Autopilot

AUTOMATED STEERING SYSTEM

INSTALLATION INSTRUCTIONS

WITH AND WITHOUT ISOLATION

John Deere

- 6110 / 6120 / 6130 / 6200 /6210 / 6220 / 6230 / 6300 / 6310 / 6320 / 6330 / 6400 / 6410 / 6420 / 6430 / 6500 / 6520 / 6600 / 6620 / 6630 / 6820 / 6830 / 6920/ 6930
- 7200 / 7210 / 7220 / 7320 / 7400 / 7410 / 7420 / 7510 / 7520 / 7600 / 7610 / 7700 / 7710 / 7720 / 7730 / 7800 / 7810 / 7820 / 7830 / 7920 / 7930

John Deere Premium

- 6130 / 6230 / 6330 / 6430
- 7130 / 7230 / 7330 / 7430 / 7530 / 7630 / 7730 / 7830 / 7930

Version 8.00
Revision A
January 2019
P/N 54035-1160-E08

Trimble

Legal Notices

Agriculture Business Area

Trimble Agriculture Division
10355 Westmoor Drive
Suite #100
Westminster, CO 80021
USA

www.trimble.com

Copyright and Trademarks

© 1999–2019, Trimble Inc. All rights reserved. Trimble, the Globe & Triangle logo, *Ag*GPS, and FmX are trademarks of Trimble Inc., registered in the United States and in other countries. Autopilot, AutoSense, CFX-750, GFX-750, and TMX-2050 are trademarks of Trimble Inc. Developed under a License of the European Union and the European Space Agency.

All other trademarks are the property of their respective owners.

Release Notice

This is the January 2019 release (Revision A) of the ***Autopilot Automated Steering System Installation Instructions***, part number 54035-1160-E08. It applies to version 8.00 of the Autopilot automated steering system.

The following limited warranties give you specific legal rights. You may have others, which vary from state/jurisdiction to state/jurisdiction.

Product Limited Warranty

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.

Software Components and Enhancements

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.
For purposes of this warranty the following definitions shall apply: (1) "Fix Update" means an error correction or other update created to fix a previous software version that does not substantially conform to its published specifications; (2) "Minor Update" occurs when enhancements are made to current features in a software program; and (3) "Major Upgrade" occurs when significant new features are added to software, or when a new product containing new features replaces the further development of a current product line. Trimble reserves the right to determine, in its sole discretion, what constitutes a significant new feature and Major Upgrade.

Warranty Remedies

Trimble's sole liability and your exclusive remedy under the warranties set forth above shall be, at Trimble's option, to repair or replace any Product that fails to conform to such warranty ("Nonconforming Product"), and/or issue a cash refund up to the purchase price paid by you for any such Nonconforming Product, excluding costs of installation, upon your return of the Nonconforming Product to Trimble in accordance with Trimble's standard return material authorization process. Such remedy may include reimbursement of the cost of repairs for damage to third-party equipment onto which the Product is installed, if such damage is found to be directly caused by the Product as reasonably determined by Trimble following a root cause analysis.

Warranty Exclusions and Disclaimer

These warranties shall be applied only in the event and to the extent that (i) the Products and Software are properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with Trimble's relevant operator's manual and specifications, and; (ii) the Products and Software are not modified or misused. The preceding warranties shall not apply to, and Trimble shall not be responsible for defects or performance problems resulting from (i) the combination or utilization of the Product or Software with hardware or software products, information, data, systems, interfaces or devices not made, supplied or specified by Trimble; (ii) the operation of the Product or Software under any specification other than, or in addition to, Trimble's standard specifications for its products; (iii) the unauthorized, installation, modification, or use of the Product or Software; (iv) damage caused by accident, lightning or other electrical discharge, fresh or salt water immersion or spray; or (v) normal wear and tear on consumable parts (e.g., batteries). Trimble does not warrant or guarantee the results obtained through the use of the Product.
THE WARRANTIES ABOVE STATE TRIMBLE'S ENTIRE LIABILITY, AND YOUR EXCLUSIVE REMEDIES, RELATING TO PERFORMANCE OF THE PRODUCTS AND SOFTWARE. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, THE PRODUCTS, SOFTWARE, AND ACCOMPANYING DOCUMENTATION AND MATERIALS ARE PROVIDED "AS-IS" AND WITHOUT EXPRESS OR IMPLIED WARRANTY OF ANY KIND BY EITHER TRIMBLE INC OR ANYONE WHO HAS BEEN INVOLVED IN ITS CREATION, PRODUCTION, INSTALLATION, OR DISTRIBUTION INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NONINFRINGEMENT. THE STATED EXPRESS WARRANTIES ARE IN LIEU OF ALL OBLIGATIONS OR LIABILITIES ON THE PART OF TRIMBLE ARISING OUT OF, OR IN CONNECTION WITH, ANY PRODUCTS OR SOFTWARE. SOME STATES AND JURISDICTIONS DO NOT ALLOW LIMITATIONS ON DURATION OR THE EXCLUSION OF AN IMPLIED WARRANTY, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.
TRIMBLE INC IS NOT RESPONSIBLE FOR THE OPERATION OR FAILURE OF OPERATION OF GPS SATELLITES OR THE AVAILABILITY OF GPS SATELLITE SIGNALS.

Limitation of Liability

TRIMBLE'S ENTIRE LIABILITY UNDER ANY PROVISION HEREIN SHALL BE LIMITED TO THE AMOUNT PAID BY YOU FOR THE PRODUCT OR SOFTWARE LICENSE. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL TRIMBLE OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER UNDER ANY CIRCUMSTANCE OR LEGAL THEORY RELATING IN ANY WAY TO THE PRODUCTS, SOFTWARE AND ACCOMPANYING DOCUMENTATION AND MATERIALS, (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS), REGARDLESS WHETHER TRIMBLE HAS BEEN ADVISED OF THE POSSIBILITY OF ANY SUCH LOSS AND REGARDLESS OF THE COURSE OF DEALING WHICH DEVELOPS OR HAS DEVELOPED BETWEEN YOU AND TRIMBLE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU.
NOTE: THE ABOVE LIMITED WARRANTY PROVISIONS MAY NOT APPLY TO PRODUCTS OR SOFTWARE PURCHASED IN THE EUROPEAN UNION. PLEASE CONTACT YOUR TRIMBLE DEALER FOR APPLICABLE WARRANTY INFORMATION.

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:
http://www.trimble.com/Corporate/Environmental_Compliance.aspx



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

Contents

Legal Notices 2

Safety Information. 8

Warnings. 8

Cautions 9

1 Introduction. 10

Technical assistance. 10

Manual system upgrade to Autopilot. 11

CFX-750 display, TMX-2050 display, FmX integrated display, GFX-750 display 11

Required components 11

Antenna mounting kits 11

Accessory kits 11

Autopilot hardware organization: As shipped. 12

Preparing the vehicle for installation 14

2 Hydraulic Control Valve Installation (John Deere 6xx0, 7430, and 7530) 15

Hydraulic components (P/N 68577-1000 hose kit) 16

Hydraulic control valve components: 6xx0, 7430, and 7530 models 16

Load sense connection alternative B 17

Load sense connection alternative C 18

Hydraulic components (P/N 68577-2000 hose kit) 19

6xx0 hydraulic components. 19

Alternative connections for power beyond 20

Adding the common fittings for -1000 and -2000 hose kits 21

Steering line connections without isolation block (P/N 68577-1000 hose kit) 24

Steering line connections with isolation block (P/N 68577-2000 hose kit). 25

Installing the manifold bracket 28

Mounting the manifold bracket: John Deere 6x30 and some small frame John Deere 7xx0 models 30

Connecting the A and B lines (P/N 68577-1000 hose kit) 31

Connecting the A and B lines (P/N 68577-2000 hose kit) 33

Connecting the Pressure, Tank, and LS lines (all hose kit types) 37

Connecting the P, T, and LS lines to the machine for 6x00 and 6x10 38

Connecting the P, T, and LS lines to the machine for 6x20. 40

Connecting the P, T, and LS lines to the machine for 6x30, 7430, and 7530 41

Connecting the manual override (P/N 68577-2000 hose kit) 44

Establishing the electrical connections 45

Checking the hydraulics 45

3 Hydraulic Control Valve Installation (John Deere 7xx0). 46

Hydraulic components (P/N 68574-1000 hose kit) 47

7xx0 hydraulic components. 47

Alternative connections for power beyond . . . 48
Hydraulic components (P/N 68574-2000 hose kit) . . . 49
7xx0 hydraulic components . . . 49
Alternative connections for power beyond . . . 50
Adding the common fittings for -1000 and -2000 hose kits . . . 51
Steering line connections without isolation block (P/N 68574-1000 hose kit) . . . 54
Steering line connections with isolation block (P/N 68574-2000 hose kit) . . . 55
Installing the manifold bracket . . . 58
Standard mount . . . 58
Slow Moving Vehicle sign mount . . . 59
Fender mount . . . 60
Connecting the A and B lines (P/N 68574-1000 hose kit) . . . 61
Connecting the A and B lines (P/N 68574-2000 hose kit) . . . 62
Connecting the Pressure, Tank, and LS lines (all hose kit types) . . . 64
Connecting the manual override (P/N 68574-1000 hose kit) . . . 66
7100 – 7500 models: 00 /10 /20/30 series . . . 66
77x0/78x0/79x0 models . . . 68
Connecting the manual override (P/N 68574-2000 hose kit) . . . 69
Establishing the electrical connections . . . 70
Checking the hydraulics . . . 70

4 AutoSense Steering Device Installation . . . 71
IMD-900 steering device components . . . 72
Installing the IMD-900 steering device . . . 73
Connecting the IMD-900 harness to the 54602 harness . . . 76

5 Antenna/External Receiver Installation (If Used) . . . 77
Antenna and receiver installation options . . . 78
Possible mounting methods . . . 78
Mounting an adjustable spar to roof bolts . . . 79
Attaching the plate with VHB adhesive . . . 82
AG-372 receiver with *Ag*GPS 450/900 radio module components (if equipped) . . . 84
Installing the AG-372 GPS receiver with *Ag*GPS 450/900 radio module (if equipped) . . . 85
Removable installation . . . 85
Permanent installation . . . 86
Installing an AG-372 receiver with magnetic feet . . . 91
*Ag*GPS 542 receiver components . . . 93
Installing the *Ag*GPS 542 receiver . . . 94

6 Display Installation . . . 97
FmX integrated display: Components . . . 98
FmX integrated display: Preparation . . . 99
FmX integrated display: Installation . . . 100
FmX integrated display: Installing the wiring harness . . . 101
CFX-750 display: Components . . . 102
CFX-750 display: Preparation . . . 103
CFX-750 display: Installation . . . 104

CFX-750 display: Installing the wiring harness 105
CFX-750 display and FmX integrated display: Connecting accessory options 106
AgCam 106
TMX-2050 display: Components 108
TMX-2050 display: Preparation 109
Installing the display and mount 109
TMX-2050 display: Installing the wiring harness 112
TMX-2050 display: AG-25 GNSS antenna 115
CFX-750, FmX and TMX-2050 displays: Installing the GNSS antenna and plate 116
Spar mount method 116
VHB adhesive method 116
CFX-750, FmX and TMX-2050 displays: Installing the RTK radio antenna 120
GFX-750/XCN-1050 display: Components 121
GFX-750/XCN-1050 display: Preparation 122
GFX-750/XCN-1050 display: Installation 123
GFX-750/XCN-1050 display: Installing the wiring harness 124

7 Power Harness Installation 126
CFX-750 display: Components 127
FmX integrated display: Components 129
Installing the power harness for the display 130
Configuring the power bus options for the display 132
Display power button is used to turn on the Autopilot system 132
External switch is used to turn on the Autopilot system 132
Installing the optional illuminated full or standard Euro switch 133
Ignition is used to turn on the Autopilot system 134
TMX-2050 display: Components 136
TMX-2050 display: Installing the power harness 137
TMX-2050 display: Configuring the power options 140
Ignition sensing 140

8 Remote Engage Switch Installation 142
Remote engage switch components: Rocker switch 143
Remote engage switch components: Foot switch 144
Preparing the remote engage cable 145
Using the remote engage switch 148

9 Controller Installation 149
Installing the controller 150
John Deere 6xx0 models 150
John Deere 7xx0 models 151
Controller connections 154
Connecting the cables to the controller 155

10 Isolation Models Setup Instructions 157
Connecting the isolation solenoid cable 158
Isolation manifold power connection (available only with NavController III) 158

Configuring the NavController III to turn on the electronic isolation manifold 163
Setting the load sense relief pressure 165
Preparing to set the relief pressure 165
Adjusting the isolation manifold pressure reducing valve (PRV) 167

11 Final Machine Check 168

Safety Information

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

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

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

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

Warnings

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

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

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

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

Cautions

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

⚠ **CAUTION –** The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

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

⚠ **CAUTION –** Always wear protective equipment appropriate to the job conditions and the nature of the vehicle. This includes wearing protective glasses when you use pressurized air or water, and correct protective welder's clothing when welding. Avoid wearing loose clothing or jewelry that can catch on machine parts or tools.

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

⚠ **CAUTION –** Do not direct pressurized water at:
- electronic or electrical components or connectors
- bearings
- hydraulic seals
- fuel injection pumps
- any other sensitive parts or components



Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

⚠ **CAUTION –** To prevent damage to the system, make sure that no wires or hoses interfere with or catch on any mechanical linkages, or contact any machine parts that get hot.

1

Introduction

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

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

Even if you have used another GNSS (Global Navigation Satellite System), such as the United States' GPS (Global Positioning System), before, spend some time reading this manual to learn about the special features of this product. If you are not familiar with GNSS, go to the Trimble website (www.trimble.com) for an interactive look at Trimble and GNSS.

Technical assistance

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

1. Log into http://agpartners.trimble.com.
2. Click the **Feedback** link at the right of the screen. A form appears.
3. Complete the form and then click **Submit Feedback**.

Manual system upgrade to Autopilot

CFX-750 display, TMX-2050 display, FmX integrated display, GFX-750 display

Retain
TMX-2050™ integrated display: P/N 96500-xx
FmX integrated display: P/N 93100-xx
CFX-750™ display: P/N 94110-xx
Integrated cable assembly, integrated harness,
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
GFX-750™/XCN-1050: P/N 121000-XX
Power cable GFX-750/XCN-1050: P/N 110551
Base power cable: P/N 67258
NAV-900 guidance controller: P/N 108993-05
GFX-750 to NAV-900 Comms cable: P/N 110540

Required components

Kits required	Special tools
Platform kit: P/N 54035-1160 Hydraulic hose kit: • P/N 68577-1000 non isolation for 6xx0 • P/N 68577-2000 isolation for 6xx0 • P/N 68574-1000 non isolation for 7xx0 • P/N 68574-2000 isolation for 7xx0	$^{3}/_{4}$" and 1 $^{5}/_{8}$" hole saw $^{5}/_{16}$" drill bit 5000 psi hydraulic gauge and extension hose Allen wrench set (metric and SAE)

Antenna mounting kits

Kits required
Bracket, GPS Spar 27.5" - 37.5": P/N 55349 (for 6xx0 and small frame 7xx0 models)
Bracket, GPS Spar 36.5" - 46.5": P/N 53676 (for large frame 7xx0 models)

Accessory kits

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

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit: P/N 54035-1160	Hydraulic valve	Chapter 2 Chapter 3
	Hydraulic manifold	
	Transducer flow switch	
	Manual override cable	
	Hydraulic brackets and bolt kits	
	Hydraulic valve cable	
AutoSense™ steering device	• AutoSense steering device and cabling • AutoSense mounting bracket and hardware	Chapter 4
Power	Power switch	Chapter 7
	Bolt kit controller	Chapter 9
Hydraulic hose kit: • P/N 68577-1000 non isolation for 6xx0 • P/N 68577-2000 isolation for 6xx0 • P/N 68574-1000 non isolation for 7xx0 • P/N 68574-2000 isolation for 7xx0	Hydraulic hoses	Chapter 2 Chapter 3
	Hydraulic adaptors	
Roof bracket kit: • P/N 55349 for 6xx0 and small frame 7xx0 models • P/N 53676 for large frame 7xx0 models	• Roof brackets • Bolt kit, roof bracket	Chapter 5
GPS receiver	• GPS receiver • GPS antenna • GPS receiver mounting bracket • GPS receiver power/data cable • RTK radio, cable, and radio antenna	Chapter 5
Display	• CFX-750 display • FmX integrated display • TMX-2050 display • GFX-750 display • Display cable(s) • Mounting bracket	Chapter 6

Hardware	Component	See...
Common parts	Controller	Chapter 9
	Controller mounting bracket	
	Cable kit: • Main wiring harness • Power bus auxiliary wiring harness • Sonalert alarm	

Preparing the vehicle for installation

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

1. Park the vehicle on a hard, level surface. Block the front and rear wheels.
2. Align the steering straight ahead. On an articulated vehicle, install the articulation locks.
3. Remove all dirt and debris from the areas of the vehicle where the Autopilot system will be installed.
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.

2

Hydraulic Control Valve Installation (John Deere 6xx0, 7430, and 7530)

- Hydraulic components (P/N 68577-1000 hose kit)
- Hydraulic components (P/N 68577-2000 hose kit)
- Adding the common fittings for -1000 and -2000 hose kits
- Steering line connections without isolation block (P/N 68577-1000 hose kit)
- Steering line connections with isolation block (P/N 68577-2000 hose kit)
- Installing the manifold bracket
- Mounting the manifold bracket: John Deere 6x30 and some small frame John Deere 7xx0 models
- Connecting the A and B lines (P/N 68577-1000 hose kit)
- Connecting the A and B lines (P/N 68577-2000 hose kit)
- Connecting the Pressure, Tank, and LS lines (all hose kit types)
- Connecting the manual override (P/N 68577-2000 hose kit)
- Establishing the electrical connections
- Checking the hydraulics

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

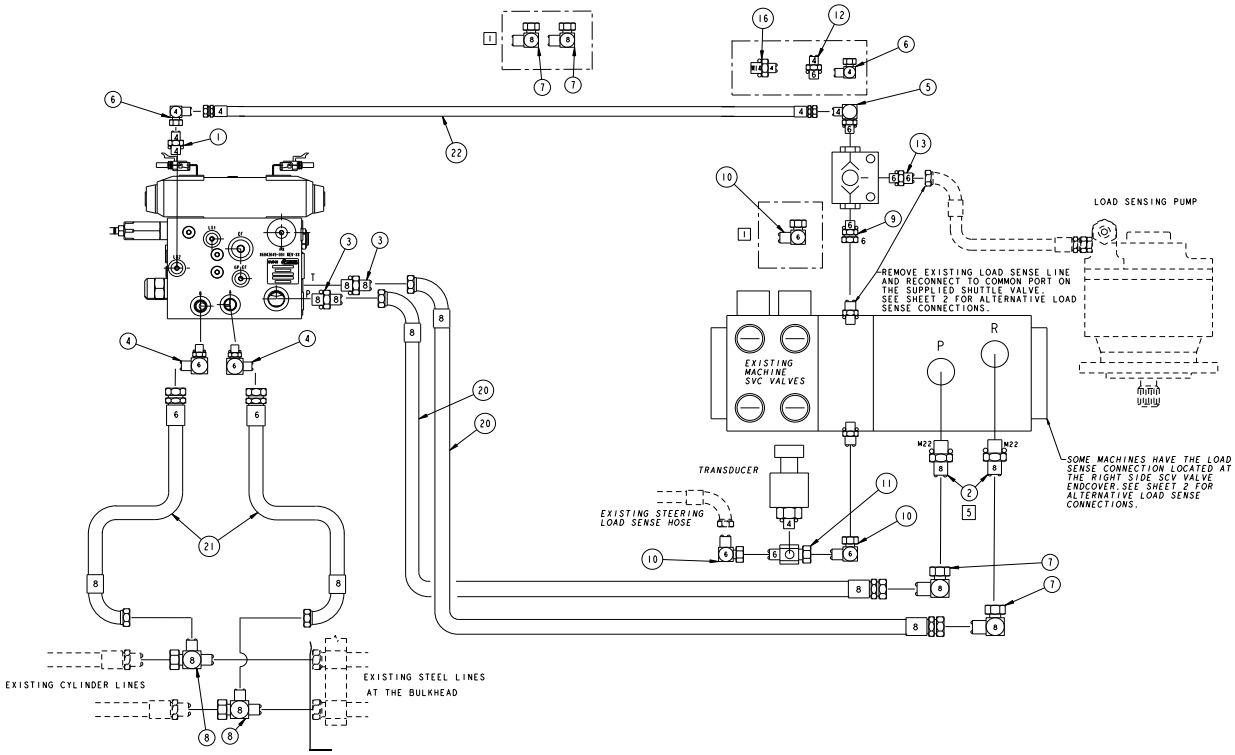
Note that the Power Beyond end cap is required for 7000 models.

The Power Beyond end cap is not included in the platform kit and may not be factory installed. To order the correct end cap, contact your John Deere dealer. Trimble recommends that you connect through the Power Beyond end cap to interface with the tractor hydraulics.

NOTE – End caps vary by model number and may not be interchangeable.

Hydraulic components (P/N 68577-1000 hose kit)

Hydraulic control valve components: 6xx0, 7430, and 7530 models

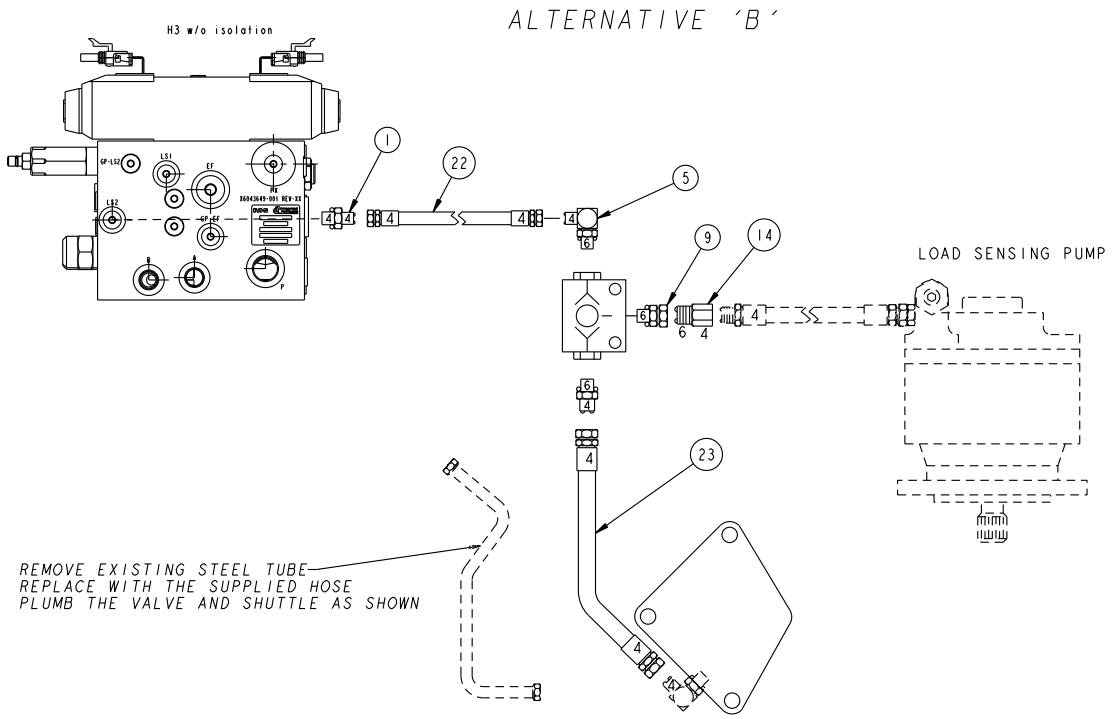


Item	Description	P/N
1	Fitting	4 F50LO
2	Fitting (x2)	8M22F870MLO
3	Fitting (x2)	8 F50LO
4	Fitting (x2)	6 C50LO
5	Fitting	4-6 C50LO
6	Fitting (x2)	4C6LO
7	Fitting (x4)	8 C6LO
8	Fitting (x2)	8 R6LO
9	Fitting	6 F650L

Item	Description	P/N
10	Fitting (x3)	6C6LO-S
11	Fitting	6-4 LOHL6G5TP
12	Fitting	4–6 F50LO
13	Fitting	6F50LO-S
16	Fitting	4MI4F870MLO
20	38" hose (x2)	F451TC JSJ9 080808-38
21	90" hose (x2)	F451TC JSJ9 060808-90
22	20" hose	F451TC JSJ9 040404-20

NOTE – Part numbers are Parker numbers and are for reference only.

Load sense connection alternative B

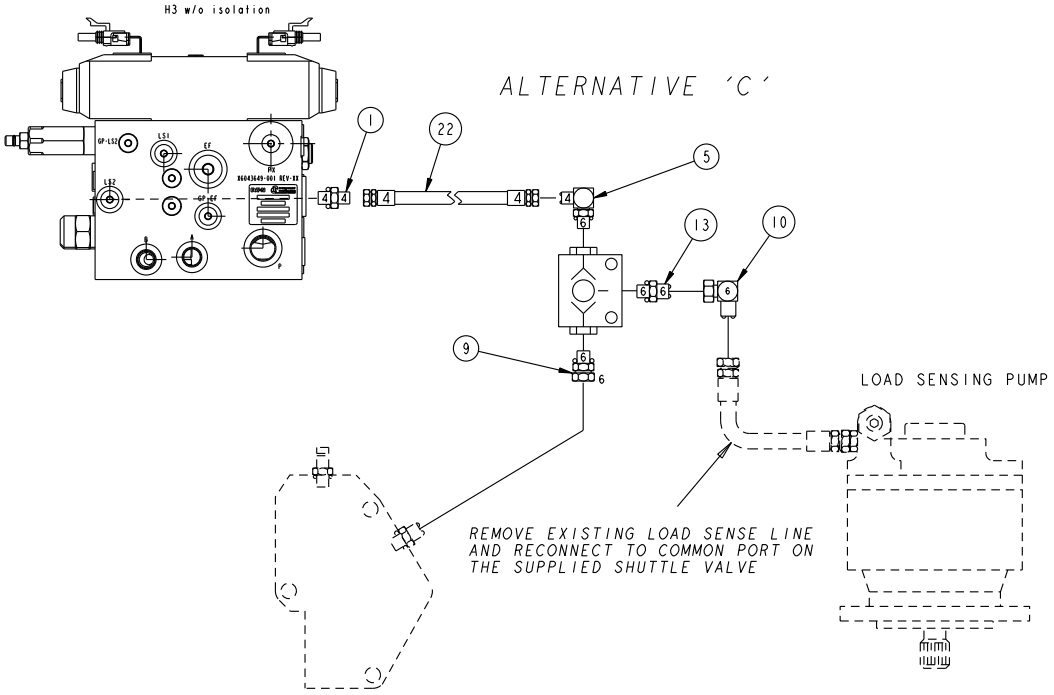


Item	Description	P/N
1	Fitting	4 F50LO
5	Fitting	4-6 C50LO
9	Fitting	6 F65OL

Item	Description	P/N
14	Fitting	6-4LOHL6
22	20" hose	F45ITC JSJS 040404-20"
23	16" hose	F45ITC JSJS 040404-16"

NOTE – Part numbers are Parker numbers and are for reference only.

Load sense connection alternative C



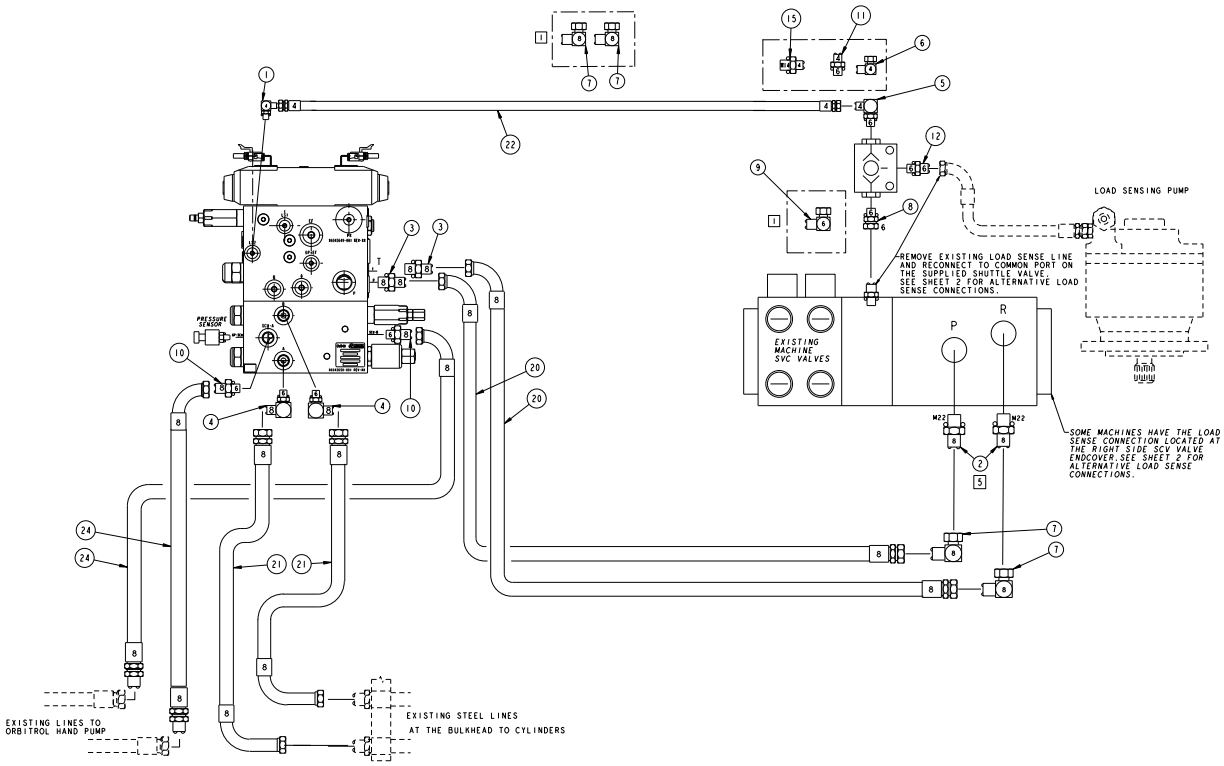
Item	Description	P/N
1	Fitting	4 F50LO
5	Fitting	4–6 C50L0
9	Fitting	6 C50L0

Item	Description	P/N
10	Fitting	6C6L0-S
13	Fitting	6F50L0-S
22	20" hose	F45ITC JSJS 040404-20"

NOTE – Part numbers are Parker numbers and are for reference only.

Hydraulic components (P/N 68577-2000 hose kit)

6xx0 hydraulic components

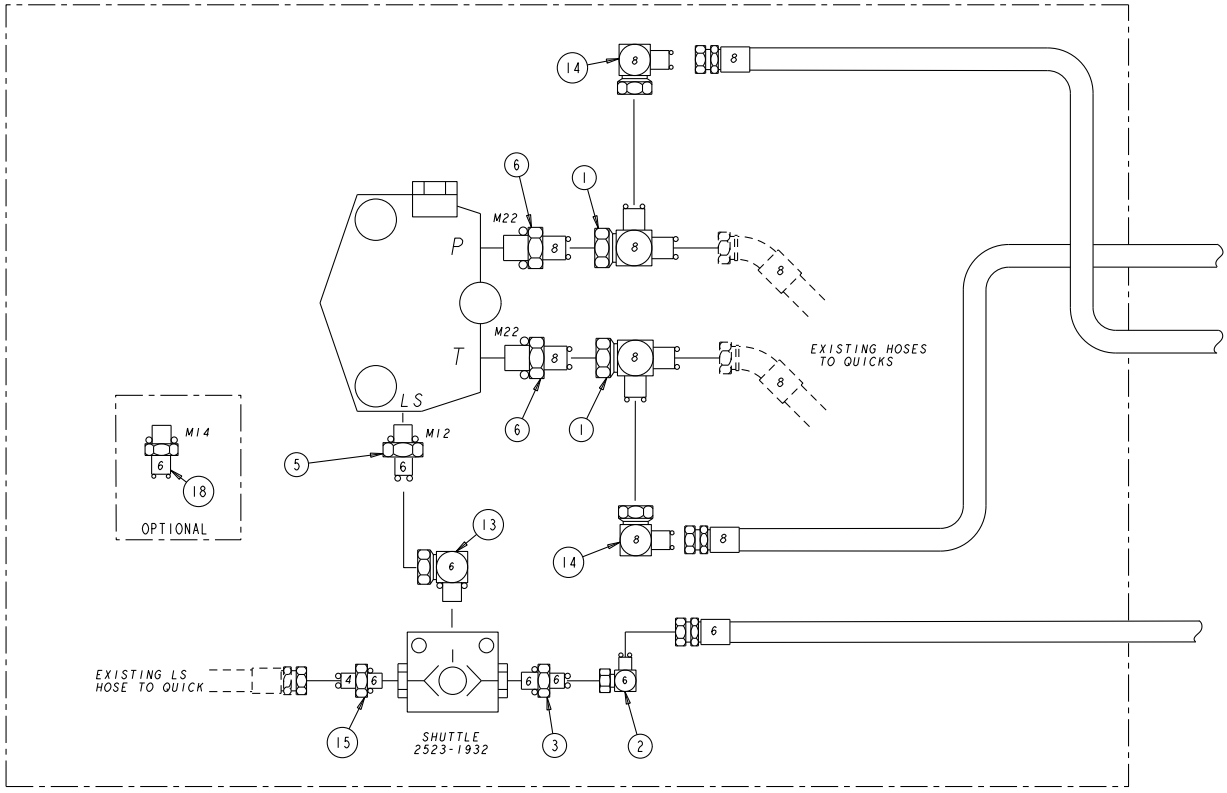


Item	Description	P/N
2	Fitting	6 C6LO
4	Fitting (x2)	8-6 F50LO
5	Fitting	6M12F870MLO
6	Fitting (x2)	8M22F870MLO
7	Fitting	4 C6LO
8	Fitting	4 F50LO
9	Fitting (x2)	8 C50LO
10	Fitting (x2)	8 V6LO
11	Fitting (x2)	8-6 LOHL6
12	Fitting (x2)	8-6 TRLON

Item	Description	P/N
14	Fitting (x2)	8 C6LO
16	Fitting	8 ELO
17	Fitting	8 HLO
18	Fitting	6M14F870MLO
19	Fitting (x2)	8–6 C50LO
20	144" hose (x2)	F451TCJSJ9 080808-144
21	174" hose	F451TCJSJ9 080808-174
22	30" hose (x2)	F451TCJSJ9 080808-30
23	30" hose	F451TCJSJ9 040604-30
24	114" hose	F451TCJSJ9 080808-114

NOTE – Part numbers are Parker numbers and are for reference only.

Alternative connections for power beyond



Item	Description	Part number
1	Fitting (x2)	8 R6L0
2	Fitting	6 C6L0
3	Fitting	6 F50L0
5	Fitting	6M12F870ML0
6	Fitting (x2)	8M22F870ML0

Item	Description	Part number
13	Fitting	6 A0EL6
14	Fitting (x2)	8 C6L0
15	Fitting	4–6 F50L0
18	Fitting	6MI4F870MLO

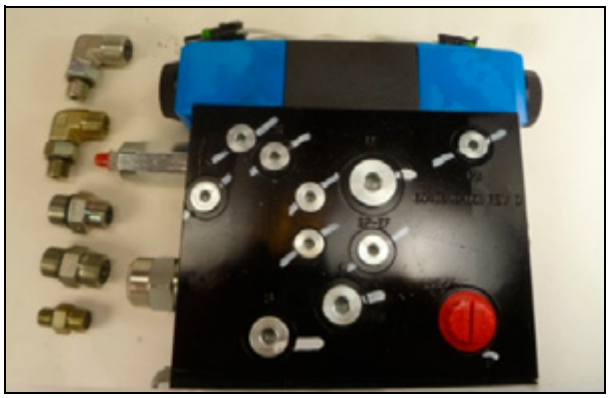
NOTE – Part numbers are Parker numbers and are for reference only

Adding the common fittings for -1000 and -2000 hose kits

⚠ **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.

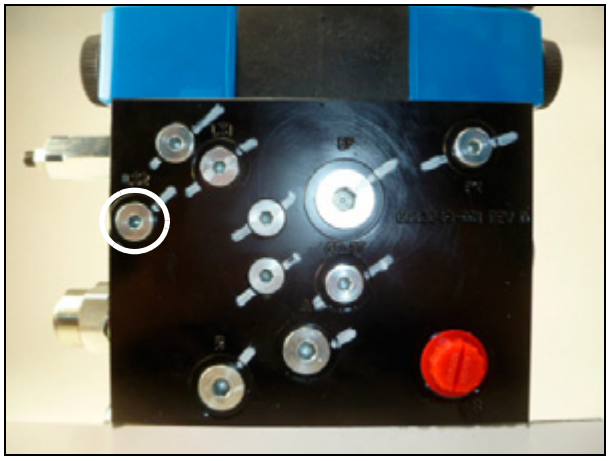
Step 1

Place the Autopilot system manifold and fittings on a clean work surface.



