Autopilot

AUTOMATED STEERING SYSTEM

INSTALLATION INSTRUCTIONS

Case IH

- AFS Connect Magnum 180
- AFS Connect Magnum 200
- AFS Connect Magnum 220
- AFS Connect Magnum 240
- AFS Connect Magnum 250
- AFS Connect Magnum 280
- AFS Connect Magnum 310
- AFS Connect Magnum 340
- AFS Connect Magnum 380
- AFS Connect Magnum 400

New Holland

- T8.320
- T8.350
- T8.380
- T8.410
- T8.435
- T8.410 SmartTrax
- T8.435 SmartTrax

Version 8.00
Revision C
December, 2022
P/N 54035-197-E08-C

Trimble Agriculture

Legal Notices

Agriculture Business Area

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Release Notice

This is the December 2022 release (Revision C) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-197-E08-C. It applies to version 8.00 of the Autopilot automated steering system.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to:
trimble.com/en/our-commitment/responsible-business/corporate-compliance/environmental-compliance



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.

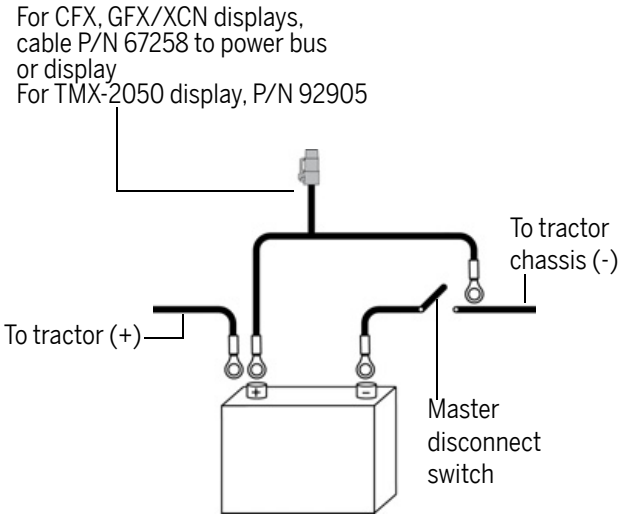
⚠ **CAUTION –** The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

⚠ **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 –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is *not* directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example.
Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



Contents

Legal Notices 2

Safety Information 3

Warnings 3

Cautions 4

1 Introduction 7

Technical assistance 7

Manual system upgrade to Autopilot 8

Displays 8

Required components 8

Antenna mounting kits 8

Preparing the vehicle for installation 9

2 Display Installation 10

CFX-750 display: Components 11

CFX-750 display: Preparation 12

CFX-750 display: Installation 13

CFX-750 display: Installing the wiring harness 13

TMX-2050 display: Components 14

TMX-2050 display: Preparation 15

Installing the display and mount 15

TMX-2050 display: Installing the wiring harness 18

TMX-2050 display: AG-25 GNSS antenna 20

CFX-750 and TMX-2050 displays: Installing the GNSS antenna and plate 21

Spar mount method 21

VHB adhesive method 21

CFX-750 and TMX-2050 displays: Installing the RTK radio antenna 25

GFX/XCN displays: Components 27

GFX/XCN displays: Preparation 28

GFX/XCN displays: Installation 28

GFX/XCN displays: Installing the wiring harness 29

3 Power Harness Installation 31

CFX-750 display: Components 32

GFX/XCN displays: Components 33

CFX-750 and GFX/XCN displays: Installing the power harness 34

CFX-750 display: Configuring the power bus options 36

Display power button is used to turn on the Autopilot system 36

External switch is used to turn on the Autopilot system 36

Ignition is used to turn on the Autopilot system 38

TMX-2050 display: Components 39

TMX-2050 display: Installing the power harness 40
TMX-2050 display: Configuring the power options 43
Ignition sensing 43

4 Controller Installation 45

Installing the controller 45
Connecting the NavController III to the tractor CAN system 47
Controller connections 48
Connecting the cables to the controller 49

5 Final Machine Check 51

Setting up 3rd party guidance 52
Enabling the Steering 55

1

Introduction

- Technical assistance
- Manual system upgrade to Autopilot
- Required components
- Antenna mounting kits
- Preparing the vehicle for installation

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

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

Technical assistance

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

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

Manual system upgrade to Autopilot

Displays

Retain
TMX-2050™/XCN-2050™ display: P/N 96500-xx
CFX-750™/FM-750™ display: P/N 94110-xx
Antenna to receiver cable: P/N 50449
Power cable: P/N 67258 & 66694
GFX-750™/XCN-1050™: P/N 121000-XX
Power cable GFX/XCN: P/N 110551
Base power cable: P/N 67258
NAV-900 guidance controller: P/N 108993-05
GFX/XCN to NAV-900 Comms cable: P/N 110540

Required components

Kits required	Special tools
Platform kit: P/N 54035-197	¾" and $1\frac{5}{8}$" hole saw
TMX-2050/CFX -750 installations: P/N 64425-07	$\frac{5}{16}$" drill bit
GFX-750 Installations: P/N 64425-08	Allen wrench set (metric and SAE)

Antenna mounting kits

Antenna options
Optional spar mounts (must measure application for proper part number): • P/N 64898: Bracket, GPS Spar 16.5"– 28.5" • P/N 55349: Bracket, GPS Spar 27.5"– 37.5" • P/N 53676: Bracket, GPS Spar 36.5"– 46.5" • P/N 55348: Bracket, GPS Spar 45"– 55" • P/N 66774: Bracket, GPS Spar 54"– 64" **NOTE –** For quick release mounting of the NAV-900 to a Spar mount, use P/N 110308: Bracket, NAV-900, Spar Quick Release Adapter For vehicles with the CNH 262/372 factory mount, you may optionally mount the NAV-900 with P/N 111339: NAV-900, Mount, CNH Quick Release Adapter

Preparing the vehicle for installation

Step 1

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

Step 2

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

Step 3

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

Step 4

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

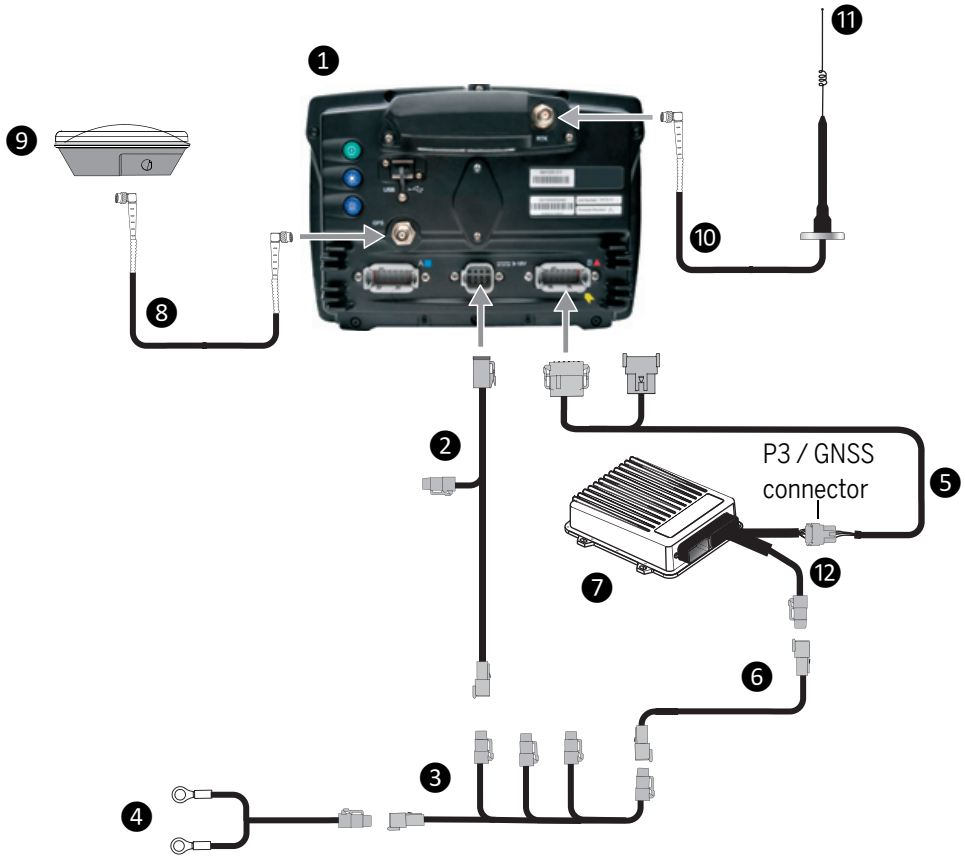
NOTE – The left and right sides of the vehicle are referenced while standing behind the unit, facing the normal direction of travel.

