INSTALLATION GUIDE

Autopilot

AUTOMATED STEERING SYSTEM

Case IH, AccuGuide Ready

- AFX 7010 / 7120 / 7240 / 8010 / 8120 / 8230 / 8240 / 9120 / 9230 / 9240
- Axial-Flow 5088 / 5130 / 5140 /6088 / 6130/6140 / 7010 / 7088 / 7130 / 7140
- FLX 3020 Titan / 3520 / 4020 / 4520
- Midrange Magnums 180 / 190 / 200 / 210 / 220 / 225 / 240
- Magnums 235 / 250 / 260 / 280 / 290 / 310 / 315 / 340 / 370 / 380
- MX Magnum: 180 / 190 / 210 / 215 / 230 / 245 / 255 / 275 / 285 / 305 / 335
- SPX 3320 Patriot: 3330 / 3340 / 4420 / 4430 / 4440
- STX 275 Steiger: 280 / 325 / 330 / 335 / 375 / 380 / 385 / 425 / 430 / 435 / 450 / 480 / 485 / 500 / 530 / 535
- Steiger 350 / 370 / 400 / 420 / 450 / 470 / 500 / 540 / 550 / 580 / 600 / 620
- WD Windrowers: WD1203 II / WD1903 II / WD 2303 II

New Holland, IntelliSteer Ready

- CR 940 / 960 / 970 / 9040 / 9060 / 9070 / 9080
- CR: CR7.90 / CR8.80 / CR8.90 / CR9.80 / CR9.90 / CR10.90
- CX 8030 / 8040 / 8050 / 8060 / 8070 / 8080 / 8090
- CX: CX7.80 / CX7.90 / CX8.70 / CX8.80 / CX8.90
- T 7030 / 7040 / 7050 / 7060 /T7070
- T7: T7.170 / T7.175 / T7.185 / T7.190 / T7.200 / T7.210 / T7.220 / T7.230 / T7.235 / T7.245 / T7.250 / T7.260 / T7.270
- T 7510 / 7520 / 7530 / 7540 / 7550
- T 8010 / 8020 / 8030 / 8040 / 8050
- T 9020 / 9030 / 9040 / 9050 / 9060
- TG 210 / 215 / 230 / 245 / 255 / 275 / 285 / 305
- T8010 / T8020 / T8030 / T8040 / T8050
- T8: T8.275 / T8.300 / T8.320 / T8.330 / T8.350 / T8.360 / T8.380 / T8.390 / T8.420
- TJ 275 / 285 / 325 / 330 / 375 / 380 / 425 / 430 / 450 / 480 / 500 / 530
- T9: T9.390 / T9.435 / T9.450 / T9.480 / T9.505 / T9.530 / T9.560 / T9.565 / T9.600 / T9.615 / T9.645 / T9.670 / T9.700
- Speedrowers: 130 / 200 / 240

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Revision A
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Trimble

LEGAL NOTICES

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All other trademarks are the property of their respective owners.

Official Language

The official language of these terms and conditions is English. In the event of a conflict between English and other language versions, the English language shall control.

Release Notice

This is the January 2017 release (Revision A) of the Autopilot Automated Steering System Installation Instructions, part number 56694-00-E06. It applies to version 6.00 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 confirm 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 cause by the Product as reasonably determine by Trimble following a root cause analysis. Where Trimble elects to replace a Product or parts, repair parts and replacement Products will be provided on an exchange basis and will be either new, equivalent to new, or reconditioned.

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 navigation limited 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 Navigation Limited is not responsible for the operation or failure of operation of GPS satellites or the availability of GPS satellite signals.

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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



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

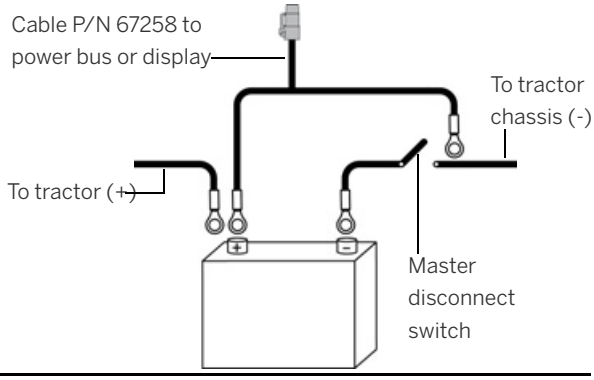


Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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.

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 result in damage to the display.



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Chapter 1

INTRODUCTION

- Technical assistance
- Manual system upgrade to the Autopilot system
- Required components
- 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 the Autopilot system

Displays

Retain
CFX-750™ / FM-750™ display: P/N 94110-xx
Power cable CFX-750/FM-750 display: P/N 77282
FmX® /FM-1000™ integrated display: P/N 93100-xx
Power cable FmX/FM-1000 display: P/N 66694
Antenna for display: P/N 60600-02 (DGPS) or 77038-00 (OmniSTAR®/RTK)
Antenna to receiver cable: P/N 50449
Basic cable (CFX-750/FM-750 and FmX/FM-1000 displays): P/N 67258
TMX-2050™ /XCN-2050™ display: P/N 96700-00
TM-200 Module: P/N 95060-00
TM-200 Module to display cable: P/N 93843
TM-200 Module power I/O cable: P/N 92676
TM-200 Module battery cable: P/N 92905

Required components

Kits required	Special tools
Platform kit: P/N 56694-00	Deutsch DT pins and crimp tools Deutsch DTM pins, sockets, and crimp tools

Antenna mounting kits

Kits required
AG-15 antenna mounting plate: P/N 62034
Bracket, GPS - V Base Plate indexing: P/N 62388-02

Accessory kits

Kits required
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

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.

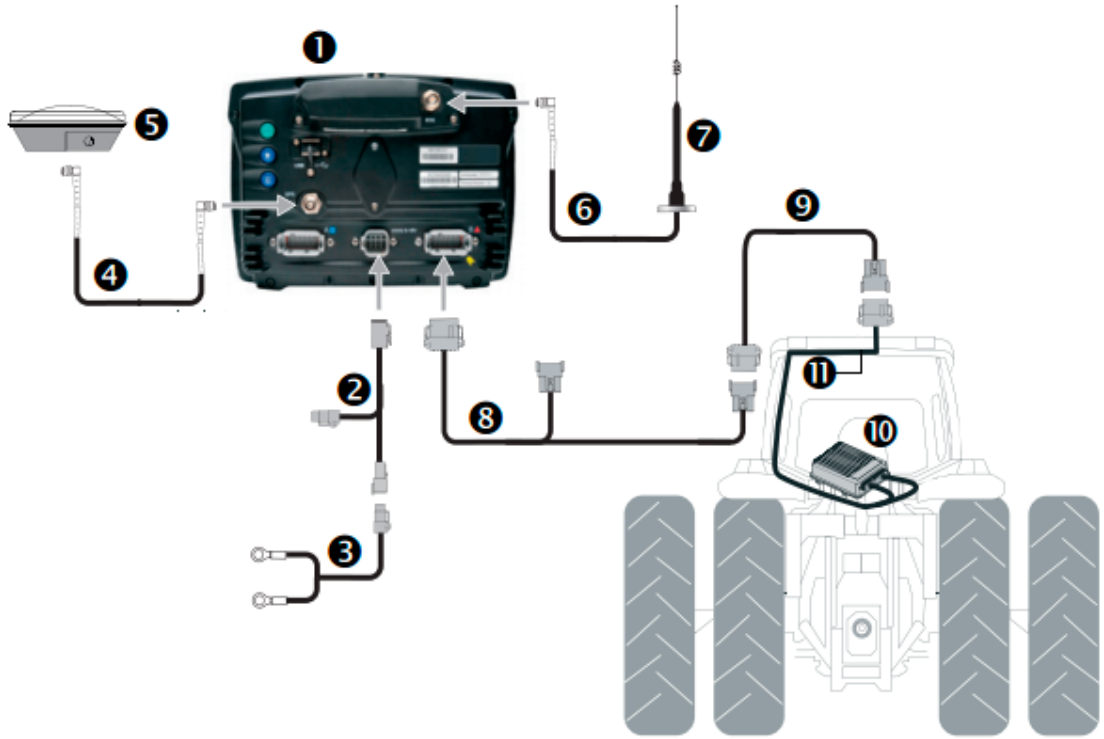
Chapter 2

DISPLAY INSTALLATION

- CFX-750/FM-750 display: Components
- CFX-750/FM-750 display: Preparation
- CFX-750/FM-750 display: Installation
- CFX-750/FM-750 display: Installing the wiring harness
- FmX/FM-1000 integrated display: Components
- FmX/FM-1000 integrated display: Preparation
- FmX/FM-1000 integrated display: Installation
- FmX/FM-1000 integrated display: Installing the wiring harness
- CFX-750/FM-750 display and FmX/FM-1000 integrated display connections
- TMX-2050/XCN-2050 display: Components
- TMX-2050/XCN-2050 display: Preparation
- TMX-2050/XCN-2050 display: Installing the AG-25 GNSS antenna
- Installing the GNSS antenna and plate
- Installing the RTK radio antenna

This chapter describes how to install and connect a Trimble display in the vehicle.

CFX-750/FM-750 display: Components



CAUTION – Connecting the Port Replicator on the Display to NavController II cable 5 to the P4 or P12 connector of the NavController II harness 12 will result in damage to the display, and will void the warranty.

CAUTION – If the vehicle has a battery disconnect, ensure that the terminal connections are made in such a way that when the battery is disconnected, the display is also disconnected.

Item	Description	Trimble part number
1	CFX-750/FM-750 display **Note –** *RTK password required.*	94110-xx
2	CFX-750/FM-750 power cable	77282
3	Basic power cable	67258
4	8 m GNSS TNC/TNC RT angle cable	50449
5	AG-25 GNSS antenna	77038-00
6	NMO-to-TNC 20 ft antenna cable and base	72122
7	900 MHz radio antenna kit	22882-10
8	CFX-750/FM-750 to NavController cable with port replicator	75741
9	CNH hybrid to GPS cable	67120
10	NavController II	55563-00
11	Factory-installed harness	N/A

CFX-750/FM-750 display: Preparation

Step 1

Locate the CFX-750/FM-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/FM-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/FM-750 display, see Chapter 4, CONTROLLER INSTALLATION.



CFX-750/FM-750 display: Installing the wiring harness

Step 1

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

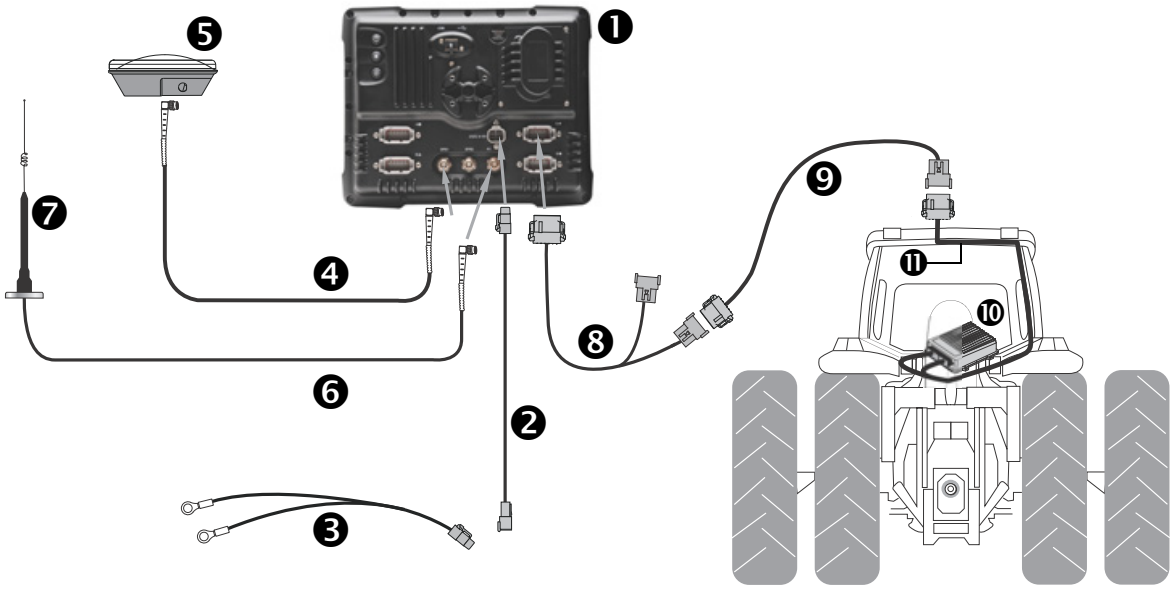
Step 2

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.



FmX/FM-1000 integrated display: Components

This figure shows how to connect the FmX/FM-1000 integrated display into a factory-ready CNH vehicle, to use RTK corrections:



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

CAUTION – If the vehicle has a battery disconnect, ensure that the terminal connections are made in such a way that when the battery is disconnected, the display is also disconnected

Item	Description	Trimble part number
1	FmX/FM-1000 integrated display	93100-02
2	FmX/FM-1000 power cable	66694
3	Basic power cable	67258
4	8 m GPS TNC/TNC RT angle cable	50449
5	Ag25 GNSS antenna	77038-00
6	NMO to TNC 20 ft antenna cable and base	62120
7	900 MHz radio antenna kit	22882-10
8	FmX/FM-1000 to NavController II cable with port replicator	75741
9	CNH hybrid to GPS cable	67120
10	NavController II	55563-00
11	Factory-installed harness	N/A

FmX/FM-1000 integrated display: Preparation

Step 1

Locate the FmX/FM-1000 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/FM-1000 integrated display: Installation

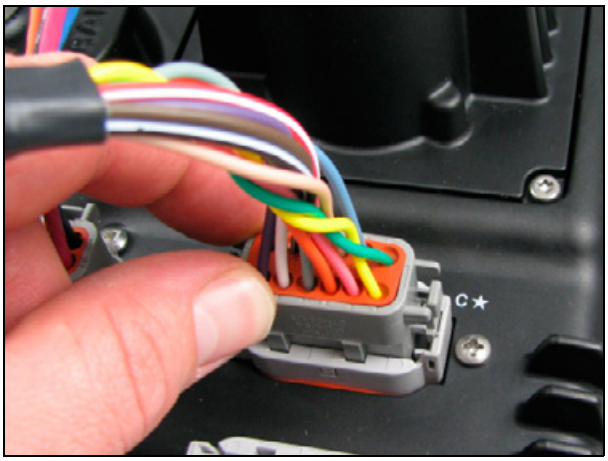
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

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

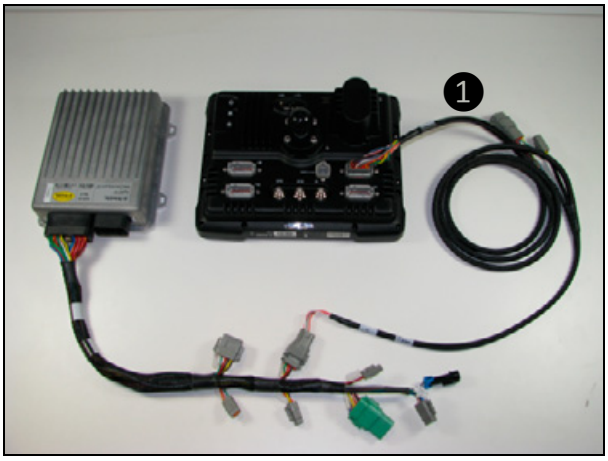
Connect the cable to the C port of the FmX/FM-1000 integrated display.



FmX/FM-1000 integrated display: Installing the wiring harness

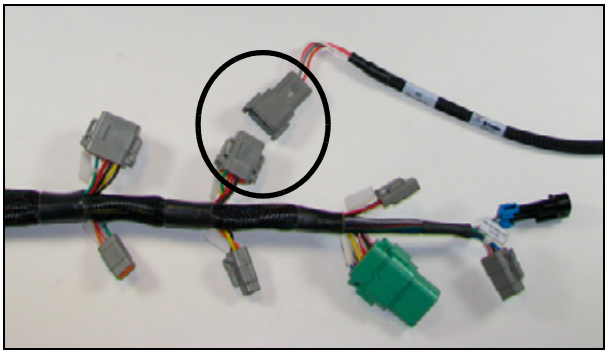
Step 1

Locate the cable that connects the FmX/FM-1000 integrated display to the NavController II ❶, P/N 75741.



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/FM-1000 integrated display.



CFX-750/FM-750 display and FmX/FM-1000 integrated display connections

Connecting accessory options

Note – *Unless otherwise stated, "the display" applies to the CFX-750/FM-750 display or the FmX/FM-1000 integrated display.*

AgCam

The AgCam and AgCam cable are accessory items that you can purchase separately from the display. The CFX-750/FM-750 display allows up to two video inputs; the FmX/FM-1000 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/FM-750 display



FmX/FM-1000 integrated display

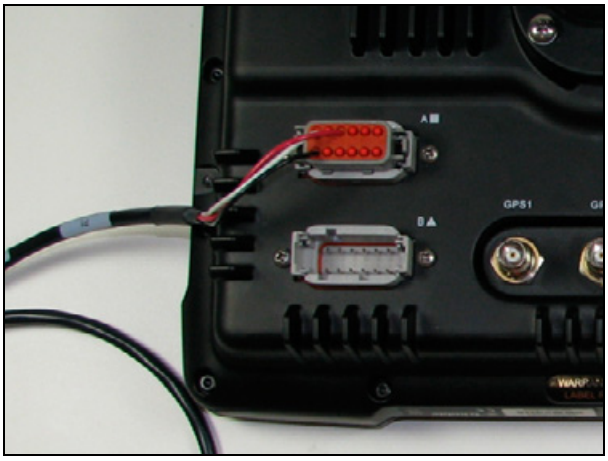
Step 3

Connect the AgCam cable to the display adaptor cable.

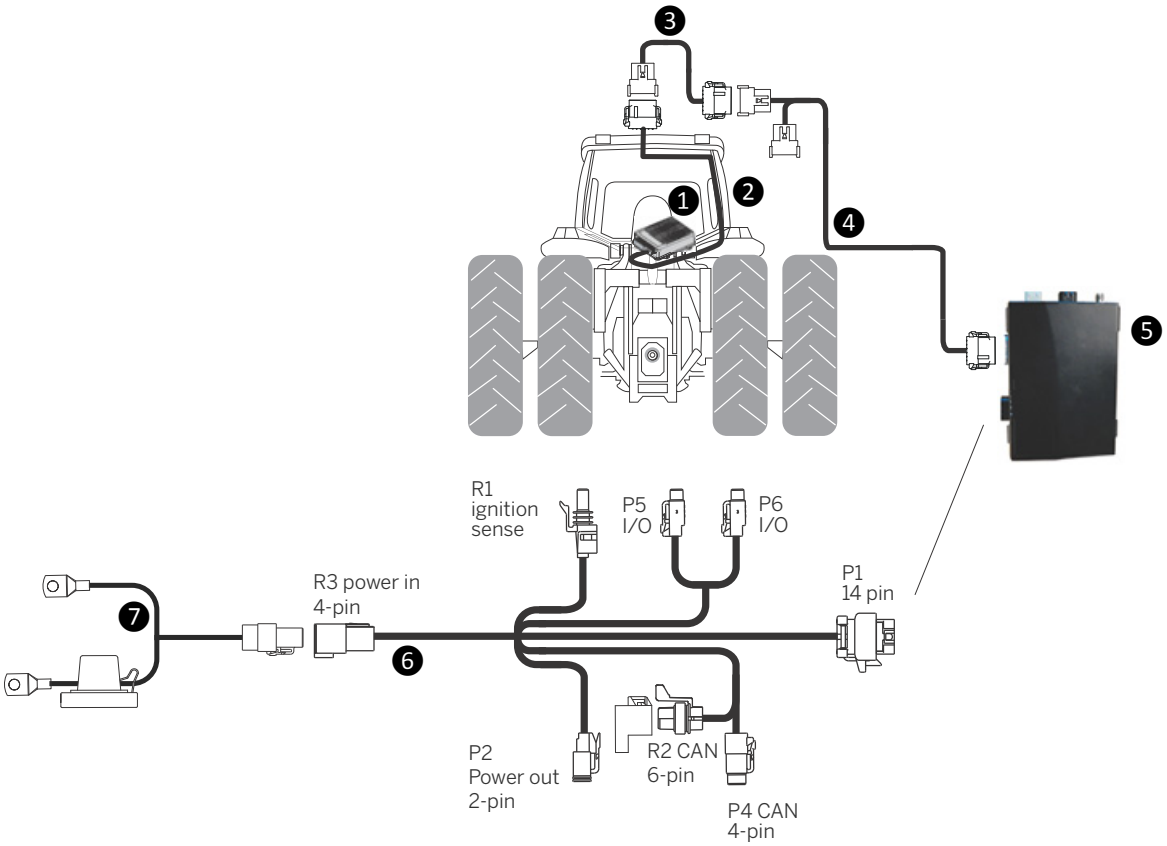


Step 4

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



TMX-2050/XCN-2050 display: Components



CAUTION – If the vehicle has a battery disconnect, ensure that the terminal connections are made in such a way that when the battery is disconnected, the display is also disconnected

Item	Description	Trimble part number
1	NavController	55563-00 55566-00
2	Factory installed harness	
3	CNH hybrid to GPS cable	67120
4	TM-200 Module to NavController cable with port replicator	75741
5	TM-200 Module	95060-00
6	TM-200 Module power and I/O cable	92676
7	Cable, battery	92905

TMX-2050/XCN-2050 display: Preparation

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

Install 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.