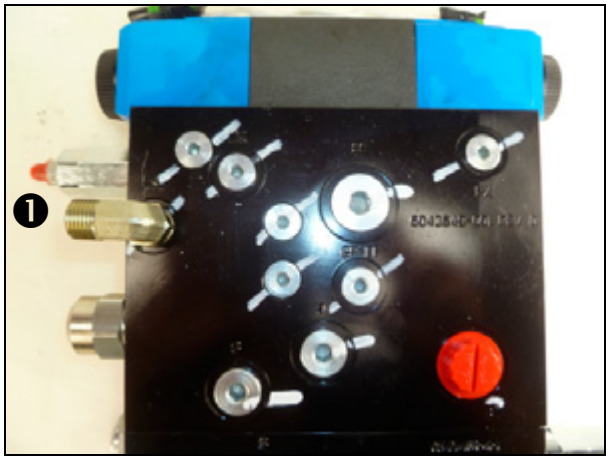
Step 2

Remove the plug in the LS2 port.



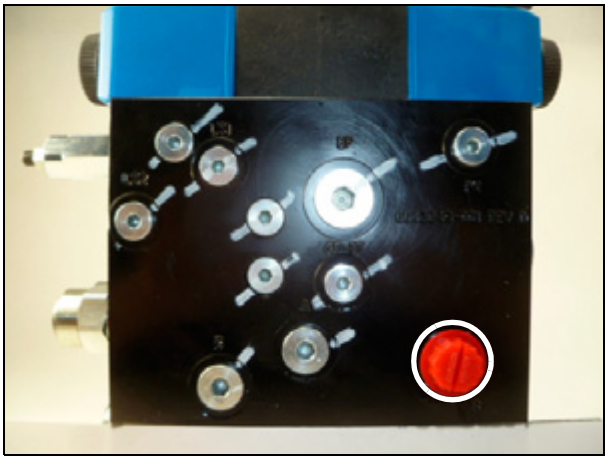
Step 3

Locate the 90 degree 4 ors/orb ❶ and install it into the LS2 port.



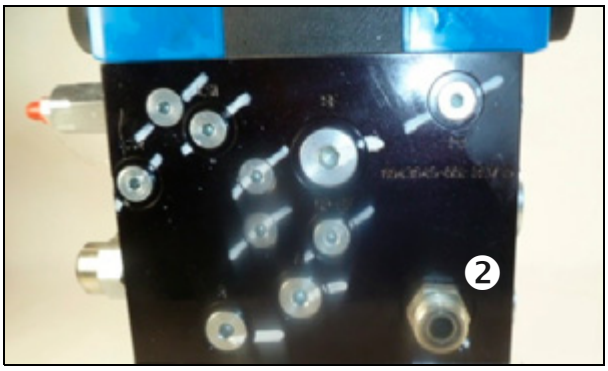
Step 4

Remove the plug from the P port.



Step 5

Locate the straight 8 ors/orb fitting and install it in the P port.



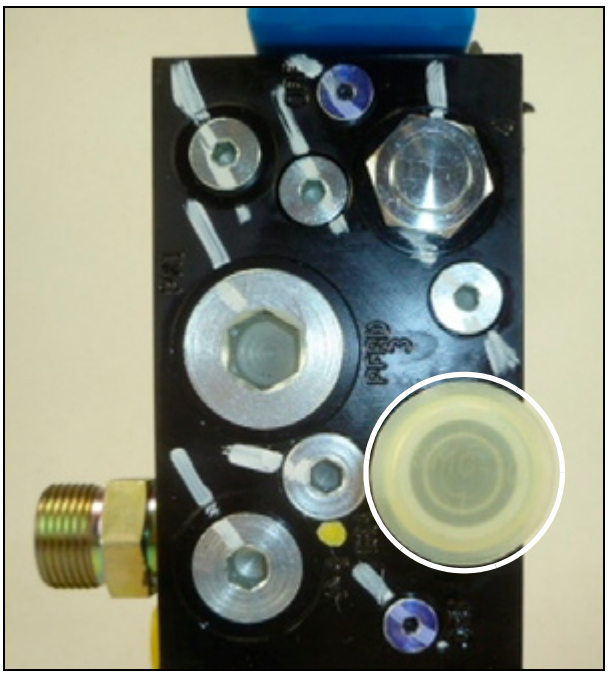
Step 6

Remove the plug from the T port.



Step 7

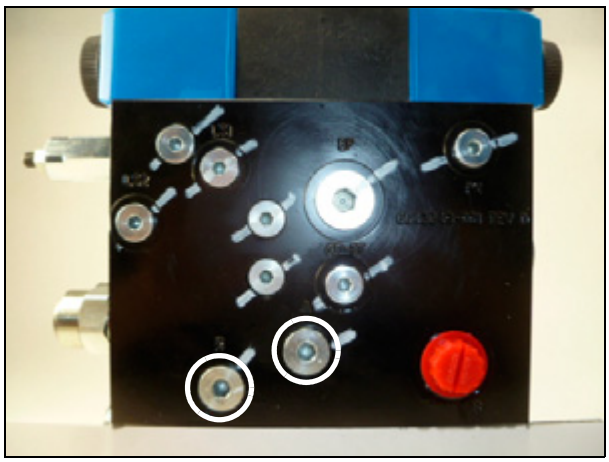
Locate the straight 8 ors/orb and install it in the T port.



Steering line connections without isolation block (P/N 68577-1000 hose kit)

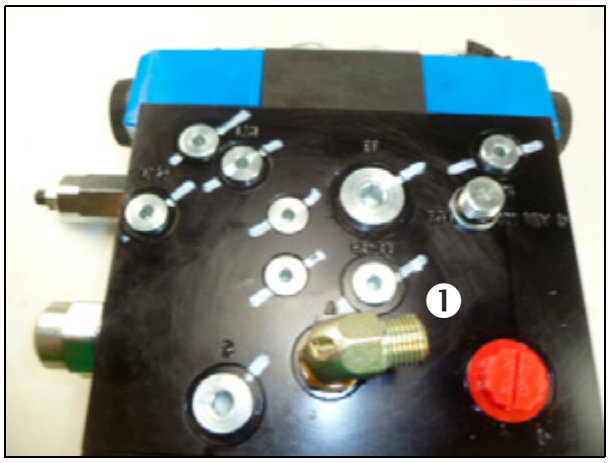
Step 1

Remove the plugs in the A and B ports.



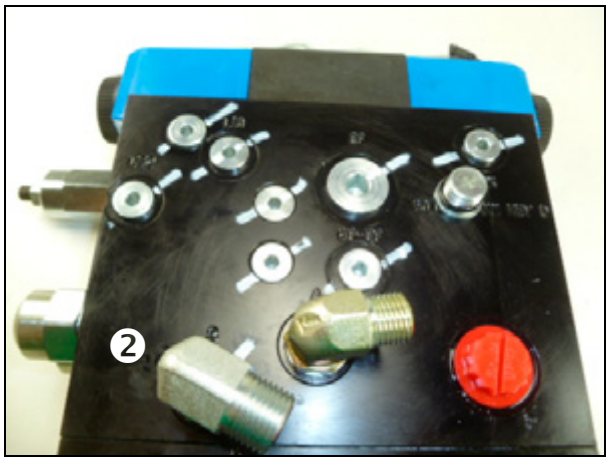
Step 2

Locate the 90 degree 6 ors/orb fitting and install it into the A port ❶.



Step 3

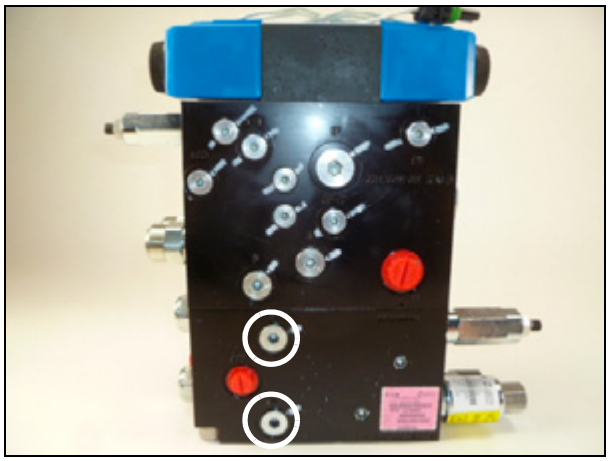
Locate the 90 degree 6 ors/orb fitting and install it into the B port ❷.



Steering line connections with isolation block (P/N 68577-2000 hose kit)

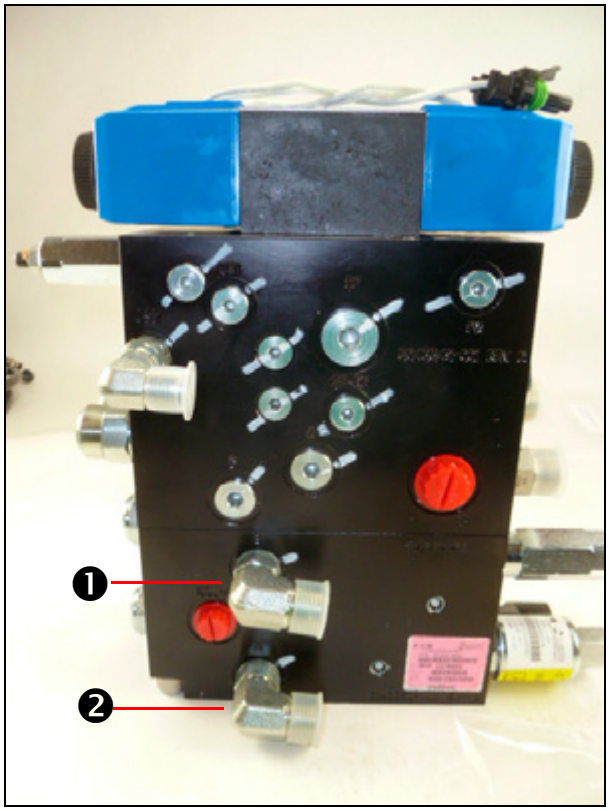
Step 1

Remove the plugs in the A and B ports.



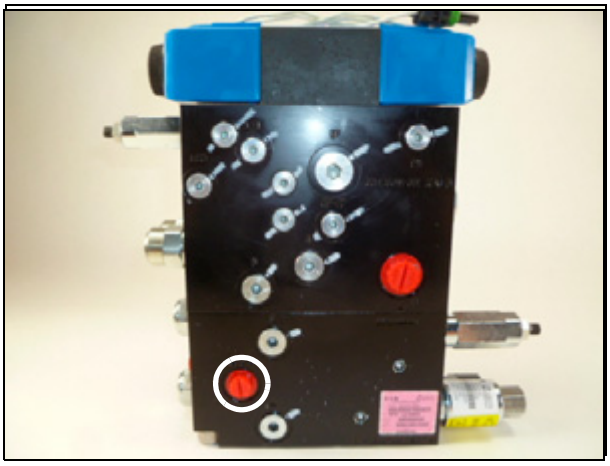
Step 2

Locate the 90 degree 8 ors/orb fitting and install it into the A port ❶ and B ❷ ports.



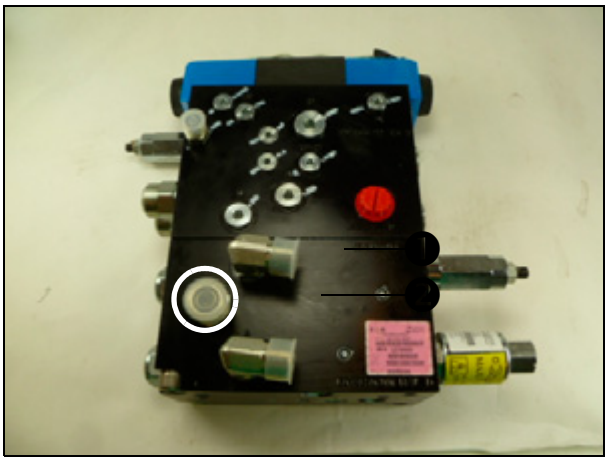
Step 3

Remove the plug from the SCU-A port.



Step 4

Locate the straight 8-6 ors/orb fitting. Install it into the SCU-A port.



Step 5

Remove plug from SCU-B port.



Step 6

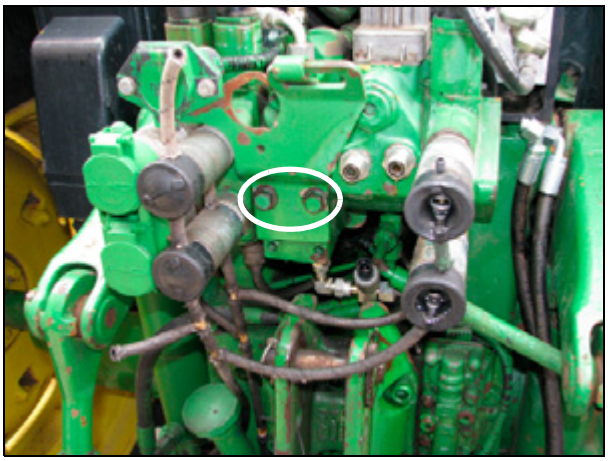
Locate the straight 8-6 ors/orb fitting. Install it into the SCU-B port.



Installing the manifold bracket

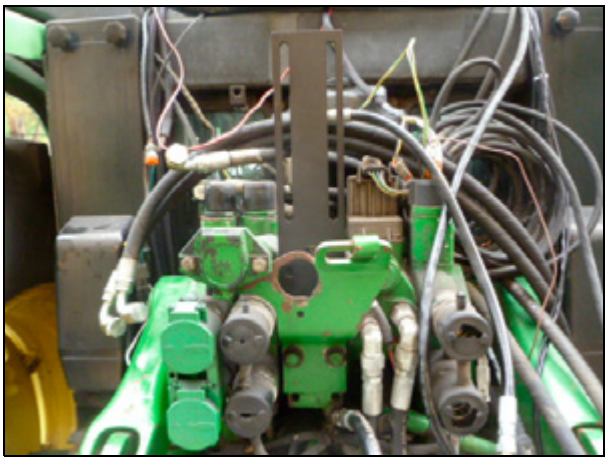
Step 1

Locate and remove the two bolts indicated in the image.

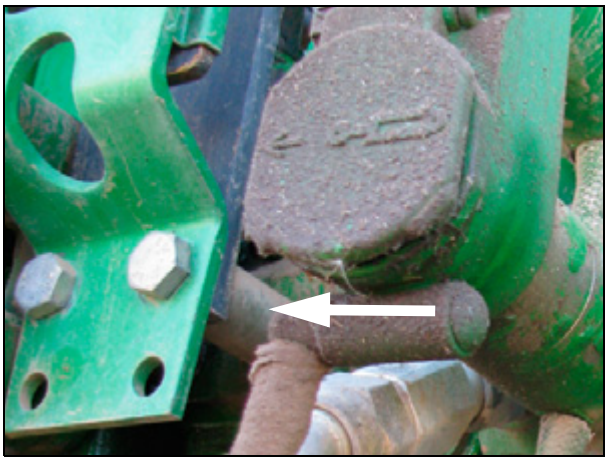


Step 2

Install the supplied bracket between the existing bracket and the tractor.

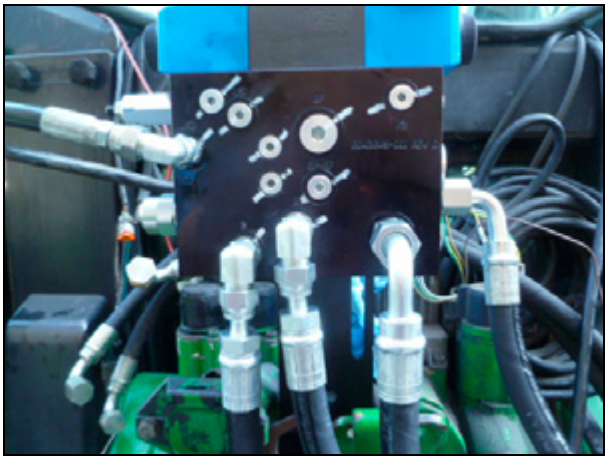


NOTE – Some tractors may require the use of the supplied spacer and longer bolts to mount the bracket in this location.



Step 3

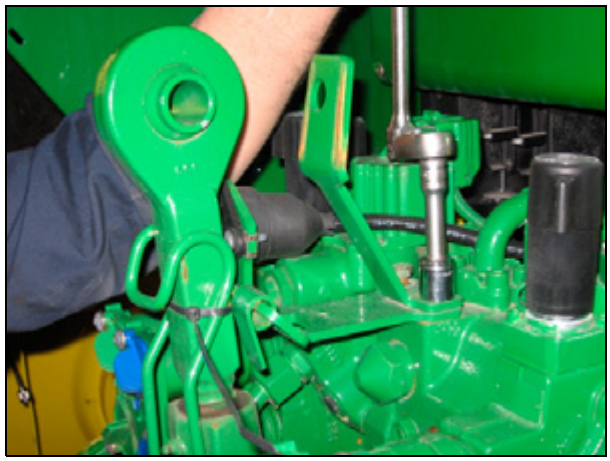
Using the hardware provided, assemble and tighten the manifold to the bracket.



Mounting the manifold bracket: John Deere 6x30 and some small frame John Deere 7xx0 models

Step 1

Locate and remove the bolts holding the 3PT center link support bracket.



Step 2

Attach the supplied angle bracket to the manifold mount bracket with the $^{7}/_{16}$" hardware provided.



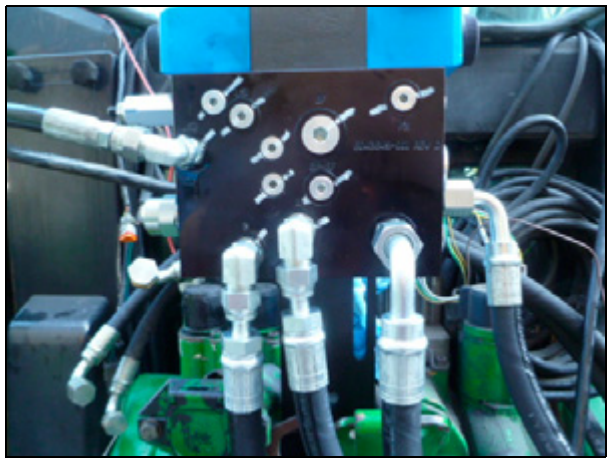
Step 3

Assemble the bracket under the 3PT center link bracket with the upper portion of the angle pointing toward the front of the tractor. Tighten the bolts securing the bracket to the tractor.

NOTE – For the JD6x30 tractors, the bracket may be shortened depending on tractor configuration. Ensure that you check for clearance before shortening the bracket.

Step 4

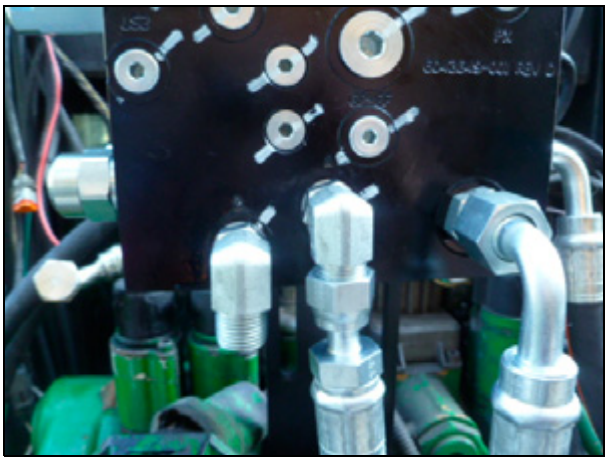
Using the hardware provided, assemble and tighten the manifold to the bracket.



Connecting the A and B lines (P/N 68577-1000 hose kit)

Step 1

The steering A and B lines are of equal length; attach them to the A and B ports of the valve.



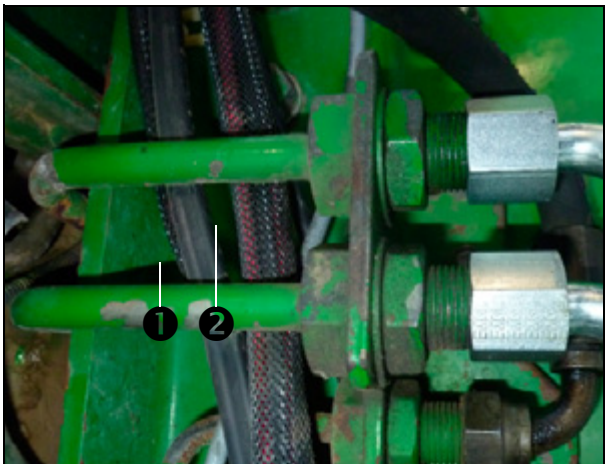
Step 2

Ensure the plastic plugs are installed onto the hose ends and route the lines to the area under the right front corner of the cab.



Step 3

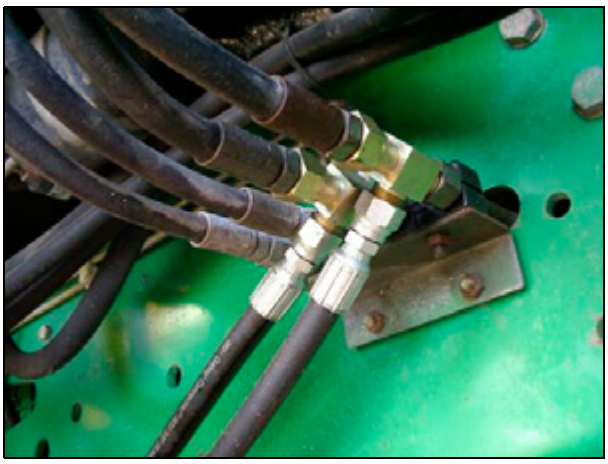
Carefully label each of the steering hoses and then remove them from the bulkhead fittings. Label the fitting and hose toward the rear as "❶" and the fitting and hose toward the front as "❷".



Step 4

Install the provided -8 ORS swivel tees to the bulkhead fittings.

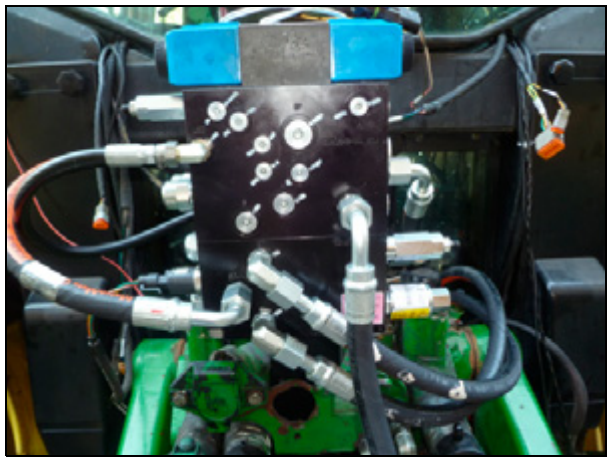
Install the A and B lines to the tees and then reconnect the existing steering hoses. The B line is connected to the forward-most fitting.



Connecting the A and B lines (P/N 68577-2000 hose kit)

Step 1

The steering A and B lines are of equal length; attach them to the A and B ports of the valve.



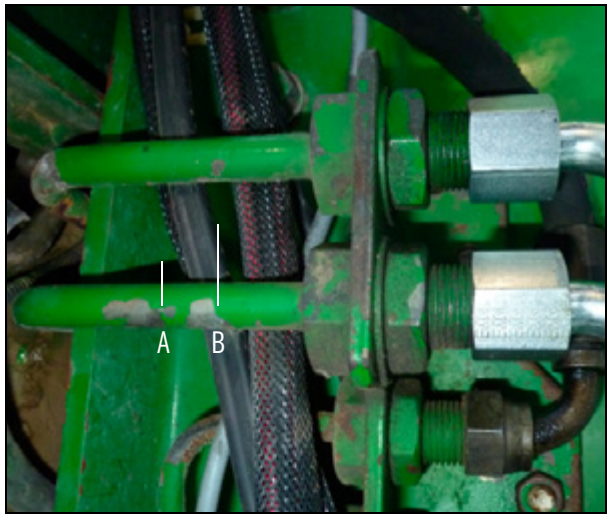
Step 2

Ensure the plastic plugs are installed onto the hose ends and route the lines to the area under the right front corner of the cab.



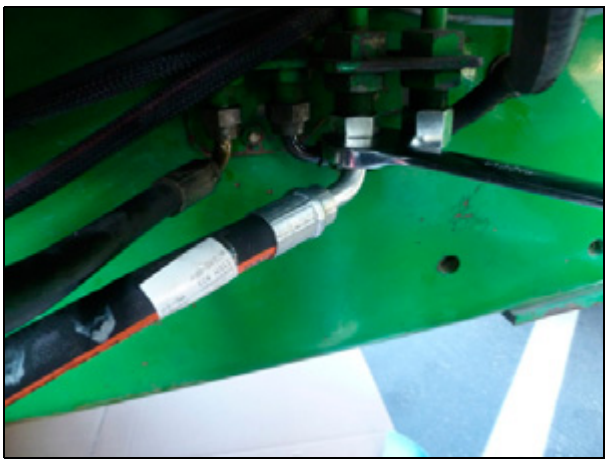
Step 3

Carefully label each of the steering hoses and then remove them from the bulkhead fittings. Label the fitting and hose toward the rear as "**A**" and the fitting and hose toward the front as "**B**".



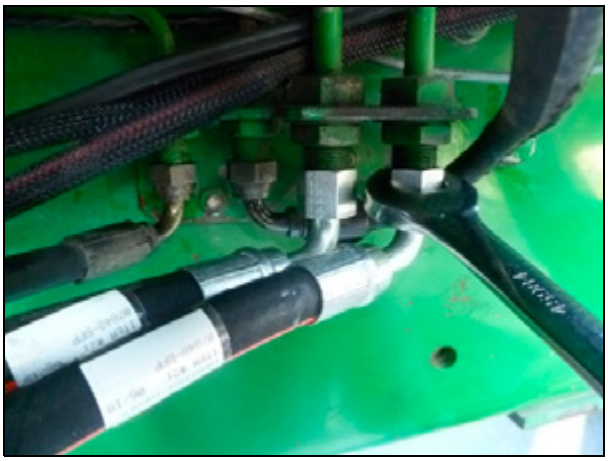
Step 4

Connect hose A from the manifold to the A fitting on the machine.



Step 5

Connect hose B.



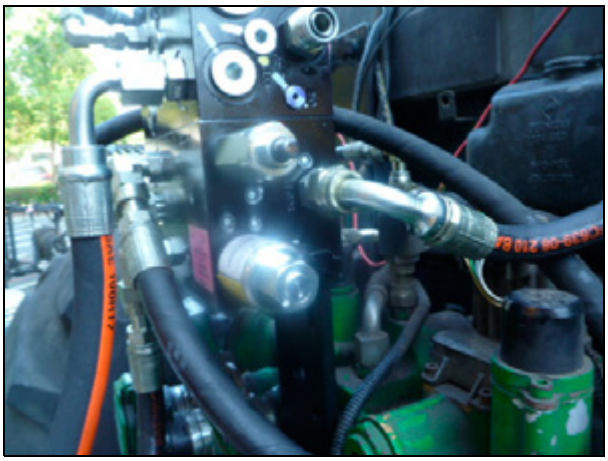
Step 6

Take hose SCU-B and attach the 90 degree 8 fitting into it. Then connect it to the B hose from the steering cylinder, which was removed earlier.



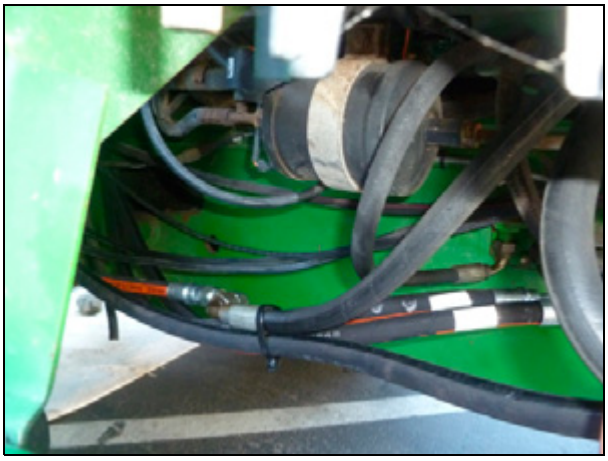
Step 7

Route the hose back to the manifold and attach it to the straight 8 ors/orb fitting in the SCU-B port.



Step 8

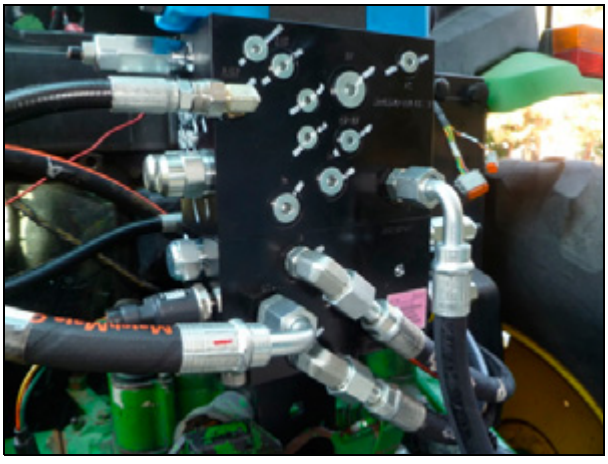
Take SCU-A hose attach the 90 degree 8 fitting to it. Then connect it to the A hose from the steering cylinder, which was removed earlier.





Step 9

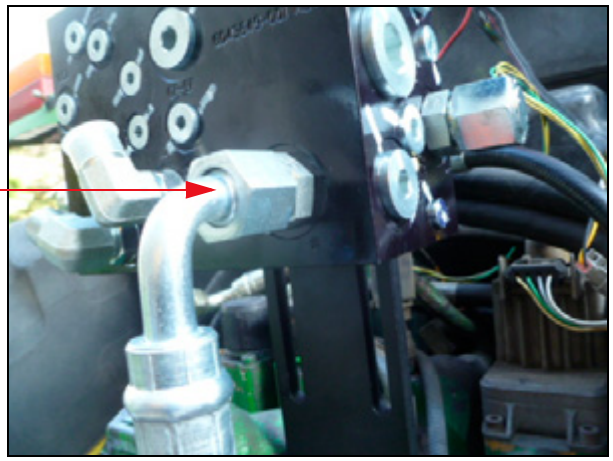
Route the end of the SCU-A hose back to the manifold and connect it to the straight 8 ors/orb fitting that is in the SCU-A port.

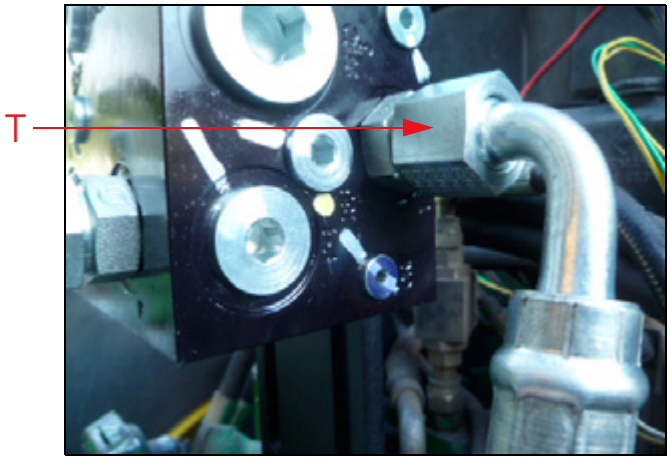


Connecting the Pressure, Tank, and LS lines (all hose kit types)

Step 1

Connect the pressure and tank lines to the manifold as shown.

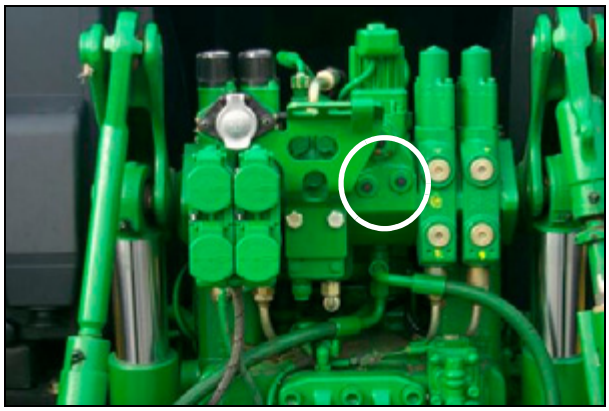




Connecting the P, T, and LS lines to the machine for 6x00 and 6x10

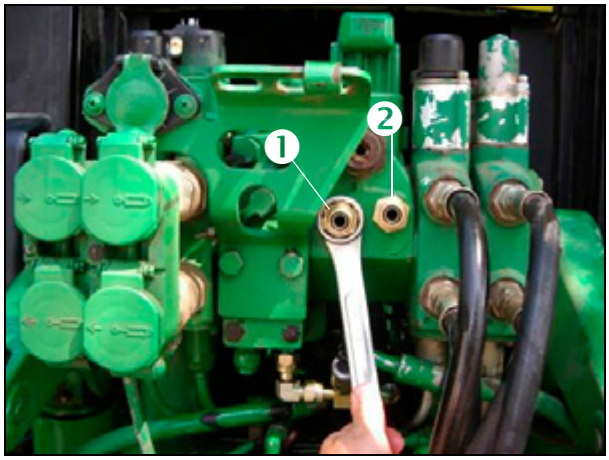
Step 1

Remove the pressure and return port plugs.



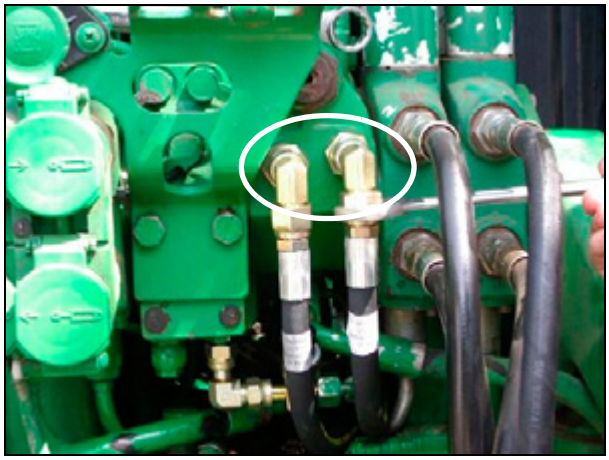
Step 2

Install the -8 port adaptors into the pressure port ❶ and the return or tank port ❷.



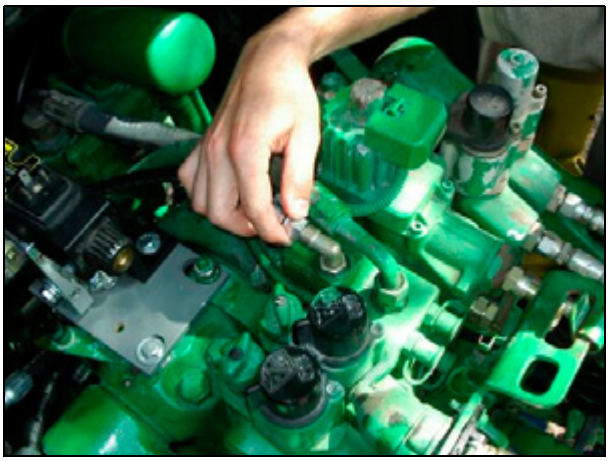
Step 3

Connect the pressure and return lines from the previously installed valve to the ports. Route the hoses so they do not contact moving 3PT arms. See the hydraulic hose kit diagram for proper connection.



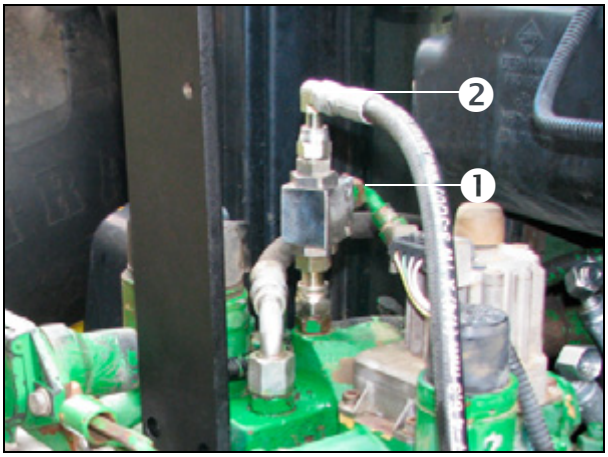
Step 4

Remove the machine load sense line from the valve. See the hydraulic hose kit diagram for machine variations.

