Installation Instructions

*Ag*GPS® Autopilot™ Automated Steering System

John Deere

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Trimble®

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This is the August 2009 release (Revision C) of the *Ag*GPS *Autopilot Automated Steering System Installation Instructions*, part number 54036-40-E04. It applies to version 4.00 of the *Ag*GPS Autopilot automated steering system.

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Trimble warrants that this Trimble product and its internal components (the "Product") shall be free from defects in materials and workmanship and will substantially conform to Trimble's applicable published specifications for the Product for a period of one (1) year, starting from the earlier of (i) the date of installation, or (ii) six (6) months from the date of product shipment from Trimble. This warranty applies only to the Product if installed by Trimble or a distributor authorized by Trimble to perform Product installation services.

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All Product software components (sometimes hereinafter also referred to as "Software") are licensed and not sold. Any Software accompanied by a separate End User License Agreement ("EULA") shall be governed by the terms, conditions, restrictions and limited warranty terms of such EULA notwithstanding the preceding paragraph. During the limited warranty period you will be entitled to receive, at no additional charge, such Fix Updates and Minor Updates to the Product software as Trimble may develop for general release, subject to the procedures for delivery to purchasers of Trimble products generally. If you have purchased the Product from an authorized Trimble distributor rather than from Trimble directly, Trimble may, at its option, forward the software Fix Update or Minor Update to the Trimble distributor for final distribution to you. Major Upgrades, new products, or substantially new software releases, as identified by Trimble are expressly excused from this enhancement process and limited warranty. Receipt of software updates shall not serve to extend the limited warranty period.

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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 +31 497 53 2430, and ask for the "WEEE Associate"

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. Falling from this height can cause broken bones and internal injuries. To avoid falling from the vehicle, ensure that when you enter or exit the vehicle, you face the vehicle and use the steps and handrails.

Cautions

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

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

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

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

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

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CHAPTER

1

Introduction

In this chapter:

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

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

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

Technical assistance

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

1. Go to the Trimble website (www.trimble.com).
2. Click the **Support & 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

EZ-Guide 500

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

FmX integrated display

Retain	Remove
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 54036-40 John Deere 4xx0 Hydraulic hose kit P/N 76284 John Deere 8xx0 Hydraulic hose kit P/N 66288	#7, $^{5}/_{16}$", and $^{7}/_{16}$" drill bits Allen wrench set (metric and SAE) ¾" hole saw ¼"-20 tap Die grinder or cutout tool

Antenna mounting kits

Antenna options
John Deere quick release (P/N 65555) or antenna spar mount: P/N 53676
Antenna V plate mount and AgGPS 262 receiver magnetic mount: P/N 62388-01 (includes magnets for quick release of the AgGPS 262 receiver – see Chapter 4, Antenna/Receiver Installation.

Autopilot hardware organization – as shipped

Hardware	Component	See...
Platform kit **(P/N 54036-40)**	Hydraulic valve	Chapter 2
	Hydraulic manifold	Chapter 2
	Transducer flow switch	Chapter 2
	Manual override cable	Chapter 2
	Hydraulic brackets and bolt kits	Chapter 2
	Hydraulic valve cable	Chapter 2
	AutoSense™ steering device and cabling	Chapter 3
	AutoSense mounting bracket and hardware	Chapter 3
	Power cable and switch	Chapter 6
	Bolt kit controller	Chapter 8
Common parts	Controller	Chapter 8
	Controller mounting bracket	Chapter 8
	Cable kit: • Main wiring harness • Auxiliary wiring harness • Sonalert alarm	Chapter 8
GPS receiver	GPS receiver	Chapter 4
	GPS antenna	Chapter 4
	GPS receiver mounting bracket	Chapter 4
	GPS receiver power/data cable	Chapter 4
	RTK radio, cable, and radio antenna	Chapter 4
Display	EZ-Guide 500 lightbar	Chapter 5
	FmX integrated display	Chapter 5
	Display cable	Chapter 5
	Mounting bracket	Chapter 5
Hydraulic hose kit **(4xx0 P/N 76284 / 8xx0 P/N 66288)**	Hydraulic hoses	Chapter 2
	Hydraulic adaptors	Chapter 2
Roof bracket kit **(P/N 53676)**	Roof brackets	Chapter 4

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

Autopilot hardware organization - as installed

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

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 *Ag*GPS Autopilot™ system will be installed.

Step 4

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

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

CHAPTER

2

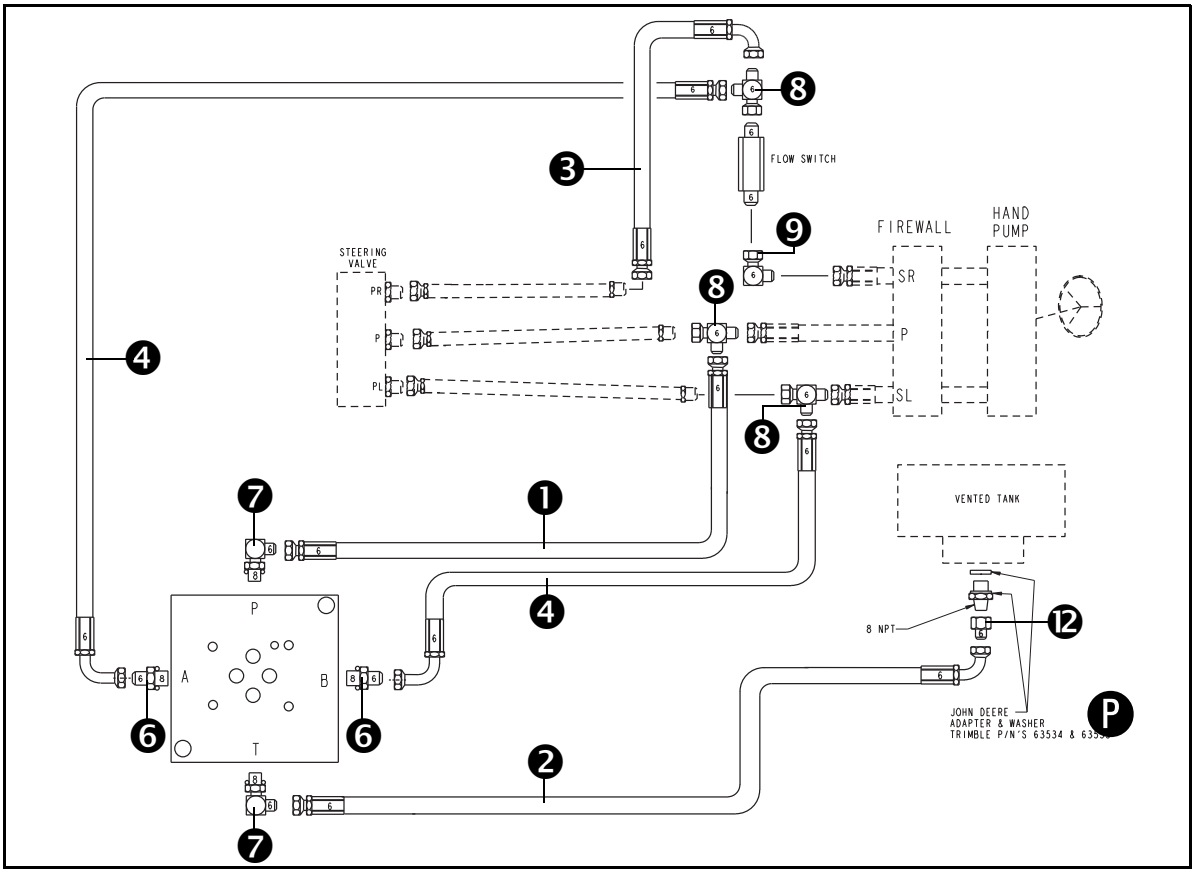
Hydraulic Control Valve Installation

In this chapter:

- Hydraulic control valve components: 4040/4240 models
- Hydraulic control valve components: 4440/4640/4840 models
- Hydraulic control valve components: 4x50/4x55/4x60 models
- Hydraulic control valve components: 8x60/8x70 models
- Preparing the hydraulic valve and cross pilot manifold: 4xx0 models
- Installing the control valve manifold: all 4xxx models
- Identifying the pressure and steering lines: 4xx0 models
- Installing the pressure and steering lines: all 4xxx models
- Installing the tank and shuttle line: Option 1
- Installing the tank and shuttle line: Option 2
- Preparing the hydraulic valve: 8x60/8x70 models
- Installing the control valve manifold: 8x60/8x70 models
- Installing the flow switch: 8x60/8x70 models
- Installing the pressure and steering lines: 8x60/8x70 models
- Bleeding the steering lines: all models
- Completing the electrical connections - all models

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

Hydraulic control valve components: 4040/4240 models

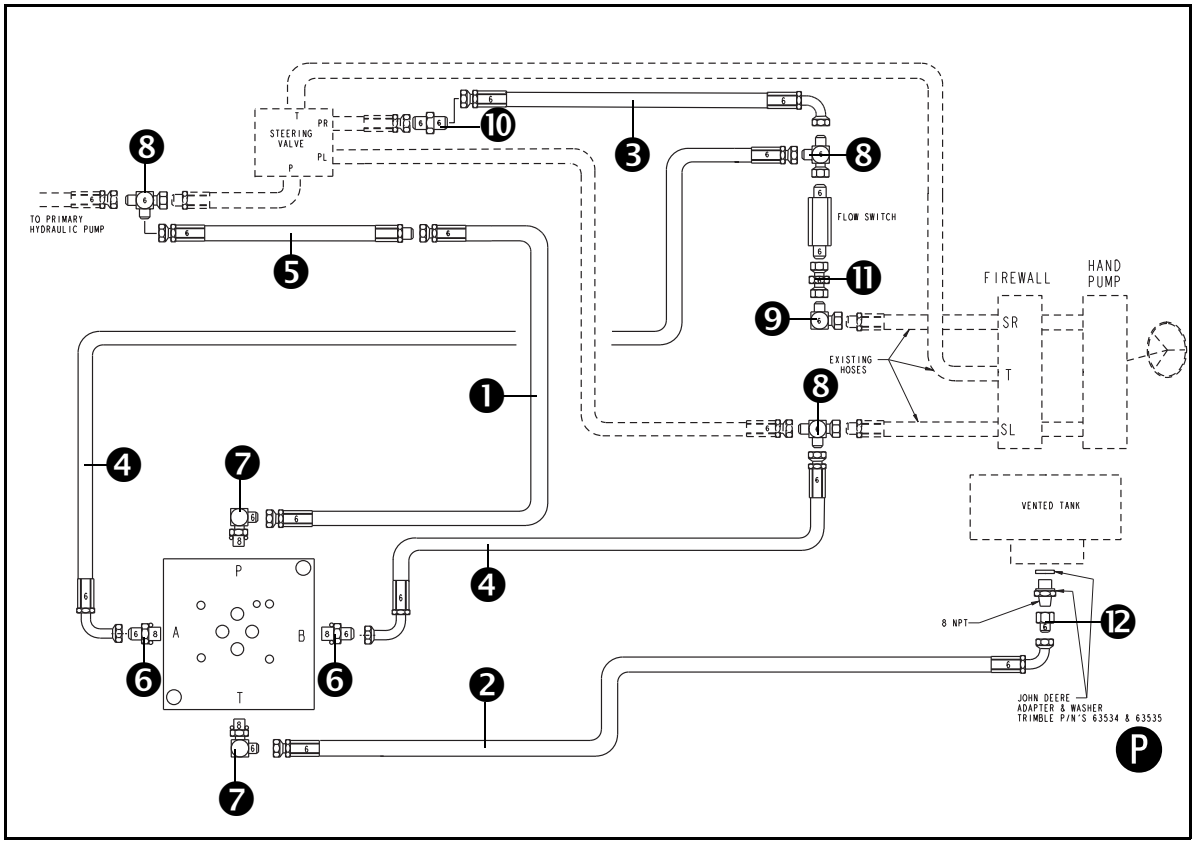


Item	Description	Part number
❶	62" hose (X1)	F451TC0606-06-06-06-62
❷	80" hose (X1)	F451TC0639-06-06-06-80
❸	20" hose (x1)	F451TC0639-04-06-04-20
❹	70" hose (x2)	F451TC0641-06-06-06-70
❺	34" hose	F451TC0641-06-06-06-62
❻	Fitting (x2)	6–8 F50X-S

Item	Description	Part number
❼	Fitting (x2)	6–8 C50X-S
❽	Fitting (x3)	6 R6X-S
❾	Fitting (x1)	6 C6X-S
❿	Fitting	6 HTX-S
⓫	Fitting	6 HX6
⓬	Fitting (x1)	6–8 GTX-S

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

Hydraulic control valve components: 4440/4640/4840 models

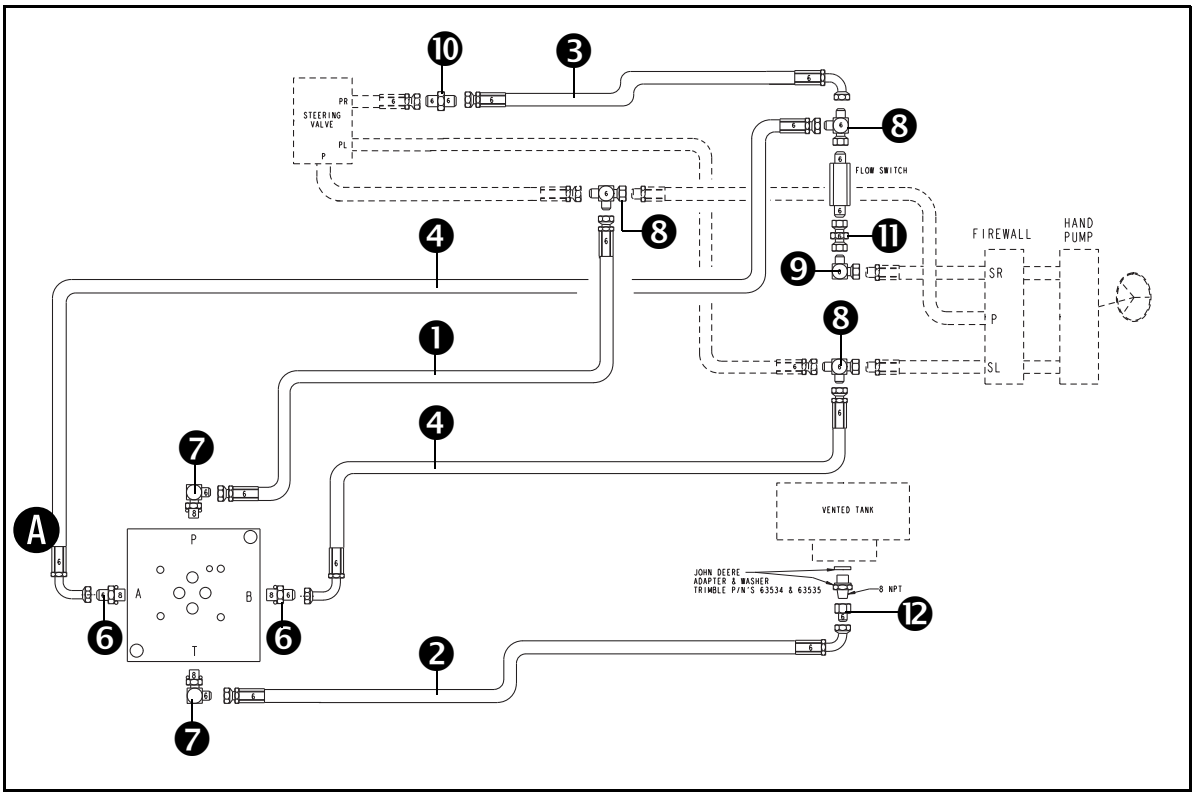


Item	Description	Part number
❶	62" hose (X1)	F451TC0606-06-06-06-62
❷	80" hose (X1)	F451TC0639-06-06-06-80
❸	20" hose (X1)	F451TC0639-04-06-04-20
❹	70" hose (x2)	F451TC0641-06-06-06-70
❺	34" hose (X1)	F451TC0641-06-06-06-62
❻	Fitting (x2)	6–8 F50X-S

Item	Description	Part number
❼	Fitting (x2)	6–8 C50X-S
❽	Fitting (x3)	6 R6X-S
❾	Fitting (x1)	6 C6X-S
❿	Fitting (x1)	6 HTX-S
⓫	Fitting (x1)	6 HX6
⓬	Fitting (x1)	6–8 GTX-S

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

Hydraulic control valve components: 4x50/4x55/4x60 models

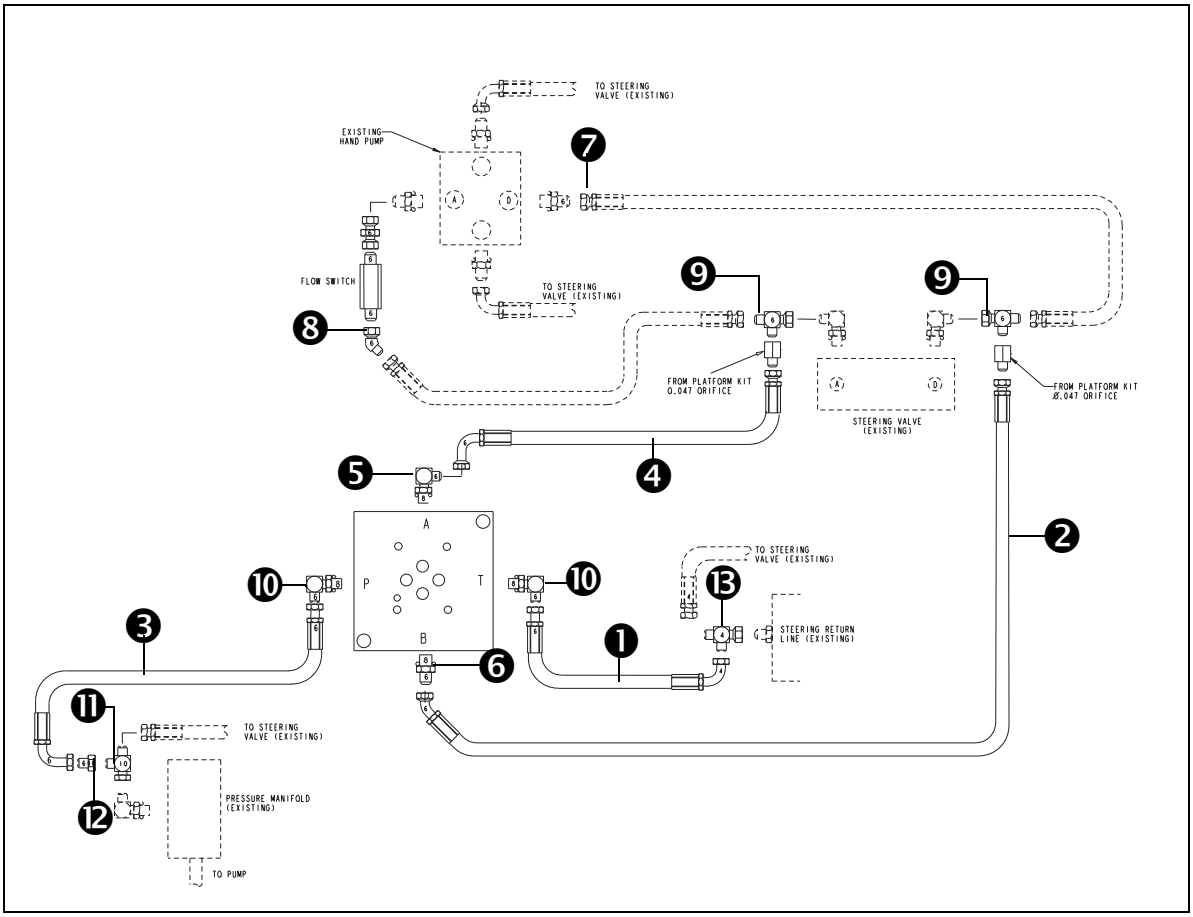


Item	Description	Part number
❶	62" hose (X1)	F451TC0606-06-06-06-62
❷	80" hose (X1)	F451TC0639-06-06-06-80
❸	20" hose (X1)	F451TC0639-04-06-04-20
❹	70" hose (x2)	F451TC0641-06-06-06-70
❺	34" hose	F451TC0641-06-06-06-62
❻	Fitting (x2)	6–8 F50X-S

Item	Description	Part number
❼	Fitting (x2)	6–8 C50X-S
❽	Fitting (x3)	6 R6X-S
❾	Fitting (x1)	6 C6X-S
❿	Fitting	6 HTX-S
⓫	Fitting (x1)	6 HX6
⓬	Fitting (x1)	6–8 GTX-S

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

Hydraulic control valve components: 8x60/8x70 models



Item	Description	Part number
❶	43" hose	F451TCJSJ9-6-4-6-43
❷	25" hose	F451TC0637-6-6-6-25
❸	22" hose	F451TCJSJ1-6-6-6-22
❹	21.5" hose	F451TC0641-6-6-6-21.5
❺	Fitting	6-8 C50X-S
❻	Fitting	6-8 F50X-S
❼	Fitting	6 HX6-S

Item	Description	Part number
❽	Fitting	6 V6X-S
❾	Fitting (x2)	6 R6X-S
❿	Fitting (x2)	6-8 C5OLO-S
⓫	Fitting	10 R6LO-S
⓬	Fitting	10-6 TRLON-S
⓭	Fitting	4 R6LO-S

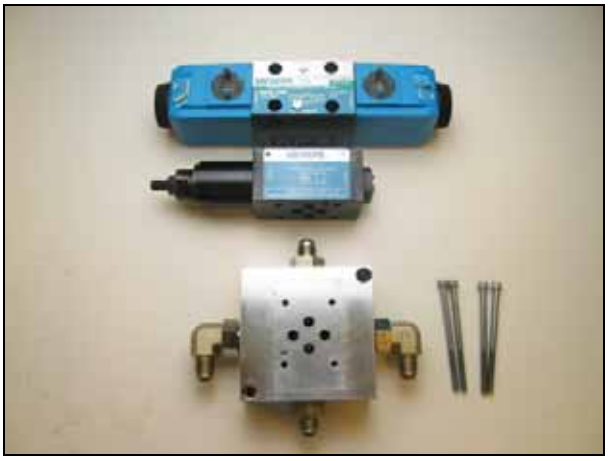
Note – *Part numbers are Parker numbers and are for reference only.*

Preparing the hydraulic valve and cross pilot manifold: 4xx0 models

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

Step 1

Locate the control valve, pressure reducing valve, subplate, and valve mounting screws (provided).