2

Display Installation

- CFX-750 display: Components
- CFX-750 display: Preparation
- CFX-750 display: Installation
- CFX-750 display: Installing the wiring harness
- TMX-2050 display: Components
- TMX-2050 display: Preparation
- TMX-2050 display: Installing the wiring harness
- TMX-2050 display: AG-25 GNSS antenna
- CFX-750 and TMX-2050 displays: Installing the GNSS antenna and plate
- CFX-750 and TMX-2050 displays: Installing the RTK radio antenna
- GFX/XCN displays: Components
- GFX/XCN displays: Preparation
- GFX/XCN displays: Installation
- GFX/XCN displays: Installing the wiring harness

CFX-750 display: Components



⚠ **CAUTION –** Connecting the Port Replicator on the CFX-750 display to NavController cable ❺ to the P4 or P12 connector of the NavController harness ⓬ will result in damage to the display, and will void the warranty.

Item	Description	Trimble part number
1	CFX-750 display **NOTE –** RTK password required.	93100-02
2	CFX-750 power cable	66694
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	CFX-750 to NavController III cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adaptor	67095
7	NavController III	55566-00
8	8 m GNSS TNC/TNC RT angle cable	50449
9	AG-25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	72122
11	900 MHz radio antenna kit	22882-10
12	Main NavControllerNavController cable	54601

CFX-750 display: Preparation

Step 1

Locate the CFX-750 display, the RAM mount, and the RAM mount clamp.



Step 2

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



Step 3

Attach the RAM mount to the rear of the display.



CFX-750 display: Installation

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

Step 1

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

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

Step 2

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

To connect power to the CFX-750 display, see Chapter 4, Controller Installation.



CFX-750 display: Installing the wiring harness

Step 1

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

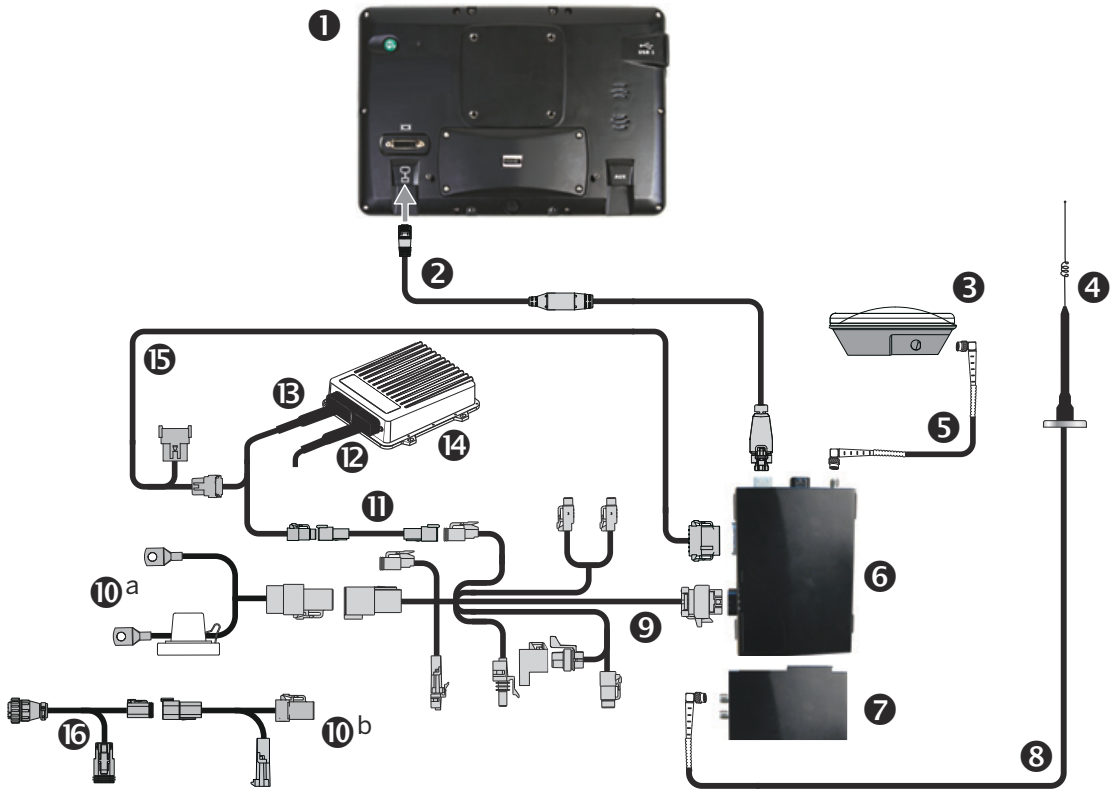
Step 2

Connect the cable to the P3 connector on the NavController main harness and then route the cable from the NavController to the mounting location on the CFX-750 display.



TMX-2050 display: Components

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



Item	Description	Trimble part number
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10a	Cable, battery	92905
10b	Cable Assy, GFX/GX display power, 6-pin DT-to-TMX, 4-pin DTP adapter	128918
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController III	55566-00
15	TM-200 Module to NavController cable with port replicator	75741
16	Cable Assy, Display Power, 16 Pin, 2ND Display Connector, CNH	122452

TMX-2050 display: Preparation

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

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

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

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

Installing the display and mount

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

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

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

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

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



Step 1

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



Step 2

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





Step 3

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



Step 4

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

Step 5

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

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

Step 6

Connect the display cable to the display.



Step 7

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



TMX-2050 display: Installing the wiring harness

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

Step 1

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

Step 2

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



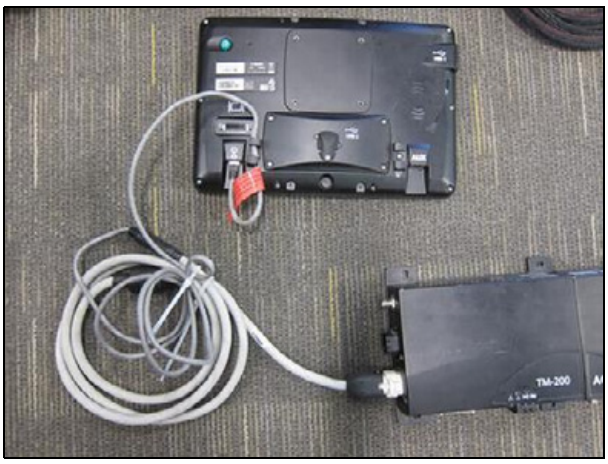
Step 3

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



Step 4

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



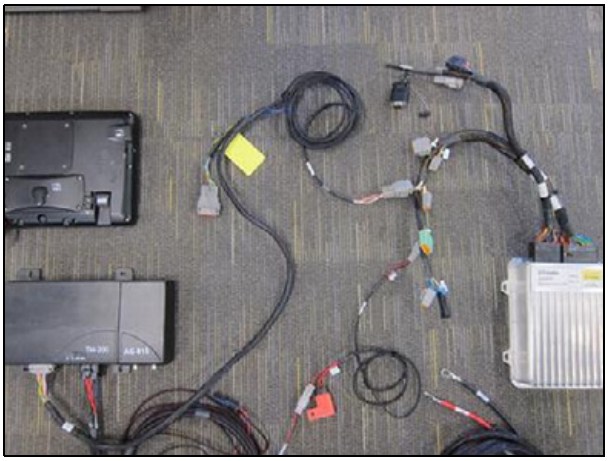
Step 5

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



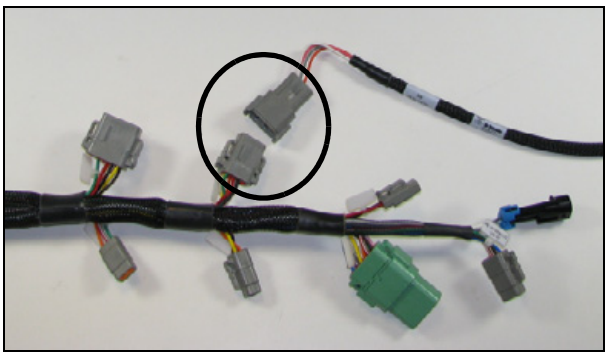
Step 6

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



Step 7

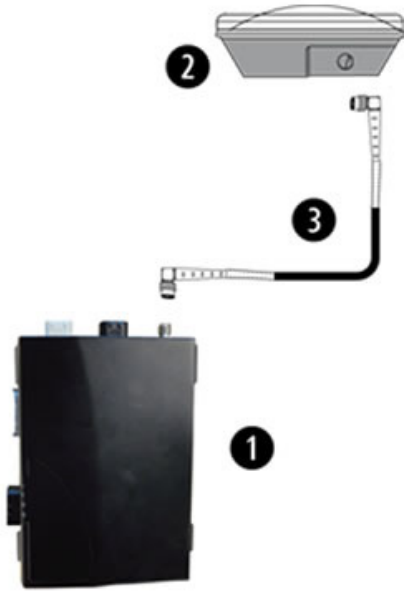
Connect the cable to the P3 connector on the NavController main harness.