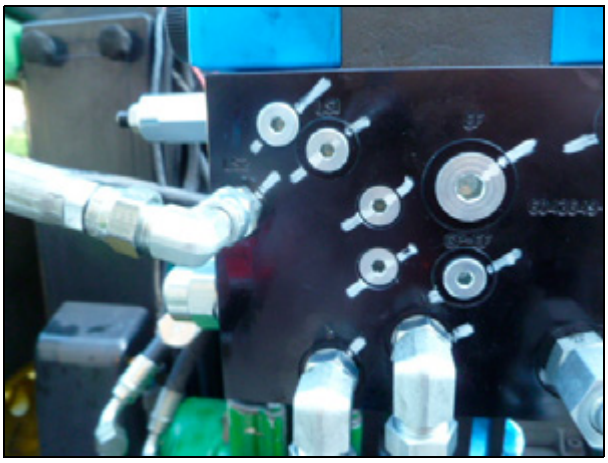


Step 5

Connect the existing pump load sense line to the common center port (❶) of the shuttle. Attach the supplied -4 line to the top port(❷). Connect the other end of the line to the load sense port on the valve.



Assemble and install the load sense shuttle valve as shown in the hydraulic hose kit diagram.



Connecting the P, T, and LS lines to the machine for 6x20

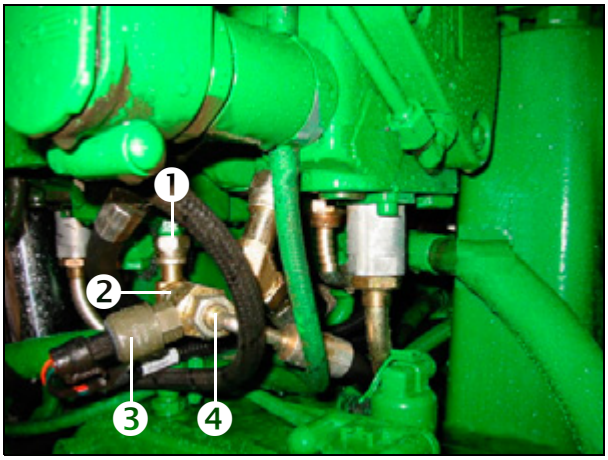
Step 1

Remove the steering load sense line from the bottom of the priority valve.



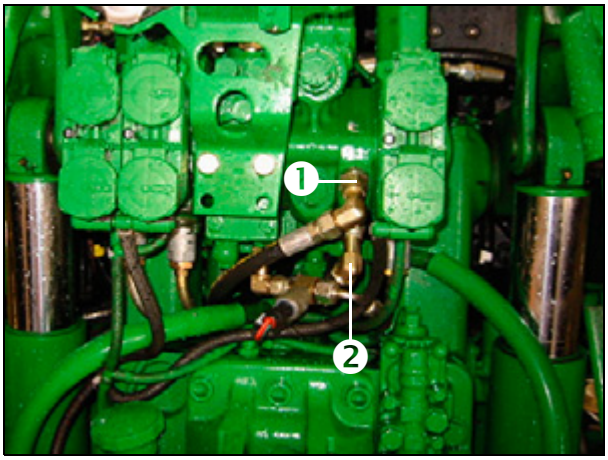
Step 2

Assemble the -4 swivel elbow (❶) and -4 test port adaptor (❷), as shown in the hydraulic diagram. Install the manual override pressure transducer (❸) and then reconnect the steering load sense line to the end of the -4 test port fitting (❹). Tighten all connections.



Step 3

Remove the pressure and return port plugs. Install the -8 port adaptors into the pressure port (❶) and the return or tank port (❷). Connect the pressure and return lines from the previously installed valve to the ports. Route the hoses so they do not contact moving 3PT arms. See the hydraulic hose kit diagram for proper connection.



Step 4

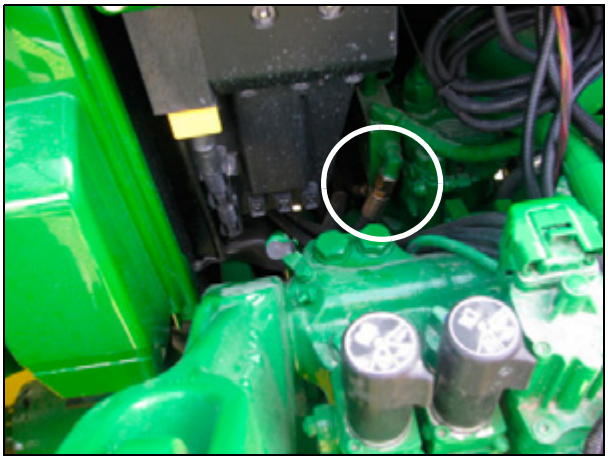
For the remainder of the John Deere 6x20 hose installation process, proceed from Step 3 on page 40.

Connecting the P, T, and LS lines to the machine for 6x30, 7430, and 7530

Step 1

To gain access to the load sense line, remove the pressure line from the valve attached to the hydraulic pump.

NOTE – The pump is forward of the manual valve bank.



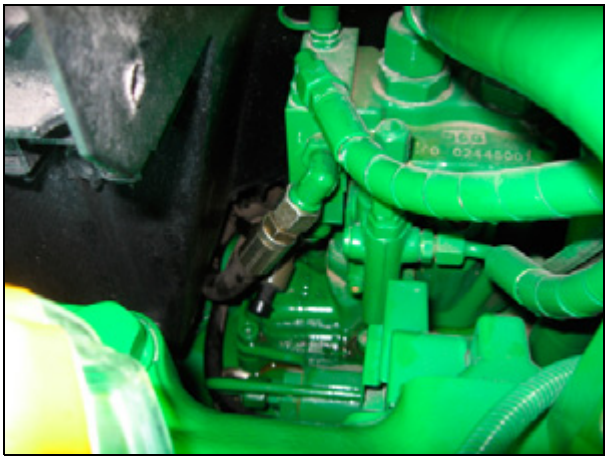
Step 2

Remove the steering load sense line (a crows foot wrench may be required) and then install the test port adaptor tee. Before installing the pressure transducer, tighten the hose and adaptor tee.



Step 3

Reconnect the steering pressure hose.



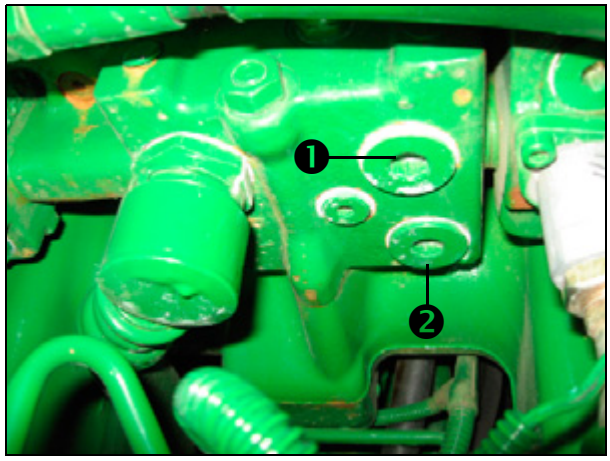
Step 4

At the bottom of the manual valve bank identify and remove the following:

❶ Pressure port plug

❷ Return port plug

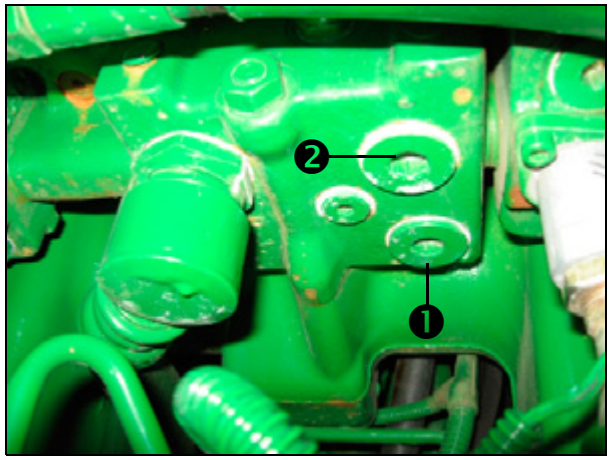
NOTE – The pressure and tank lines in model 6030 are opposite to those in models 7430 and 7530.



Model 6030

Connect the pressure and return lines from the previously installed valve to the ports.

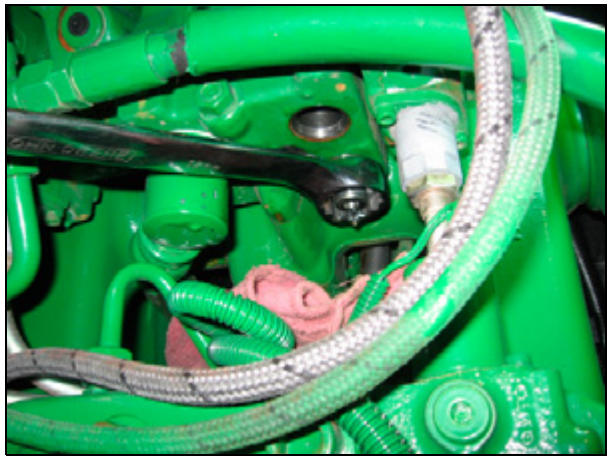
Route the hoses so that they do not contact moving 3pt arms.



Models 7430 and 7530

Step 5

Install the port adaptors in the pressure port and the tank port.



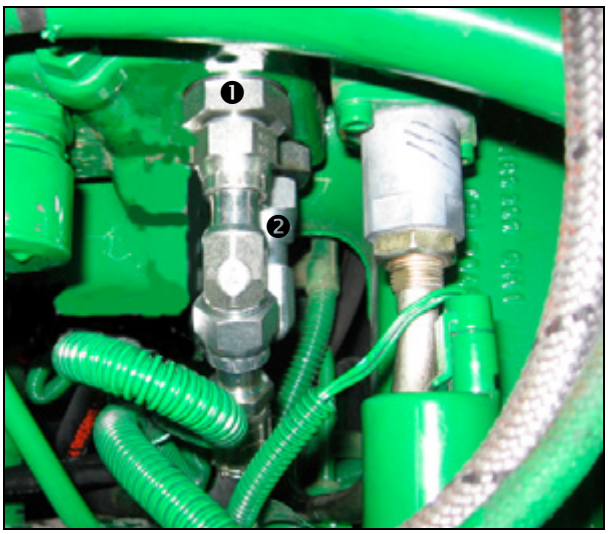
Step 6

Connect the pressure and return lines from the previously installed valve to the ports.

❶ Pressure port plug

❷ Return port plug

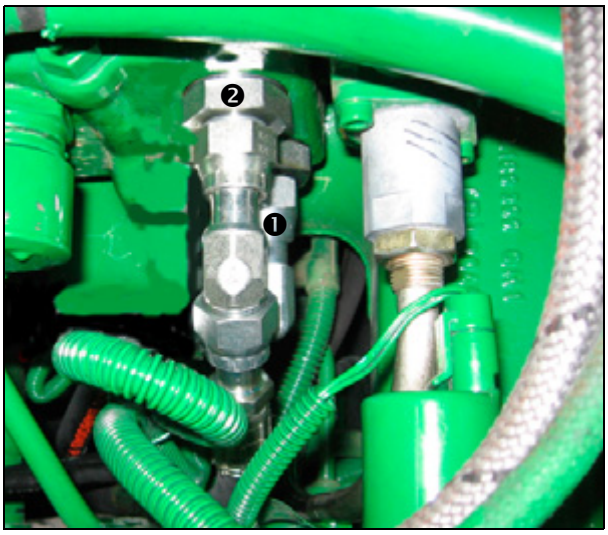
NOTE – The pressure and tank lines in model 6030 are opposite to those in models 7430 and 7530.



Model 6030

Route the hoses so they do not contact moving 3pt arms.

For the correct connection, see Hydraulic components (P/N 68577-1000 hose kit), page 16.



Models 7430 and 7530

Connecting the manual override (P/N 68577-2000 hose kit)

NOTE – For the 68577-1000 kit, the manual override sensor installation is covered in the previous section.

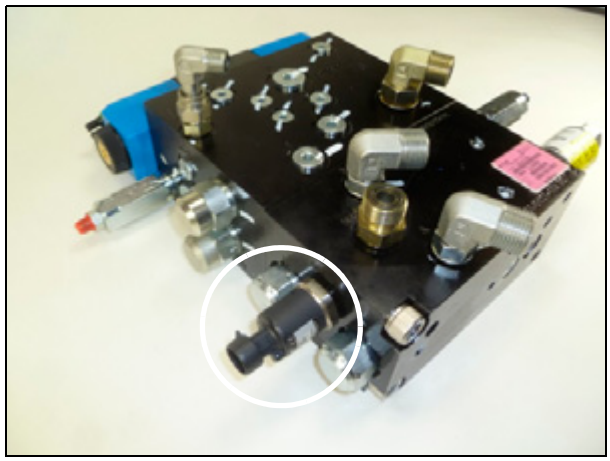
Step 1

Remove the plug from the GP-SCU port.



Step 2

Locate the pressure transducer and install it into the GP-SCU port.



Establishing the electrical connections

Step 1

Attach the transducer manual override cable to the transducer connector.

Step 2

Connect the two valve connectors on the harness to the valve connectors on the autopilot valve.

Connect the plugs marked valve A and Valve B to the plugs on the autopilot manifold. Swapping connectors will be addressed during initial calibration.



Step 3

Tighten all the hydraulic connections.

Check the oil level in the hydraulic tank and top up if necessary.

To check for hydraulic leaks, reconnect the battery and start the machine. Disconnect the battery when the leak check is complete.

Checking the hydraulics

1. Make sure that all the hydraulic connections are tight.
2. Check the oil level in the hydraulic tank. If necessary, top it up.
3. Check for hydraulic leaks. Connect the battery and then start the machine. Once you complete the leak check, disconnect the battery.

3

Hydraulic Control Valve Installation (John Deere 7xx0)

- Hydraulic components (P/N 68574-1000 hose kit)
- Hydraulic components (P/N 68574-2000 hose kit)
- Adding the common fittings for -1000 and -2000 hose kits
- Steering line connections without isolation block (P/N 68574-1000 hose kit)
- Steering line connections with isolation block (P/N 68574-2000 hose kit)
- Installing the manifold bracket
- Connecting the A and B lines (P/N 68574-1000 hose kit)
- Connecting the A and B lines (P/N 68574-2000 hose kit)
- Connecting the Pressure, Tank, and LS lines (all hose kit types)
- Connecting the manual override (P/N 68574-1000 hose kit)
- Connecting the manual override (P/N 68574-2000 hose kit)
- Establishing the electrical connections
- Checking the hydraulics

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

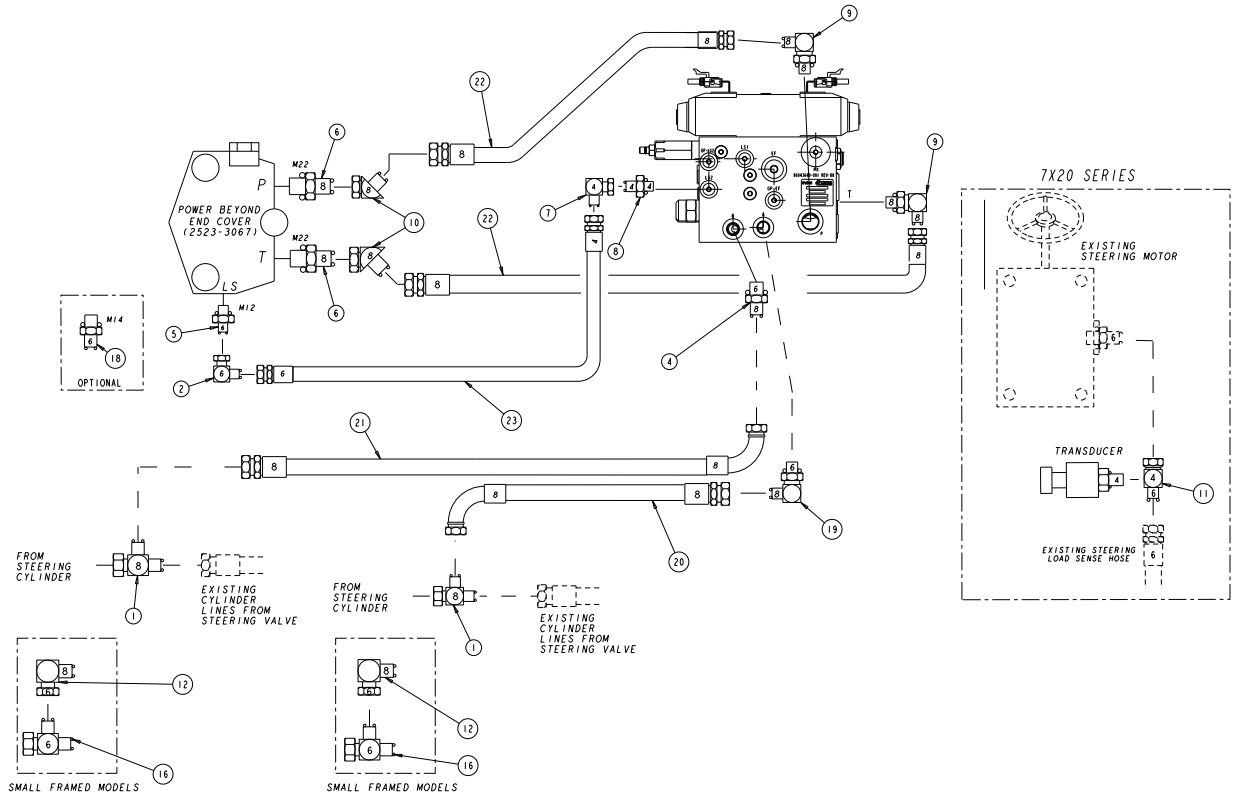
Note that the Power Beyond end cap is required for 7000 models.

The Power Beyond end cap is not included in the platform kit and may not be factory installed. To order the correct end cap, contact your John Deere dealer. Trimble recommends that you connect through the Power Beyond end cap to interface with the tractor hydraulics.

NOTE – End caps vary by model number and may not be interchangeable.

Hydraulic components (P/N 68574-1000 hose kit)

7xx0 hydraulic components

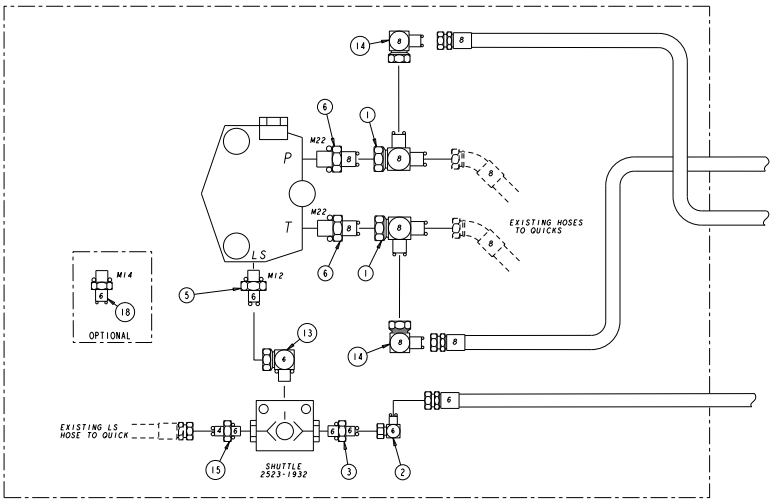


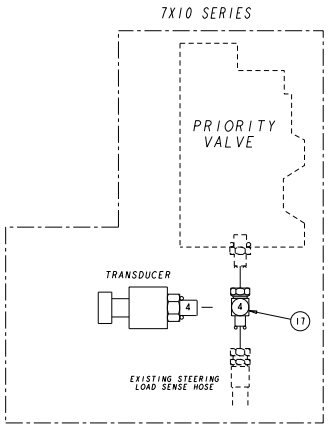
Item	Description	P/N
1	Fitting (x2)	8 R6LO
2	Fitting	6 C6LO
4	Fitting	8-6 F50LO
5	Fitting	6M12F870MLO
6	Fitting (x2)	8M22F870MLO
7	Fitting	4 C6LO
8	Fitting	4 F50LO
9	Fitting (x2)	8 C50LO
10	Fitting (x2)	8 V6LO
11	Fitting	6-4LOHL6G5TP

Item	Description	P/N
12	Fitting (x2)	FS6500-08-06-FG Brennan Fitting
14	Fitting (x2)	8 C6L0
16	Fitting (x2)	6R6LO
17	Fitting	4-4LOHL6GP5TP
18	Fitting	6M14F870MLO
19	Fitting	8–6 C50LO
20	144" hose	F451TCJSJ9 080808-144
21	174" hose	F451TCJSJ9 080808-174
22	30" hose (x2)	F451TCJSJ9 080808-30
23	30" hose	F451TCJSJ9 040604-30

NOTE – Part numbers are Parker numbers and are for reference only.

Alternative connections for power beyond





ALTERNATIVE CONNECTIONS IF POWER BEYOND IS INSTALLED AND UTILIZED

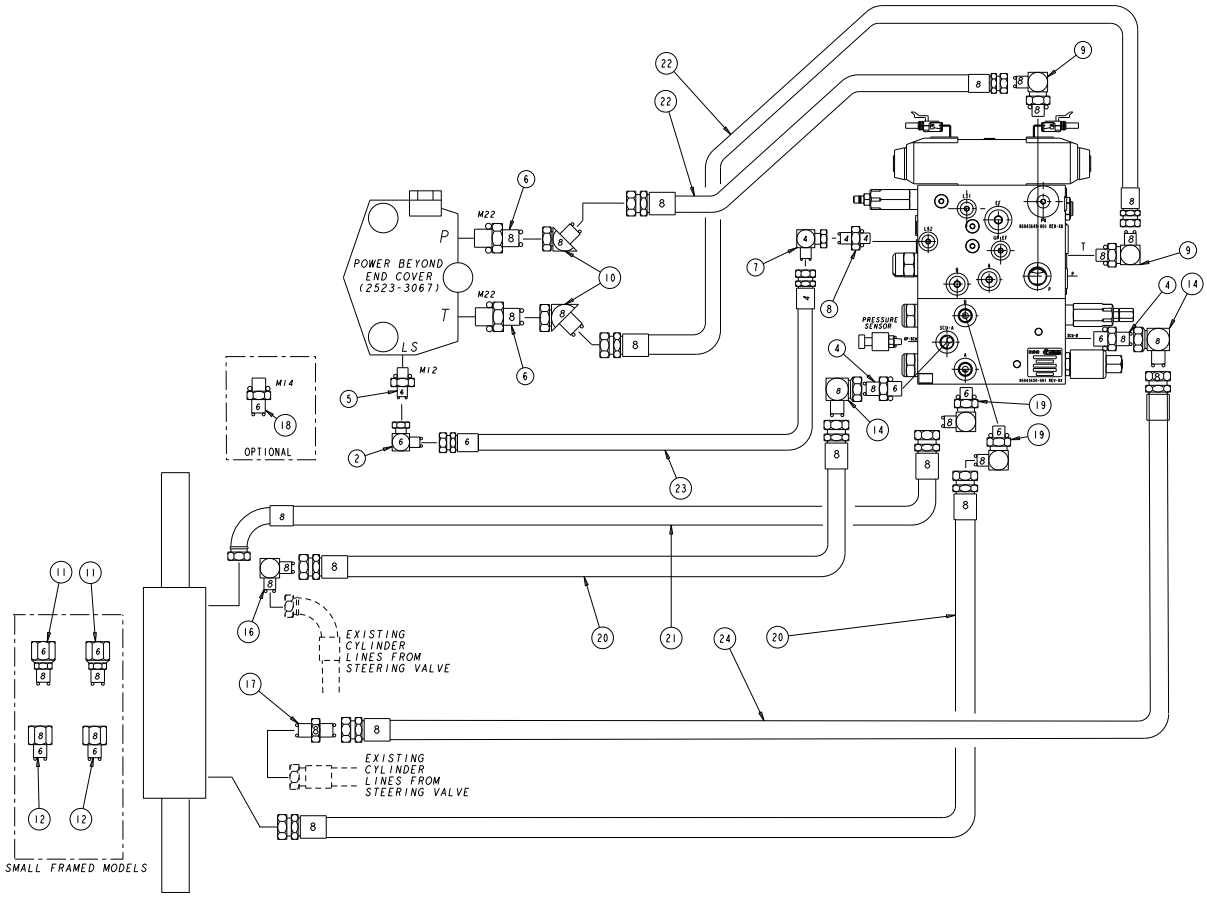
Item	Description	P/N
1	Fitting (x2)	8 R6L0
2	Fitting	6 C6L0
3	Fitting	6 F50L0
5	Fitting	6M12F870ML0
6	Fitting (x2)	8M22F870ML0

Item	Description	P/N
13	Fitting	6 A0EL6
14	Fitting (x2)	8 C6L0
15	Fitting	4–6 F50L0
18	Fitting	6MI4F870MLO

NOTE – Part numbers are Parker numbers and are for reference only.

Hydraulic components (P/N 68574-2000 hose kit)

7xx0 hydraulic components

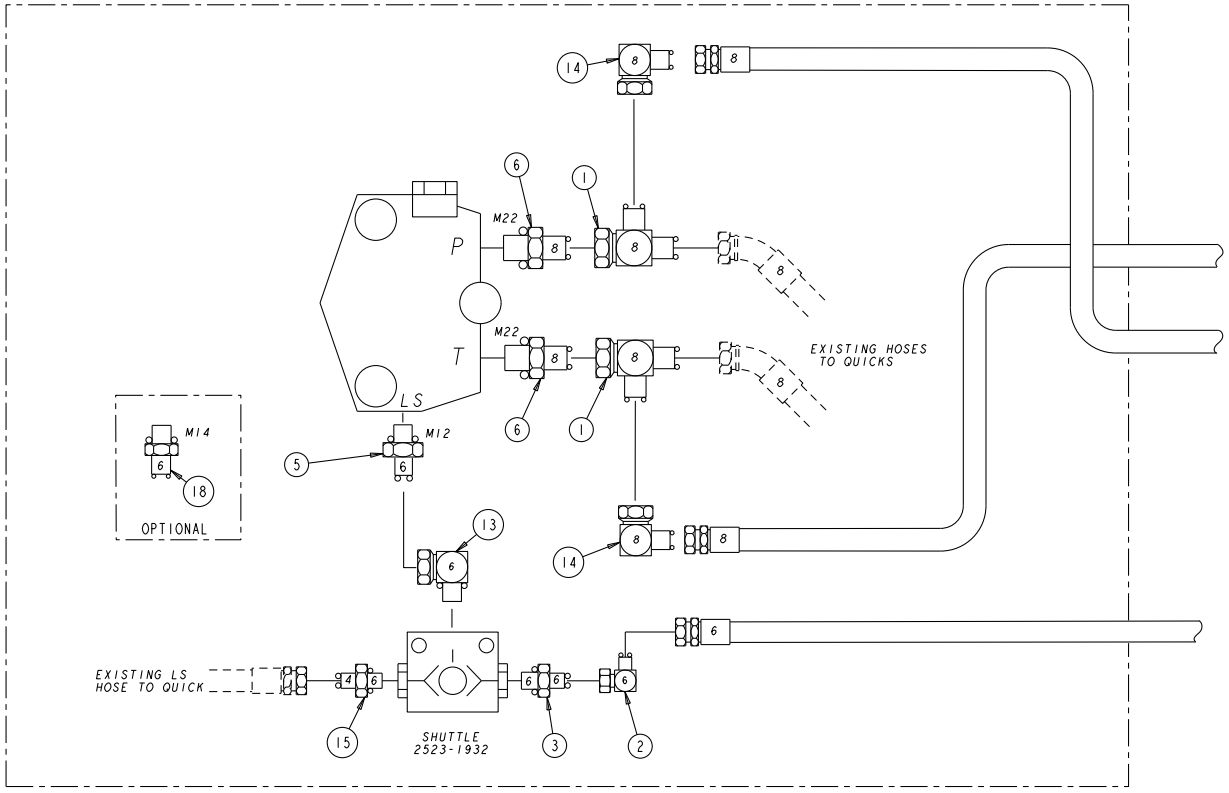


Item	Description	P/N
2	Fitting	6 C6LO
4	Fitting (x2)	8-6 F50LO
5	Fitting	6M12F870MLO
6	Fitting (x2)	8M22F870MLO
7	Fitting	4 C6LO
8	Fitting	4 F50LO
9	Fitting (x2)	8 C50L0
10	Fitting (x2)	8 V6L0
11	Fitting (x2)	8-6 LOHL6
12	Fitting (x2)	8-6 TRLON

Item	Description	P/N
14	Fitting (x2)	8 C6L0
16	Fitting	8 ELO
17	Fitting	8 HLO
18	Fitting	6M14F870MLO
19	Fitting (x2)	8–6 C50LO
20	144" hose (x2)	F451TCJSJ9 080808-144
21	174" hose	F451TCJSJ9 080808-174
22	30" hose (x2)	F451TCJSJ9 080808-30
23	30" hose	F451TCJSJ9 040604-30
24	114" hose	F451TCJSJ9 080808-114

NOTE – Part numbers are Parker numbers and are for reference only.

Alternative connections for power beyond



Item	Description	Part number
1	Fitting (x2)	8 R6L0
2	Fitting	6 C6L0
3	Fitting	6 F50L0
5	Fitting	6M12F870ML0
6	Fitting (x2)	8M22F870ML0

Item	Description	Part number
13	Fitting	6 A0EL6
14	Fitting (x2)	8 C6L0
15	Fitting	4–6 F50L0
18	Fitting	6MI4F870MLO

NOTE – Part numbers are Parker numbers and are for reference only.

Adding the common fittings for -1000 and -2000 hose kits

⚠ **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.

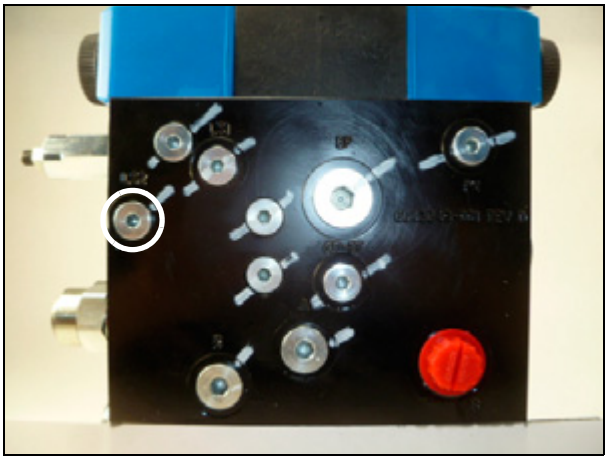
Step 1

Place the Autopilot system manifold and fittings on a clean work surface.



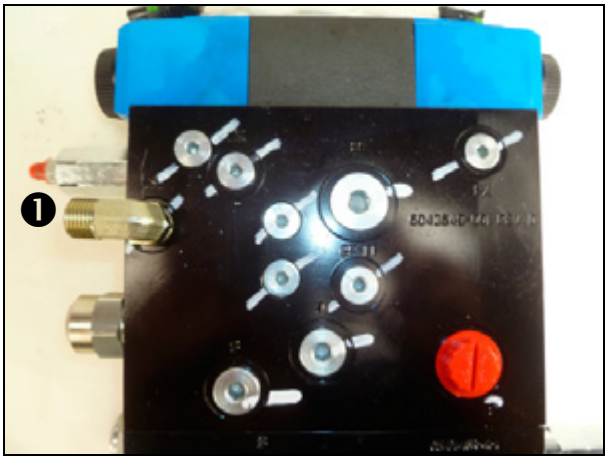
Step 2

Remove the plug from the LS2 port.



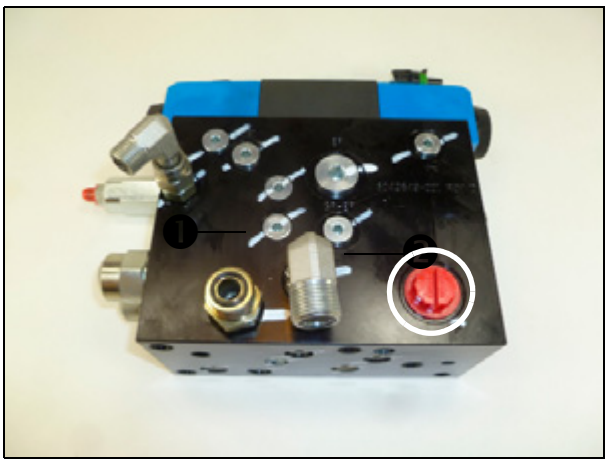
Step 3

Locate the 90 degree 4 ors/orb and install it into the LS2 port.



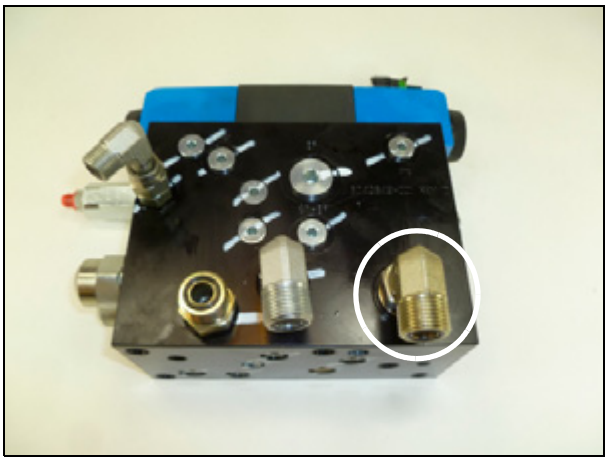
Step 4

Remove the plug in the P port.



Step 5

Locate the 90 degree 8 ors/orb fitting and install it in the P port.



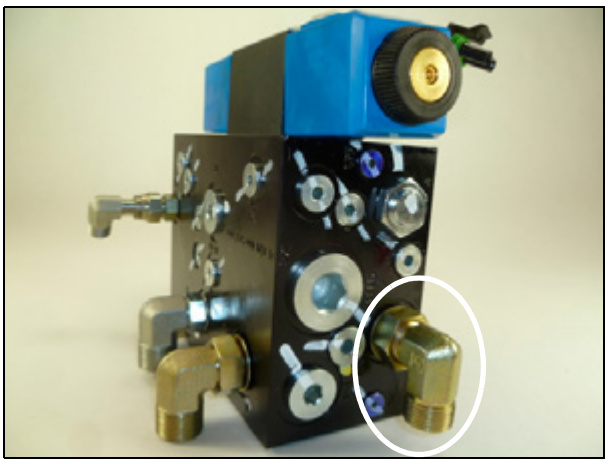
Step 6

Remove the plug from the T port.



Step 7

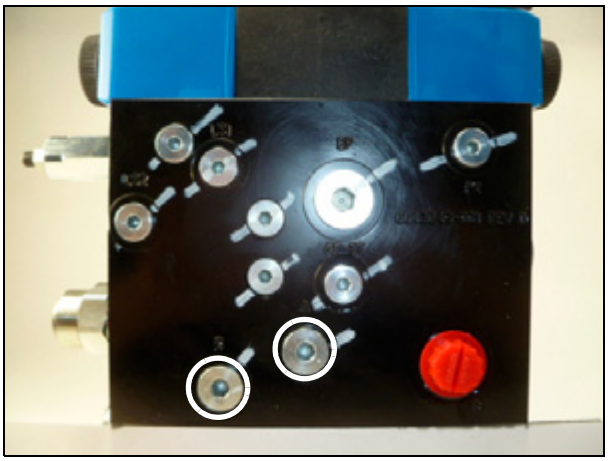
Locate the 90 degree 8 ors/orb and install it in the T port.



Steering line connections without isolation block (P/N 68574-1000 hose kit)

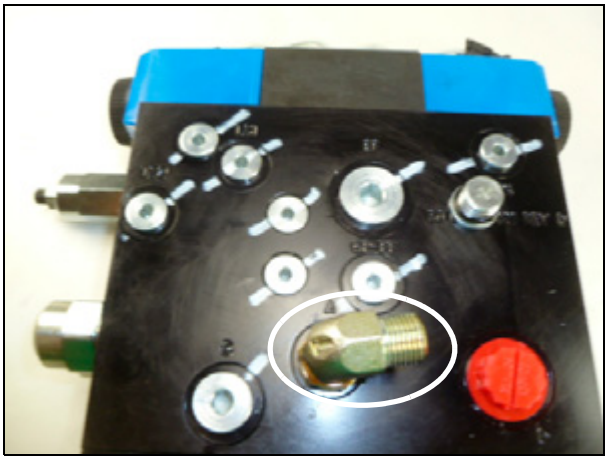
Step 1

Remove the plugs in the A and B ports.



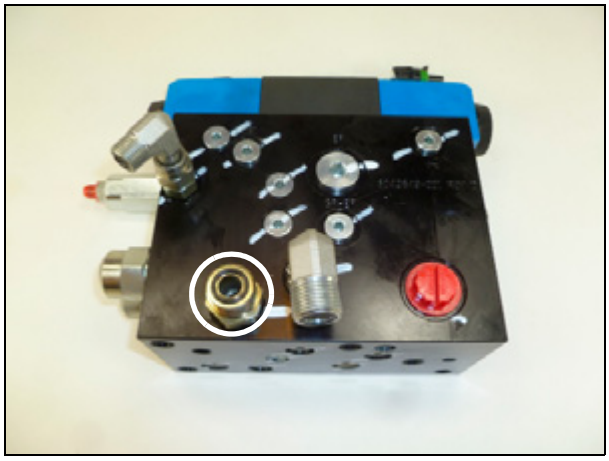
Step 2

Locate the 90 degree 6-8 ors/orb fitting and install it into the A port.