Step 2

Install the following fittings to the subplate as shown:

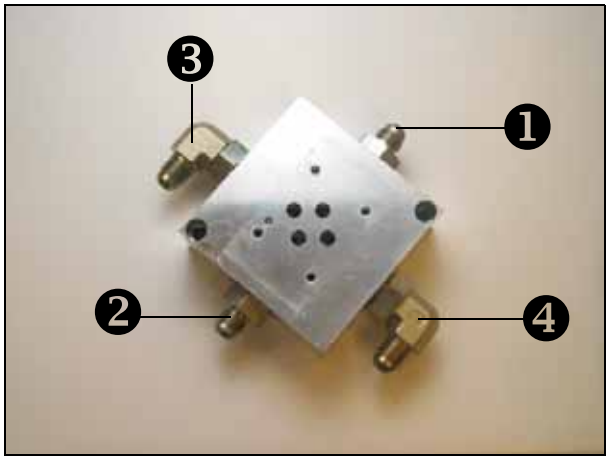
❶ Port A: -6 JIC Male Straight

❷ Port B: -6 JIC Male Straight

❸ Port P (pressure): -6 JIC Male 90

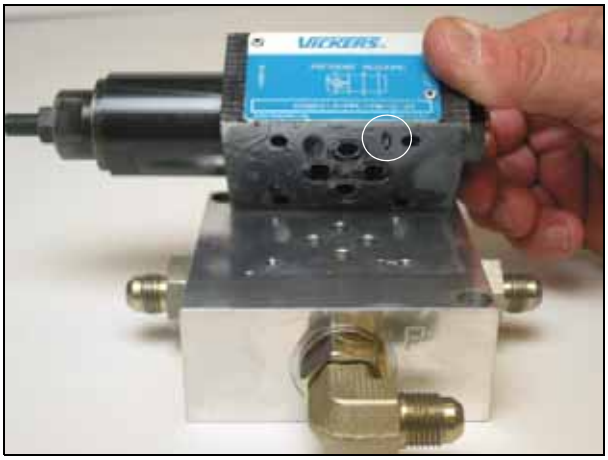
❹ Port T (tank): -6 JIC Male 90

Note – *All subplate ports are -8 ORB.*



Step 3

Use the pin guide to align the pressure reducing valve to the subplate. Ensure that the four O-rings are seated correctly.



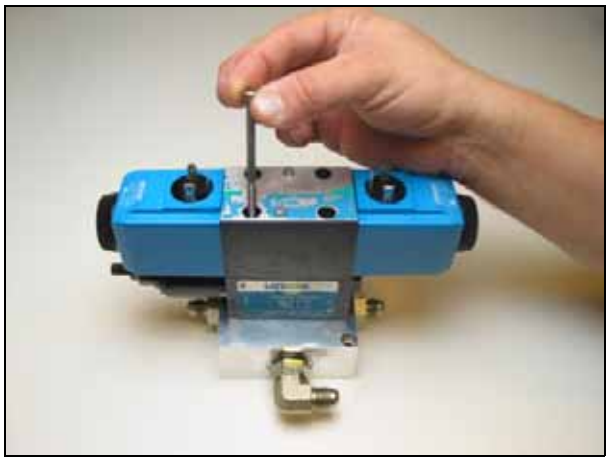
Step 4

Use the pin guide to align the control valve with the reducing valve sandwich. Ensure that the four O-rings are seated correctly.



Step 5

Use the four 10/24 x 3" socket head screws (provided in the bolt kit) to fasten the control and reducing valve to the subplate.



Installing the control valve manifold: all 4xxx models

Step 1

Identify the cab brace behind the left battery box.

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



Step 2

Clamp the hydraulic manifold bracket to the existing cab structure.



Step 3

Align the bracket with the lower edge of the cab structure and 3" beyond the outside edge.



Step 4 40/50/55 Series

Use the bracket as a template to mark and drill two $^{7}/_{16}$" holes as shown.



60 Series

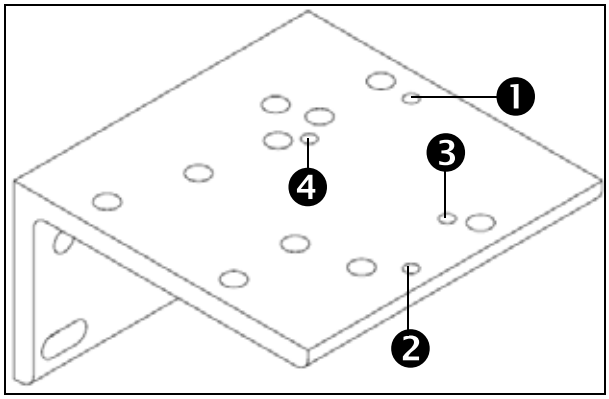
Use the bracket as a template to drill and tap two $^{3}/_{8}$"-16 holes as shown.

Note – *When adequate room for nuts is available, tapping is optional.*

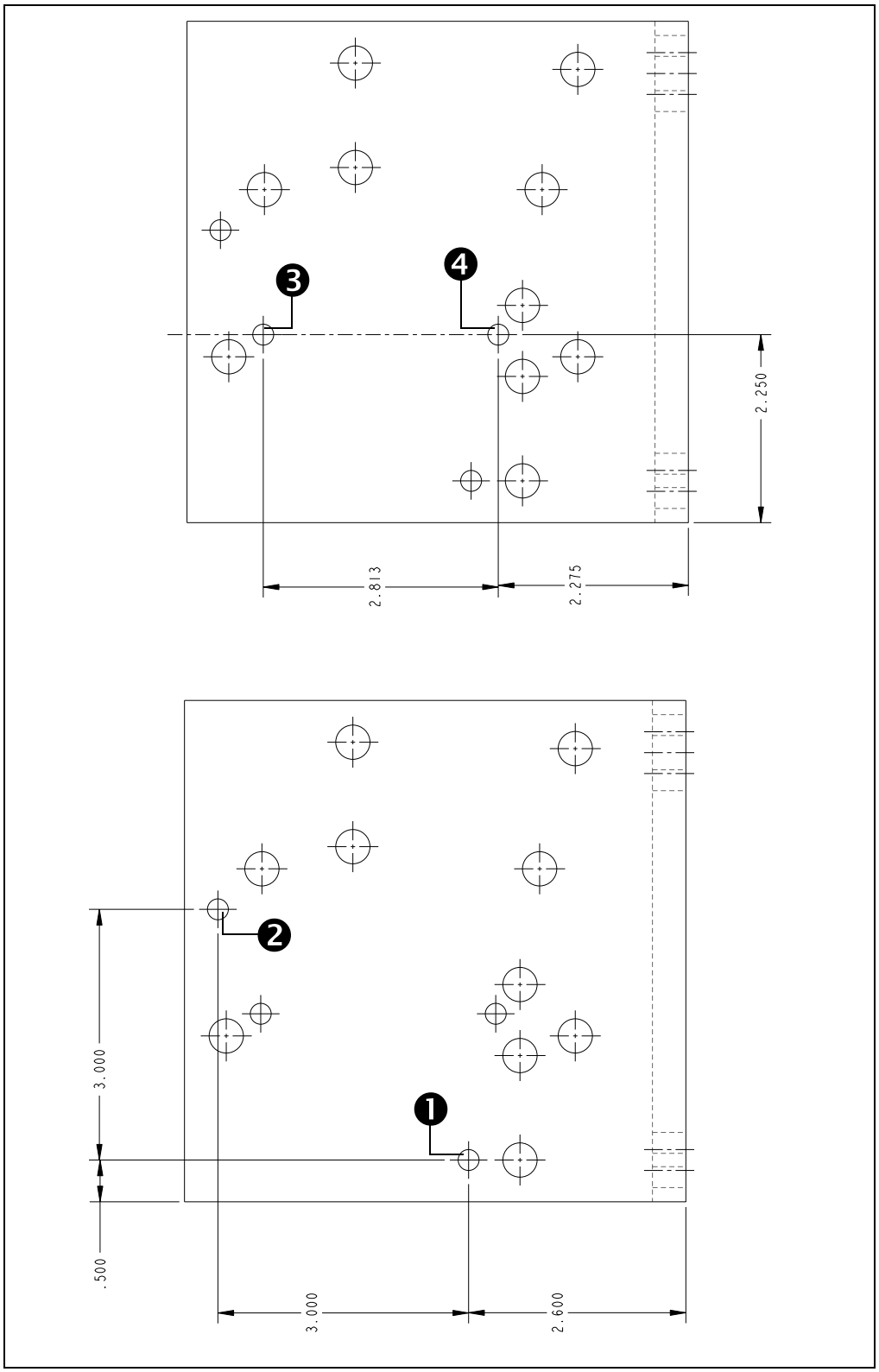
Step 5

Drill and tap four ¼"-20 threaded holes to mount the valves. See the following diagrams for hole placement.

Note – *This view shows the base of the bracket.*

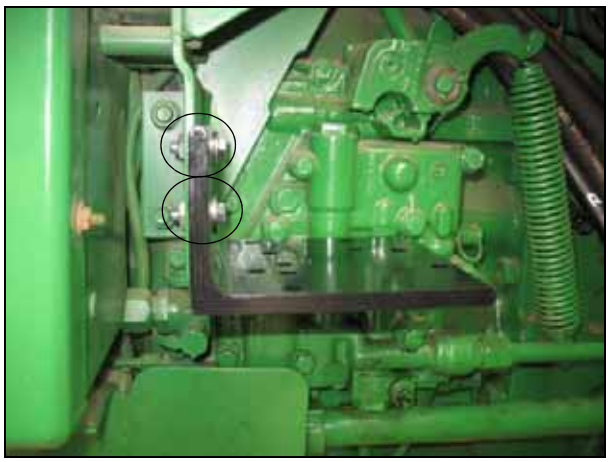


Note – *These views show the base of the bracket.*



Step 6 40/50/55 Series

Install the bracket using the kit provided $^{3}/_{8}$"-16 x 1 ½" screws, flat washers, and nylock nuts.



60 Series

Install the bracket using $^{3}/_{8}$"-16 x 1" screws and flat washers.



Step 7

Install the control valve manifold upside down with the T port facing outward. Position at the outer edge of the bracket and use the tapped holes and ¼"-20 x 1½" long socket head screws provided.



Identifying the pressure and steering lines: 4xx0 models

When installing the pressure and steering lines on the 4xx0 series machines, the initial stages of the process are dependant upon the tractor configuration. For the correct configuration, follow these links:

- 4040/4240 models
- 4440/4640/4840 models
- 4x50/4x55/4x60 series

4040/4240 models

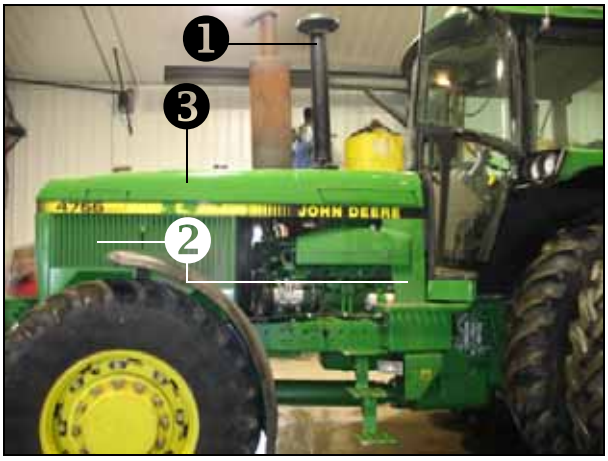
Step 1

Remove the following items to gain access to the steering hand pump lines:

❶ Air cleaner

❷ Side panels

❸ Hood

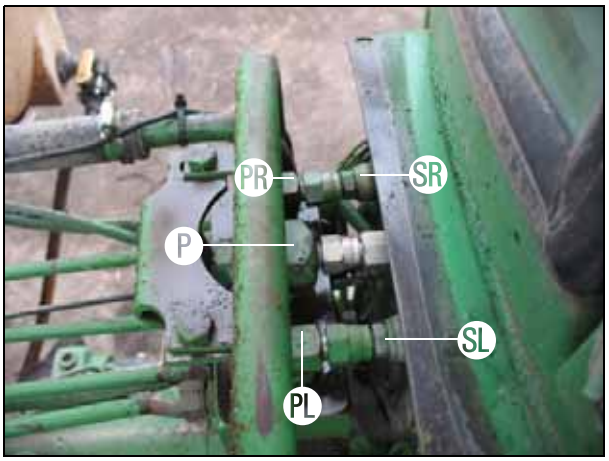




Step 2

Identify and label the steering lines at the steering valve:

Steering line	Label
Steer left	SL
Pilot left	PL
Pressure	P
Steer right	SR
Pilot right	PR



Step 3

Disconnect the outer hoses from the steel lines.

For further instructions, see Installing the pressure and steering lines: all 4xxx models, page 31.



4440/4640/4840 models

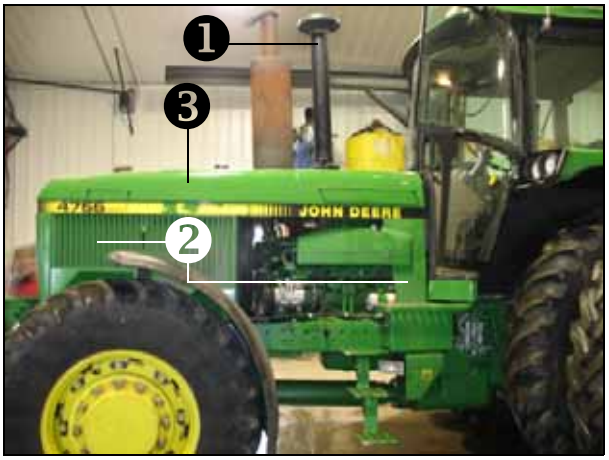
Step 1

Remove the following items to gain access to the steering hand pump lines:

❶ Air cleaner

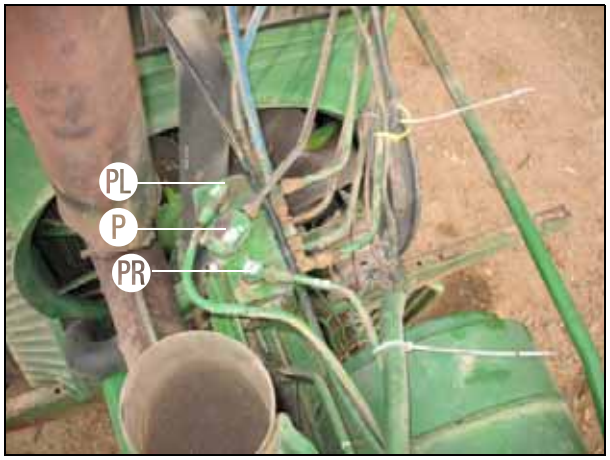
❷ Side panels

❸ Hood



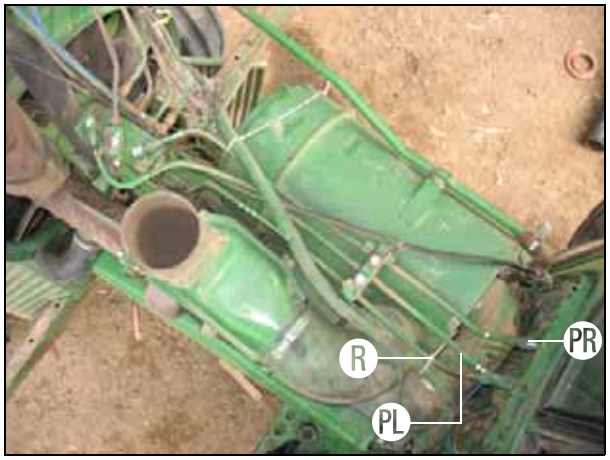
Step 2

Identify the pressure and steering pilot lines at the steering block. Mark the pressure line.



Step 3

Follow the left and right pilot lines back to the firewall of the cab where the steel lines connect to hoses.

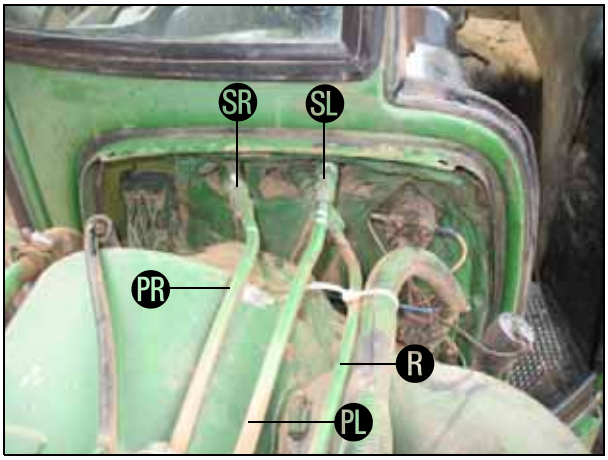


Step 4

Identify and label the steering lines at the steering valve:

Steering line	Label
Steer left	SL
Pilot left	PL
Return	R
Steer right	SR
Pilot right	PR

Note – *In most other models, the pressure line is in the place of the return line.*



Step 5

Disconnect the outer hoses from the steel lines.

For further instructions, see Installing the pressure and steering lines: all 4xxx models, page 31.



4x50/4x55/4x60 series

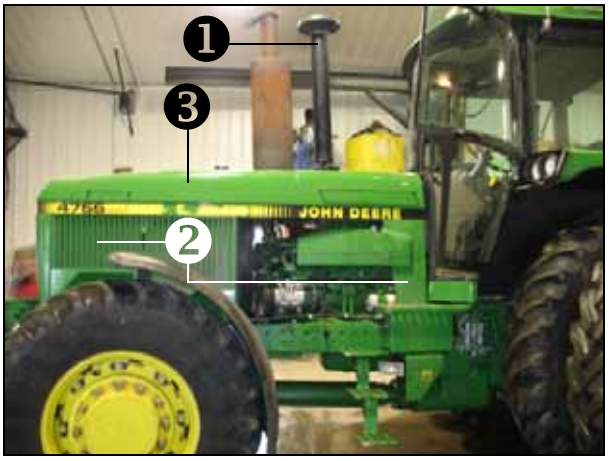
Step 1

Remove the following items to gain access to the steering hand pump lines:

❶ Air cleaner

❷ Side panels

❸ Hood

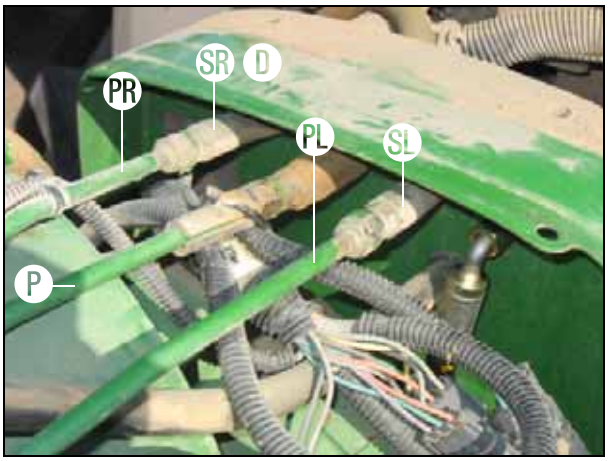




Step 2

Identify and label the steering lines:

Steering line	Label
Steer left	SL
Pilot left	PL
Pressure	P
Steer right	SR
Pilot right	PR



Step 3

Disconnect the outer hose from the steel lines.

For further instructions, see Installing the pressure and steering lines: all 4xxx models, page 31.



Installing the pressure and steering lines: all 4xxx models

This section continues the pressure and steering line installation process, begun on page 26.

Step 1

Install a -6 JIC run T-fitting to the pressure line, orientated as shown. Push the hose into the firewall to make room for the T-fitting.

Reconnect the existing pressure line to the free end of the T-fitting and attach the pressure line to the branch on the T-fitting.



Step 3

Install a -6 JIC run T-fitting to the PL line, orientated as shown. Pull the hard line back slightly to make room for the T-fitting.

Reconnect the existing PL hard line to the free end of the T-fitting.



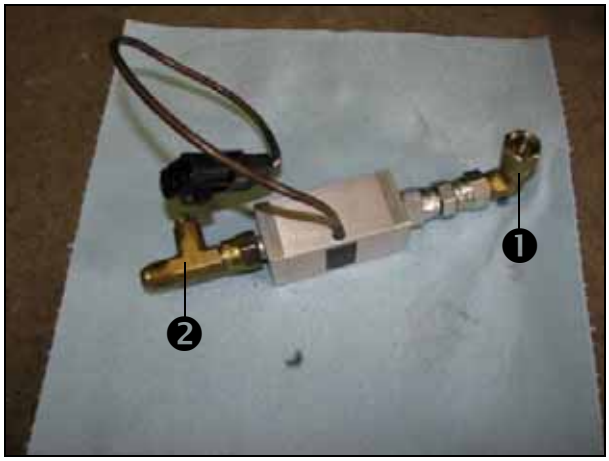
Step 4

Attach the straight end of the PL hose to the previously installed -6 JIC run T-fitting and then route the hose to the Autopilot manifold.



Step 5

Install a -6 JIC 90° swivel (❶) and a -6 JIC run T-fitting (❷) to the flow switch, approximately orientated a shown.



Step 6

Install the flow switch assembly to the PR soft line of the tractor.



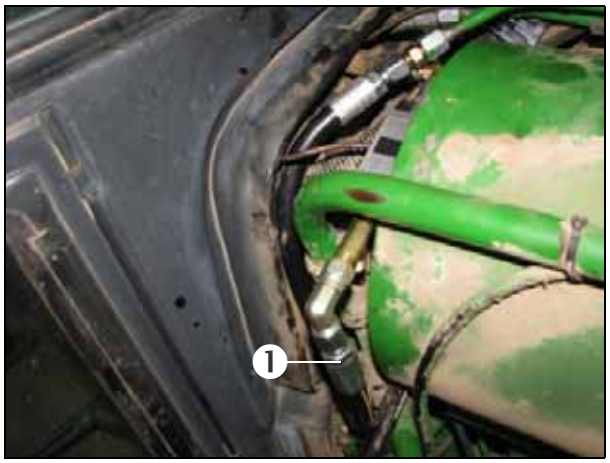
Step 7

Attach the straight end of the PR line (❶) to the branch of the T-fitting on the flow switch assembly.



