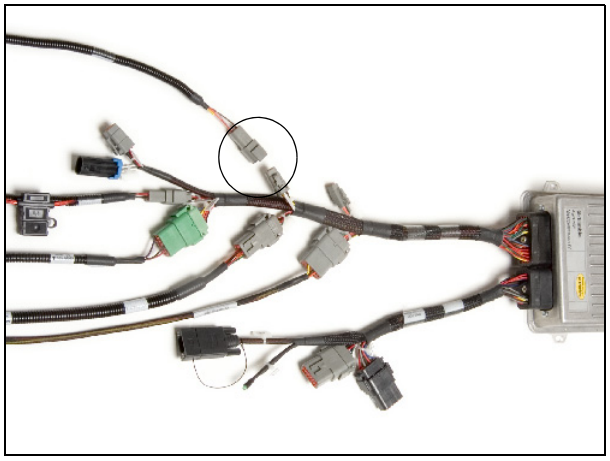
Leave adequate length in the jumper cable to avoid tension during full left or right turns.



Step 9

Connect the 57885 AutoSense steering cable to P6 on the main wiring harness. P-6 is labeled “Steering Sensor”.

See Chapter 8, Controller Installation.

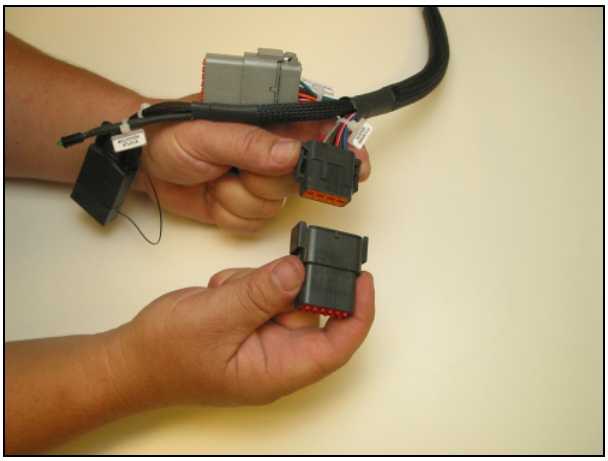


Preparing the harness (P/N 54602 Rev C)

Step 1

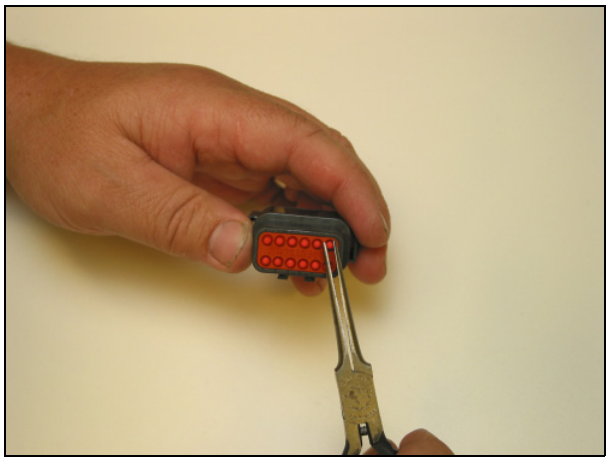
Remove the black Deutsch DTM receptacle from the P-13 sensors leg of the Autopilot controller auxiliary harness.

See Chapter 8, Controller Installation.



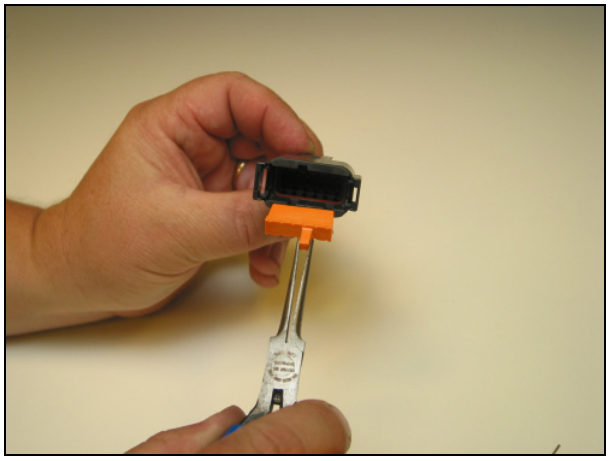
Step 2

Remove the plug from cavity number 1.



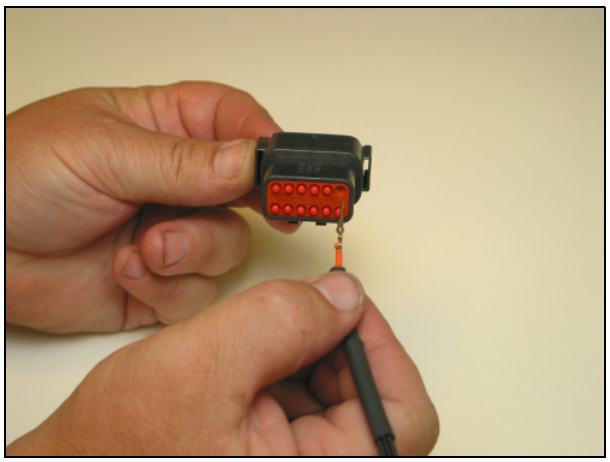
Step 3

Remove the wedge from the connector.



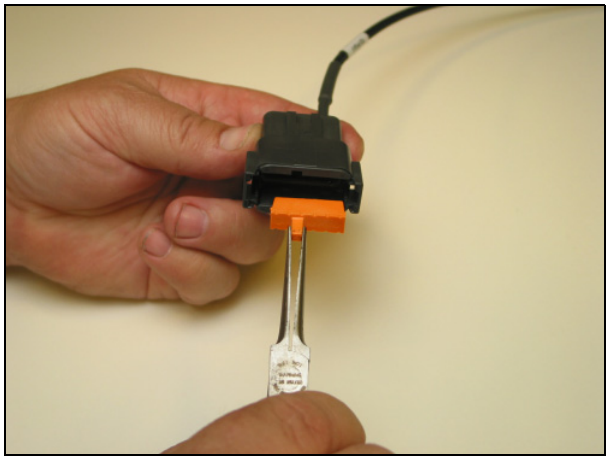
Step 4

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.



Step 6

Plug the assembled Deutsch receptacle into the P-13 sensors leg of the AutoPilot controller auxiliary harness.

See Chapter 8, Controller Installation.

CHAPTER

4

Antenna/Receiver Installation

In this chapter:

- Antenna and receiver installation options
- AgGPS 252 GPS receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AgGPS 252 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AgGPS 252 receiver with magnetic feet
- AgGPS 332 receiver components
- Installing the AgGPS 332 receiver
- AgGPS 442/432 receiver components
- Installing the AgGPS 442/432 receiver
- Installing a SiteNet radio and antenna
- Installing a PDL radio modem

This chapter describes how to install an *Ag*GPS 252 receiver and *Ag*GPS radio module, an *Ag*GPS 332 receiver and antenna, or an *Ag*GPS 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 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. It is recommended for *Ag*GPS 252 mounting. 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 252 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 88.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting.
    - For quick release magnetic mounting with an *Ag*GPS 252 receiver, order the kit listed in Antenna mounting kits, page 13 and bolt the V plate to the spar. When spar mounting is not available and high accuracy is required, see Installing an AgGPS 252 receiver with magnetic feet, page 96 for mounting magnetic feet directly to the base plates.
    - 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.

This table shows the possible mounting methods for each GPS receiver:

GPS receiver	V plate on spar (removable)	VHB plate on roof (removable)	Standard *Ag*GPS 252 plate bolted to spar (permanent)
*Ag*GPS 252 receiver	✓	X	✓
*Ag*GPS 332 receiver	✓	✓	X
*Ag*GPS 432/442 receiver	✓	X	X
EZ-Guide 500 lightbar	✓	✓	X

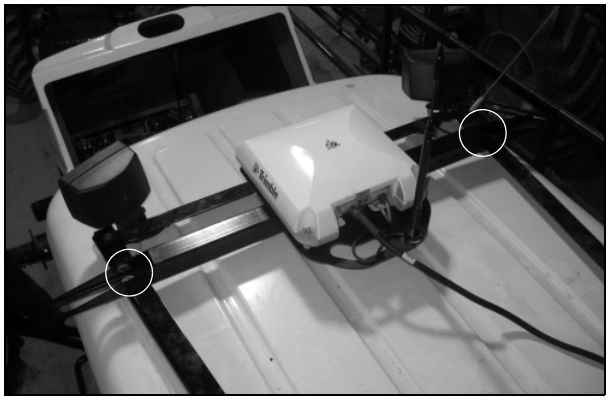
Mounting an adjustable spar to roof bolts

Step 1

Locate the cab bolts on the roof of the vehicle.



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



Step 2

Replace the existing bolts with longer bolts if required.



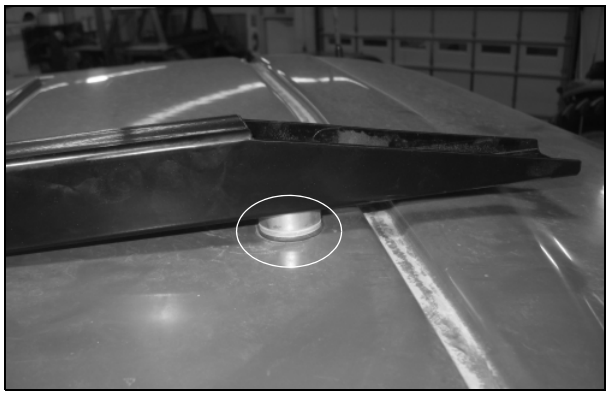
If you use the light bracket, drill two holes to match the spar width.



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, Autopilot system performance may be affected. Ensure that the GPS antenna is aligned with the center of the vehicle before you tighten the cab bolts.*



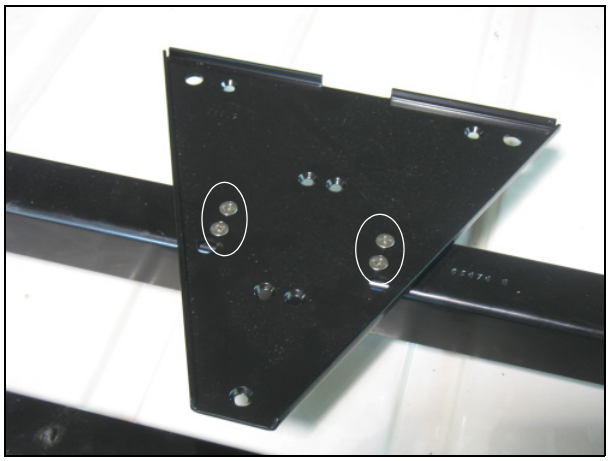
Step 4

For either of the following applications:

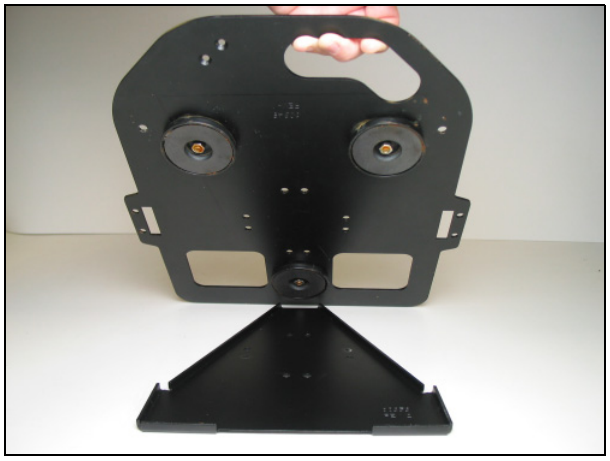
- A single magnet antenna mount
- An *Ag*GPS 252 receiver with magnetic option for quick removal

Install a V plate with four ¼" flathead screws.

The "V" points to the front of the vehicle.



V PLATE ON SPAR



MAGNETIC MOUNT ON V PLATE

If you use a standard *Ag*GPS 252 plate for permanent mounting, complete the radio antenna installation first. Use four ¼" flathead screws to mount the plate with the handle to the back of the vehicle.

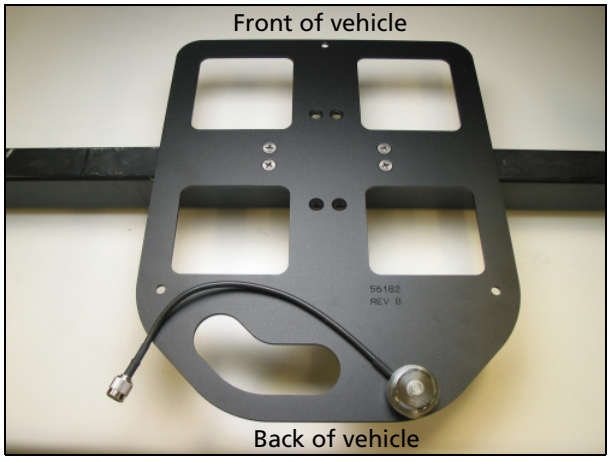


PLATE ON SPAR

Mounting with Very High Bond (VHB) adhesive

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

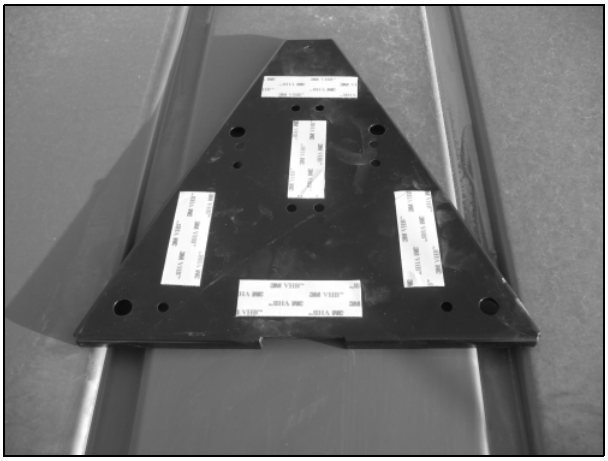
Clean the antenna location on the roof of the cab with a light solvent to remove oil and dust. Apply force to the roof to find a firm location.



Step 2 V PLATE ONLY

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

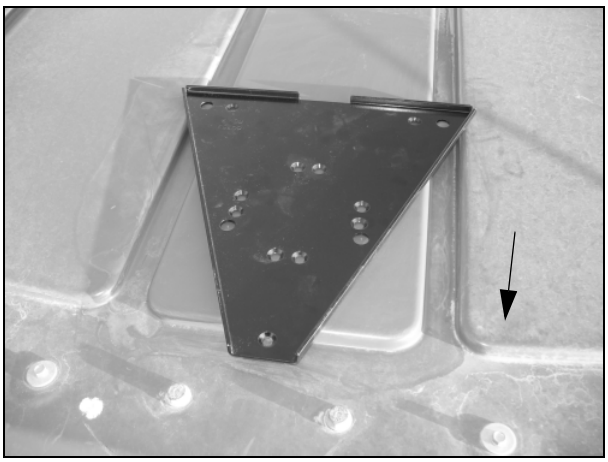
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



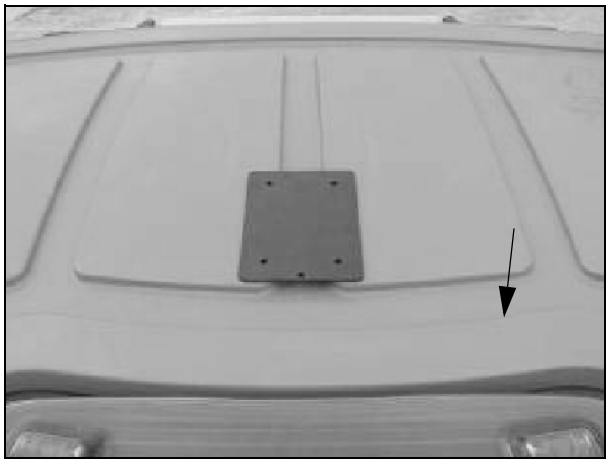
Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof pointed 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.*

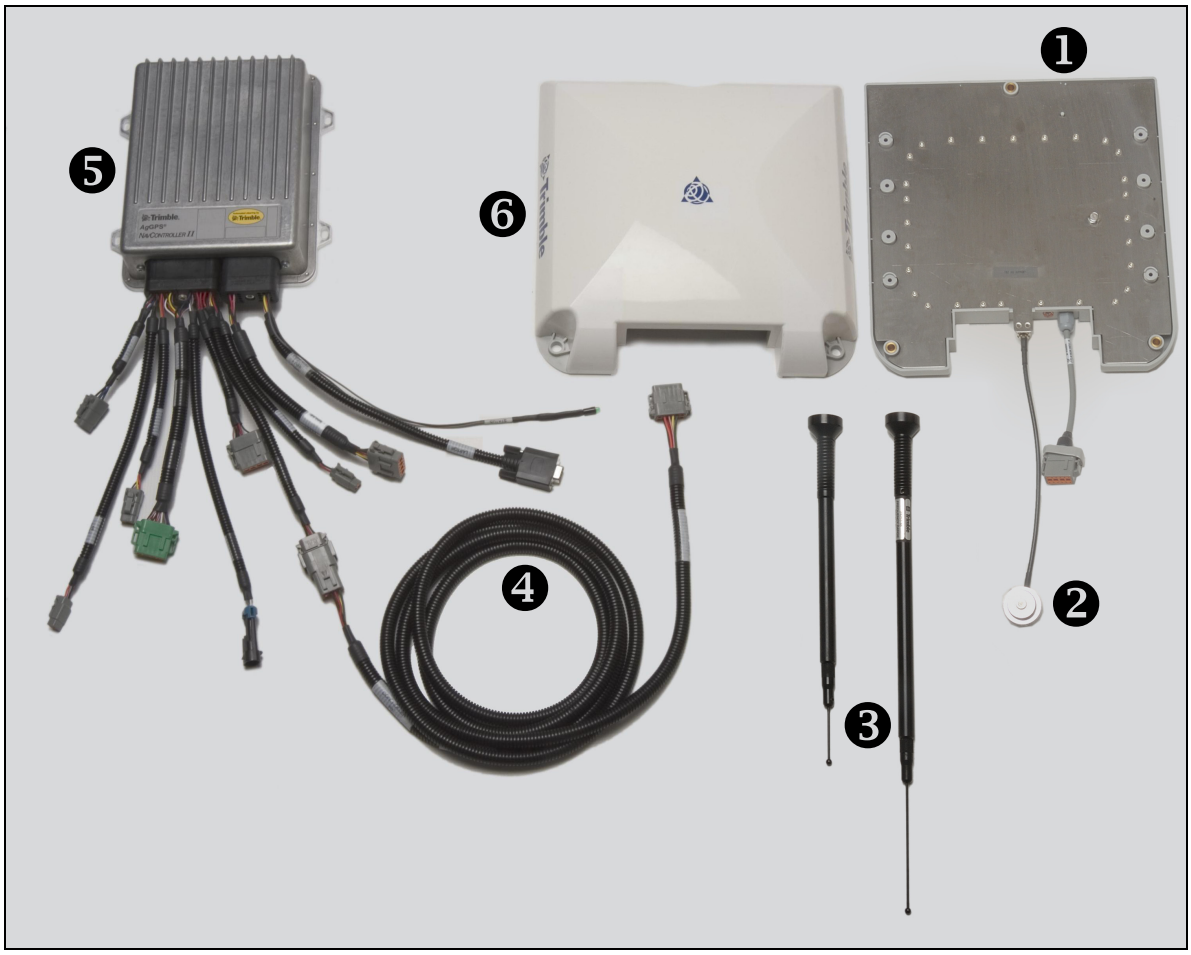


V PLATE SHOWN



4" x 6" PLATE

*Ag*GPS 252 GPS receiver with *Ag*GPS 450/900 radio module (if equipped) components



Item	Description
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 (P/N 54608)
❺	Autopilot controller
❻	*Ag*GPS 252 antenna/receiver

Installing the *Ag*GPS 252 GPS receiver with *Ag*GPS 450/900 radio module (if equipped)

To attach the *Ag*GPS 252 receiver plate to the cab roof, do one of the following:

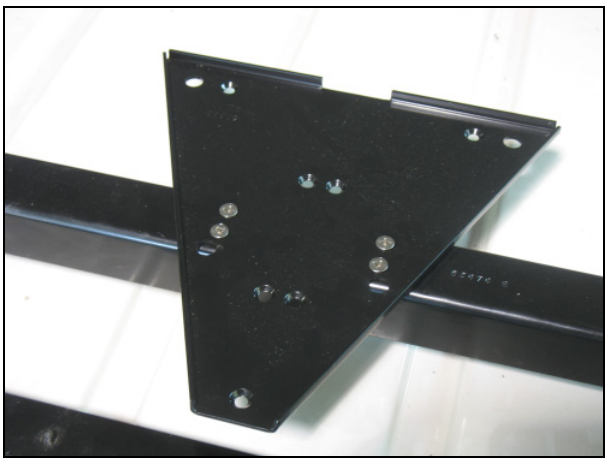
- Attach a V plate to a spar and then stick the receiver plate to the V plate with magnets, for a removable installation.
- Bolt the receiver plate to a spar, for a permanent installation.