Step 1

Use the provided bolts to attach the bar mount **4** to a rail in the cab.

Step 2

Use the supplied screws to firmly attach the mounting plate **1** to the back of the TMX-2050/XCN-2050 display.

Step 3

Turn the tightening arm **3** to loosen the Zirkona mount **2**.

Step 4

Adjust the TMX-2050/XCN-2050 display until it is positioned where you want it. Turn the tightening arm **3** in the other direction to tighten the Zirkona mount **2**.



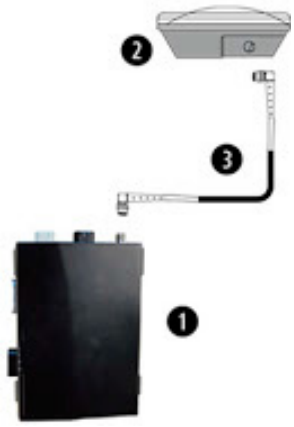
Item	Description
1	Mounting plate
2	Zirkona mount
3	Tightening arm
4	Bar mount



TMX-2050/XCN-2050 display: Installing the 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. The GNSS antenna may experience interference if you operate the vehicle within 100 m (300 ft) of any power line, radar dish, or cell phone tower.



Item	Description	Trimble part number
1	TM-200 Module	95060-00
2	AG-25 GNSS antenna cable	50449
3	AG-25 GNSS antenna	77038-00

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

Note – *If you are using the AG-25 GNSS antenna with a steering system, see the installation instructions for the steering system to determine the proper location for mounting the antenna.*

1. Connect the antenna cable to the AG-25 GNSS antenna.
2. Place the antenna on the roof of the vehicle, at the front and centered from left to right.
3. On the mounting plate, remove the protective covers from the adhesive strips.
4. Attach the mounting plate to the vehicle roof with the adhesive strips.
5. Place the antenna on top of the mounting plate.
6. Route the other end of the antenna cable into the cab.
7. Connect the GNSS antenna cable to the TM-200 Module.

Note – *To minimize any interference to the GNSS signal, make sure that any other antenna(including a radio antenna is at least 1 m (3 ft) from the AG-25 GNSS antenna.*

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 9.

Use the VHB adhesive method to install the GNSS antenna and plate.

VHB adhesive method

Standard 5" x 5" plates (P/N 62034) are provided in most kits. You can use Very High Bond (VHB) to attach either a 5" x 5" plate (P/N 62034) 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 the P/N 62034 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.

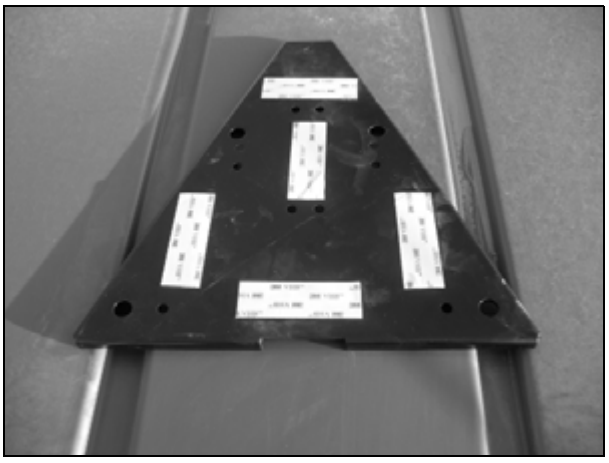


Step 2

V plate only

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

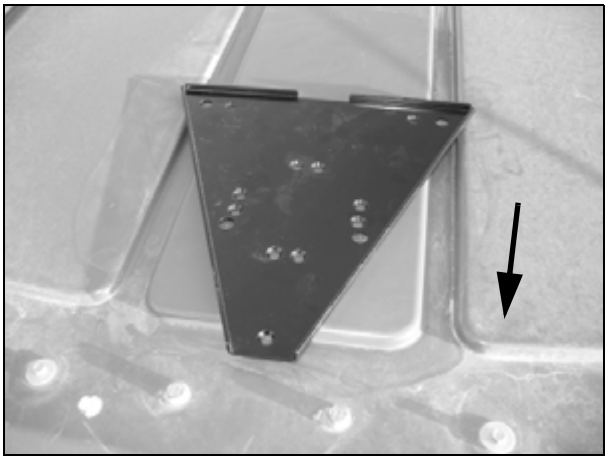
Note – *The VHB strips are pre-applied to the P/N 62034 plate.*



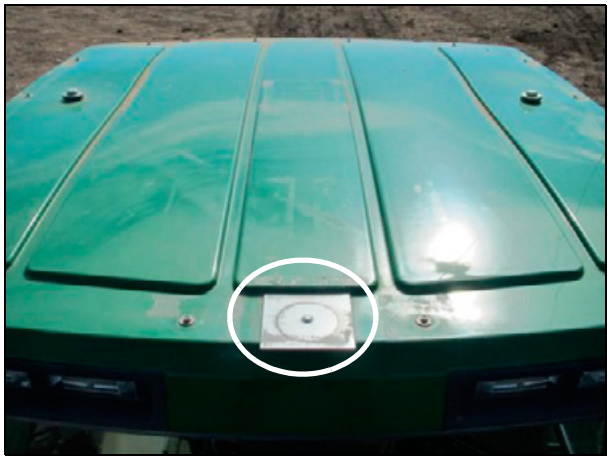
Step 3

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.*



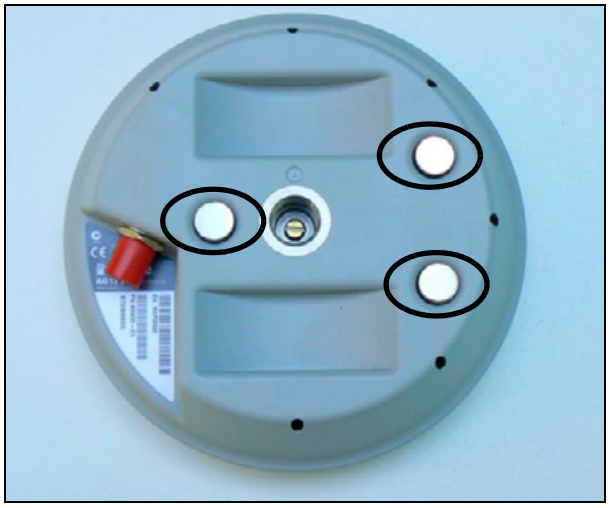
V plate



P/N 62034

Step 4

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



Otherwise, attach the large magnet with a 5⁄8" stud to the GNSS antenna.



Step 5

GLONASS, RTK, RTX, OmniSTAR HP/XP/G2, DGPS, applications

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



WAAS, EGNOS, OmniSTAR VBS applications

Attach the antenna to the center of the P/N 62034, 5" x 5" 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.



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 P/N 62034 plate with the VHB provided to relocate the antenna.



Step 3

Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the P/N 62034 plate with the VHB provided to relocate the antenna.



Chapter 3

ANTENNA / RECEIVER INSTALLATION

- Antenna and receiver installation options
- AG-372 receiver with AgGPS 450/900 radio module (if equipped) components
- Installing the AG-372 GPS receiver with AgGPS 450/900 radio module (if equipped)
- Installing the optional RTK radio (as required)
- Installing an AG-372 receiver with magnetic feet
- AgGPS 542 receiver components
- Installing the AgGPS 542 receiver
- Antenna and receiver installation options
- FmX/FM-1000 / Autopilot / Factory-ready CNH vehicle / external receiver
- TMX-2050/XCN-2050 / Autopilot / Factory-ready CNH vehicle / external receiver
- This figure shows how to connect the TMX-2050/XCN-2050 display into a factory ready CNH vehicle, using the Autopilot system and an AG-372 external receiver.
- Legacy displays: Installing the P4 display jumper for all vehicles, except combines
- Installing the P4 display jumper for combines

This chapter describes how to install the required receiver and antenna, and radio module (if used).

To install the antenna for the CFX-750/FM-750 or FmX/FM-1000 display, see Chapter 2, 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:

- VHB mount – Attach a P/N 62034 plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 32.
- 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	Mounted to roofrack
CFX-750/FM-750 display; FmX/FM-1000 integrated display TMX-2050/XCN-2050 display (TM-200 Module)	✓	✓	✘
AG-372 receiver	✘	✓	✓
Trimble *Ag*GPS® 542 receiver	✓	✓	✘

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

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 P/N 62034 plates are provided in most kits. You can use the VHB mounting method to attach either a P/N 62034 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 P/N 62034 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.

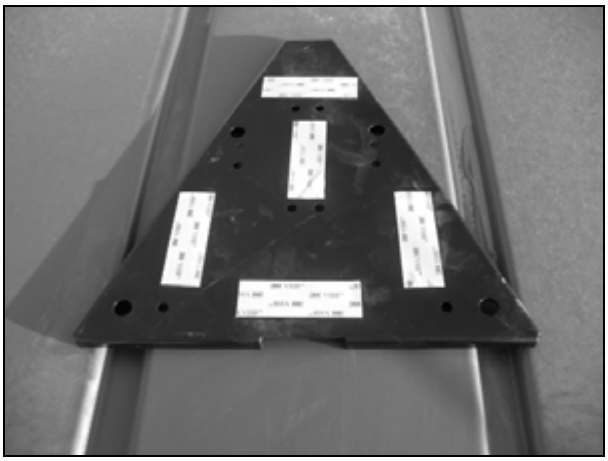


Step 2

V plate only

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

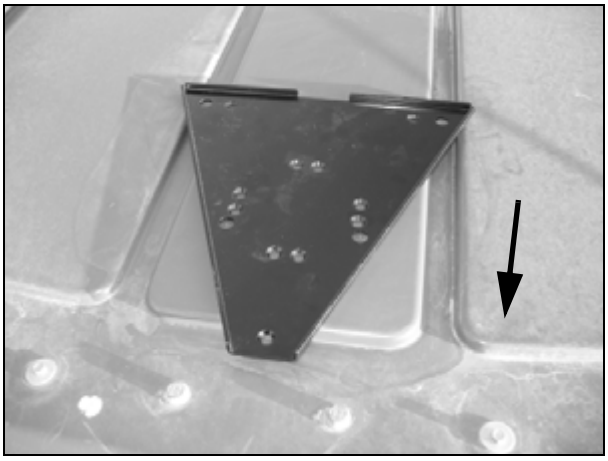
Note – *The VHB strips are pre-applied to the P/N 62034 plate.*



Step 3

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

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

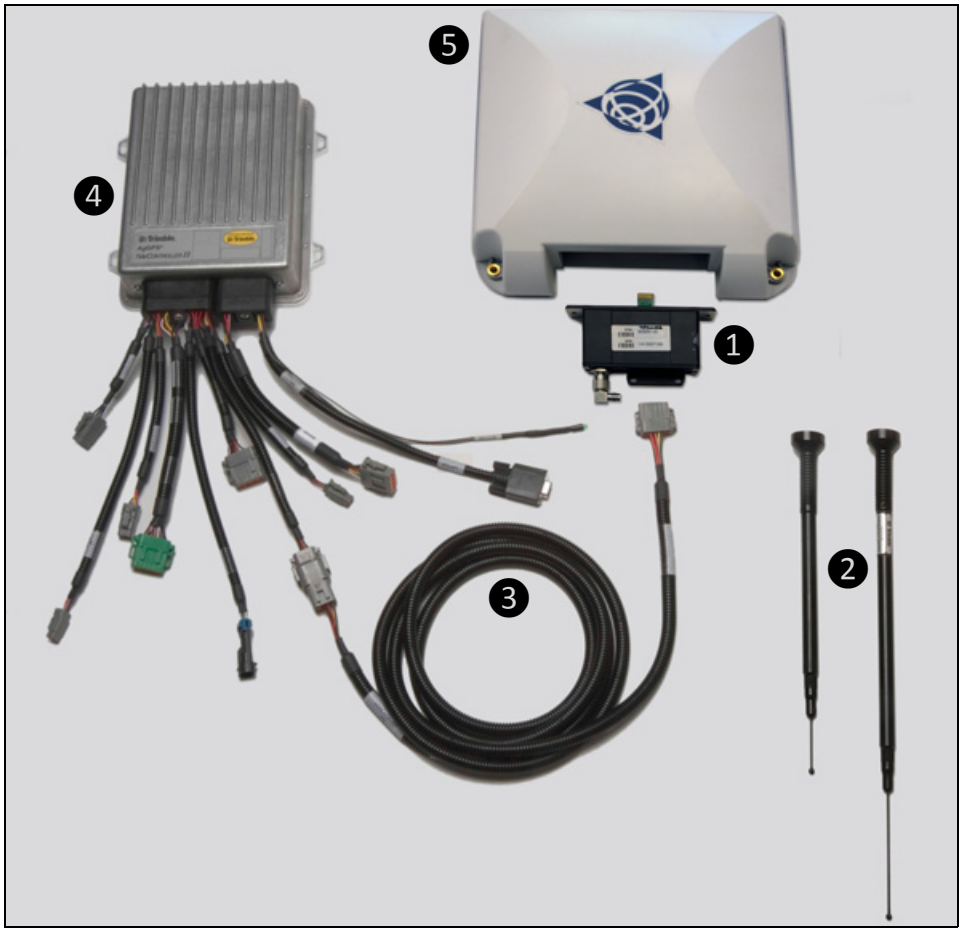


V plate



P/N 62034

AG-372 receiver with AgGPS 450/900 radio module (if equipped) components



Item	Description	Trimble part number
1	AgGPS 450 or 900 radio (if equipped)	
2	Radio antenna cable and magnetic mount	
3	AgGPS 450 or 900 radio antenna	
4	Antenna/receiver cable	54608
5	Autopilot controller	

Installing the AG-372 GPS receiver with AgGPS 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:

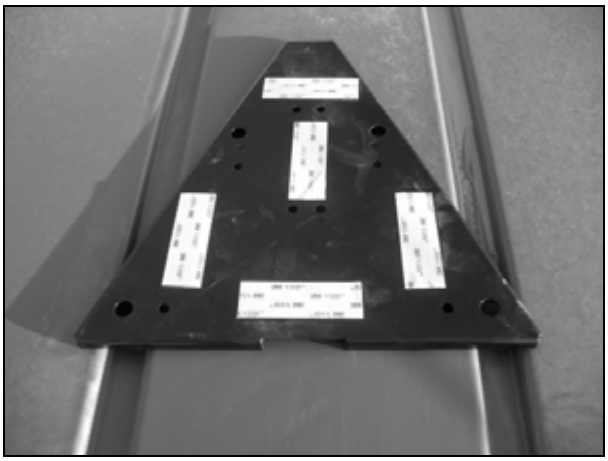
- For a removable installation, attach a V plate to a spar and then stick the receiver plate to the V plate with magnets.
- For a permanent installation, bolt the receiver plate to a spar.

Removable installation

Step 1

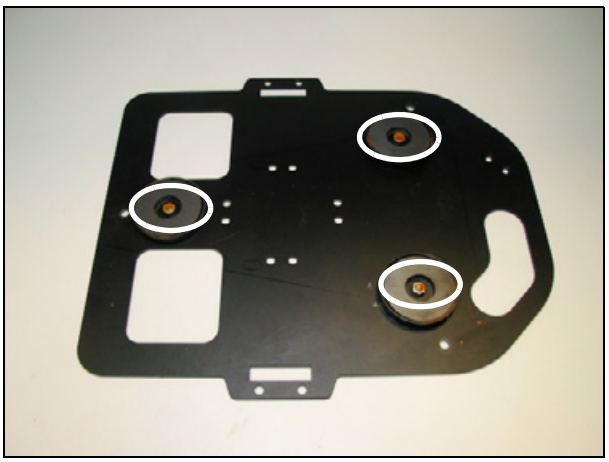
V plate

Use VHB to attach the V plate to the roof. Ensure that the narrow end points forward.



Mounting plate

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



Underside of plate

Installing the optional RTK radio (as required)

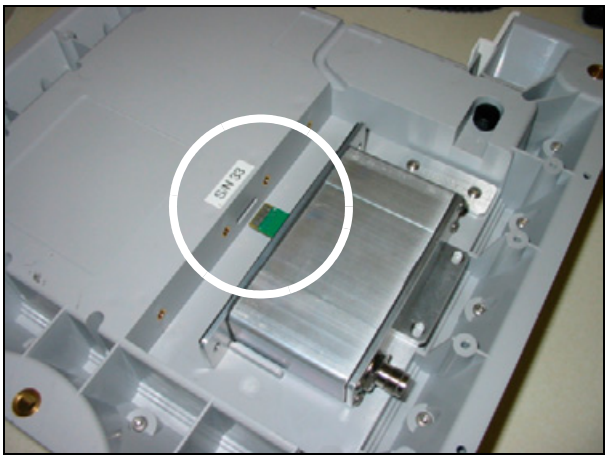
Step 1

Remove the blanking plate and set it aside.



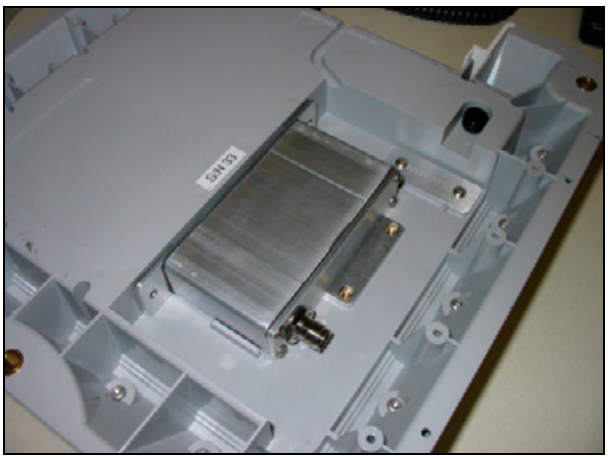
Step 2

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.



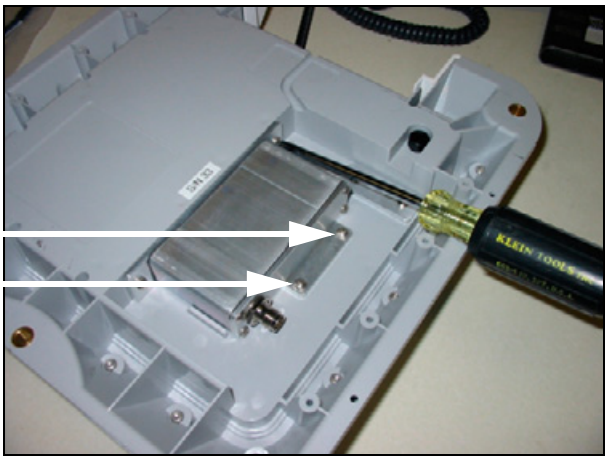
Step 3

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



Step 4

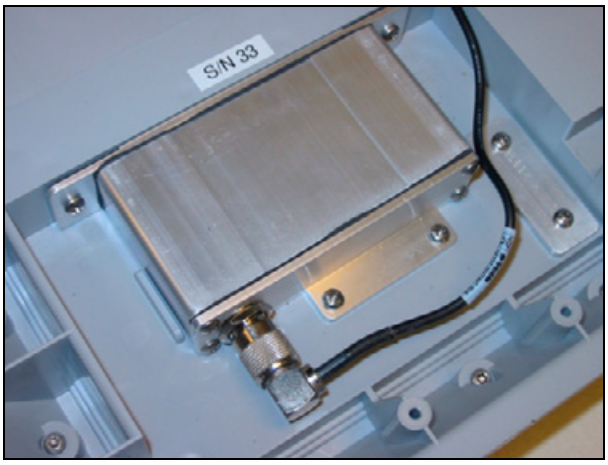
Use a #1 or #2 Phillips screwdriver and the supplied screws to install the integrated radio. First insert and tighten the two screws on the horizontal wall (arrowed), and then insert the remaining screws.



Step 5

Install the supplied antenna cable.

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

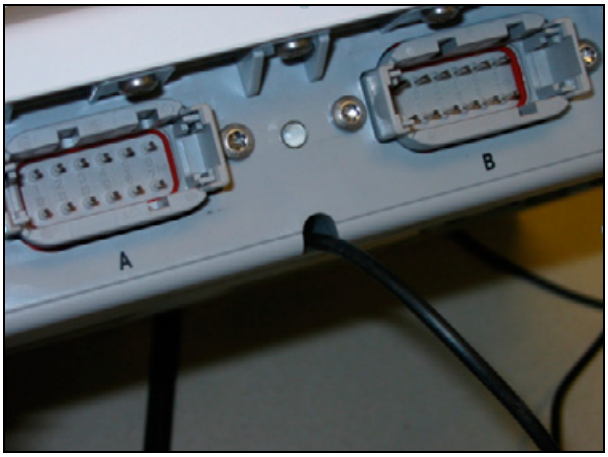


Step 6

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

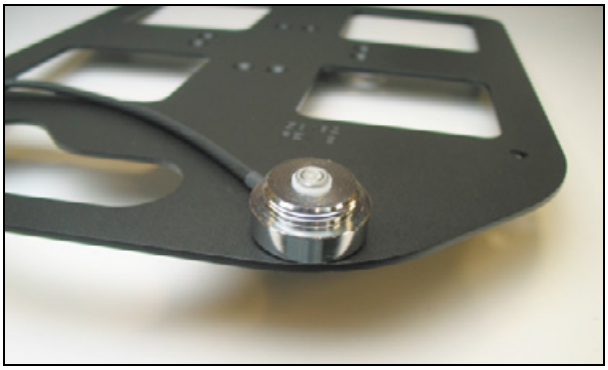


This image shows the unit with the cable routed through the channel.