Step 8

Attach the 90° end of the Manual Override hose (❶) to the free end of the T-fitting on the flow switch assembly. Route the hose back to the PR hard line and then connect the two with a -6 union.



Step 9

Route the pressure line from the T-fitting and connect it to the P port on the manifold.



Step 10

Route the A line (PR) to the manifold and connect it to the A port.

Note – *It is best to run the hose under the cab and up to the connections.*



Step 11

Route the B line (PL) to the manifold and connect it to the B port.

Note – *It is best to run the hose under the cab and up to the connections.*



Step 12

Connect the tank line to the manifold and then route the line to the rear of the tractor.



Installing the tank and shuttle line: Option 1

Note – *This is the preferred location for tank connections due to minimal back pressure.*

Step 1

Locate the vented tank port at the rear of the tractor.





Step 2

Locate the John Deere ½" NPT adaptor and washer provided in the platform kit.



Step 3

Remove the vented tank plug with a ½" socket driver.



Step 4

Install the adaptor fitting and washer to the port.



Step 5

Connect a ½" female NPT x -6 JIC adaptor provided in the hose kit. Use thread sealant for NPT connections only.



Step 6

Route the 90° end of the 80" tank hose to the vented tank port. The opposite end of the hose routes to the *Ag*GPS Autopilot valve. Add hose guard where required.



Installing the tank and shuttle line: Option 2

Note – *Only use this option if Option 1 is unavailable. This return port may produce back pressure above 80 psi when high demand for Selective Control Valve (SCV) or 3-point hitch operations occur.*

Note – *If this method affects Autopilot system steering performance when using the 3-point hitch or with SCVs, use* *Installing the tank and shuttle line: Option 1, page 35**.*

Step 1

Locate the selective control valve (SCV) housings at the rear of the machine.



Step 2

Remove the cap from the existing port and install a -8 ORB by -6 JIC 90° adaptor fitting.

Note – *Any of the selective control valves can be used. If required, an additional straight fitting is included in the kit.*





Step 3

Connect the 90° end of the kit supplied 80" tank line to the fitting in the return port of the SCV.

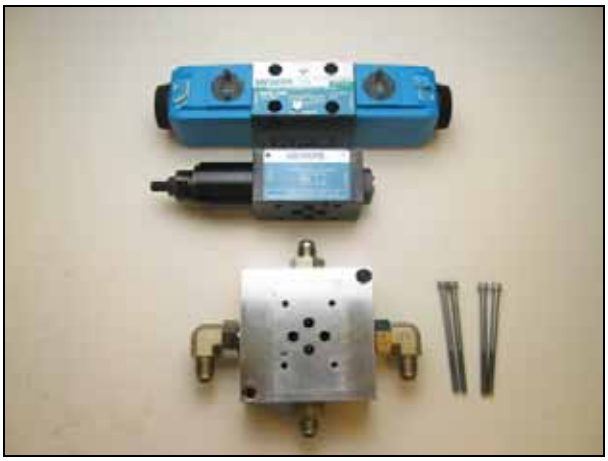


Preparing the hydraulic valve: 8x60/8x70 models

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

Step 1

Locate the control valve, pressure reducing valve, subplate, and valve mounting screws (provided).



Step 2

Install the following fittings to the subplate as shown:

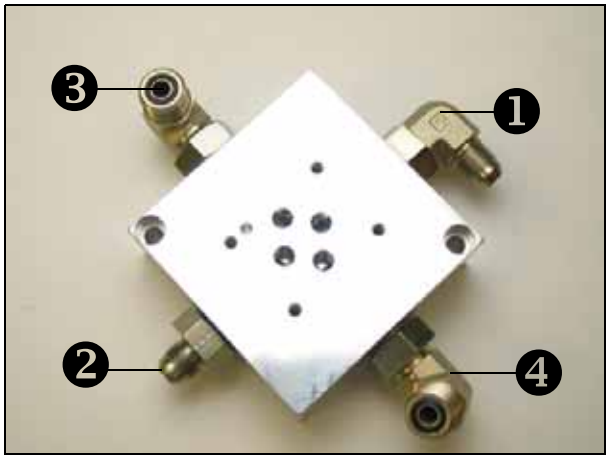
❶ Port A: -6 JIC Male 90°

❷ Port B: -6 JIC Male Straight

❸ Port P (pressure): -6 ORFS Male 90°

❹ Port T (tank): -6 ORFS Male 90°

Note – *All subplate ports are -8 ORB.*



Step 3

Use the pin guide to align the pressure reducing valve to the subplate. Ensure that the four O-rings are seated correctly.

Note – *The fittings shown may vary from previous steps.*



Step 4

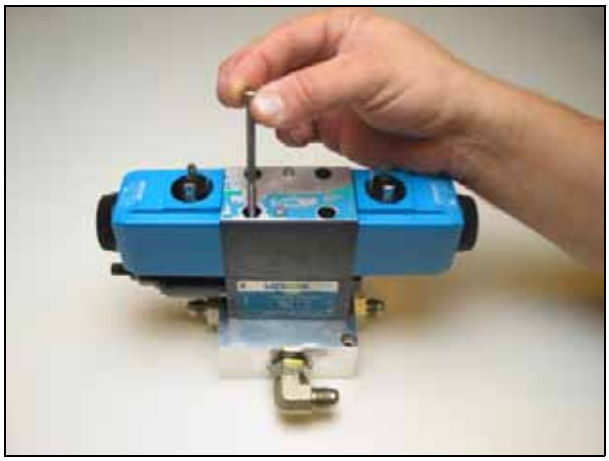
Use the pin guide to align the control valve with the reducing valve sandwich. Ensure that the four O-rings are seated correctly.



Step 5

Use the four $^{10}/_{24}$" x 3" socket head screws (provided in the bolt kit) to fasten the control and reducing valve to the subplate.

Note – *The fittings shown may vary from previous steps.*



Installing the control valve manifold: 8x60/8x70 models

Step 1

Identify the cross member under the hood.

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



Step 2

Clamp the hydraulic manifold bracket to the existing hood structure.



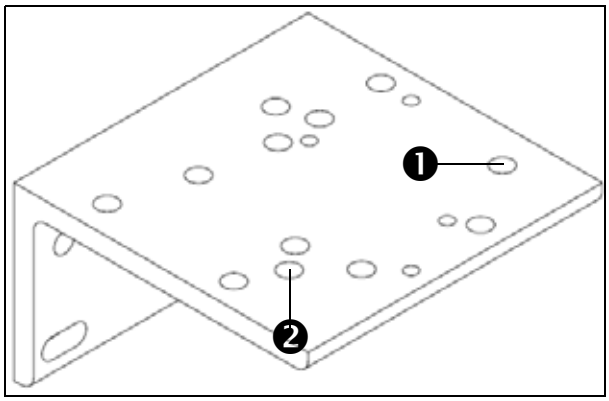
Step 3

Use the bracket as a template to mark and drill two $^{7}/_{16}$" holes as shown.



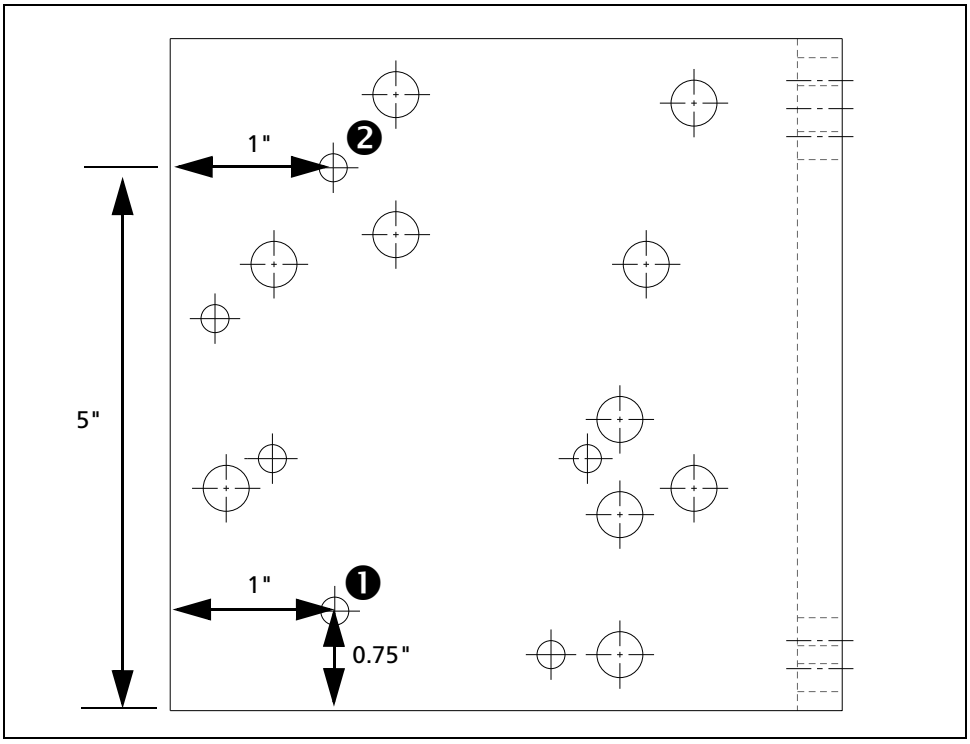
Step 4

Drill and tap two ¼"-20 threaded holes to mount the valves. See the following diagram for hole placement. Use the subplate as a template.





This view shows the base of the bracket:



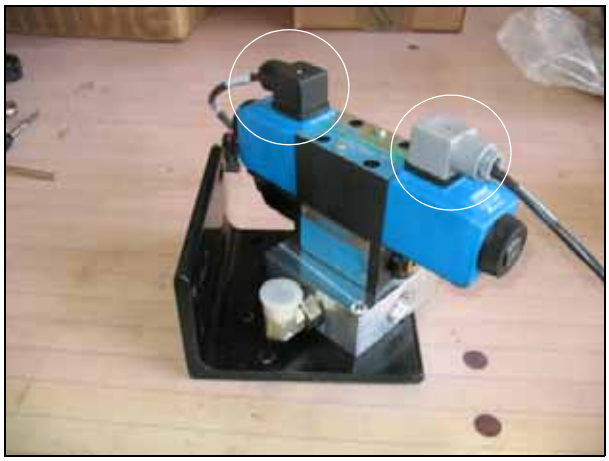
Step 5

Install the bracket using the kit provided ($^{3}/_{8}$"-16 x 1½" screws, flat washers, and nylock nuts).



Step 6

Install the DIN to the Weatherpack jumpers to the A and B coils.



Step 7

Install the control valve manifold upside down with the T and B ports facing the cab. Use the tapped holes and ¼"-20 x 1½" long socket head screws provided.



Installing the flow switch: 8x60/8x70 models

Step 1

Identify the hand pump left pilot line.

Note – *These photos are from the left side of the vehicle, in front of the cab.*



60 series



70 series

Step 2

Install a -6 JIC union to the flow switch provided in the platform kit. The switch measures flow in both directions.



Step 3

Disconnect the existing hose and then install the flow switch to the left steering pilot line. You can place the switch at the other end of the hose before the T-fitting, if necessary.



Step 4

Install a -6 JIC 45° or 90° to improve the hose routing and then connect the existing hose to the switch.



Installing the pressure and steering lines: 8x60/8x70 models

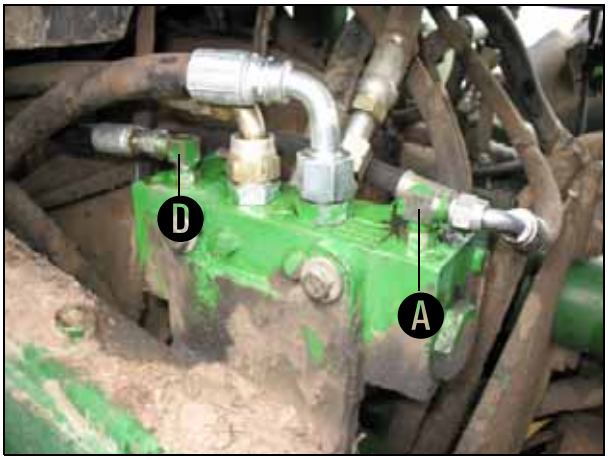
Step 1

Locate the tractor steering valve block.



Step 2

Identify the left (marked "A") and right (marked "D") steering pilot line connections. These lines should lead to the left and right connections on the hand pump.



Step 3

Install a -6 JIC run T-fitting to each of the steering pilot line ports.



Step 4

Locate the two -4 JIC ".047" orifices provided in the platform kit.



Step 5

Install an orifice on the branch of each T-fitting at port A and D.



Step 6

Connect the -6 JIC 90° end of the 21.5" hose to the A port of the subplate.



Step 7

Connect the straight end of the 21.5" hose to the A port on the existing steering block.



Step 8

Connect the -6 JIC 45° end of the 25" hose to the B port of the subplate.



Step 9

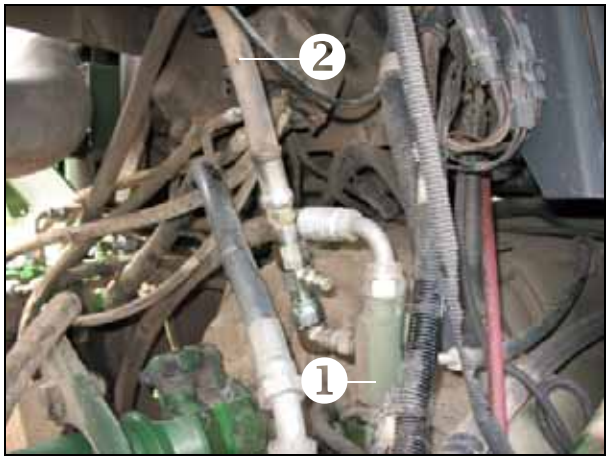
Connect the straight end of the 25" hose to the D port on the existing steering block.



Step 10

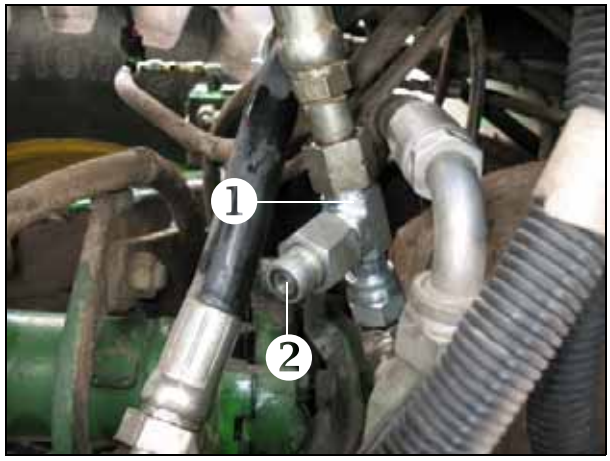
Locate the pressure manifold on the left side in front of the cab (❶). If in question, verify by checking that the pressure is approximately 2250 psi. Follow the pressure line to the steering block (❷).





Step 11

Install a -10 ORFS run T-fitting (❶) and a -10 to -6 ORFS reducer (❷) on the line that runs to the steering block.



Step 12

Connect the -6 ORFS 90° end of the 22" hose to the reducer at the pressure manifold.



Step 13

Connect the -6 ORFS straight end of the 22" hose to the P port of the subplate.



Step 14

Locate the return line on the right side inside frame rail under the cab.



Step 15

There are various lines connected to the steel return manifold. Locate the return line leading to the hand pump by following the hose to the hand pump.



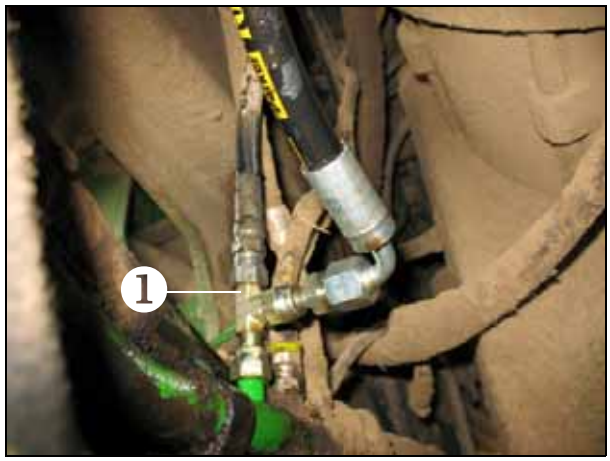
Step 16

The return line connects to the lower port of the hand pump (❶).



Step 17

Install a -4 ORFS run T-fitting (❶) in the line returning from the hand pump.



Step 18

Connect the -4 ORFS 90° end of the 43" hose to the run T-fitting.



Step 19

Connect the -6 ORFS straight end of the 43" hose to the subplate T port.



Bleeding the steering lines: all models

Note – *When you install the steering hoses, oil bleeds out of the hand pump. This results in no reaction to steering wheel movement. Use the manual adjustment on the Pilot Operated Check (POC) valves to bleed air out of the system.*

CAUTION – Air in the steering lines can cause erratic tire movement. Stand clear of the tires.



Step 1

Start the tractor and then turn the steering wheel in both directions until the steering is immediately responsive in either direction. Turn the steering wheel from full lock to lock several times.

Step 2

Manually stroke the control valve using a small punch at the end of the solenoid. Steer the wheels from full lock to lock several times.



Completing the electrical connections - all models

Step 1

Connect the hydraulic valve cable to the DIN connectors on the hydraulic valve.



Step 2

Connect the manual override cable to the flow switch. Route the cables to the pass-through at the right rear corner of the cab.



Step 3

Route the cable into the cab through the access hole at the rear corner of the cab. If required, drill an access hole and then line it with a grommet.



CHAPTER

3

AutoSense Steering Device Installation

In this chapter:

- AgGPS AutoSense device components
- Installing the AgGPS AutoSense device: 8x60/8x70 models
- Preparing the harness (P/N 54602 Rev C)

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

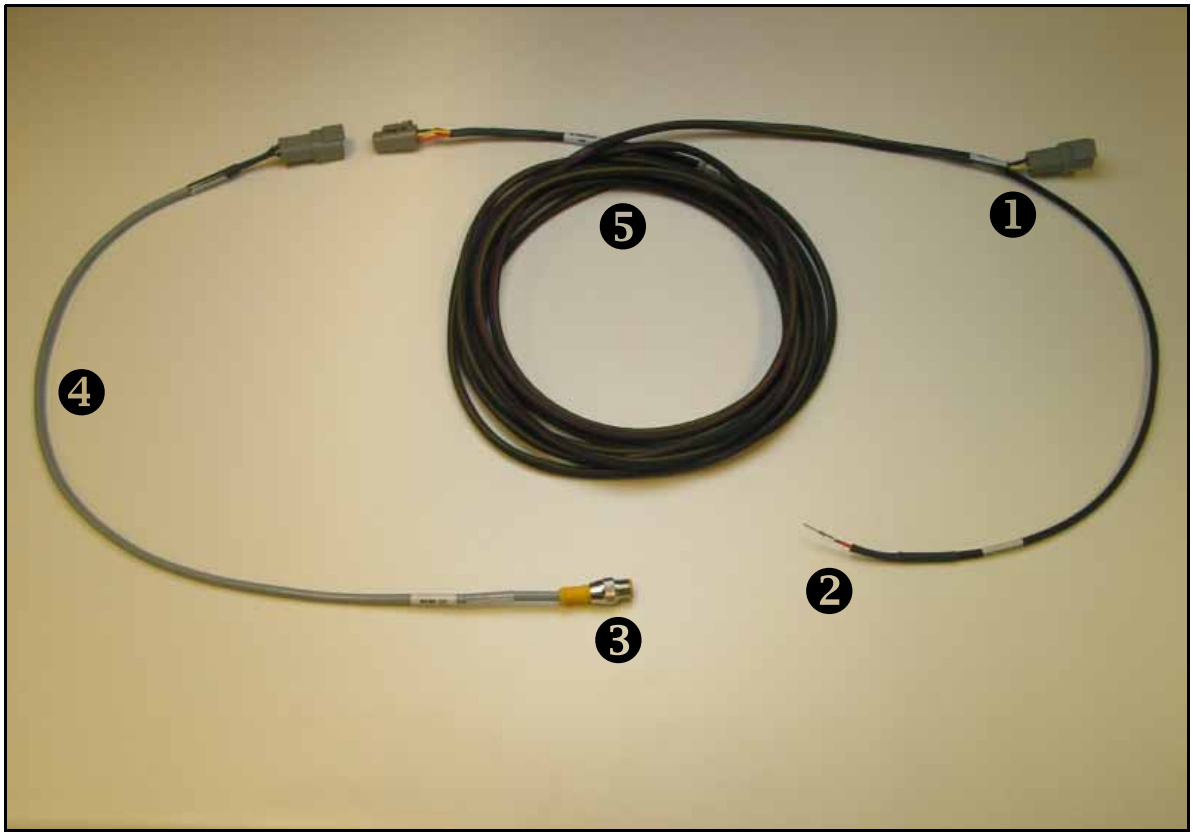
If the described mounting location is not accessible, chose an alternate location. To ensure proper function, the AutoSense device must be located in a position that is free of obstructions and allows it to rotate with the wheels when they turn.

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

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

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

*Ag*GPS AutoSense 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 *Ag*GPS AutoSense device: FWD 4xxx models

Note – *To install the AutoSense device on a two wheel drive model, see* *Installing the AgGPS AutoSense device: 2WD 4xxx models, page 63**.*

Step 1

Locate the mounting location on the right front wheel.



FENDERS NOT INSTALLED



FENDERS INSTALLED

Step 2

Use the appropriate fender mounting hardware provided in the bolt kit to attach the bracket as shown.



FENDERS NOT INSTALLED



FENDERS INSTALLED

Step 3

Mount the steering device to the bracket. Use the provided #6 socket head screws.