Step 3

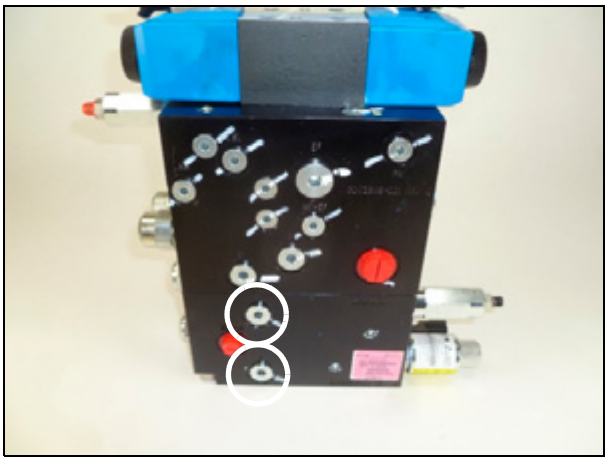
Locate the straight 6 ors/orb fitting and install it into the B port.



Steering line connections with isolation block (P/N 68574-2000 hose kit)

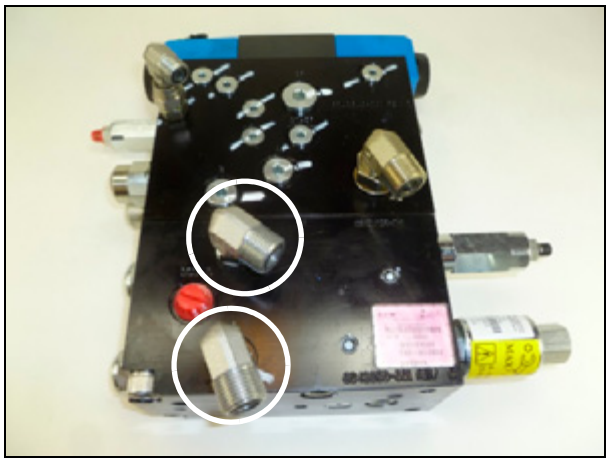
Step 1

Remove the plugs in the A and B ports.



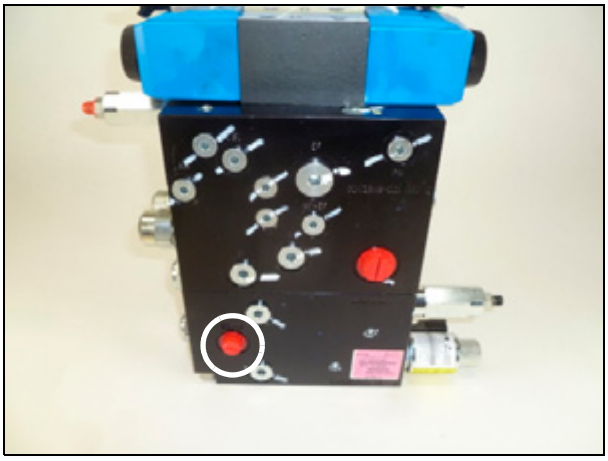
Step 2

Remove the 90 degree 8-6 fittings and install them into the A and B ports.



Step 3

Remove the plug in the SCU-A port.



Step 4

Locate the straight 8 ors/orb and install it in the SCU-A port.



Step 5

Remove the plug from the SCU-B port.



Step 6

Locate the straight 8-6 ors/orb fitting and install it into the SCU-B port.



Step 7

Install the provided swivel 90 degree fitting to the 8-6 fitting that was installed in the previous step.



Installing the manifold bracket

NOTE – Applies to both manifold with, and without, the isolation block.

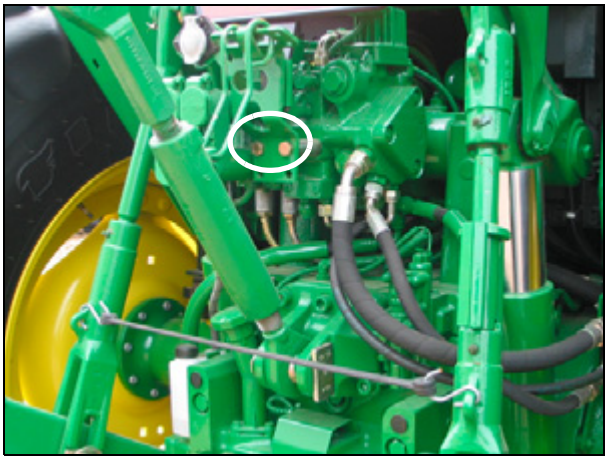
Choose one of the following places to mount the bracket on the John Deere 7xx0 tractors.

- Standard mount, see page 58.
- **Slow Moving Vehicle** sign location mount, see page 59.
- Fender mount, see page 60.

Standard mount

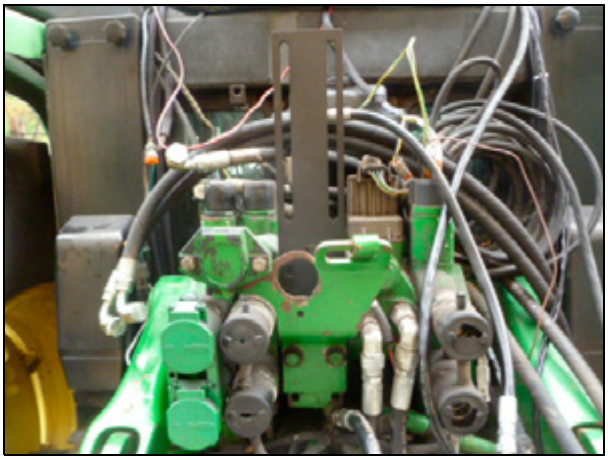
Step 1

Locate and remove the two bolts indicated in the image.



Step 2

Install the supplied bracket between the existing bracket and the tractor.



Slow Moving Vehicle sign mount

Step 1

Remove the four bolts holding the electrical connector plate to the back of the tractor.

NOTE – Removal of this bracket provides access for drilling in step 3.



Step 2

Remove the bolts holding the **Slow Moving Vehicle** sign bracket.

NOTE – The Slow Moving Vehicle sign will need to be relocated and re-attached to the tractor.



Step 3

Attach the bracket to the tractor with one of the supplied $^{7}/_{16}$" bolts. Ensure the bracket is squarely lined up, and then center punch the position for the second bolt.



Step 4

Drill a hole and install the second $^{7}/_{16}$" bolt. Ensure both bolts are tightened securely.



Step 5

Install the electrical connector plate that you removed earlier and securely tighten the four bolts.

Fender mount

Drill two holes through the fender of the tractor and then attach the provided bracket to the tractor using two bolts. Attach the manifold to the bracket.

NOTE – You can use the John Deere 6x30 tractor method to mount some small frame John Deere 7xx0 tractors.

Step 6

Using the hardware provided, assemble and tighten the manifold to the bracket.



Connecting the A and B lines (P/N 68574-1000 hose kit)

Step 1

Select the 174" hose. Tape the straight connector end of the hose to prevent contamination. Route the hose end under the cab from the left side along the frame to the right side steering cylinder.

Install a tee to the existing steering cylinder line and connect the hose as shown.



Step 2

Select the 144" hose. Tape the 90° connector end of the hose to prevent contamination. Route the hose to the left steering cylinder.

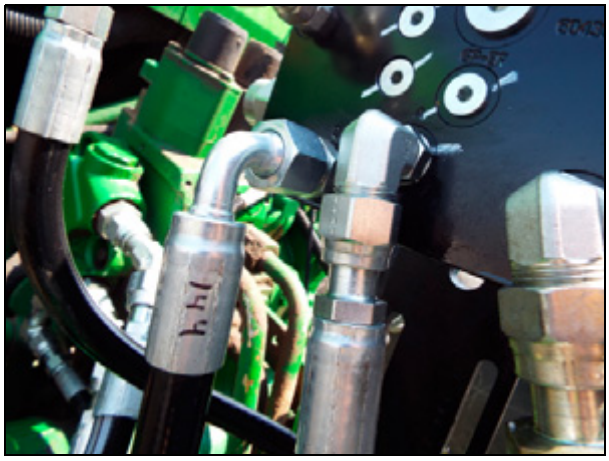
Install a tee to the existing steering cylinder line and connect the hose as shown.



Step 3

Connect the 90° hose end to the A port adaptor on the valve.

Connect the straight hose end to the B port on the valve using a 90° elbow.



Connecting the A and B lines (P/N 68574-2000 hose kit)

Step 1

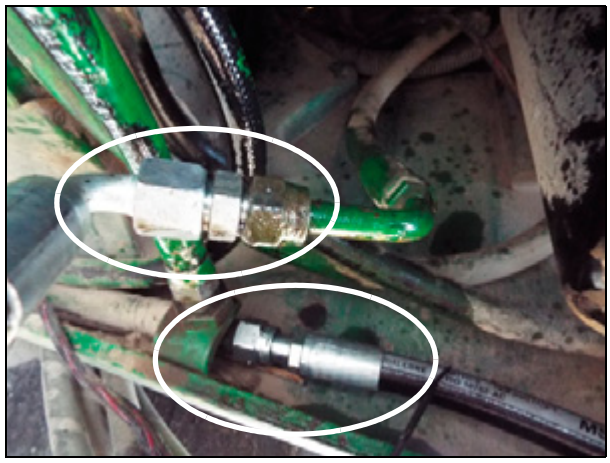
Locate the steering hoses from the steering cylinder. Each hose will be on the inside of frame rail in the same area but one on the left side and one on the right side.



Step 2

Remove the hose coming from the hand pump. Locate the SCU-A hose (❶). Connect it to the line from the hand pump. Then route the SCU-A hose back to the manifold.

Locate the A hose (❷). Connect it to the fitting that the hand pump hose was connected to. Then route the A hose back to the manifold.



Step 3

Connect the A and B hoses to the A and B ports on the Autopilot manifold as shown.



Step 4

Connect the swivel 90 fitting to the SCU-A port, then connect the SCU-A hose to the end of the fitting as shown.



Step 5

SCU-B port connection.



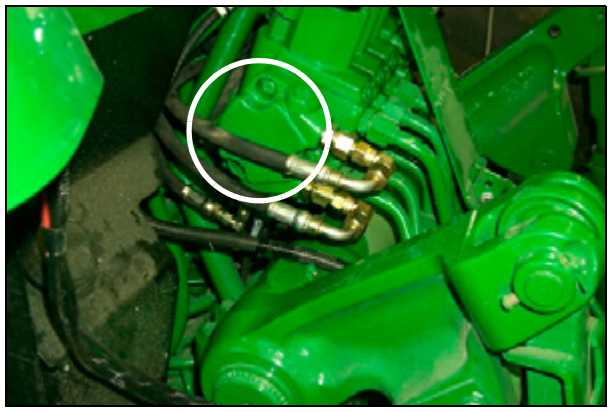
Connecting the Pressure, Tank, and LS lines (all hose kit types)

Step 1

Power Beyond end cap option

The Power Beyond end cap is not included in the platform kit and may not be factory installed. To order the correct end cap, contact your John Deere dealer. End caps vary by model number and may not be interchangeable.

NOTE – Trimble recommends this method.

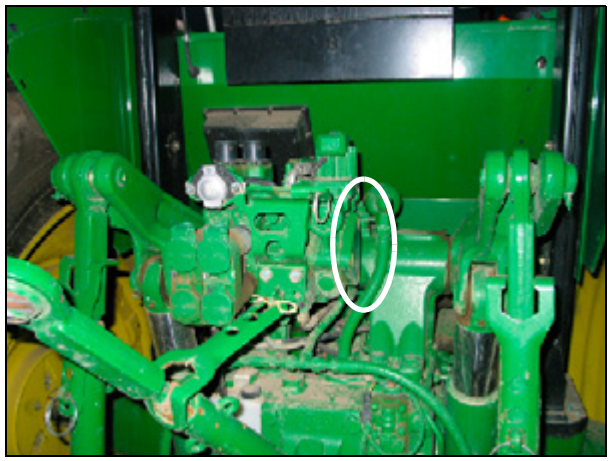


POWER BEYOND END CAP ON LEFT SIDE (INSTALLED)

To determine whether or not a Power Beyond end cap is installed, review the examples on the right. End caps are located at the left or right side of the SCV stack, depending on model number.

NOTE – Not all models are shown.

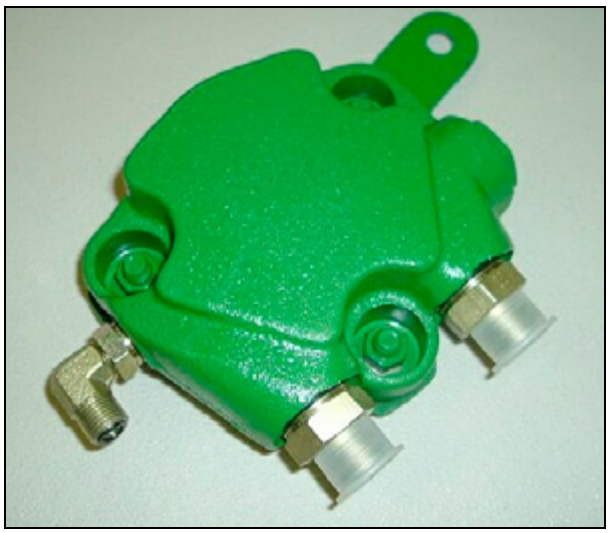
If a Power Beyond end cover is installed and in use, skip to Step 3.



POWER BEYOND LOCATION ON RIGHT SIDE (NOT INSTALLED)

Step 2

If the vehicle is not already equipped with a Power Beyond end cover, assemble the end cover. Attach two M22 x -8 adaptors and the supplied M12 x -6 fitting to the cover casting. Remove the shipping plate.



Do not lose the shuttle valve disk (if used) during installation. Use a small amount of grease to hold the disk in position for assembly.

Remove the existing end cover from the Selective Control Valve (SCV). Reuse the original nuts to install the Power Beyond end cover. Evenly tighten the three nuts to 50 Nm (37 ft/lbs).

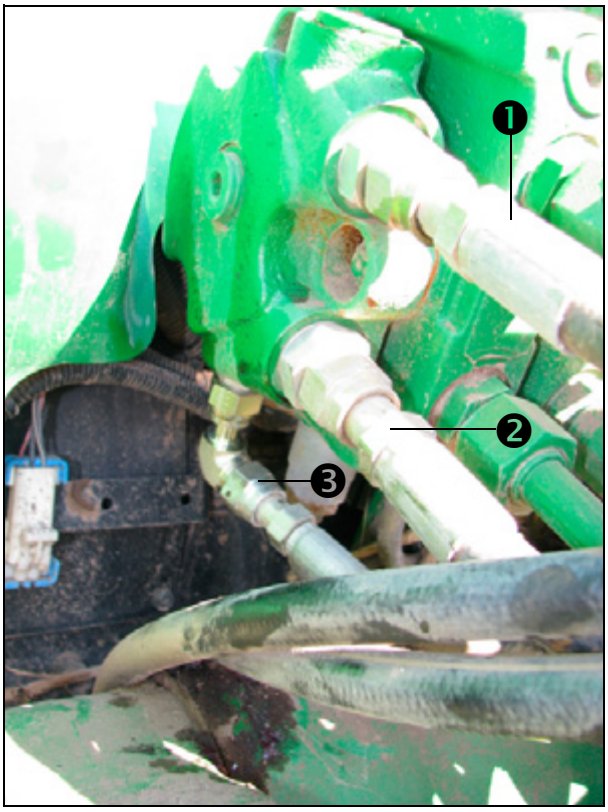
NOTE – If the disk is not installed, the hydraulic system will respond poorly.



Shuttle valve disk (❶)

Step 3

Connect the pressure (❶), tank (❷), and load sense (❸) hoses to the Power Beyond end cover and route the hoses to the Autopilot manifold. (See the hydraulic hose kit diagram for the proper connection).



Connecting the manual override (P/N 68574-1000 hose kit)

7100 – 7500 models: 00 /10 /20/30 series

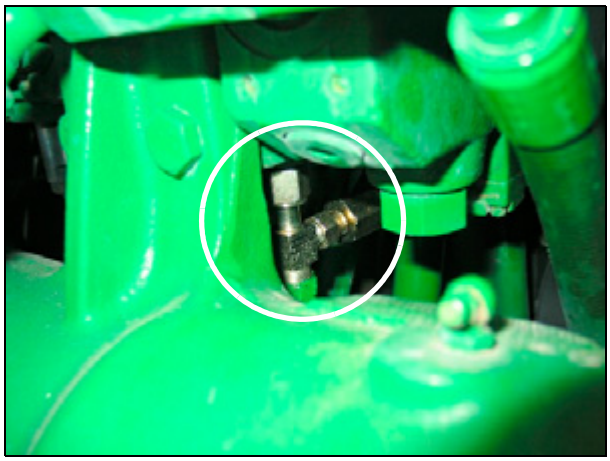
Step 1

The manual override transducer can be installed at the priority valve at the rear of the vehicle. The LS connection from the steering hand pump is located at the bottom of the priority valve.



Step 2

Install the -4 adaptor supplied to the bottom of the priority valve connecting the original LS line to the Tee adaptor. Connect the transducer to the center point on the adaptor. When installed, the transducer is not visible.

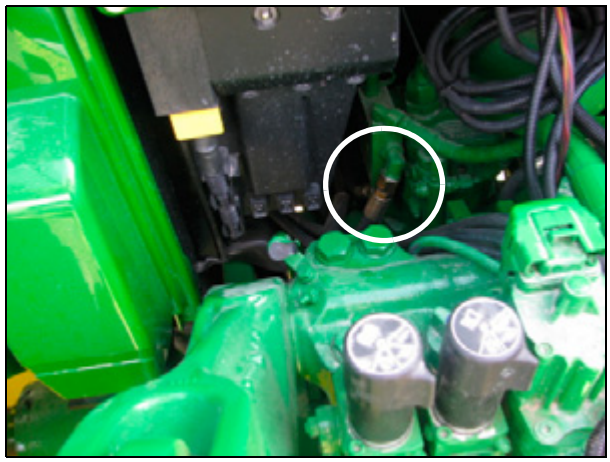


7130 – 7530 models

Step 1

To gain access to the load sense line, remove the pressure line from the valve attached to the hydraulic pump.

NOTE – The pump is forward of the manual valve bank.



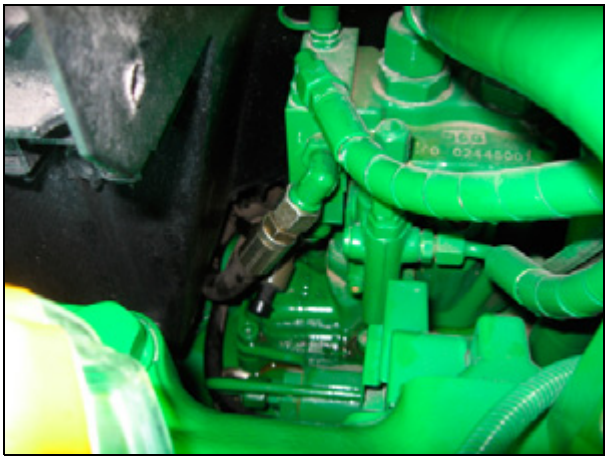
Step 2

Remove the steering load sense line. (a crows foot wrench may be required) and then install the test port adaptor tee. Tighten the hose and adaptor tee before installing the pressure transducer.



Step 3

Reconnect the steering pressure hose.



77x0/78x0/79x0 models

Step 1

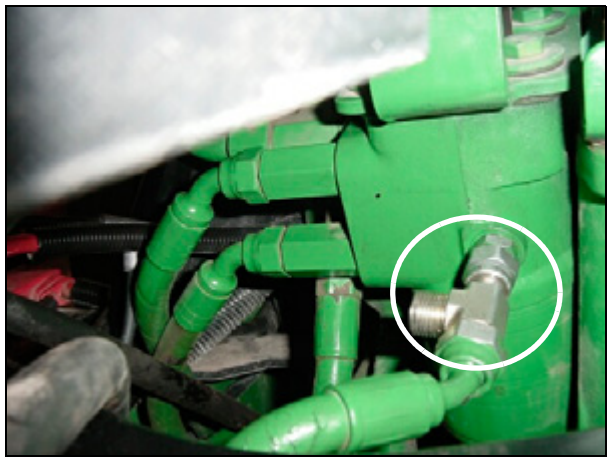
The pressure transducer is connected to the LS port on the steering pump. To access the steering hand pump, remove the left side access panel in front of the cab.



7820/7920 models

Step 2

Install the transducer to the center port of the -6 tee adaptor. Remove the existing LS line and insert the -6 adaptor.



7820/7920 models

Connecting the manual override (P/N 68574-2000 hose kit)

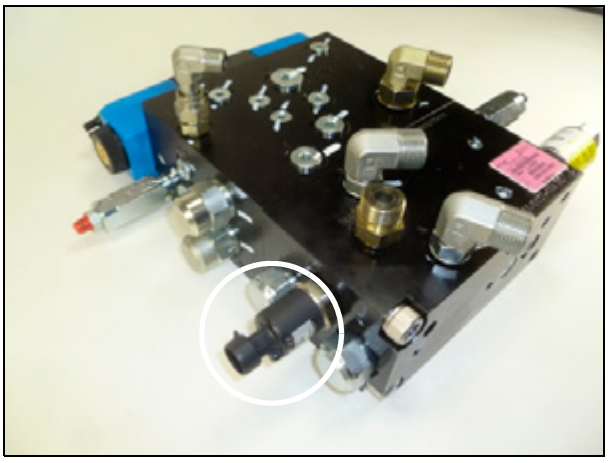
Step 1

Remove the plug from the GP-SCU port.



Step 2

Locate the pressure transducer. Install it into the GP-SCU port.



Establishing the electrical connections

Step 1

Attach the transducer manual override cable to the transducer connector.

Step 2

Connect the two valve connectors on the harness to the valve connectors on the autopilot valve.

Connect the plugs marked valve A and Valve B to the plugs on the autopilot manifold. Swapping connectors will be addressed during initial calibration.



Step 3

Tighten all the hydraulic connections.

Check the oil level in the hydraulic tank and top up if necessary.

To check for hydraulic leaks, reconnect the battery and start the machine. Disconnect the battery when the leak check is complete.

Checking the hydraulics

1. Make sure that all the hydraulic connections are tight.
2. Check the oil level in the hydraulic tank. If necessary, top it up.
3. Check for hydraulic leaks. Connect the battery and then start the machine. Once you complete the leak check, disconnect the battery.

4

AutoSense Steering Device Installation

- IMD-900 steering device components
- Installing the IMD-900 steering device
- Connecting the IMD-900 harness to the 54602 harness

This chapter describes how to install the IMD-900 module steering device.

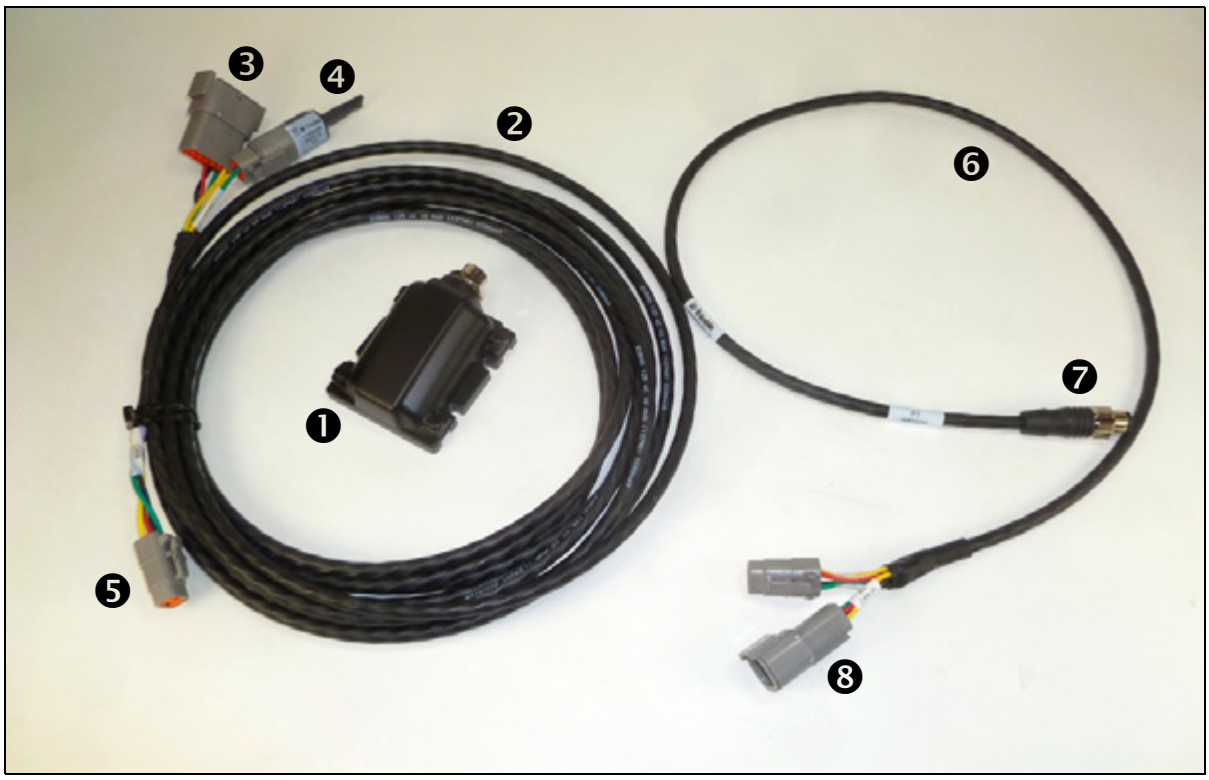
If the required mounting location is not accessible, choose a different place. To ensure proper function, the IMD-900 device must be located where it is free of obstructions and can rotate with the wheels when they turn.

On articulated vehicles, mount the IMD-900 device on the opposite side of the pivot point to the Autopilot controller.

Mount the device base down or base up so that it maintains a level orientation. Do not mount it on its side. An angle of up to 10° in any direction is acceptable, but as flat as possible is recommended.

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

IMD-900 steering device components



Item	Description
❶	IMD-900 steering device (P/N 109256-00)
❷	Cable (114675)
❸	R1-CAN connector
❹	CAN terminal (×2)
❺	P3 CAN connector
❻	Cable (112759)
❼	P1-IMD900
❽	P3/R3: CAN out/CAN in

Installing the IMD-900 steering device

⚠ **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.

Step 1

The IMD-900 steering device is shown on the right. Install it using the following steps.



Step 2

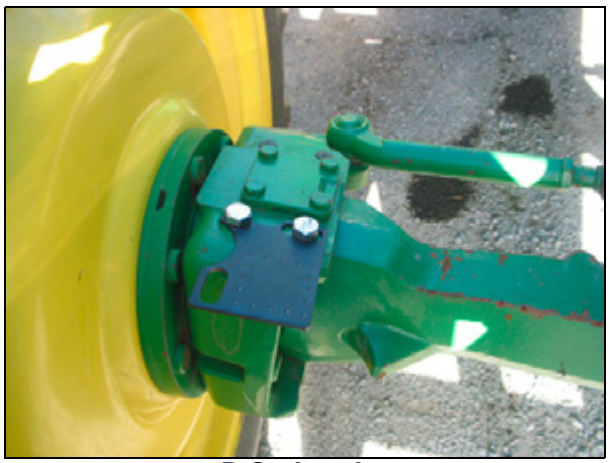
If no fenders are installed, use the hardware provided in the kit to mount the bracket, as shown.

If fenders are installed, remove the fender bolts and then insert the bracket between the fender mount and the kingpin. Use the existing hardware to mount the bracket.

NOTE – The IMD-900 device will install in the same way as the AutoSense™ sensor shown here.



A-Style axle



B-Style axle



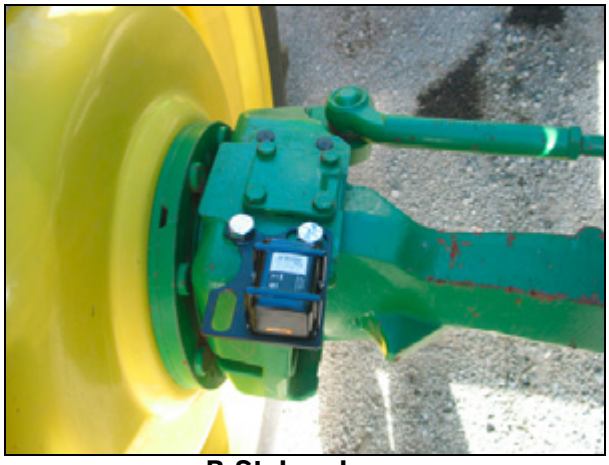
C-Style axle

Step 3

Mount the device with the connector pointing toward the rear of the vehicle.



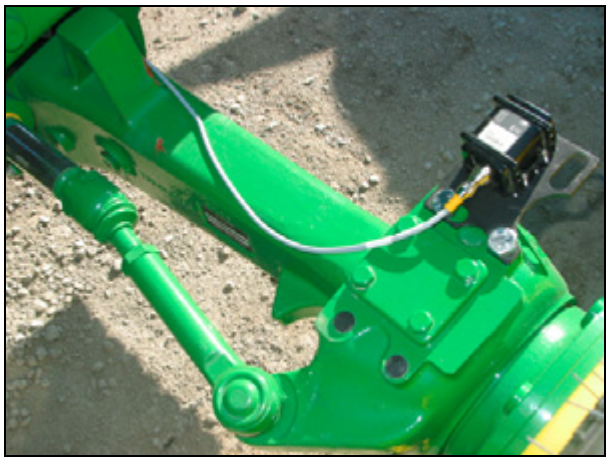
A-Style axle



B-Style axle

Step 4

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



A-Style axle



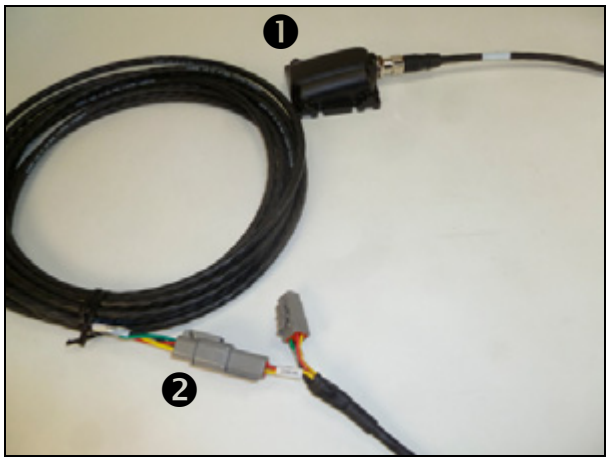
B-Style axle

Connecting the IMD-900 harness to the 54602 harness

Step 1

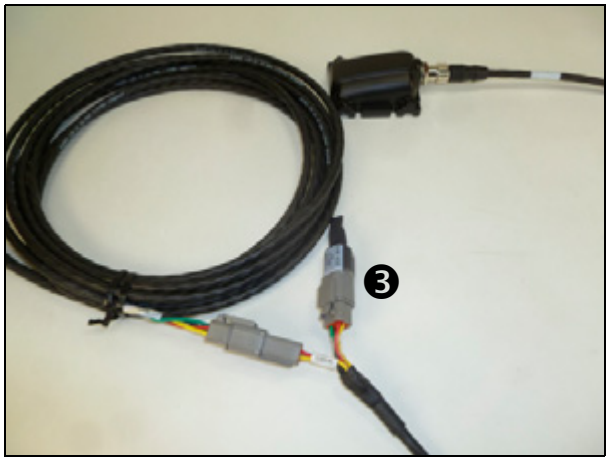
Connect the P1 connector of the 112759 cable to the IMD-900 ❶.

Connect the R3 connector to the 114675 cable ❷.



Step 2

Connect the CAN terminal to the P3 connector of the 112759 cable (❸).



Step 3

With the cable routed to the NavController, connect the R1 connector to the P12 connector on the 54602 harness on the NavController as shown.

NOTE – One terminator should be installed near the P12 connector and one terminator near the IMD-900 device on the 112579 cable.



5

Antenna/External Receiver Installation (If Used)

- Antenna and receiver installation options
- Mounting an adjustable spar to roof bolts
- AG-372 receiver with *Ag*GPS 450/900 radio module components (if equipped)
- Installing the AG-372 GPS receiver with *Ag*GPS 450/900 radio module (if equipped)
- Installing an AG-372 receiver with magnetic feet
- AgGPS 542 receiver components
- Installing the *Ag*GPS 542 receiver

This chapter describes how to install the required receiver and antenna, and radio module (if used). To install the antenna for the CFX-750, FmX or TMX-2050 display, see Chapter 6, Display Installation.

Antenna and receiver installation options

There are several options for mounting components (the antenna, radio module, or GNSS 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-372 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-372 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 82.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting.

Possible mounting methods

GNSS receiver	VHB mounted plate	VHB V mounted plate	AG15/AG25/Zephyr/ AG-372 bolted to spar mount
CFX-750 display; FmX integrated display	✓	✓	✓
AG-372 receiver	✘	✓	✓
*Ag*GPS 542 receiver	✓	✓	✓

NOTE –

- For quick release magnetic mounting with an AG-372 receiver, order the kit listed in Antenna mounting kits, page 11 and bolt the V plate to the spar.
- 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

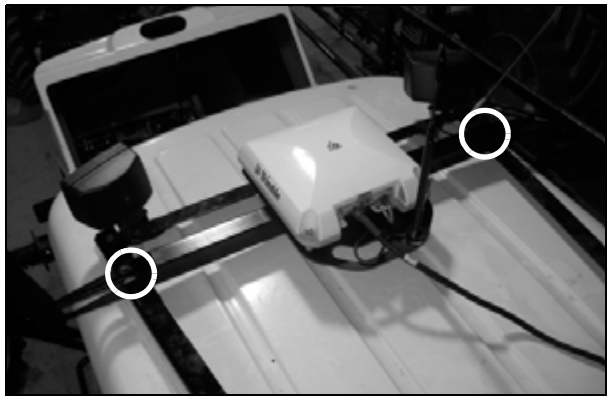
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Locate the cab bolts on the roof of the vehicle.

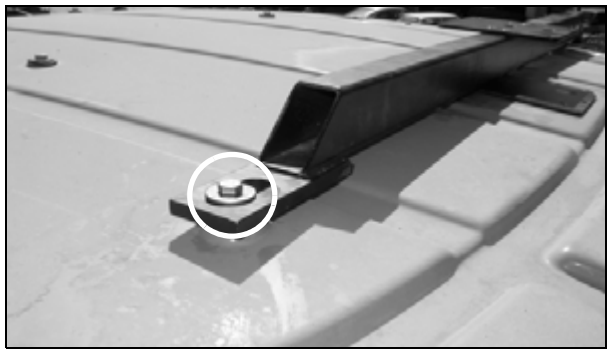


If a light bracket already occupies the roof studs, mount the spar directly onto the light bracket.



Step 2

If required, replace the existing bolts with longer bolts.



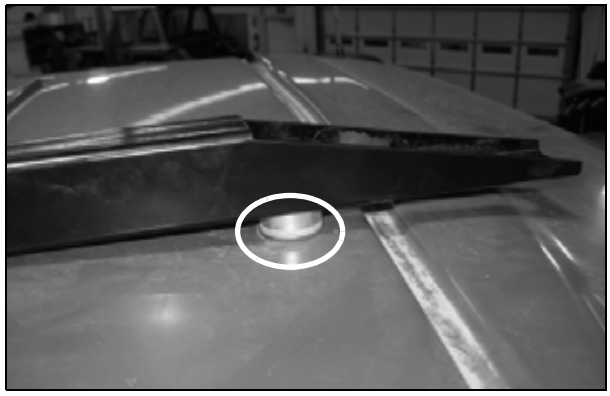
If you use the light bracket, drill two holes to match the spar width.



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, Autopilot system performance may be affected. Before you tighten the cab bolts, make sure that the GNSS antenna is aligned with the center of the vehicle.