TMX-2050 display: AG-25 GNSS antenna

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

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



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

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

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

CFX-750 and TMX-2050 displays: Installing the GNSS antenna and plate

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

NOTE – The V plate antenna bracket is available on the Autopilot price list. See Antenna mounting kits, page 8.

Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations.

Use a ⅝" bolt to attach the AG-25 antenna to the spar, as shown.

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

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



VHB adhesive method

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

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

Step 1

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

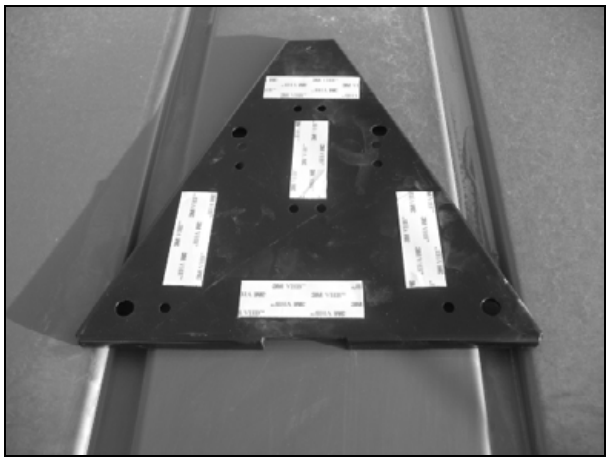


Step 2

V plate only

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

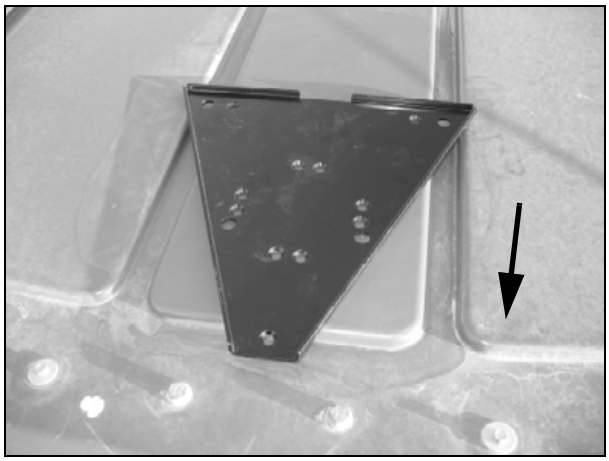
NOTE – The VHB strips are pre-applied to the 4" x 6" plate.



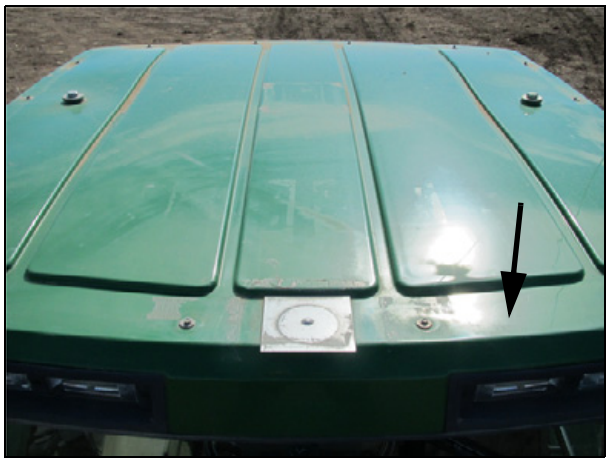
Step 3

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

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



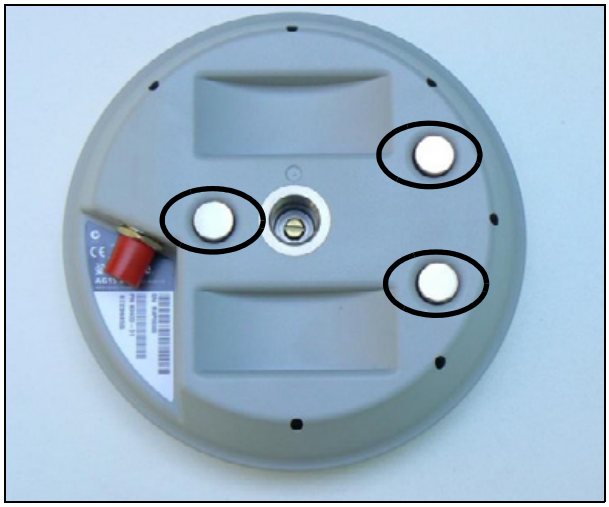
V plate



4" x 6" plate

Step 4

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



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



Step 5

GLONASS, RTK, OmniSTAR, DGPS, applications

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



WAAS, EGNOS, VBS, Beacon applications

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



Step 6

Both models

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



CFX-750 and TMX-2050 displays: Installing the RTK radio antenna

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

Step 1

Connect the radio antenna to the magnetic antenna base.



Step 2

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



Step 3

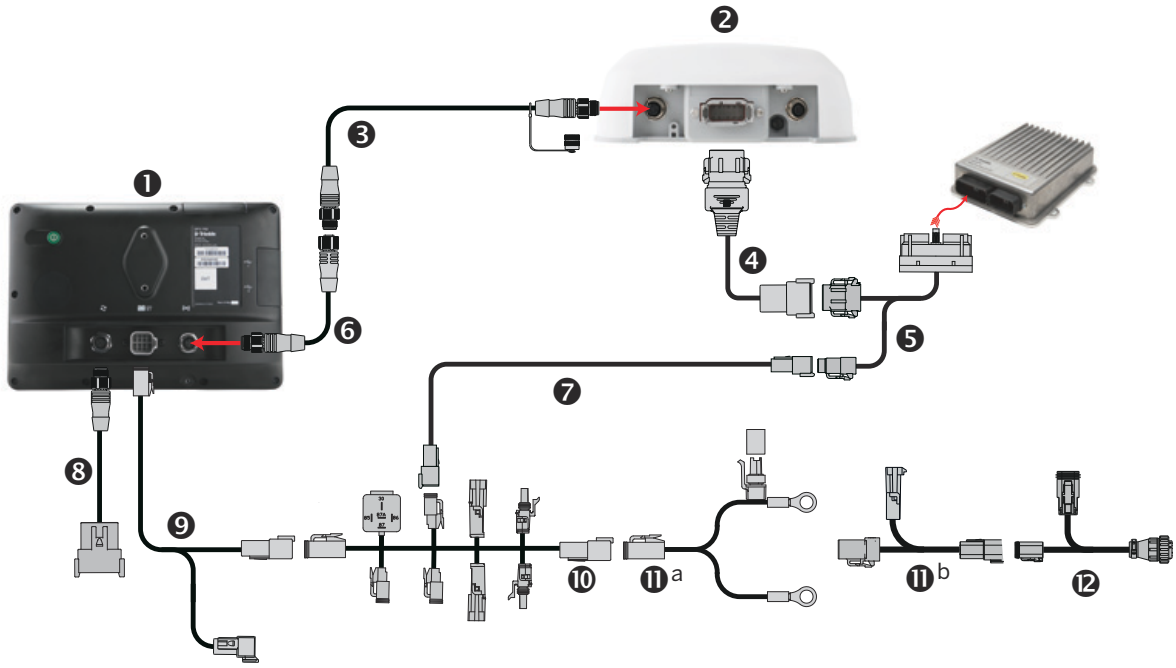
Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the P/N 62034 plate with the VHB provided to relocate the antenna.



Step 4

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

GFX/XCN displays: Components



Item	Description	Trimble P/N
1	GFX/XCN display, with PIQ App	121000-XX
2	NAV-x00 Guidance controller	
3	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR), 5m	110540
4	Cable Assy, NAV-900 to Nav II/III, Autopilot	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR) Extension, 2.5m	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX/XCN, Expansion Port Basic, RS232, Dig I/O, 2.5m	110545
9	Cable Assy, GFX/XCN, Power to display, CAN, 2.5m	110551
10	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Power with Relay and Switch (Acc)	67259
11a	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Basic Power, 4m	67258
11b	Cable Assy, GFX/GX display power, 6-pin DT-to-TMX, 4-pin DTP adapter	128918
12	Cable Assy, Display Power, 16 Pin, 2ND Display Connector, CNH	122452

GFX/XCN displays: Preparation

The GFX/XCN displays utilize the RAM mount system.