Note – *Point the connector in the best direction for cable routing.*



FENDERS NOT INSTALLED



FENDERS INSTALLED

Step 4

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



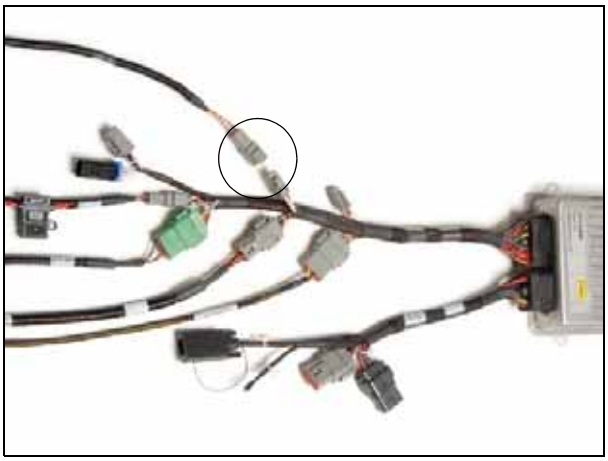
FENDERS NOT INSTALLED



FENDERS INSTALLED

Step 5

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



Installing the *Ag*GPS AutoSense device: 2WD 4xxx models

Step 1

Locate the existing tie rod end near the right front wheel as shown.



Step 2

Remove the existing nut from the tie rod end and replace it with the provided $^{5}/_{8}$" or ¾" castle nut adaptor. When the nut is tight, ensure that you replace the cotter pin.



Step 3

Use a $^{3}/_{8}$" bolt and thread locker to attach the AutoSense mounting plate onto the castle nut.



Step 4

Mount the *Ag*GPS AutoSense steering device on the bracket. Use the provided #6 socket head screws.

Note – *Point the connector in the best direction for cable routing.*



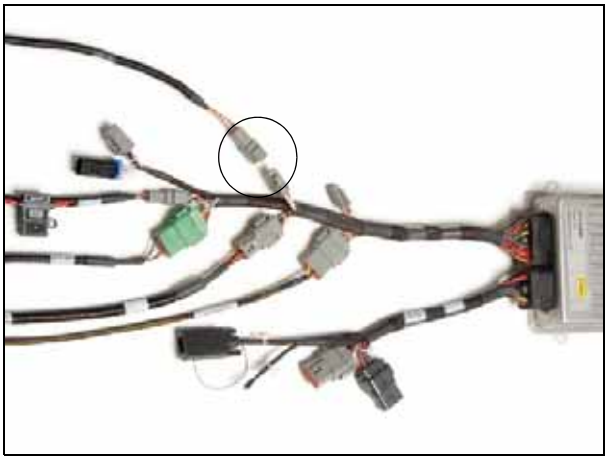
Step 5

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



Step 6

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



Installing the *Ag*GPS AutoSense device: 8x60/8x70 models

Step 1

Locate the mounting location on the rear articulating structure.

Note – *You can place the device on the left or the right of the hoses. Place it in the most protected location.*



Step 2

Identify the existing through-hole in the frame behind the articulation pin.

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



Step 3

Secure the plate to the frame with a $^{3}/_{8}$" bolt and nylock nut.

Note – *The orientation of the plate to the direction of travel is not critical.*



Step 4

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



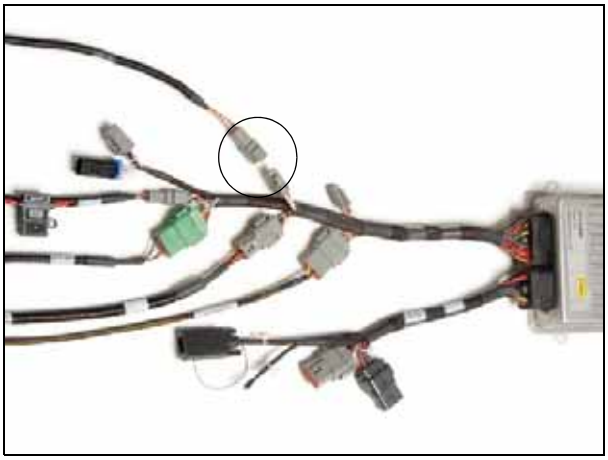
Step 5

Route the steering cable and then connect the jumper cable to the steering device. Leave adequate length in the cable to avoid tension during full left or full right turns.



Step 6

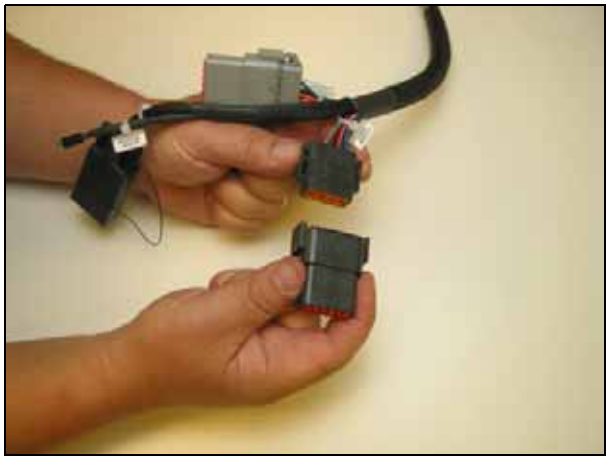
Connect the steering device cable connection to P-6 on the main wiring harness. P-6 is labeled "Steering Sensor".



Preparing the harness (P/N 54602 Rev C)

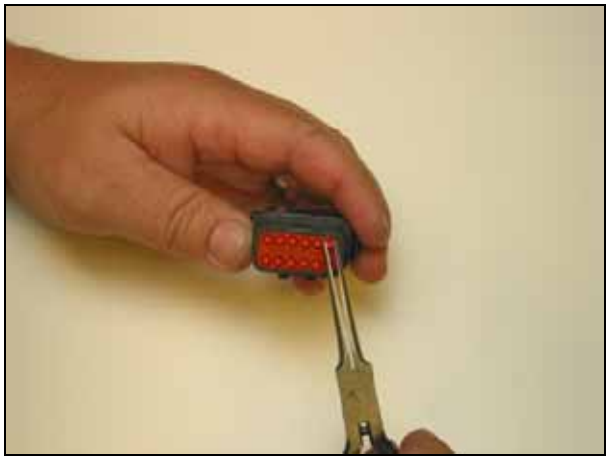
Step 1

Remove the black Deutsch DTM receptacle from the P-13 sensors leg of the auxiliary harness. See Controller connections.



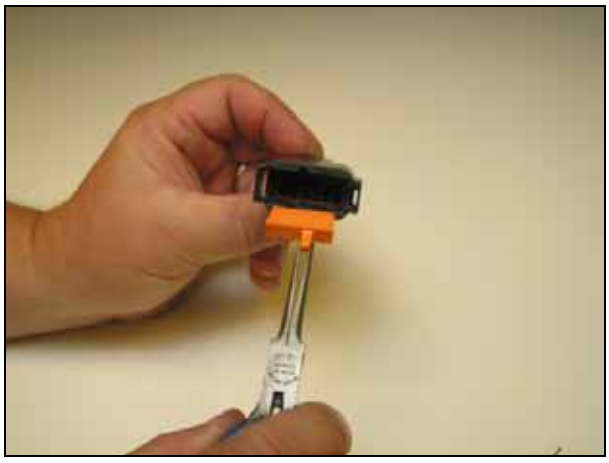
Step 2

Remove the plug from cavity number 1.



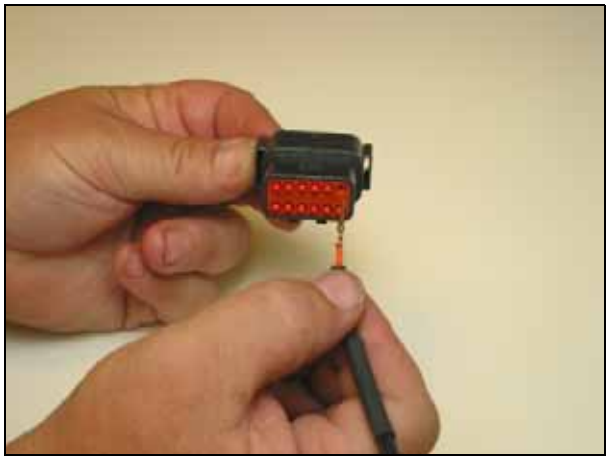
Step 3

Remove the wedge from the connector.



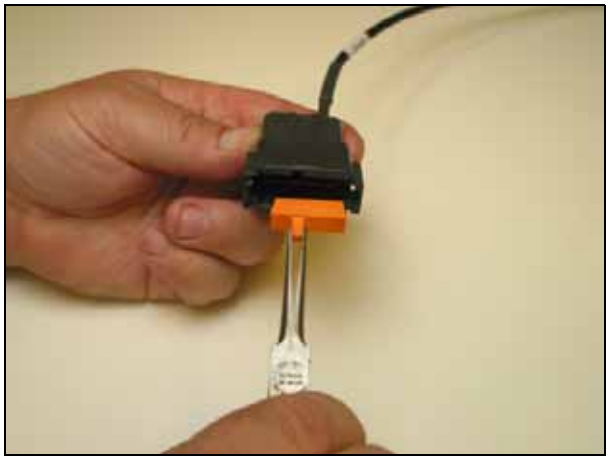
Step 4

Insert the DTM pin labeled “Cavity 1” into the connector.



Step 5

Pull back on the wire to seat the pin. Replace the wedge in the connector.



CHAPTER

4

Antenna/Receiver Installation

In this chapter:

- Antenna and receiver installation options
- Assembling and installing antenna solutions using the John Deere Starfire antenna bracket adaptor
- AgGPS 262 GPS receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AgGPS 262 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing an AgGPS 262 receiver with magnetic feet
- AgGPS 432/442 receiver components
- Installing the AgGPS 432/442 receiver
- Installing a PDL radio modem

This chapter describes how to install an *Ag*GPS 262 receiver and *Ag*GPS radio module, an *Ag*GPS 432 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 the antenna type:

- **Spar mount** – This bracket mounts directly to the roof bolts and is required for all high accuracy applications such as RTK and OmniSTAR. Trimble recommends this method for mounting an *Ag*GPS 262 receiver. Bolt a metal spar to the roof or to a light bracket and then attach either a V plate for magnetic mounting or an *Ag*GPS 262 receiver plate for permanent mounting.
- **VHB mount** – Attach a 4" x 6" plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 74.
- **Starfire quick release mount** – Attach the desired receiver or receiver mount plate as described in the Starfire adaptor section. See page page 76.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting:

Possible mounting methods

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

Notes –

– *For quick release magnetic mounting with an AgGPS 262 receiver, order the kit listed in Antenna mounting kits, page 11 and bolt the V plate to the spar. When spar mounting is not available and high accuracy is required, see Installing an AgGPS 262 receiver with magnetic feet, page 86.*

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

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

Mounting an adjustable spar to roof bolts

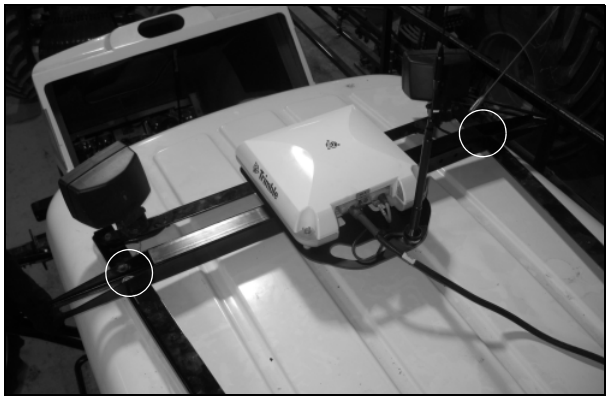
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

Position the cab bolts on the roof of the vehicle.

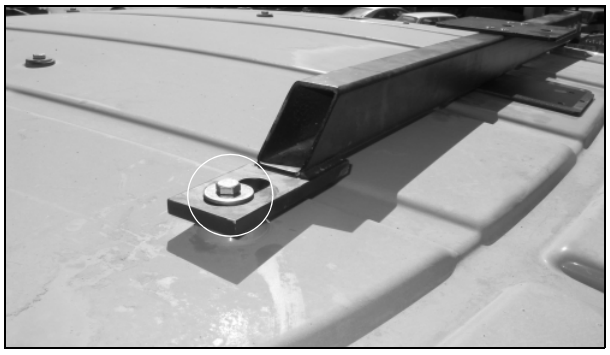


If a light bracket already occupies the roof studs, mount the spar directly onto the light bracket.



Step 2

If required, replace the existing bolts with longer bolts.



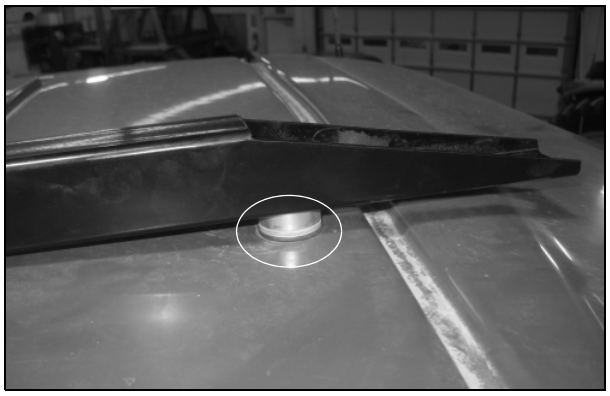
If you use the light bracket, drill two holes to match the spar width.



Step 3

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

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



Step 4

For either of the following applications:

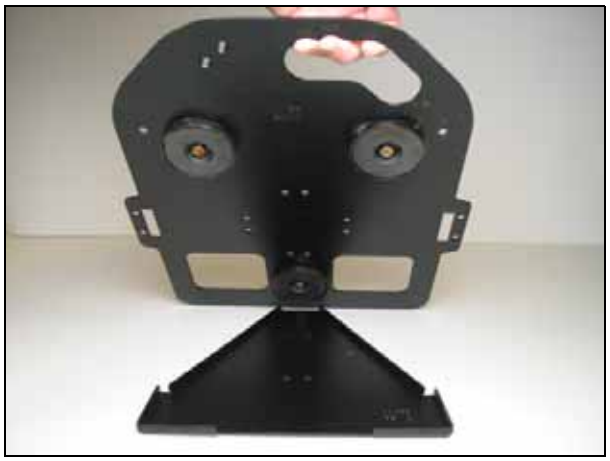
- A single magnet antenna mount
- An *Ag*GPS 262 receiver with magnetic option for quick removal

Attach a V plate with four ¼" flathead screws.

The narrow end points to the front of the vehicle.



V plate on the spar



Magnetic mount on the V plate

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

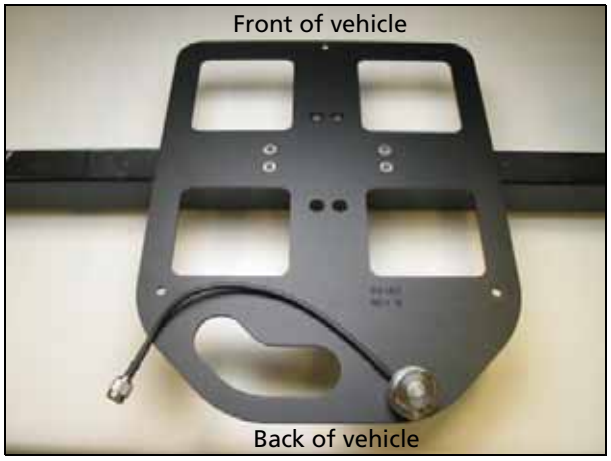


Plate on the spar

Attaching the plate with VHB adhesive

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

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

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

Step 1

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

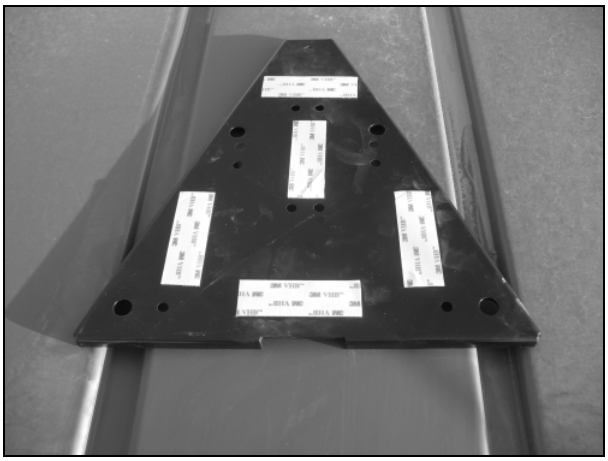


Step 2

V plate only

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

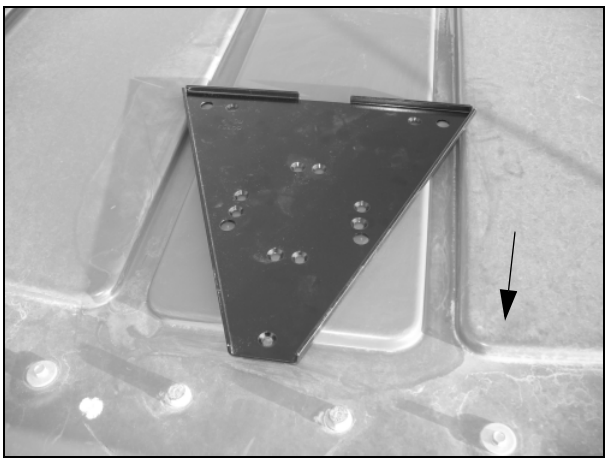
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



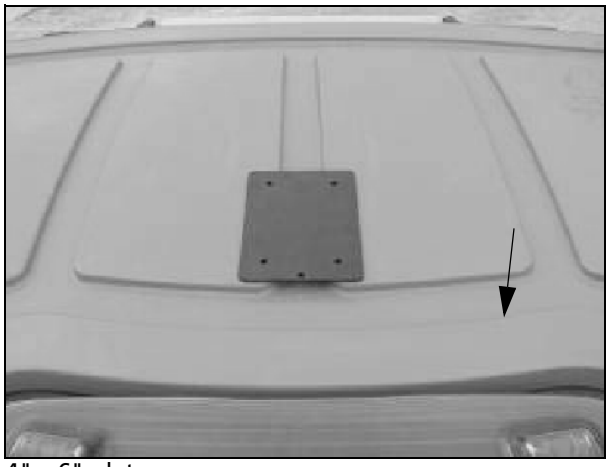
Step 3

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

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



V plate



4" x 6" plate

Assembling and installing antenna solutions using the John Deere Starfire antenna bracket adaptor

On vehicles equipped with the John Deere optional Starfire antenna bracket, you can use the Trimble JD ATR antenna bracket to provide a fast release antenna mount.

Step 1

Layout the bracket and hardware on a clean surface.



Step 2

Using the hardware provided, install the lock-pin and the lanyard as shown.



Step 3

Install two washers onto a stud.



Step 4

Install a T-knob locking handle onto the stud and then repeat Steps 3 to 4 for the second stud.



Step 5

Standard mount

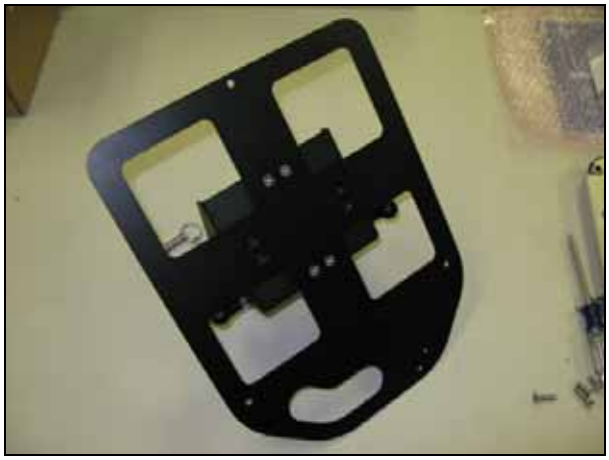
For antennas using a standard $^{5}/_{8}$" - 11 threaded mount, attach the antenna to the bracket with a $^{5}/_{8}$" - 11 bolt.



Plate mount

For antennas that use a plate mount, attach the adaptor to the plate with four ¼" - 20 flat head screws.

Note – *A standard mount (P/N 56182) is shown, others are similar.*



Step 6

If you are using an external radio antenna with this option, attach the radio antenna to the *Ag*GPS 262 flat mount plate as shown.



Step 7

Insert the tab situated at the bottom of the adaptor into the slot in the vehicle mounted antenna bracket.



Step 8

Tighten both knobs securely.



Step 9

Tip the adaptor back until the pin holes line up and insert the attached steel lock pin through the bracket and the adaptor.