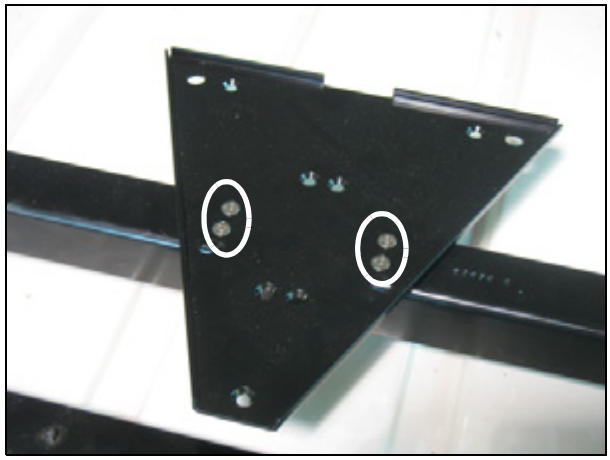
Step 4

For either of the following applications:

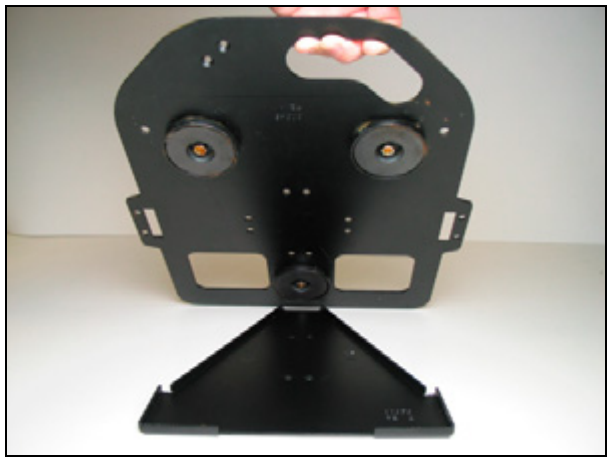
- A single magnet antenna mount
- An AG-372 receiver with magnetic option for quick removal

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-372 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.

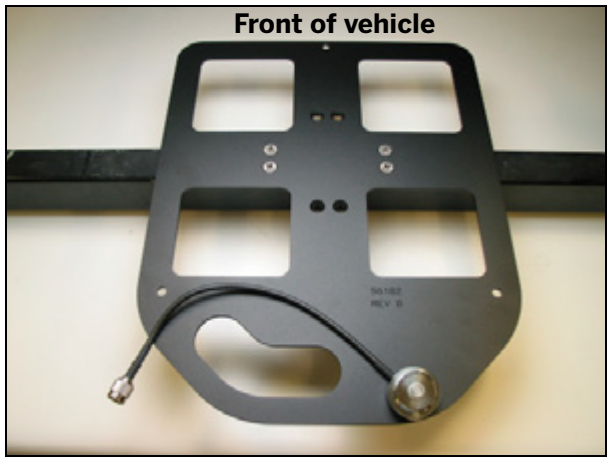


Plate on the spar

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.

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.

- **RTK, OmniSTAR, DGPS, GLONASS applications** – 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.
- **WAAS, EGNOS, OmniSTAR VBS, Beacon applications** – 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.

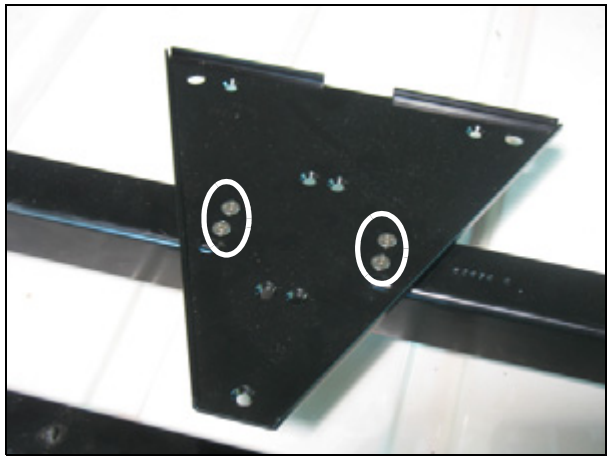


Step 2

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.

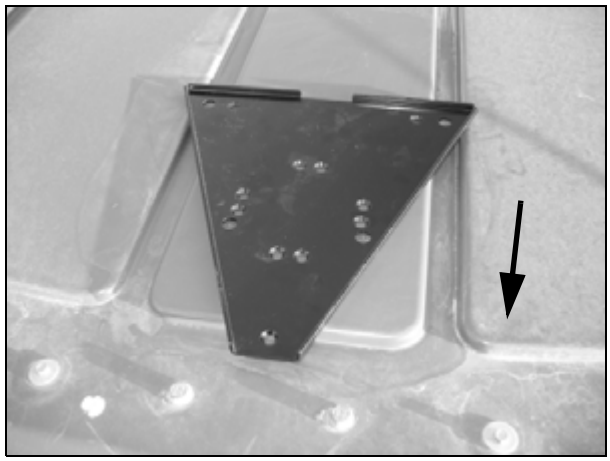


V plate on the spar

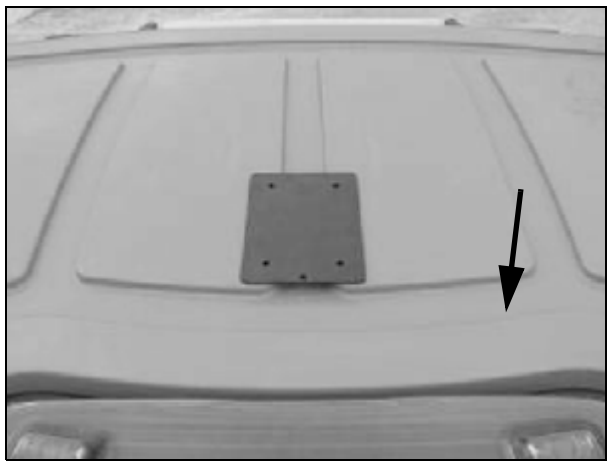
Step 3

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

NOTE – The arrow points to the front of the vehicle.

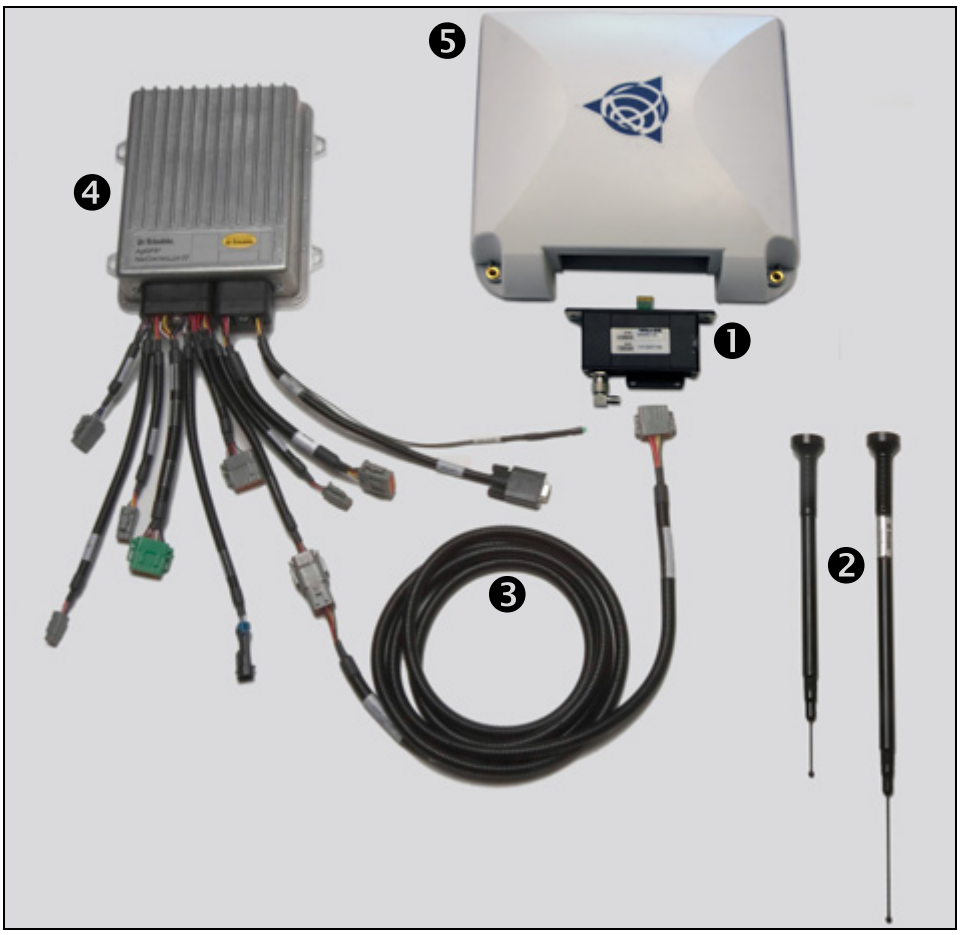


V plate



4" x 6" plate

AG-372 receiver with *Ag*GPS 450/900 radio module components (if equipped)



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

Installing the AG-372 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.

To attach the AG-372 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.

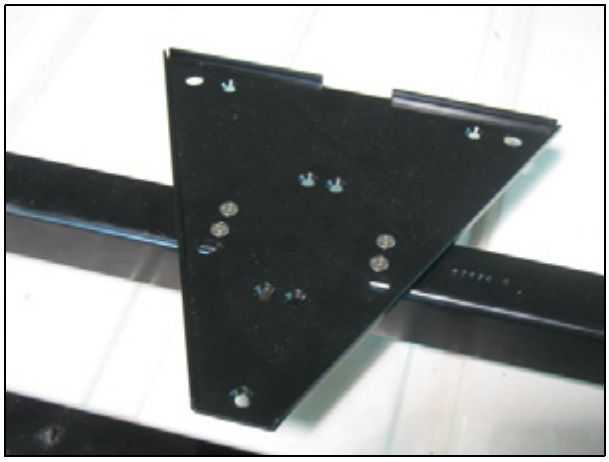
Removable installation

Step 1

V plate

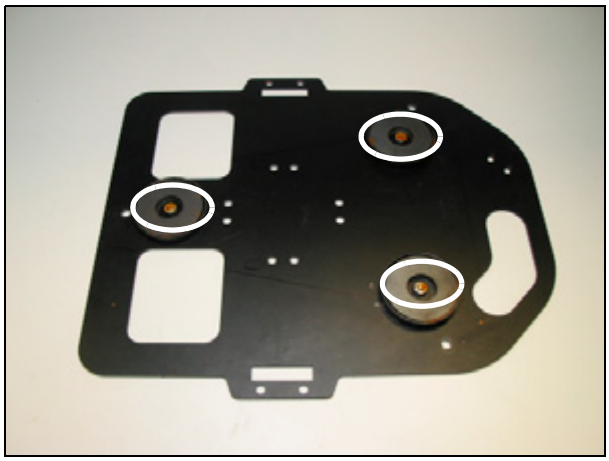
Attach the V plate to the spar using the ¼" flathead screws provided in the V plate bolt kit. Ensure that the narrow end points forward.

For spar mounting instructions, see page 79.



Mounting plate

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



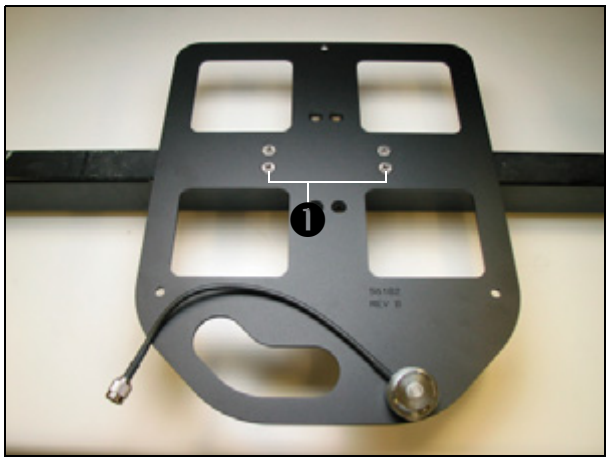
Underside of plate

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 79.



Step 2

Remove the blanking plate and set it aside.



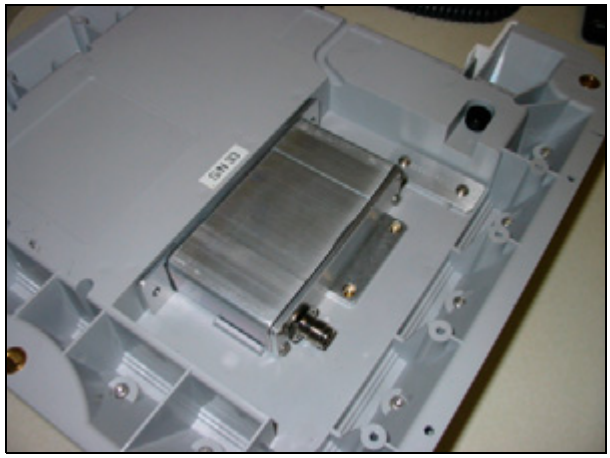
Step 3

Place the integrated radio inside the AG-372 receiver. Ensure that the circuit board is aligned with the slot in the vertical wall of the receiver.



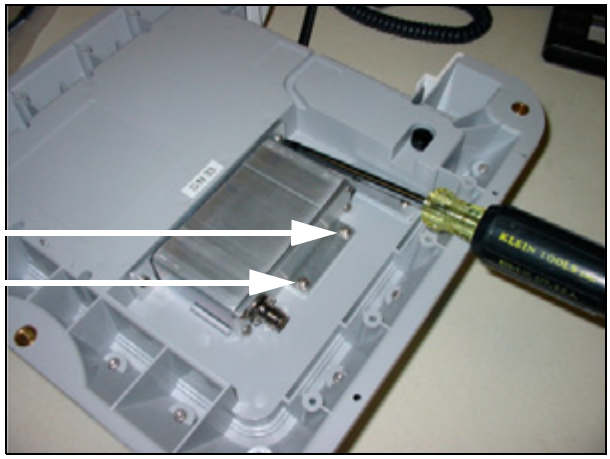
Step 4

Slide the integrated radio back so that it is flush with the vertical wall of the receiver.



Step 5

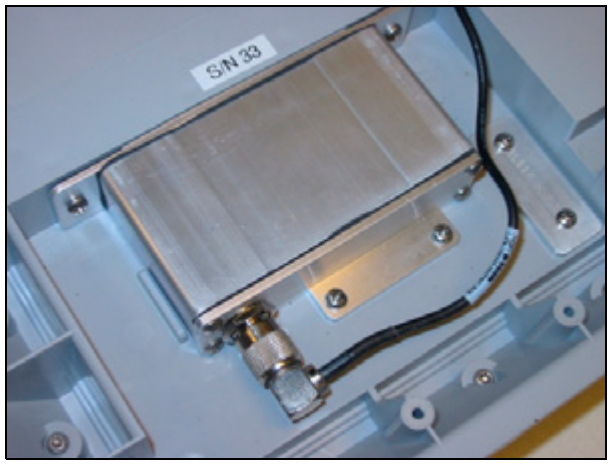
Use a #1 or #2 Phillips screwdriver and the supplied screws to install the integrated radio. First insert and tighten the two screws on the horizontal wall (arrowed), and then insert the remaining screws.



Step 6

Install the supplied antenna cable.

NOTE – The housing can accommodate a cable diameter of up to ¼".

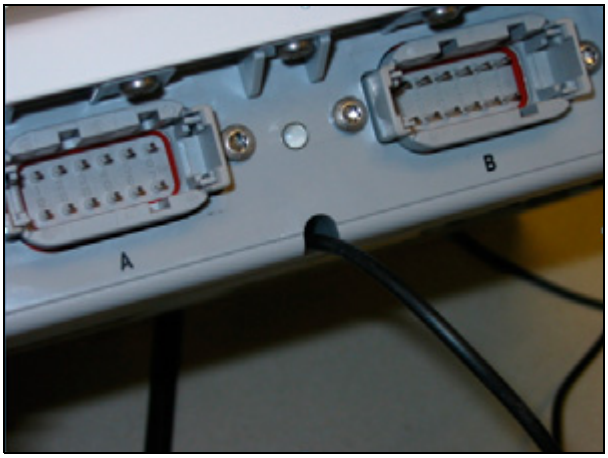


Step 7

Route the cable through the cable channel and then insert the cable cover.

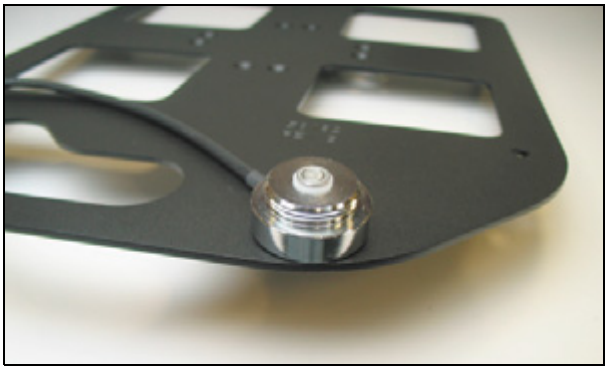


This image shows the unit with the cable routed through the channel.



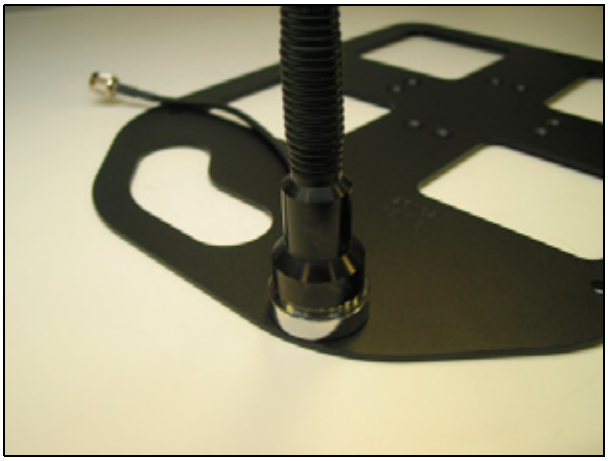
Step 8

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



Step 9

Attach the radio antenna to the antenna base.



Step 10

Position the AG-372 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.



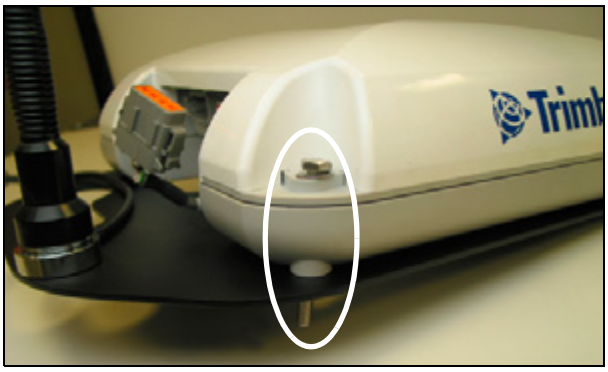
Step 11

Insert the nylon bushings provided.



Step 12

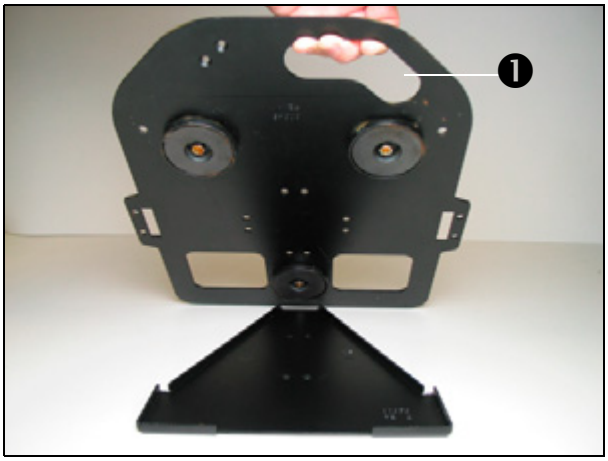
Insert the bolts through the receiver, radio, and mounting bracket. Place nuts on the bolt ends and then tighten them.



Step 13

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.

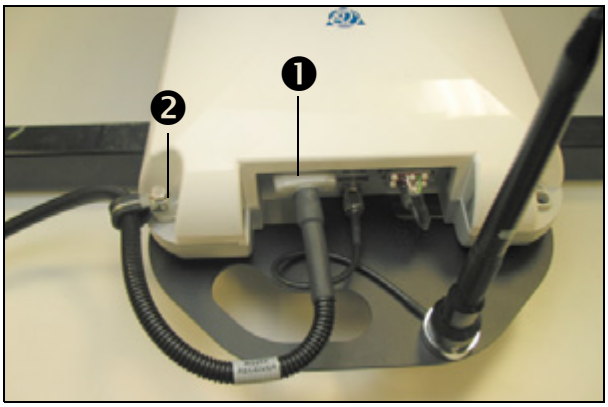


Step 14

Both methods

Connect the cable from the cab controller into port A ❶ of the AG-372 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-372 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.

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

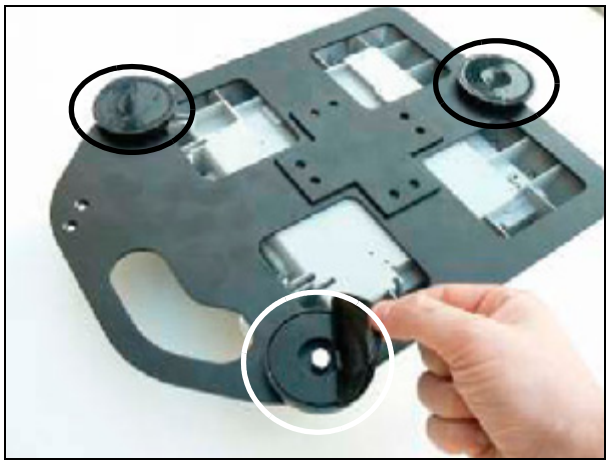
Attach the magnets to the receiver mounting plate. Mount the AG-372 receiver using the three ¼" bolts.

Place the nuts on the receiver side.



Step 2

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

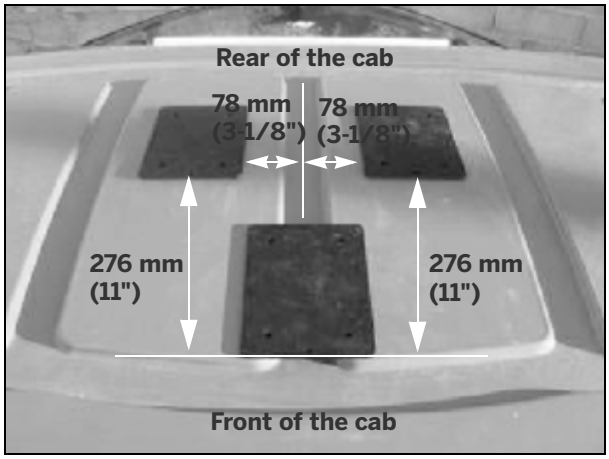


Step 3

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

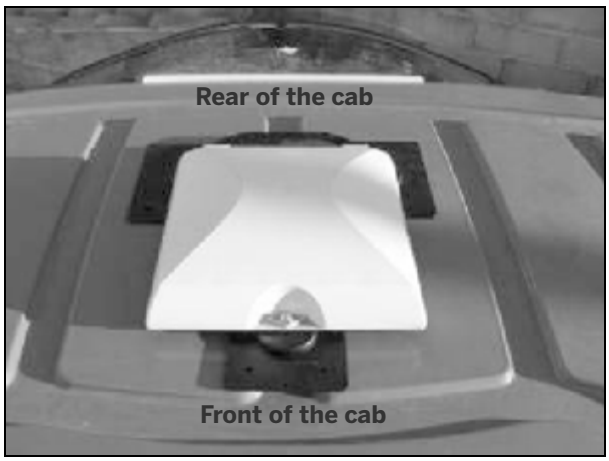
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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.

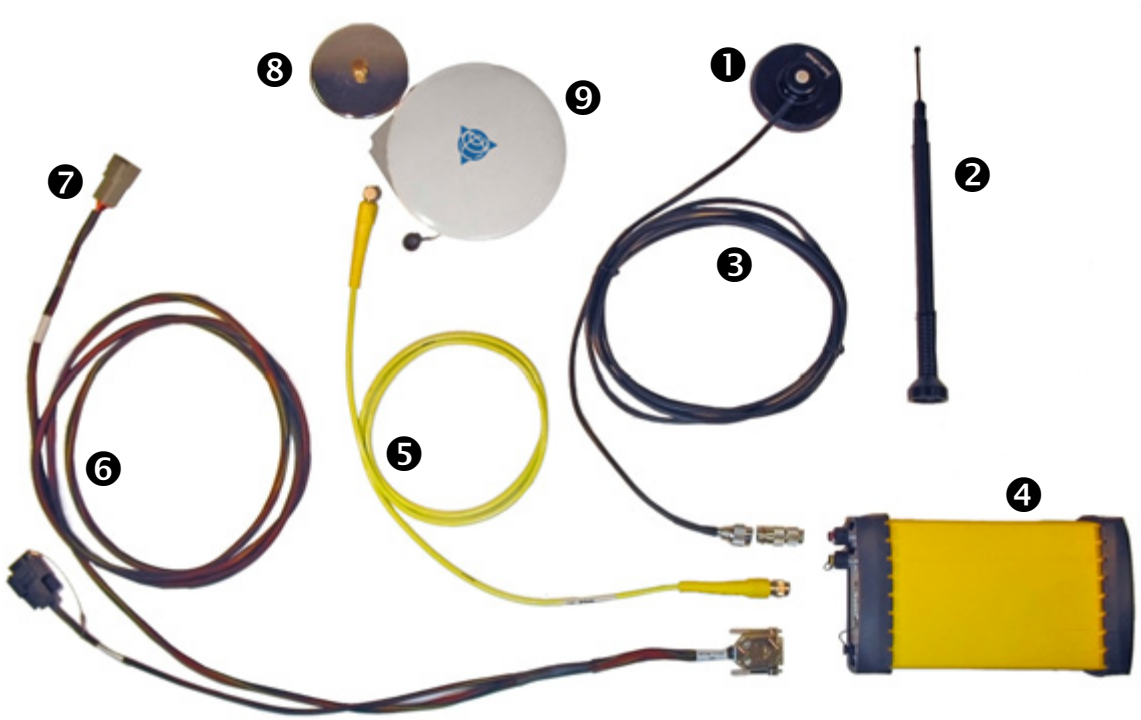


Step 5

Connect the antenna cable to port A of the AG-372 GPS receiver and then route the cable toward the NavController II harness.



*Ag*GPS 542 receiver components



Item	Description
❶	Radio antenna magnetic base
❷	Radio antenna
❸	Radio antenna cable
❹	*Ag*GPS 542 GPS receiver
❺	Antenna cable
❻	Receiver cable (P/N 62037)
❼	To controller “P3 GPS”
❽	Antenna magnetic mount
❾	*Ag*GPS 542 GPS receiver

Installing the AgGPS 542 receiver

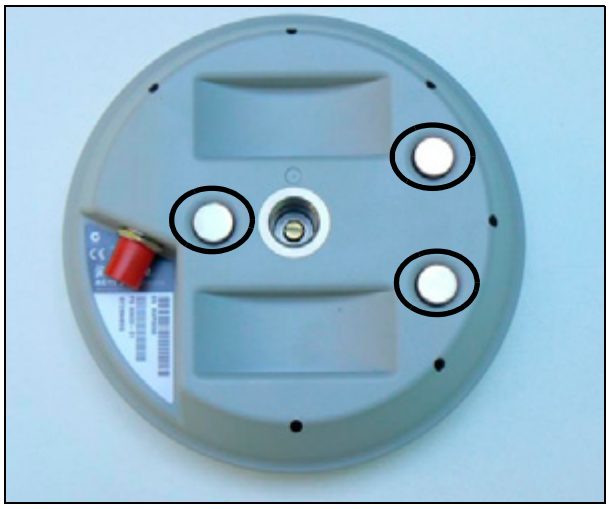
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

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

GLONASS, RTK, OmniSTAR, DGPS applications

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

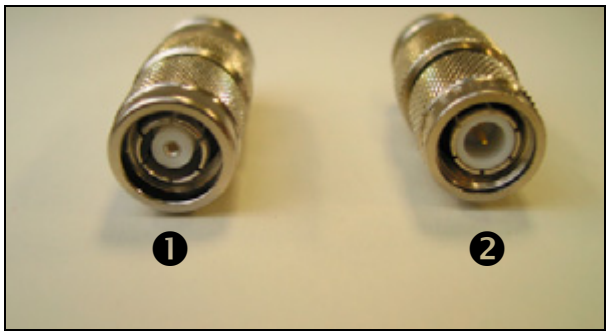
Mount the receiver in a convenient location in the cab. Route the antenna cable to the receiver and then connect it.



Step 5

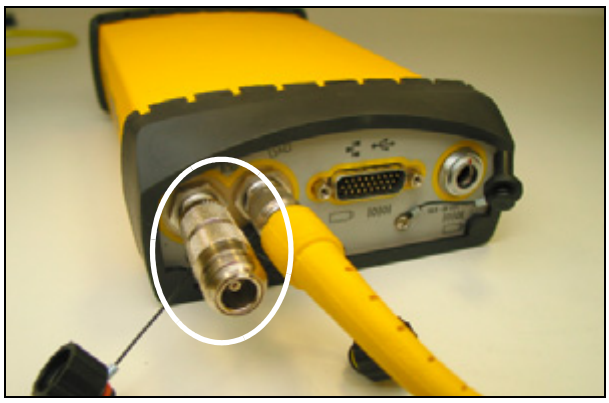
Identify the correct adaptor for the radio connection:

- 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 in Chapter 9, 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.

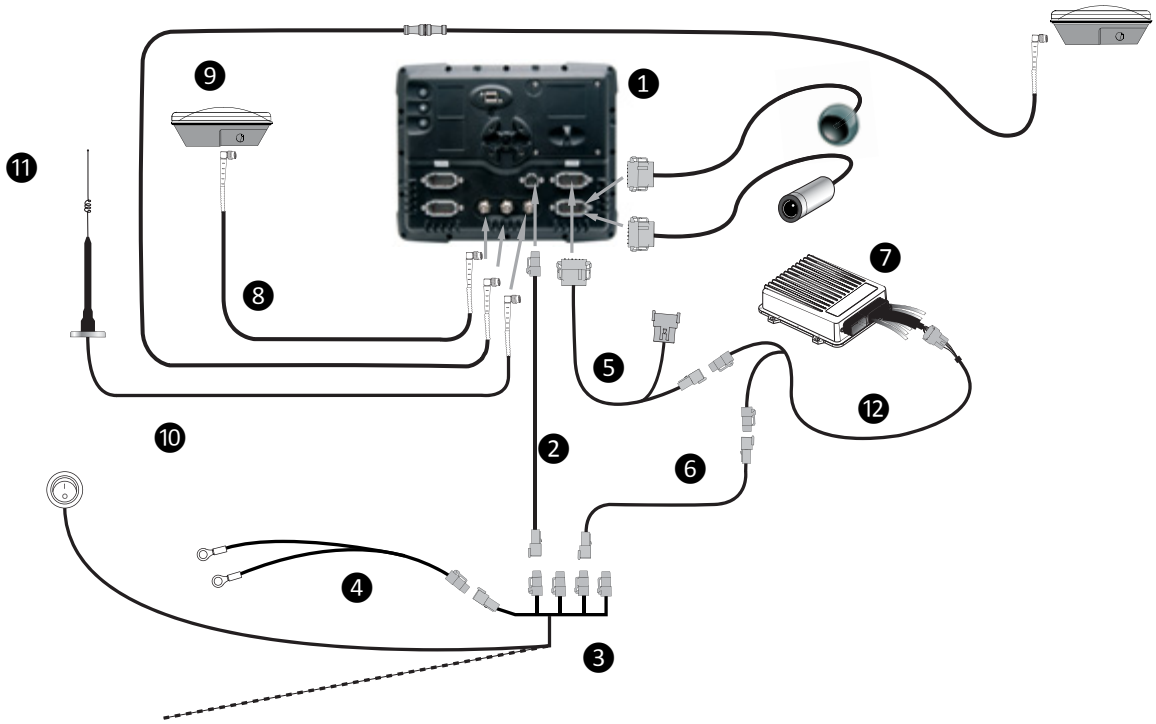


6

Display Installation

- FmX integrated display: Components
- FmX integrated display: Preparation
- FmX integrated display: Installation
- FmX integrated display: Installing the wiring harness
- CFX-750 display: Components
- CFX-750 display: Preparation
- CFX-750 display: Installation
- CFX-750 display: Installing the wiring harness
- CFX-750 display and FmX integrated display: Connecting accessory options
- TMX-2050 display: Components
- TMX-2050 display: Preparation
- TMX-2050 display: Installing the wiring harness
- TMX-2050 display: AG-25 GNSS antenna
- CFX-750, FmX and TMX-2050 displays: Installing the GNSS antenna and plate
- CFX-750, FmX and TMX-2050 displays: Installing the RTK radio antenna
- GFX-750/XCN-1050 display: Components
- GFX-750/XCN-1050 display: Preparation
- GFX-750/XCN-1050 display: Installation
- GFX-750/XCN-1050 display: Installing the wiring harness

FmX integrated display: Components



⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
1	FmX integrated display	93100-02
2	FmX power cable	66694
3	FmX power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	FmX to NavController II cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adaptor	67095
7	NavController II	55563-00
8	8 m GNSS TNC/TNC RT angle cable	50449
9	AG25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	72122
11	900 MHz radio antenna kit	22882-10
12	Main NavController II cable	54601

FmX integrated display: Preparation

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.



FmX integrated display: Installation

⚠ **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.

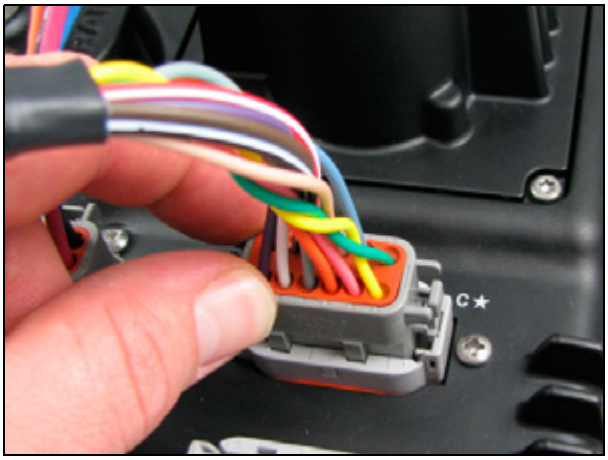
Step 1

Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the bar mount to the rail. Attach the free end of the RAM mount to the bar mount and then tighten the clamp on the RAM mount so that the display is secure.

Step 2

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

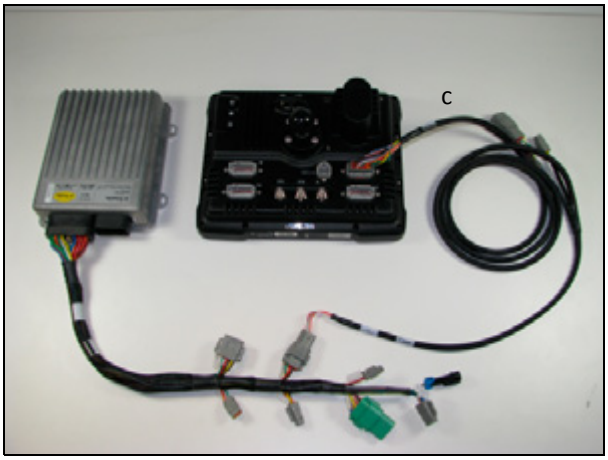
To connect power to the FmX integrated display, see Chapter 9, Controller Installation.



FmX integrated display: Installing the wiring harness

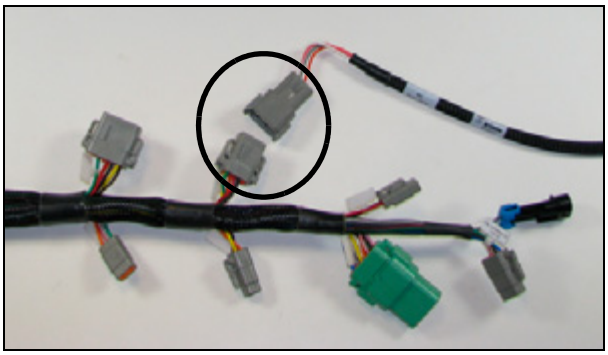
Step 1

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

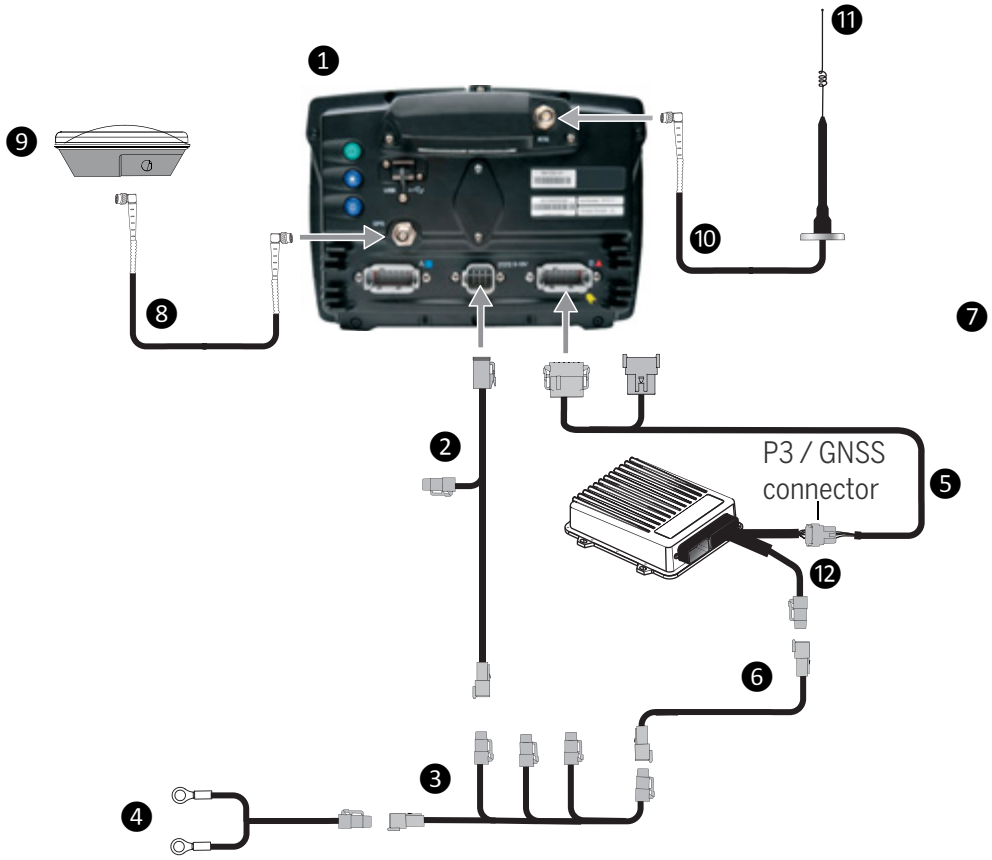


Step 2

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



CFX-750 display: Components



⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX / FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
1	CFX-750 display **NOTE –** RTK password required.	93100-02
2	CFX-750 power cable	66694
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	FmX to NavController II cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adaptor	67095
7	NavController II	55563-00
8	8 m GNSS TNC/TNC RT angle cable	50449
9	AG25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	72122
11	900 MHz radio antenna kit	22882-10
12	Main NavController II cable	54601

CFX-750 display: Preparation

Step 1

Locate the CFX-750 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.