Removable magnet mounting option

Step 1 V PLATE

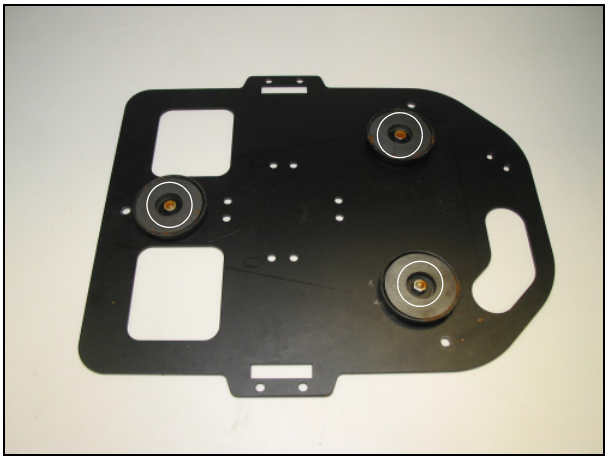
Attach the V plate to the spar using the ¼" flathead screws provided in the V plate bolt kit. Ensure that the "V" points forward.

For spar mounting instructions, see page 85.



Step 2 MOUNTING PLATE

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



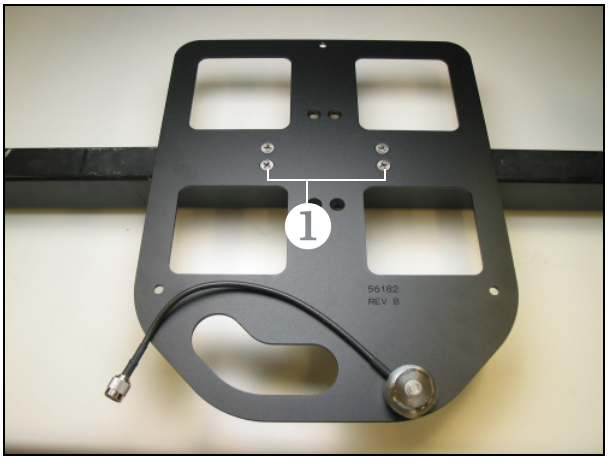
UNDERSIDE OF PLATE SHOWN

Permanent mounting option

Step 1

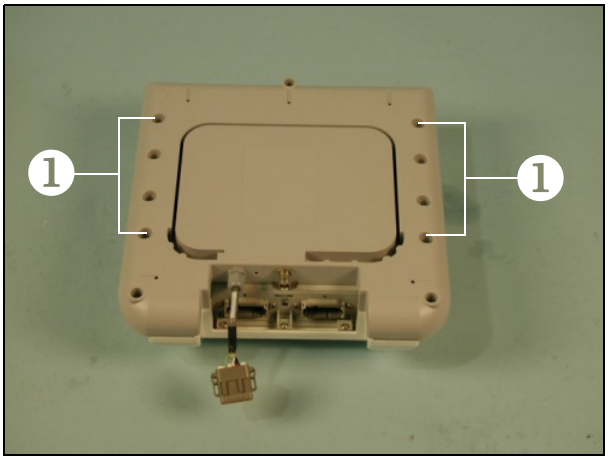
Use the four provided ¼" flathead screws ❶ to attach the receiver mounting bracket to the spar.

For spar mounting instructions, see page 85.



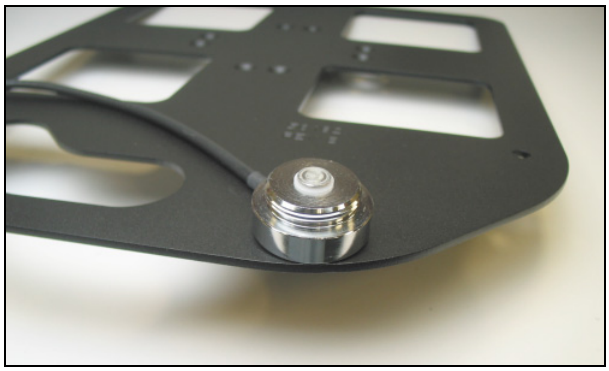
Step 2 BOTH METHODS

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



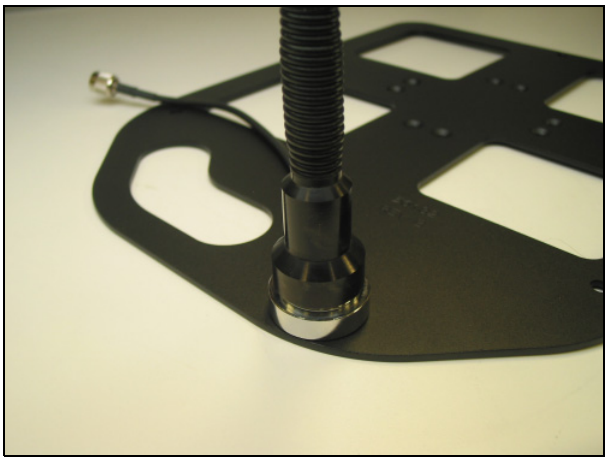
Step 3

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



Step 4

Install the radio antenna to the antenna base.



Step 5

Position the *Ag*GPS 252 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.



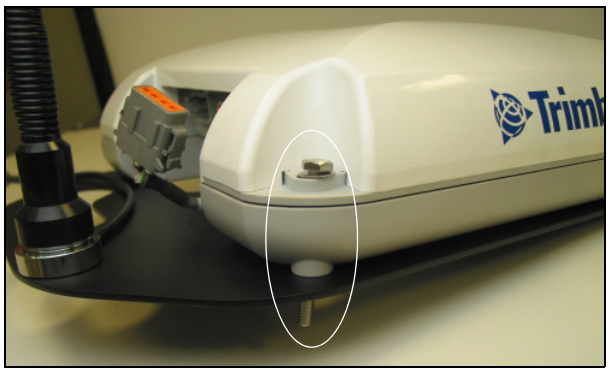
Step 6

Install the nylon bushings provided.



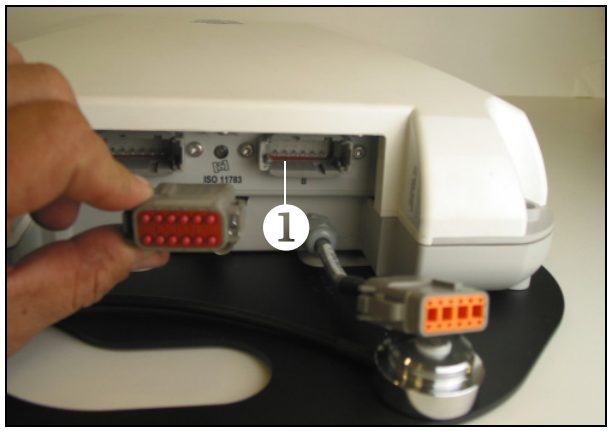
Step 7

Install 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.



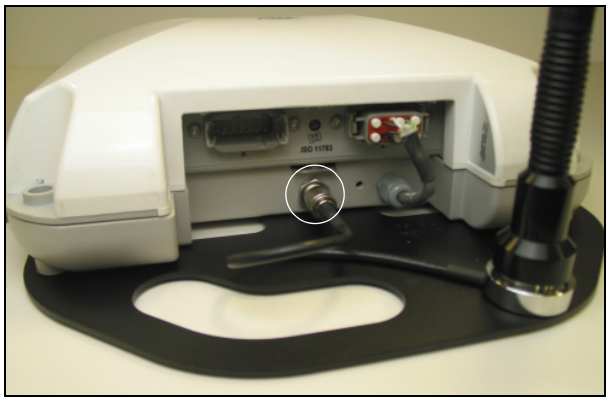
Step 9

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



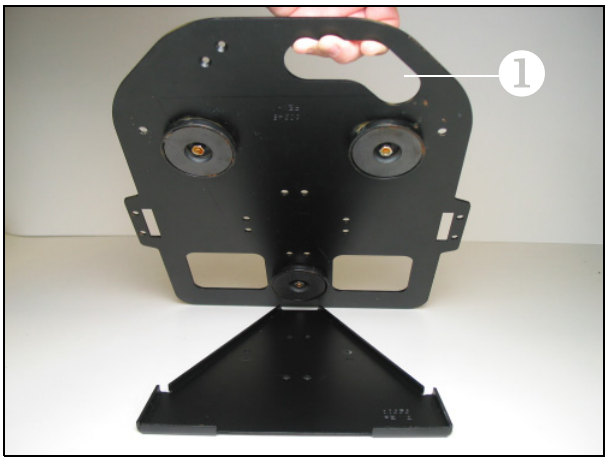
Step 10

Connect the radio antenna to the antenna port.



Step 11 MAGNET METHOD

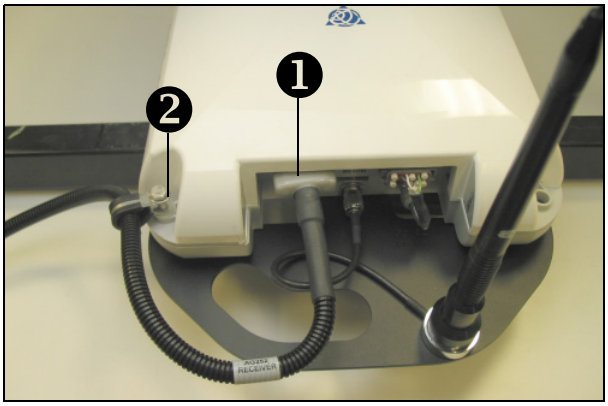
Place the receiver on the roof by aligning the magnets with the V plate. Ensure that the handle ❶ is to the back of the vehicle.



Step 12 BOTH METHODS

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

Route the cable into the cab and into the controller.



Installing an *Ag*GPS 252 receiver with magnetic feet

Only use this option 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 and may require drilling or fabrication if a firm location is not available.

Step 1

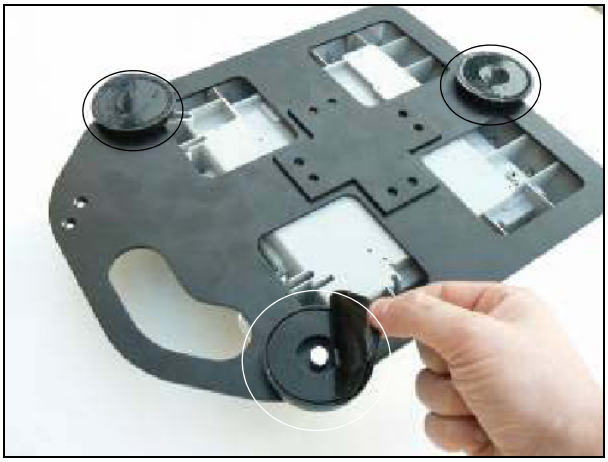
Attach the magnets to the receiver mounting plate. Mount the *Ag*GPS 252 GPS receiver using the three ¼" bolts.

Place the nuts on the receiver side.



Step 2

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

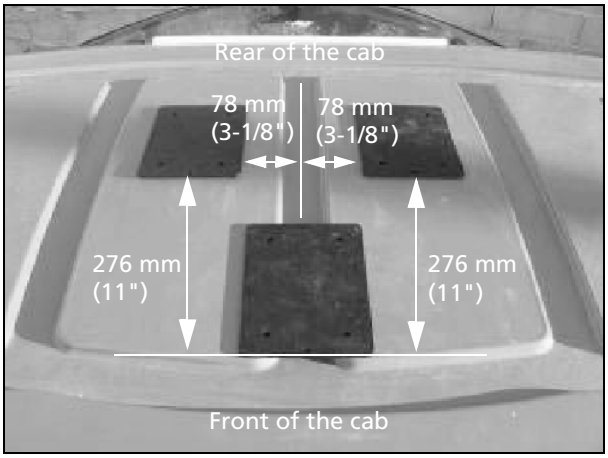


Step 3

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

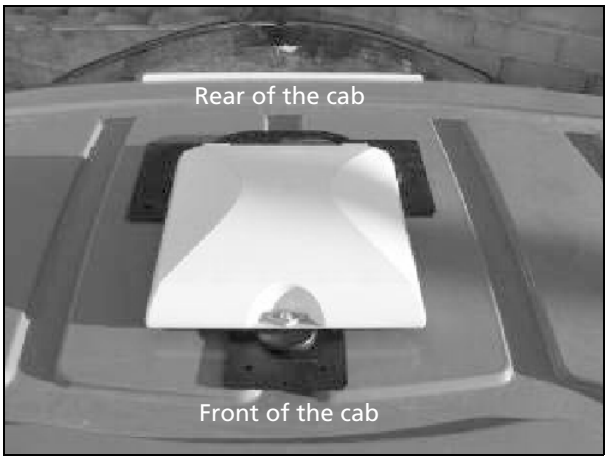
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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



Step 4

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



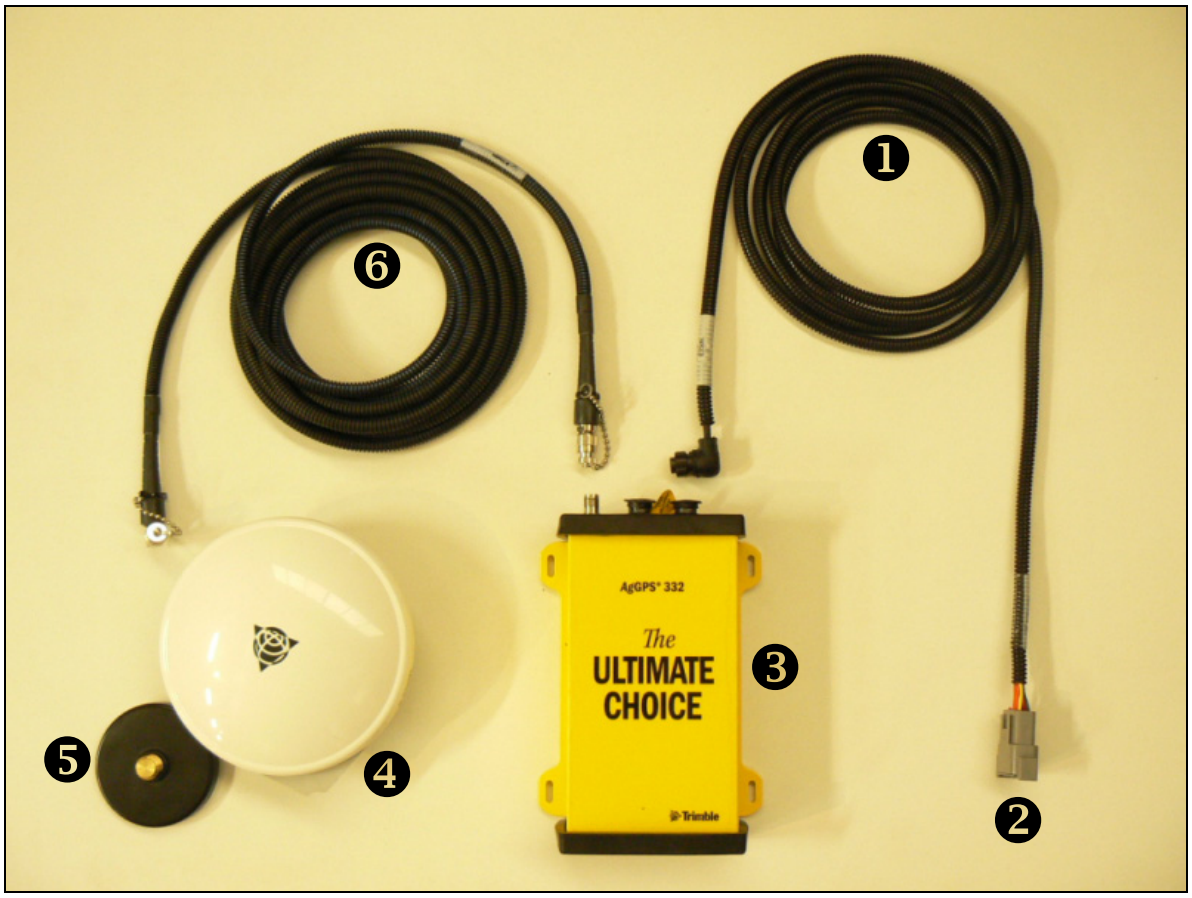
Step 5

Connect the antenna cable to port A of the *Ag*GPS 252 GPS receiver and then route the cable toward the NavController II controller harness.



*Ag*GPS 332 receiver components

Note – *To receive RTK corrections with a radio, Trimble recommends the use of the AgGPS 432 GPS receiver with integrated radio modem.*



Item	Description
❶	Receiver-to-Autopilot controller cable (P/N 54610)
❷	To controller “P3 GPS” connection
❸	*Ag*GPS 332 GPS receiver
❹	GPS antenna
❺	Magnetic mount
❻	GPS antenna cable

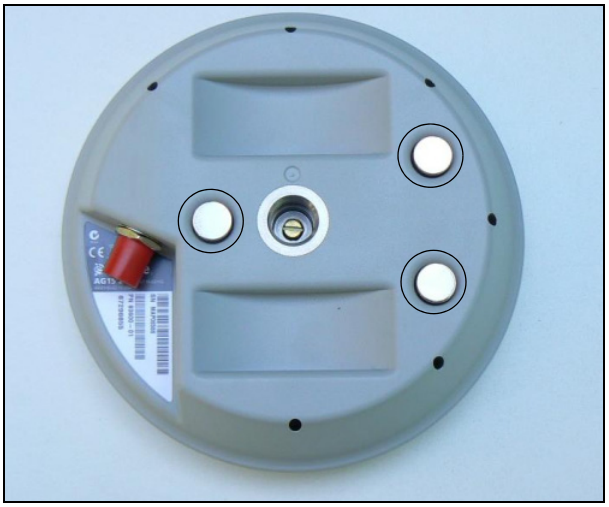
Installing the *Ag*GPS 332 receiver

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 ANTENA (RTK, OmniSTAR, DGPS)

Place the antenna against the lip at the point of the V plate for repeatable positioning.