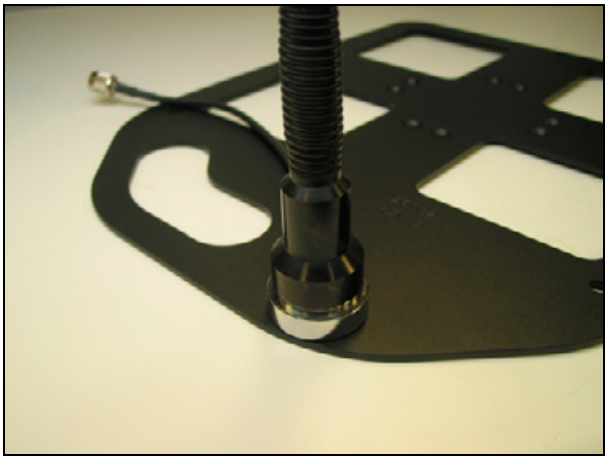
Step 7

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



Step 8

Attach the radio antenna to the antenna base.



Step 9

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.



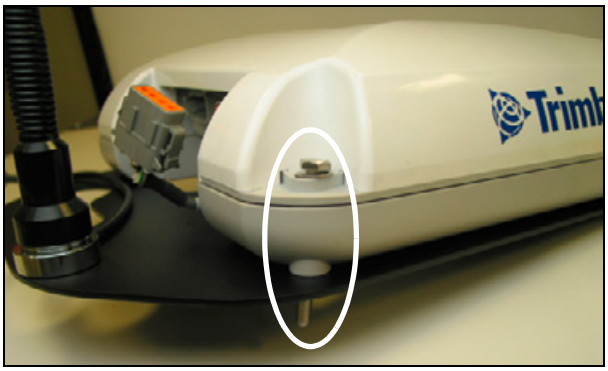
Step 10

Insert the nylon bushings provided.



Step 11

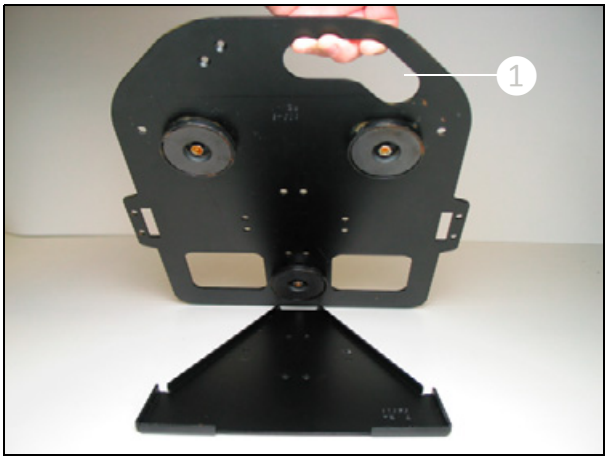
Insert the bolts through the receiver, radio, and mounting bracket. Place nuts on the bolt ends and then tighten them.



Step 12

Magnet method

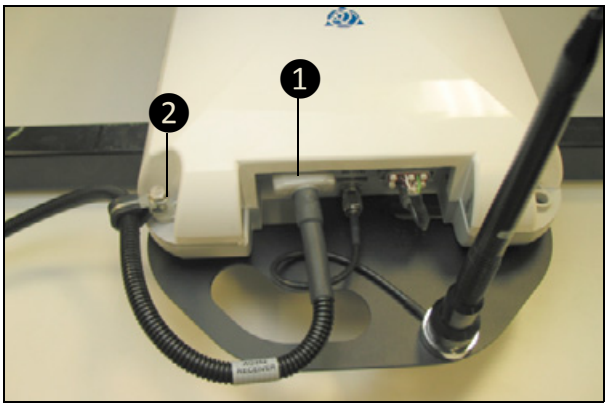
Place the receiver on the roof by aligning the magnets with the V plate. Ensure that the handle 1 is toward the back of the vehicle.



Step 13

Connect the cable from the cab controller into port A 1 of the AG-372 receiver. Bolt the cable clamp 2 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

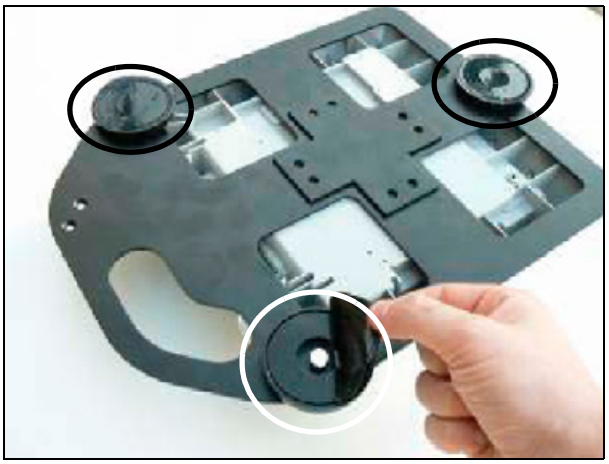
Attach the magnets to the receiver mounting plate. Use the three ¼" bolts to mount the AG-372 receiver.

Place the nuts on the receiver side.



Step 2

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

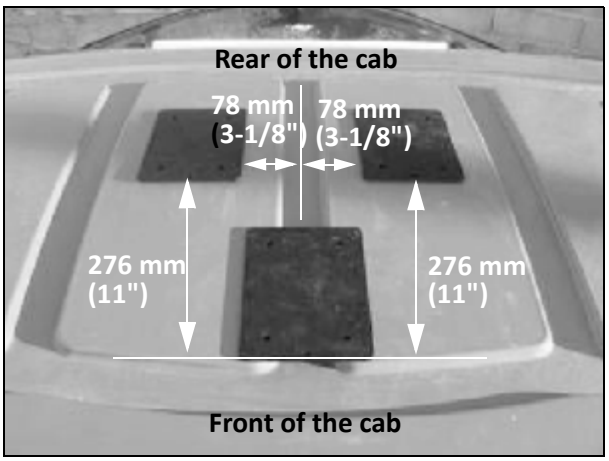


Step 3

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

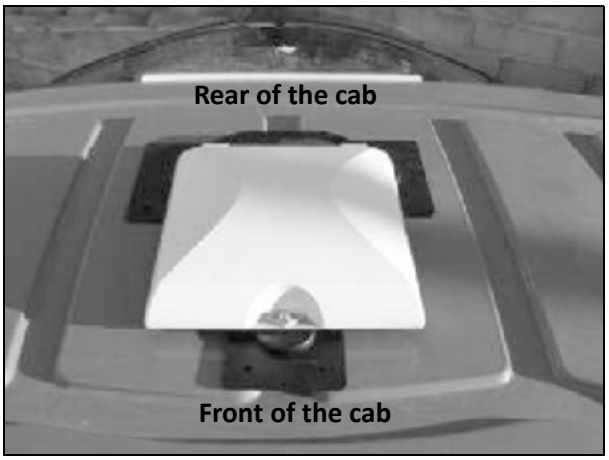
Remove the backing from the VHB strips and then apply the plates to the cab roof.

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.

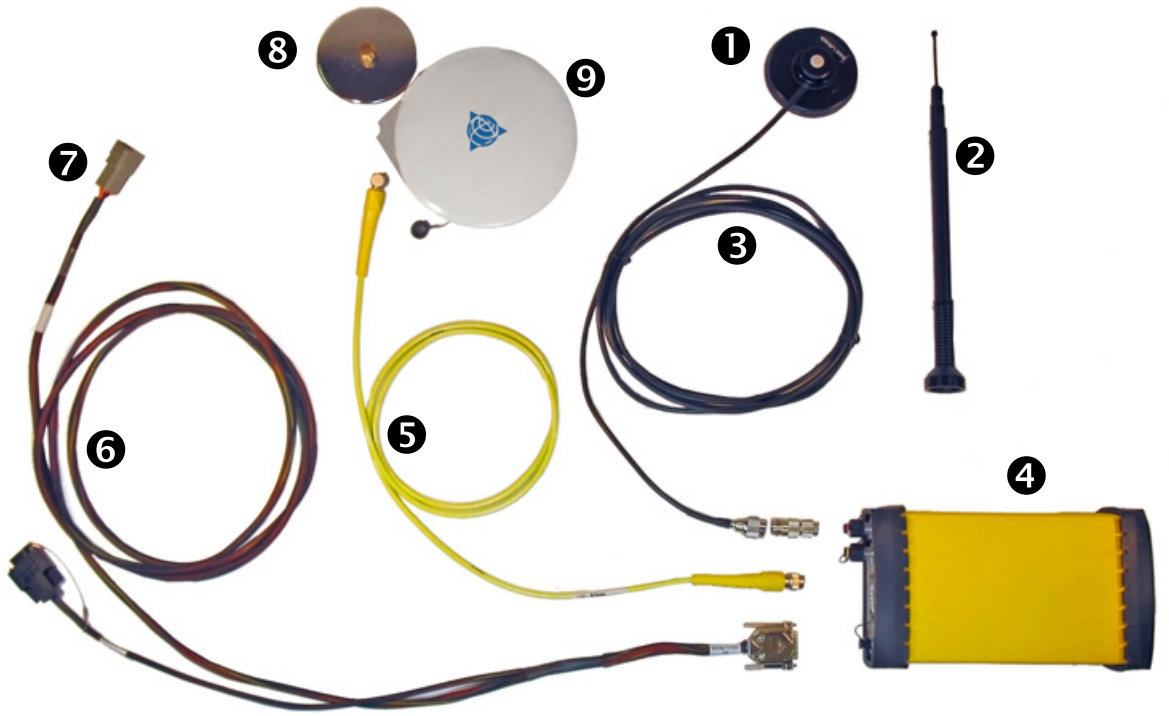


Step 5

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



AgGPS 542 receiver components



Item	Description	Trimble part number
1	Radio antenna magnetic base	
2	Radio antenna	
3	Radio antenna cable	
4	*Ag*GPS 542 GPS receiver	
5	Antenna cable	
6	Receiver cable	62037
7	To controller "P3 GPS"	
8	Antenna magnetic mount	
9	*Ag*GPS 542 GPS receiver	

Installing the AgGPS 542 receiver

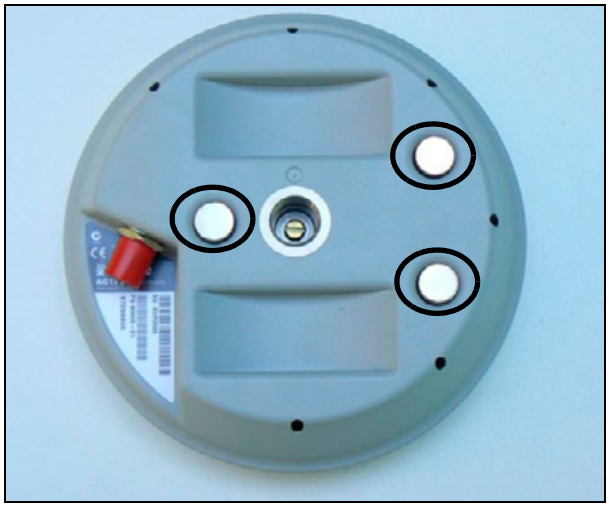
WARNING – To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

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



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



Step 2

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.

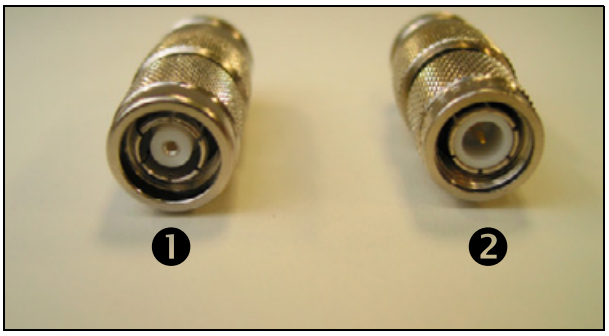


Step 5

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.



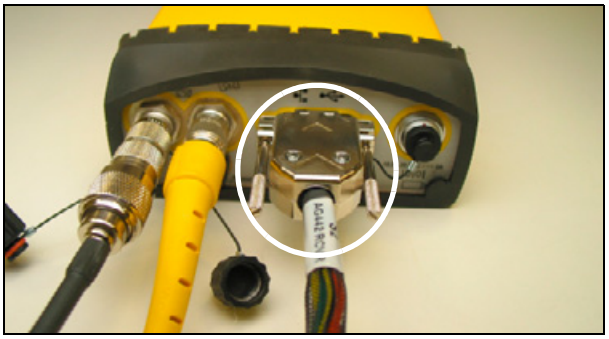
Step 7

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 later.



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.



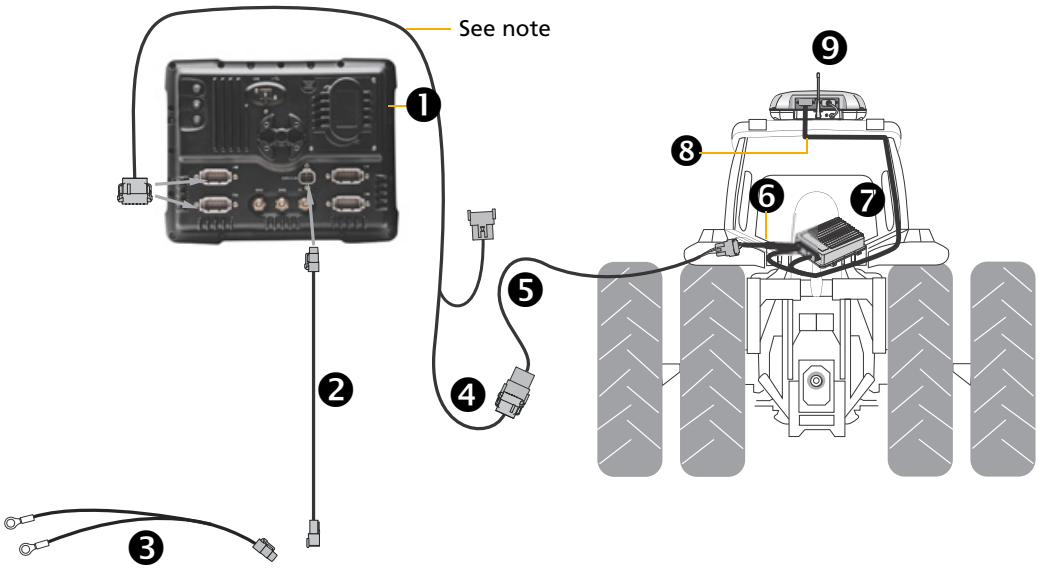
Antenna and receiver installation options

Possible mounting methods

GPS receiver	V plate on spar (removable)	VHB plate on roof (removable)	Standard *Ag*GPS 252/262 plate bolted to spar (permanent)
*Ag*GPS 252/262 receiver AG-372 receiver	3	x	3
*Ag*GPS 432/442 receiver	3	x	x

FmX/FM-1000 / Autopilot / Factory-ready CNH vehicle / external receiver

This figure shows how to connect the FmX/FM-1000 integrated display into a factory ready CNH vehicle, using the Autopilot system and an Ag25 external receiver:



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

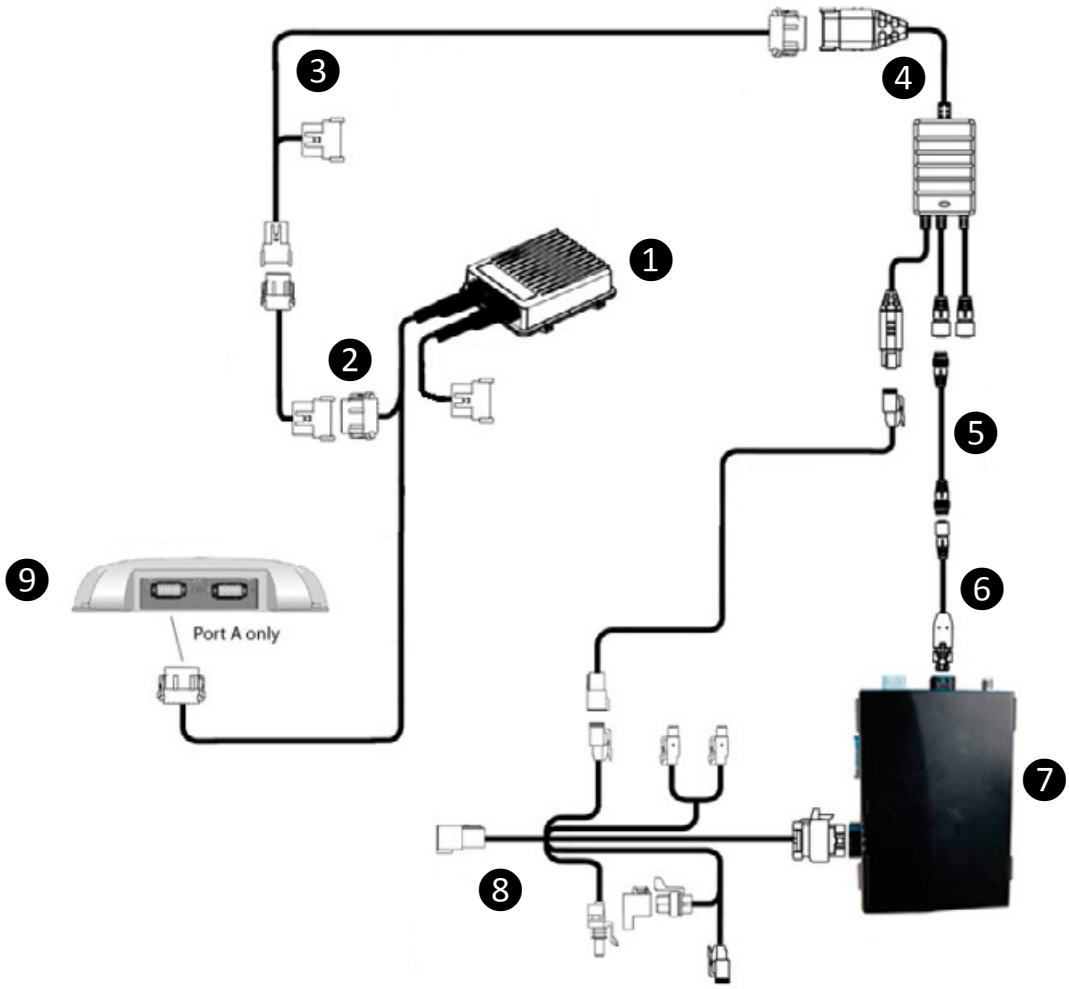
CAUTION – If the vehicle has a battery disconnect, ensure that the terminal connections are made in such a way that when the battery is disconnected, the display is also disconnected.

Note – *Connect only to port A or B on the FmX/FM-1000 integrated display.*

Item	Description	Trimble part number
1	FmX/FM-1000 integrated display	93100-02
2	FmX/FM-1000 power cable	66694
3	Basic power cable	67258
4	FmX/FM-1000 to NavController II cable with port replicator	75741
5	8-pin to 12-pin DTM adaptor cable	76442
6	CNH hybrid P4 extension cable kit	56694-00S
7	NavController II	55563-00
8	Factory installed harness	N/A
9	*Ag*GPS 252/262/ AG-372 receiver	Varies

TMX-2050/XCN-2050 / Autopilot / Factory-ready CNH vehicle / external receiver

This figure shows how to connect the TMX-2050/XCN-2050 display into a factory ready CNH vehicle, using the Autopilot system and an AG-372 external receiver.