Attach the diamond based RAM mount to the back of the display using the provided fasteners



GFX/XCN displays: Installation

Step 1

The display should be mounted on the top right side of the cab using the RAM mount ball provided in the tractor for mounting a second display.



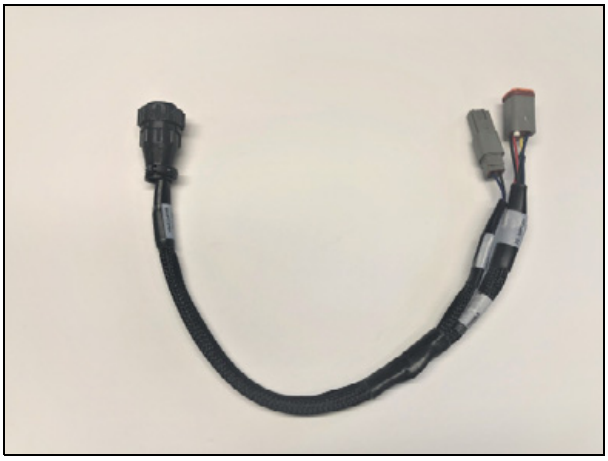
GFX/XCN displays: Installing the wiring harness

The GFX/XCN displays require a nominal 12 volt power source.

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

Step 1

Locate the display power adapter cable P/N 122452.



Step 2

Connect the 6-pin DT power/CAN cable P/N 122452 to the middle port of the display.



Step 3

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





Step 4

Attach the round P1 connector on P/N 122452 to the second display connector in the cab.

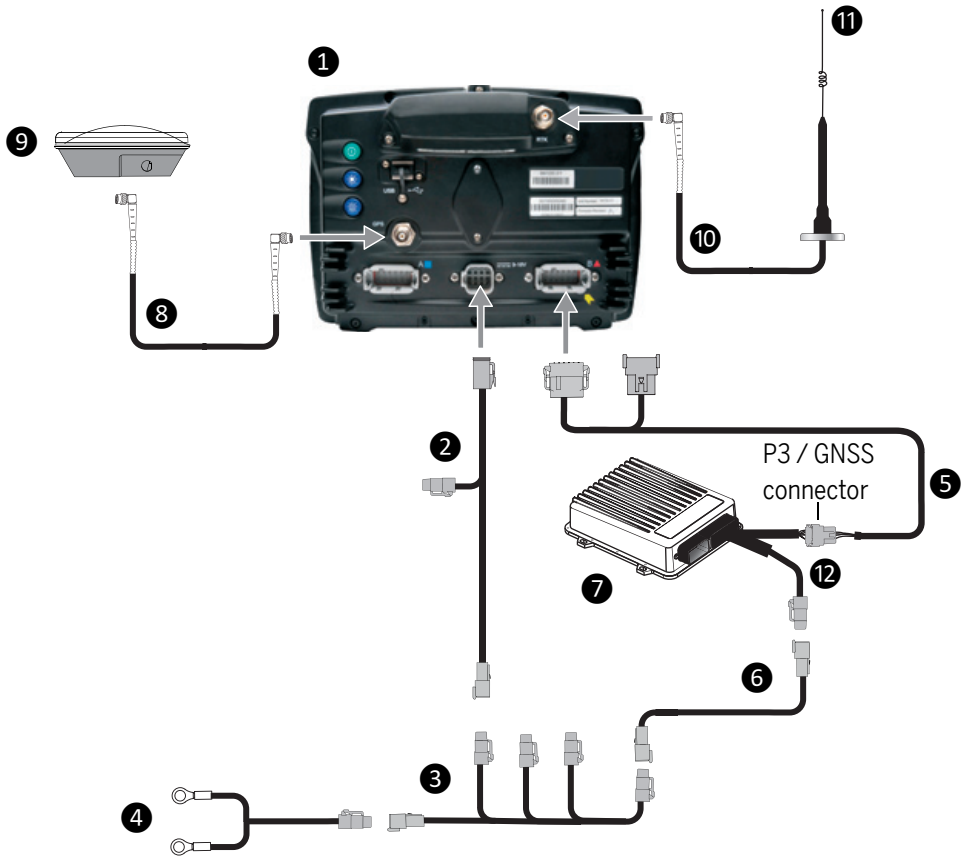


3

Power Harness Installation

- CFX-750 display: Components
- GFX/XCN displays: Components
- CFX-750 and GFX/XCN displays: Installing the power harness
- CFX-750 display: Configuring the power bus options
- TMX-2050 display: Components
- TMX-2050 display: Installing the power harness
- TMX-2050 display: Configuring the power options

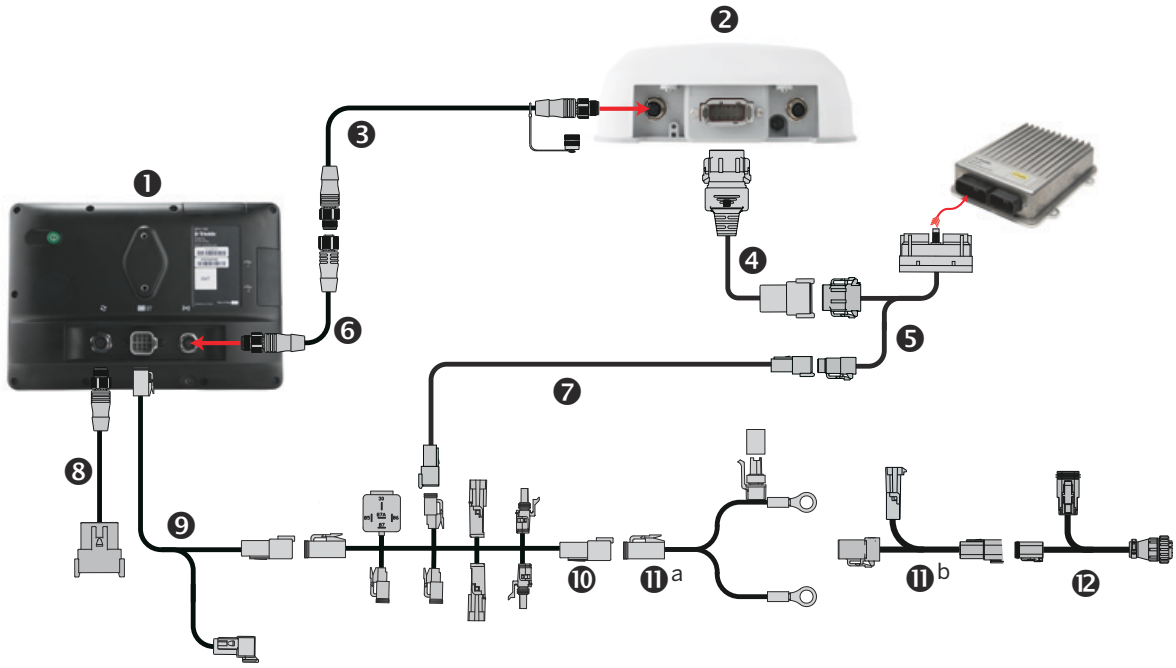
CFX-750 display: Components



CAUTION – Connecting the Port Replicator on the CFX-750 display to NavController III cable ❺ to the P4 or P12 connector of the NavController III harness ⓮ will result in damage to the CFX-750 display and will void the warranty.

Item	Description	Trimble part number
1	CFX-750 display **NOTE –** RTK password required.	94100-02
2	CFX-750 power cable	77282
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	CFX-750 to NavController cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adaptor	67095
7	NavController III	55566-00
8	8 m GPS TNC/TNC RT angle cable	50449
9	AG-25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	62120
11	900 MHz radio antenna kit	22882-10
12	External switch cable included with kit	Part of P/N 67259
13	External switch included with kit	Part of P/N 67259
14	Main NavController cable	54601

GFX/XCN displays: Components



Item	Description	Trimble P/N
1	GFX/XCN display, with PIQ App	121000-XX
2	NAV-x00 Guidance controller	
3	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR), 5m	110540
4	Cable Assy, NAV-900 to Nav II/III, Autopilot	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR) Extension, 2.5m	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX/XCN, Expansion Port Basic, RS232, Dig I/O, 2.5m	110545
9	Cable Assy, GFX/XCN, Power to display, CAN, 2.5m	110551
10	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Power with Relay and Switch (Acc)	67259
11a	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Basic Power, 4m	67258
11b	Cable Assy, GFX/GX display power, 6-pin DT-to-TMX, 4-pin DTP adapter	128918
12	Cable Assy, Display Power, 16 Pin, 2ND Display Connector, CNH	122452

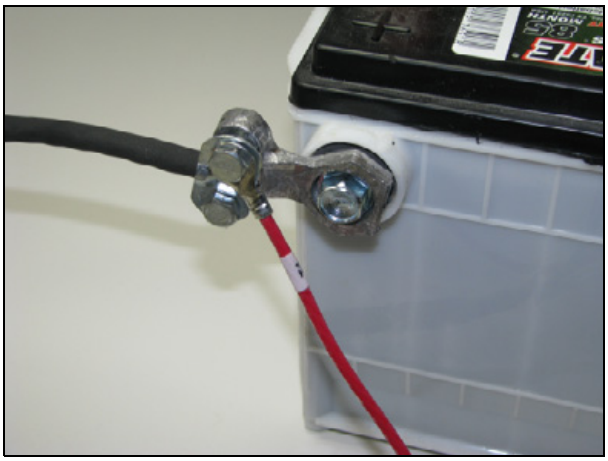
CFX-750 and GFX/XCN displays: Installing the power harness

NOTE – Unless otherwise stated, instructions for "the display" refer to either the CFX-750 display or the GFX/XCN display.