L1 SINGLE BAND ANTENNA (WAAS, EGNOS, VBS, Beacon)

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



Step 3

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

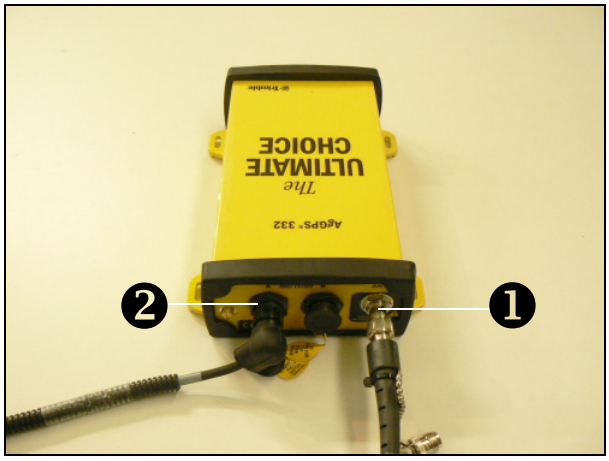


Step 4

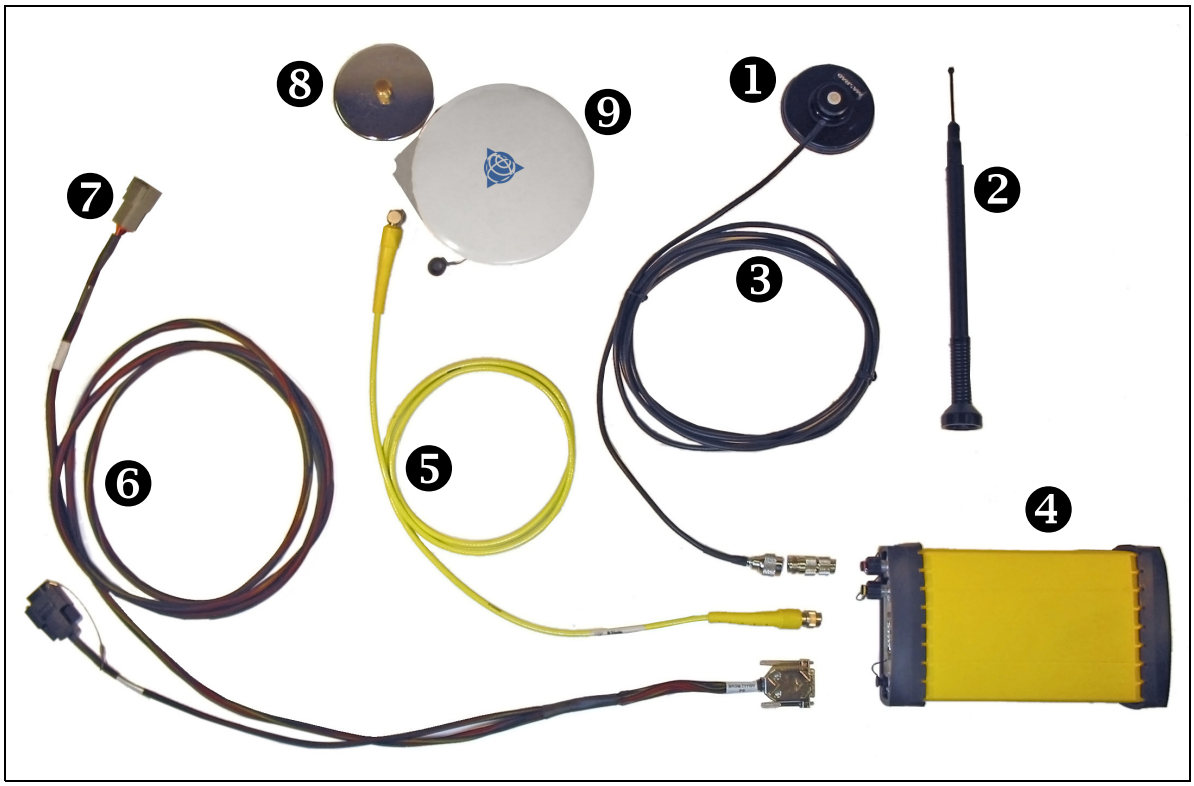
Mount the receiver in a convenient location in the cab.

Route the antenna cable ❶ to the receiver and then connect it. Connect the controller cable to cavity "A" ❷ of the receiver.

Controller cable connections will be established later in the *Installation Instructions*.



*Ag*GPS 442/432 receiver components



Item	Description
❶	Radio antenna magnetic base
❷	Radio antenna
❸	Radio antenna cable
❹	*Ag*GPS 442/432 GPS receiver
❺	Antenna cable
❻	Receiver cable (P/N 62037)
❼	To controller "P3 GPS"
❽	Antenna magnetic mount
❾	*Ag*GPS 442/432 antenna

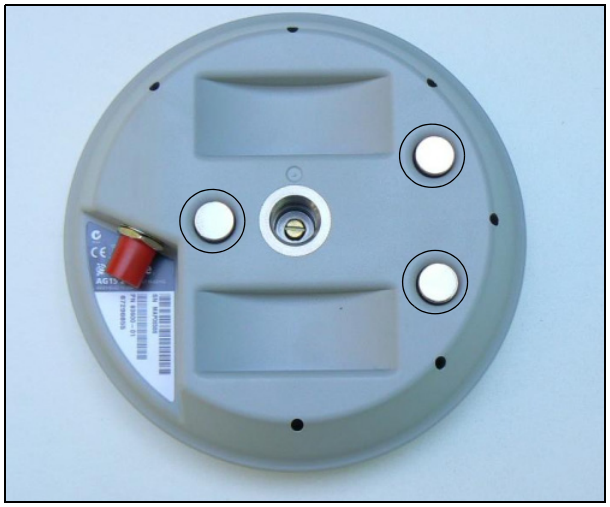
Installing the *Ag*GPS 442/432 receiver

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)

Place the antenna against the lip at the point of the V plate for repeatable positioning.



Step 3

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



Step 4

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

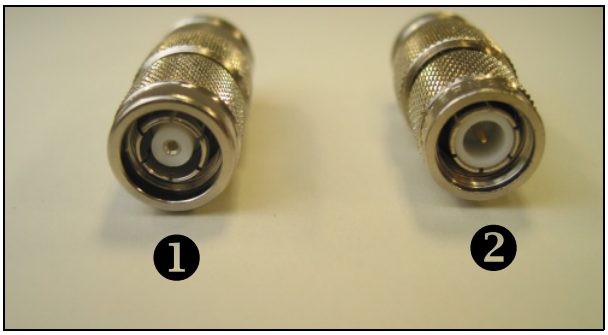


Step 5

Identify the correct adaptor for the radio connection:

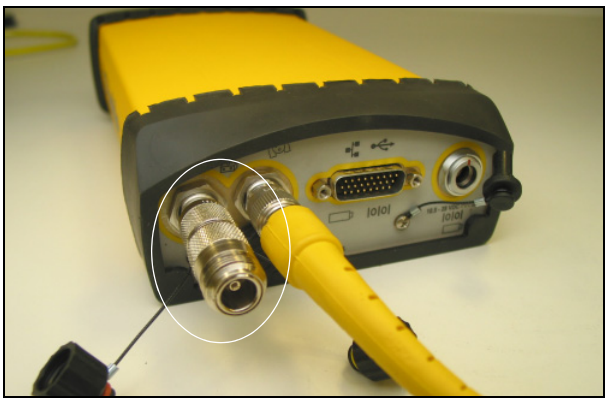
❶ Reverse polarity TNC-to-N for 900 MGHz radios

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



Step 6

Attach the adaptor to the radio port.



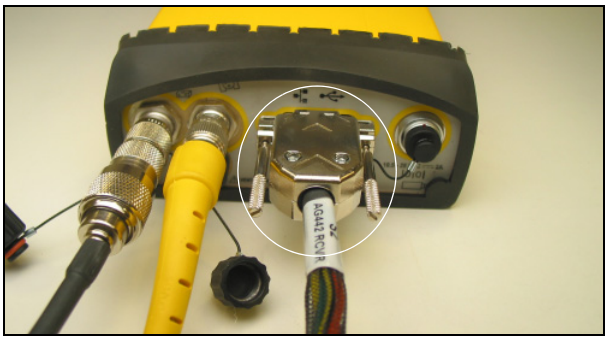
Step 7

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 established later in the *Installation Instructions*.



Step 9

Connect the radio antenna to the magnetic antenna base.



Step 10

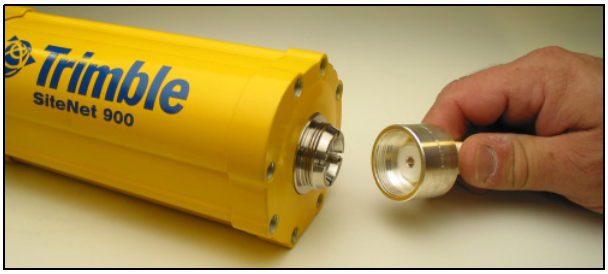
Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the 4" x 6" plate with the VHB provided to relocate the antenna.



Installing a SiteNet radio and antenna

Step 1

Install the SiteNet radio in the cab in a location where it is hidden and secured from rolling. Connect the antenna adaptor to the SiteNet radio.



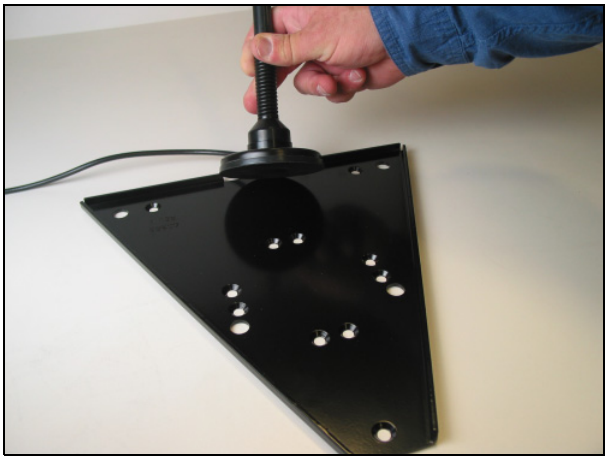
Step 2

Connect the radio antenna to the magnetic antenna base.



Step 3

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.



Step 4

Feed the radio antenna cable down from the roof and into the cab to the radio. Connect the cable to the radio.



Installing a PDL radio modem

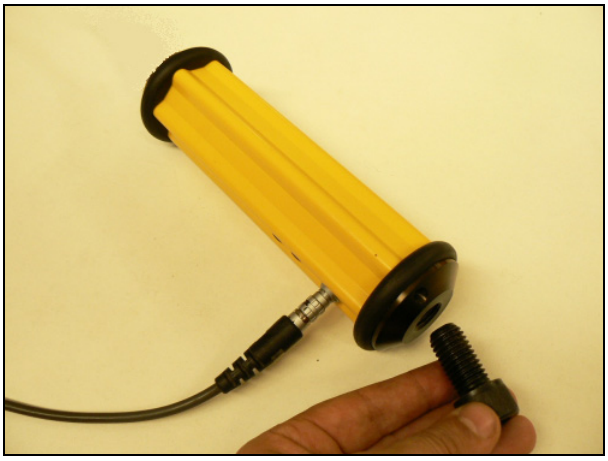
Step 1

Install the radio in a location where it is accessible when the operator needs to select a new radio channel ID.



There are several mounting options:

- For a permanent mount, bolt the radio onto a bracket with a 5/8" UNC screw.

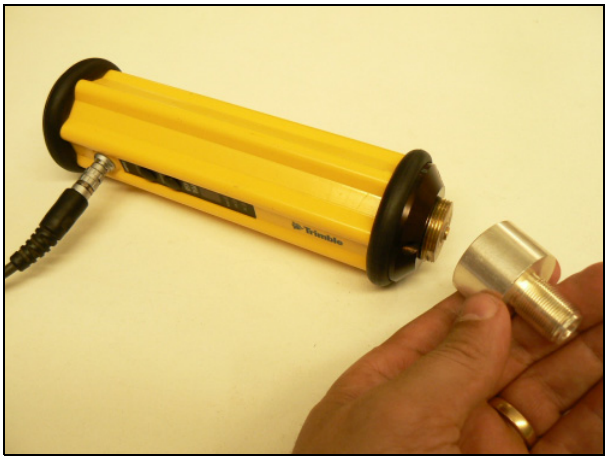


- For a temporary mount (so it can be moved between vehicles), mount the radio on a magnet with a 5/8" UNC stud.



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

5

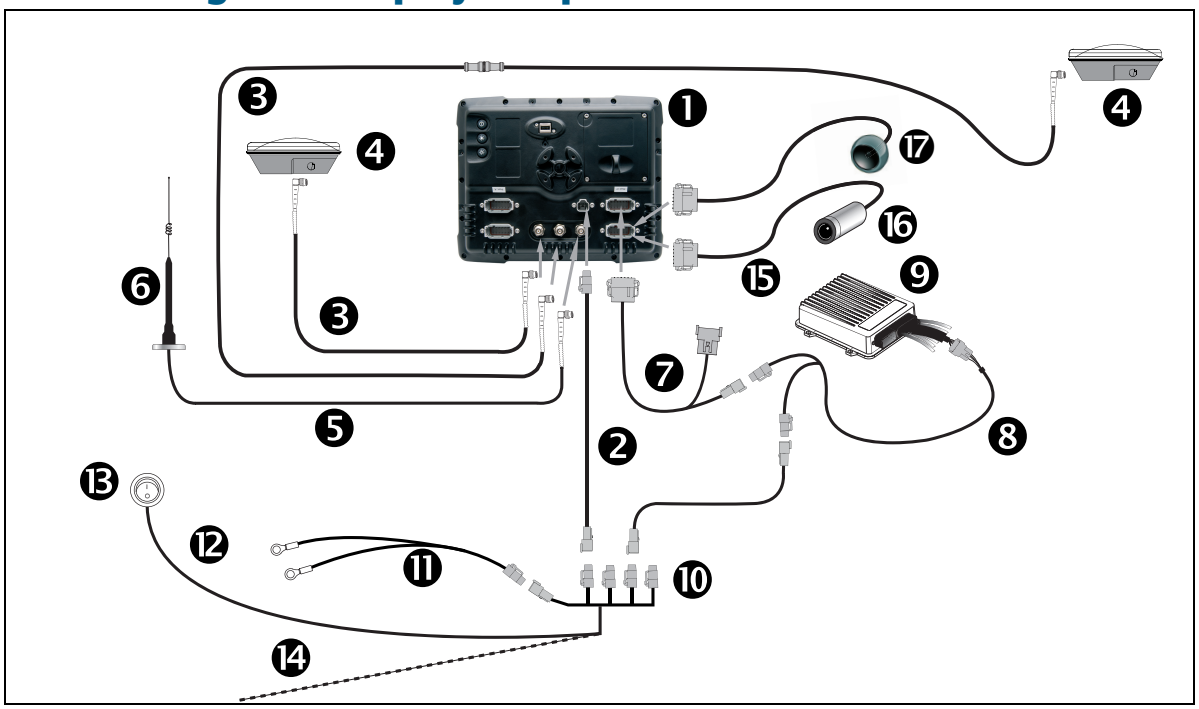
Display Installation

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, or the EZ-Guide 500 lightbar in the vehicle.

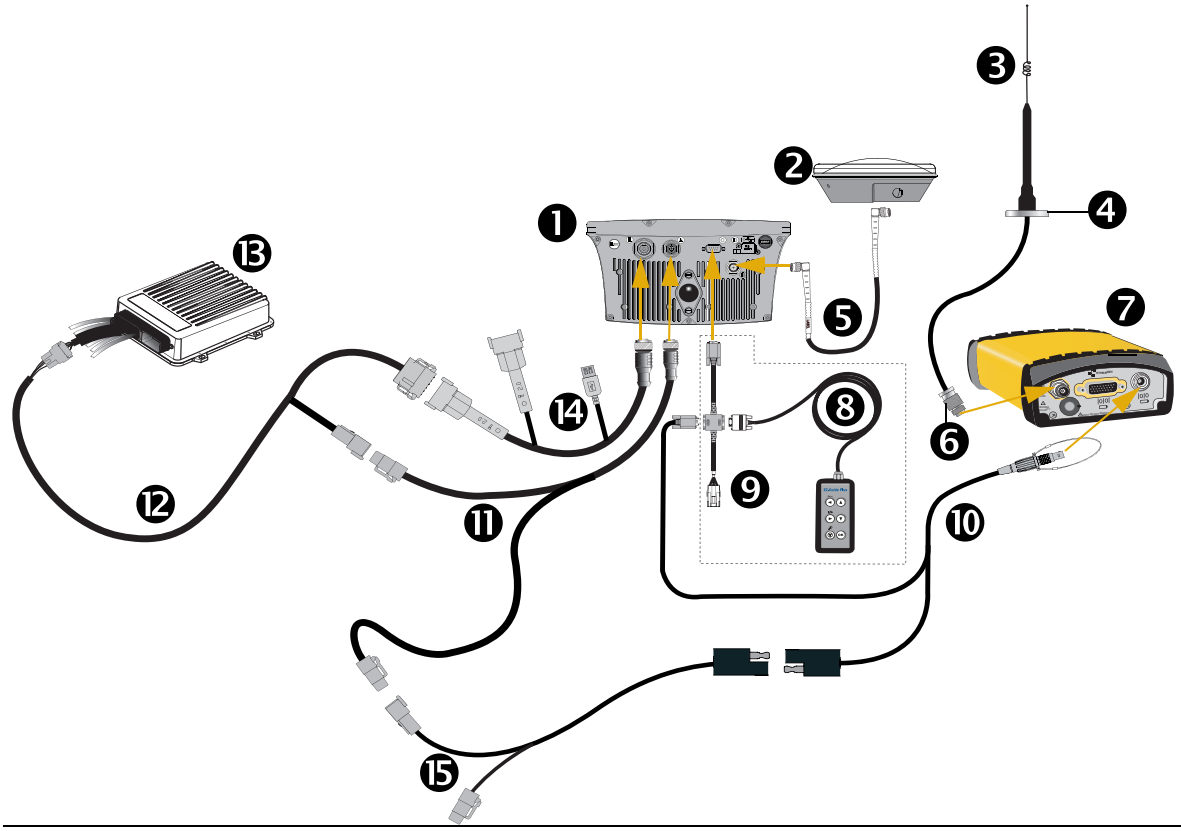
FmX integrated display components



Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	GPS, 5M, TNC/TNC RT angle cable	50449
❹	GPS antenna	57200-00
❺	Antenna cable and base	62120
❻	SNB900 radio antenna kit	28822-10
❼	FmX to NavController II cable w/ port replicator	65522
❽	NavController II main cable	54601
❾	NavController II	55563-00
❿	FmX power cable w/ relay and switch	67259
⓫	FmX basic power cable	67258
⓬	Switch cable	Incl with 67259
⓭	Switch - optional (illuminated switch sold separately)	Incl with 67259
⓮	Ignition sense cable	Incl with 67259
⓯	FmX to camera cable	67090