Note – *The pin prevents the bracket from falling should you forget to tighten the locking knobs.*



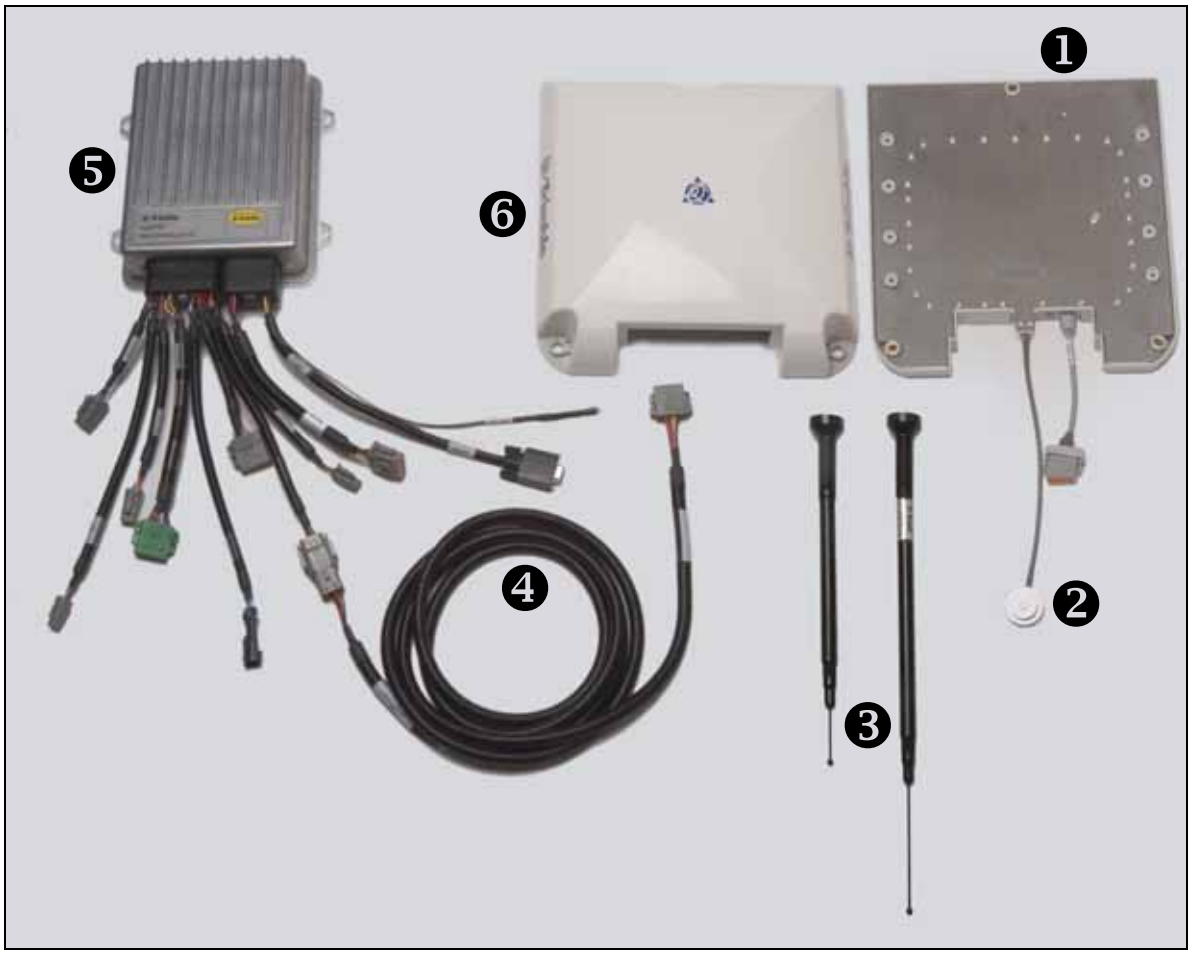
Step 10

When using the Starfire antenna bracket adaptor with an external radio antenna.

Provision for mounting the radio antenna can be made using the standard adhesive backed steel plate with a standard magnetic mount as shown.



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



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

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

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

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

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

Removable installation

Step 1

V plate

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

For spar mounting instructions, see page 71.



Mounting plate

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



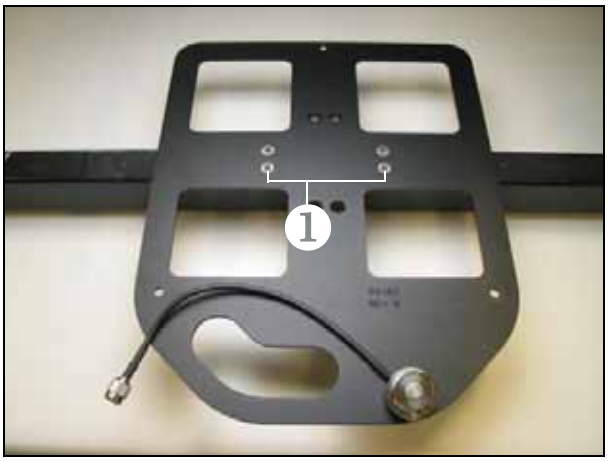
Underside of plate

Permanent installation

Step 1

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

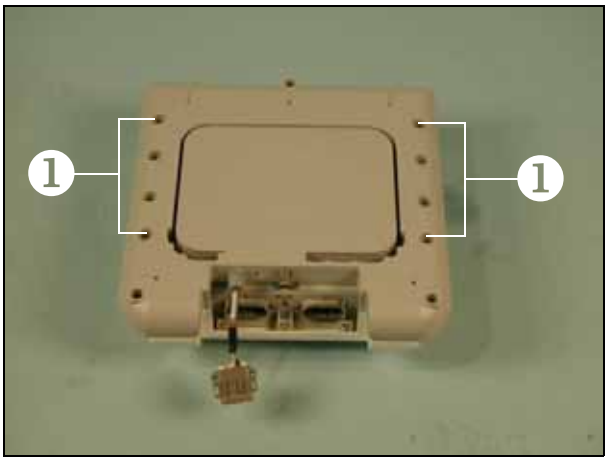
For spar mounting instructions, see page 71.



Step 2

Both installation methods

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



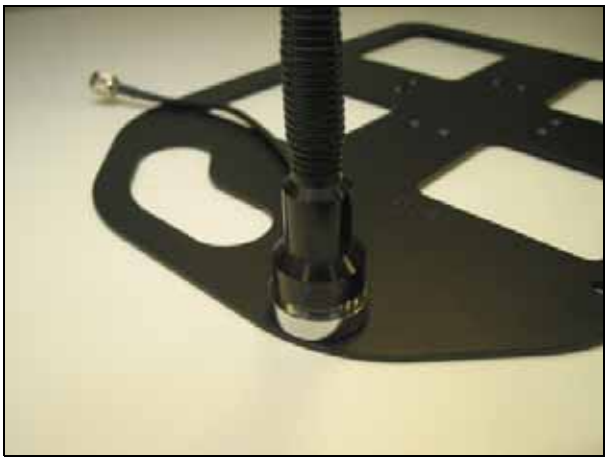
Step 3

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



Step 4

Attach the radio antenna to the antenna base.



Step 5

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



Step 6

Insert the nylon bushings provided.



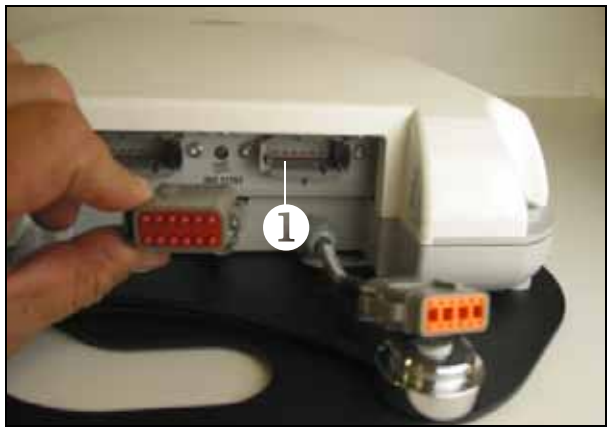
Step 7

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



Step 8

Remove the connector plug from port B ❶.



Step 9

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



Step 10

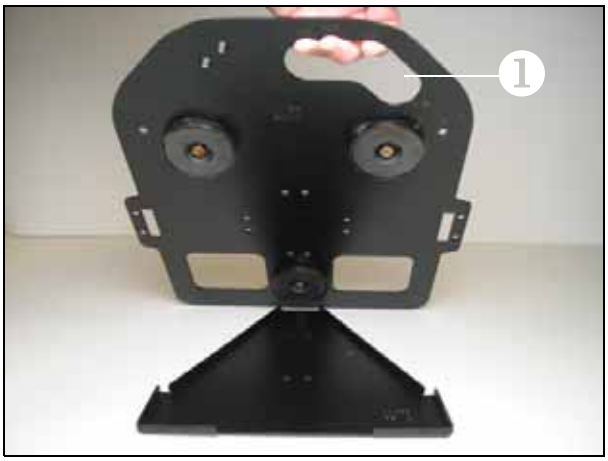
Connect the radio antenna to the antenna port.



Step 11

Magnet method

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

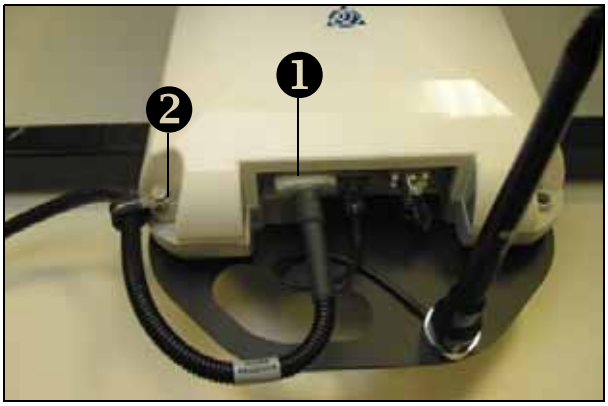


Step 12

Both methods

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

Route the cable into the cab and into the controller.



Installing an *Ag*GPS 262 receiver with magnetic feet

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

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

Step 1

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

Place the nuts on the receiver side.



Step 2

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

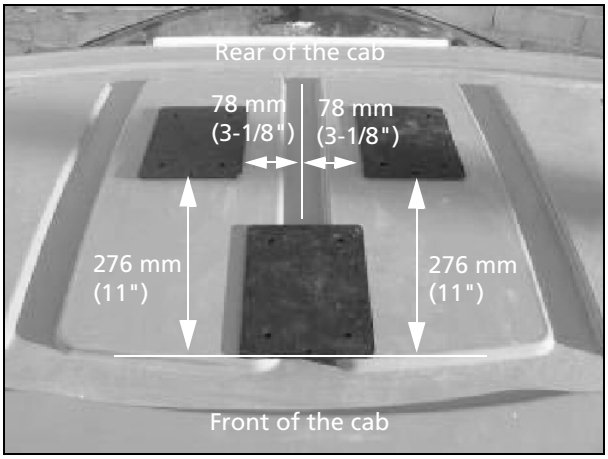


Step 3

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

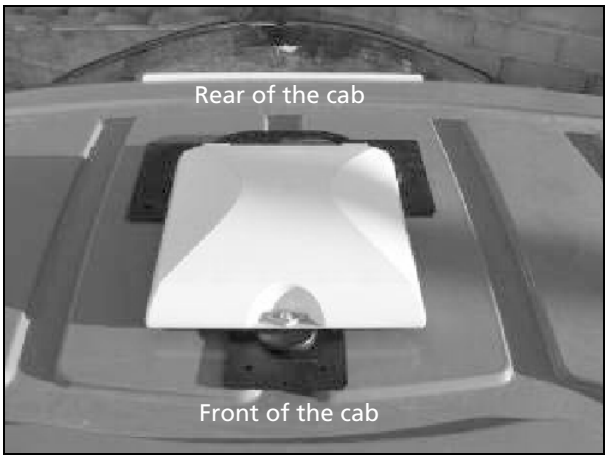
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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



Step 4

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

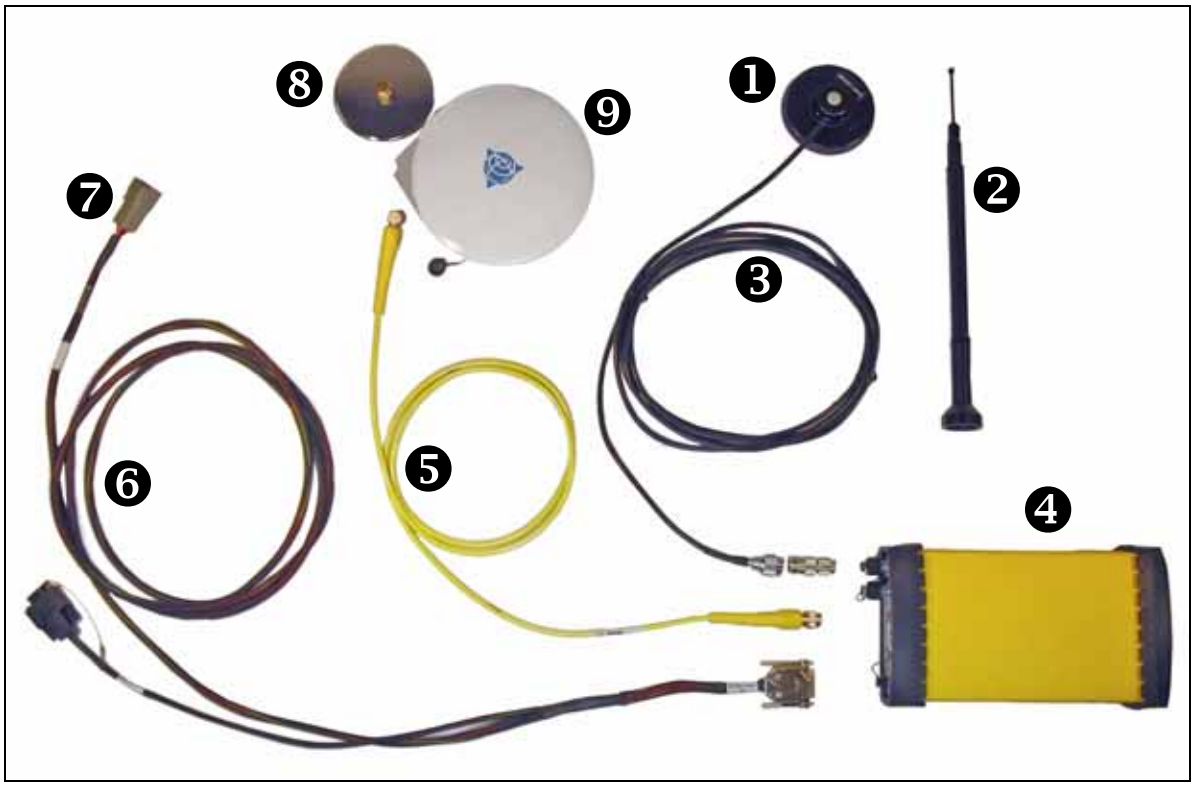


Step 5

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



*Ag*GPS 432/442 receiver components



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

Installing the *Ag*GPS 432/442 receiver

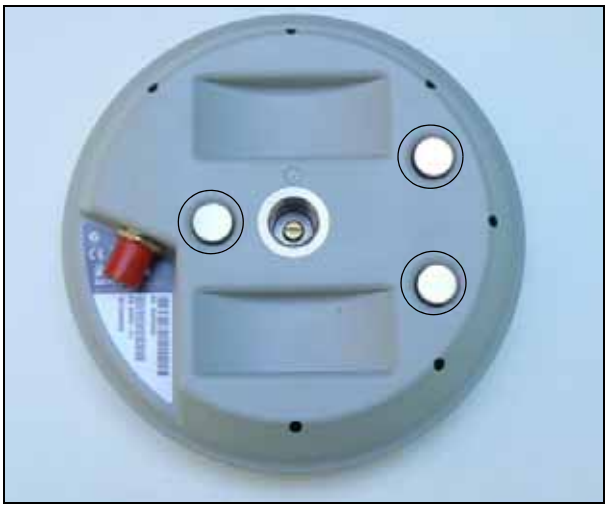
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

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



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



Step 2

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

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



Step 3

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



Step 4

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



Step 5

Identify the correct adaptor for the radio connection:

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

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



Step 6

Attach the adaptor to the radio port.



Step 7

Connect the radio antenna cable to the radio port adaptor.



Step 8

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



Step 9

Connect the radio antenna to the magnetic antenna base.



Step 10

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



Installing a PDL radio modem

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

Step 1

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



Permanent mount

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



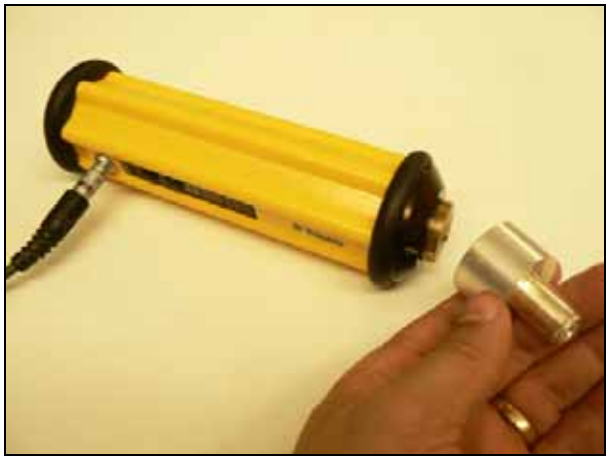
Temporary mount

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



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

5

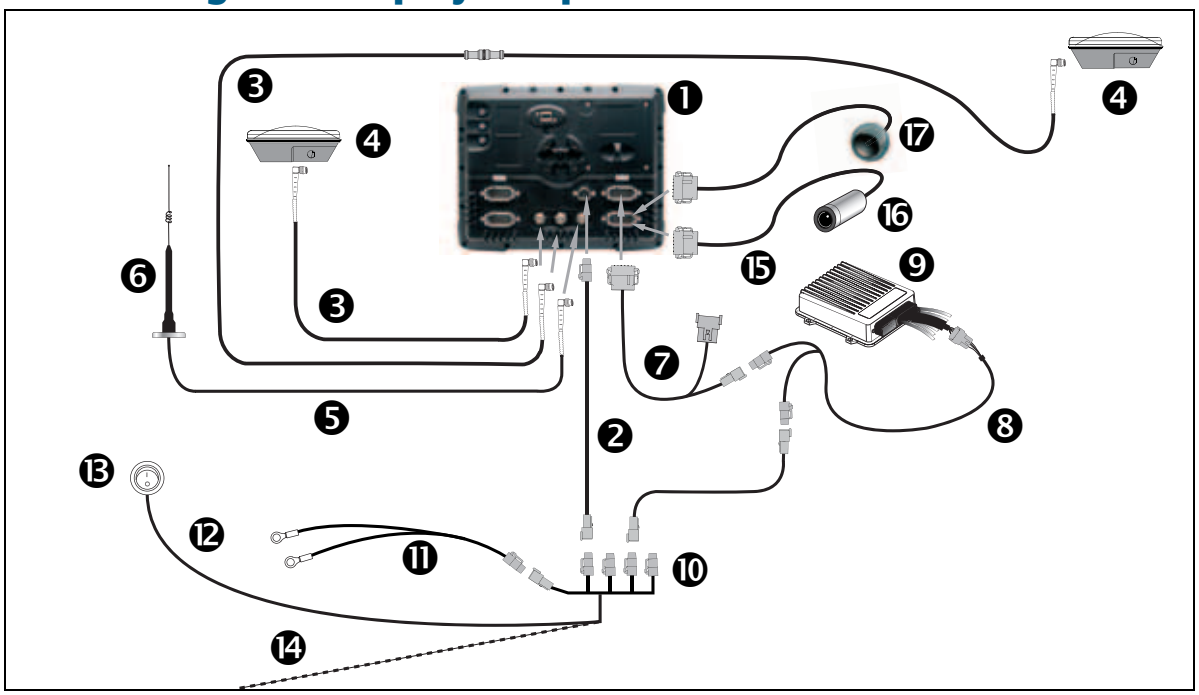
Display Installation

In this chapter:

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

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

FmX integrated display components

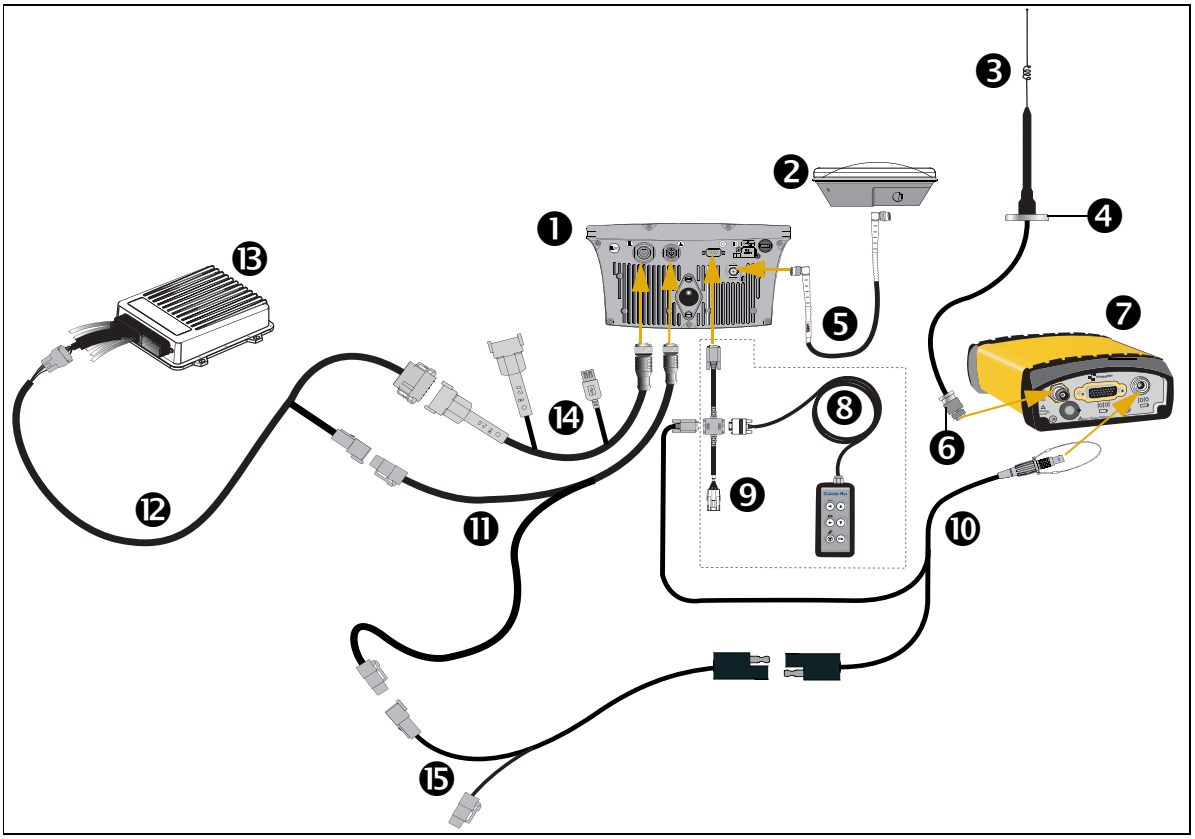


Item	Description
❶	FmX integrated display: P/N 93100-02
❷	FmX power cable: P/N 66694
❸	GPS, 5M, TNC/TNC RT angle cable: P/N 50449
❹	GPS antenna: P/N 57200-00
❺	Antenna cable and base: P/N 62120
❻	SNB900 radio antenna kit: P/N 28822-10
❼	FmX to NavController II cable w/ port replicator: P/N 65522
❽	NavController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

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

EZ-Guide 500 lightbar components

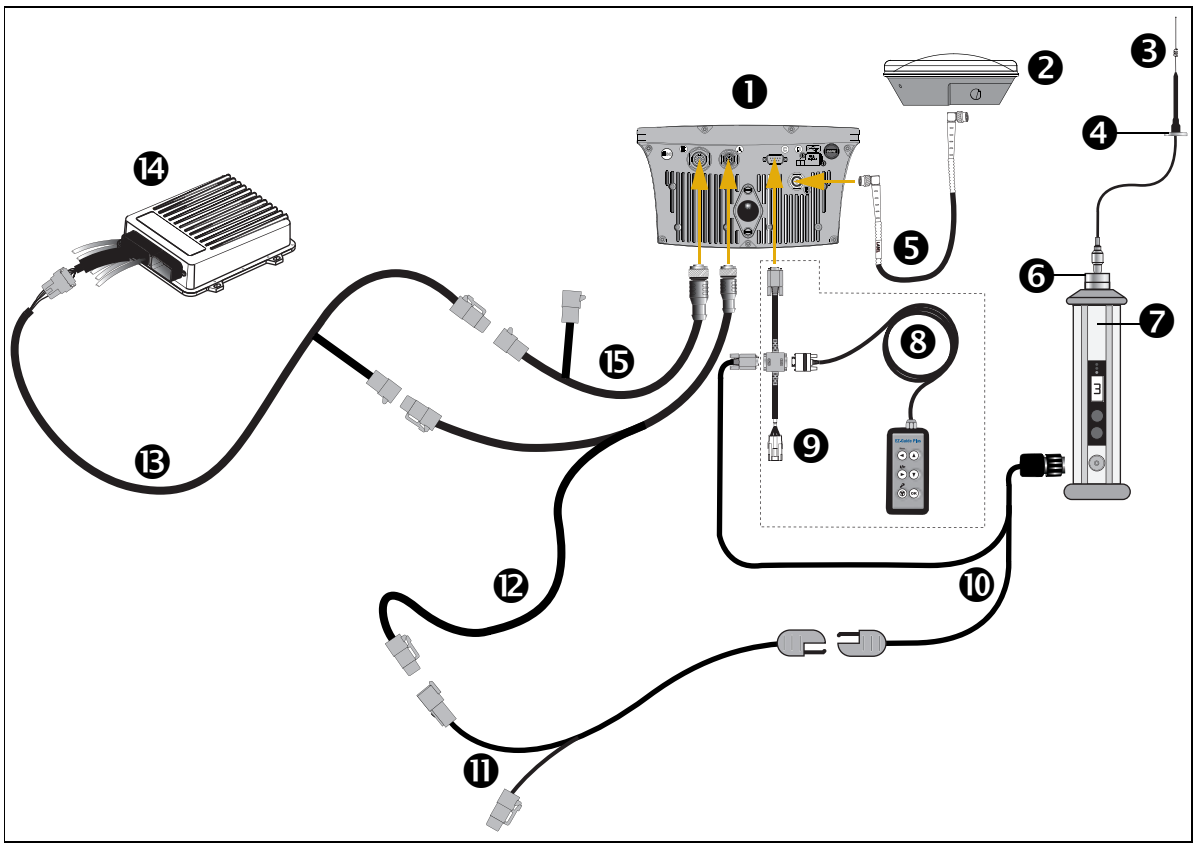
With SNB900 radio for 900 MHz RTK corrections (if equipped)



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

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

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



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

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

Preparing the FmX integrated display

Step 1

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



Step 2

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



Step 3

Attach the RAM mount to the rear of the display.