CFX-750 display: Installation

⚠ **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.

Step 1

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

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

Step 2

Connect the cable to the B port of the CFX-750 display.

To connect power to the CFX-750 display, see Chapter 9, Controller Installation.



CFX-750 display: Installing the wiring harness

Step 1

Locate the cable that connects the CFX-750 display to the NavController II.

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 CFX-750 display.



CFX-750 display and FmX integrated display: Connecting accessory options

NOTE – Unless otherwise stated, "the display" applies to the CFX-750 display or the FmX integrated display.

AgCam

The AgCam and AgCam cable are accessory items that you can purchase separately from the display. The CFX-750 display allows up to two video inputs; the FmX integrated display allows up to four.

Step 1

Locate the AgCam and AgCam cable.

Step 2

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



CFX-750 display



FmX display

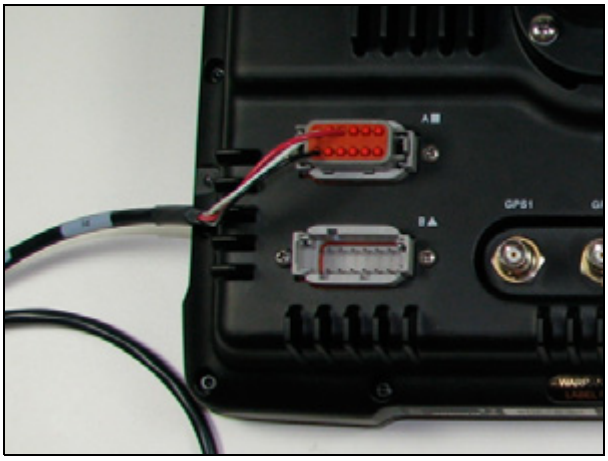
Step 3

Connect the AgCam cable to the display adaptor cable.



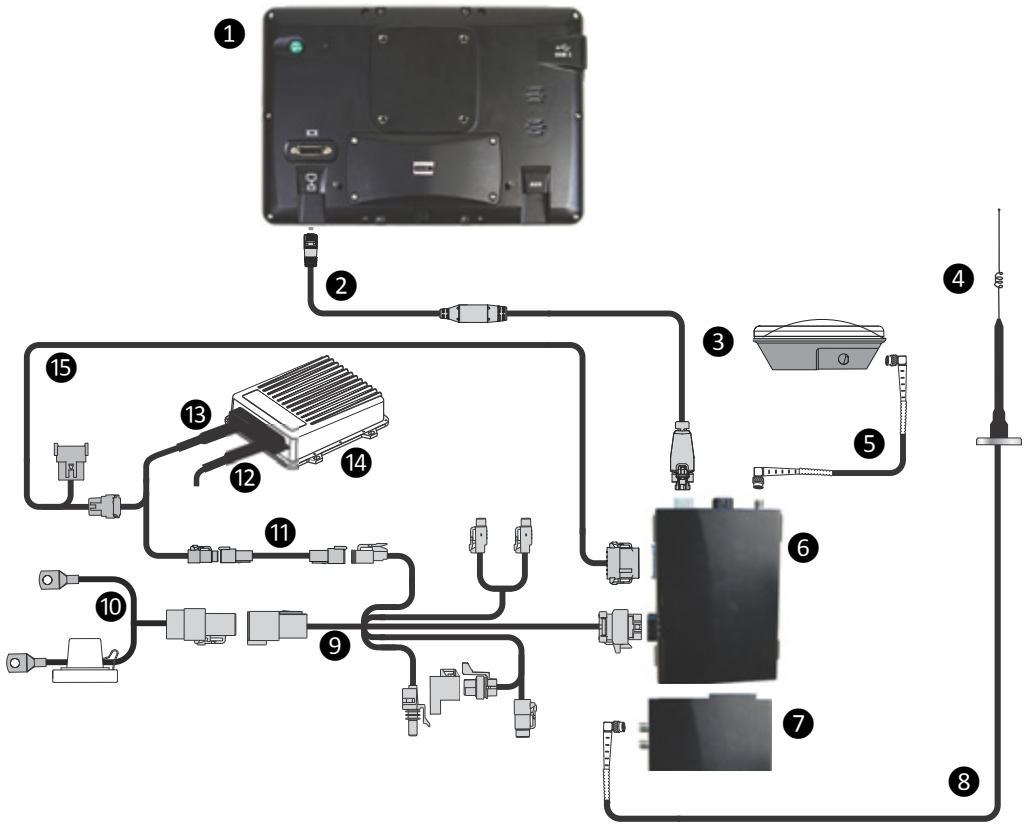
Step 4

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



TMX-2050 display: Components

This graphic shows how to connect the TM-200 Module and the Autopilot system for after-market installations.



Item	Description	Trimble part number
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10	Cable, battery	92905
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController	55563-00 55566-00
15	TM-200 Module to NavController cable with port replicator	75741

TMX-2050 display: Preparation

The display mount attaches to a rail in the cab of the vehicle. The TMX-2050 display connects to the display mount.

The TM-200 Module connects to the display with a single cable.

Additional components to install depend on your connection and correction services, and the features you are using.

⚠ **CAUTION –** Make sure the vehicle power is off when you are connecting system components.

Installing the display and mount

Use the mounting hardware supplied in the display kit to mount the display in the vehicle cab.

⚠ **CAUTION –** Make sure the vehicle power is off when you are connecting system components.

Before completing installation steps, select a position in the cab where the bar mount (4) can be attached to a rail. Hold the display in the selected location and make sure that it:

- Is easy to see, but does not block the driver's view.
- Is within the driver's reach so that the USB drive is easy to remove and replace.
- Does not interfere with the driver getting in or out of the cab, or any other activities.

Item	Description
1	Mounting plate
2	Zirkona mount
3	Tightening arm
4	Bar mount



Step 1

Locate the TMX-2050 display and the Zircona mount and mounting hardware.



Step 2

Use the provided hardware to attach the Zircona mount to the display as shown.





Step 3

Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the rail mount of the Zircona display mount to the rail of the vehicle.



Step 4

The Zircona mount has a tightening arm 3. Loosen the arm to let the display move on the mount.

Step 5

Adjust the TMX-2050 display until it is positioned where you want it.

Turn the tightening arm clockwise to tighten the Zircona mount and lock the display in the desired position.

Step 6

Connect the display cable to the display.



Step 7

Route the other end of the display cable to the TM-200 Module and then connect it to the TM-200 Module.



TMX-2050 display: Installing the wiring harness

⚠ **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.

Step 1

Connect the P5 and P2 connectors on the harness, P/N 106111, to the TM-200 Module.

Step 2

On the TM-200 Module locate the display connection point.



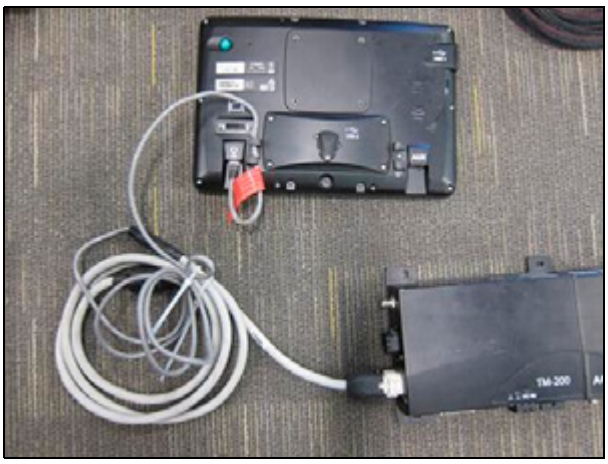
Step 3

Connect the display cable P/N 93843 to the TM-200 Module.



Step 4

Route the cable between the TMX-2050 display and the TM-200 Module.



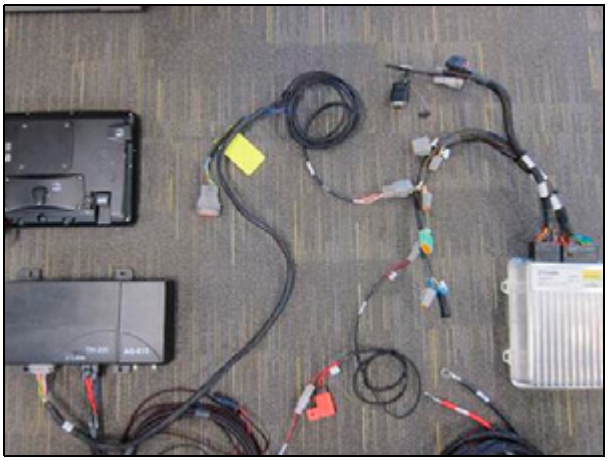
Step 5

Locate the Port labeled **A** on the TM-200 Module and then connect NavController connection cable, P/N 75741.



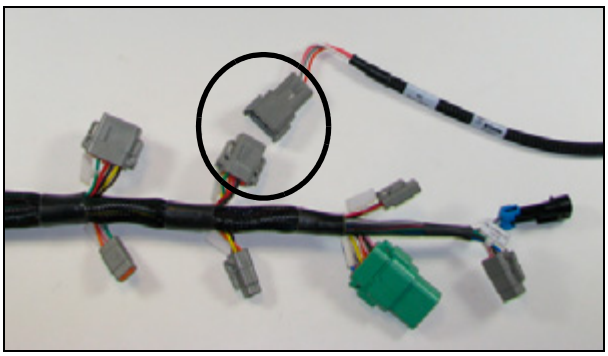
Step 6

Route the other end of the P/N 75741 cable to the plug on the P/N 54601 harness labeled **GPS**.



Step 7

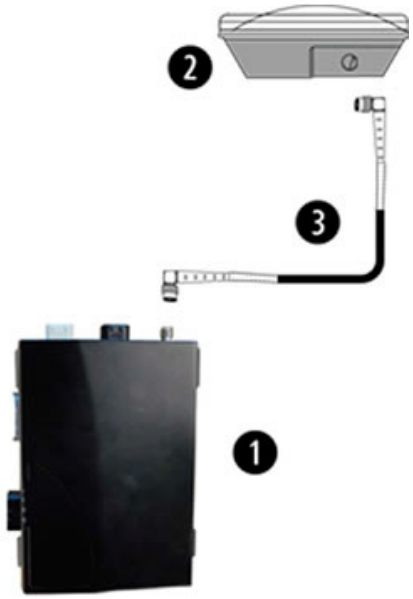
Connect the cable to the P3 connector on the NavController main harness.



TMX-2050 display: AG-25 GNSS antenna

The AG-25 GNSS antenna is required for all correction services. It enables the GNSS receiver in the TM-200 Module to receive GPS / GNSS corrections. The antenna connects to the antenna connector on the TM-200 Module

⚠ **CAUTION –** Wireless cellular radio and GNSS signals can interfere with each other. For best performance, mount antennas at least 1 meter away from each other.



Item	Description
1	TM-200 Module
2	AG-25 GNSS antenna
3	AG-25 antenna to TM-200 Module cable

The AG-25 GNSS antenna has integrated magnets for easy installation. To attach the antenna to a non-metal surface, use the mounting plate.

NOTE – If you are using the AG-25 GNSS antenna with a steering system, refer to the installation instructions for the steering system to determine the correct location for mounting the antenna.

CFX-750, FmX and TMX-2050 displays: Installing the GNSS 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.

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 78.

Use a ⅝" bolt to attach the AG25 antenna to the spar, as shown.

Measure the length between the bolts on the roof of the vehicle and order the appropriate spar:

- Spar 36.5" - 46.5": P/N 53676
- Spar 54" - 64": P/N 66774



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.

- **GLONASS, RTK, OmniSTAR, DGPS applications** – 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.
- **WAAS, EGNOS, OmniSTAR VBS, Beacon applications** – 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.

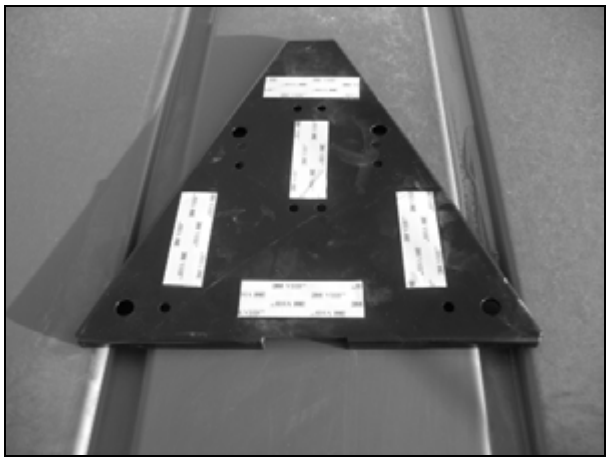


Step 2

V plate only

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

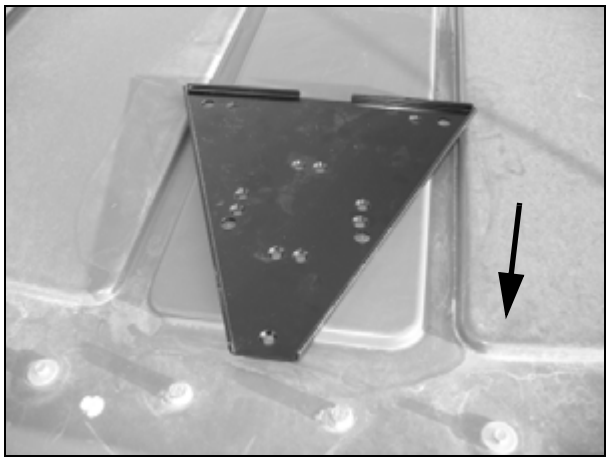
NOTE – The VHB strips are pre-applied to the 4" x 6" plate.



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.



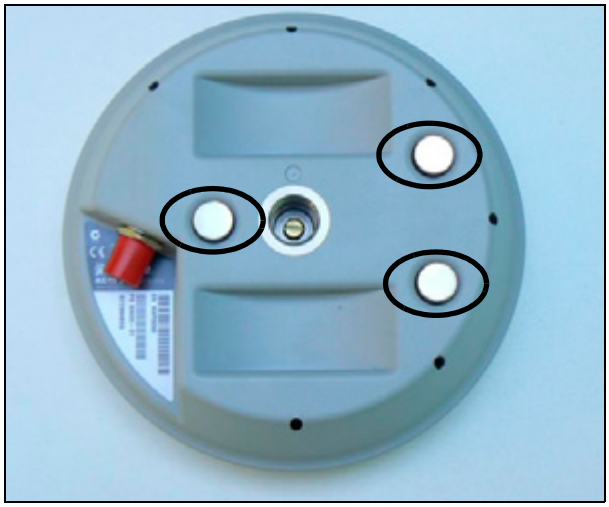
V plate



4" x 6" plate

Step 4

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



Otherwise, attach the large magnet with a ⅝" stud to the GNSS antenna.



Step 5

GLONASS, RTK, OmniSTAR, DGPS, applications

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



WAAS, EGNOS, VBS, Beacon applications

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.



CFX-750, FmX and TMX-2050 displays: 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.

Step 1

Connect the radio antenna to the magnetic antenna base.



Step 2

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

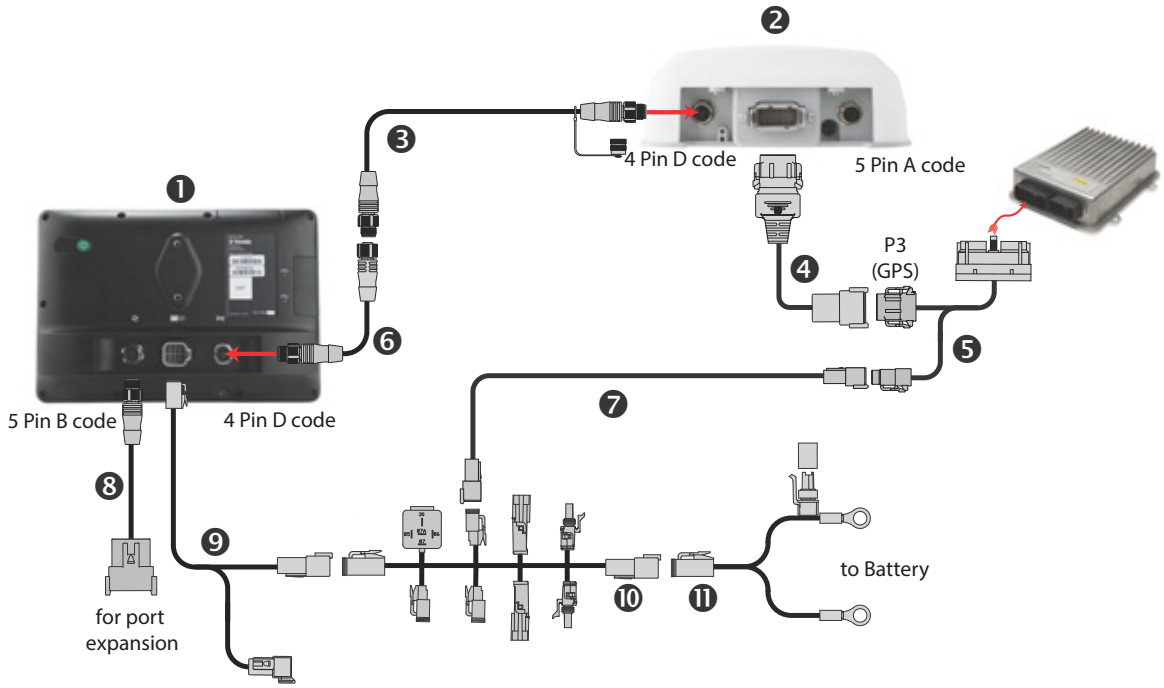


Step 3

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

GFX-750/XCN-1050 display: Components

This graphic shows the Autopilot system using NAV-900 as an external guidance device.



Item	Description	Trimble part number
1	GFX-750/XCN-1050 display, with PIQ App	121000-XX
2	NAV-900 Guidance controller	108993-05
3	Cable Assy, GFX-750/XCN-1050 to NAV-900, Power/Ethernet (BRR), 5 m	110540
4	Cable Assy, NAV-900 to Nav II/III, AutoPilot™	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX-750/XCN-1050 to NAV-900, Power/Ethernet (BRR) Extension, 2.5 m. Optional extension for large vehicles	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX-750/XCN-1050, Expansion Port Basic, RS-232, Dig I/O, 2.5 m	110545
9	Cable Assy, GFX-750/XCN-1050, Power to display, CAN, 2.5 m	110551
10	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Power with Relay and Switch (Acc)	67259
11	Cable Assy, GFX-750/CFX-750/FM-750/XCN-1050/FmX/FM-1000 Basic Power, 4 m	67258

GFX-750/XCN-1050 display: Preparation

The GFX-750/XCN-1050 display utilizes the RAM mount system.



Attach the diamond-based ram mount to the back of the display using the provided fasteners.



GFX-750/XCN-1050 display: Installation

Step 1

Using the supplied V bolts or alternate hardware (not supplied), attach the RAM mount base ball to the desired bracket in the cab.



Step 2

Using the supplied RAM connecting clamp, connect the display RAM ball to the base ball.

Position the display in a fashion that is easy to see and interact with. Then tighten the handle on the clamp.





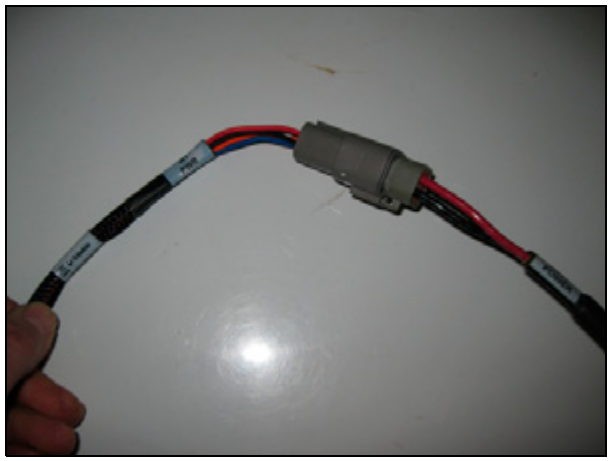
GFX-750/XCN-1050 display: Installing the wiring harness

The GFX-750 display requires a nominal 12 volt power source. The P/N 67258 cable has ring terminal leads for connecting to a battery or other cable mount point.

⚠ **WARNING –** If the machine has a master electrical disconnect, ensure that the display/receiver will be disconnected from the battery when the master disconnect is used. Failure to do so may result in hardware damage and void warranty. Additionally, it is suggested to utilize power terminals located within the cab of the vehicle that ground in the same location as the cab components to avoid ground shifts between the display and any vehicle ECUs.

Step 1

Connect the other 4-pin Deutsch connector of cable P/N 110551 to the P/N 67258 base power cable.



Step 2

Connect the 6-pin DT power/CAN cable P/N 110551 to the middle port of the display.



Step 3

Connect the 4-pin M12 connector to the 4-pin receiver connector. Note the Keying and number of pins.





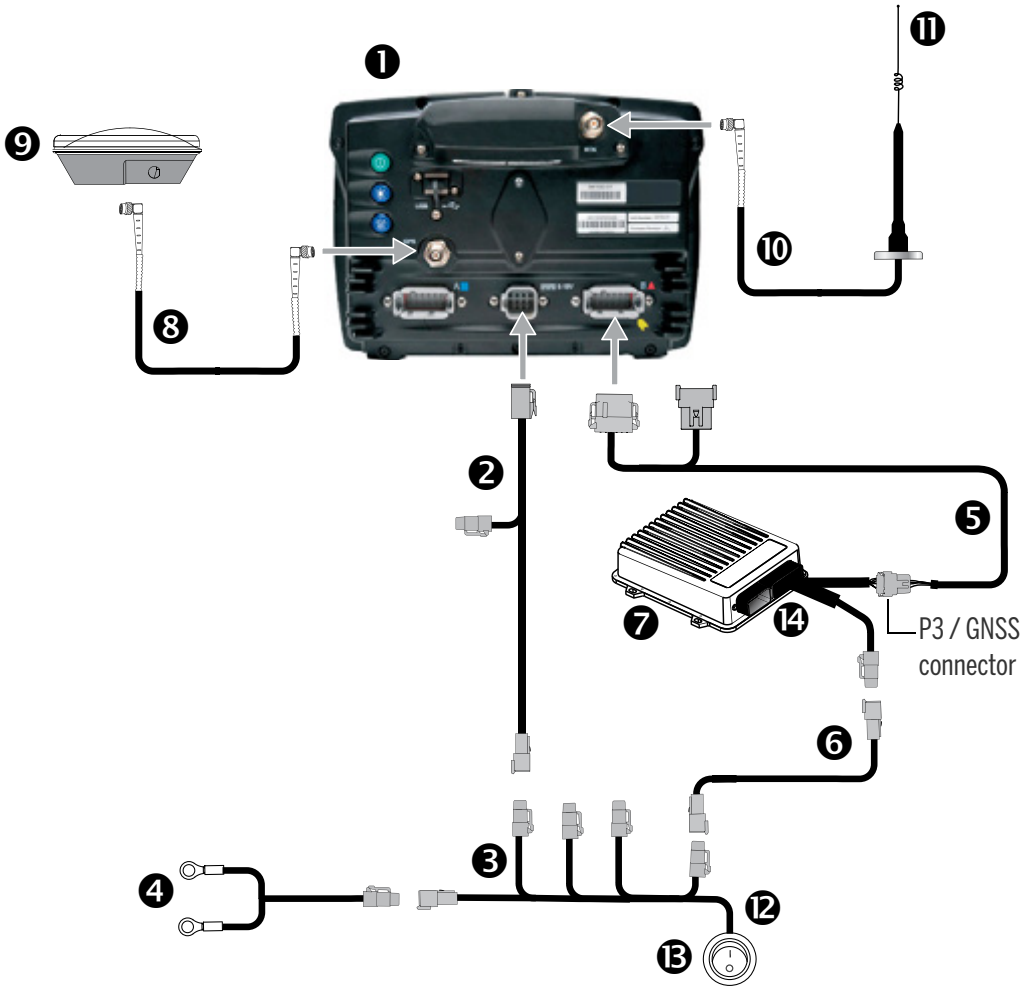
7

Power Harness Installation

- CFX-750 display: Components
- FmX integrated display: Components
- Installing the power harness for the display
- Configuring the power bus options for the display
- TMX-2050 display: Components
- TMX-2050 display: Installing the power harness
- TMX-2050 display: Configuring the power options

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

CFX-750 display: Components

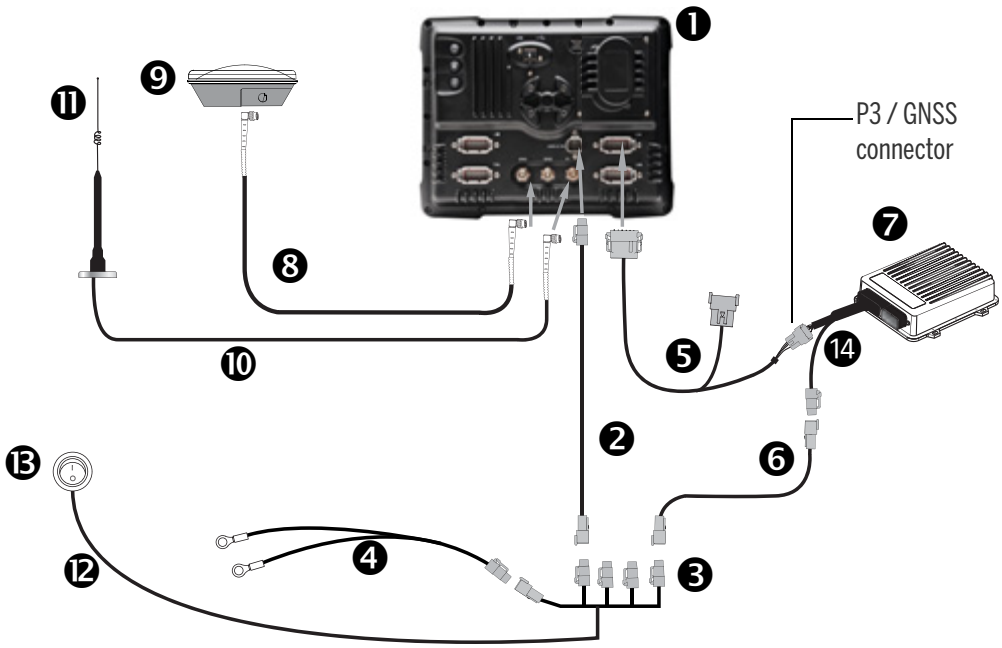


⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX/FM-1000 integrated display, and will void the warranty.

Item	Description	Trimble part number
❶	CFX-750 display **NOTE –** RTK password required.	93100-02
❷	CFX-750 power cable	66694
❸	CFX-750 power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GNSS TNC/TNC RT angle cable	50449
❾	AG-25 GNSS antenna	77038-00

Item	Description	Trimble part number
⑩	NMO to TNC 20ft antenna cable and base	72122
⑪	900 MHz radio antenna kit	22882-10
⑫	External switch cable included with kit	Part of P/N 67259
⑬	External switch included with kit	Part of P/N 67259
⑭	Main NavController II cable	54601

FmX integrated display: Components



⚠ **CAUTION –** Connecting the Port Replicator on the FmX to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the FmX/FM-1000 integrated display, and will void the warranty.

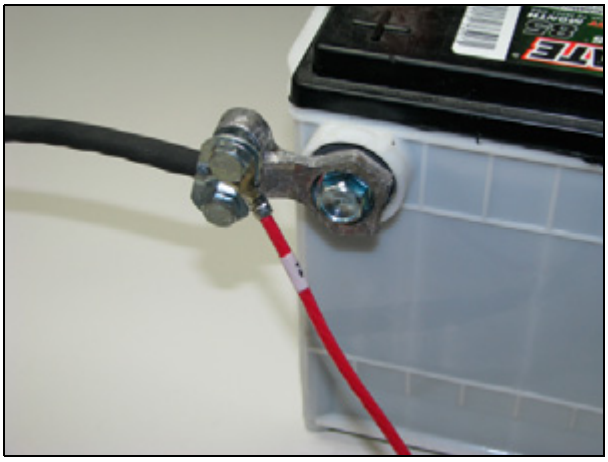
Item	Description	Trimble part number
❶	FmX integrated display	93100-02
❷	FmX power cable	66694
❸	FmX power cable with relay and switch (power bus)	67259
❹	Basic power cable	67258
❺	FmX to NavController II cable with port replicator	75741
❻	2 pin DTM to 2 pin DT power adaptor	67095
❼	NavController II	55563-00
❽	8 m GNSS TNC/TNC RT angle cable	50449
❾	AG-25 GNSS antenna	77038-00
❿	NMO to TNC 20ft antenna cable and base	72122
⓫	900 MHz radio antenna kit	22882-10
⓬	External switch cable included with kit	Part of P/N 67259
⓭	Switch	67095
⓮	NavController II harness	54601

Installing the power harness for the display

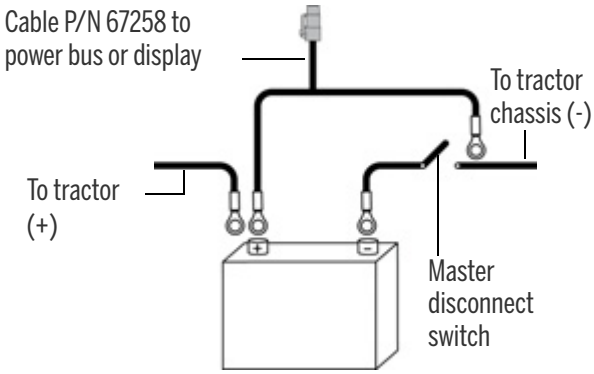
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

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

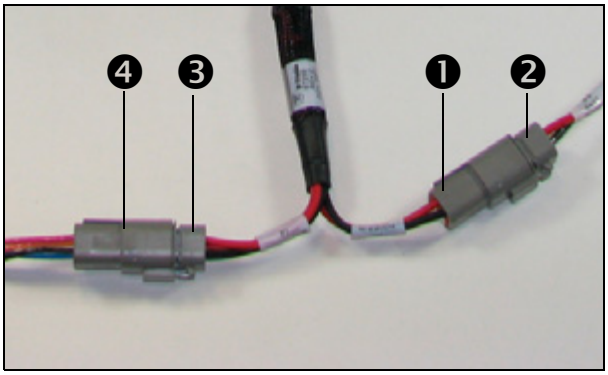


⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258) is *not* directly attached to the battery terminal that is disconnected by the master switch—the negative pole in this example.
Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can damage the display.



Step 2

Locate and connect the 4-pin Deutsch DTP receptacle on the power bus ❶ to the 4-pin Deutsch DTP plug ❷ on the basic power cable and then remove the protective cap from the 4-pin Deutsch DTP plug ❸ on the power bus and connect the plug to the 4-pin Deutsch DTP receptacle ❹ on the display power adaptor.

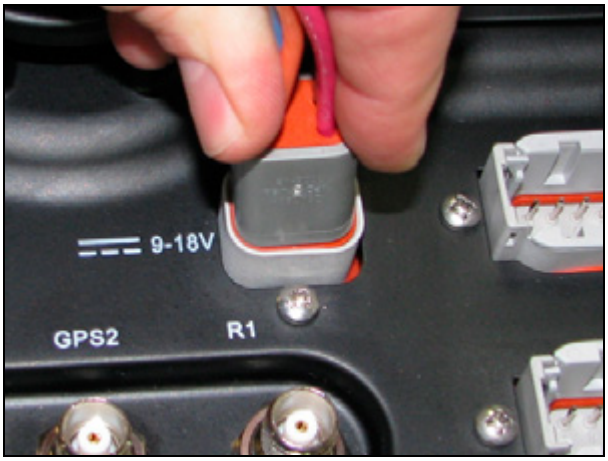


Step 3

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



CFX-750 display



FmX display

Configuring the power bus options for the display

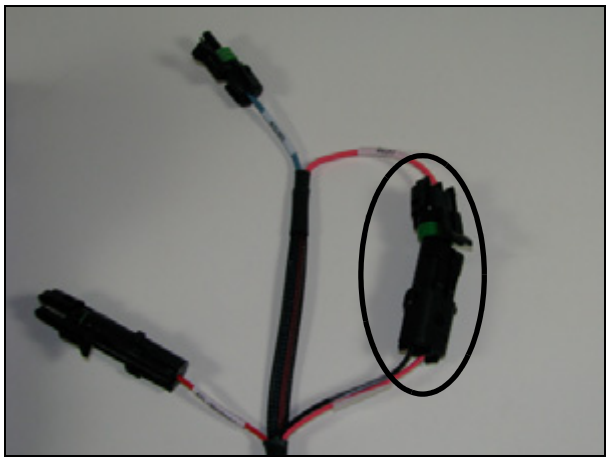
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

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

- 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

Display power button is used to turn on the Autopilot system

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

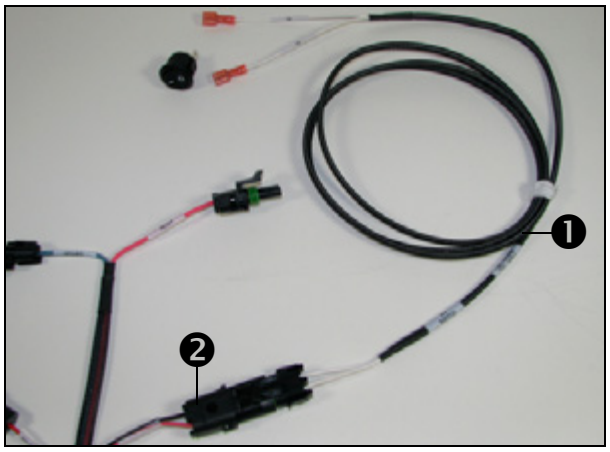


External switch is used to turn on the Autopilot system

Step 1

Connect the cable labeled R7 switch ❶ (included with the power bus) to connector labeled P2 on the power bus ❷ and then route the cable labeled R7 to a switch location.

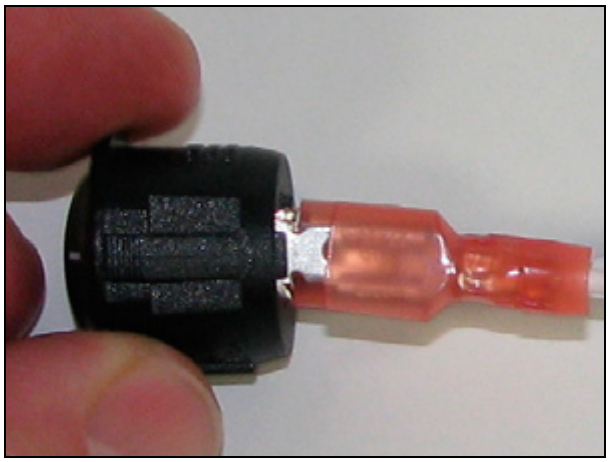
NOTE – To install the switch provided, drill a ¾" hole.



Step 2

Connect the cable labeled R7 to the switch pins.

NOTE – Polarity is not important.