Item	Description	Trimble part number
1	NavController III	55566-00
2	8-pin to 12-pin DTM adaptor cable	76442
3	Display to NavController cable with port replicator	75741
4	EXP-100 port expander	101895-00
5	EXP-100 patch cable	102730
6	TM-200 Module to Ethernet cable	100904
7	TM-200 Module	95060-00
8	TM-200 Module power and input cable	92676
9	AG-372 receiver	
10	Machine AGR harness	N/A

Legacy displays: Installing the P4 display jumper for all vehicles, except combines

Note – *The P4 display connection is used for legacy displays. It is not needed for FmX/FM-1000, CFX-750/FM-750, or TMX-2050/XCN-2050 display installations.*

Case IH, AccuGuide Ready

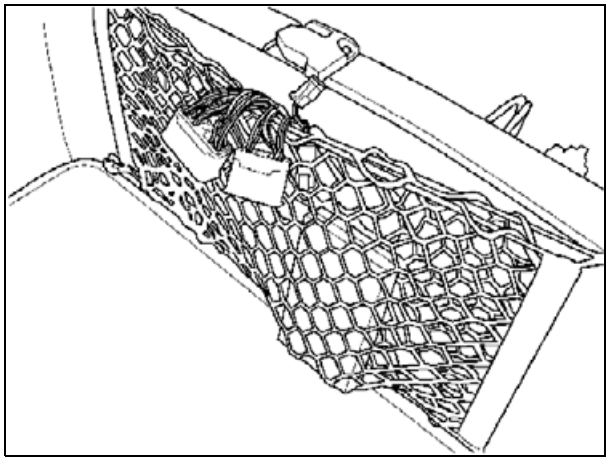
- Floaters
- MFWD tractors
- Self-propelled sprayers
- Articulated tractors

New Holland IntelliSteer Ready

- MFWD tractors
- Articulated tractors

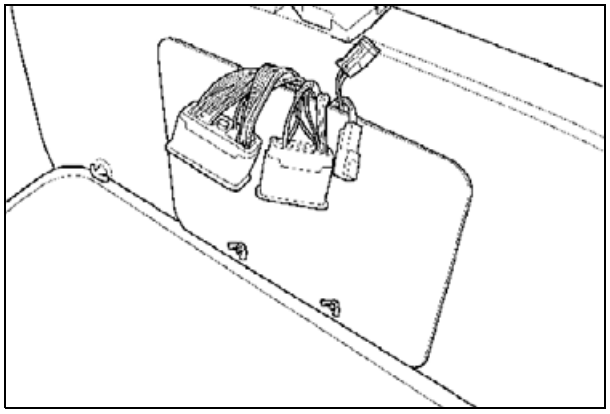
Step 1

Remove the net from the rear cab wall.



Step 2

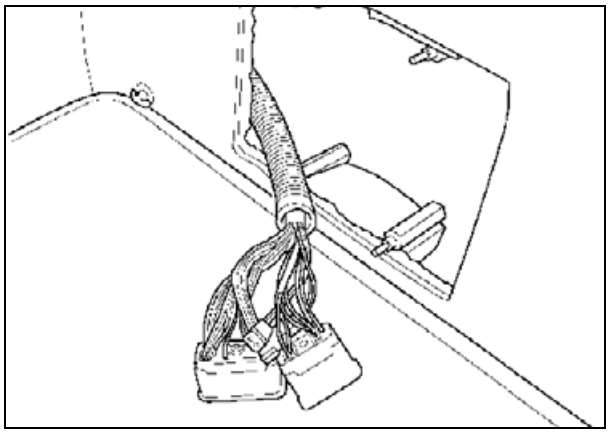
Remove the four wing nuts from the rear controller cover and remove the cover.



Step 3

Remove the protective covers from the auto-guidance connectors.

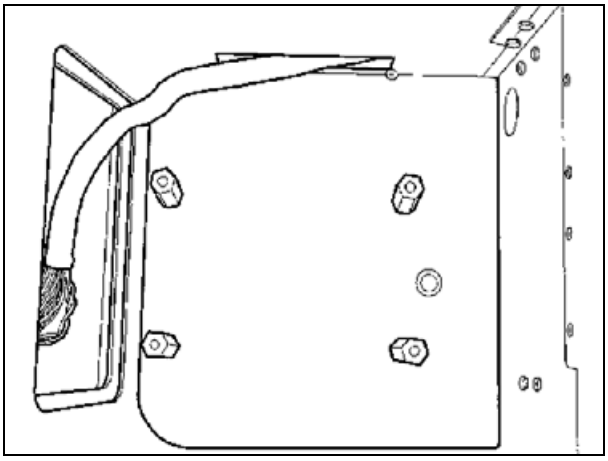
Continue with All controllers, page 52.



FLX, SPX4420, TJ, T9000 and STX only

Step 1

Open the instructor seat and remove the tray.
Unscrew the four hex spacers from the cab floor.



Step 2

Locate the guidance harness under the instructor seat.

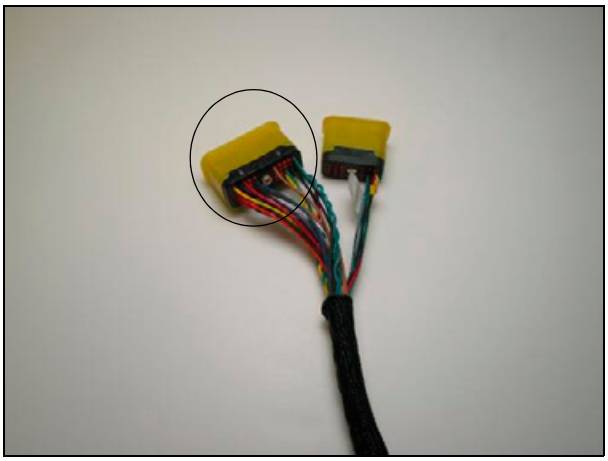
Continue with All controllers, below.



All controllers

Step 1

Locate the 40-pin Deutsch connector at the end of the guidance cable and the display P4 jumper cable.



Step 2

Install the display jumper.

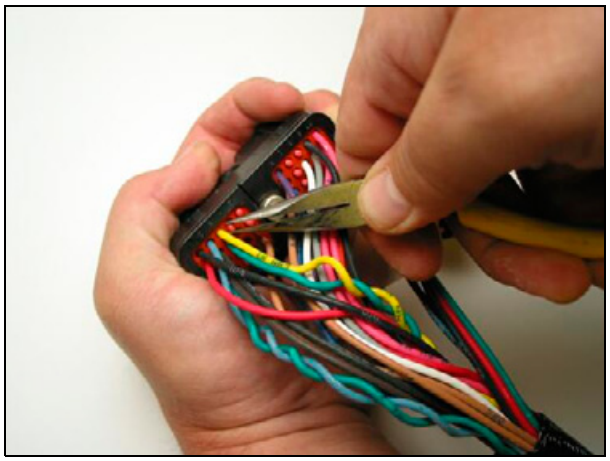


Item	Description
1	Display jumper
2	Display connector

Step 3

Remove the plastic seals in pins 33, 4, and 14.

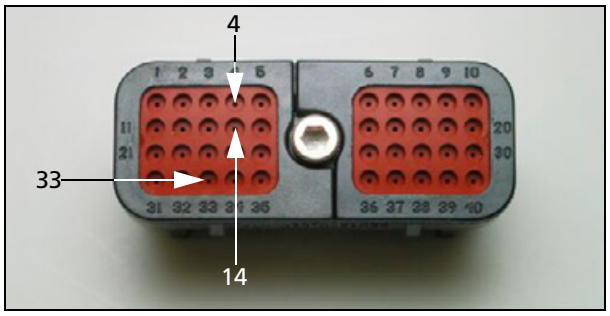
Use the table above as a guide to insert the loose wires on the display jumper (P4).



Wire ID#	Conn term Guidance	Conn term Jumper	Description
1 (red/white)	P1-33	P4-2	Autopilot display port RS232 TX
2 (orange)	P1-4	P4-3	Autopilot display port RS232 RX
3 (green)	P1-14	P4-5	Autopilot display port RS232 GND

Note – *The cavity numbers are embossed on the connector and read left to right and top to bottom.*

Note – *Wire ends from the display jumper (P4) for power are not used.*

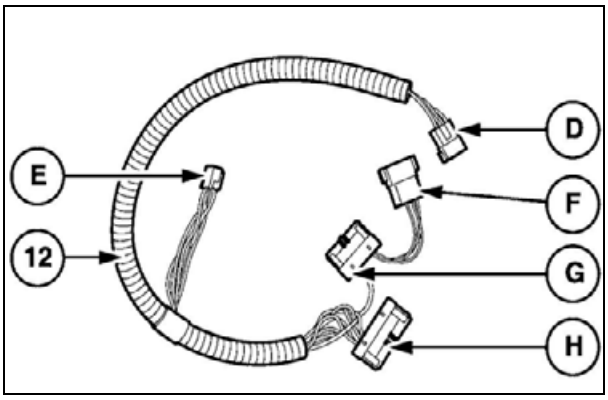


Installing the P4 display jumper for combines

Note – *The P4 display connection is used for legacy displays. It is not needed for FmX/FM-1000, CFX-750/FM-750, or TMX-2050/XCN-2050 display installations.*

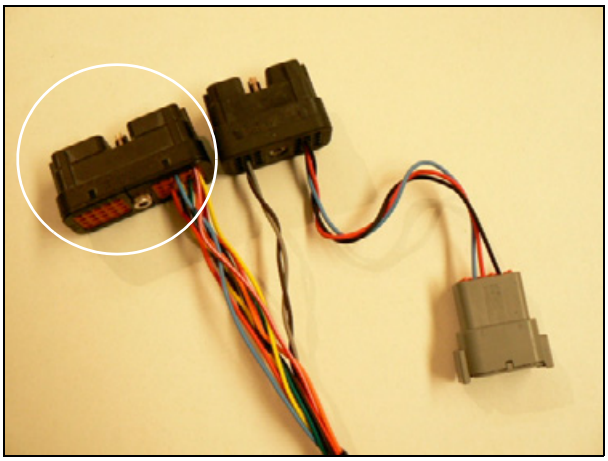
Step 1

Locate the NavController II wiring harness ⓬. This is available from the CNH GPS Guidance Kit.



Step 2

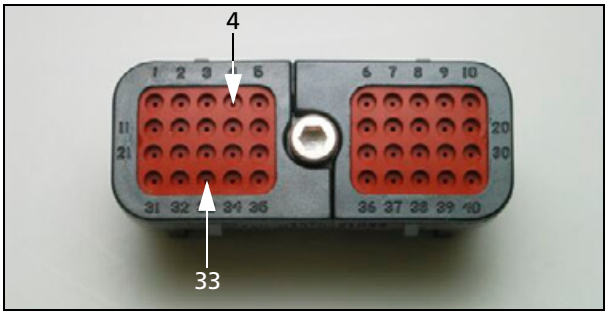
Locate the 40-pin Deutsch connector (H) at the end of the guidance cable.



Step 3

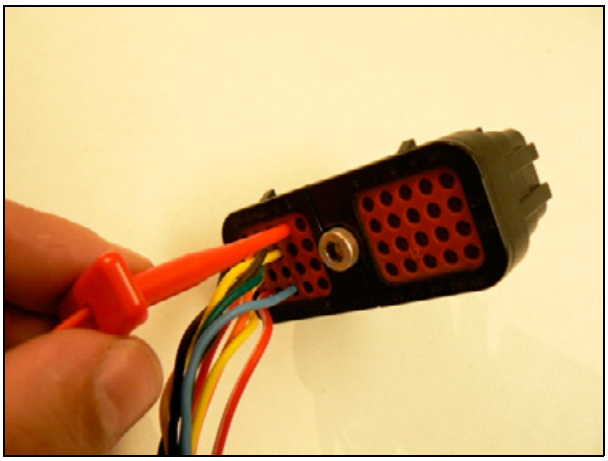
Locate cavity 4 and 33 on the back of the connector.

Note – *The connector is displayed without wires for clarity. The cavity numbers are embossed on the connector and read left to right and top to bottom.*



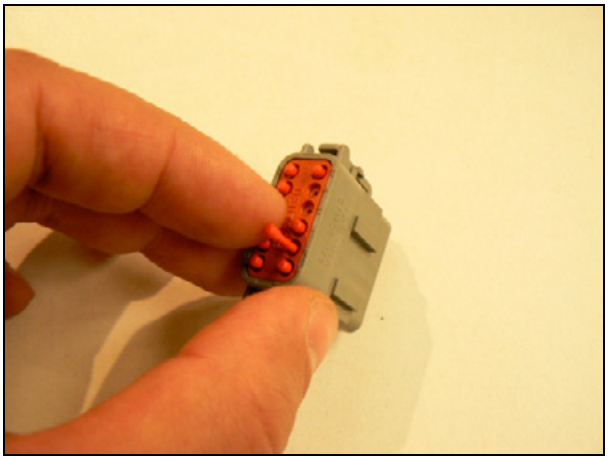
Step 4

Use the pin removal tools to extract the red and blue wires from cavities 4 and 33.



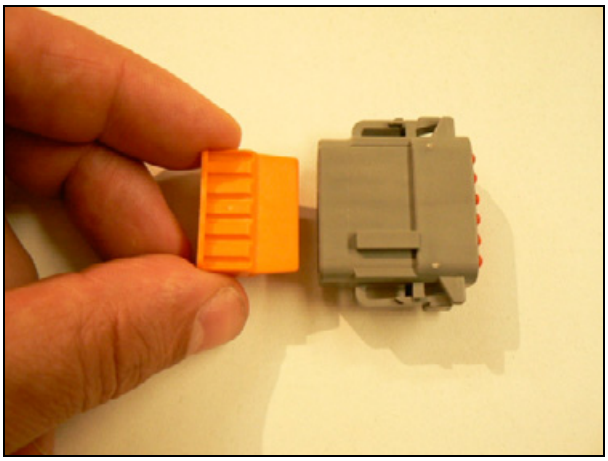
Step 5

Use a DTM06-12S connector (not provided) and remove the plastic seals from the pin 2 and 3 positions.



Step 6

Remove the wedge from the connector.

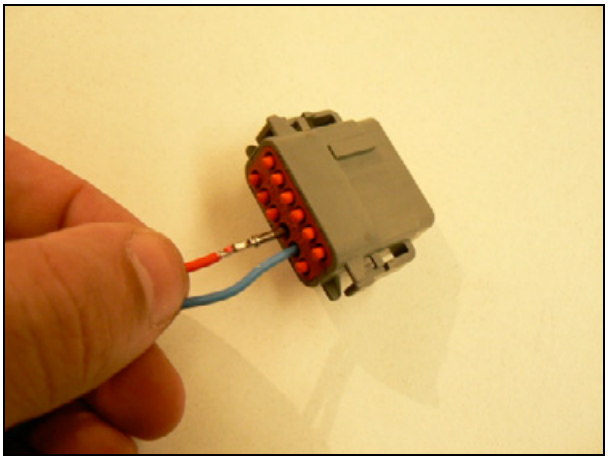


Step 7

Insert the loose wires from the 40-pin connector into the DTM06-12S connector as shown in the table.

Wire ID #	Connector terminal DTM06-12S	Description
1212 (blue)	DTM06-2	NMEA RS232 TX
1211 (red)	DTM06-3	NMEA RS232 RX

Pull back on the wires to seat them and then replace the wedge.

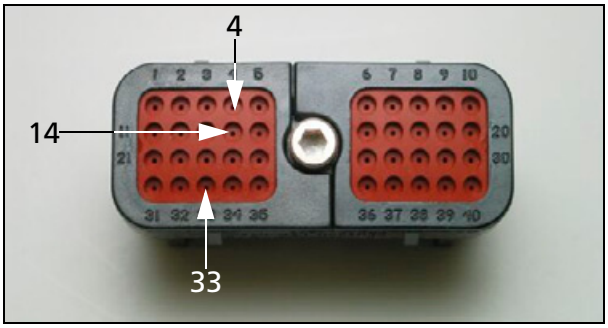


Step 8

Remove the plastic seal in pin 14.

Locate cavity 4 and 33.

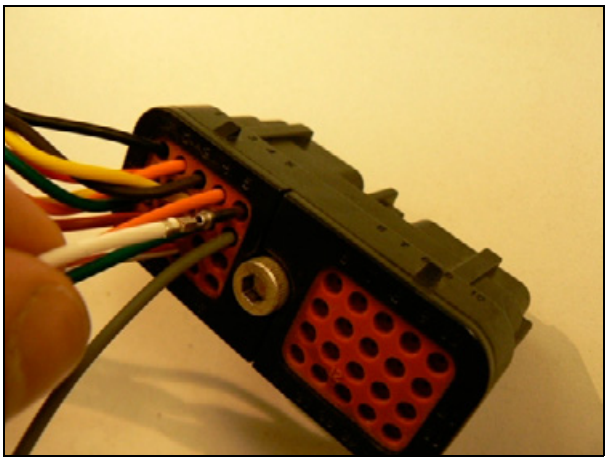
Note – *The connector is displayed without wires for clarity. The cavity numbers are embossed on the connector and read left to right and top to bottom.*



Step 9

Insert the loose wires on the Display jumper (**P4**) into the 40-pin connector as shown in the table.

See also Step 2, page 52.



Wire ID #	Connection terminal Guidance	Connection terminal Jumper	Description
1 (red/white)	P1-33	P4-2	Display RS232 TX
2 (orange)	P1-4	P4-3	Display RS232 RX
3 (green)	P1-14	P4-5	Display RS232 GND

Chapter 4

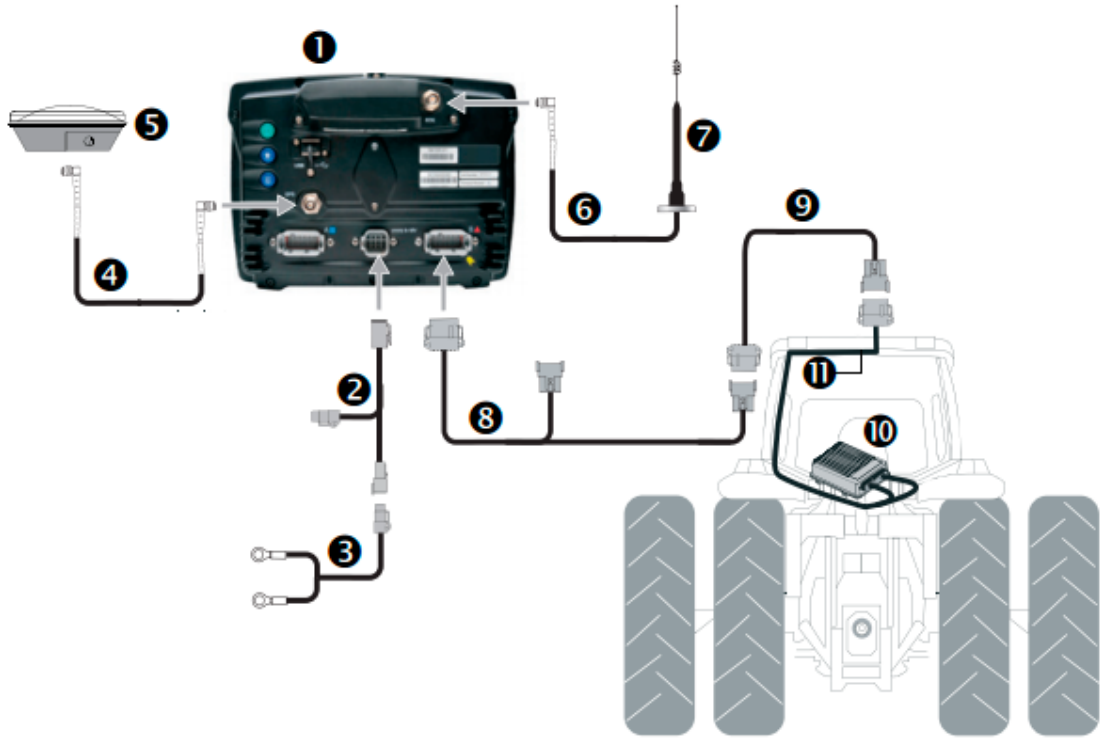
CONTROLLER INSTALLATION

- CFX-750/FM-750 / Factory ready CNH vehicle
- FmX/FM-1000 / Factory ready CNH vehicle
- TMX-2050/XCN-2050 / Factory ready CNH vehicle
- Cable overview
- Installing the controller
- Installing the controller P4 connector for combines
- Configuring CAN jumper for an STX/TJ 2006 model
- Configuring CAN jumper for an STX/TJ 2007 model

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.

CFX-750/FM-750 / Factory ready CNH vehicle

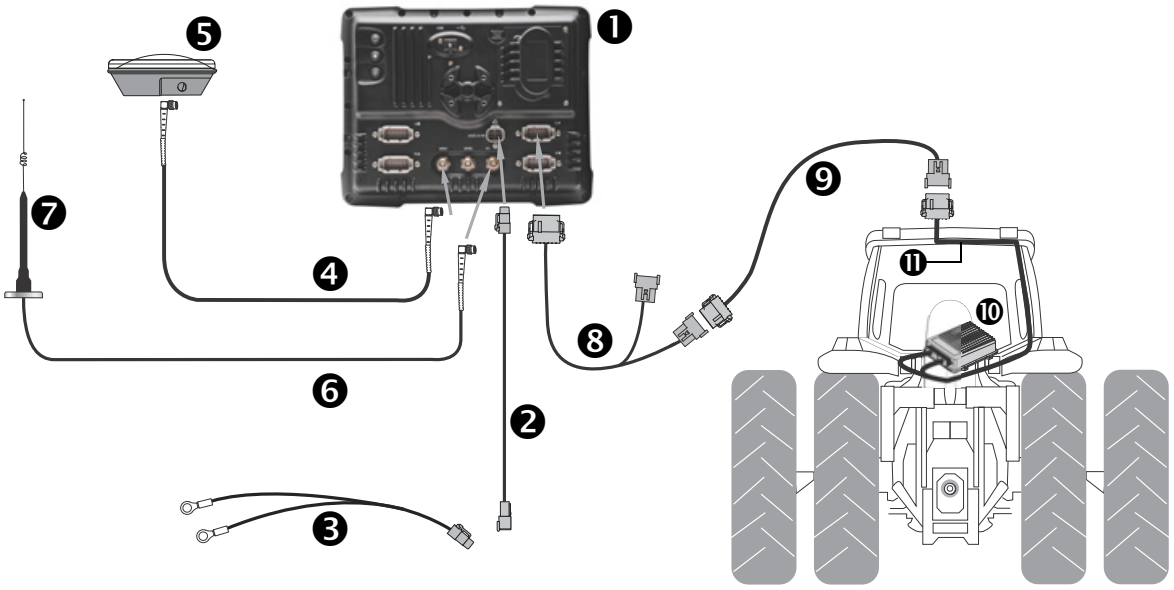


⚠ **CAUTION –** Connecting the Port Replicator on the Display to NavController II cable ❺ to the P4 or P12 connector of the NavController II harness ⓬ will result in damage to the display, and will void the warranty.