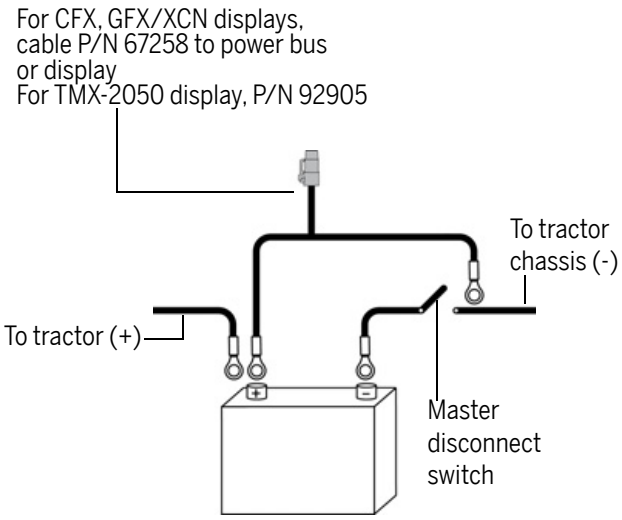
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

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

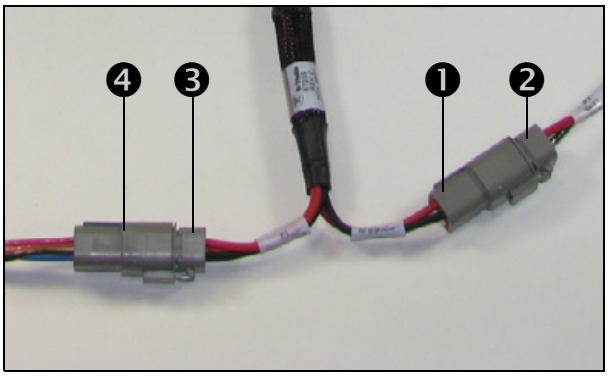


⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is *not* directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example.
Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



Step 2

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



Step 3

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



CFX-750 display

CFX-750 display: Configuring the power bus options

NOTE – Unless otherwise stated, instructions for "the display" refer to either the CFX-750 display.

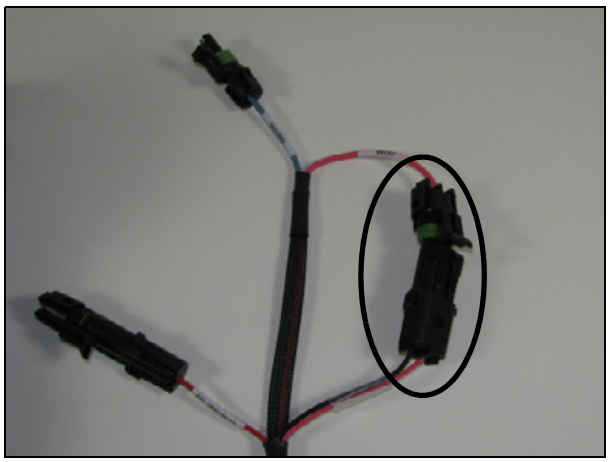
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

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

- Display power button is used to turn on the Autopilot system
- External switch is used to turn on the Autopilot system
- Ignition is used to turn on the Autopilot system

Display power button is used to turn on the Autopilot system

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

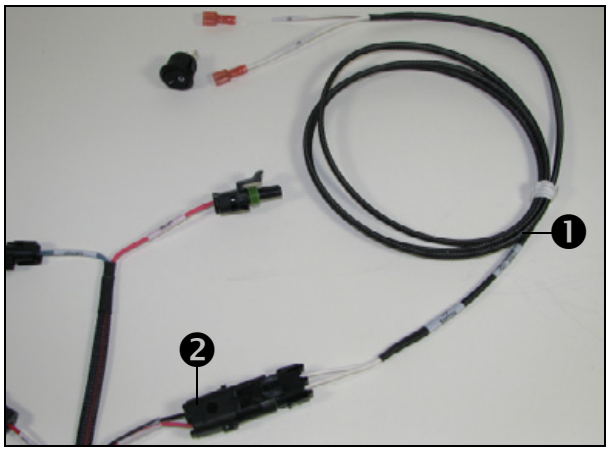


External switch is used to turn on the Autopilot system

Step 1

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

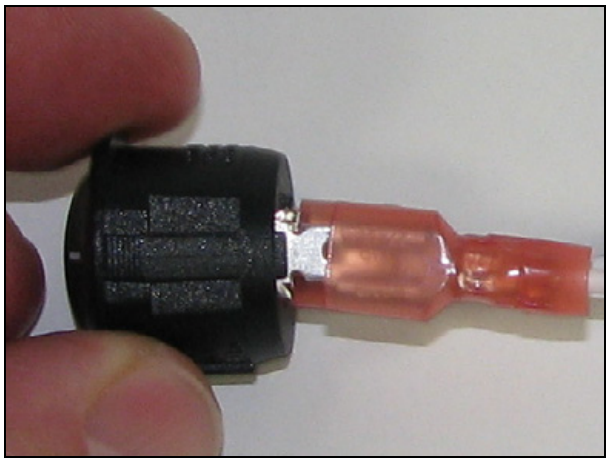
NOTE – To install the switch provided, drill a ¾" hole.



Step 2

Connect the cable labeled **R7** to the switch pins.

NOTE – Polarity is not important.

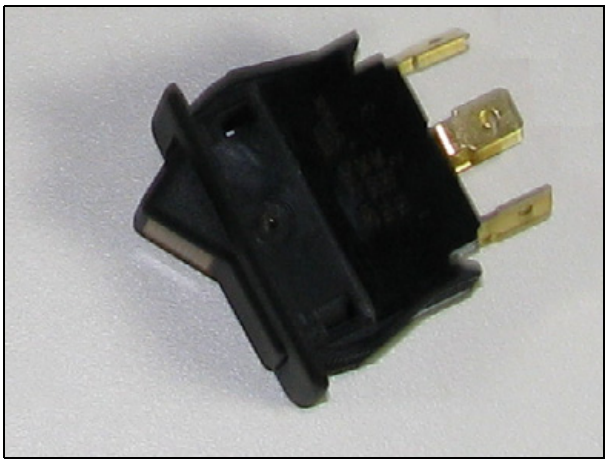


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

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

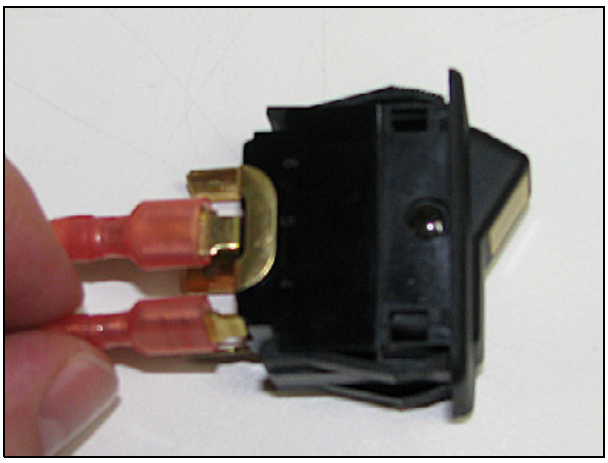


Step 2

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

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

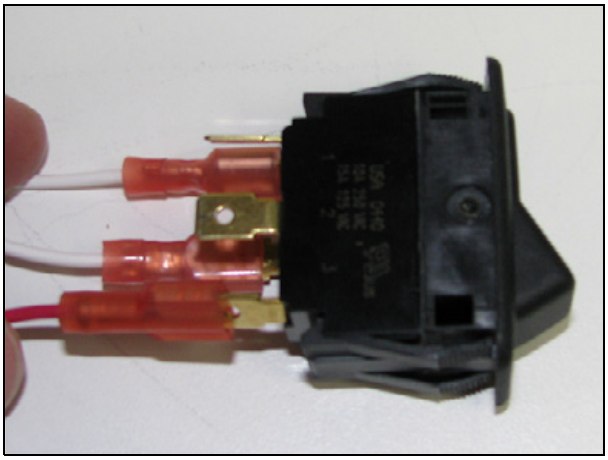
NOTE – Polarity is important.