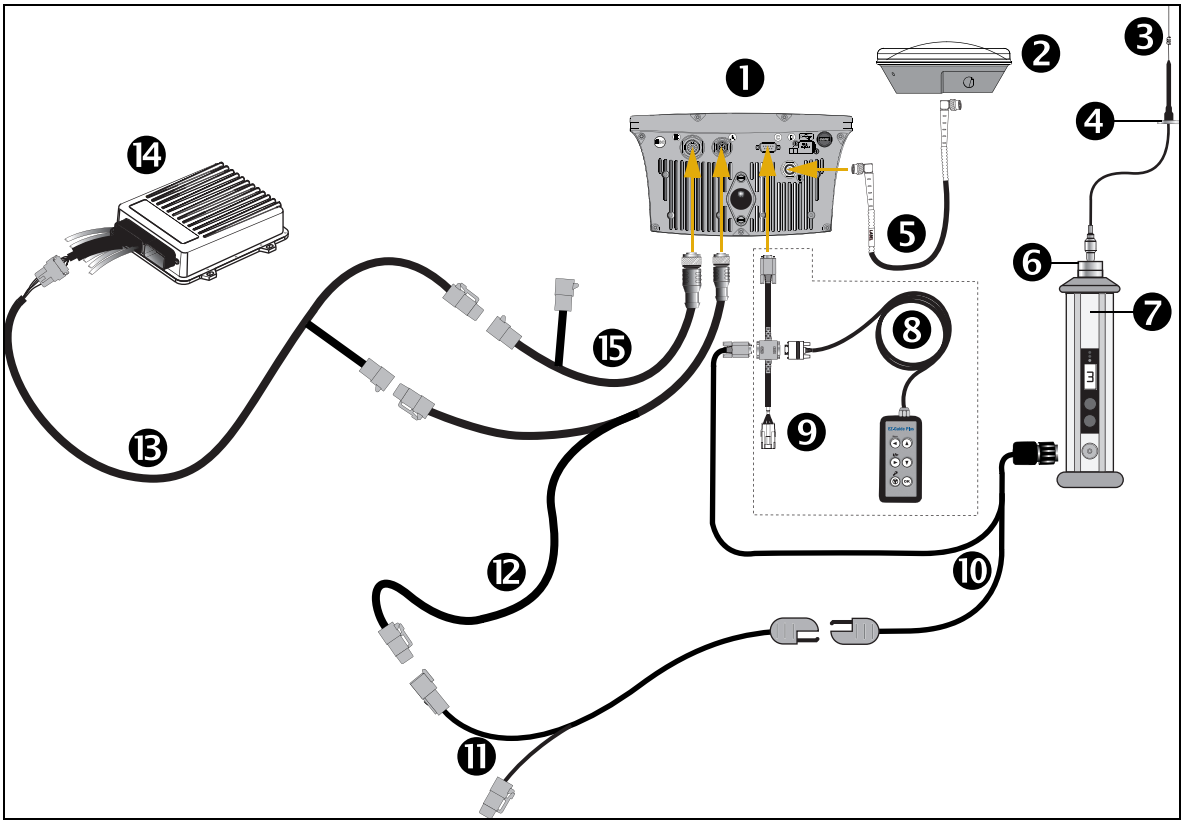
EZ-Guide 500 lightbar components

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



Item	Description	Trimble part number
❶	EZ-Guide 500 lightbar	
❷	GPS antenna	57200-00
❸	SNB900 radio antenna	22882-00
❹	SNB900 radio antenna magnetic mount	62109
❺	GPS antenna cable	50449
❻	N Female to REV. POL TNC Male	62114
❼	SNB900 radio	X8480-X0
❽	Remote keypad (optional)	66030-00
❾	External interface cable	62749
❿	Radio power/data cable	61158
⓫	EZ-Guide 500 power cable	62817
⓬	EZ-Guide 500-to-Autopilot cable	62754
⓭	NavController II	55563-00
⓮	Port expansion cable	62609
⓯	Power tap to PDL radio	63185

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



Item	Description	Trimble part number
❶	EZ-Guide 500 lightbar	
❷	GPS antenna	57200-00
❸	PDL 450 radio antenna	5187-x0-x0
❹	Radio antenna magnetic mount	62109
❺	GPS antenna cable	50449
❻	Radio antenna connector	63278
❼	PDL 450 radio	62550-4x-xx
❽	Remote keypad (optional)	66030-00
❾	External interface cable	62749
❿	PDL radio power/data cable	51861-00
⓫	Power tap to PDL radio	63185
⓬	EZ-Guide 500 power cable	62817
⓭	EZ-Guide 500-to-Autopilot cable	62754
⓮	NavController II	55563-00
⓯	Port expansion cable	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.



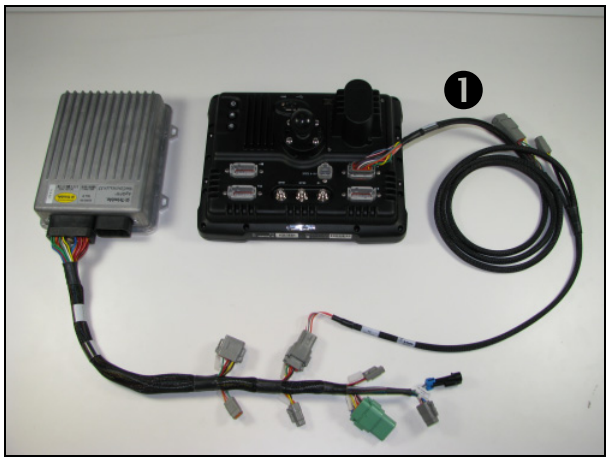
Step 2

Attach the free end of the RAM mount to the existing right side cab post. Tighten the clamp on the RAM mount so that the display is secure.

FmX integrated display: Installing the wiring harness

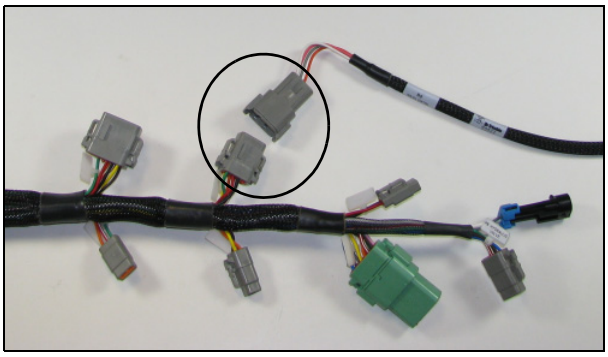
Step 1

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



Step 2

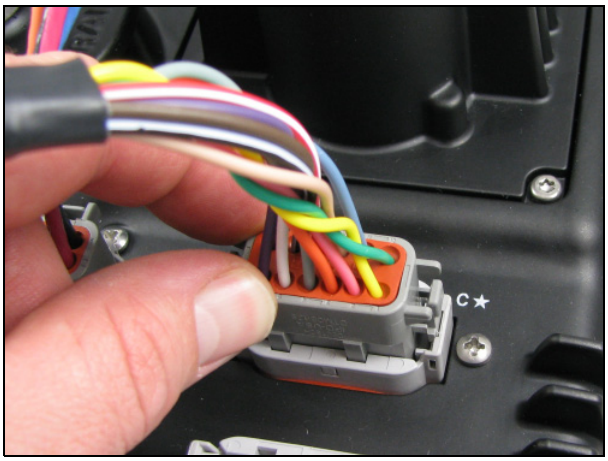
Connect the cable to the P3 connector on the NavController II main harness, and then route the cable from the NavController II to the mounting location on the FmX integrated display.



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.

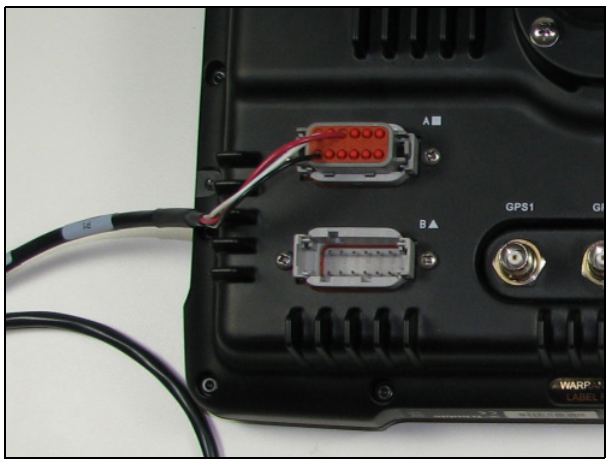
Step 3

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.

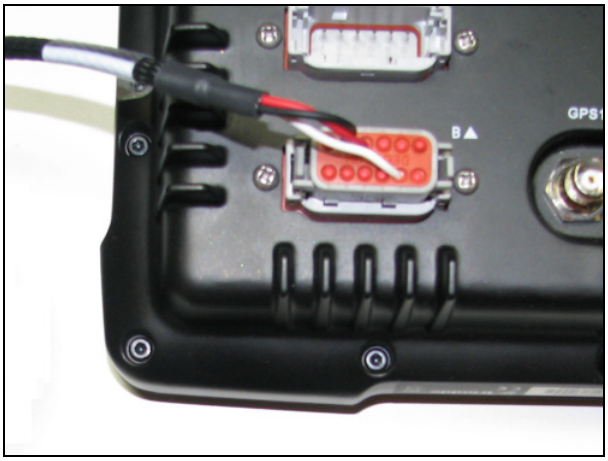


Step 2

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.

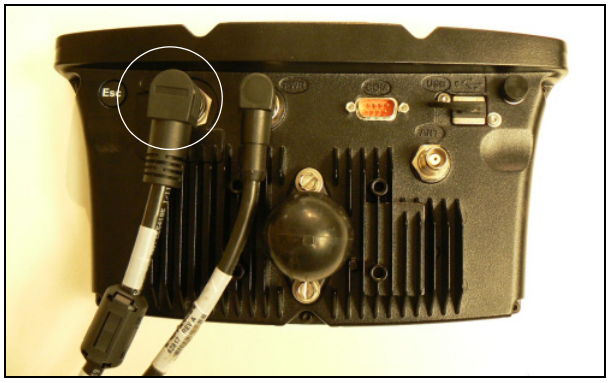


Connecting the EZ-Guide 500 lightbar cables

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

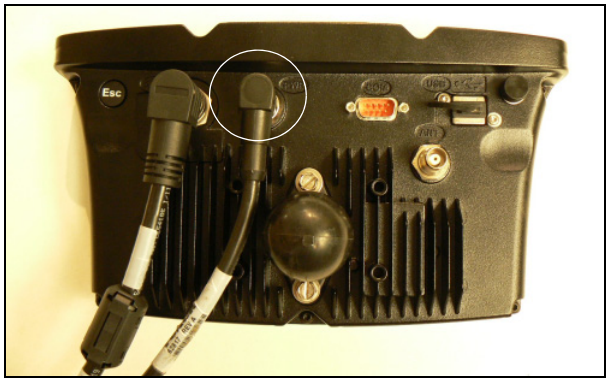
Step 1

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

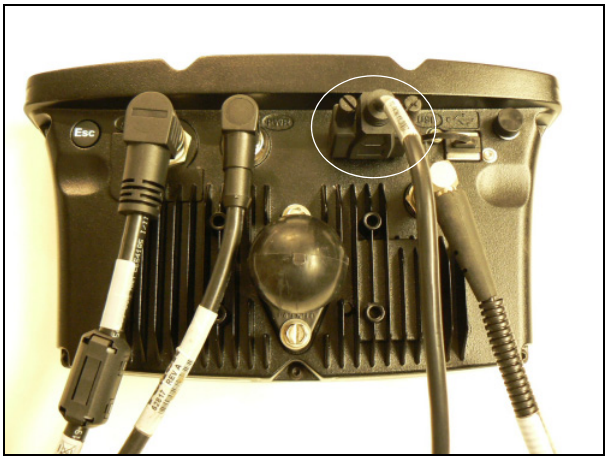
Feed the GPS antenna cable into the cab and then connect it to the antenna port on the back of the lightbar.



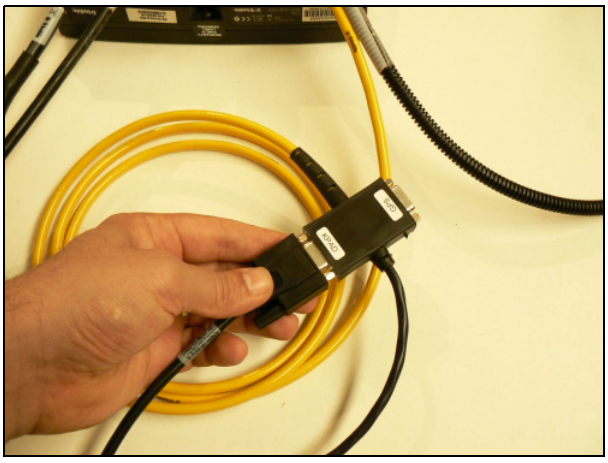
Step 5

With keypad

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

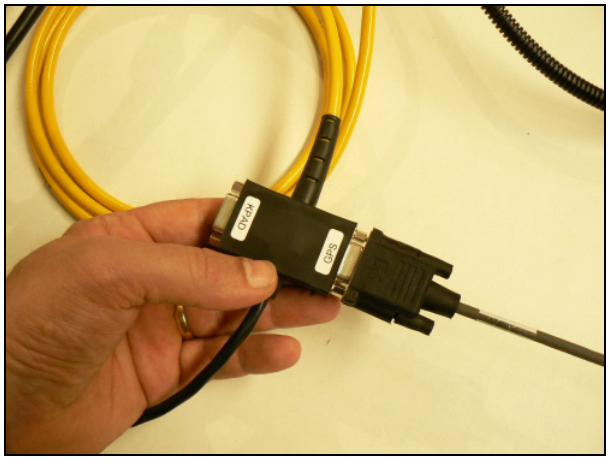


Connect the remote keypad to the KPAD serial port on the external interface cable.



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

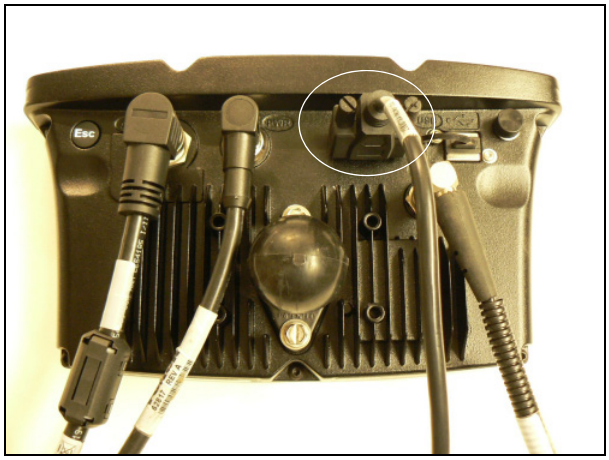
Radio type	Cable to connect
SNB900 radio	EZ-Guide 500-to-radio cable (P/N 61158)
PDL 450 radio	PDL radio power/data cable (P/N 51861-00)



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 13**.*

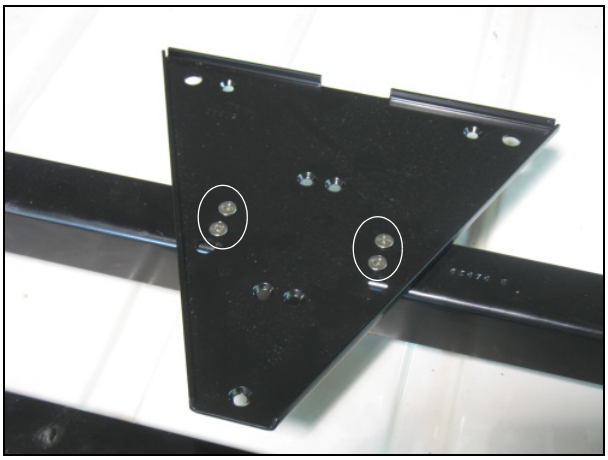
Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations. For more information, see Antenna mounting kits, page 13.

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.

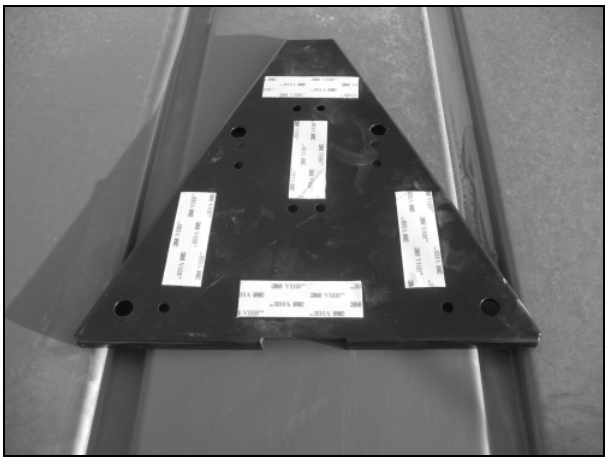


Step 2

V plate only

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

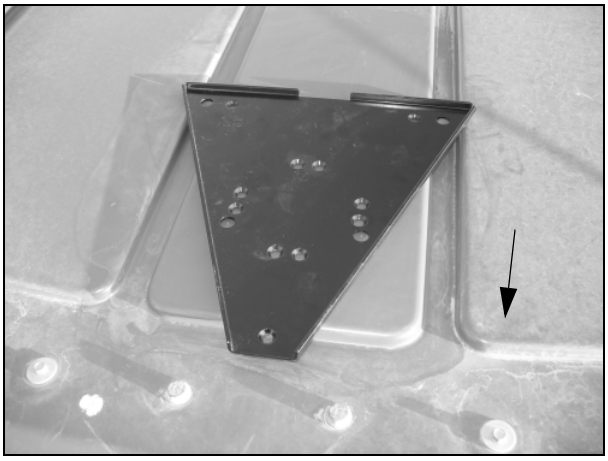
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



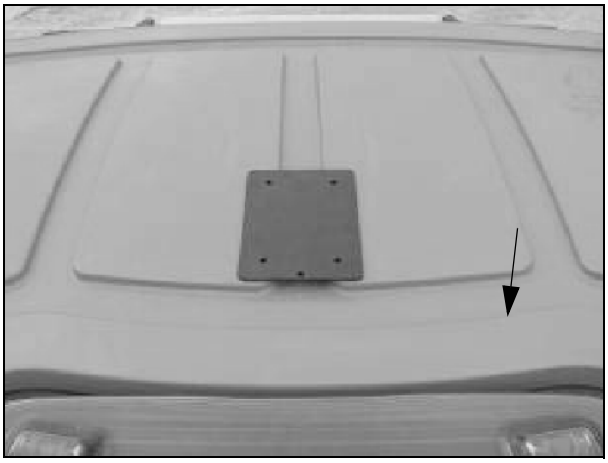
Step 3

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.*



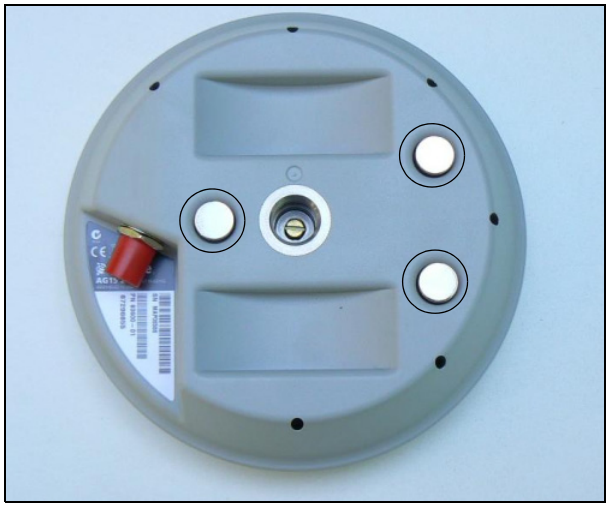
V plate



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.