Item	Description	Trimble part number
1	CFX-750/FM-750 display **Note –** *RTK password required.*	94110-xx
2	CFX-750/FM-750 power cable	77282
3	Basic power cable	67258
4	8 m GNSS TNC/TNC RT angle cable	50449
5	AG-25 GNSS antenna	77038-00
6	NMO-to-TNC 20 ft antenna cable and base	72122
7	900 MHz radio antenna kit	22882-10
8	CFX-750/FM-750 to NavController cable with port replicator	75741
9	CNH hybrid to GPS cable	67120
10	NavController II	55563-00
11	Factory-installed harness	N/A

FmX/FM-1000 / Factory ready CNH vehicle

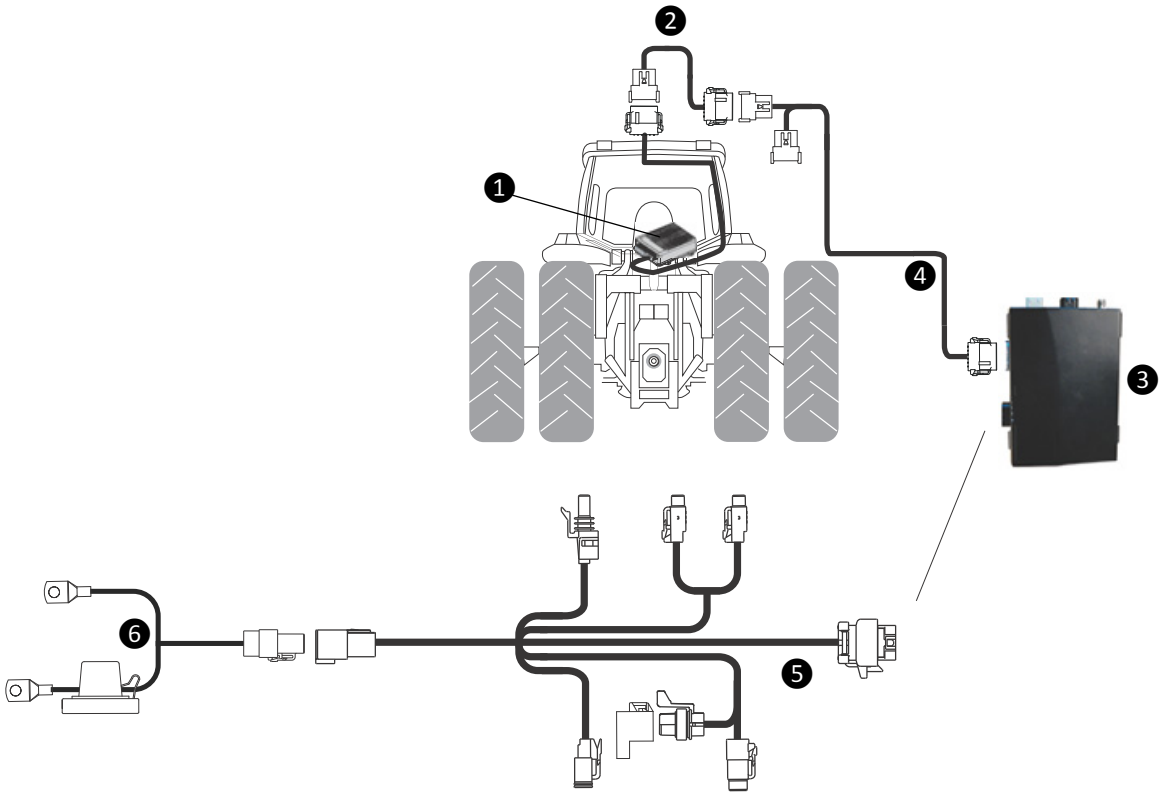
This figure shows how to connect the FmX/FM-1000 integrated display into a factory ready CNH vehicle, using RTK corrections:



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

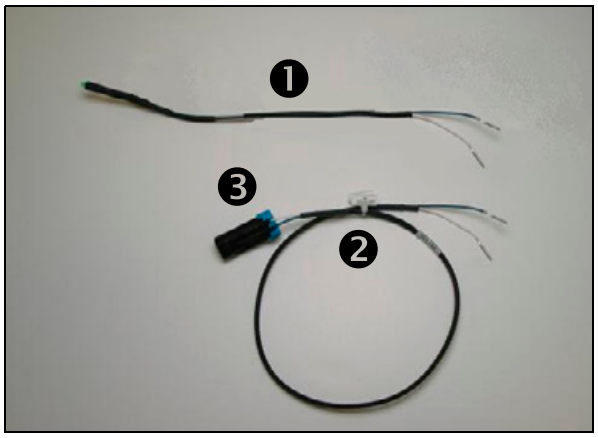
Item	Description	Trimble part number
1	FmX/FM-1000 integrated display	93100-02
2	FmX/FM-1000 power cable	66694
3	Basic power cable	67258
4	8 m GPS TNC/TNC RT angle cable	50449
5	Ag25 GNSS antenna	68040-00S
6	NMO to TNC 20ft antenna cable and base	62120
7	900 MHz radio antenna kit	22882-10
8	**FmX/FM-1000 to NavController II cable with port replicator**	75741
9	CNH hybrid to GPS cable	67120
10	NavController II	55563-00
11	Factory-installed harness	N/A

TMX-2050/XCN-2050 / Factory ready CNH vehicle



Item	Description	Trimble part number
1	NavController	55563-00 55566-00
2	CNH hybrid to GPS cable	67120
3	TM-200 Module	95060-00
4	TM-200 Module to NavController cable with port replicator	75741
5	TM-200 Module power and I/O cable	92676
6	Cable, battery	92905

Cable overview



Item	Description
1	Status LED
2	Sonalert jumper
3	Sonalert connector

Note – *You may find it easier to establish the cable connections to the controller before you install the controller. Read through the sections in this chapter and then decide the order in which you wish to proceed. If you attach the cables first, ensure that you feed the cables through any necessary routes.*

Installing the controller

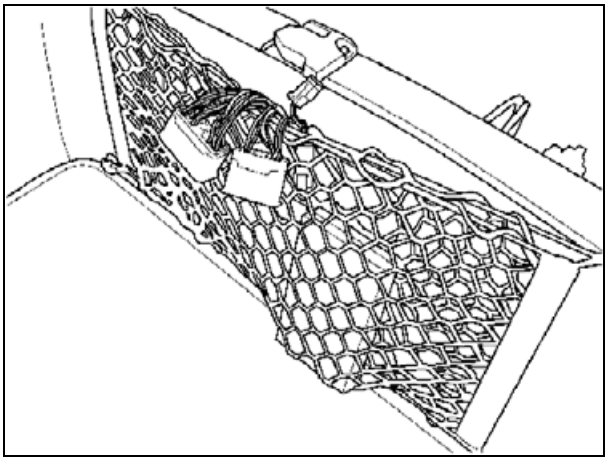
Procedure 1 (MX Magnum, Magnum T4A, TG, T8000, T8 T4A, SPX)

This procedure applies to the following:

- CIH: MX Magnum up to tier 4A, Midrange magnum up to Tier 4A
- NH: TG up to tier 4A, T8000, T8.xxx up to tier 4A and
- CIH: SPX 3320 / 3330 only

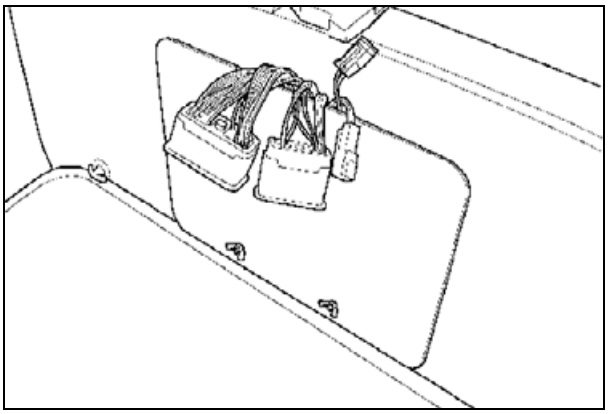
Step 1

Remove the net from the rear cab wall.



Step 2

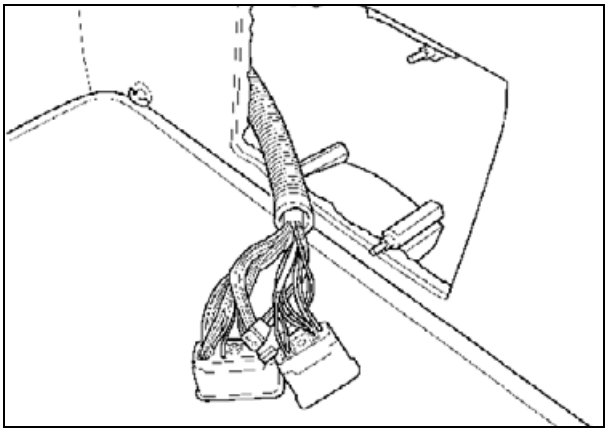
Remove the four wing nuts from the rear controller cover and remove the cover.



Step 3

Remove the protective covers from the auto-guidance connectors.

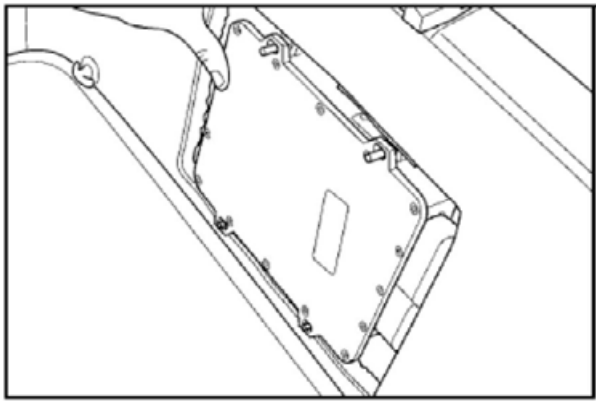
Continue with All controllers, page 79.



Step 4

Attach the controller to the machine on the 4 standoffs as shown.

Reinstall the cover plate and net.



Controller orientation

Roll: 106

Pitch: 0

Yaw: 90

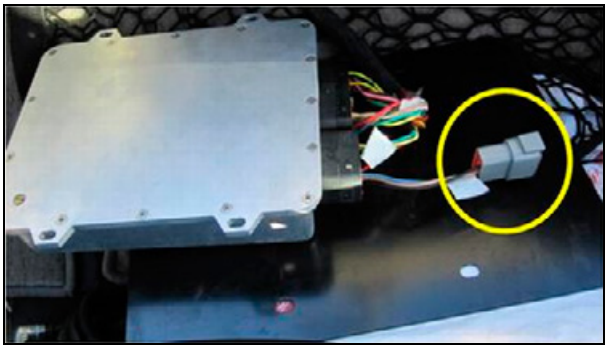
Diagnostic connectors

The **diagnostic connector** is a 12-pin Deutsch receptacle is contained within the mounting cavity.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



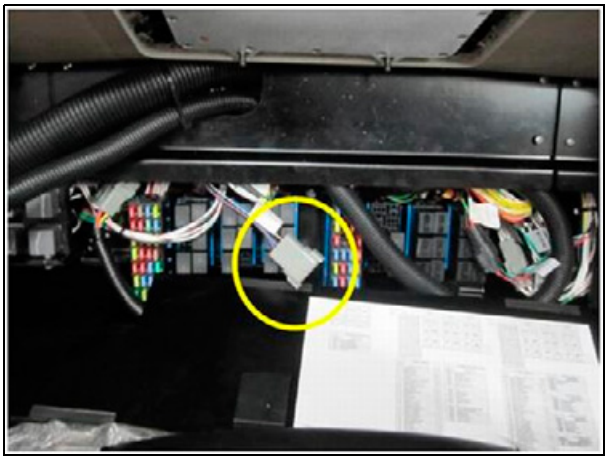
The **SPX 3xxx diagnostic connector** is a 12-pin Deutsch receptacle contained behind the seat, under the fuse panel.

To access it, remove the rubber mat that covers it.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



Procedure 2 (Magnum, T8 Tier 4B)

This procedure applies to the following:

- CIH: MX Magnum up to tier 4B, Midrange Magnum Tier 4B
- NH: T8.xxx Tier 4B

Step 1

Remove the rear cover behind the cab in front of the remote stack.



Step 2

Lift up the rubber flap to access the controller mounting area.

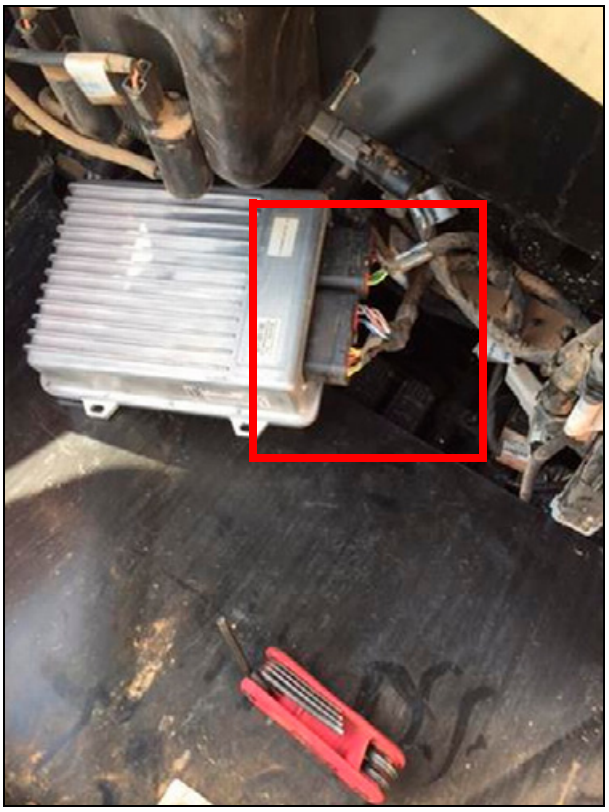


The controller will be mounted in the location shown on the rear cab of the machine.



Step 3

Connect the two connectors to the NavController as shown.



Step 4

Assemble the NavController to the machine using the four studs on the back wall of the machine.



Step 5

Use four 8 mm nuts to assemble the controller to the machine as shown.



Controller orientation

Roll: 0

Pitch: 106

Yaw: 0

Diagnostic connectors

The **diagnostic connector** is a 12-pin Deutsch receptacle mounted in the electronics compartment behind the seat (under the mat) on the back left of the vehicle.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



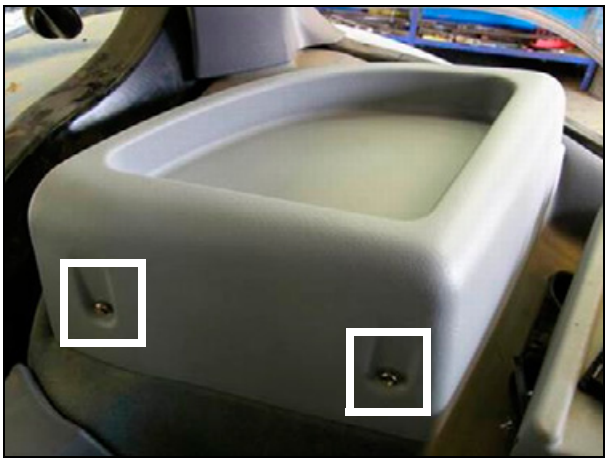
Procedure 3 (Puma, Optum, T7000, T7, T7 HD)

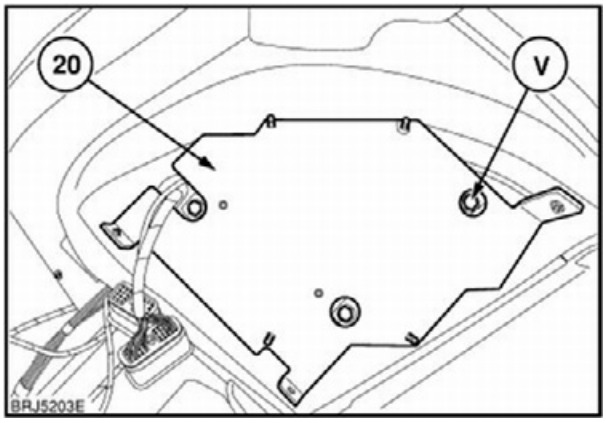
This procedure applies to the following:

- CIH: Puma, Optum
- NH: T7000, T7.xxx, T7 HD

Step 1

At the left rear of the cab remove the cover to access the NavController mounting position.





Step 2

Assemble the NavController to the mounting plate as shown.



Controller orientation

Roll: 0

Pitch: 0

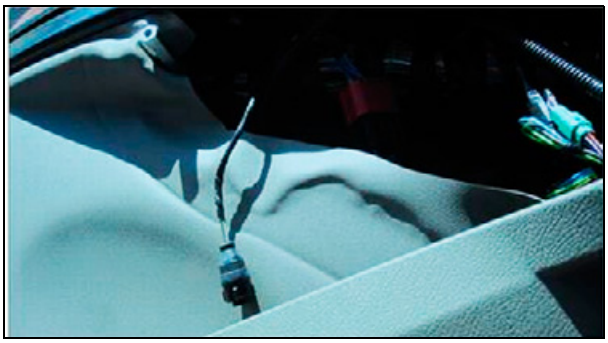
Yaw: 318

Diagnostic connectors

The **CIH Puma Tier 4A and earlier diagnostic connector** is located under the cover in the right rear of the cab. Remove the screws to access the connector.

The connector is the Round DC conexal.





The **CIH Puma Tier 4B and Optum Tier 4B diagnostic connector** is a 12-pin Deutsch receptable contained under the fuse box at the lower right of the cab.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



Additional notes for Puma, Optom, T7xxx

On these vehicles, there is a steering sensor cabling connection that may need to be made for guidance to work.

On the right front of the engine, remove the plug from the connector and connect it to the present mating connector.



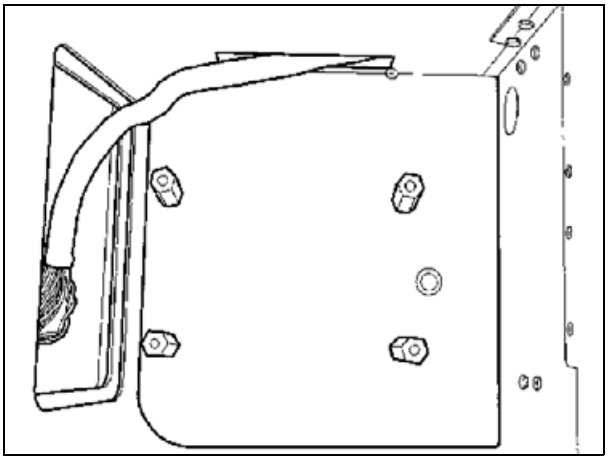
Procedure 4 (SPX, FLX, STX, TJ9000)

This procedure applies to the following:

- CIH STX tier 3 and before
- FLX, SPX4420
- NH: TJ, T9000 Tier 3 and before

Step 1

Open the instructor seat and remove the tray. Unscrew the four hex spacers from the cab floor.



Step 2

Locate the guidance harness under the instructor seat.

Continue with All controllers, page 79.



Step 3

Assemble the controller to the location shown with the connector facing right.



Controller orientation

Roll: 0

Pitch: 0

Yaw: 270

Diagnostic connectors

The **diagnostic connector** is in the fuse panel under the arm rest; The connector is the DC conexal connector.



Procedure 5 (Steiger, T9)

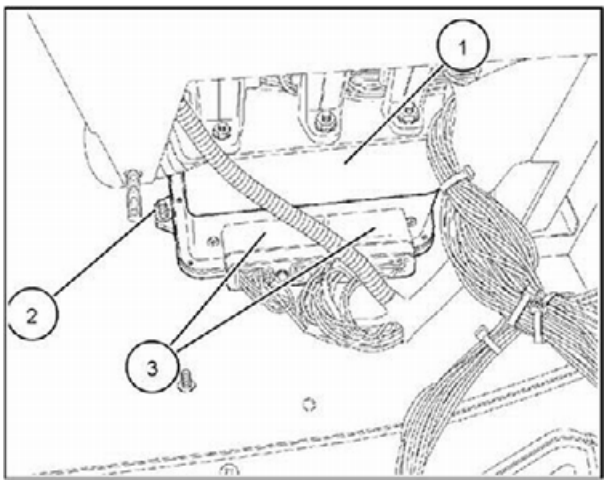
This procedure applies to the following:

- CIH STX Steiger tier 4a, STX Steiger tier 4B, STX Steiger tier 4b- CAN
- NH: T9 Tier 4A, T9 Tier 4B, T9 Tier 4B CAN

Step 1

On these machines the NavController should be located under the buddy seat in the location shown.