Installing the FmX integrated display

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

Step 1

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

Step 2

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

FmX integrated display: Installing the wiring harness

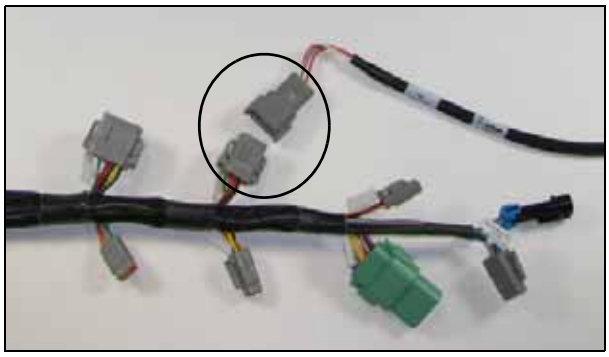
Step 1

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



Step 2

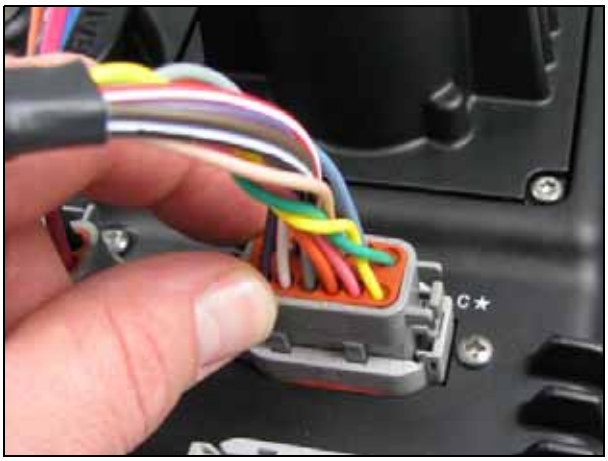
Connect the cable to the P3 connector on the NavController II main harness, and then route the cable from the NavController II to the mounting location on the FmX integrated display.



Step 3

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

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



FmX integrated display: Connecting accessory options

AgCam

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

Step 1

Locate the AgCam and AgCam cable.



Step 2

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

Step 3

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



Step 4

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



Speaker

Step 1

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



Step 2

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

Step 3

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



Preparing the EZ-Guide 500 lightbar

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

Step 1

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



Step 2

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



Connecting the EZ-Guide 500 lightbar cables

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

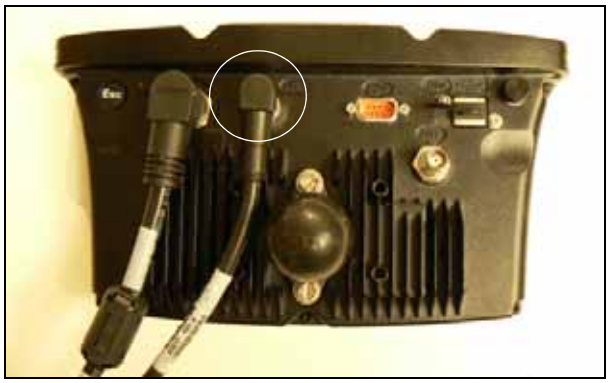
Step 1

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



Step 2

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



Step 3

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

Step 4

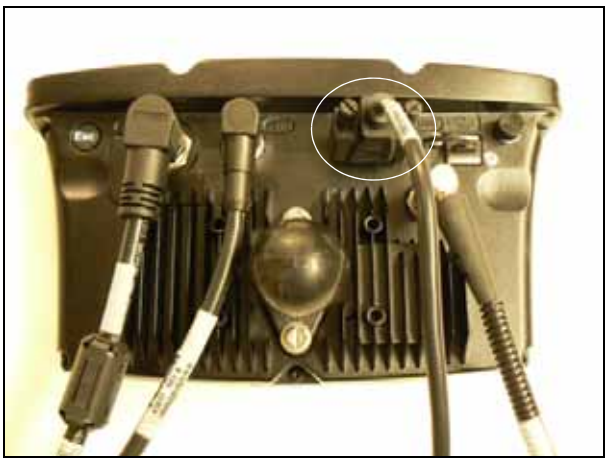
Feed the GPS antenna cable into the cab and then connect it to the antenna port on the back of the lightbar.



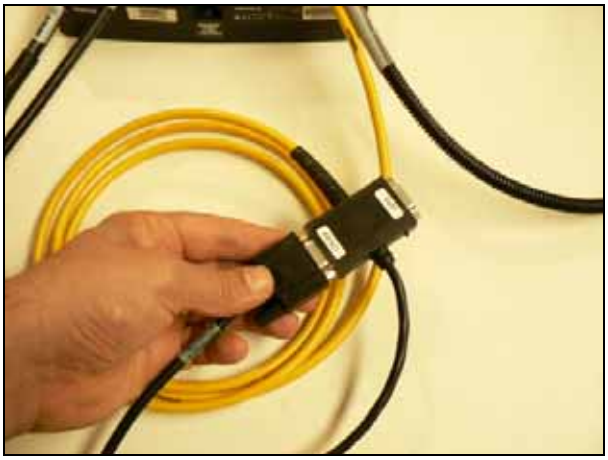
Step 5

With keypad

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

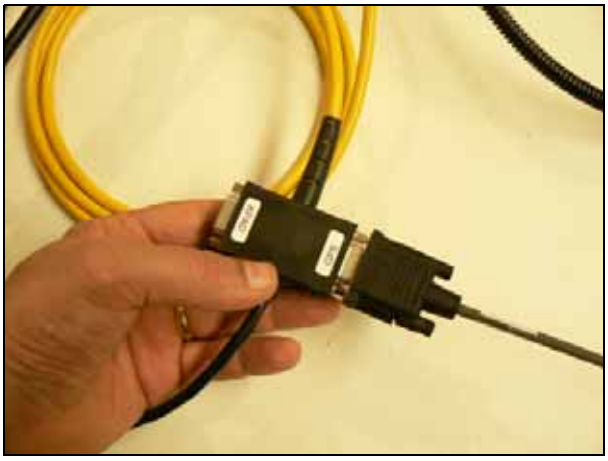


Connect the remote keypad to the KPAD serial port on the external interface cable.



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

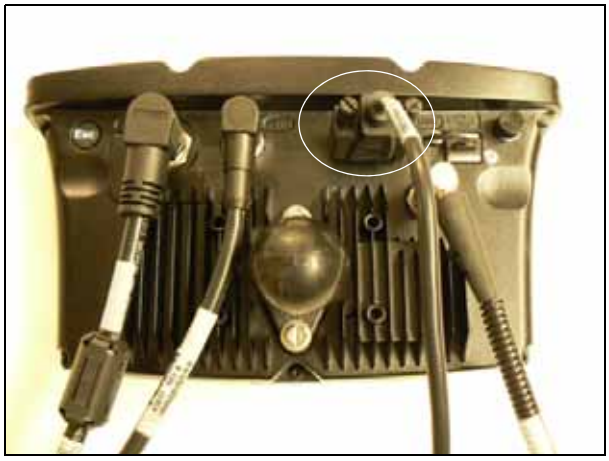
Radio type	Cable to connect
SNB900 radio	EZ-Guide 500-to-radio cable (P/N 61158)
PDL 450 radio	PDL radio power/data cable (P/N 51861-00)



Without keypad

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

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



Step 6

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

Step 7

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

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

Installing the EZ-Guide 500 lightbar

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

Step 1

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



Step 2

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



Step 3

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



Step 4

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



Step 5

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



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

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

Note – *The V plate antenna bracket is available on the Autopilot price list. See* *Antenna mounting kits, page 11*.

Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations. For more information, see Antenna and receiver installation options, page 70.

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



VHB adhesive method

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

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

Step 1

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

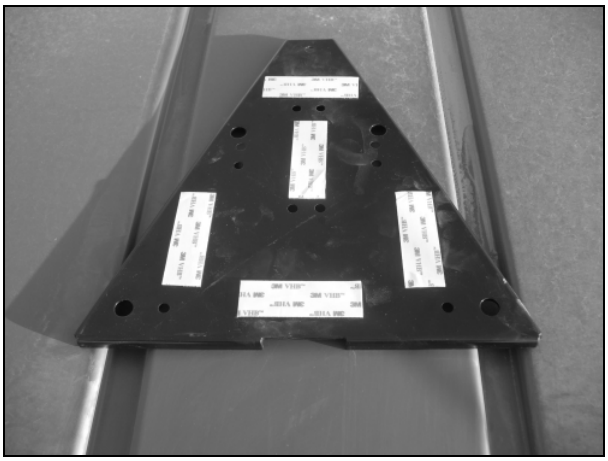


Step 2

V plate only

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

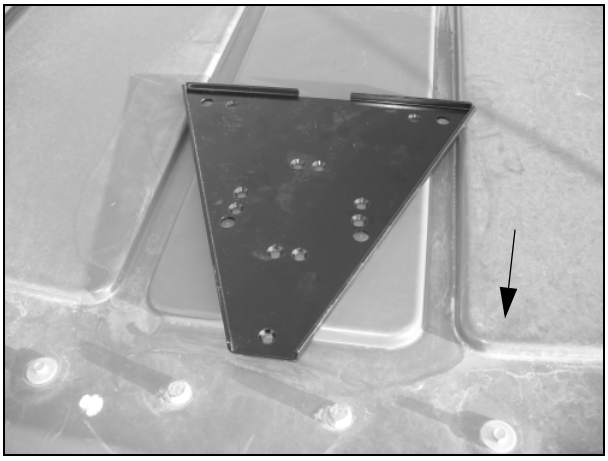
Note – *The VHB strips are pre-applied to the 4" x 6" plate.*



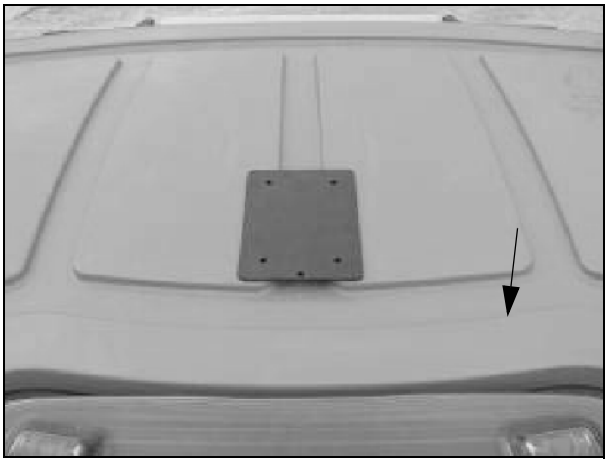
Step 3

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

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



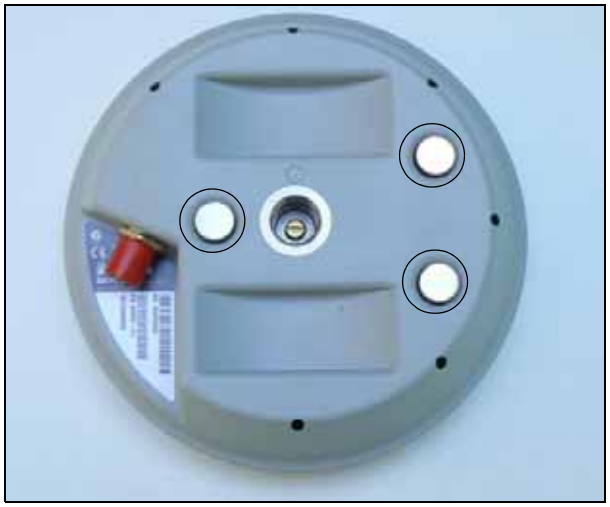
V plate



4" x 6" plate

Step 4

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



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



Step 5

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

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



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

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



Step 6

Both models

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



FmX integrated display: Installing the RTK radio antenna

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

Step 1

Connect the radio antenna to the magnetic antenna base



Step 2

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



Step 3

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

EZ-Guide 500 lightbar: Installing a PDL radio modem

Step 1

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



Permanent mount

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



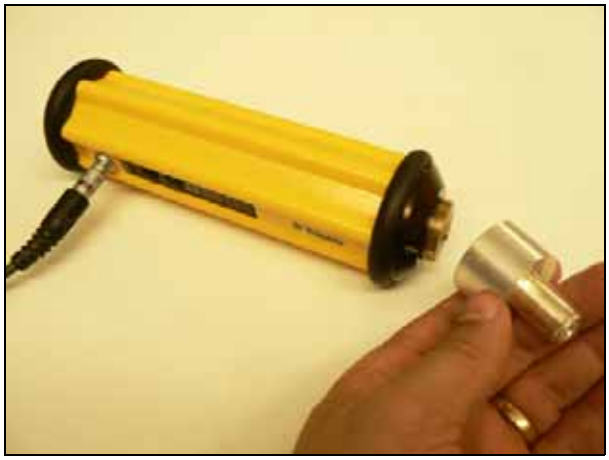
Temporary mount

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



Step 2

Connect the radio antenna cable adaptor to the radio.



Step 3

Connect the radio cable to the adaptor.



CHAPTER

6

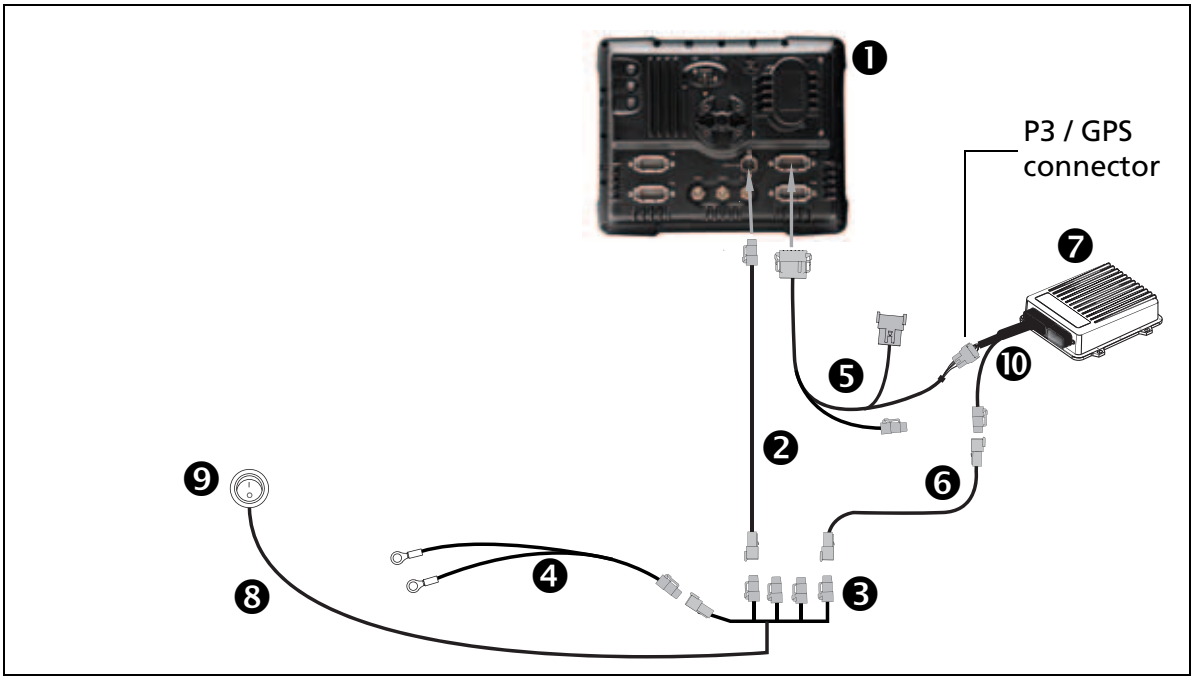
Power Harness Installation

In this chapter:

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

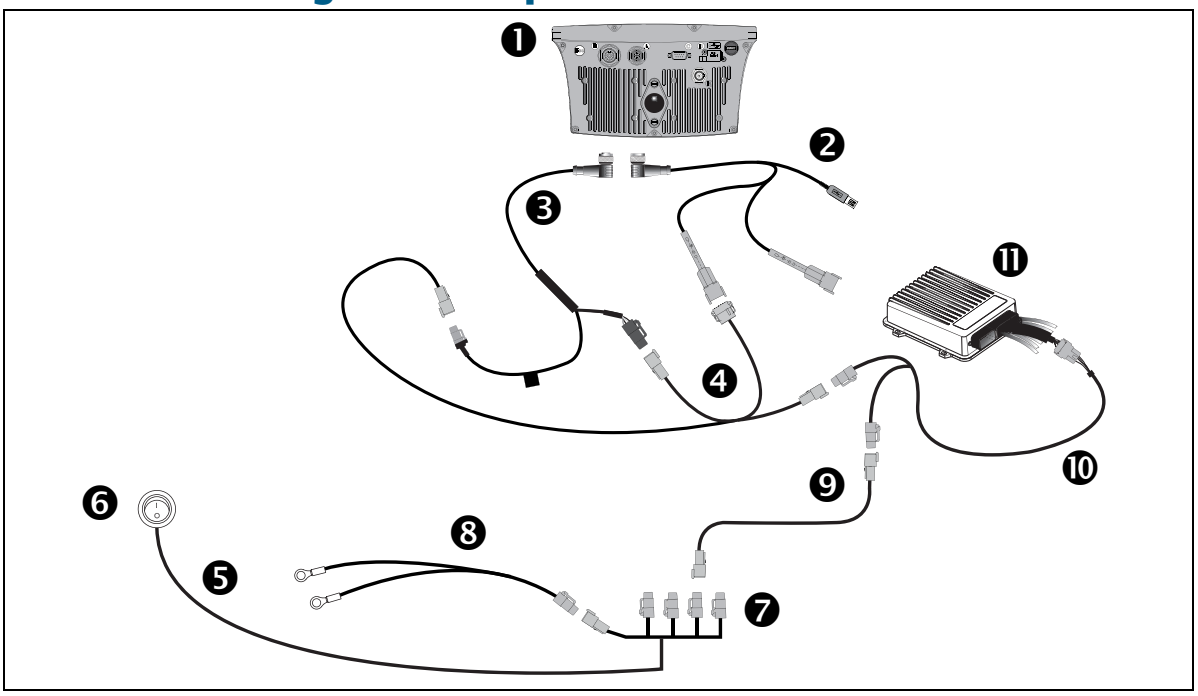
This chapter describes how to install the power harness in the vehicle.