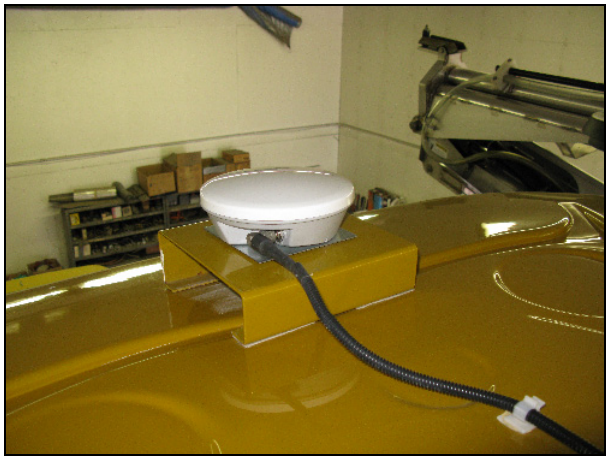


Step 6

Both models

Attach the antenna/receiver cable to the antenna and then route the cable into the cab.





Antenna mounting example



Antenna cable routing example

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.

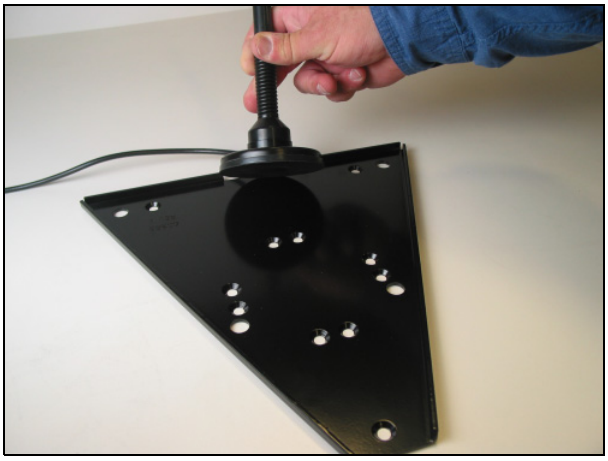
Step 1

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.

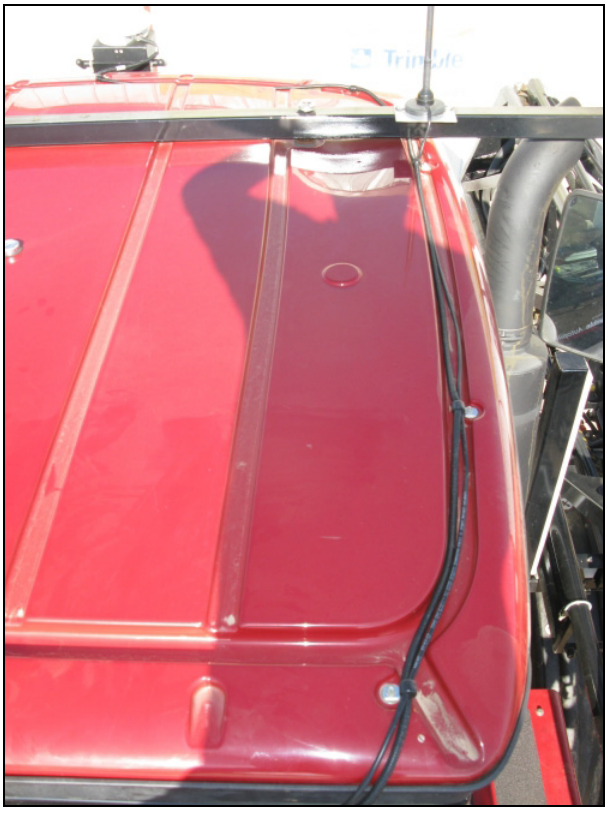


Step 3

Route the radio cable from the roof into the cab.



Radio antenna mounting example



Radio antenna cable routing example

EZ-Guide 500 lightbar: Installing a PDL radio modem

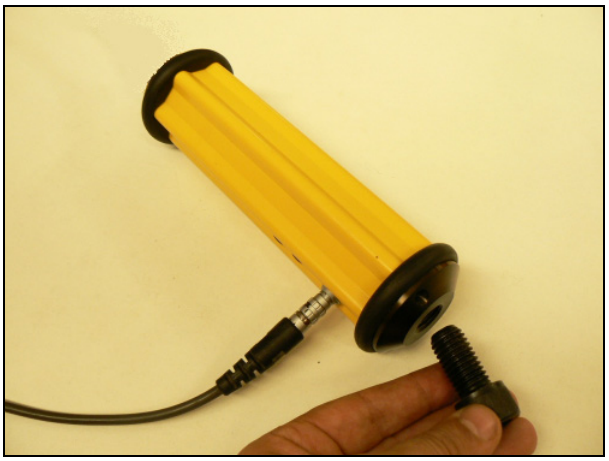
Step 1

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.



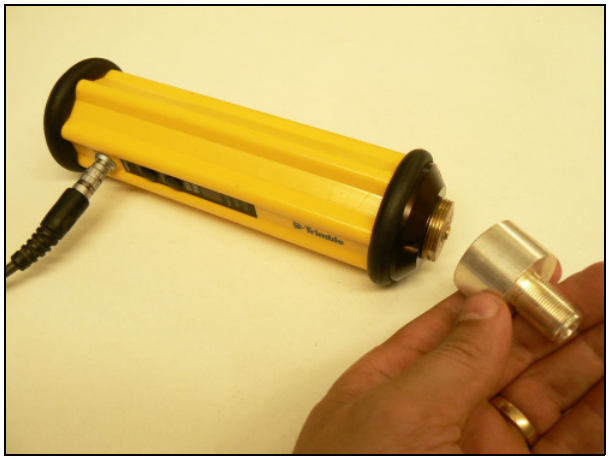
Temporary mount

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



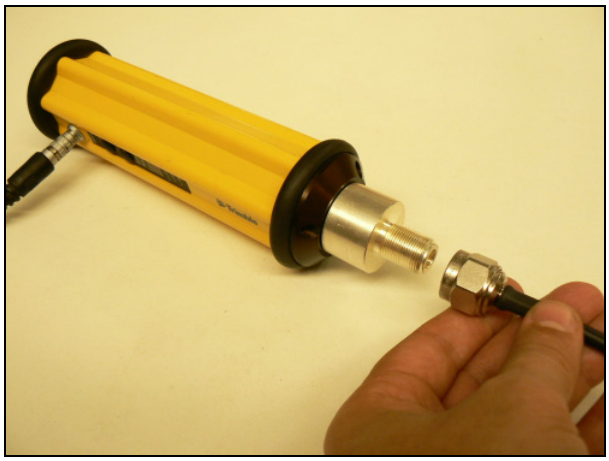
Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

6

Power Harness Installation

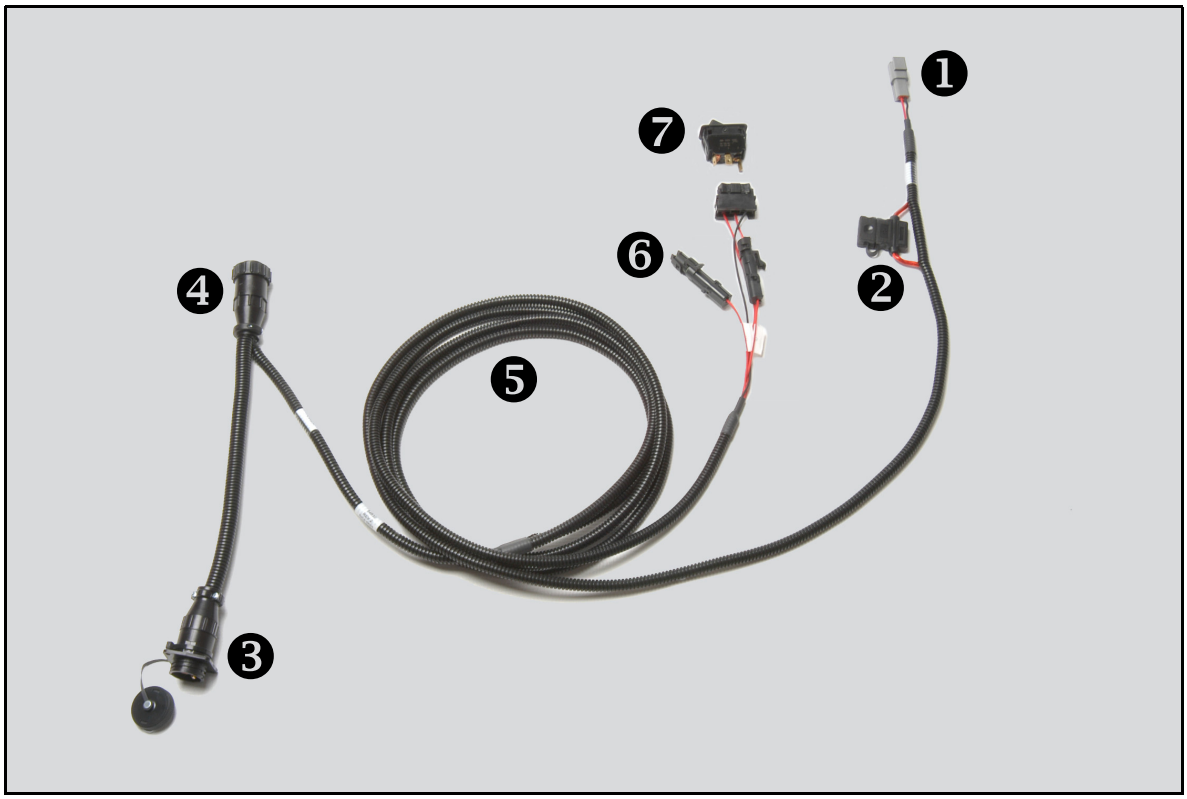
In this chapter:

- Power harness components
- Installing the power harness: Models 6103, 8103, 81x4, and 910x
- Installing the power harness: Models 6203, 8203, 82x4, and 920x

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

Power harness components

Note – *The power harness is not included in the installation kit for the 9103 vehicle.*



Item	Description
u	Controller power connection
v	Fuse holder - Littlefuse 257010, 10 amp
w	Extra accessory outlet
x	Accessory jumper cable
y	Power harness cable (P/N 54630)
z	Switch receptacle
{	Switch

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

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

Installing the power harness: Models 6103, 8103, 81x4, and 910x

Step 1

Locate the auxiliary power connection on the switch panel to the right of the operator seat.



Step 2

Remove the switch panel.



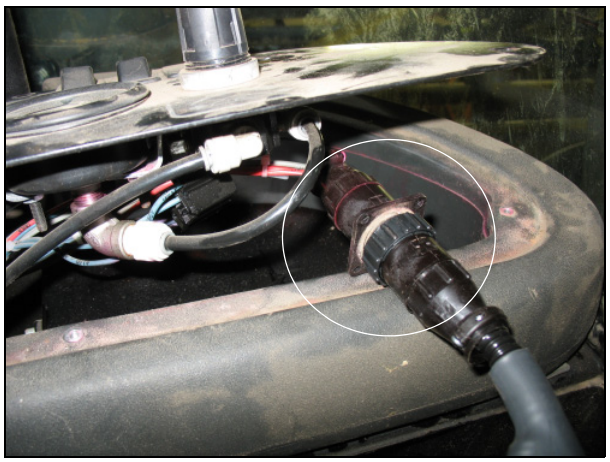
Step 3

Remove the auxiliary connector from the panel. This view is from below the panel.



Step 4

Connect the power harness to the existing connector removed in the previous step. Install the opposite end of the supplied power cable jumper in place of the original connector.



Step 5

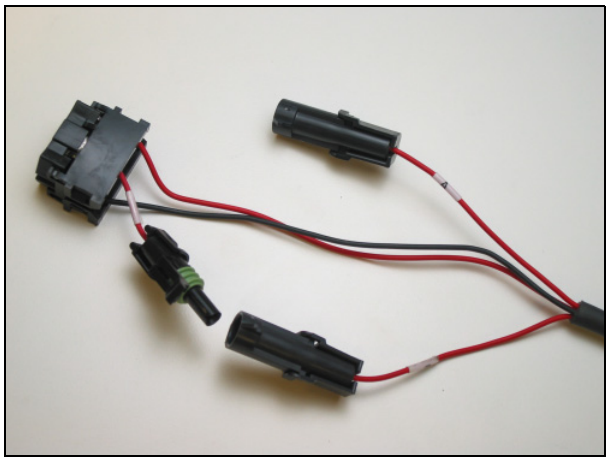
Route the switch receptacle through a knockout plug and the opposite end of the cable to the Autopilot controller.



Step 6

Move the switched power from the A lead to the B lead at the 1-pin Weatherpack connector.

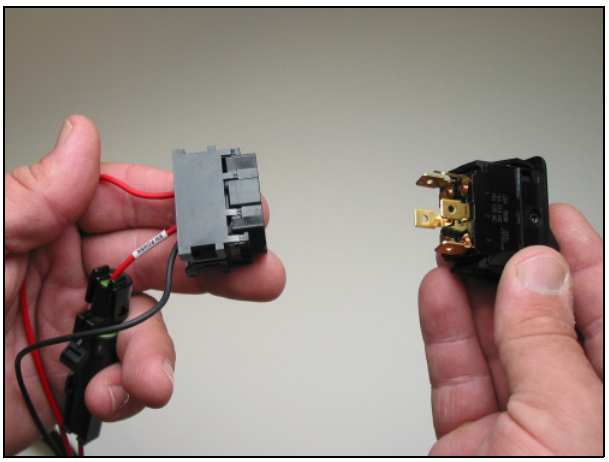
Note – *The A lead is battery power. The B lead is switched power.*



Step 7

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

Note – *If the switch is properly connected, the switch will light up when you turn on the Autopilot system.*



Step 8

Reinstall the switch panel.





Alternative switch mount location

Installing the power harness: Models 6203, 8203, 82x4, and 920x

Step 1

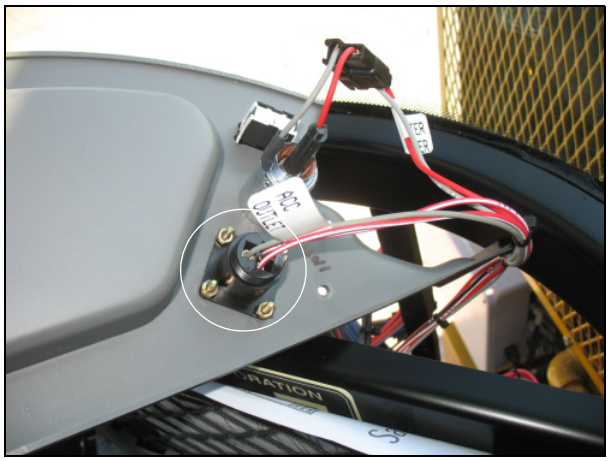
Locate the auxiliary power connection on the switch panel to the right of the operator seat.



Step 2

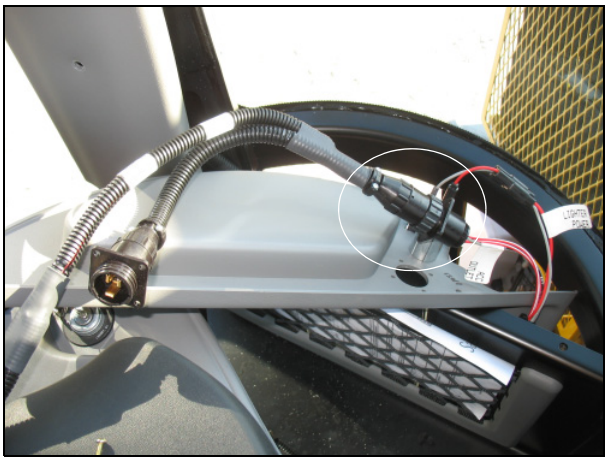
Remove the auxiliary connector from the panel.

Note – *This view is of the underside of the panel.*



Step 3

Connect the power harness to the existing connector removed in the previous step.



Step 4

Install the opposite end of the supplied power cable jumper in place of the original connector.



Step 5

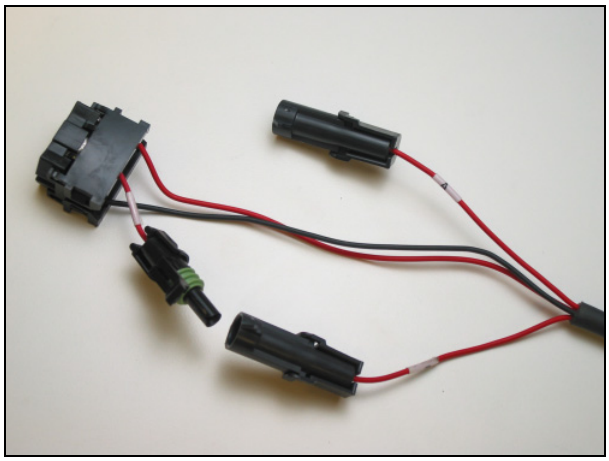
Route the switch receptacle to a knockout and the controller connection to the controller.



Step 6

Move the switched power from the "A" lead to the "B" lead at the 1-pin Weatherpack connector.

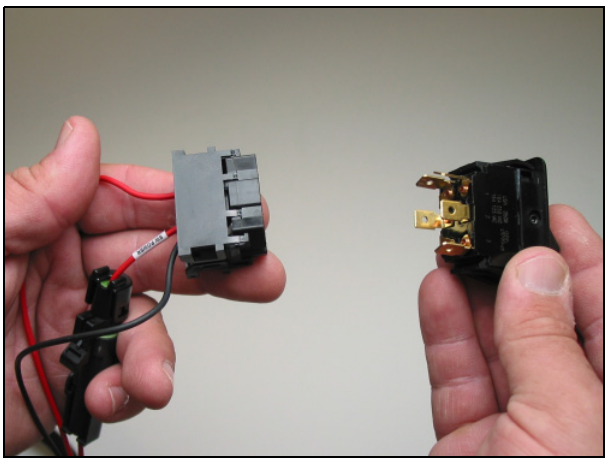
Note – *The "A" lead is battery power. The "B" lead is switched power.*



Step 7

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

Note – *If the switch is properly connected, the switch will light up when you turn on the Autopilot system.*



Step 8

Install the switch in the panel.