Install the controller with the fins facing up and the connector on the left side of the machine.



Step 2

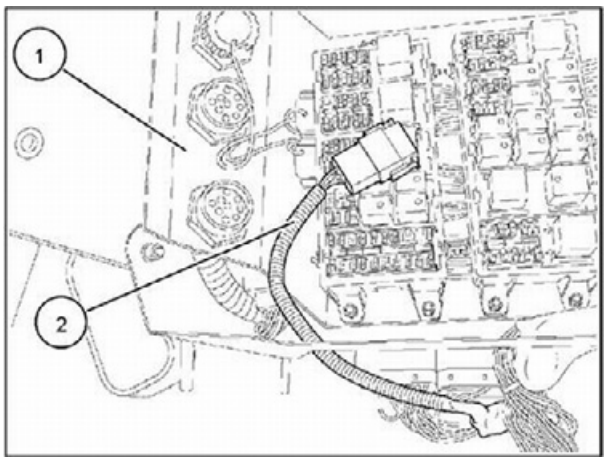
The diagnostic connector is right next to the controller

The diagnostic connector is a 12-pin Deutsch connector.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



Controller orientation

Roll: 0

Pitch: 0

Yaw: 90

Additional notes

- On some machines the steering is backwards of commands; you must change the PLA and PLB TAP values. (One should always be 1 and the other 0.)
- For CAN machines: There is a road mode and a field mode as commanded by the Pro700 when using Factory install (CNH NAV). For the Autopilot system to function correctly it may not be in Road mode.

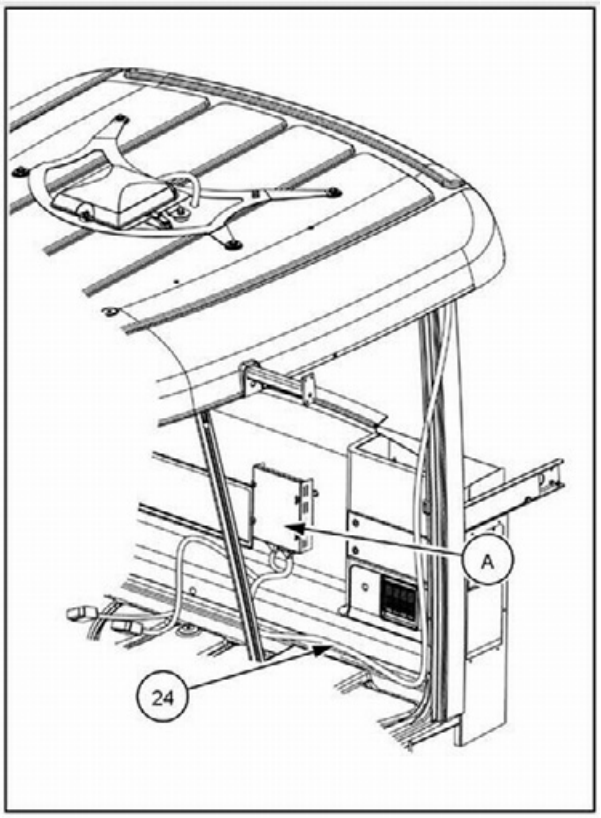
Procedure 6 (Windrower, Speedrower)

This procedure applies to the following:

- CIH: WD series II windrower
- NH: Speedrower

Step 1

The Nav Controller will be installed on the rear wall of the cab in the location shown with the fins facing back and the connector facing down.



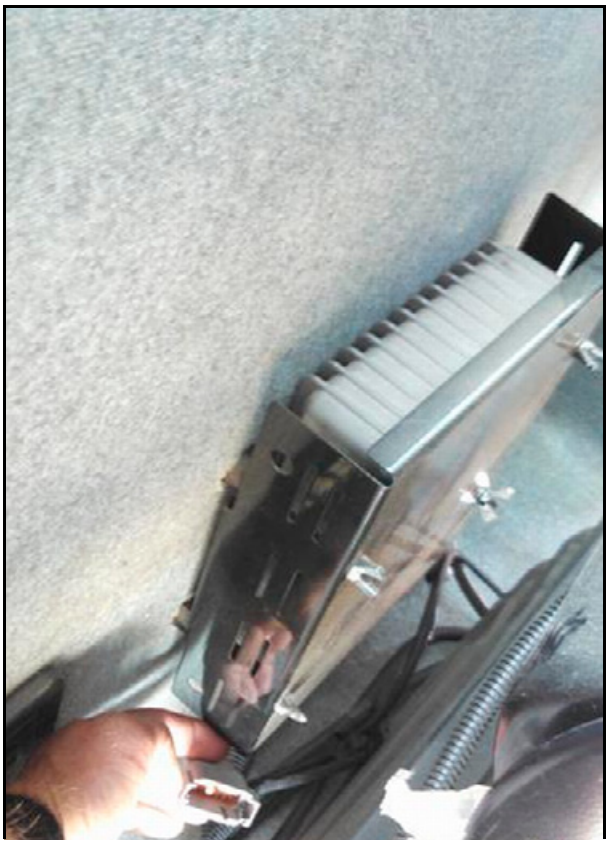
Diagnostic connector

The **diagnostic connector** is a 12-pin Deutsch receptable contained under the fuse box at the lower right of the cab.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



Controller orientation

Roll: 0

Pitch: 100

Yaw: 0

Additional notes

- Pro 700 Monitor must be used to do the Valve/Pump calibration
- If using the small performance monitor, a power/can adapter cable (P/N100637) is required.

For more information, see Appendix A, CASE IH WINDROWER SERIES II AND NEW HOLLAND SPEEDROWER: AUTOPILOT HYBRID INSTALLATION SUPPLEMENT.

Procedure 7 (New Holland Guardian Sprayers)

This procedure applies to the following:

- New Holland Guardian sprayers

Step 1

In the cab of the machine locate the storage bin near the driver's seat.

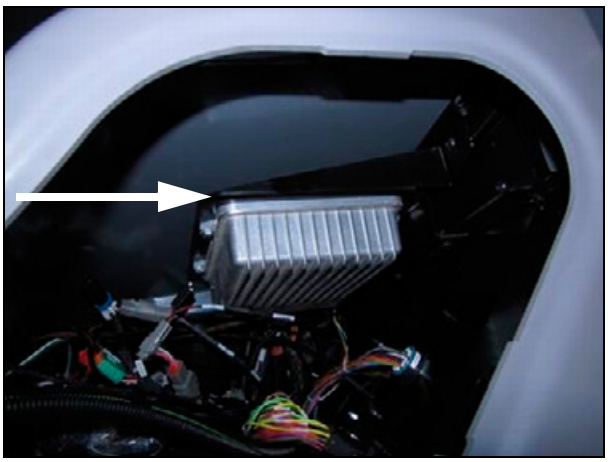


Step 2

Remove the bin to access the controller mounting area.



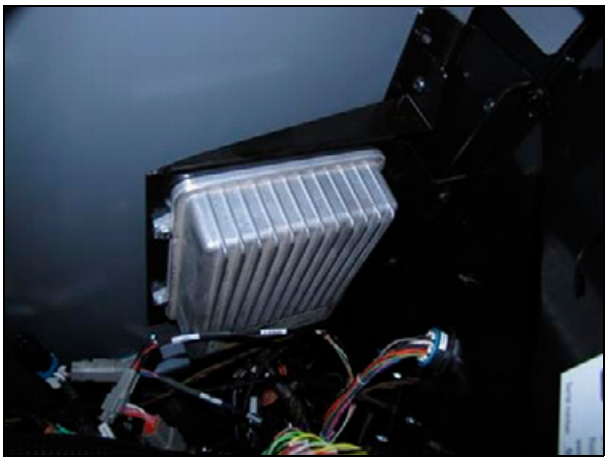
The controller will be mounted to the existing bracket attached to the machine in the location shown



Step 3

Attach the controller to the bracket on the machine using the provided bolts.

The connector on the NavController should face down.





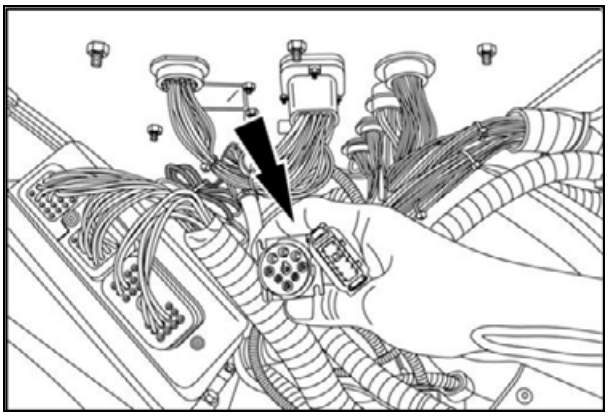
Diagnostics connector

The diagnostic cable connection is located inside the console near the service tool connector. A DE9 to 12 pin Deutsch plug adapter is required.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

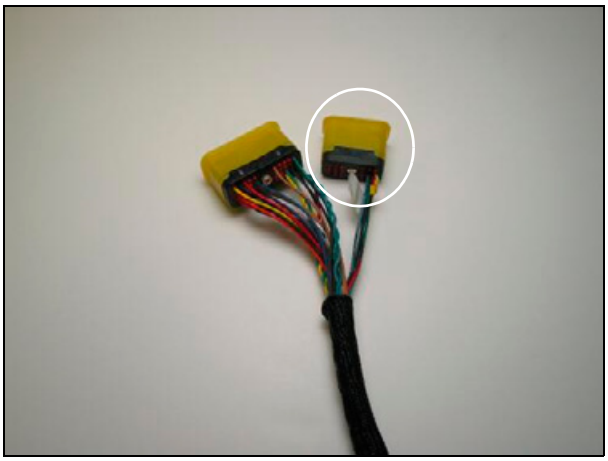
Pin 5 -RS232 GRND



All controllers

Step 1

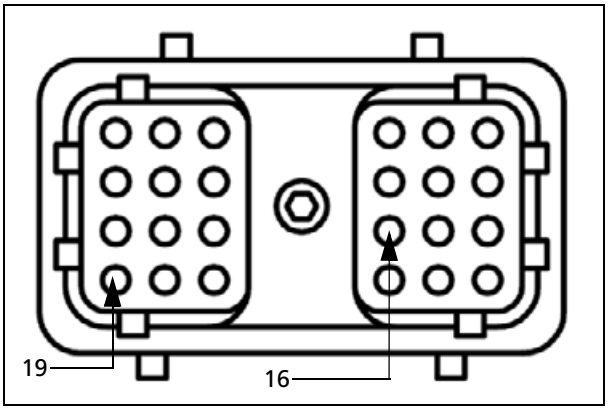
Locate the 24-pin Deutsch connector at the end of the guidance cable.



Step 2

Remove the plastic seals in pins 16 and 19

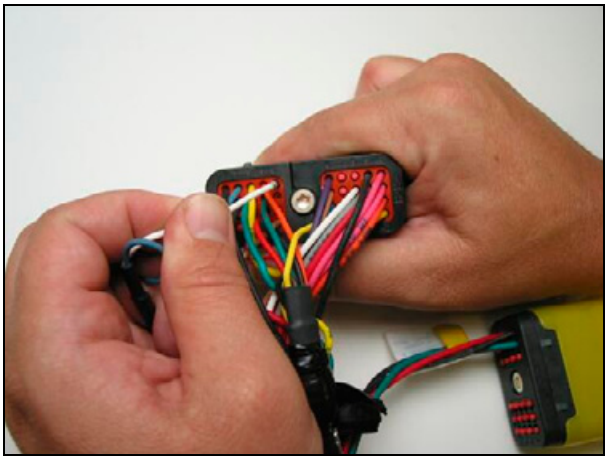
Note – *The cavity numbers are embossed on the connector and read left to right and top to bottom.*



Wire ID#	Conn term Guidance	Conn term Jumper	Description
1 (gray)	P2-16	LED-A	Sensor 12 V OUT
2 (brown)	P2-19	LED-B	Status LED

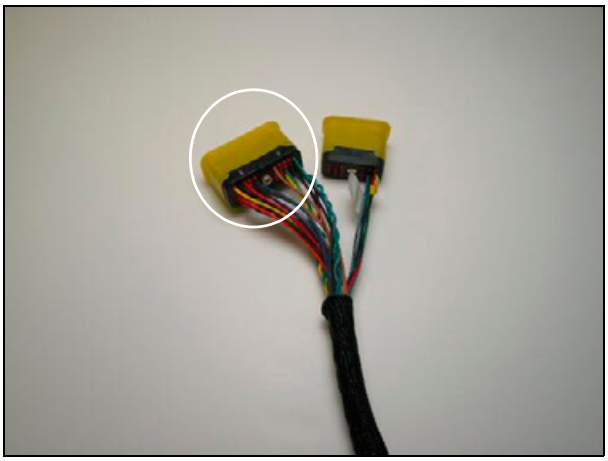
Step 3

Use the table above as a guide to insert the wire ends on the supplied status LED jumper.



Step 4

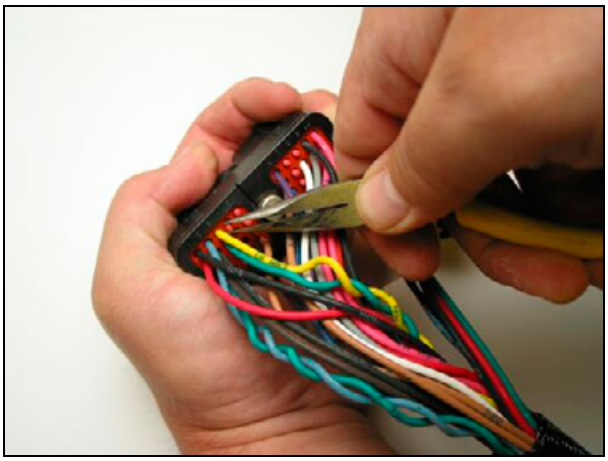
Locate the 40-pin Deutsch connector at the end of the guidance cable.



Step 5

Remove the plastic seals in pins 5 and 15.

Use the table below as a guide to insert the loose wires on the Sonalert jumper (P9) into the 40-pin connector.



Wire ID#	Conn term Guidance	Conn term Jumper	Description
4 (white)	P1-5	P9-A	Sonalert V+
5 (gray)	P1-15	P9-B	Sonalert GND

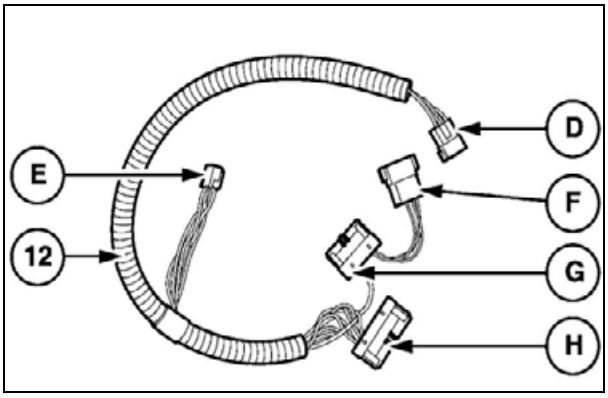
Installing the controller P4 connector for combines

Note – *This is for legacy displays using a P4 connector only. It is not used on the CFX-750/FM-750, FmX/FM-1000, or TMX-2050/XCN-2050 displays. For CFX-750/FM-750, FmX/FM-1000, or TMX-2050/XCN-2050 display installations, the display interfaces through the roof connector.*

You will only need to carry out this procedure if you have not already completed it as described in the Antenna installation, as described in Installing the P4 display jumper for combines, page 54.

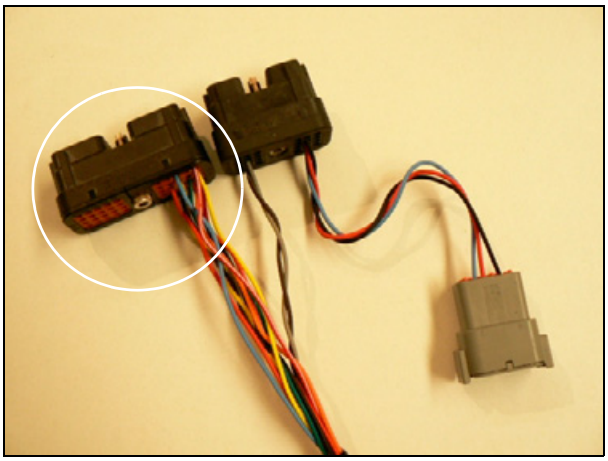
Step 1

Locate the NavController II wiring harness ⓬. This is available from the CNH GPS Guidance Kit.



Step 2

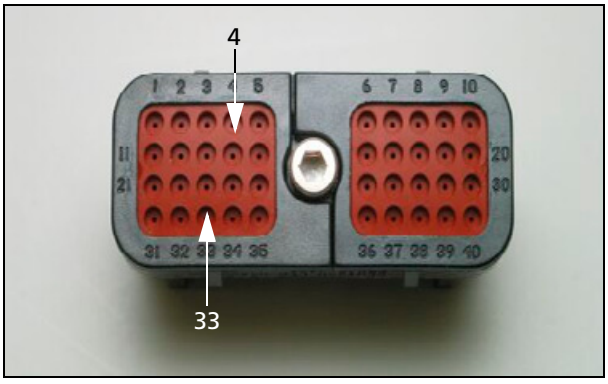
Locate the 40-pin Deutsch connector (H) at the end of the guidance cable.



Step 3

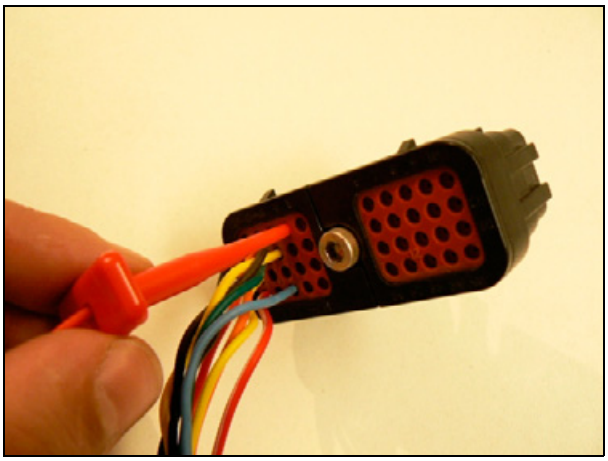
Locate cavity 4 and 33 on the back of the connector.

Note – *The connector is displayed without wires for clarity. The cavity numbers are embossed on the connector and read left to right and top to bottom.*



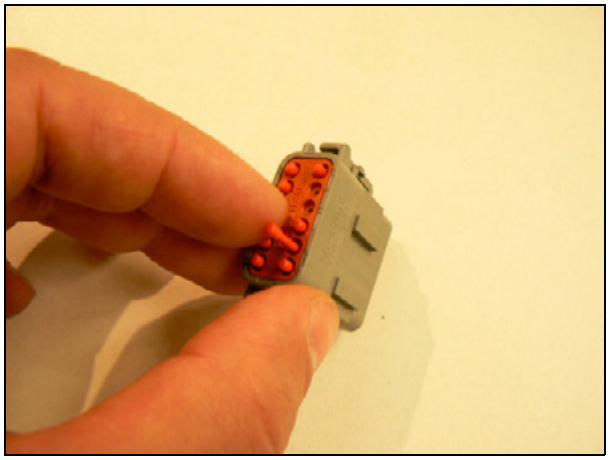
Step 4

Use the pin removal tools to extract the red and blue wires from cavities 4 and 33.



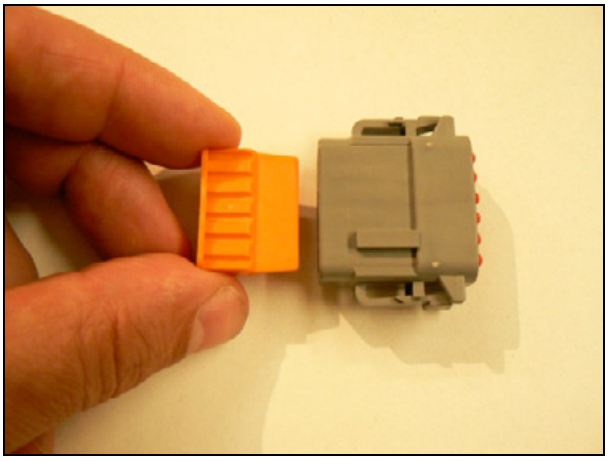
Step 5

Use a DTM06-12S connector (not provided) and remove the plastic seals from the pin 2 and 3 positions.



Step 6

Remove the wedge from the connector.