Step 3

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

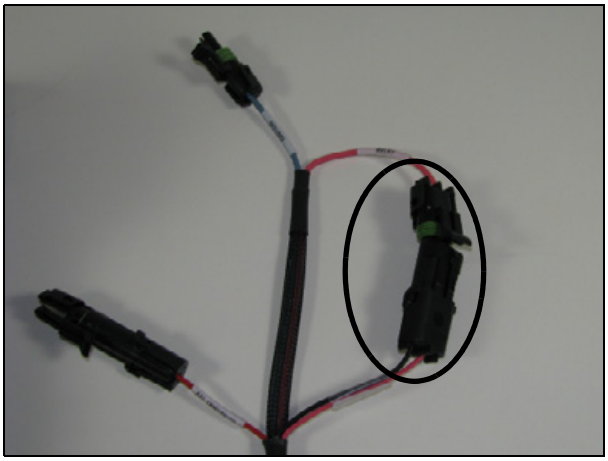
NOTE – This additional wire is required to allow the switch to illuminate.



Ignition is used to turn on the Autopilot system

Step 1

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

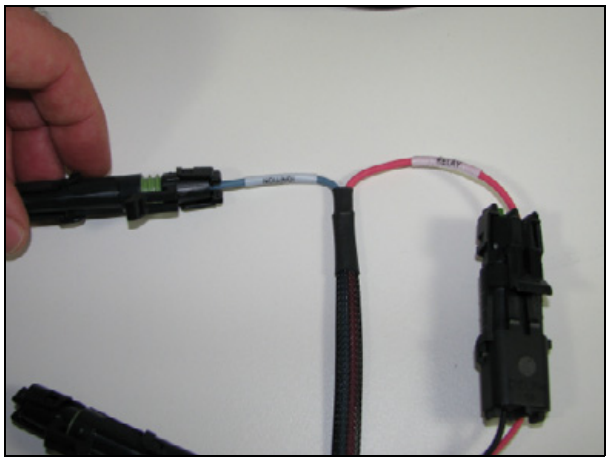


Step 2

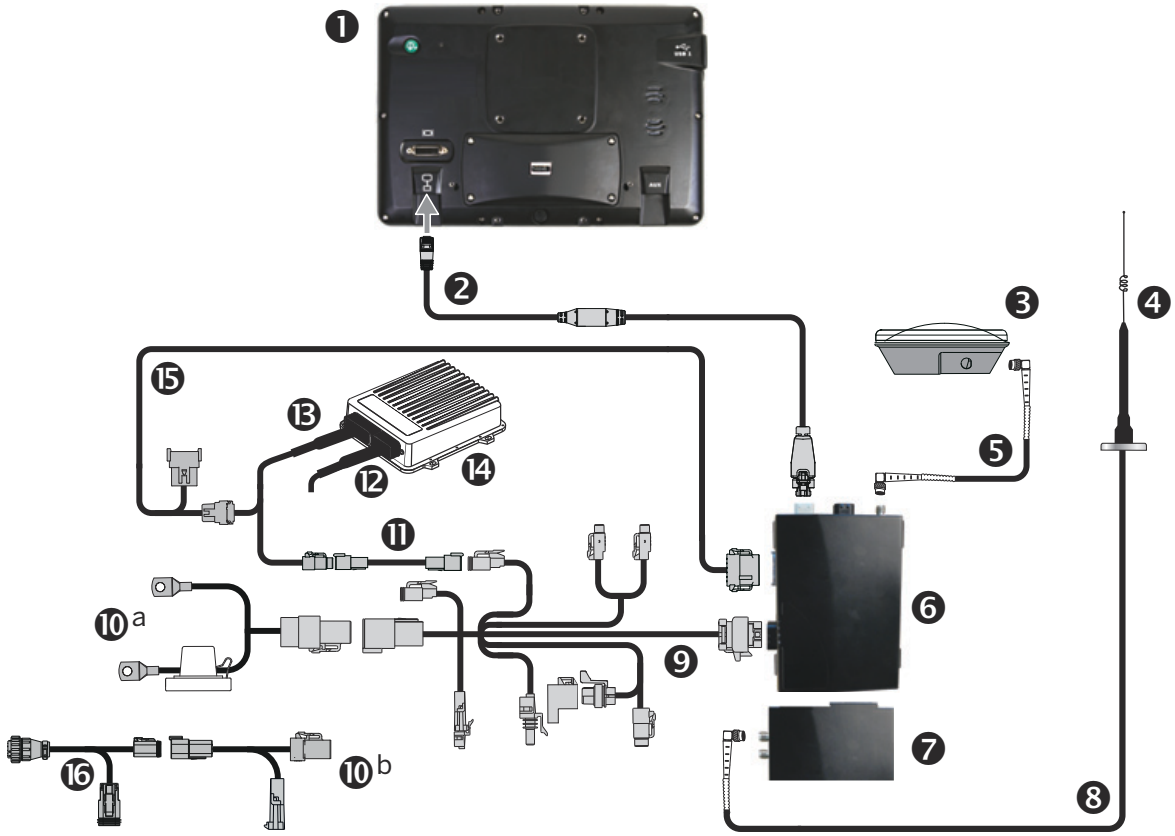
Connect the cable labeled **R8 Ignition** (included with the power bus) to connector **P3 Ignition** on the power bus.

Step 3

Route the cable to the vehicles ignition.



TMX-2050 display: Components



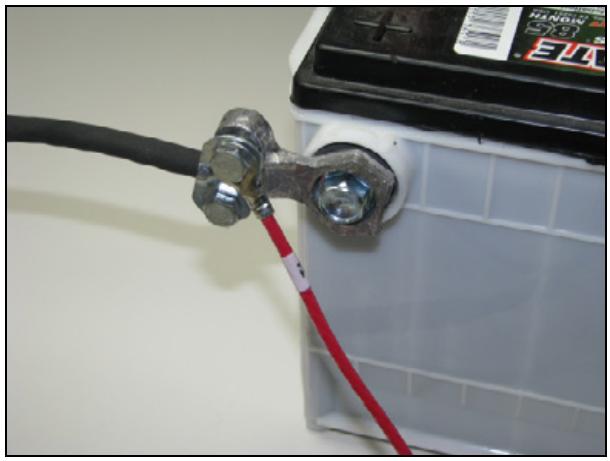
Item	Description	Trimble part number
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10a	Cable, battery	92905
10b	Cable Assy, GFX/GX display power, 6-pin DT-to-TMX, 4-pin DTP adapter	128918
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController III	55566-00
15	TM-200 Module to NavController cable with port replicator	75741
16	Cable Assy, Display Power, 16 Pin, 2ND Display Connector, CNH	122452

TMX-2050 display: Installing the power harness

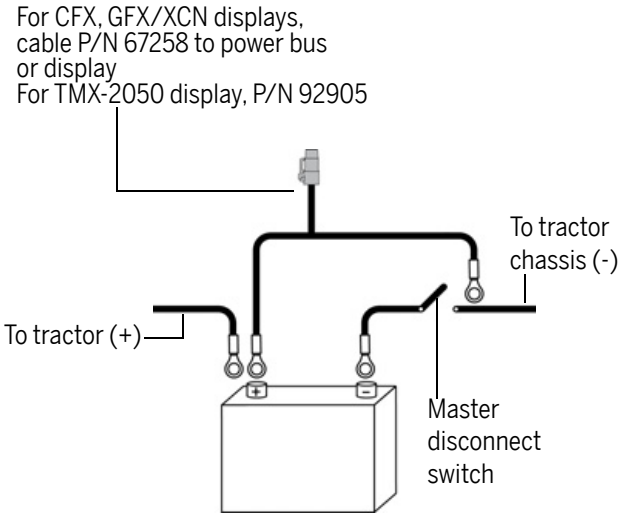
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

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



⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is *not* directly attached to the battery terminal that is disconnected by the master switch - the negative pole in this example.
Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