CHAPTER

7

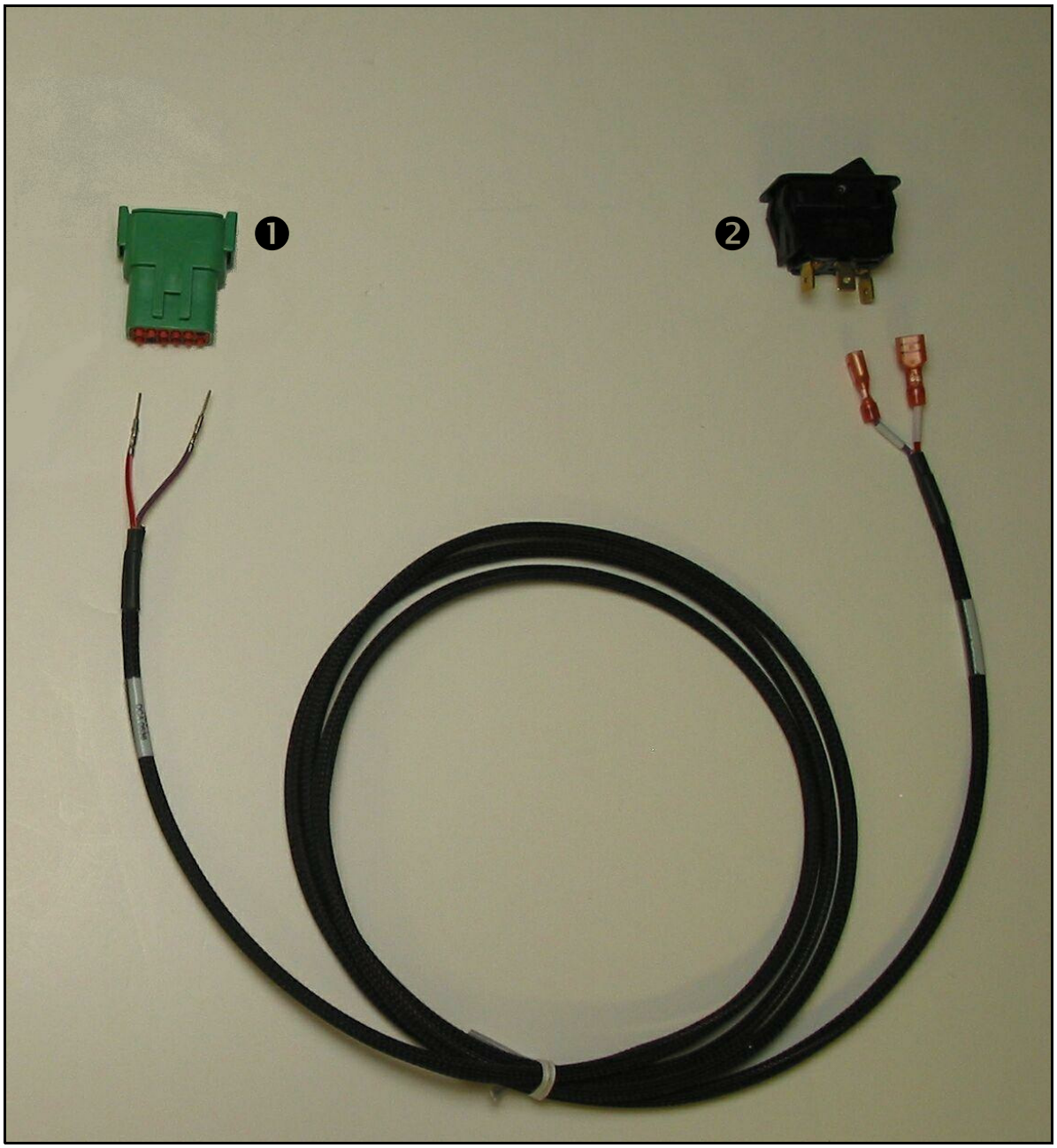
Remote Engage Switch Installation

In this chapter:

- Remote engage switch components: Rocker switch
- Remote engage switch components: Foot switch
- Preparing the remote engage cable
- Using the remote engage switch

This chapter describes how to install the remote engage switch.

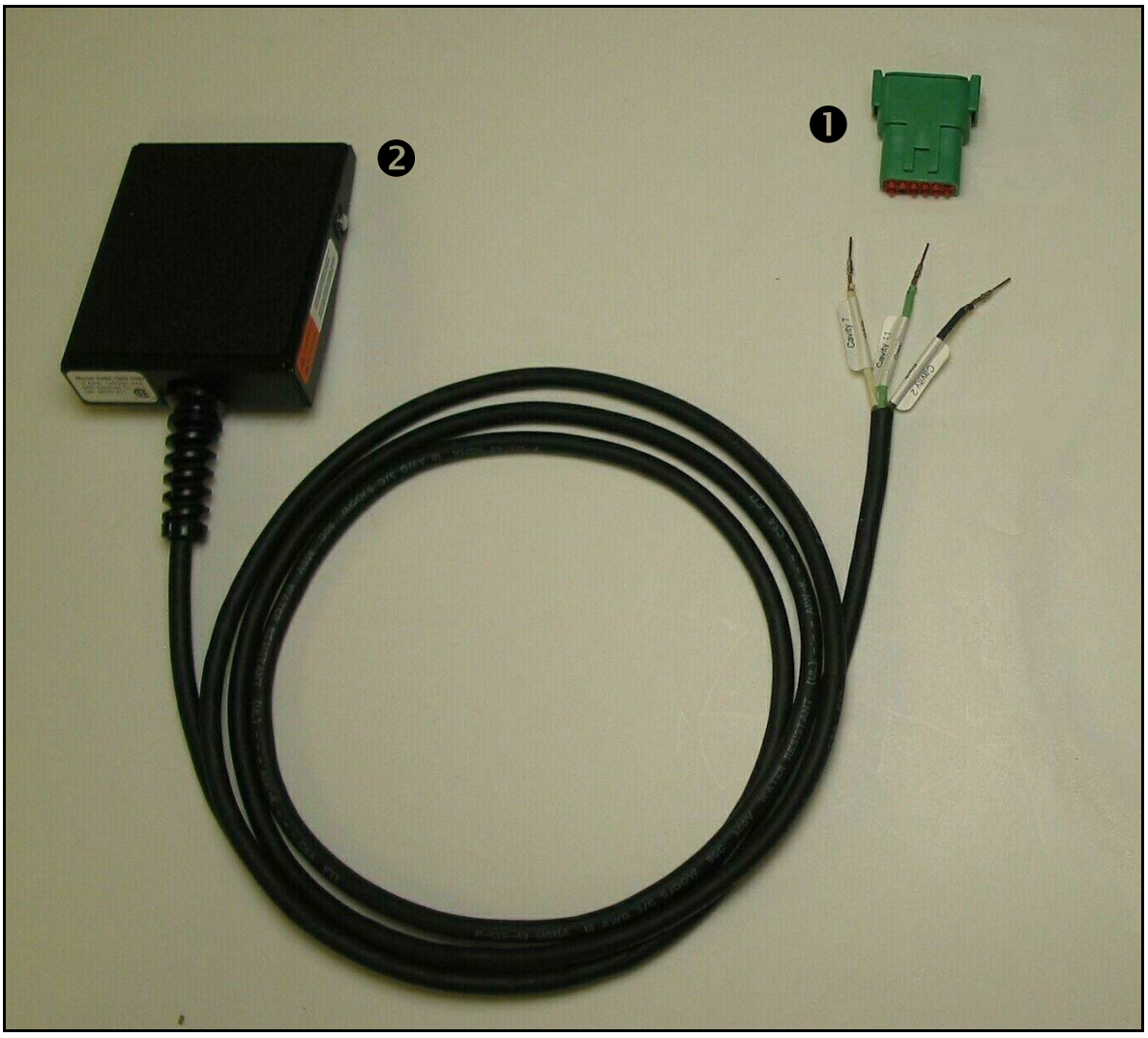
Remote engage switch components: Rocker switch



Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

Note – *This is a Full or Standard Euro switch, depending on the kit ordered.*

Remote engage switch components: Foot switch

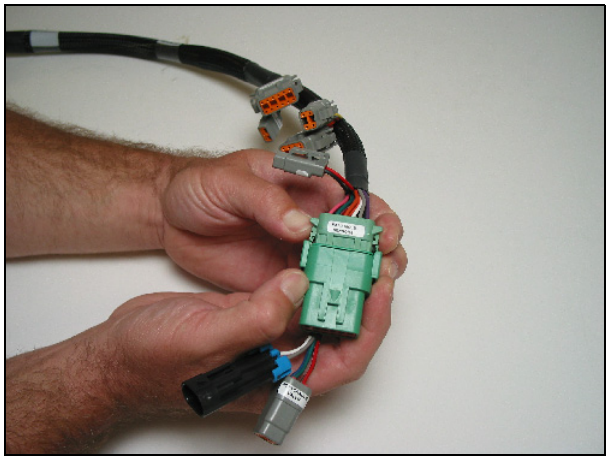


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Preparing the remote engage cable

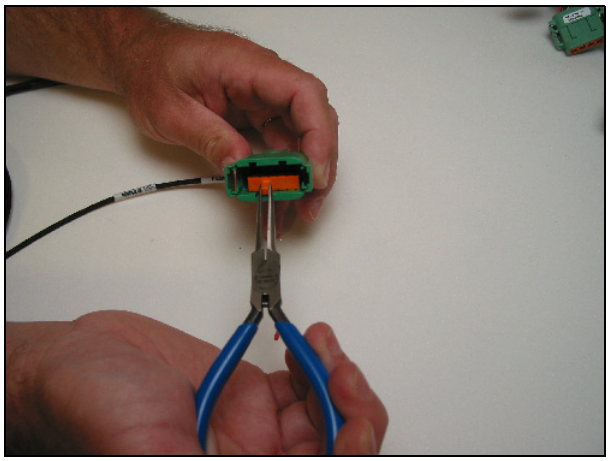
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. For more information, see Chapter 8, Controller connections.



Step 2

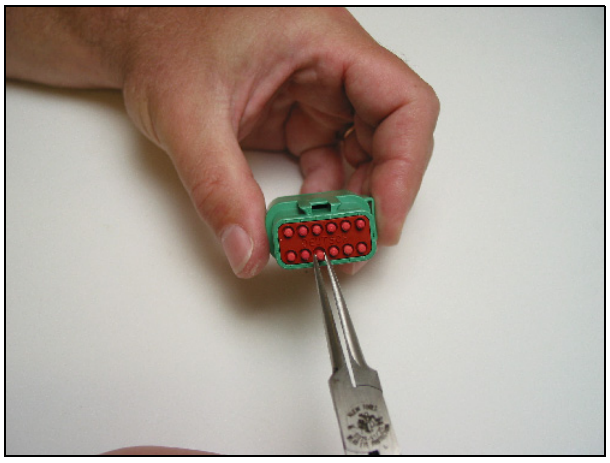
Remove the wedge from the connector.



Step 3

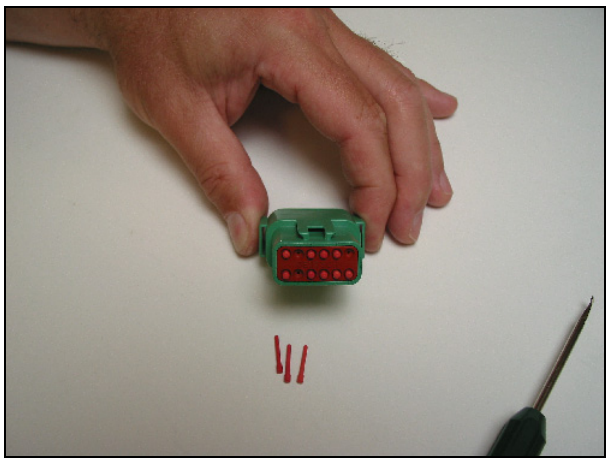
Rocker switch only

Remove the plugs from cavity 2 and cavity 7.



Foot Switch Only

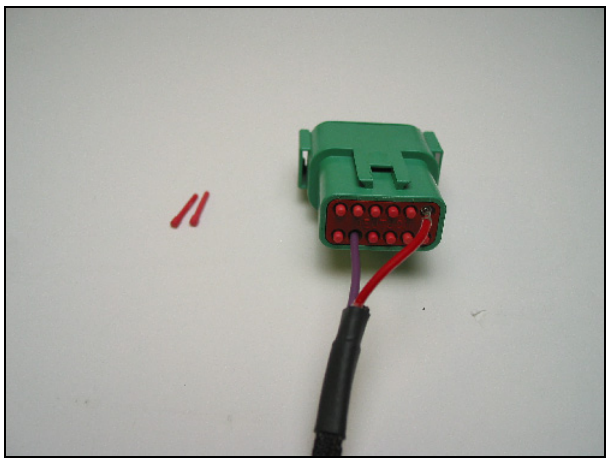
Remove the plugs from cavity 2, cavity 7, and cavity 11.



Step 4

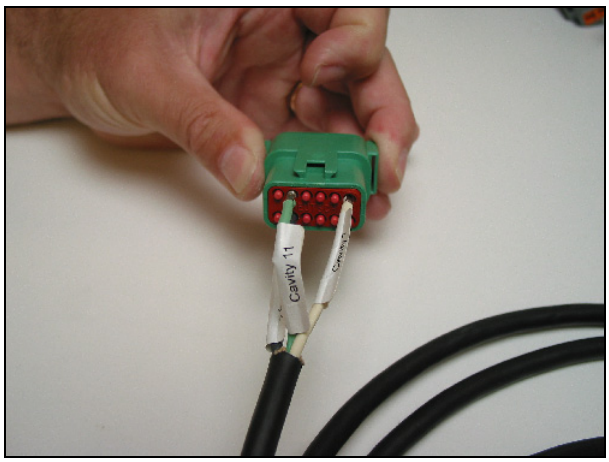
Rocker switch only

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



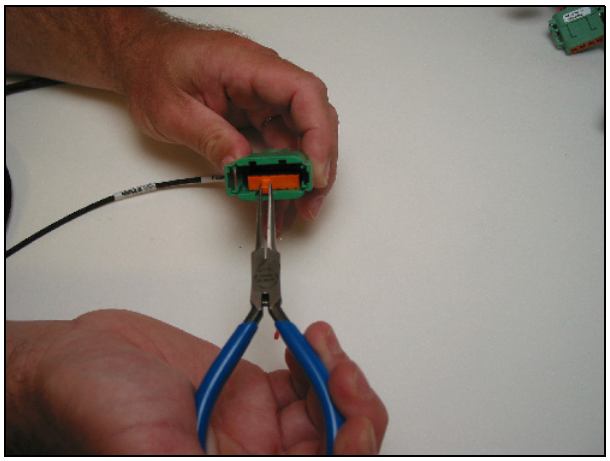
Foot switch only

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



Step 5

Pull on the wires to seat them in place and then replace the wedge in the connector.



Step 6

Plug the assembled Deutsch receptacle into the P-5 leg of the AutoPilot controller harness.

See Chapter 8, Controller Installation

Step 7

Rocker switch only

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



Foot switch only

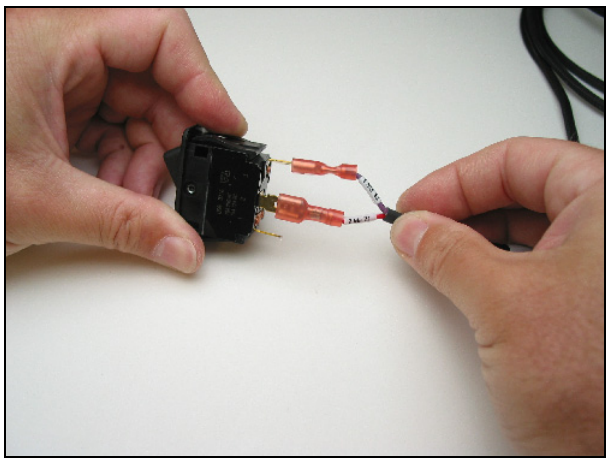
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 8

Rocker Switch Only

Connect the wires to the switch. Match the print on the switch body with the labels on the wires.



Step 9

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 for less than 0.5 seconds will not engage the system.*

Step 2

Release the switch between 0.5 and 4.0 seconds. When you release the switch, the vehicle will engage.

CHAPTER

8

Controller Installation

In this chapter:

- Installing the controller: Models 6103, 8103, 81x4, and 910x
- Installing the controller: Models 6203, 8203, 82x4, and 920x
- Installing the controller: Models 6303 and 8303
- Routing cables into the operator's cab
- Controller connections

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

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

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

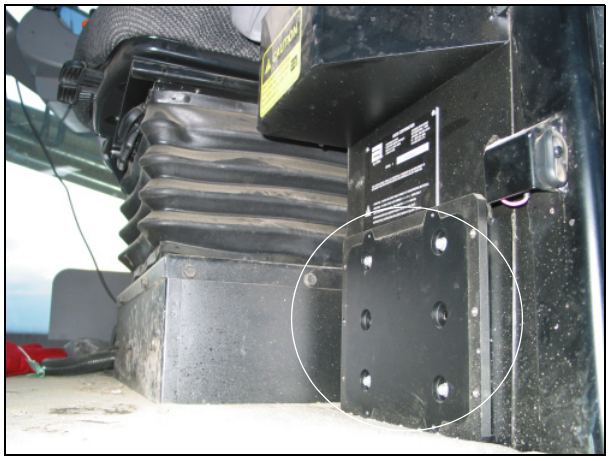
Installing the controller: Models 6103, 8103, 81x4, and 910x

Option 1: Front of console

Step 1

Locate the controller mounting location.





Step 2

Place the controller mounting plate level with the floor and 0.5" from the left edge of the console. Before drilling, clear the area behind the plate. Match drill four of the six holes with a 5/16" drill bit.



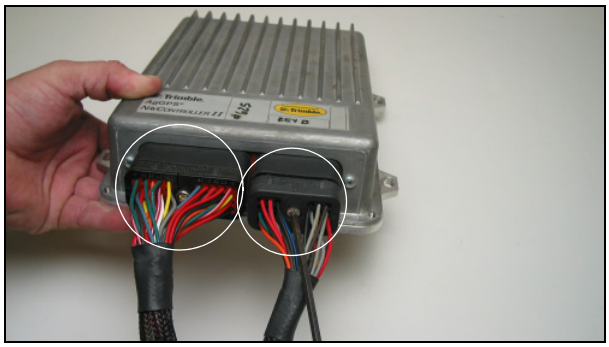
Step 3

Use the ¼" bolts and hardware provided in the bolt kit to attach the plate to the console wall.



Step 4

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



Step 5

Use the four #10 Philips screws provided in the bolt kit to mount the controller on the bracket. Route the cables along the seat to the back of the cab.



Option 2: Right of seat

Step 1

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



Step 2

Position the controller mounting plate vertically, even with the top lip and 4" from the rear wall. Mark the drill points.