FmX integrated display components



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

EZ-Guide 500 lightbar components



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

Installing the power harness for the FmX integrated display

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

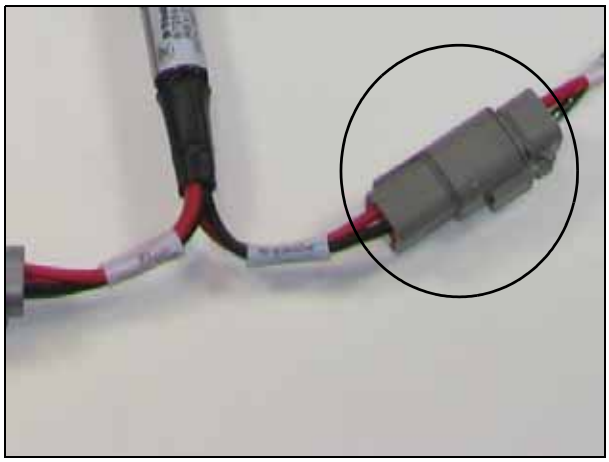
Step 1

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



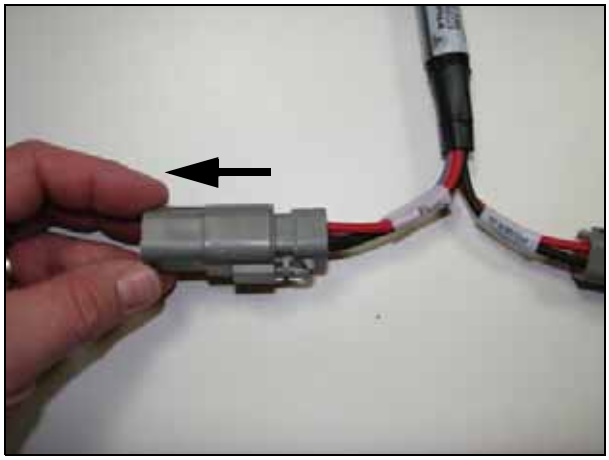
Step 2

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



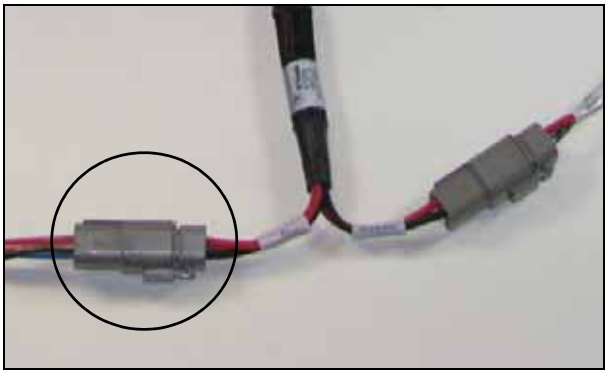
Step 3

Remove the protective receptacle from the power bus.



Step 4

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



Step 5

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



Configuring the power bus options for the FmX integrated display

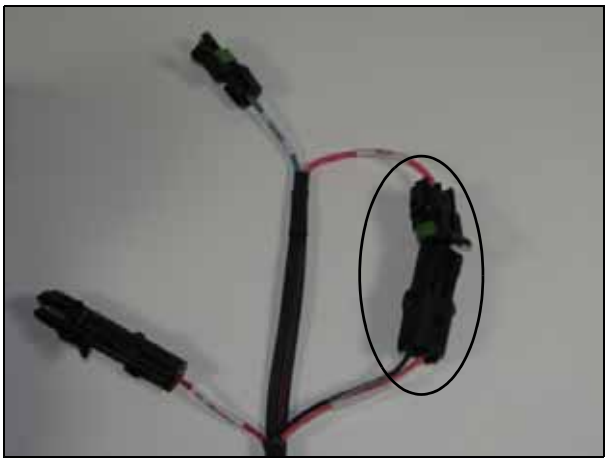
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

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

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

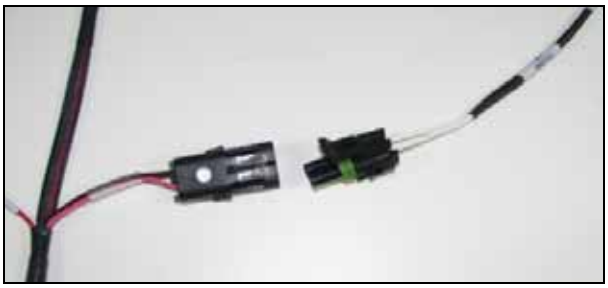
Connect the 2 pin connectors labeled R2 and P2 on the power bus.



External switch is used to turn on the Autopilot system

Step 1

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



Step 2

Route the cable labeled R7 to a switch location.

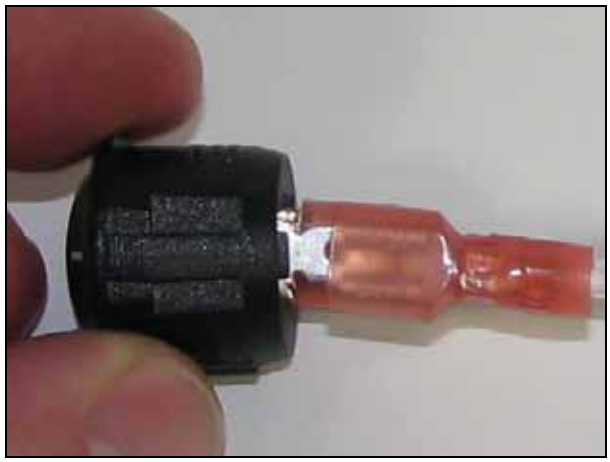
Note – *To install the switch provided, drill a ¾" hole.*



Step 3

Connect the cable labeled R7 to the switch pins.

Note – *Polarity is not important.*



Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

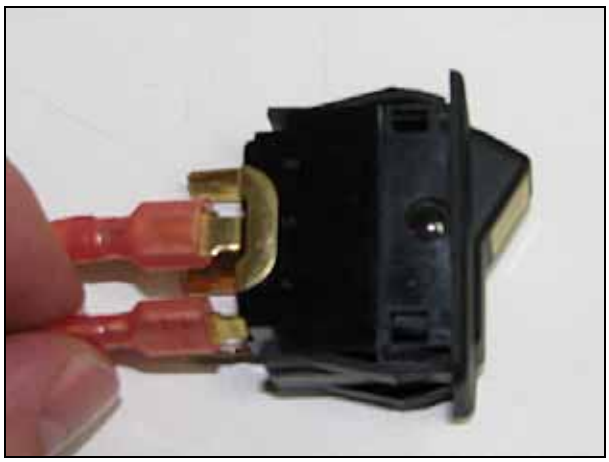


Step 2

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

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

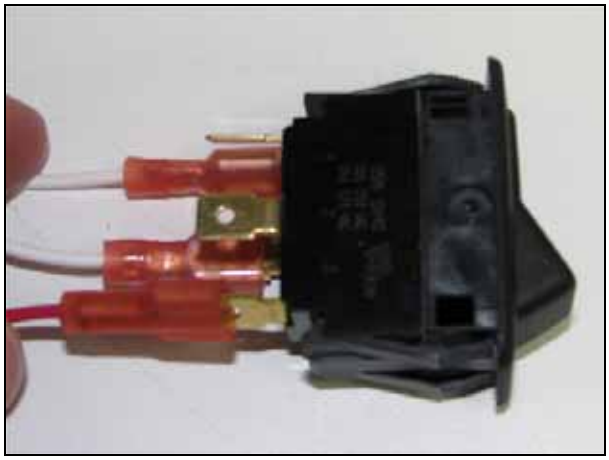
Note – *Polarity is important.*



Step 3

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

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

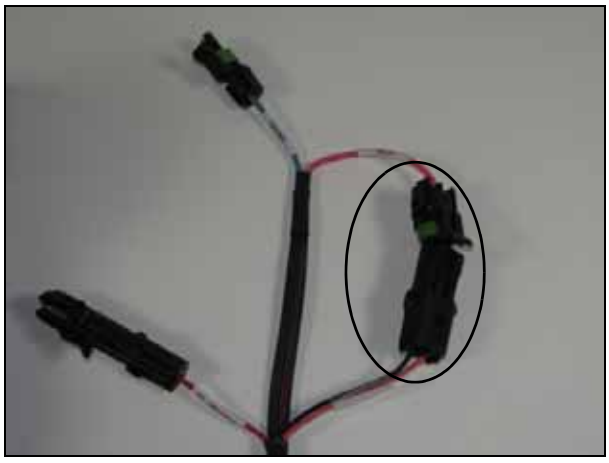


Ignition is used to turn on the Autopilot system

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

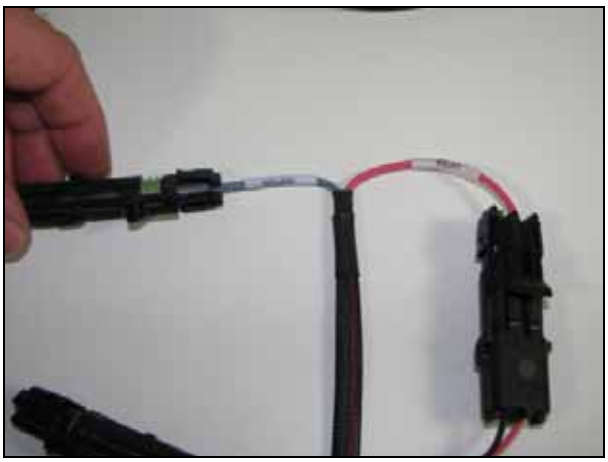
Step 1

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



Step 2

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

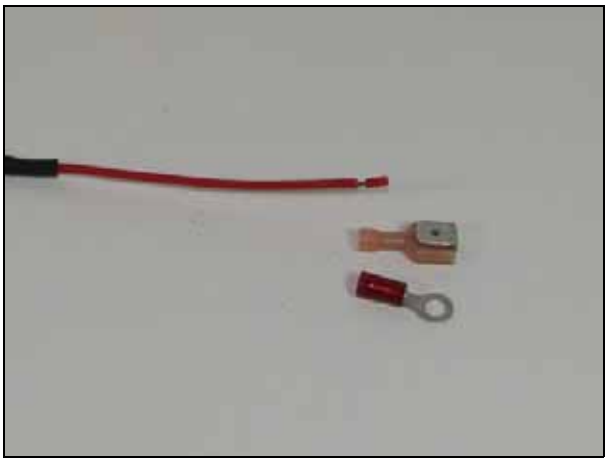


Step 3

Route the cable to the vehicles ignition.

Step 4

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



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

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

Note – *For the AgGPS EZ-Guide 500 lightbar cable installation instructions, see* *EZ-Guide 500 lightbar components, page 119*

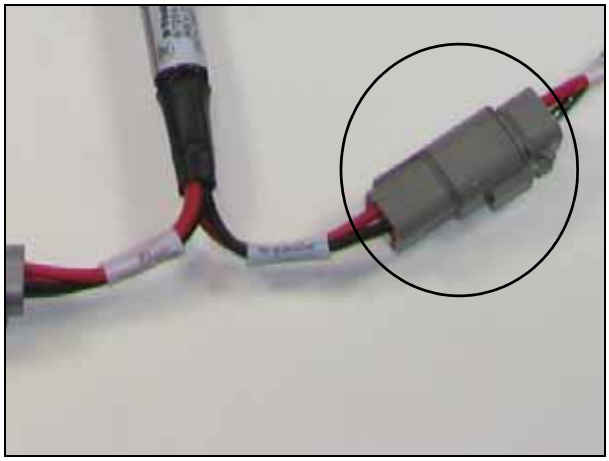
Step 1

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



Step 2

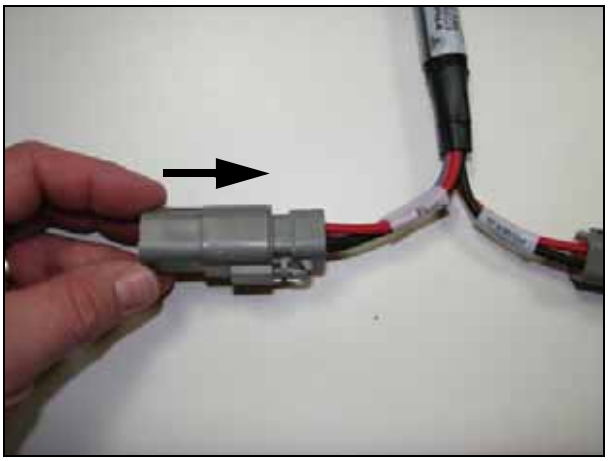
Locate and connect the 4-pin Deutsch DTP receptacle on the power bus to the 4-pin Deutsch DTP plug on the basic power cable.



Step 3

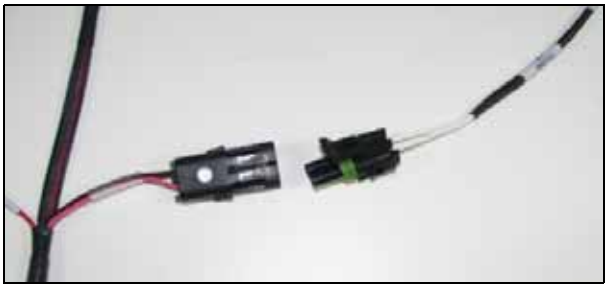
Verify that the protective receptacle is installed on the power bus.

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



Step 4

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



Step 5

Route cable labeled R7 to a switch location.

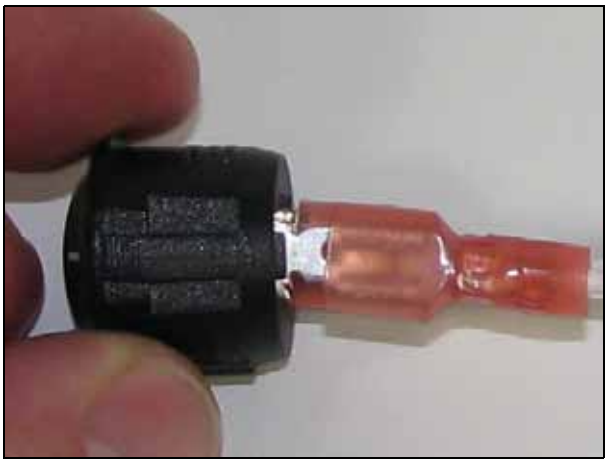
Note – *To install the switch provided, drill a ¾" hole.*



Step 6

Connect cable labeled R7 to the switch pins

Note – *Polarity is not important.*



Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

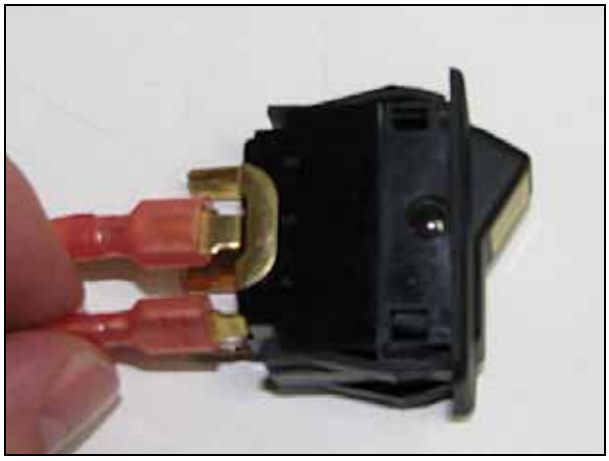


Step 2

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

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

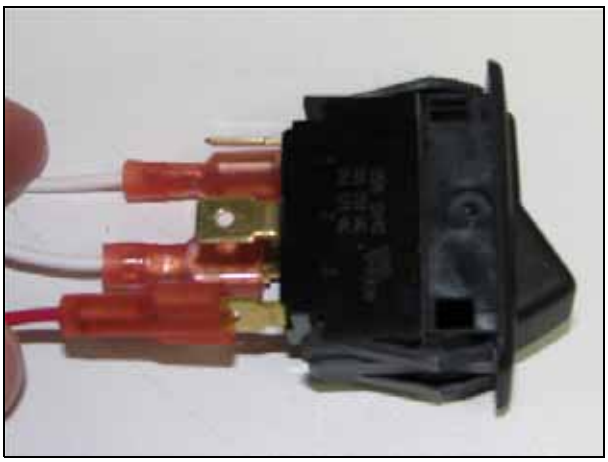
Note – *Polarity is important.*



Step 3

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

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



CHAPTER

7

Remote Engage Switch Installation

In this chapter:

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

This chapter describes how to install the remote engage switch.

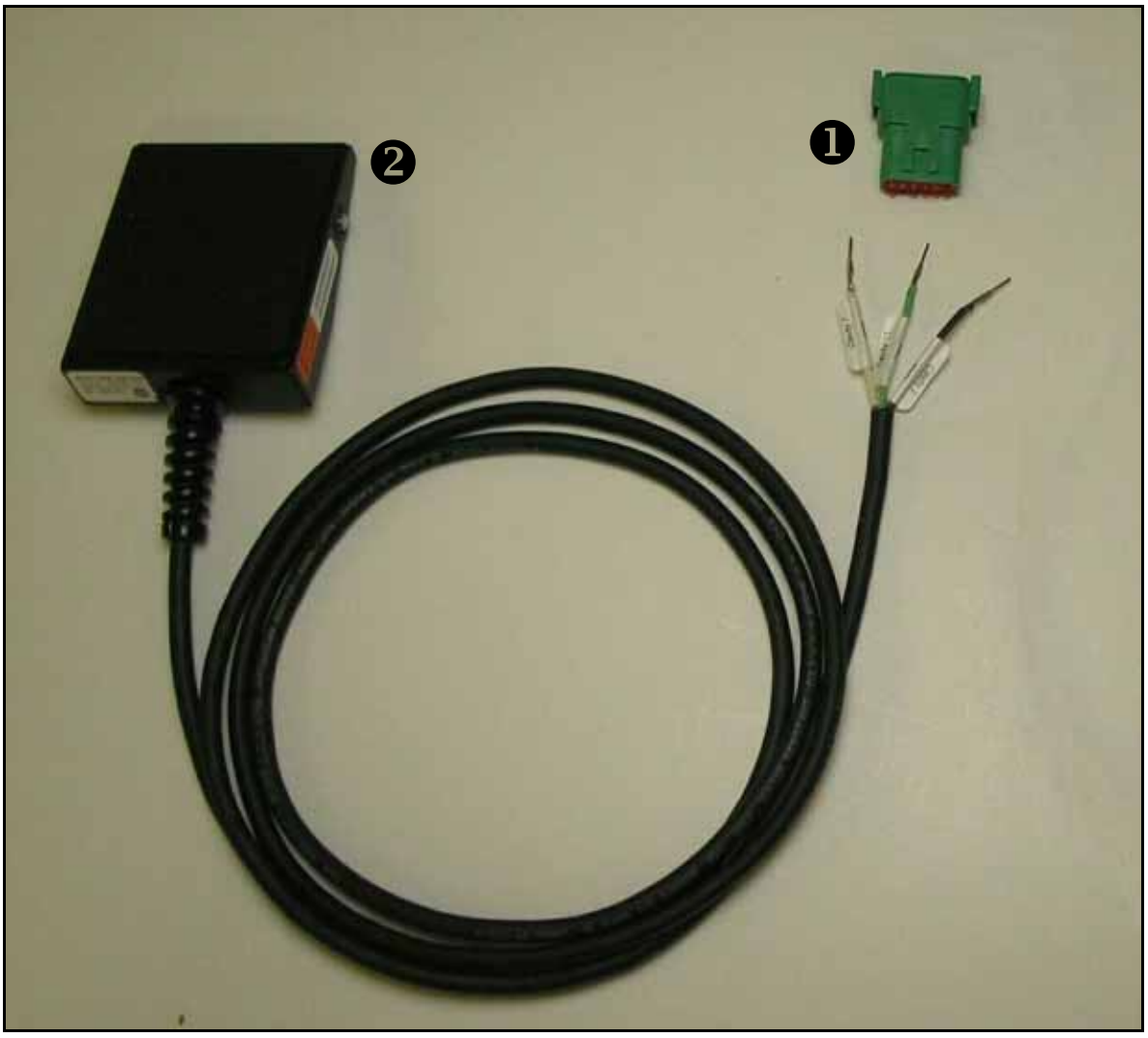
Remote engage switch components: Rocker switch



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

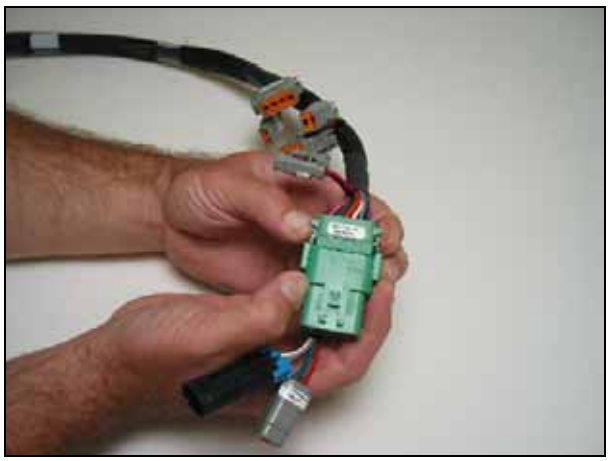


Item	Description
❶	DTM receptacle
❷	Remote engage foot switch

Preparing the remote engage cable

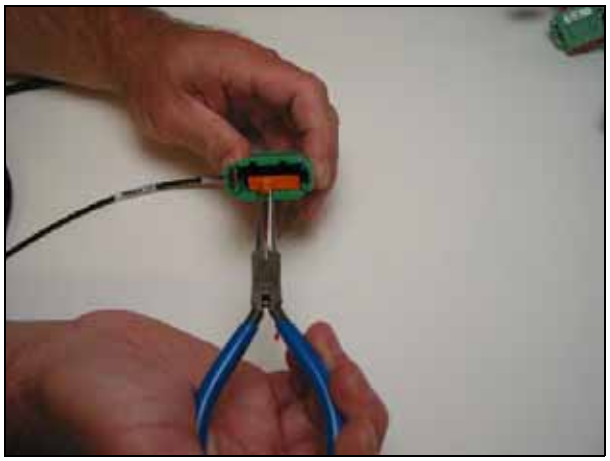
Step 1

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



Step 2

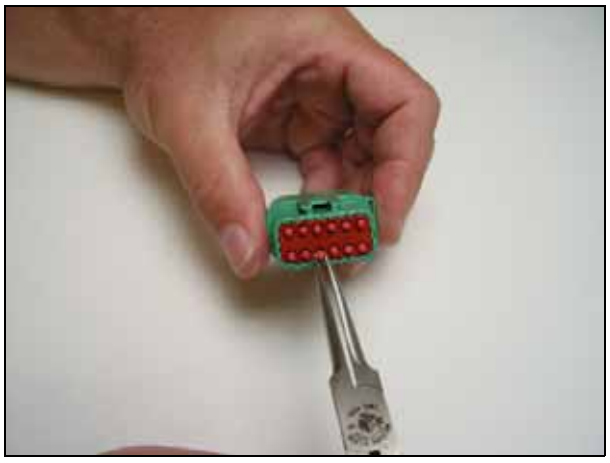
Remove the wedge from the connector.