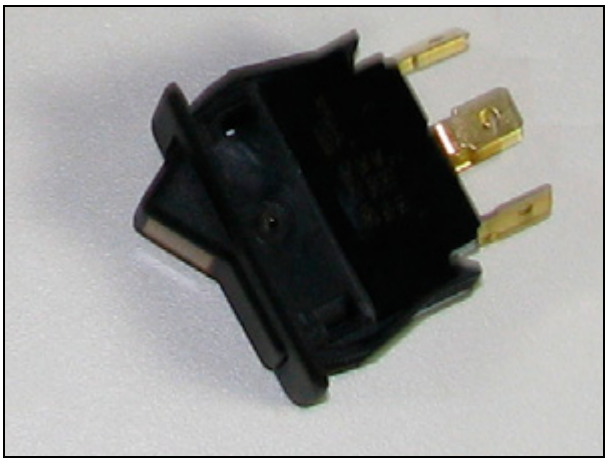


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

NOTE – An alternative location is required for the switch provided.

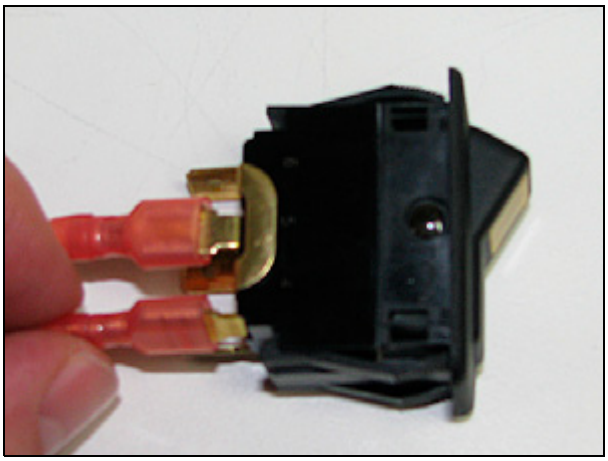


Step 2

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

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

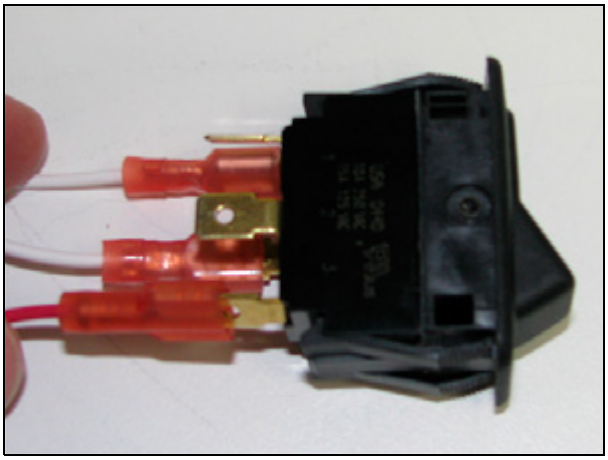
NOTE – Polarity *is* important.



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.

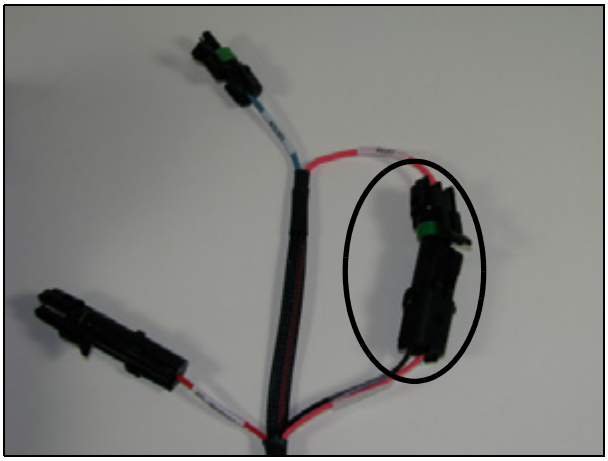


Ignition is used to turn on the Autopilot system

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.

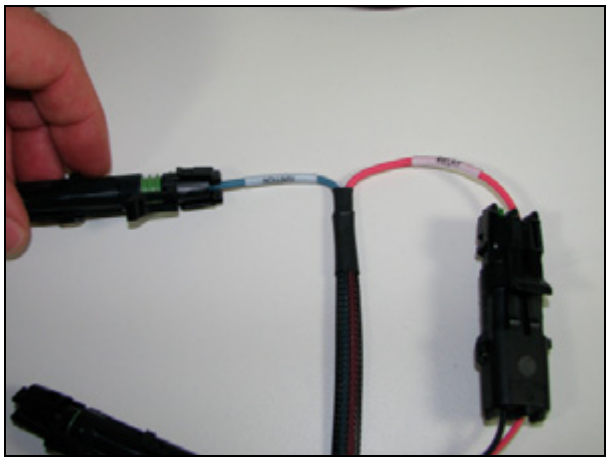


Step 2

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

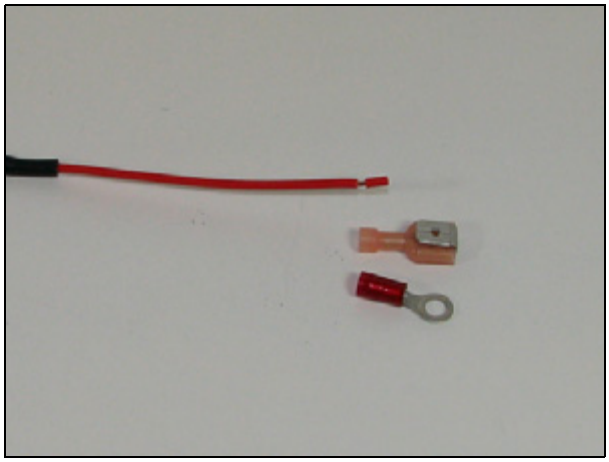
Step 3

Route the cable to the vehicles ignition.

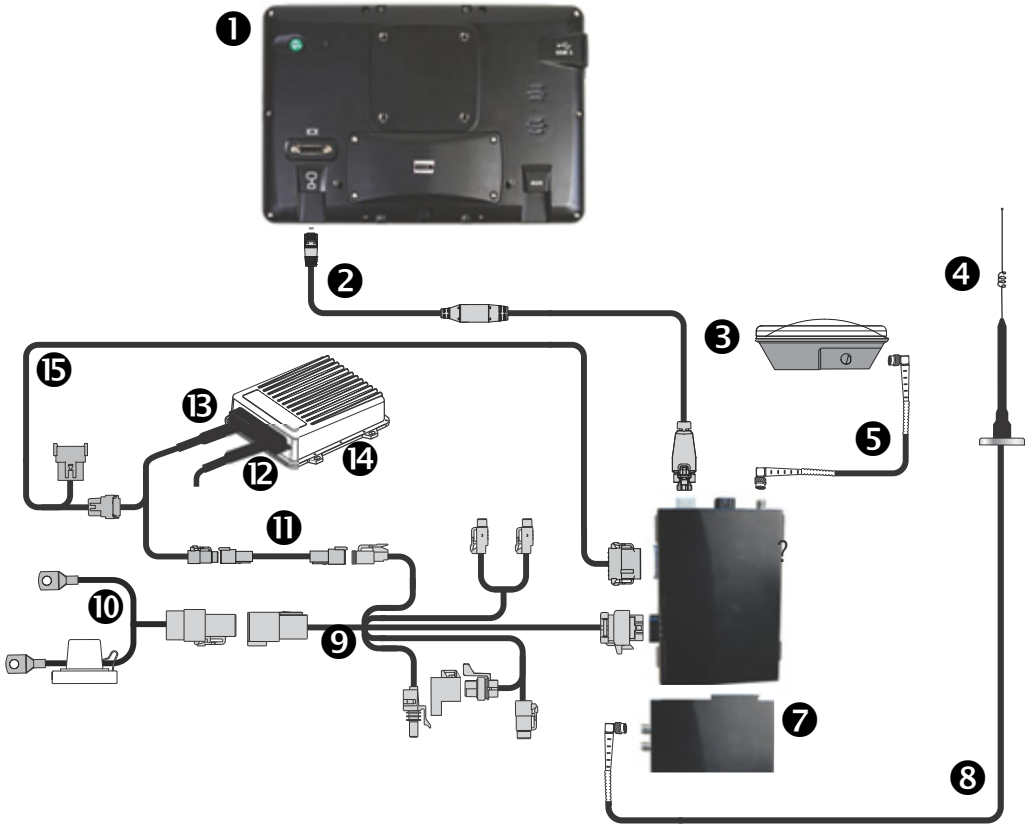


Step 4

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



TMX-2050 display: Components



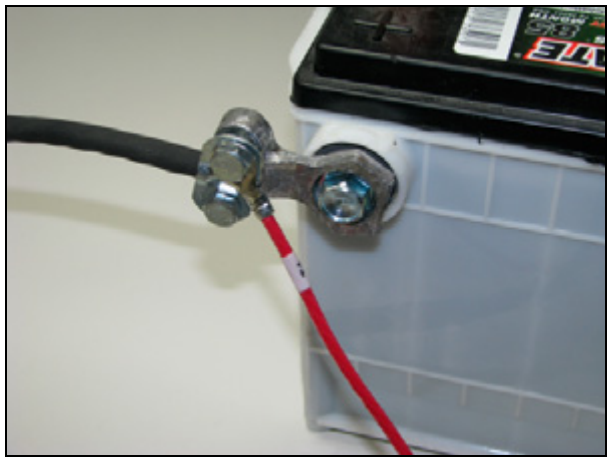
Item	Description	Trimble part number
❶	TMX-2050 display	96700-00
❷	TM-200 Module to display cable	93843
❸	AG-25 GNSS antenna	77038-00
❹	900 MHz radio antenna kit	22882-10
❺	8 m GNSS TNC/TNC RT angle cable	50449
❻	TM-200 Module	95060-00
❼	AG-815 radio	
❽	NMO-to-TNC 20 ft antenna cable and base	72122
❾	TM-200 Module power and I/O cable	92676
❿	Cable, battery	92905
⓫	2-pin DTM to 2-pin DT power adapter cable	67095
⓬	Cable, NavController diagnostic	54602
⓭	Main NavController cable	54601
⓮	NavController	55563-00 55566-00
⓯	TM-200 Module to NavController cable with port replicator	75741

TMX-2050 display: Installing the power harness

⚠ **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.

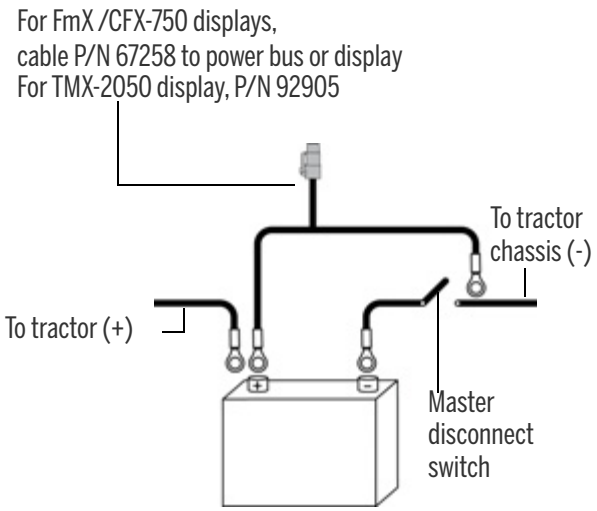
Step 1

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



⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is *not* directly attached to the battery terminal that is disconnected by the master switch—the negative pole in this example.

Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



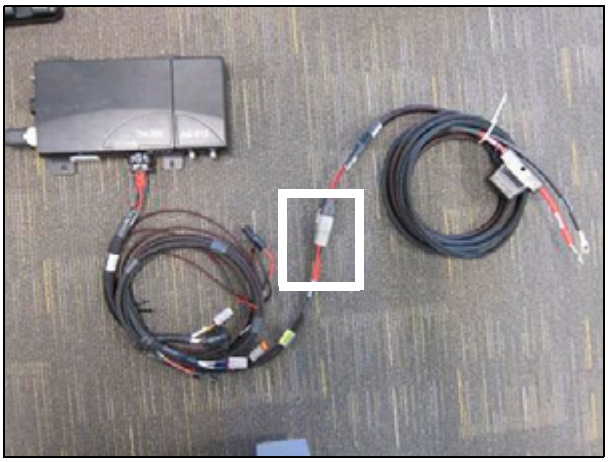
Step 2

Connect the power I/O cable P/N 92676 to the power port on the TM-200 Module.



Step 3

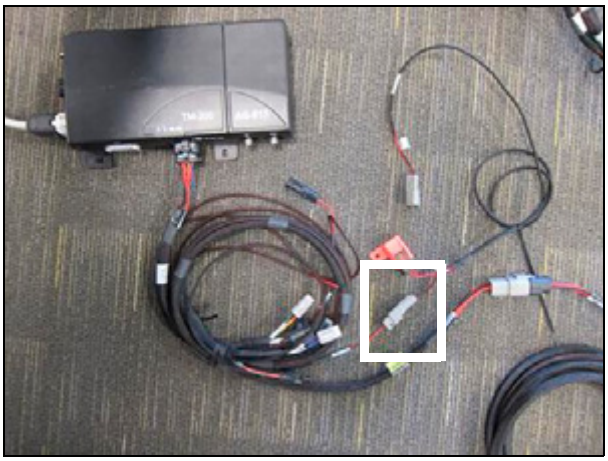
Route the power cable P/N 92905 that you previously connected to the battery and connect it to the R3 power in plug on the P/N 92676 cable.



Step 4

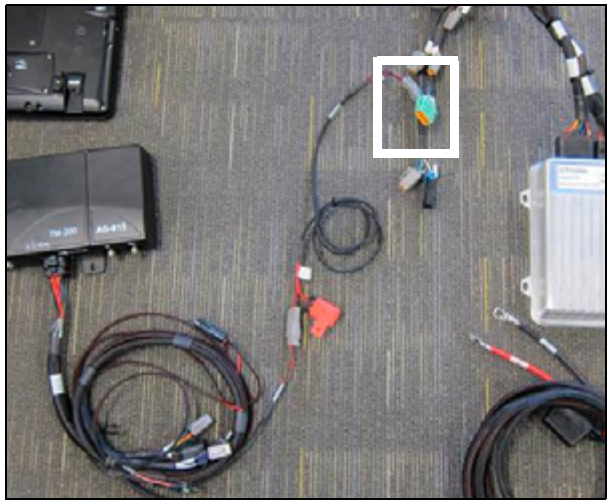
Connect the 2-pin DTM to 2-pin DT power adaptor P/N 67095 to the P2 power out connector on the P/N 92676 cable.

Route the other end to the NavController harness P/N 54601.



Step 5

Connect the other end of the P/N 67095 cable to the P2 power plug on the P/N 54601 cable.



TMX-2050 display: Configuring the power options

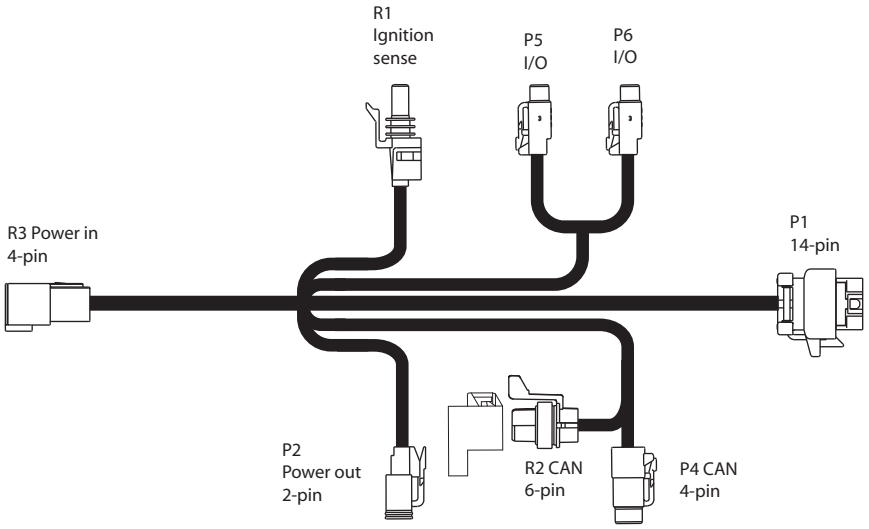
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

When you use the power bus cable, use one of the following methods to turn on the Autopilot system on the Trimble TMX-2050 displays:

- The display power button. No further changes need to be made to the power cables.
- Ignition sensing. See below.

Ignition sensing

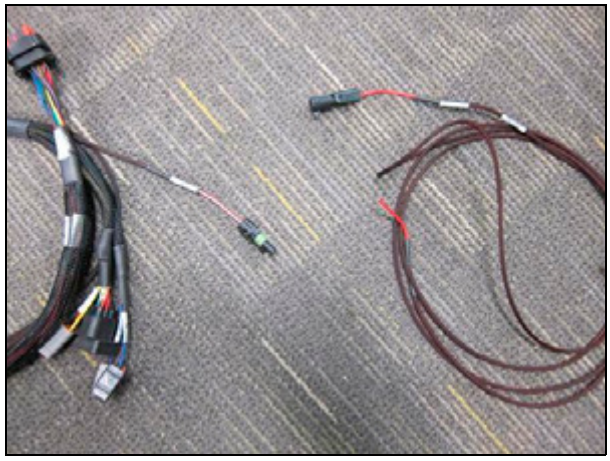
For ignition sensing with the TMX-2050 display, connect the ignition on the power supply to the R1 connector on the harness, P/N 92676.



For more information on how to use the ignition sensing option, refer to the *TMX-2050 Display User Guide*.

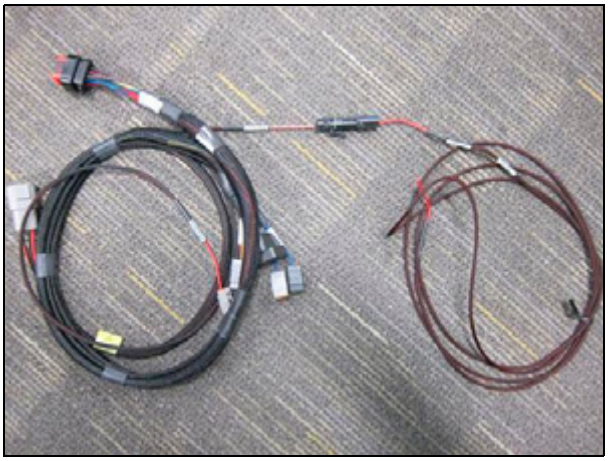
Step 1

Locate the R1 ignition sensing plug on the P/N 92676 cable; also locate the ignition sensing wire provided with the P/N 92676 cable.



Step 2

Connect the red ignition sense wire to the vehicle ignition source then route to the plug on the harness and then connect it.



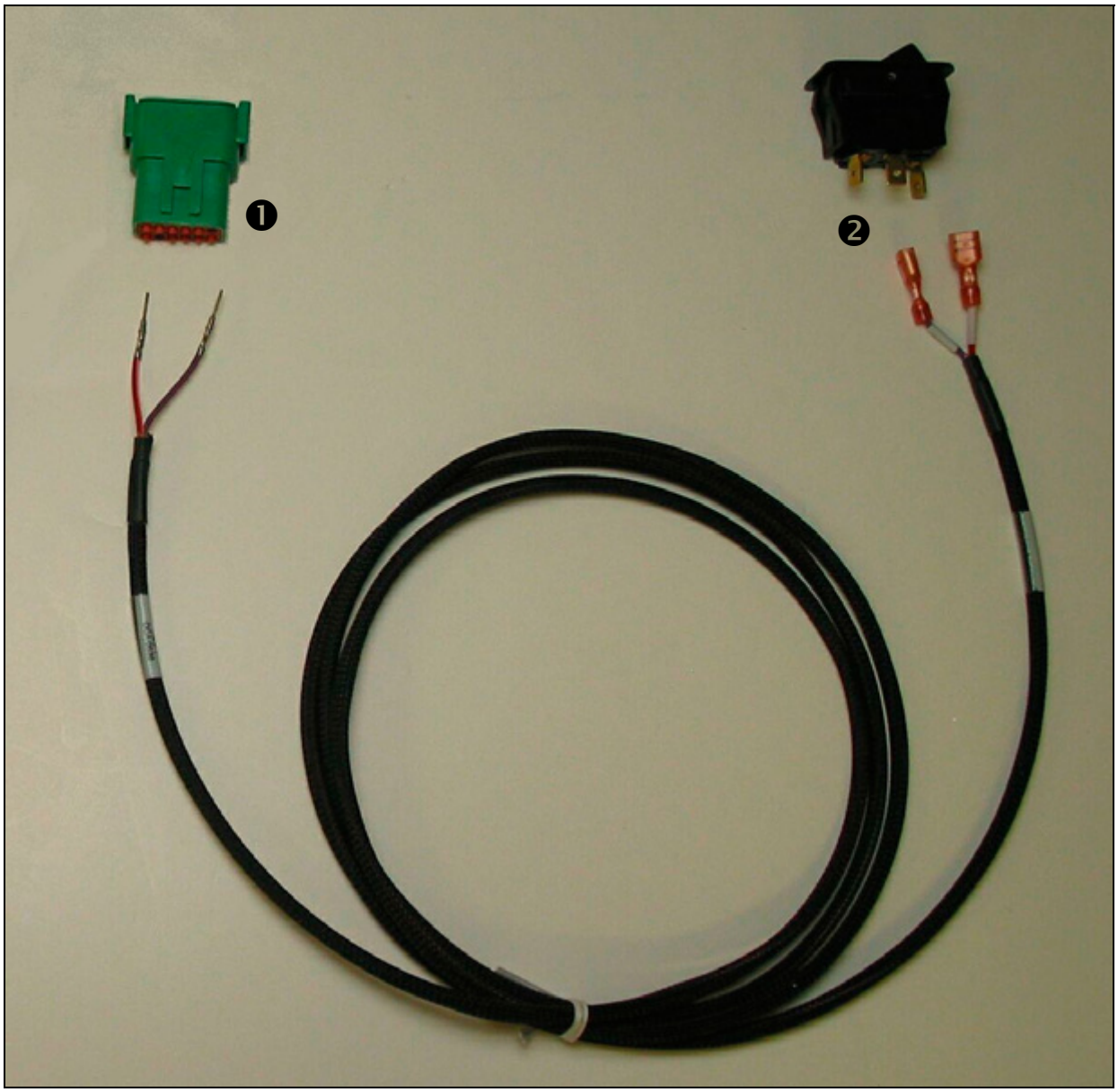
8

Remote Engage Switch Installation

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

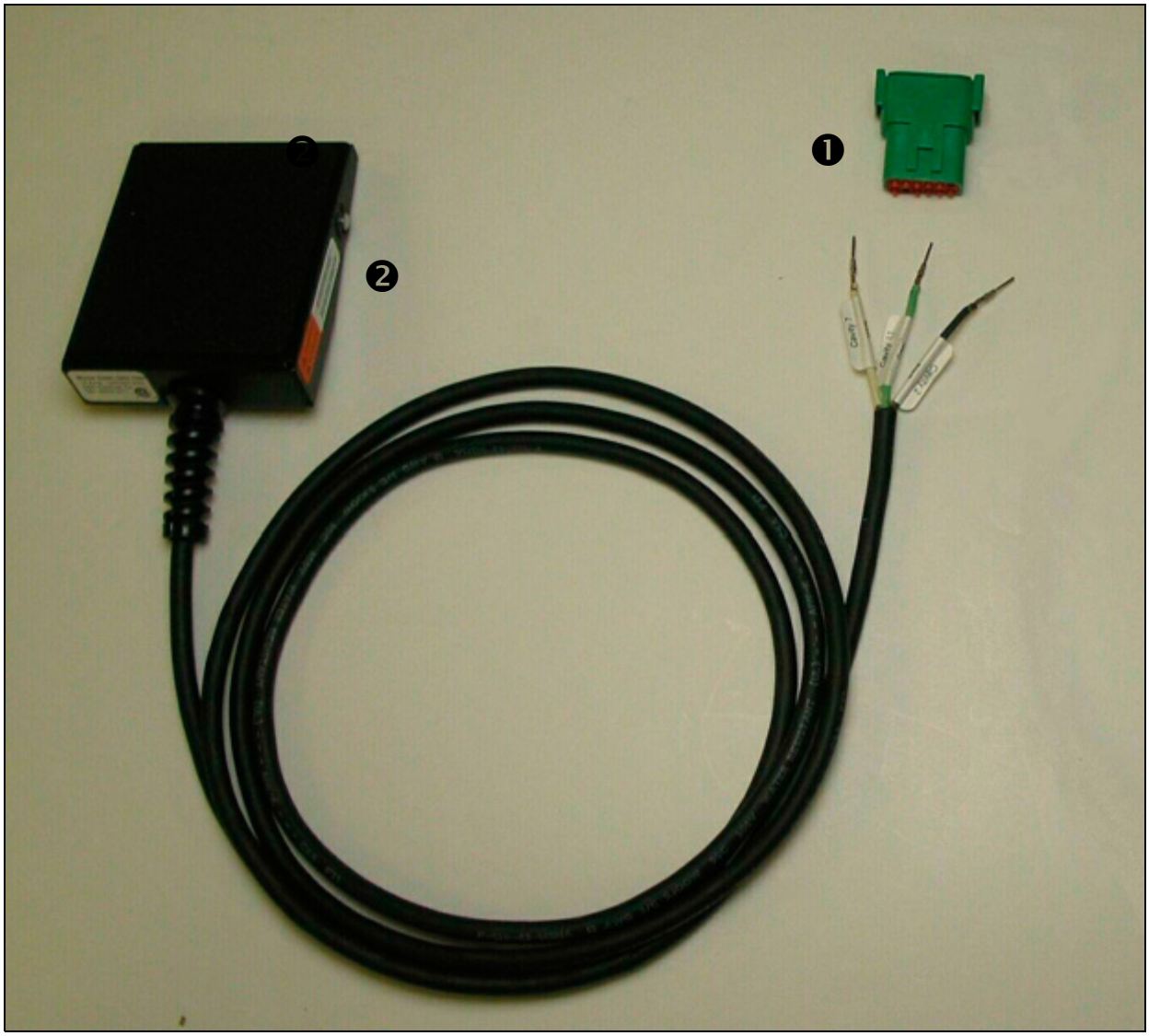
This chapter describes how to install the remote engage switch.

Remote engage switch components: Rocker switch



Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

Remote engage switch components: Foot switch

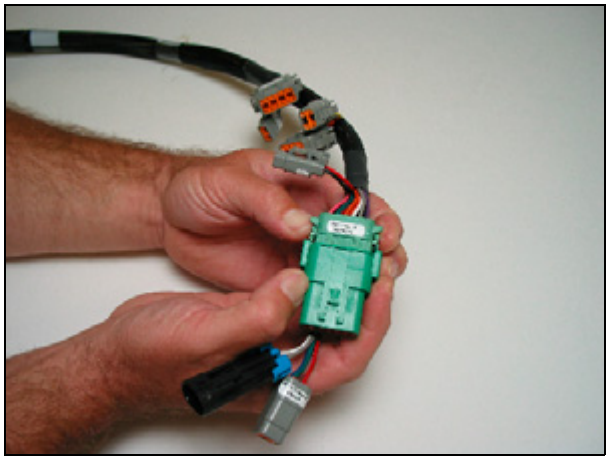


Item	Description
❶	DTM receptacle
❷	Remote engage rocker switch

Preparing the remote engage cable

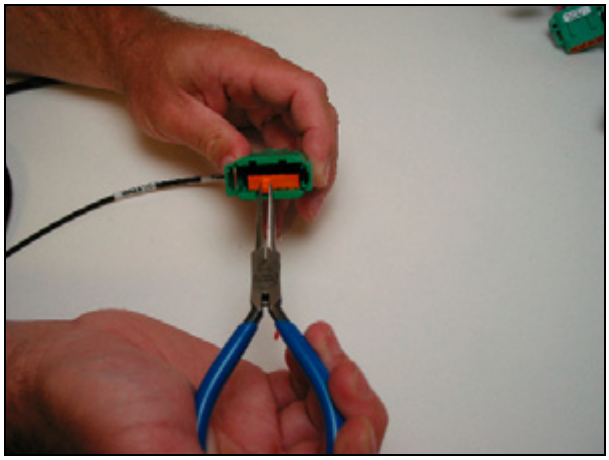
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. For more information, see Chapter 9, Controller Installation.



Step 2

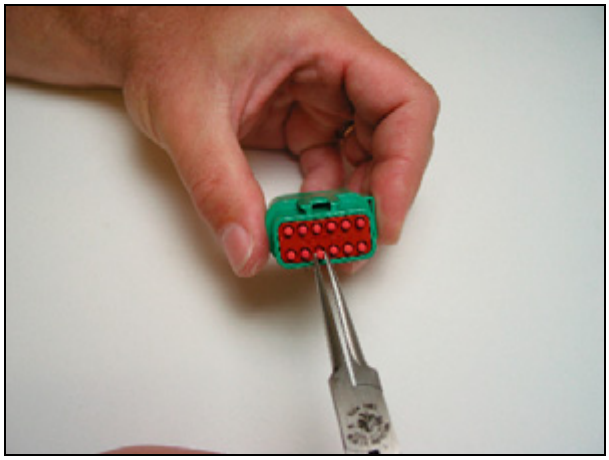
Remove the wedge from the connector.



Step 3

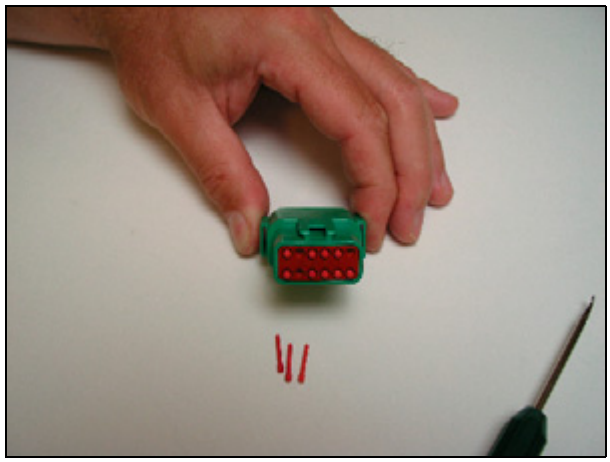
Rocker switch only

Remove the plugs from cavity 2 and cavity 7.



Foot Switch Only

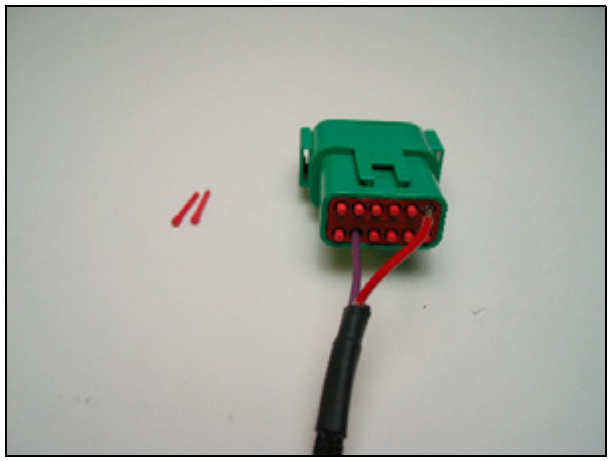
Remove the plugs from cavity 2, cavity 7, and cavity 11.



Step 4

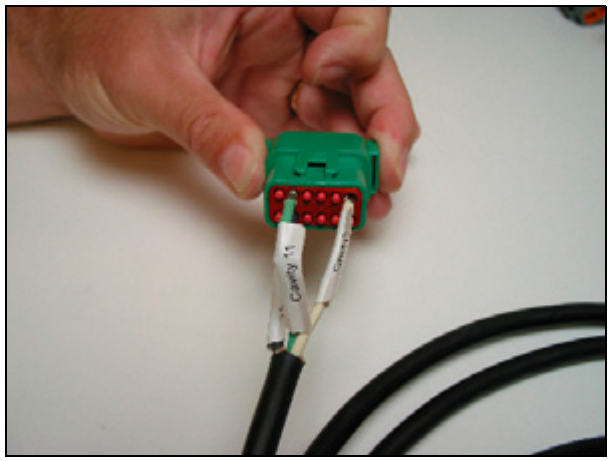
Rocker switch only

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



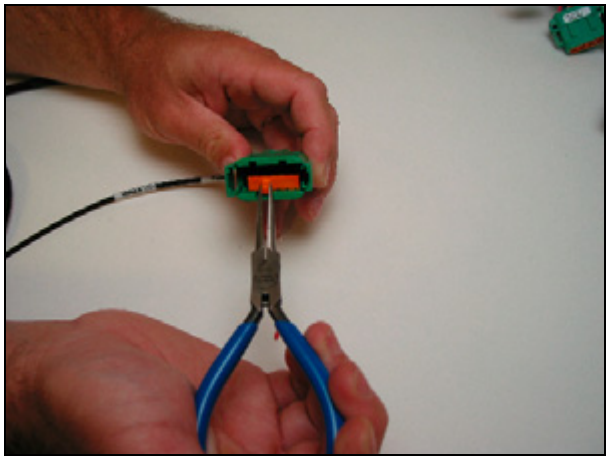
Foot switch only

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

Replace the receptacle on the P5 plug of the NavController II harness.

Step 7

Rocker switch only

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



Foot switch only

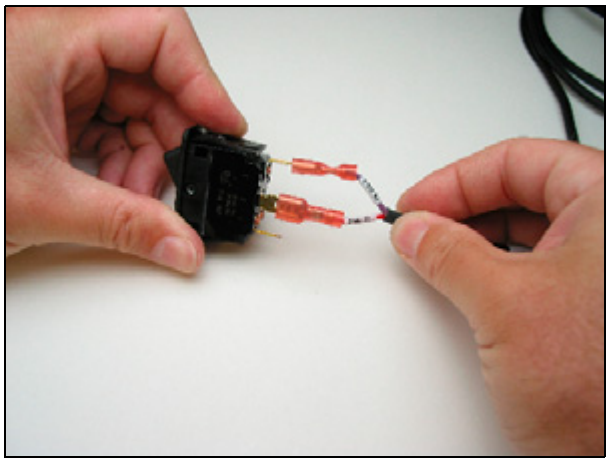
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 8

Rocker Switch Only

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



Step 9

Rocker Switch Only

Place the switch in the console.



Using the remote engage switch

To use NavController II to engage the system:

- For firmware versions 5.20 and earlier: Hold down the remote engage switch for longer than **0.5** seconds and less than **4** seconds.
- For firmware 5.21 and later: Hold the switch down for longer than **0.15** seconds and less than **4** seconds.

The system engages when you release the switch.

9

Controller Installation

- Installing the controller
- Controller connections
- Connecting the cables to the controller

This chapter describes how to install the controller unit.

⚠ **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.

Installing the controller

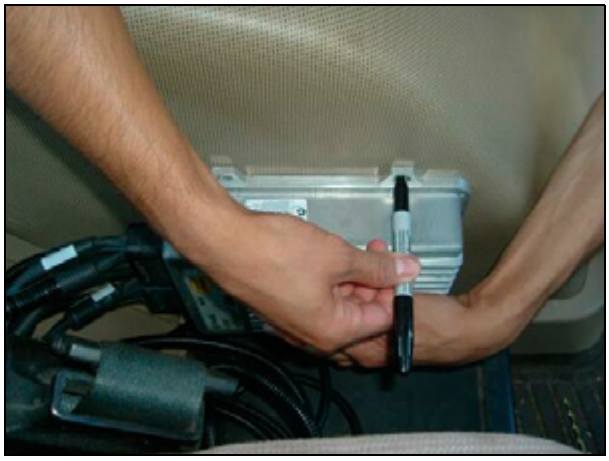
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

John Deere 6xx0 models

Step 1

Locate the controller connectors back and flanges left on the left fender wall. Use the controller as a template to mark the locations of the four mounting holes.

NOTE – For best performance, the controller must be parallel to the cab floor.



Step 2

Use a right angle drill to drill four -10 clearance holes through the fender well.



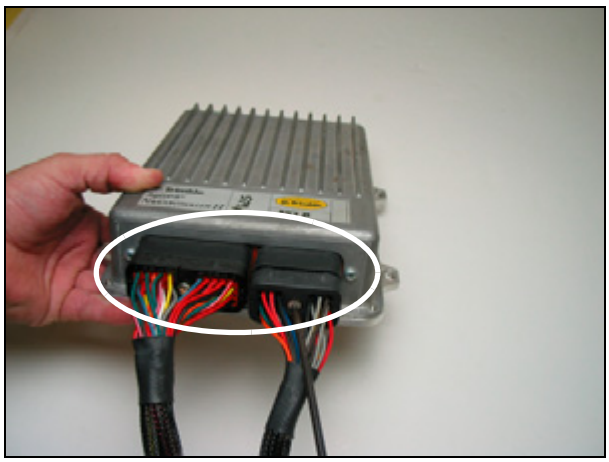
Step 3

Use the provided -10 screws and nylock nuts to firmly mount the controller to the fender well.



Step 4

Insert the main and auxiliary harnesses into the connectors on the controller. Use an Allen wrench to tighten the Allen head screws to secure the harnesses to the controller. They should be only snug; do not overtighten.