Note – *The plate and controller must be mounted level.*



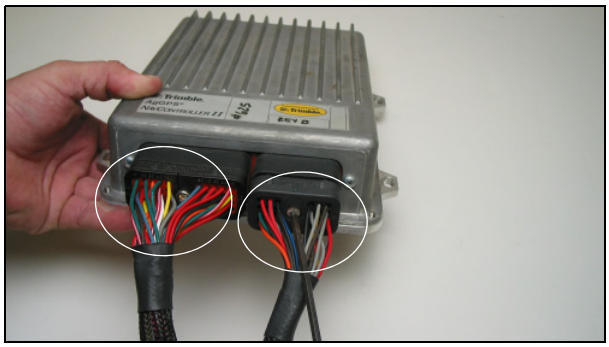
Step 3

Drill four 5/16" holes as marked. Use the ¼" hardware provided to attach the plate.



Step 4

Attach the main and auxiliary cable harness prior to installing the controller. Use an allen wrench to secure the connector to the controller.



Step 5

Use the four #10 machine screws provided to attach the controller to the mounting plate with cables pointed down and routed behind the seat.

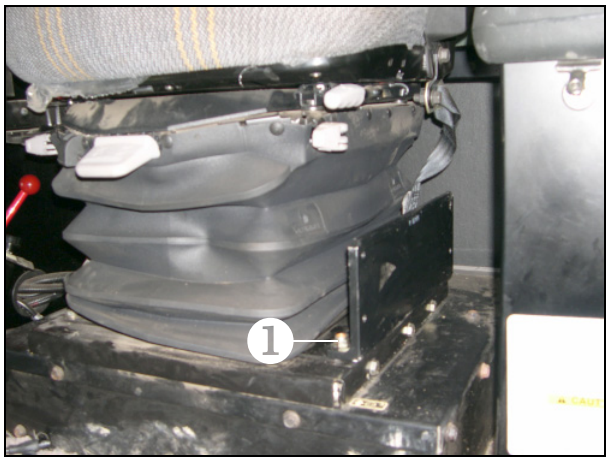


Option 3: Left side of seat base

Step 1

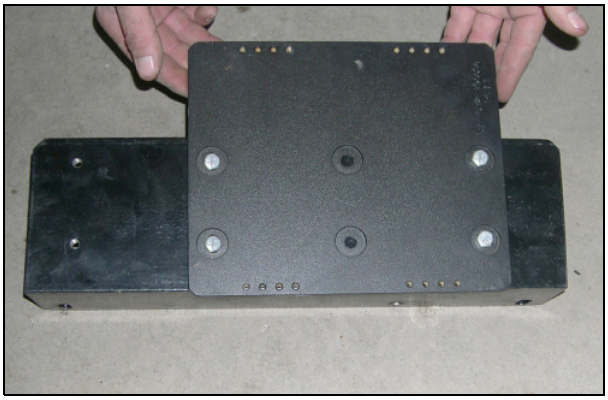
Locate and remove the two left seat mounting nuts ❶.

Note – *When you mount the controller left of the seat, you may need to drill a hole in the seat bracket to correctly align it with the rear stud.*



Step 2

Use four 5/16"-18 x 5/8 bolts to mount and secure the controller mounting plate to the seat backing.



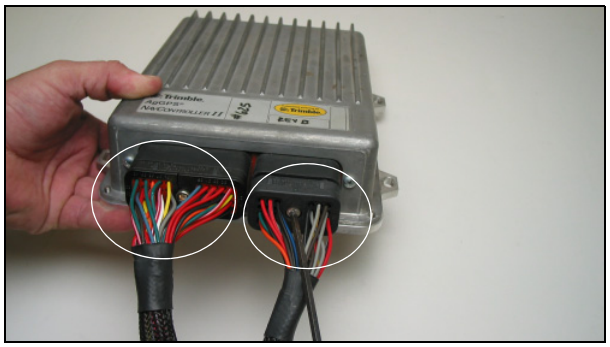
Step 3

Use four 10/32 machine screws to mount and secure the controller to the mounting plate.



Step 4

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



Step 5

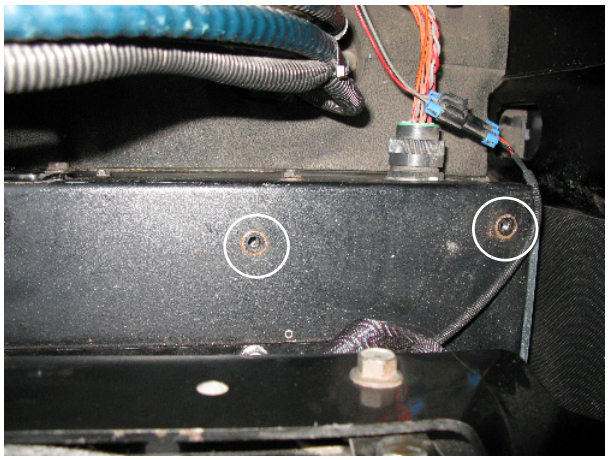
Use the two existing nuts to mount and secure the controller seat bracket.



Option 4: Right side of seat base

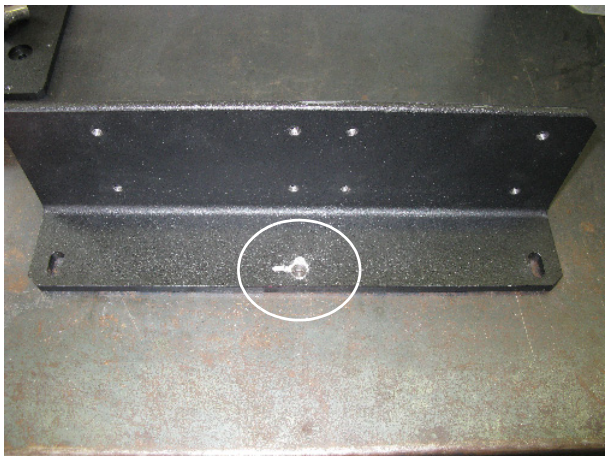
Step 1

Locate and remove the two bolts (as shown) at the right side base of operator's seat.



Step 2

When you mount the controller to the right of the seat base, you must drill a hole in the 51168 L bracket, as follows:



- 7 11/16" from the center of the existing end slot.

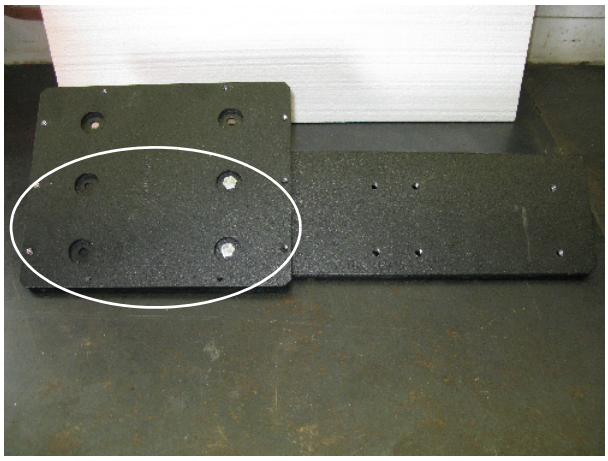


- 1/2" from the edge of the plate.



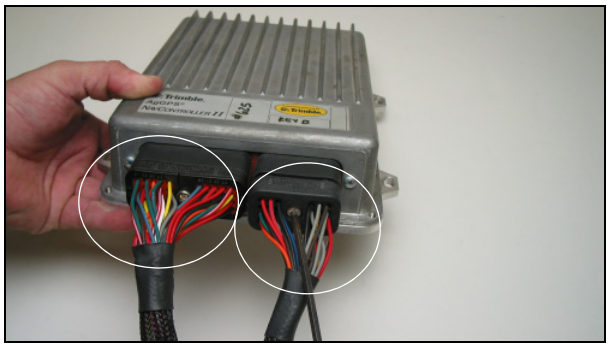
Step 3

Use four 5/16"-18 x 5/8 bolts to mount and secure the controller mounting plate to the 51168 L bracket.



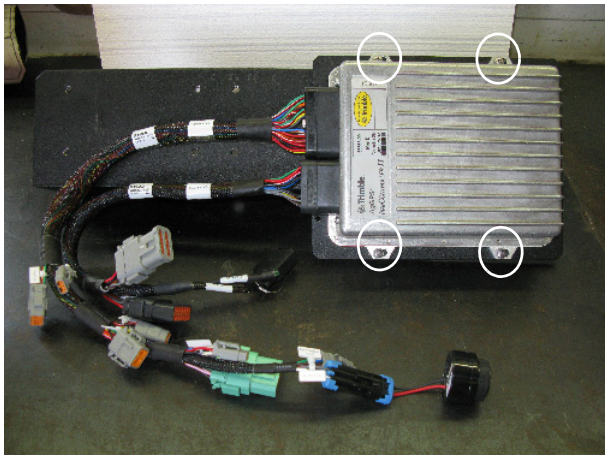
Step 4

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



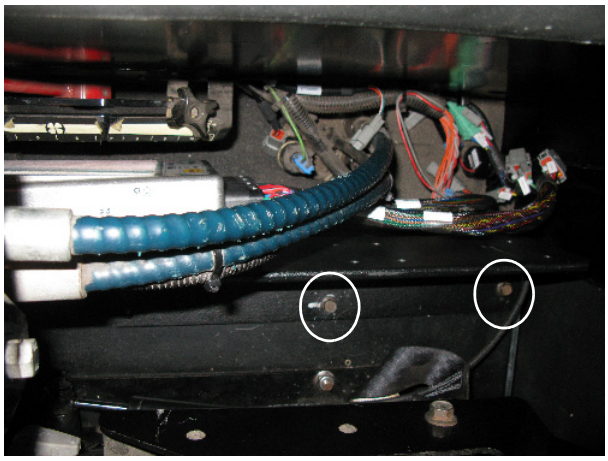
Step 5

Use the supplied four #10-32 machine screws to mount and secure the controller to the mounting plate.

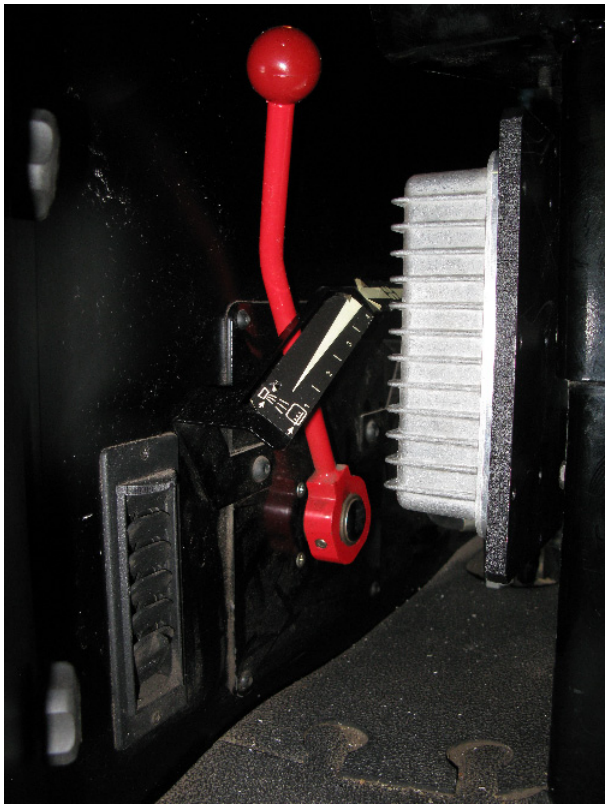


Step 6

Reinstall the two existing bolts to secure the L bracket to the seat base.



Top view: Controller installed



Front view: Controller installed

Installing the controller: Models 6203, 8203, 82x4, and 920x

Step 1

Identify the controller mounting location on the cab floor to the right of the seat.



Step 2

Pull back the floor mat to inspect the area underneath the mat.



Step 3

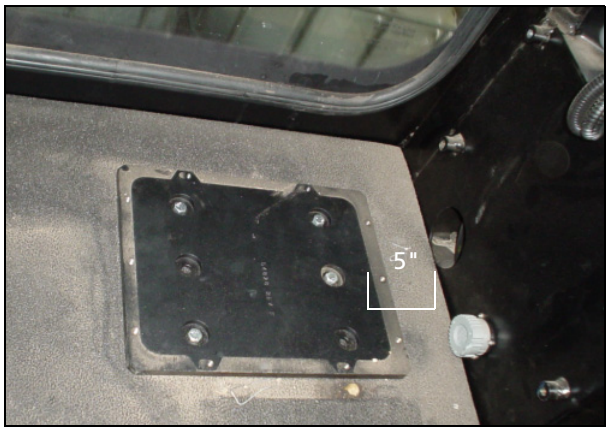
Remove the floor panel for access below the cab floor.



Step 4

Position the controller mounting plate parallel to the seat base so that the mounting holes can be drilled through the floor behind the removable panel. The connectors on the controller will face the rear of the cab. The plate should also be parallel and approximately 5" from the vertical steel panel shown.

Note – *Use the cab structure and seat base to ensure the controller is parallel to the direction of travel.*



Step 5

CAUTION – Before you drill the holes, ensure that the area below the floor is clear. Failure to do so may result in damage to the vehicle.

Mark and drill four ¾" or larger holes through the floormat with a hole saw and then ¼" holes through the floor.



Step 6

Install the standoffs and ¼"-20 bolts (provided in the kit) by reaching through the access panel.



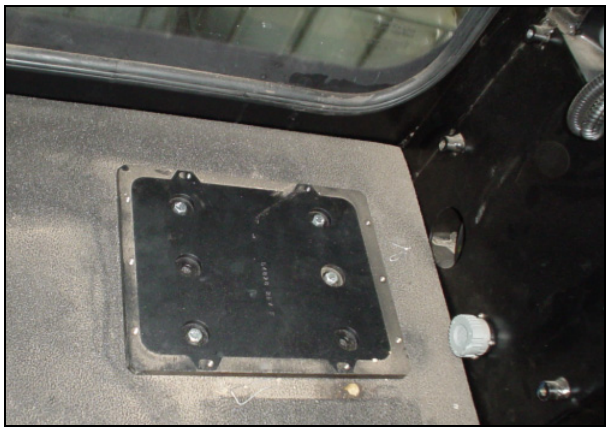
Step 7

Tighten the standoffs into place. Reinstall the access panel.



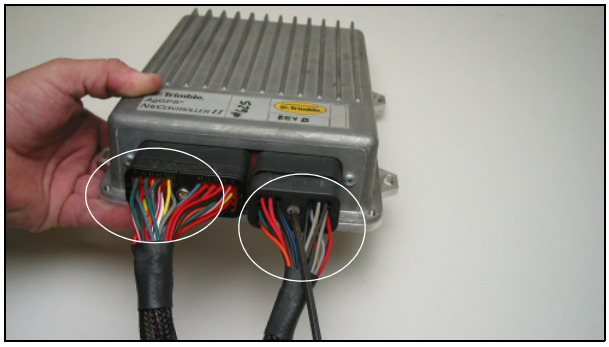
Step 8

Attach the controller mounting plate to the standoffs with ¼" hardware in the controller bolt kit.



Step 9

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



Step 10

Use four #10-32 screws to install the controller with connectors to the back of the cab.

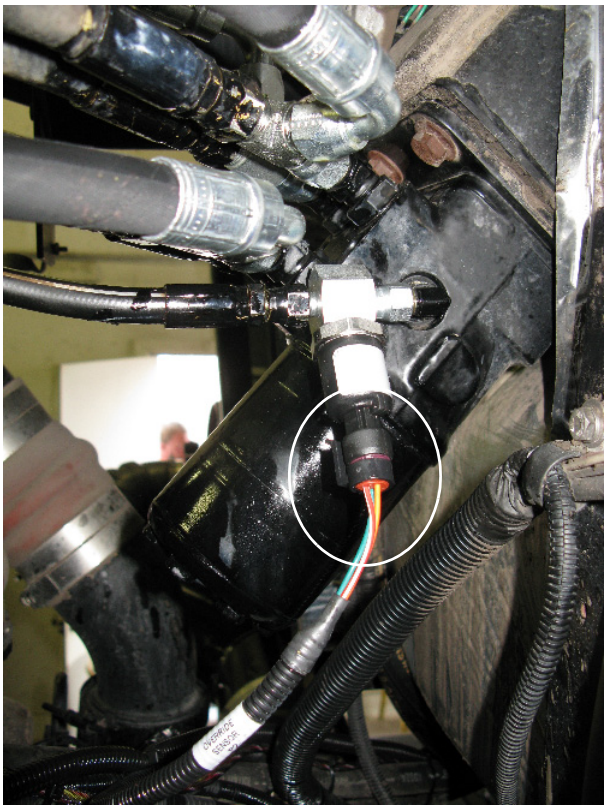


Connecting cables to sensors

Step 1

Connect the 54618 pressure sensor cable to the pressure transducer located at the hand pump.

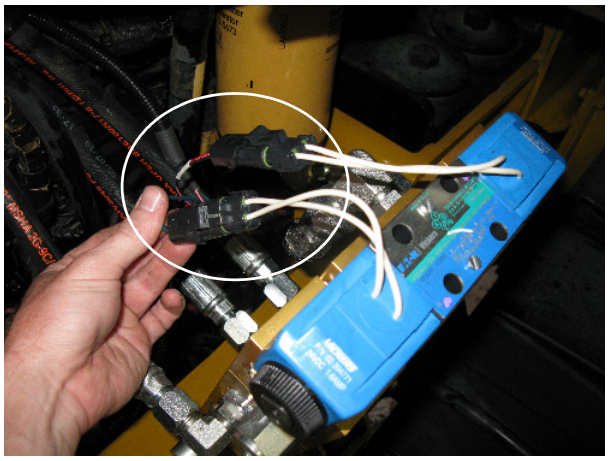
Route the opposite end of the cable to bottom right side of the operator's cab.



Step 2

Connect the 54617 control valve cable to the Autopilot valve solenoids.

Route the opposite end of the cable to bottom right side of the operator's cab.



Step 3

Connect the 67258 power cable to the battery.

Route the opposite end of the cable to bottom right side of the operator's cab.

Installing the controller: Models 6303 and 8303

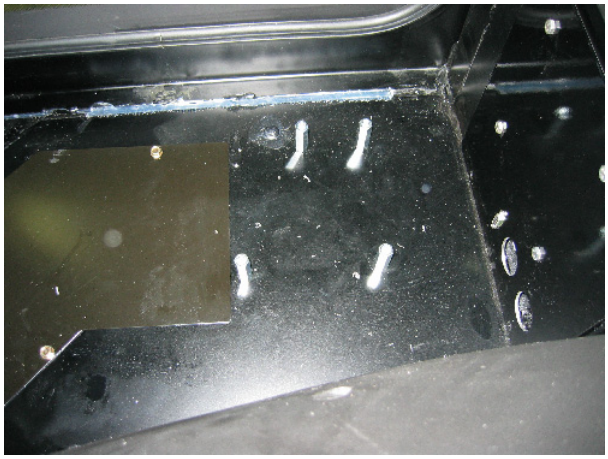
Step 1

Identify the controller mounting location on the cab floor to the right of the seat.



Step 2

Pull back the floor mat to inspect the area underneath the mat.