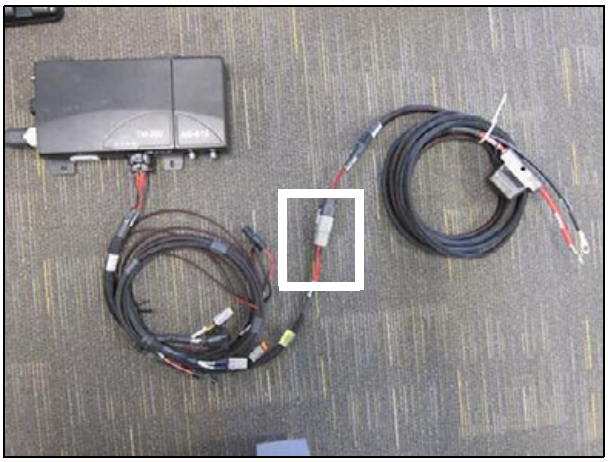
Step 2

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

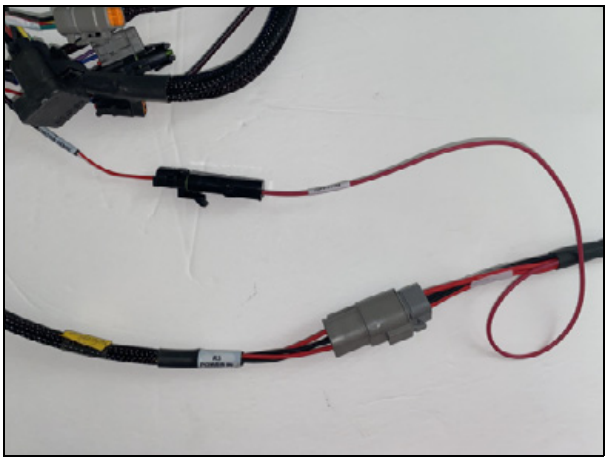


Step 3

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



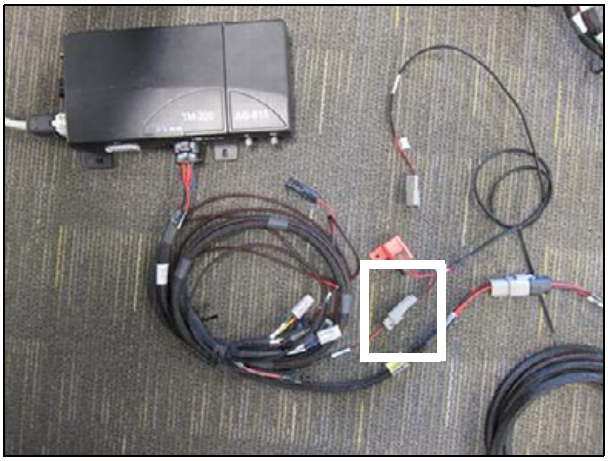
NOTE – Alternate connection would be to use cable P/N 128918. Connect P/N 128918 to R3 on the P/N 92676 cable.



Step 4

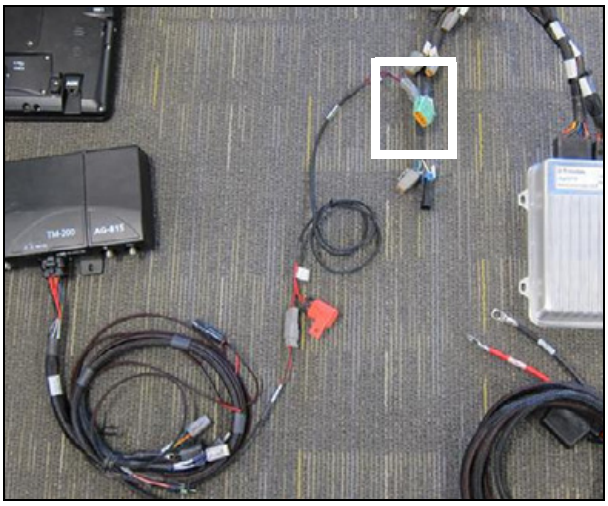
Connect the 2-pin DTM to 2-pin DT power adapter P/N 67095 to the P2 power out connector on the P/N 92676 cable.

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



Step 5

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



TMX-2050 display: Configuring the power options

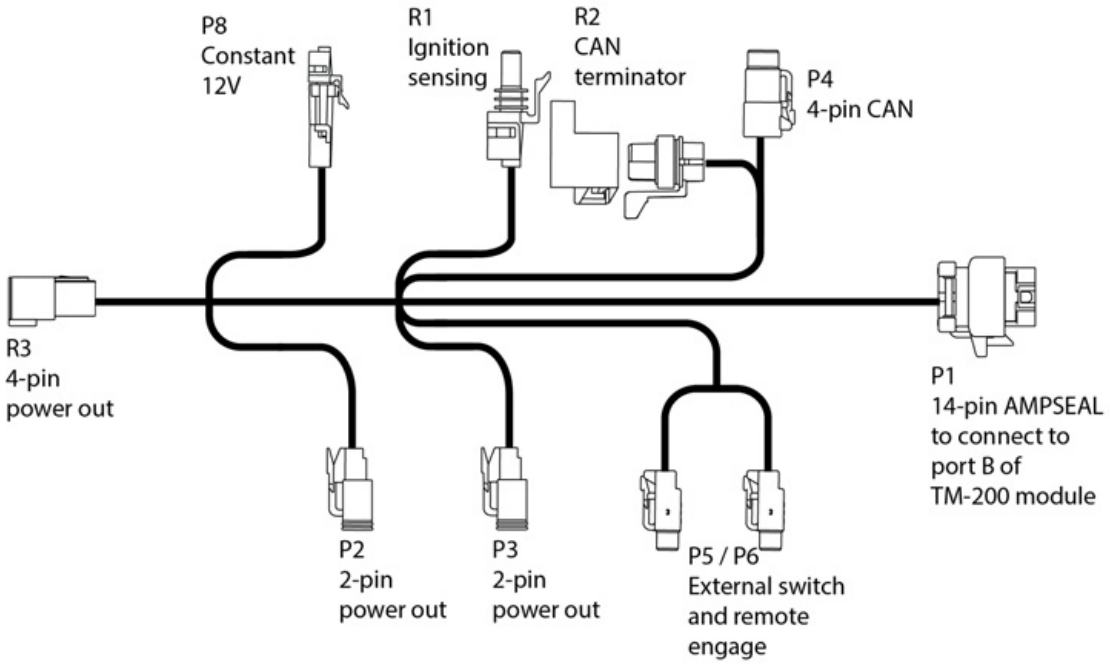
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

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

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

Ignition sensing

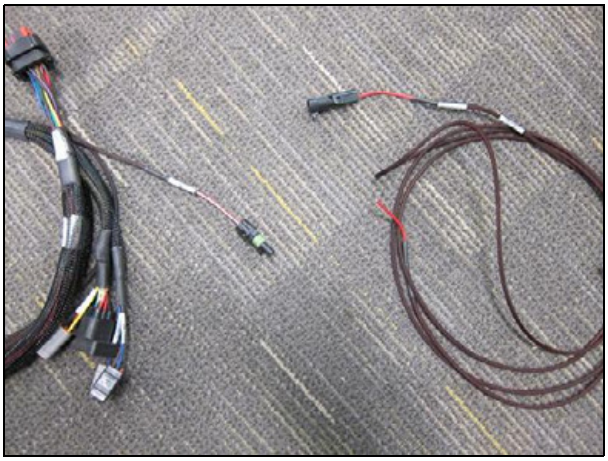
For ignition sensing with the TMX-2050 display, connect the ignition on the power supply to the R1 connector on the harness, P/N 92676.



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

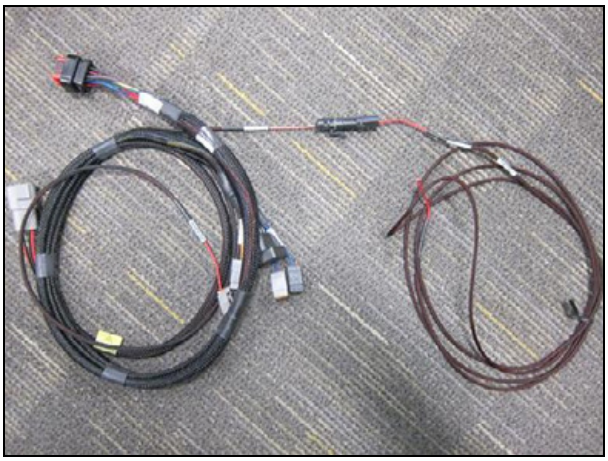
Step 1

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



Step 2

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



4

Controller Installation

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

Installing the controller

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

Step 1

Lift the rubber along the left side of the seat to locate the two bolts used to mount the NavController III mounting bracket, P/N 118241.