Step 3

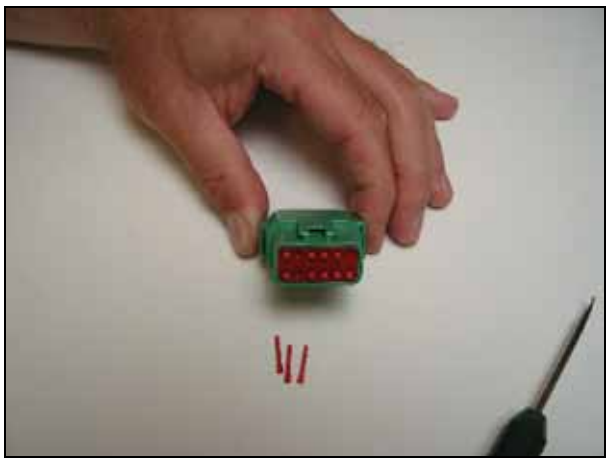
Rocker switch only

Remove the plugs from cavity 2 and cavity 7.



Foot Switch Only

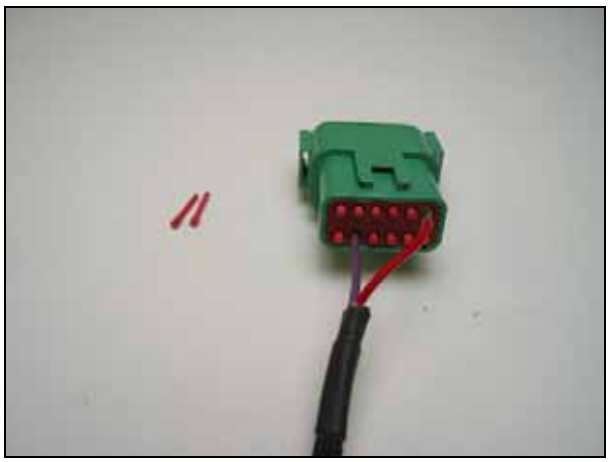
Remove the plugs from cavity 2, cavity 7, and cavity 11.



Step 4

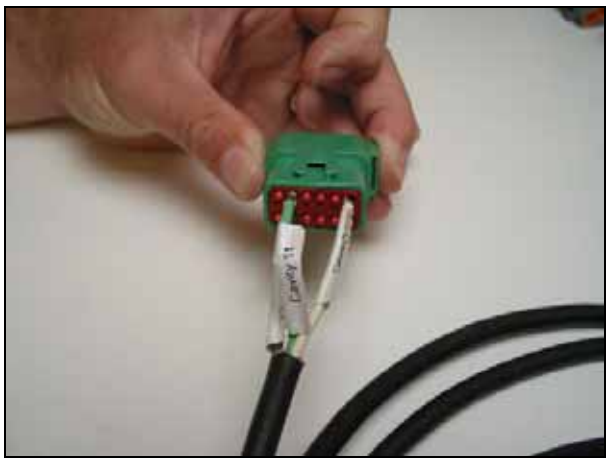
Rocker switch only

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



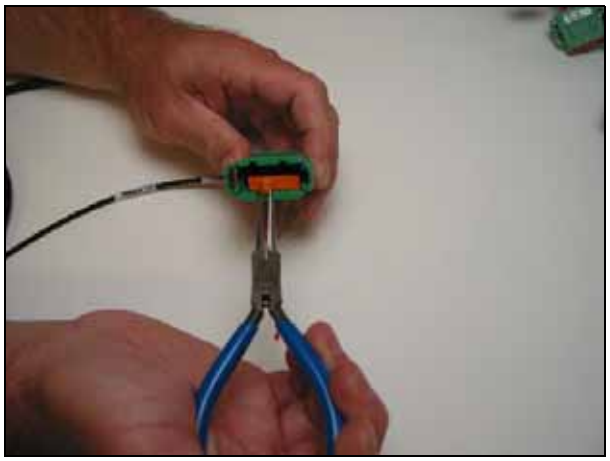
Foot switch only

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

Rocker switch only

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



Foot switch only

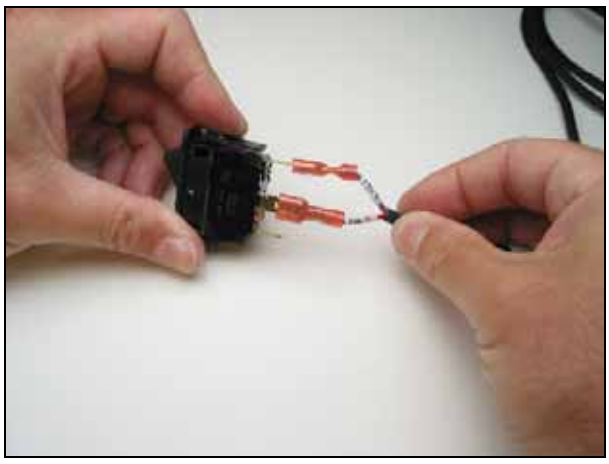
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 7

Rocker Switch Only

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



Step 8

Rocker Switch Only

Place the switch in the console.



Using the remote engage switch

Step 1

Hold the switch down for at least 0.5 seconds.

Note – *Holding the switch 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: 4xxx models
- Installing the controller: 8x60/8x70 models
- Controller connections

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

Installing the controller: 4xxx models

Step 1

Identify the controller mounting location to the left of the operator seat.



Note – *Use this mounting location if the area beside the seat is occupied.*



Step 2

Position the bracket even with the front of the seat pedestal and level with the ground. Use a level to verify that the plate is level.



Step 3

CAUTION – Before drilling, ensure that the area opposite the cab wall is free of hydraulic or electrical lines.



Mark and drill four $^{7}/_{16}$" holes. Use the controller plate as a template. Secure the plate with the ¼"-20 hardware provided.



Step 4

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



Step 5

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



Step 6

Route the cables into the cab. Use the cable pass-through at the right rear corner of the cab.



Installing the controller: 8x60/8x70 models

Step 1

Identify the controller mounting location to the right of the operator seat.



Step 2

Position the bracket parallel to the seat base with the rear mounting holes 9" from the rear cab wall and the left mounting holes 4" from the seat base. Use the plate as a template to mark the four mounting holes.



Step 3

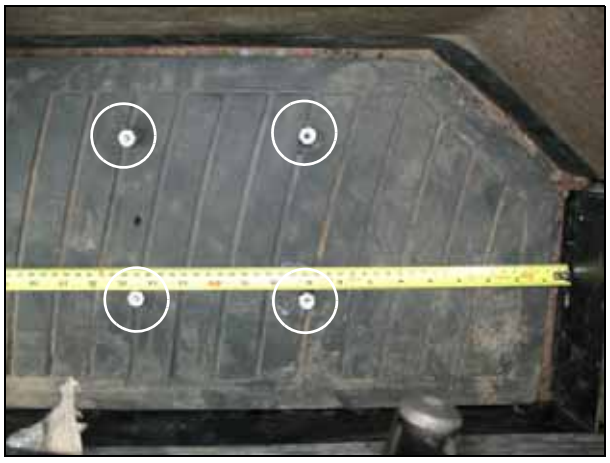
CAUTION – Before you begin drilling, remove the floor mat and ensure that the area under it is free of hydraulic or electrical lines and other vehicle components.





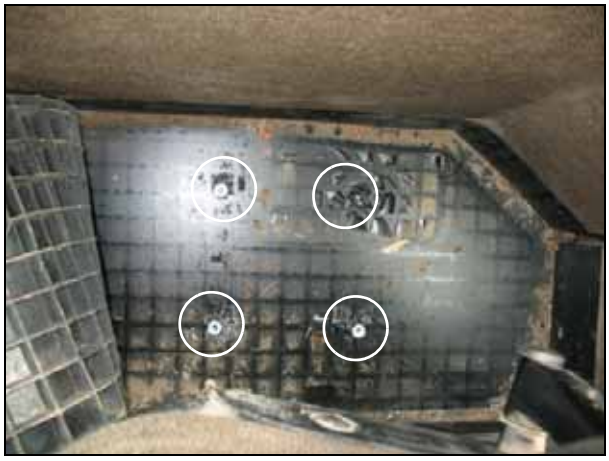
Step 4

Drill four holes through the floor mat using a ¾" hole saw. Continue drilling the four holes through the cab floor using a $^{5}/_{16}$" drill bit.



Step 5

Install the four ¼" standoffs provided in the controller bolt kit using ¼" hardware.





Step 6

Replace the floor mat and then install the controller mounting plate onto the standoffs using ¼" hardware.



Step 7

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



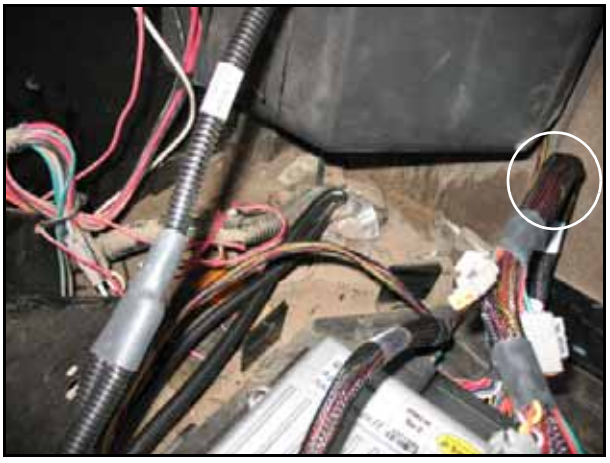
Step 8

Use four $^{10}/_{32}$" screws to install the controller with connectors in the back of the cab.

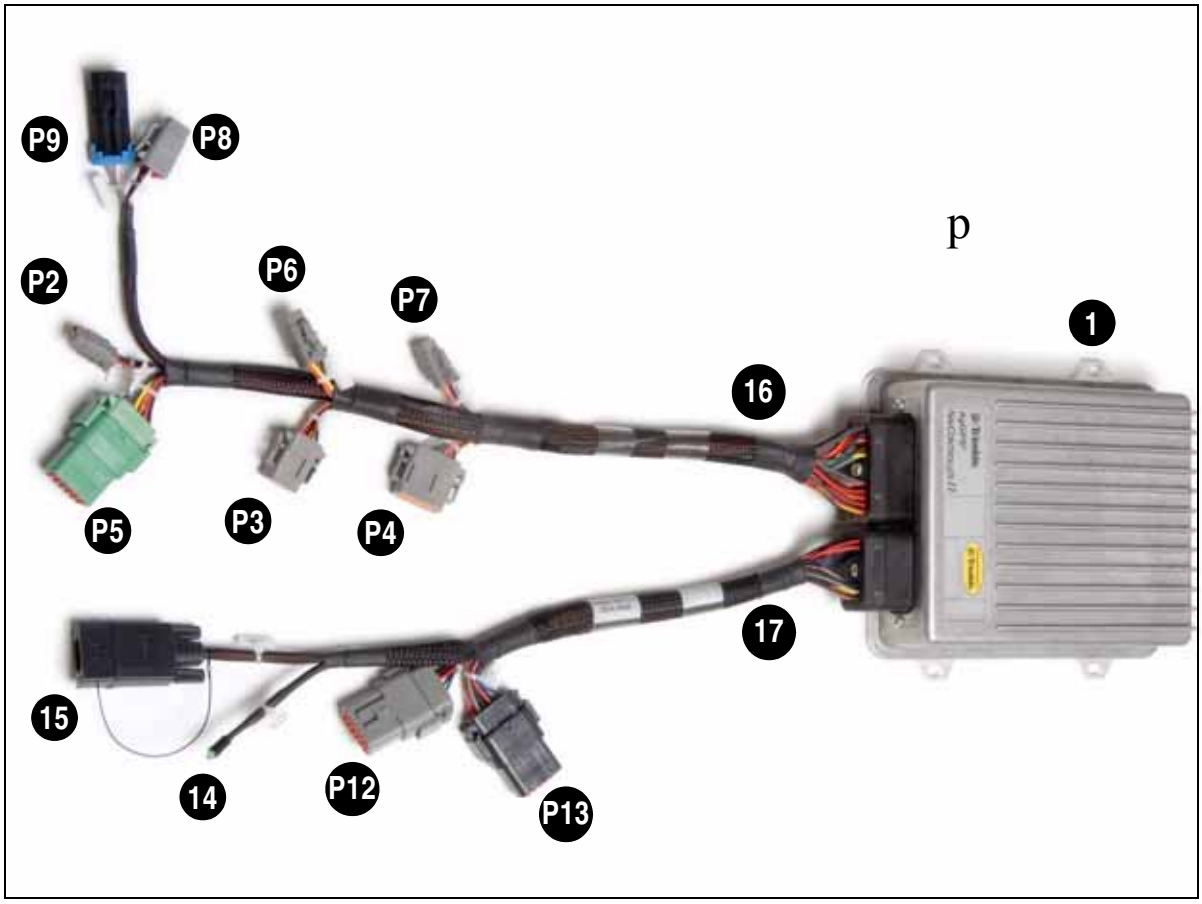


Step 9

Route the cables into the cab. Use the cable pass-through at the right rear corner of the cab.



Controller connections



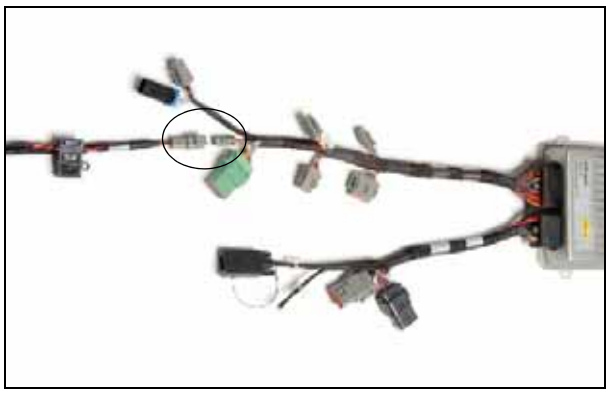
Item	Description
1	NavController II controller
P2	Power connector
P3	GPS connector
P4	Display connector
P5	Vehicle sensors connector
P6	Steering sensor connector
P7	Manual override connector
P8	Hydraulic valve connector

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 10 Step 1

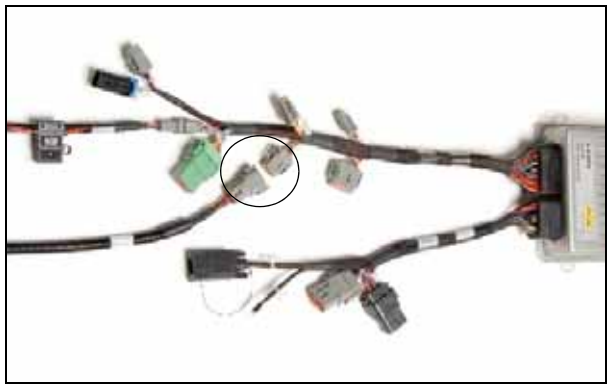
Connect the power cable connection to P-2, which is labeled “Power”. P-2 is located on the main wiring harness.

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



Step 11 Step 2

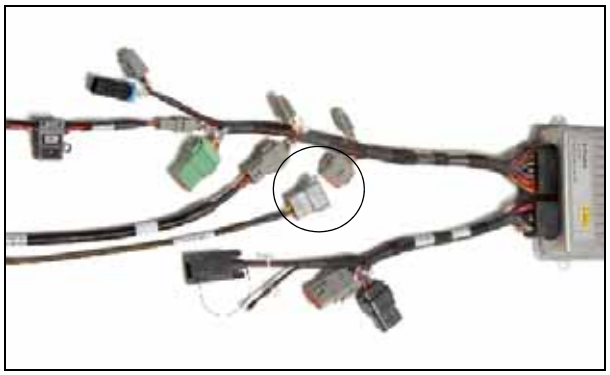
Connect the GPS cable connection to P-3, which is labeled “GPS”. P-3 is located on the main wiring harness.



Step 12 Step 3

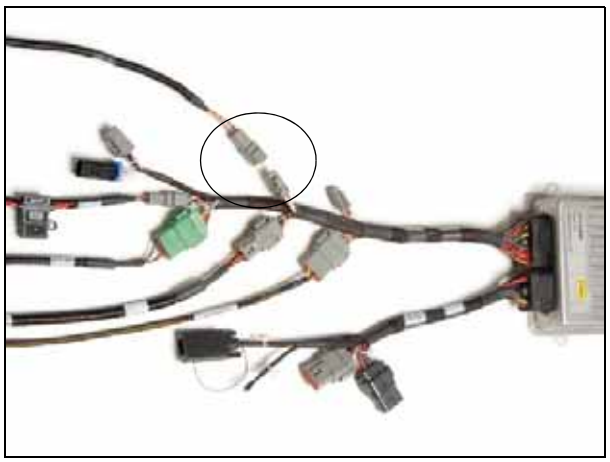
Connect the primary display cable connection to P-4, which is labeled “Display”. P-4 is located on the main wiring harness.

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



Step 13 Step 4

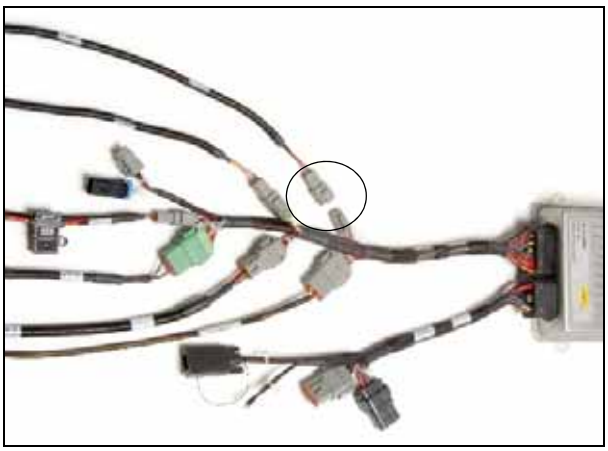
Connect the steering sensor cable connection to P-6, which is labeled “Steering Sensor”. P-6 is located on the main wiring harness.



Step 14 Step 5

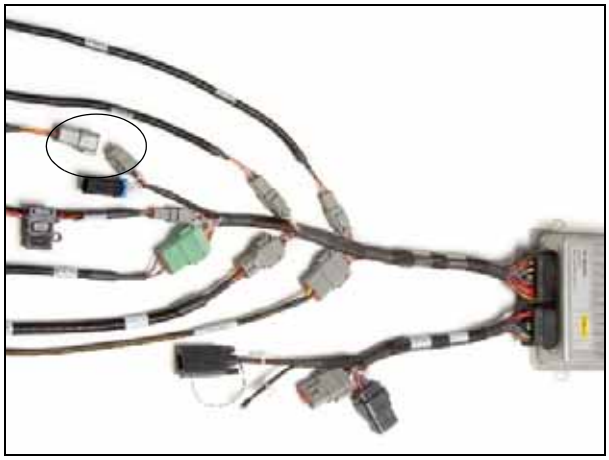
Connect the manual override cable connection to P-7, which is labeled "Manual Override". P-7 is located on the main wiring harness.

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



Step 15 Step 6

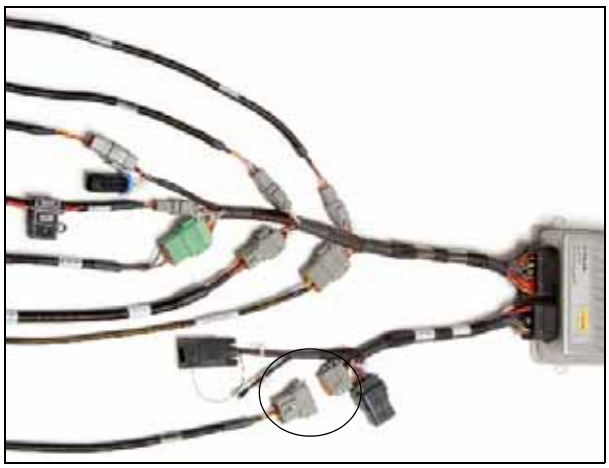
Connect the hydraulic steering valve cable connection to P-8, which is labeled "Hydraulic Valve". P-8 is located on the main wiring harness.



Step 16 Step 7

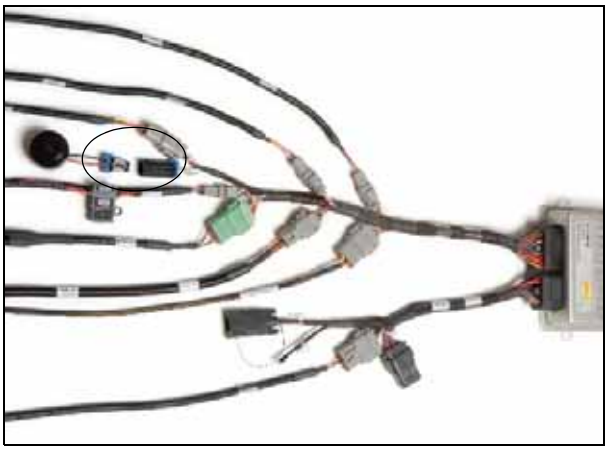
When using a lightbar as a secondary display to an *Ag*GPS 170 field computer, connect the lightbar cable connection to P-12, which is labeled "Lightbar/Spare". P-12 is located on the auxiliary wiring harness.

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



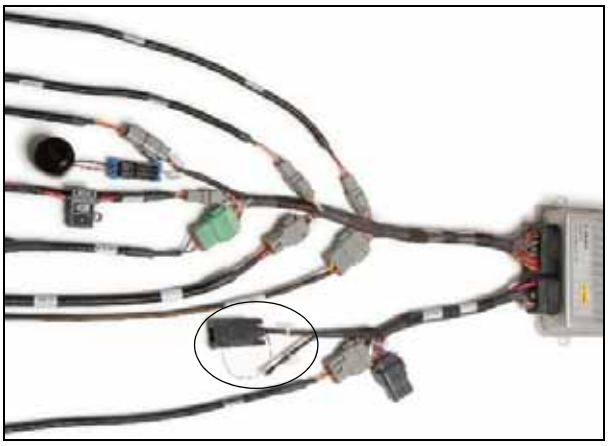
Step 17 Step 8

Connect the Sonalert P-9 to the 2-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 18 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 19 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

Step 1

Connect the battery.

Step 2

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

Step 3

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

Step 4

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