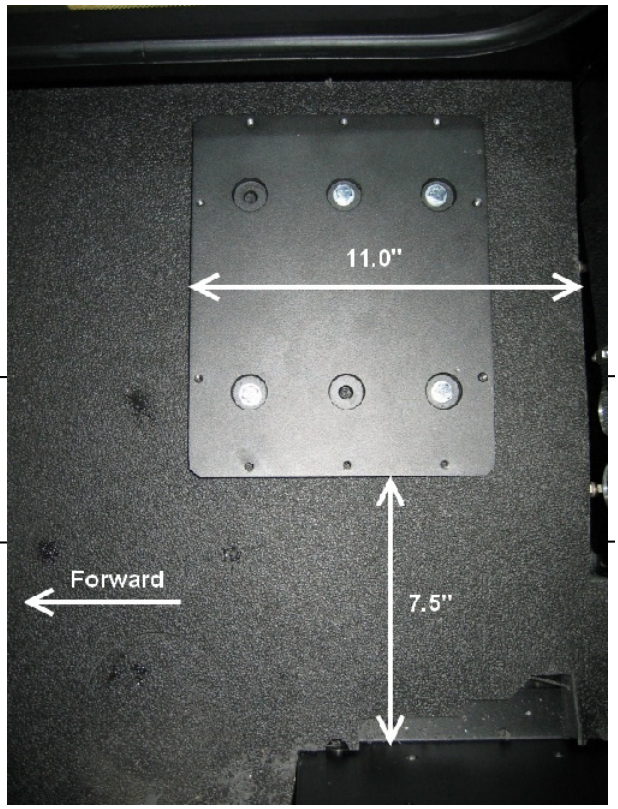
Step 3

Position the controller mounting plate parallel to the seat base so that the mounting holes can be drilled through the floor. The connectors on the controller will face the seat.

Note – *Use the seat base to ensure the controller is parallel to the direction of travel.*

CAUTION – Before you drill the holes, ensure that the area below the floor is clear. Failure to do so may result in damage to the vehicle.

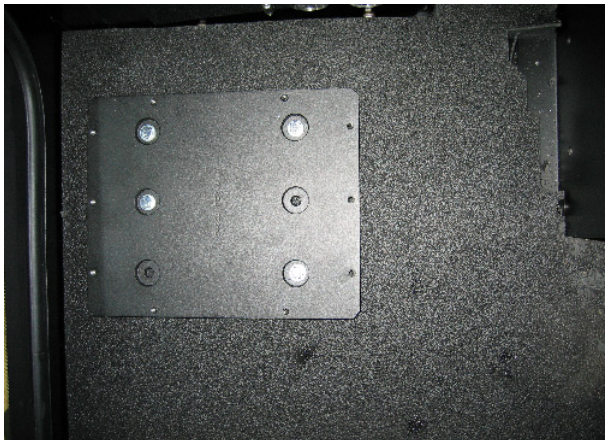
Mark and drill four ¾" or larger holes through the floormat with a hole saw and then ¼" holes through the floor.



Step 4

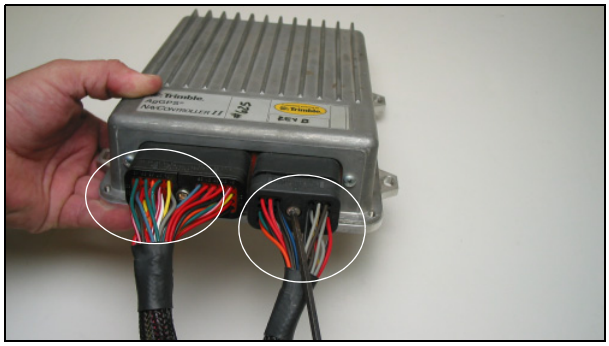
Install the standoffs and ¼"-20 bolts.

Attach the controller mounting plate to the standoffs with ¼" hardware in the controller bolt kit.



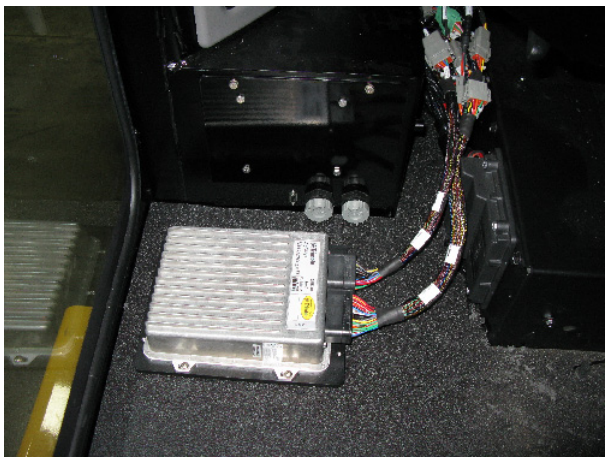
Step 5

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



Step 6

Use four #10-32 screws to install the controller with connectors to the seat base.



Routing cables into the operator's cab

Step 1

Locate the electronics bay shield on the exterior right lower corner of the cab and then remove the shield.



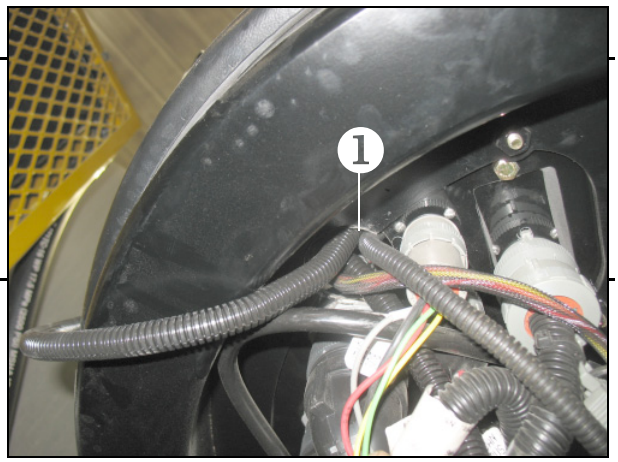
Depending on the style of operator's cab, remove the panel on the right side of cab or at the right rear corner.





Step 2

WARNING – Before you begin drilling, check for loose cables behind the access panel. If required, remove the access panel to ensure that all obstructions are clear.



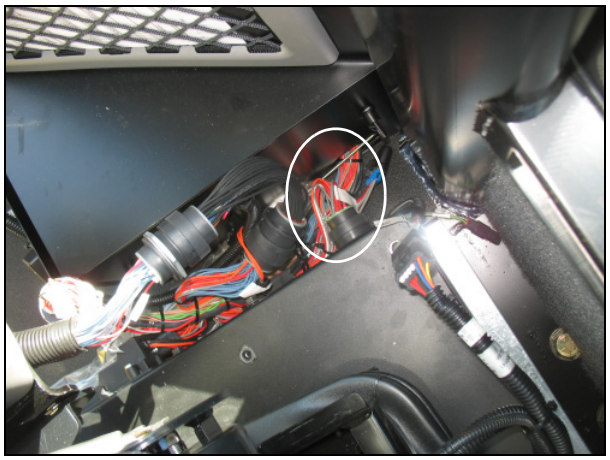
Route the cables into the cab through the existing pass-through plug on the bottom of the cab. Otherwise, use a hole saw to drill a 2" hole in the lower left corner of the electronics bay ❶.



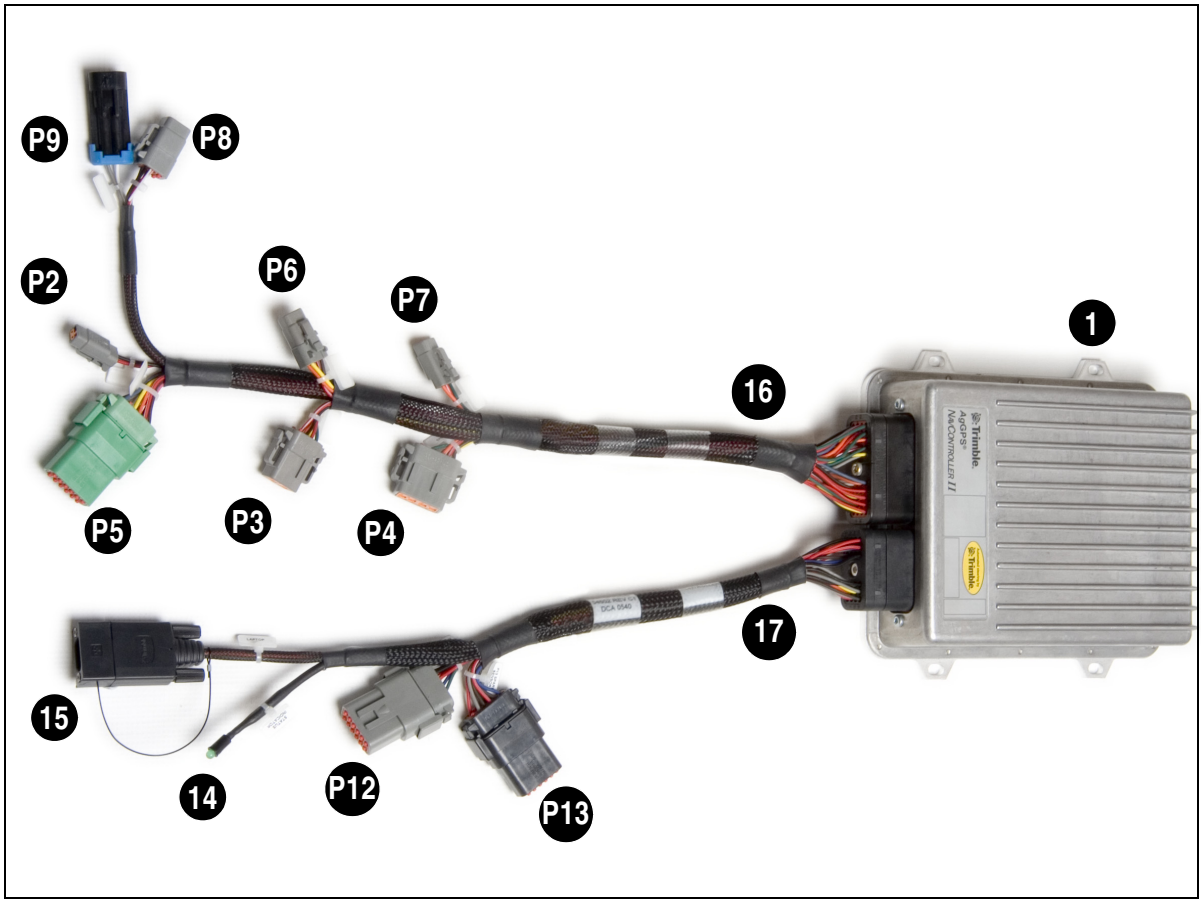
Pass thru plug

Step 3

Route the cables through the right rear corner of the cab to the controller location.



Controller connections



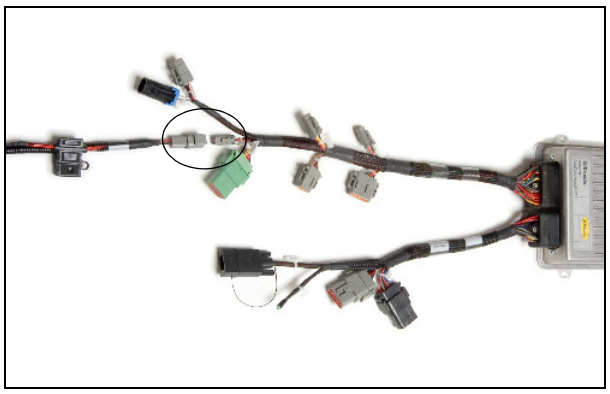
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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

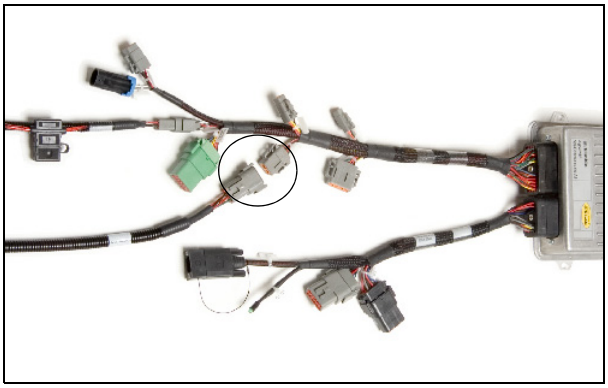
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 2

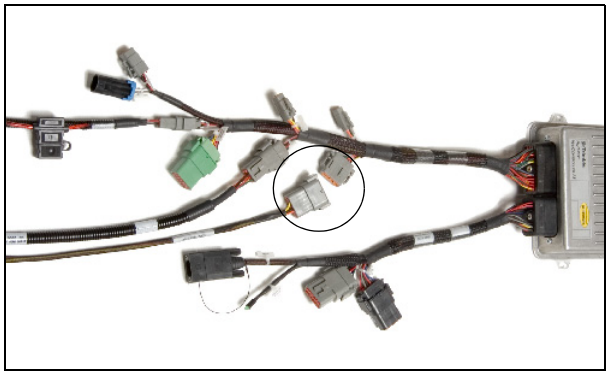
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 3

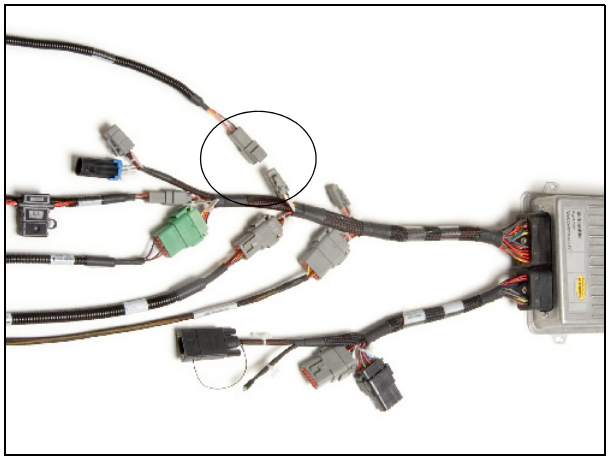
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 4

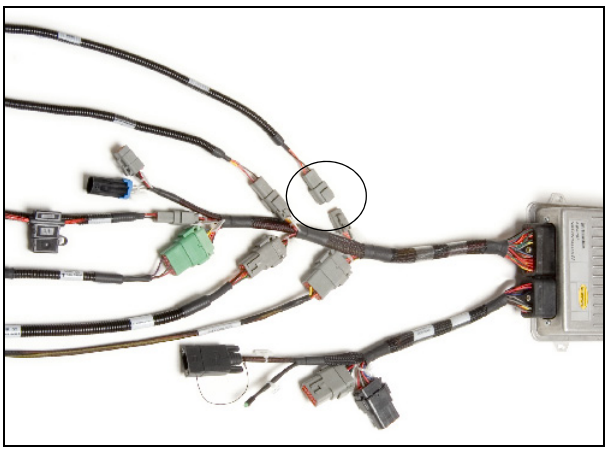
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 5

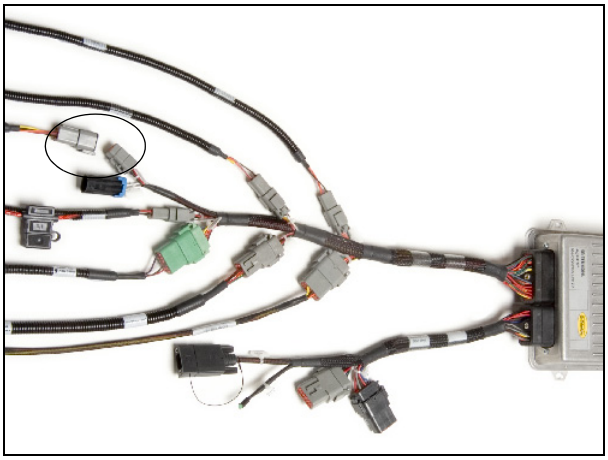
Connect the manual override cable connection to P-7, which is labeled “Manual Override”. P-7 is located on the main wiring harness.

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



Step 6

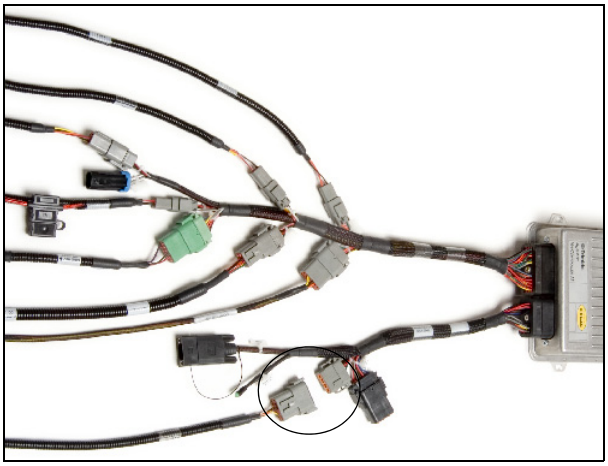
Connect the hydraulic steering valve cable connection to P-8, which is labeled “Hydraulic Valve”. P-8 is located on the main wiring harness.



Step 7 Step 7

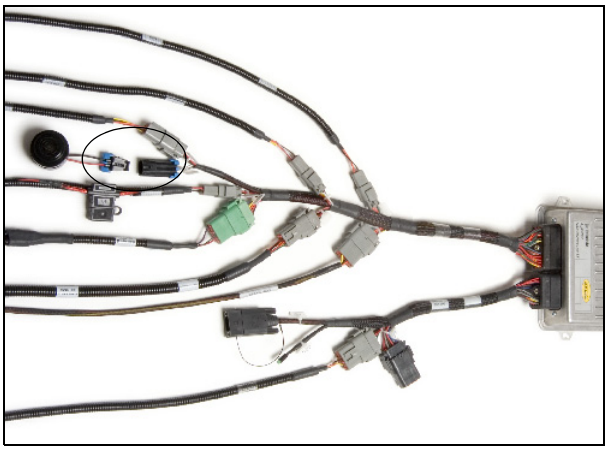
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled “Lightbar/Spare”. P-12 is located on the auxiliary wiring harness.

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



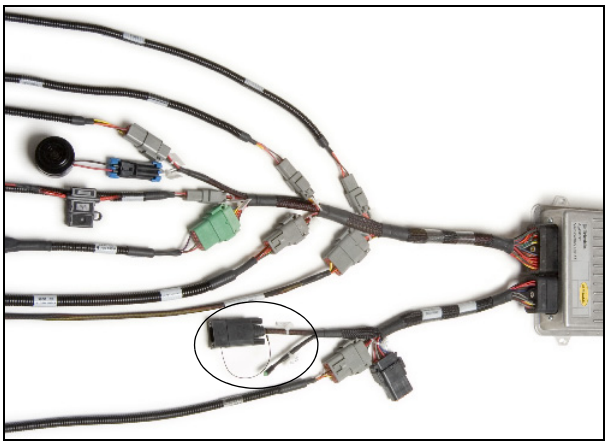
Step 8

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:

- Performing the final machine check

This chapter describes how to perform a final check of the vehicle.

Performing the 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

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

Step 4

Open the *Diagnostic* page of the Autopilot Toolbox II software and ensure that all signals from the hydraulics and sensors are active.