John Deere 7xx0 models

Step 1

Pull back the floor mat between the operator's seat and the left hand console.



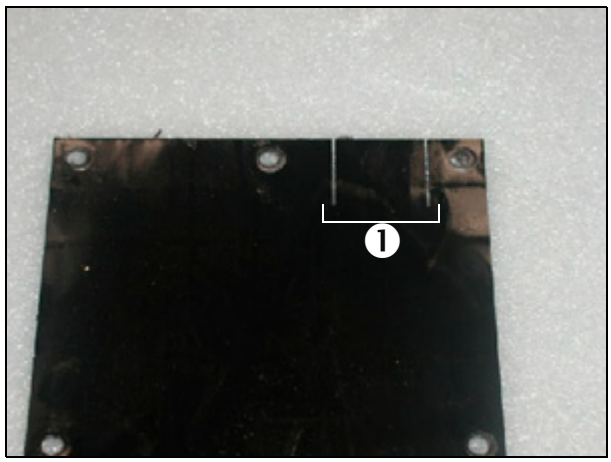
Step 2

Locate the plate bolted to the floor and remove the bolts.



Step 3

Remove the plate and then cut two notches ❶ in the back corner of the plate between the bolt holes.



Step 4

Bend back the piece between the cuts. Smooth the rough edges on the plate with a file.



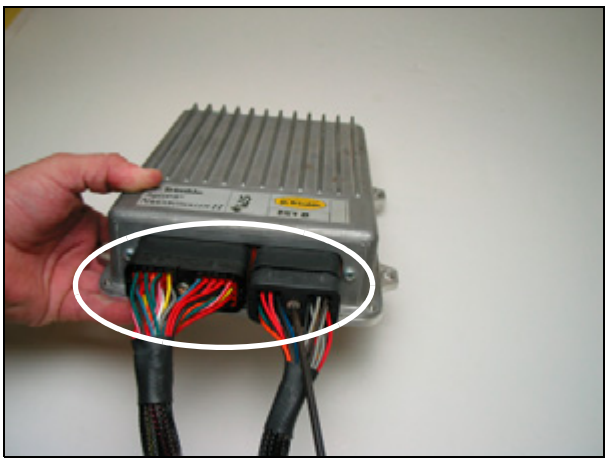
Step 5

Replace the plate in the floor and tighten the bolts. Route all cables (except the antenna/receiver cables) into the cab through this access hole. Replace the floor mat. Leave the cables out from under the mat.



Step 6

Insert the main and auxiliary harnesses into the connectors on the controller. Tighten the Allen head screws to secure the harnesses to the controller. They should only be snug; do not overtighten them.



Step 7

Use the four -10-32 Phillips head screws provided to attach the controller to the mount plate. Tighten them securely.

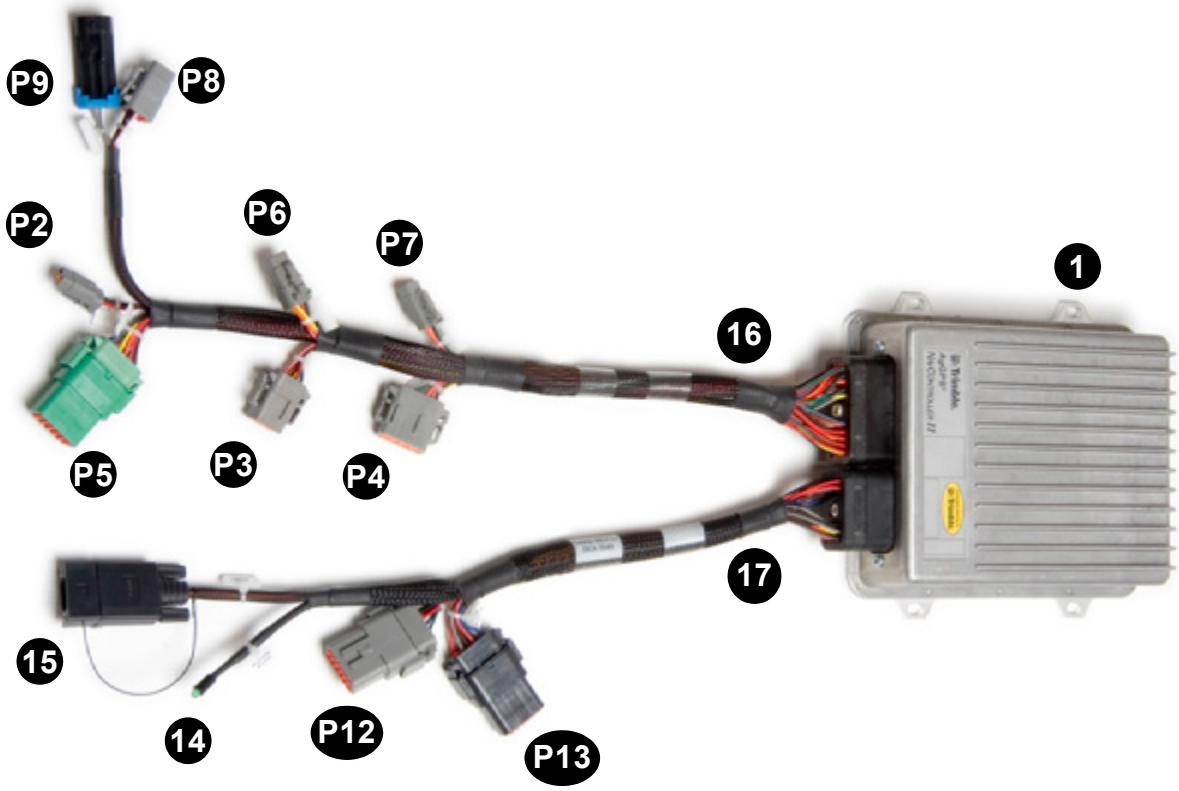


Step 8

Connect the cables to the main harness.



Controller connections



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

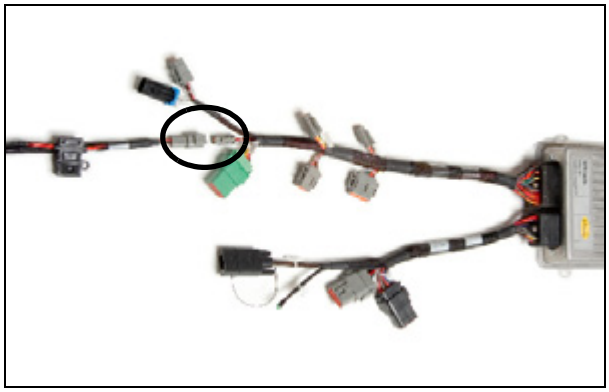
Item	Description
P9	Sonalert connector
P12	Lightbar/spare connector
P13	Spare sensors connector
14	Status indicator
15	Laptop connector
16	Main harness
17	Auxiliary harness

Connecting the cables to the controller

Step 1

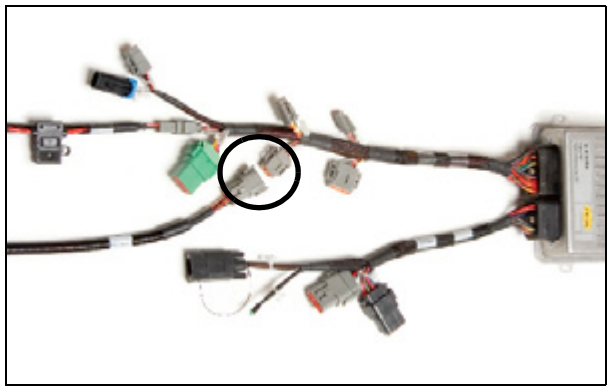
Connect the power cable connection to P-2, which is labeled **Power**. P-2 is located on the main wiring harness.

NOTE – The power connection supplies power through the controller to all connected devices, including GNSS and displays.



Step 2

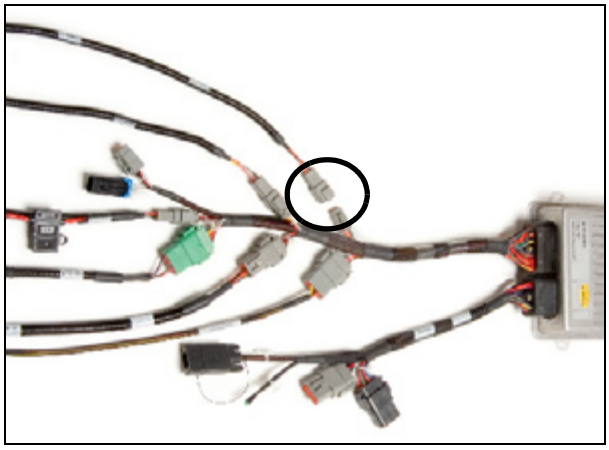
Connect the CFX-750 display or FmX integrated display to P-3, which is labeled **GPS**. P-3 is located on the main wiring harness.



Step 3

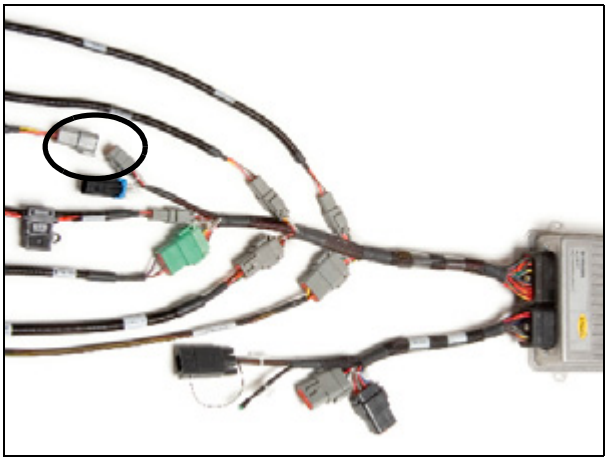
Connect the manual override cable connection to P-7, which is labeled **Manual Override**. P-7 is located on the main wiring harness.

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



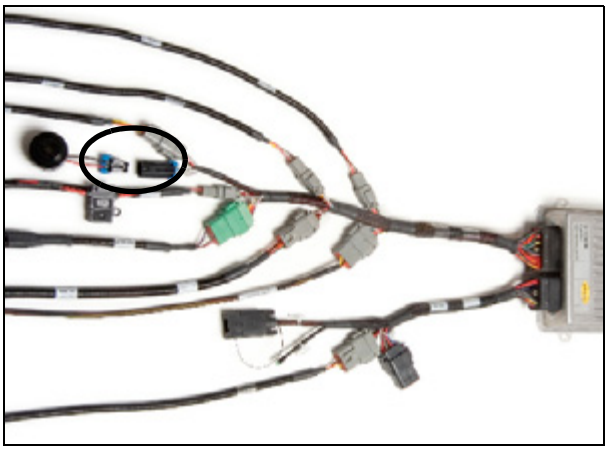
Step 4

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



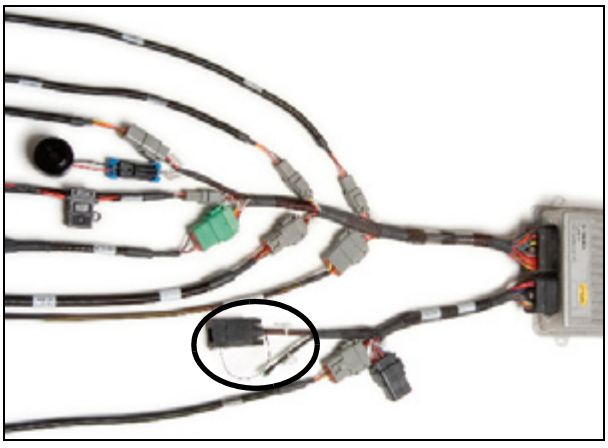
Step 5

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



Step 6

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 7

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.

10

Isolation Models Setup Instructions

- Connecting the isolation solenoid cable
- Configuring the NavController III to turn on the electronic isolation manifold
- Setting the load sense relief pressure
- Adjusting the isolation manifold pressure reducing valve (PRV)

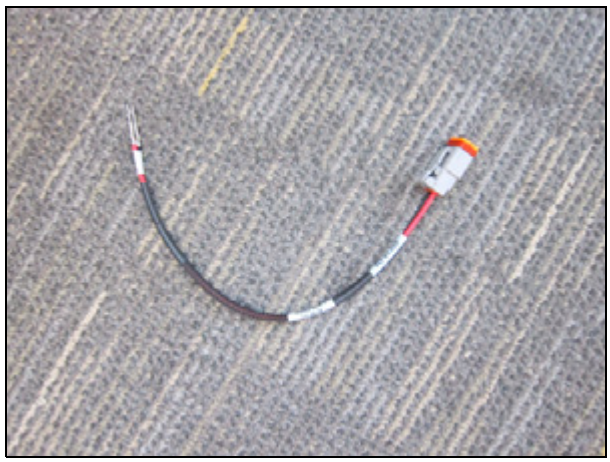
These instructions must only be completed by users familiar with operation of H4 manifold.

Connecting the isolation solenoid cable

Connect the P/N 100199 and 103378 cables to provide power to the Autopilot cut-off coil.

Locate the supplied P/N 103378 and 100799 isolation manifold cable in the isolation manifold kit.





Isolation manifold power connection (available only with NavController III)

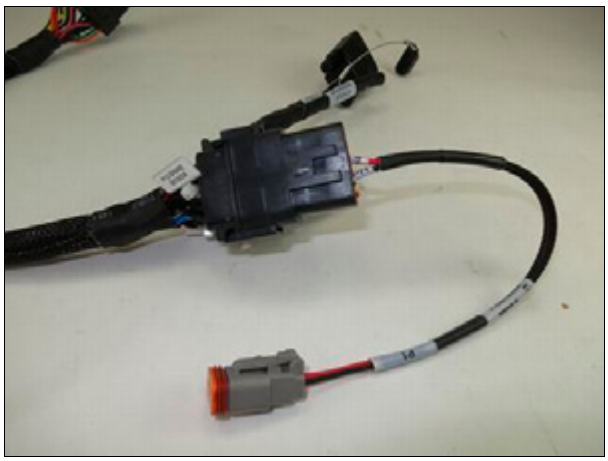
NOTE – This feature is not available with the NavController II.

NOTE – This connection type activates the isolation manifold automatically, using the third solenoid drive function of the NavController III.

Follow this procedure to connect the P/N 100199 cable to the NavController III harness, P/N 54602.

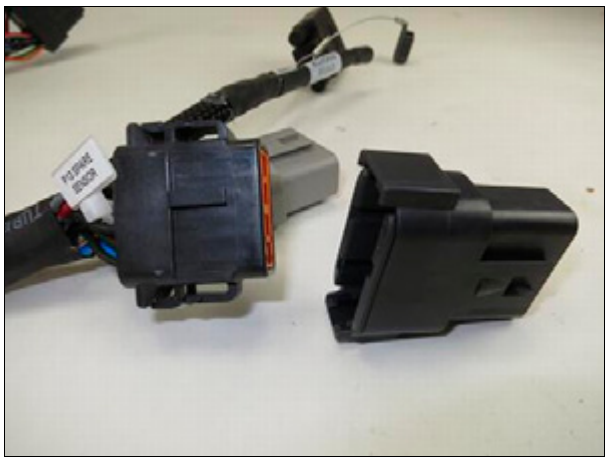
Step 1

Locate the supplied P/N 100199 cable in the isolation manifold kit.



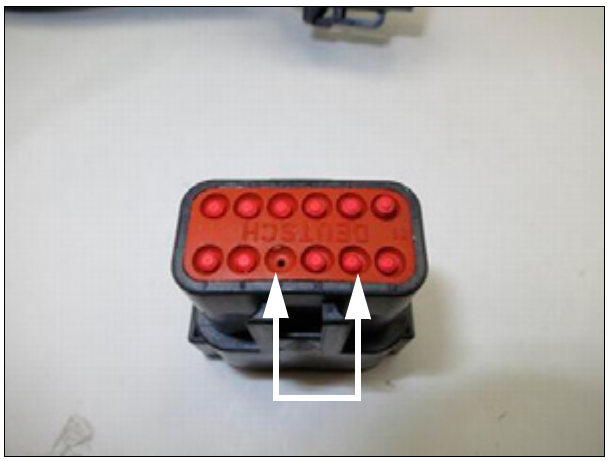
Step 2

Locate and remove the connector plug from the P/N 54602 P13 connector.



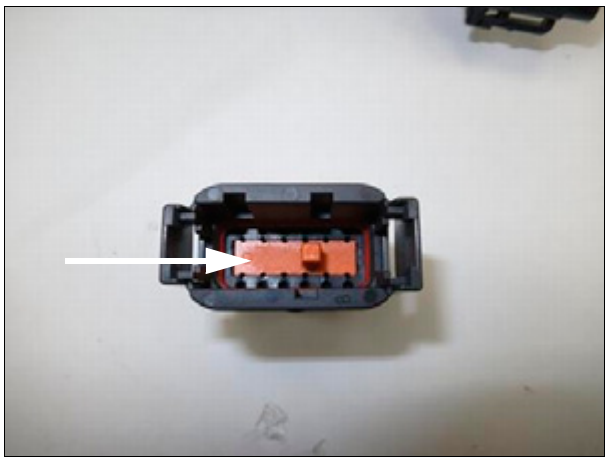
Step 3

On the rear of the plug, remove the sealing pins from the 9 and 11 sockets.



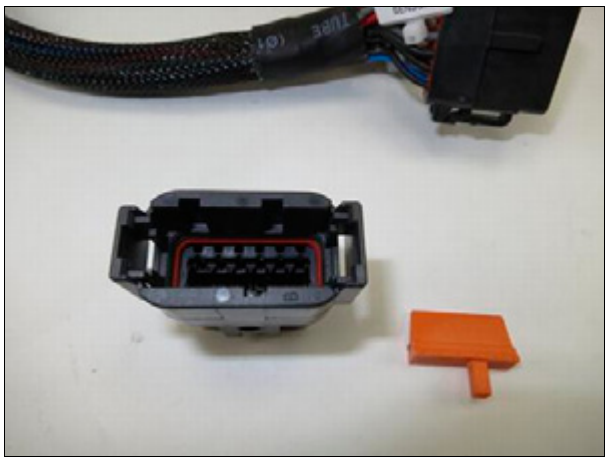
Step 4

On the inside of the connector, locate the orange wedge lock.



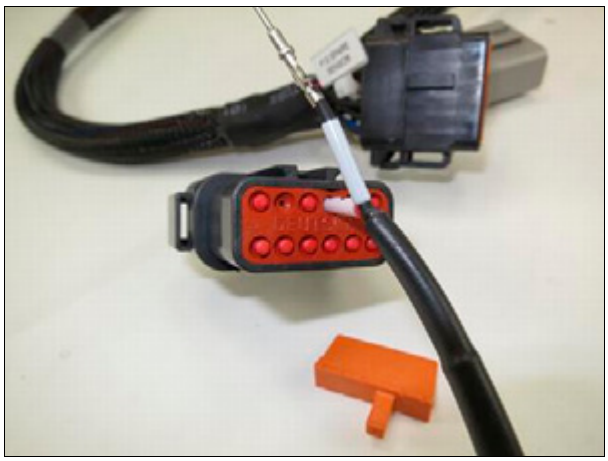
Step 5

Use needle-nose pliers to remove the wedge lock by pulling it straight out of the plug connector.



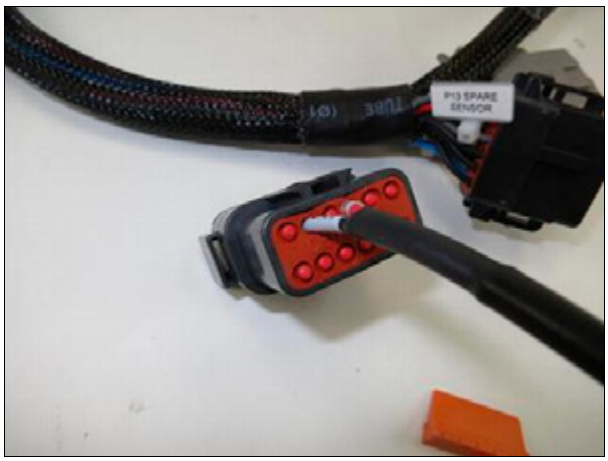
Step 6

Insert the pin labeled **to p13-9** into the 9-pin location on the connector plug.



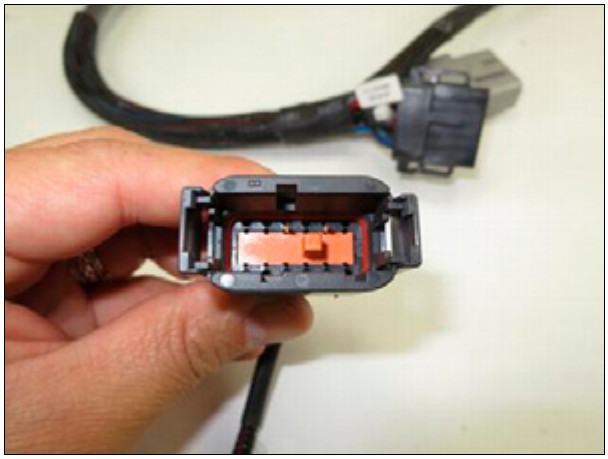
Step 7

Insert the pin labeled **to p13-11** into the 11-pin location on the connector plug.



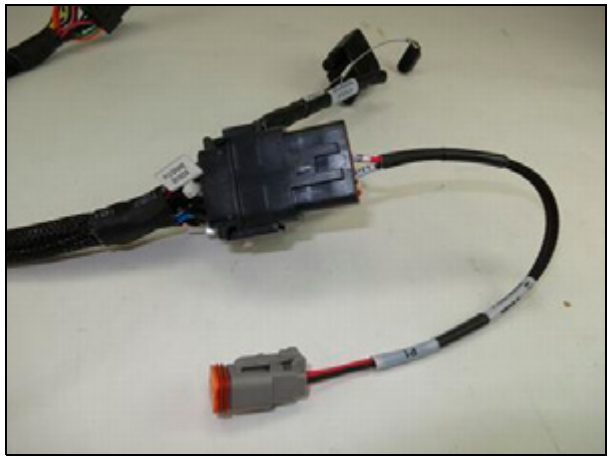
Step 8

Re-install the orange wedge lock into the connector plug.



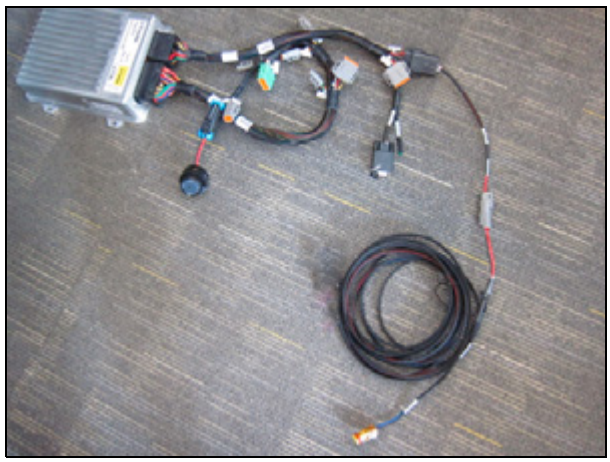
Step 9

Connect the P13 plug to the P/N 54602 harness on the NavController III.



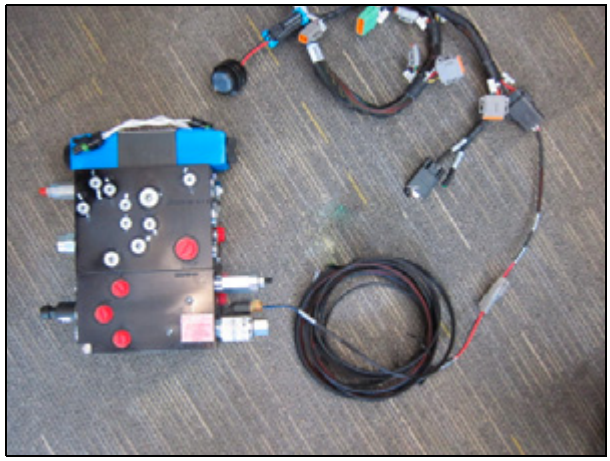
Step 10

Connect the R1 connector on cable P/N 103378 to the P1 connector on cable P/N 100799.



Step 11 - Connecting to the solenoid

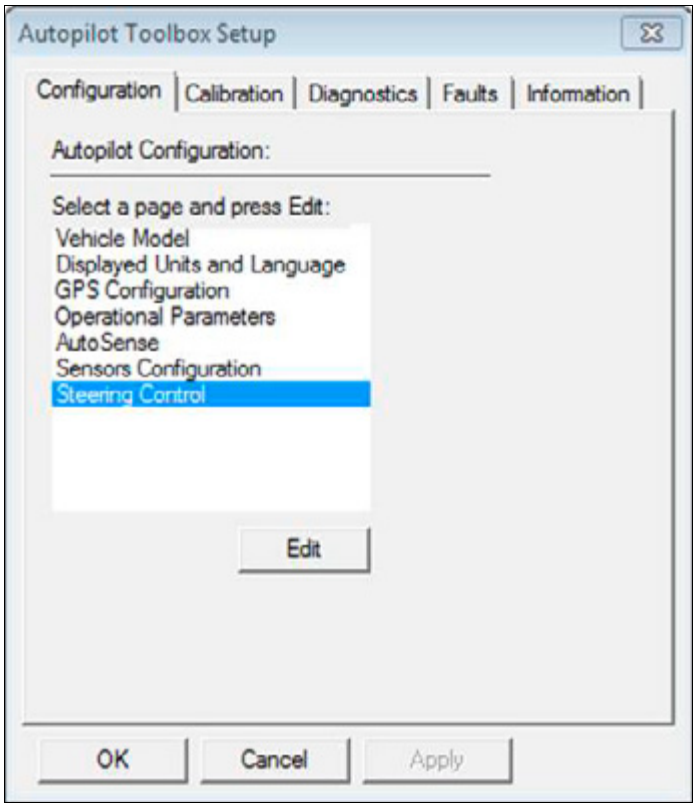
Route the P2 plug of cable P/N 103378 to the Autopilot manifold isolation solenoid and connect it as shown.



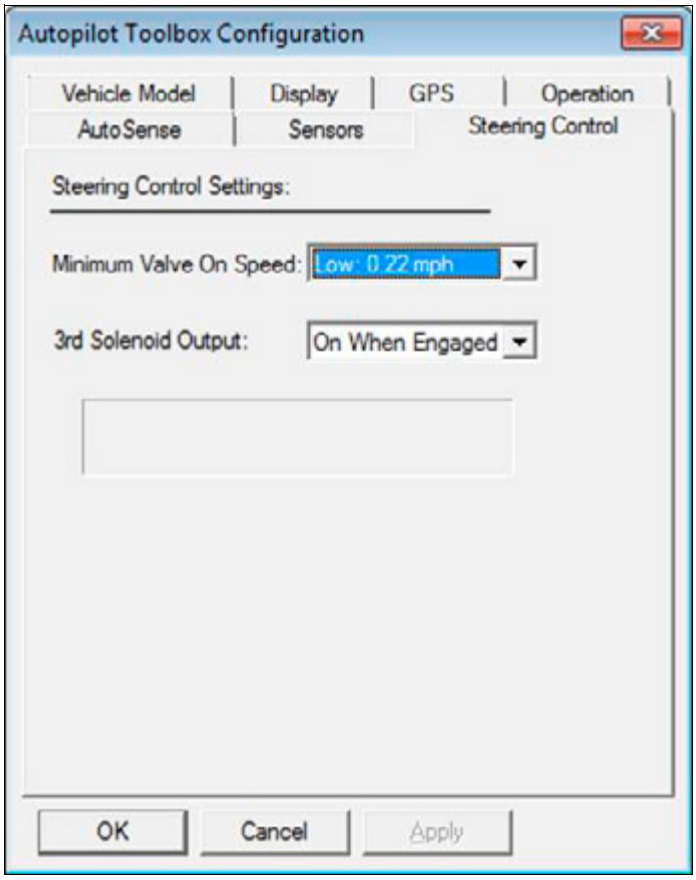


Configuring the NavController III to turn on the electronic isolation manifold

1. In Autopilot Toolbox version 3.3 or later, in the Setup screen, click the **Configuration** tab, select **Steering Control** and then click **Edit**:



2. From the **3rd Solenoid Output** drop-down list, select **On When Engaged** and then click **OK**:



NOTE – The **Minimum Valve On Speed** applies also to the third solenoid valve. The third solenoid will not be active until the set speed is reached. If the vehicle drops below the selected speed, the third solenoid will no longer be active.

PIQ and FmX+ version 5.61 and later have the ability to enable the third solenoid within the UI. Note that third solenoid cannot be used in conjunction with NextSwath connect.

Setting the load sense relief pressure

The Load sense relief pressure should be set approximately 100 psi lower than the system relief pressure to allow margin in the adjustment and to fully protect the system. The default setting of the LS relief valve is 2700 psi. If a lower pressure is required, these instructions will provide a procedure for adjusting the LS relief pressure. The relief pressure should not be increased above 2700 psi.

Preparing to set the relief pressure

Step 1

Install a pressure gauge into the LS2 port; if no DSV2 cartridge is present, the PX ports can also be used.

Step 2

Connect the P line of the manifold to a 3000 psi pressure source such as a remote on a tractor.

Step 3

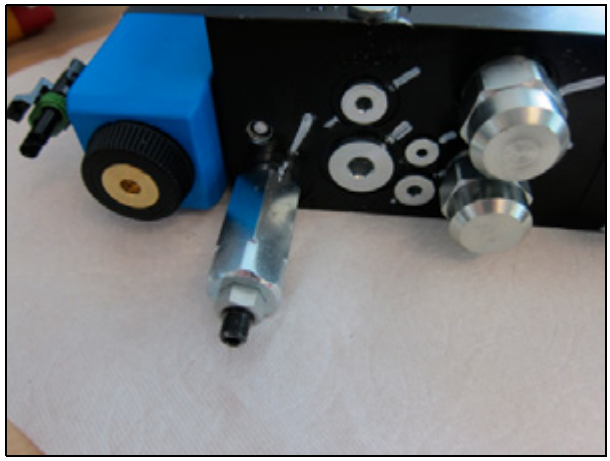
Connect the T line of the manifold to an oil tank or return line on the remote of a tractor.

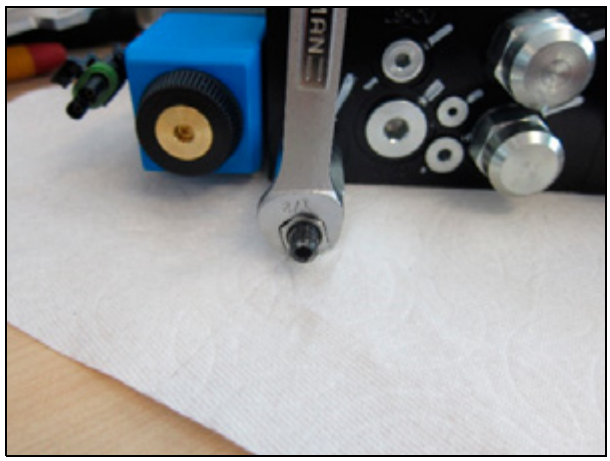
Step 4

The A and B / SCU-A, SCU-B lines: May be either connected to the steering cylinders / orbitrol or capped off for this test.

Step 5

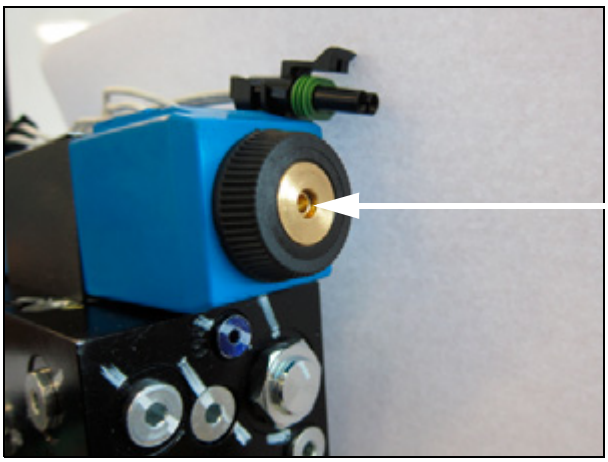
Loosen the jam nut on the LS relief valve'





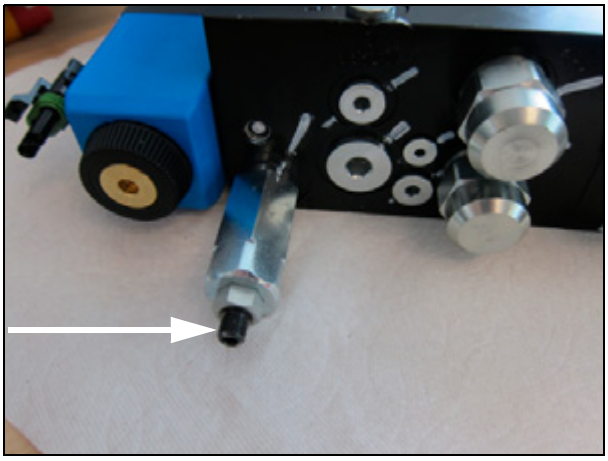
Step 6

With pressure applied to the P port, press on one of the Detent overrides on the electro hydraulic valve. If the steering cylinders are present in the system, make sure to run the override until you hit and end stop to ensure you are at peak pressure.



Step 7

With the override pressed, turn the relief valve in or out and watch the gauge to set the LS relief pressure.



Adjusting the isolation manifold pressure reducing valve (PRV)

⚠ **CAUTION –** Increasing the pressure setting of the PRV can lead to the loss of ability to mechanically override the autopilot steering.

The isolation sandwich on the H4 manifold uses spring-biased pilot to shift cartridges to toggle between manual steering and Autopilot steering. The manual steering pressure adds to the spring cavity to pilot the cartridges open even in situations where the isolation solenoid were to remain on.

A Pressure reducing valve is present in the system to ensure that the isolation valve pilot pressure can always be overcome by the spring force **+** the manual steering pressure.

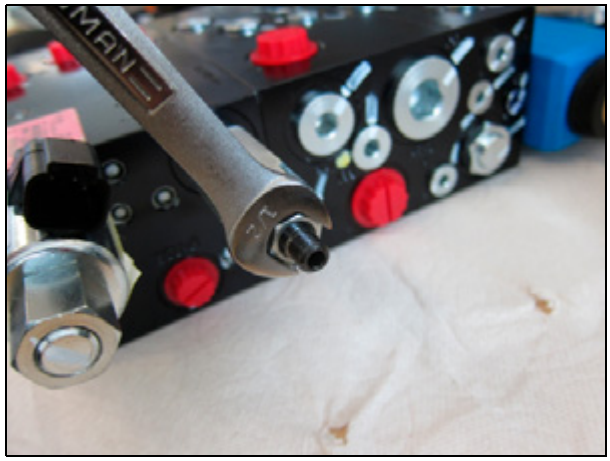
In some machines, it may be necessary to adjust the PRV setting in order to bias the cartridges more towards the manual steering or towards the Autopilot steering.

For the system to function as intended, manual steering should always overcome Autopilot steering. To test this function the P/N 103378 cable can be connected to the power bus or other 12 V source, with the switch on and 12 V being supplied to the cut-off coil. Manually steering the machine should result in movement of the wheels.

In the state where the isolation valve is powered when you are not steering manually, the Autopilot should be able to steer the machine; this means that if you were to press on the detent valve overrides you should be able to actuate wheel movement.

Step 1

Locate and loosen the jam nut on the PRV cartridge.



Step 2

Adjust the PRV valve by turning the screw with a hex wrench.

NOTE – Screwing the screw clockwise / inward will *add* pressure to the PRV setting, resulting in an increased bias towards Autopilot steering. This should be done if the Autopilot is sometimes not steering the machine.

Screwing the screw counterclockwise / outward will *reduce* pressure from the PRV, biasing the system more towards the manual steering side. The PRV setting should be decreased if the isolation solenoid is powered and manual steering is sometimes not possible.

11

Final Machine Check

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

To perform the final machine check:

1. Connect the battery.
2. Start the machine and check for hydraulic leaks. Correct as needed.
3. Update the Trimble display and the Autopilot NavController II to the latest firmware from http://agpartners.trimble.com.

   You can use FlashLoader 200 software version 3.19 to update the Autopilot controller: Download it from http://agpartners.trimble.com.
4. Load the correct configuration file into the Autopilot NavController II for the vehicle model being used.

   Download the latest set of configuration files from http://agpartners.trimble.com.

   You can use the latest Autopilot Toolbox II software to load the configuration file into the Autopilot controller. You can download the Autopilot Toolbox II software from http://agpartners.trimble.com.
5. Calibrate the Autopilot system using the Trimble display or Autopilot Toolbox II software version 4.02 or later. Depending on your machine type, the following items must be calibrated before you can use the Autopilot system:
   - NavController II mounting orientation
   - Manual override
   - AutoSense mounting orientation
   - Valve deadzone
   - Autopilot P-gain
   - Antenna height/Antenna axle offset, and Roll offset