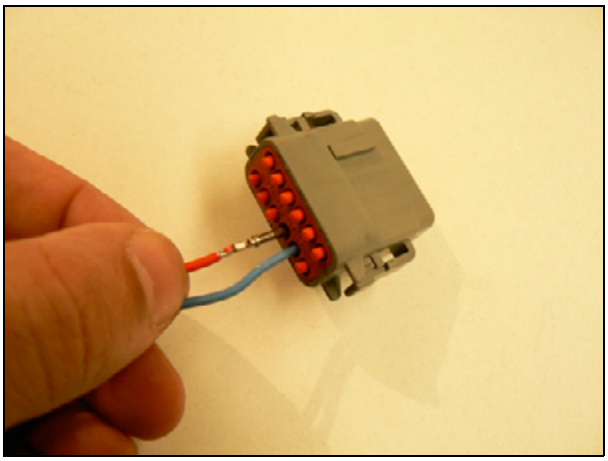


Step 7

Insert the loose wires from the 40-pin connector into the DTM06-12S connector as shown in the table.

Wire ID #	Connector terminal DTM06-12S	Description
1212 (blue)	DTM06-2	NMEA RS232 TX
1211 (red)	DTM06-3	NMEA RS232 RX

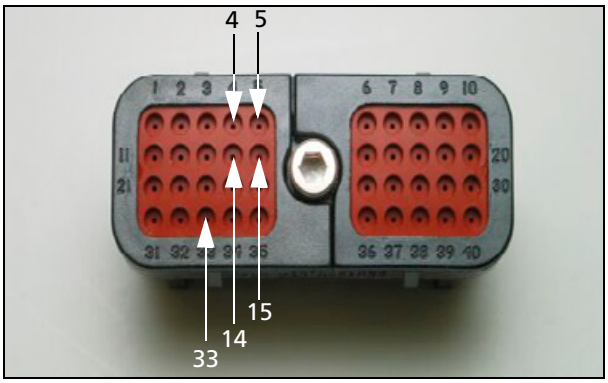
Pull back on the wires to seat them and then replace the wedge.



Step 8

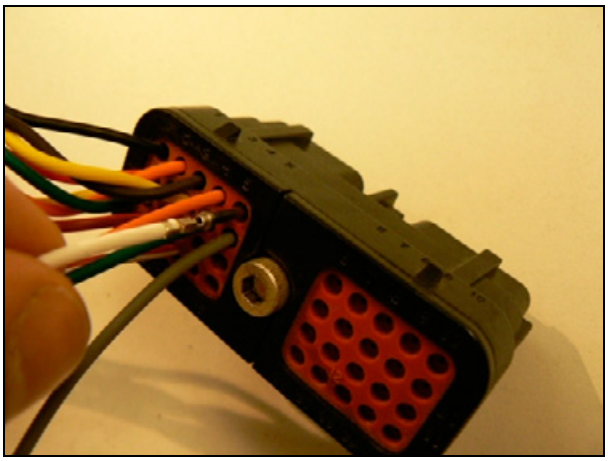
Remove the plastic seals in pin 5 and 15.

Note – *The connector is displayed without wires for clarity. The cavity numbers are embossed on the connector and read left to right and top to bottom.*



Step 9

Insert the loose wires on the Sonalert jumper (**P9**) into the 40-pin connector as shown in the table.

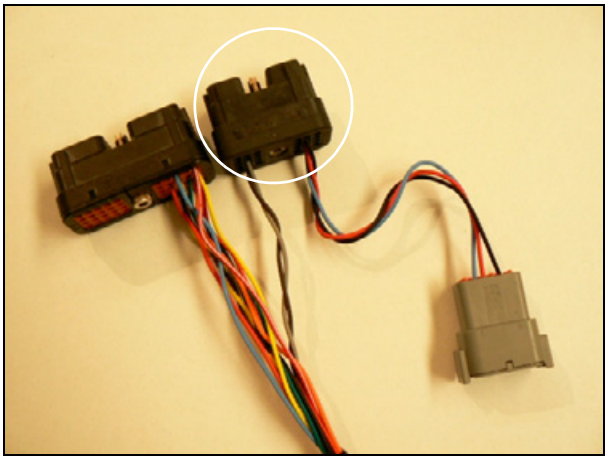


Wire ID #	Connection terminal Guidance	Connection terminal Jumper	Description
4 (white)	P1-5	P9-A	Sonalert V+
5 (gray)	P1-15	P9-B	Sonalert GND

Step 10

Locate the 24-pin Deutsch connector (G) at the end of the NavController II harness.

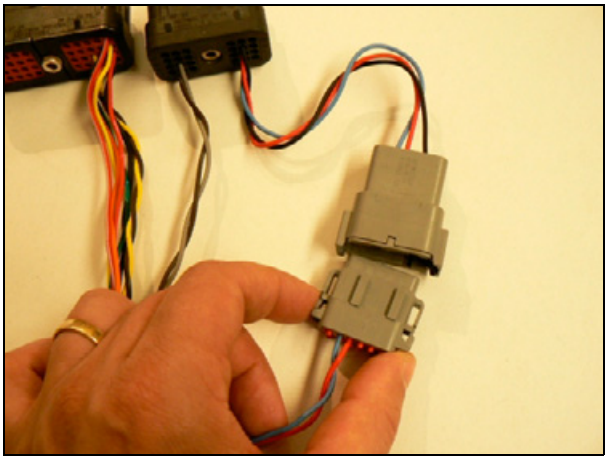
Use the table below as a guide to insert the wire ends on the supplied status LED jumper.



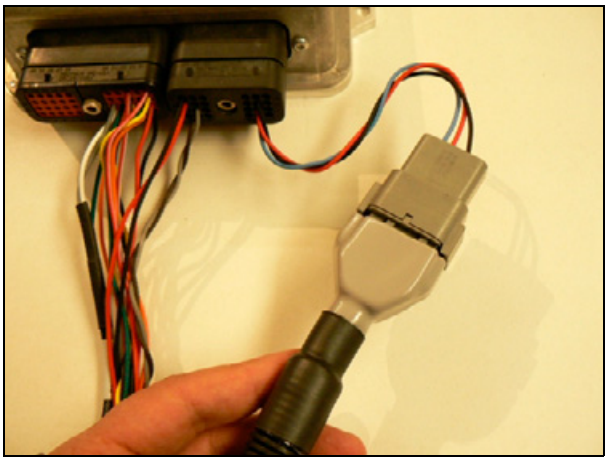
Wire ID#	Conn term Guidance	Conn term Jumper	Description
1 (gray)	P2-16	LED-A	Sensor 12 V OUT
2 (brown)	P2-19	LED-B	Status LED

Step 11

After the calibration is done, plug the DTM06-12S connector into connector (F) of the NavController II wiring harness ⓬ shown in Step 1.



Note – *The same connector (F) will also be used to configure the NavController II with cable P/N 50166. See* Chapter 5, NAVCONTROLLER AND THE COMBINE DISPLAY CONFIGURATION *for more information.*



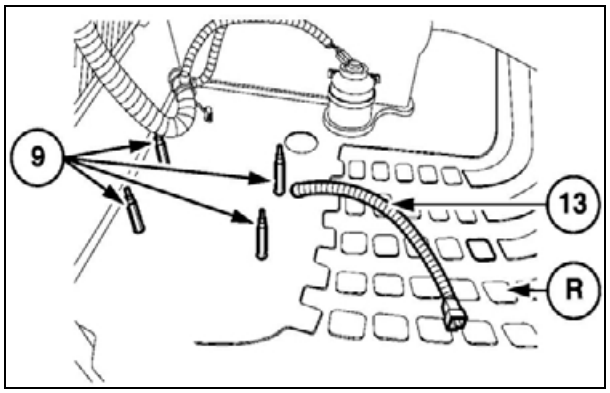
Procedure 1 (early model AFX combine)

This procedure shows the NavController location for early model AFX combines. For other applications, see further on in the document.

Step 1

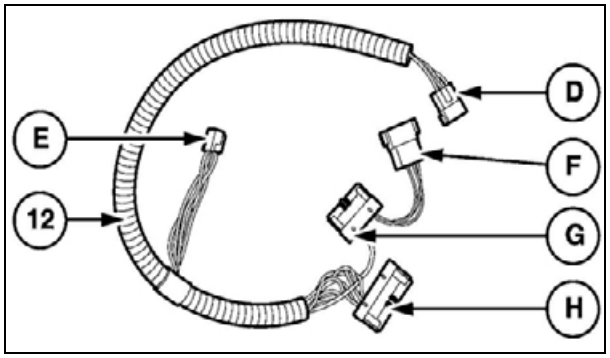
Locate the four standoffs (9) that are mounted onto the cab floor at the right side of the sear.

Locate the AgGPS 252/262/372 cable (13) that comes from the cab roof.



Step 2

Connect the connector (D) of the NavController harness (12) to the existing connector under the right module.



Step 3

AgGPS 252 / 262 / 372 receiver only

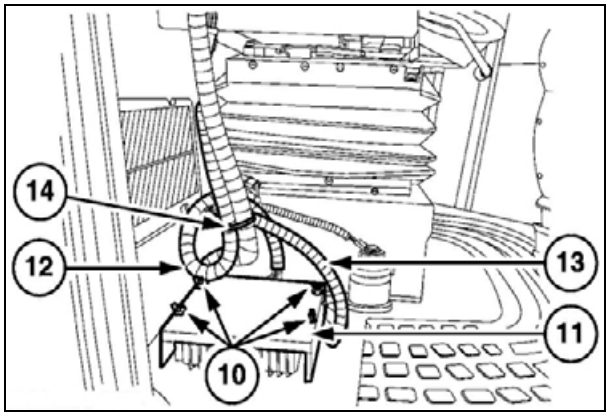
Connect the connector (E) of the NavController harness (12) to the connector (R) of the receiver cable (13).

The receiver cable must be connected to Port A on the receiver.

Step 4

Install the controller upside down onto the standoffs and ensure that the connectors are facing the seat.

Mount the cover (11) over the controller and secure with wing nuts.



Controller orientation

Roll: 0

Pitch: 90

Yaw: 180

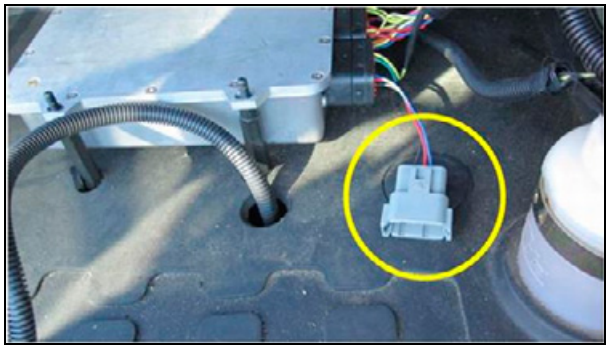
Diagnostic connectors

The **diagnostic connector** is right next to the controller. The connector is a 12-pin Deutsch connector.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



Additional notes

- Pro600/Pro700 must be setup for correct GNSS configuration.

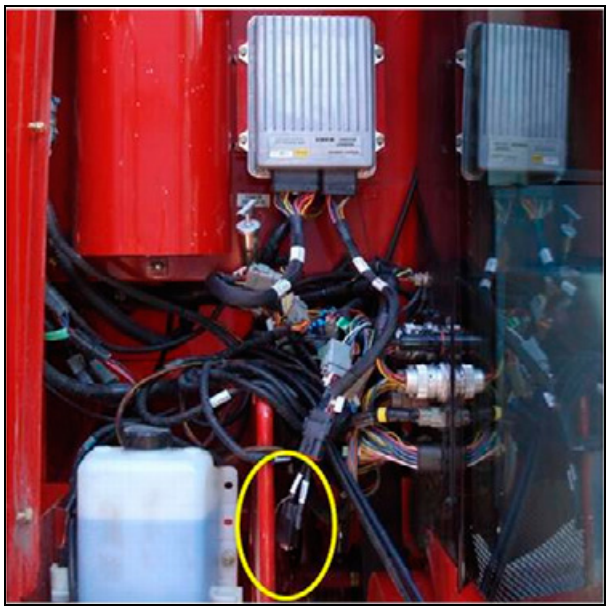
Procedure 2 (23XX / 25XX combine)

This procedure applies to the following:

- CIH: 23XX and 25XX combines

Step 1

Install the controller behind the right hand service door, with the fins forward and the connector facing down.



Step 2

The diagnostic connector is below the P/N 54602 harness.

The diagnostics connector is the same as standard Trimble harnessing: DE9 on the 24-pin connector of the NavController harness.

Controller orientation

Roll: 0

Pitch: 90

Yaw: 180

Additional notes

- There are two methods of manual override: Flow switch or a toothed gear in the steering column. A different profile exists for each.

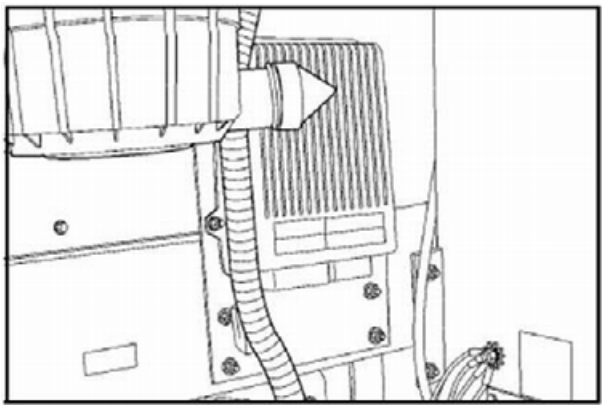
Procedure 3 (x088 combines)

This procedure applies to the following:

- CIH: x088 combines

Step 1

Install the controller behind the right-hand service door, with the fins forward and the connector facing down.



Controller orientation

Roll: 0

Pitch: 90

Yaw: 180

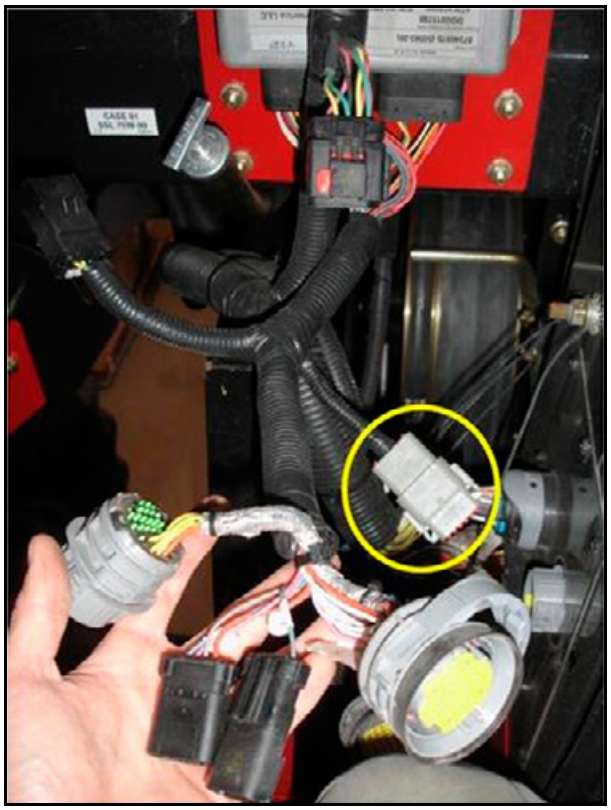
Diagnostic connectors

The **diagnostic connector** is a 12-pin Deutsch connector right below the NavController.

Pin 2 -RS232 TX

Pin 3 -RS232 RX

Pin 5 -RS232 GRND



Additional notes

- Pro600/Pro700 must be setup for correct GNSS configuration.

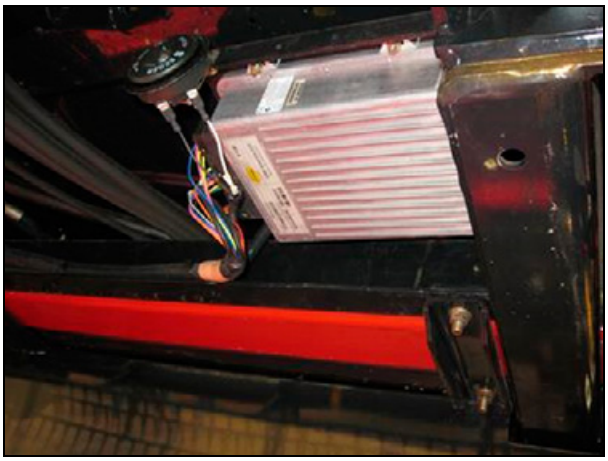
Procedure 4 (Midship combines)

This procedure applies to the following:

- Case IH Combines. Midship machines (51X0-71X0)

Step 1

On these models the NavController is located as shown under the left front of the cab.



Controller orientation

Roll: 0

Pitch: 180

Yaw: 90

Additional notes

- The Pro600/Pro700 must be setup for proper GNSS configuration.
- Need to enable guidance and do steering calibration.

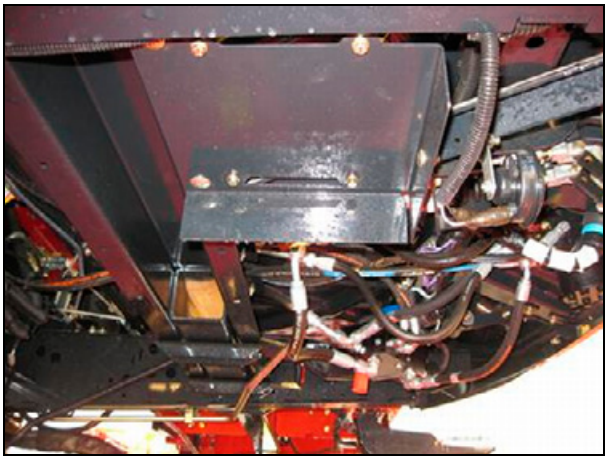
Procedure 5 (Flagship, AFX common cab, CR/CX common cab combines)

This procedure applies to the following:

- CIH Flagship combines AFX Later model machines
- New Holland CR/CX combines: late model with common cab

Step 1

On these models the NavController will be installed under the cab of the machine in the location shown on the right side of the cab.



Controller orientation

Roll: 180

Pitch: 0

Yaw: 0

Additional notes

- Intelliview display must be setup for proper GNSS configuration.
- Need to enable guidance and do steering calibration.

Configuring CAN jumper for an STX/TJ 2006 model

Note – *If the STX/TJ model has a VT harness installed, skip this section.*

Step 1

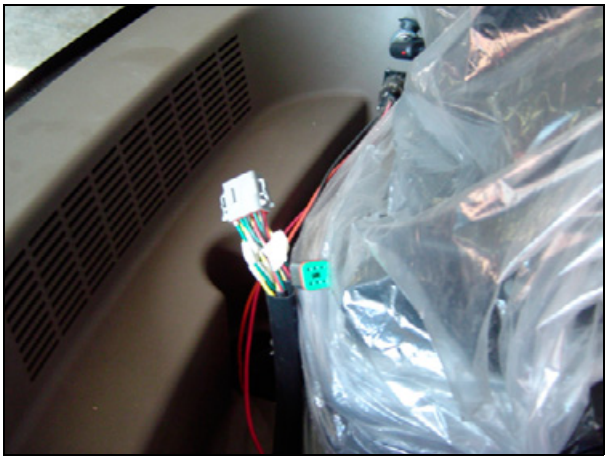
If no VT harness is present, remove the jumper from connector 377F, located in the electrical bay to the right of the seat.



Step 2

Move the jumper to connector 214F, which is located under the liner and filter behind the cab seat.

Connect the two gray 12-pin DTM connectors in the fuse panel area together.



Step 3

Verify the two black 8-pin connectors in the fuse panel area are also connected together.



Configuring CAN jumper for an STX/TJ 2007 model

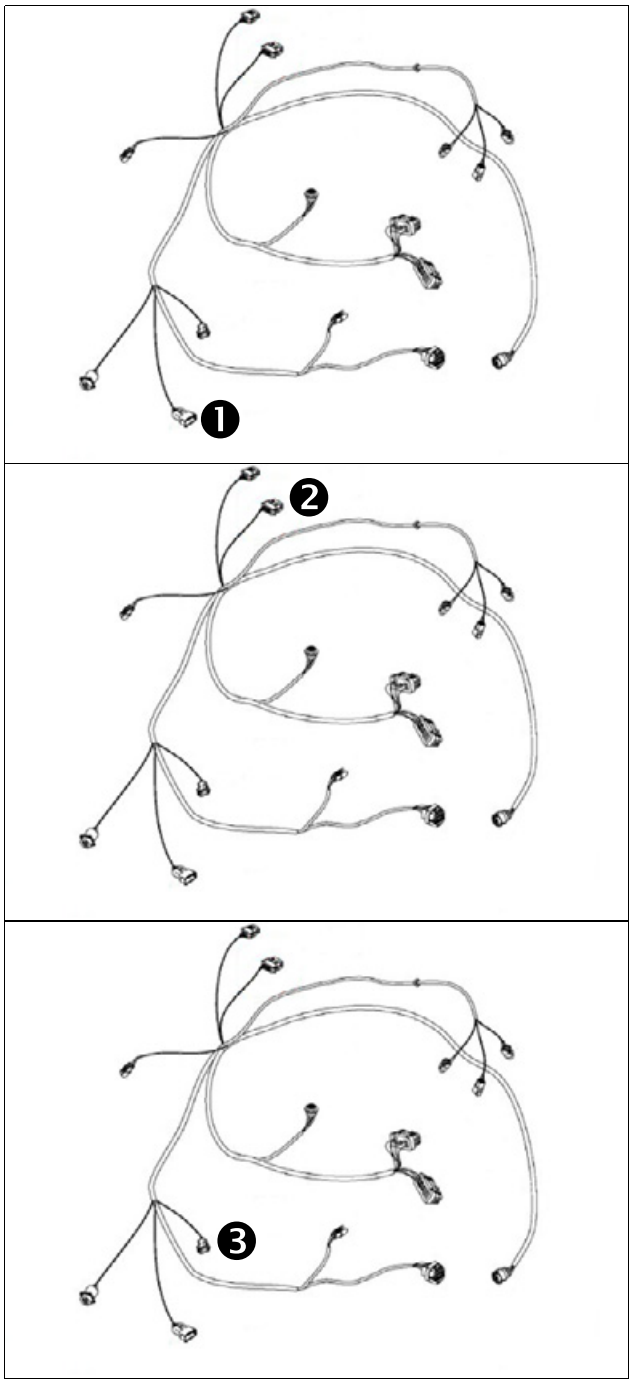
Perform these steps if the STX/TJ is a 2007 model with a serial number >= Z7F105338.

Note – *If the STX/TJ model has an AFS Pro 600/IntelliView Plus II display harness installed, skip this section.*

The #2 connector on the CNH inside auto-guidance cab harness may be difficult to find. It can be located in the right rear corner of the electrical bay to the right of the seat.

When the 4WD is provided as auto-guidance-ready, the inside auto-guidance harness connector ❶ is left unplugged.

The matching tractor harness connection has a CAN Bus jumper installed.



Step 1

Remove the jumper from the matching tractor harness connection and then place the jumper on the harness connector ❷ shown.

Step 2

Ensure that the connection shown ❸ is connected to the tractor harness. This establishes the power and ground circuit for the Autopilot NavController II controller and an *Ag*GPS 252/262 GPS receiver.

Chapter 5

NAVCONTROLLER AND THE COMBINE DISPLAY CONFIGURATION

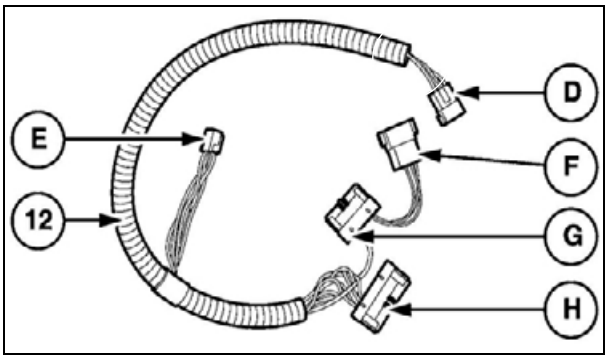
- Configuring the NavController II
- Configuring the combine display
- Calibrating sensors on combines
- Enabling guidance for combines
- CNH Autoguidance: Installing the lockout switch and seat switch

This chapter describes how to configure the NavController and the combine display.

Configuring the NavController II

Step 1

Bring the connector (F; diagnostics connector) of the NavController II harness to the top and then connect it to your laptop with cable P/N 50166 (not provided).



Step 2

Upload the VBD file to the NavController II with Autopilot Toolbox utility.

Note – *You can also upload the VBD file to the NavController II from the FieldManager™, FmX/FM-1000, TMX-2050/XCN-2050, or CFX-750/FM-750 display.*

Note – *Do not connect the cigarette lighter plug power lead of cable P/N 50166 during this operation.*

Step 3

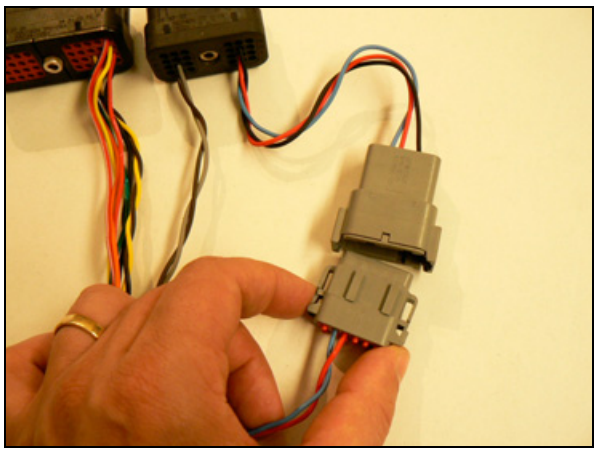
Using Autopilot Toolbox, or appropriate Trimble display configuration screens, set the antenna height and distance between the antenna and the fixed (front) axle, and perform the roll calibration.

Steering sensor, DZ, and P Gain calibration are not calibrated or adjustable through the Trimble display—this is done through the Combine display. For more information, refer to either the Pro700 or Intelliview 4 user guide.

Step 4

Displays that connect to a P4 connection only; not used on CFX-750/FM-750, FmX/FM-1000, or TMX-2050/XCN-2050 displays

Once the calibration is done, reconnect the NMEA-out cable to the NavController configuration port.



Configuring the combine display

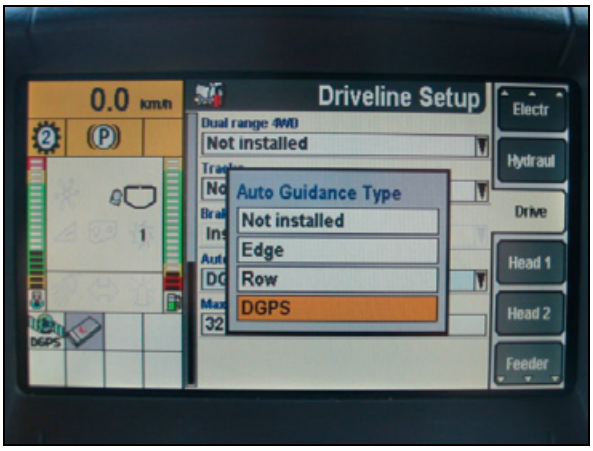
Step 1

Select the Toolbox icon to open the *Configuration* menu.



Step 2

Enable DGPS guidance:
Select *Drive / Autoguidance Type* and then select *DGPS*.



Step 3

Disable the CNH NavController II:
Select *NAV / NAV I*I Installed and then select *No*.

Note – *If the Guidance dll is not installed on the combine, the NAV tab will not be available.*



Step 4

GPS Receiver Configuration

The Yield Monitor does not use GPS positions

a. Uninstall GPS.

b. From the Configuration menu, select GPS / GPS Location and then select Not Installed.

The Yield Monitor uses GPS positions.

a. Install GPS.

b. From the Configuration menu, select GPS / GPS Location and then select the location where the antenna was installed.



Step 5

AgGPS 252/262 receiver only

The AgGPS 252/262 receiver communicates with the Yield Monitor through the display port CAN B.

Set Connection Type to CAN-B.

Note – *The receiver cable must be connected to the Port A of the AgGPS receiver.*



Calibrating sensors on combines

The valve and steering sensor need to be calibrated before use, follow the instructions in the operators manual for the CIH/NH applicable display.

Enabling guidance for combines

After a power cycle, before you are allowed to engage in Automatic mode, you must enable guidance:

Step 1

Turn the steering wheel one complete revolution to the left and one complete revolution to the right so that the manual override sensor is detected.

AutoGuidance is now enabled and the Automatic mode can be engaged from the Trimble display or from the optional Remote Engage Foot Pedal.



View of the AFX AXIAL-FLOW right hand module

Step 2

Press and hold the AutoGuidance switch for about 3 seconds. You will hear a tone confirming that the first condition is filled out.

The switch is available from the armrest.

Note – *For Axial Flow series 5088/6088/7088 combines, first turn the separator on to complete these steps.*



View of the CR CX right hand module

CNH Autoguidance: Installing the lockout switch and seat switch

If the light is OFF on the switch, with the switch not pressed in the upper position, the system is ready to engage Autoguidance.

Most systems are kept with the switch in the OFF position.



If the light is ON on the switch, with the switch pressed in the upper position, Autoguidance lockout is valid and will not engage.



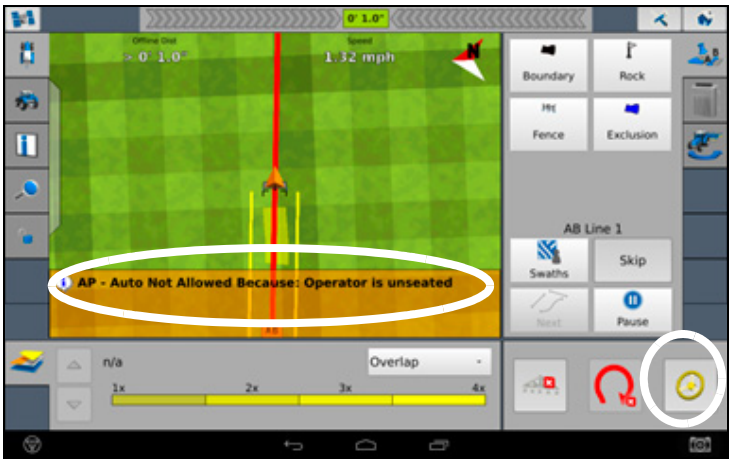
The system will call out that the switch is on. Turn off the switch on the right console of the cabe and acknowledge the help text warning on the screen and system.



Operator becomes unseated while Autoguidance feature is active

If the operator leaves his seat (or becomes unseated) while Autoguidance is operational, the system will disengage and display text will notify the operator.

The operator must return to his seat, acknowledge the text on screen, and re-engage Autoguidance.



There is no need to touch the Autoguidance Lockout switch



Chapter 6

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 Autopilot Toolbox II software version 2.92 or later 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 2.92 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

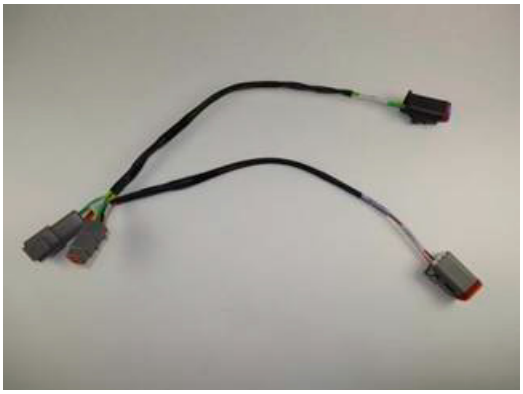
Appendix A

CASE IH WINDROWER SERIES II AND NEW HOLLAND SPEEDROWER: AUTOPILOT HYBRID INSTALLATION SUPPLEMENT

This document describes how to install the power adapter for CNH guidance ready swathers. The vehicle must be equipped with the guidance ready kit. If not, please contact the CNH dealer to have this kit installed.

For normal Accuguide or Intellisteer installations, the CNH display harness provides power to the NavController and communications between the UCM control module on the vehicle and the NavController.

For hybrid installations on these guidance ready vehicles, an adapter cable, P/N 100637, is required. Follow the Accuguide/Intellisteer install instructions for NavController mounting.



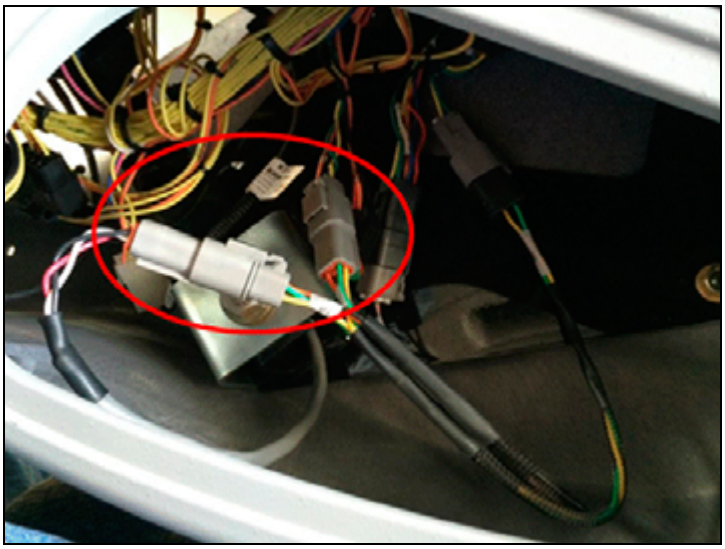
Calibrating the auto-guidance valve

Before the power adapter cable can be installed the steering valve on the machine must be calibrated. This functionality is currently only available through the CNH display. A CNH display (you do not need a CNH NavController II) must be installed temporarily to do the valve calibration.

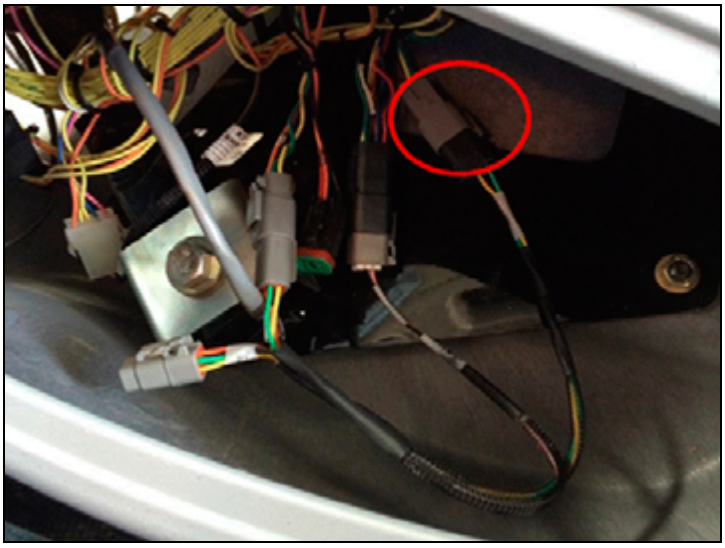
1. Make sure the UCM firmware is version 14.6.0 or later. Check with the local CNH dealer as this must be updated using the EST tool.
2. Install the CNH display (Pro 700 or Intelliview IV) in the vehicle in accordance with the instructions.
3. Operate the vehicle for a while to ensure the hydraulic oil is up at operating temperature.
4. Follow the steps in the software guide for calibration (New Holland, P/N 47452730).
5. Once the valve calibration is complete, remove the CNH display and immediate harness.

Installing the adapter cable

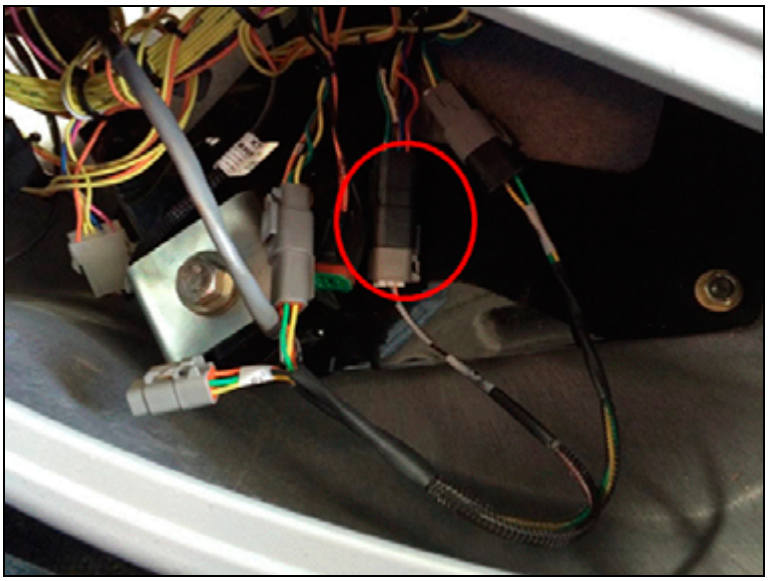
1. Find the 4-pin DTM power and CAN connection to the swather's basic 4 line display.
2. With the machine off, separate these two connectors and install connectors R1 and P1 of cable P/N 100637 between them.



3. Find connectors X-155A(3 pin DT receptacle) and X-497(6 pin DT receptacle) on the CNH guidance harness.
4. Connect P2 of the P/N 100637 adapter to X-115A.



5. Connect P3 of the P/N 100637 adapter to X-497.



6. Once the connections are made, put all covers back in place.
7. Install the NavController behind the seat in the dedicated mounting.
8. Install the desired display using cabling provided in the CNH Guidance ready controller kit P/N 54425-27.

When installation is complete, load the correct VDB profile from the most recent VDB release. Reference the latest supported platforms list.

Follow the steps in the display and/or Autopilot Toolbox to finish setup and calibration.

For additional operational requirements (for example, enabling the autoguidance functionality) refer to the swather's operators manual.

Note – *Currently, the remote engage button on the hydrostat handle is only functional with a CNH display. An additional remote engage switch installation may be desired by the user as the only way to engage the system is with the button on the screen.*

Appendix B

NEW HOLLAND GUARDIAN INTELLISTEER READY SPRAYERS: POWER ADAPTER

This document describes how to install the power adapter for New Holland Guardian sprayers that are Intellisteer ready.

Depending on the sprayer configuration, it may be required to install a power adapter to provide power to NavController when installing an FmX /FM-1000™ or CFX-750 / FM-750™ display.

Switched power for the NavController on guidance-ready vehicles is controlled by either the Intelliview display or the Raven system master switch. If the vehicle is not equipped with either of these, you must install the P/N 95964 power adapter cable. This cable takes power from the P/N 67259 powerbuss (purchased separately) and provides it to the NavController when the powerbuss is turned on.

Installing the adapter

1. Locate the tray in the right rear of the cab.



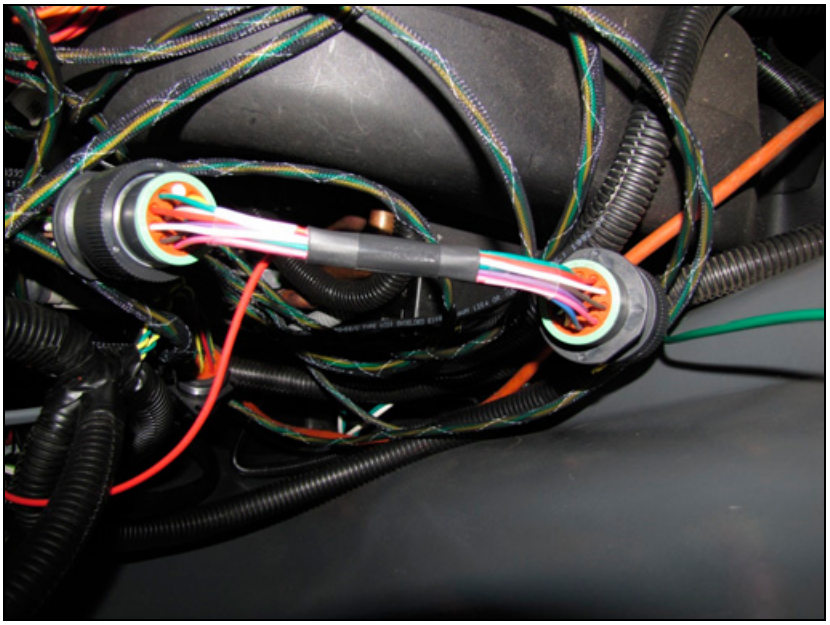
2. Remove the tray to gain access to the harnessing.



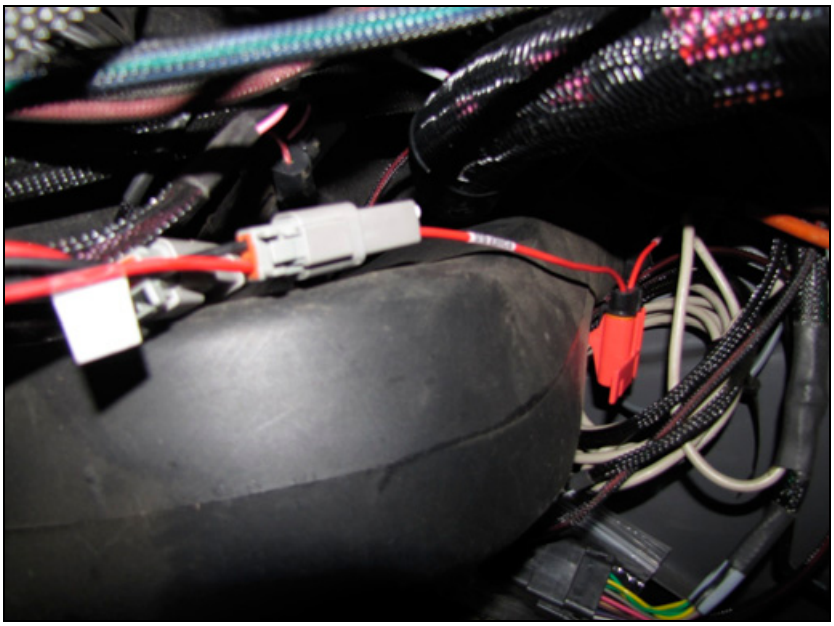
3. Locate the round 14 pin Deutsch connector.



4. With the machine off, separate the connectors and insert the adapter cable.



5. Connect the 2-pin Deutsch DT receptacle to one of the 3 DT power plugs on the P/N 67259 power buss harness.



6. Reinstall the tray.