Remove the two nuts from the studs.

Place the NavController mounting bracket over the studs and then secure the bracket with the two nuts.



Step 2

Secure the NavController III to the bracket using the mounting hardware provided.



Step 3

Attach cables P/N 54601 and 54602 to the NavController III.



Connecting the NavController III to the tractor CAN system

Step 1

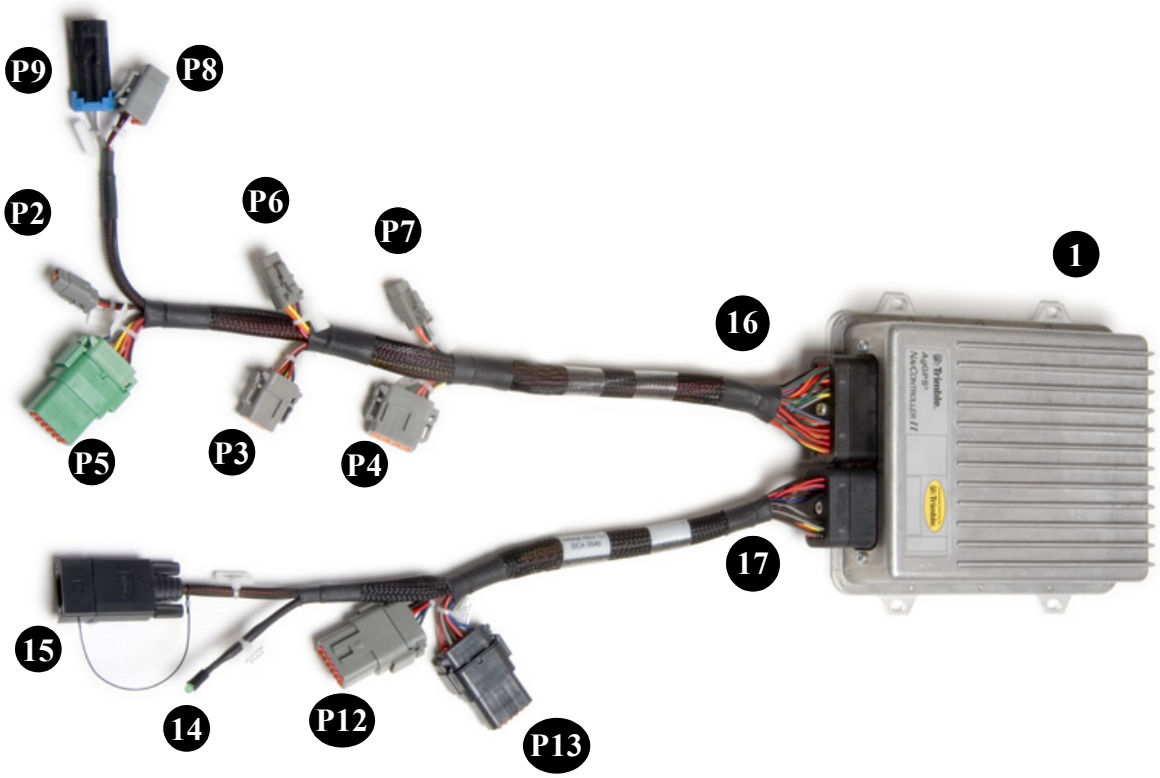
Locate the 9-pin ISO connector on the right side of the tractor behind the seat.



Connect P1 of cable P/N 85037 to the 9-pin ISO connector and then route the R4 connector to the NavController III.



Controller connections



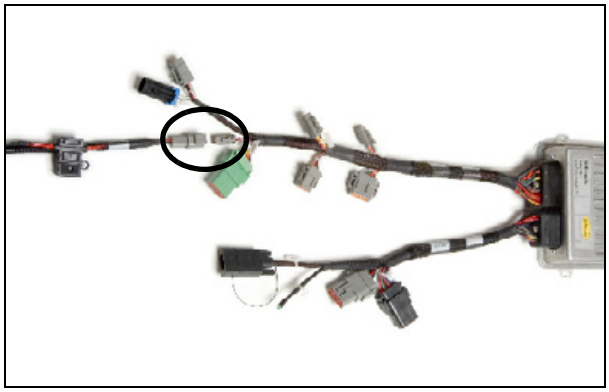
Item	Description	Item	Description
1	NavController III controller	P9	Sonalert connector
P2	Power connector	P12	Lightbar/spare connector
P3	GPS connector	P13	Spare sensors connector
P4	Display connector	14	Status indicator
P5	Vehicle sensors connector	15	Laptop connector
P6	Steering sensor connector	16	Main harness
P7	Manual override connector	17	Auxiliary harness
P8	Hydraulic valve connector		

Connecting the cables to the controller

Step 1

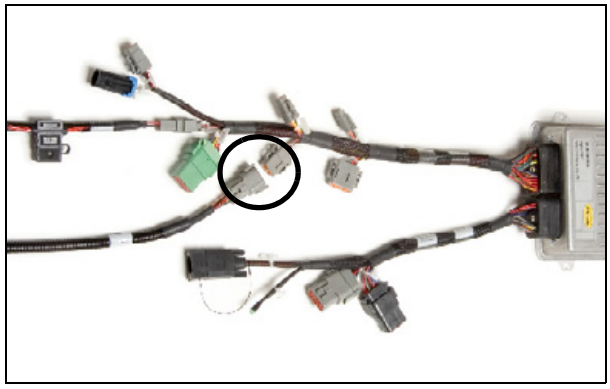
Connect the power cable connection to P2, which is labeled **Power**. P2 is located on the main wiring harness.

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



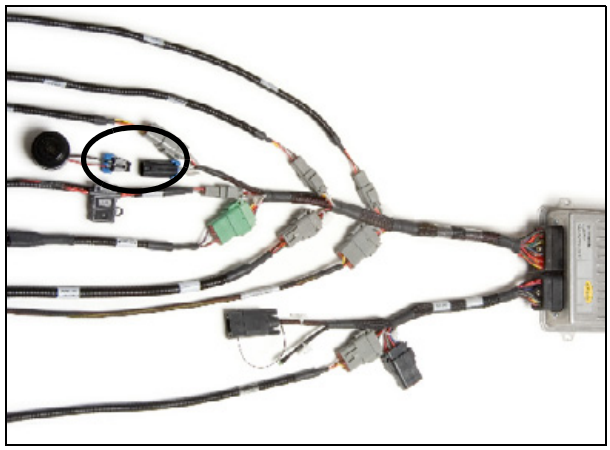
Step 2

Connect the CFX-750 display to P3, which is labeled **GPS**. P3 is located on the main wiring harness.



Step 3

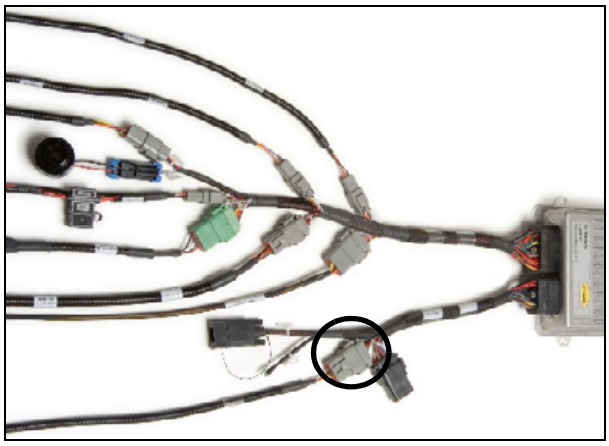
Connect the Sonalert P9 to the 2-pin Delphi connector on the main wiring harness. Route the cable so the Sonalert warning device is in a position that is audible to the operator.



Step 4

Connect the R4 connector on the CAN cable P/N 85037 to the P12 connector.

Route the LED and laptop lead, which is located on the auxiliary wiring harness, to a location that allows the operator to determine the controller status. See controller LED status for status determination. Six flashes per second indicates a correctly functioning controller.



Step 5

Use the provided sleeving to secure the harness cables with tie wraps. Cover and route the cable bundle to avoid damage to connectors and strain on wire connections.

5

Final Machine Check

- Setting up 3rd party guidance
- Enabling the Steering

> ⚠ **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. Update the Trimble display and the Autopilot NavController II/III to the latest firmware from http://agpartners.trimble.com.

   You can use FlashLoader 200 software version 4.03 to update the Autopilot controller: Download it from http://agpartners.trimble.com.
3. 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 4.01 or later to load the configuration file into the Autopilot controller. You can download the Autopilot Toolbox II software from http://agpartners.trimble.com.
4. Calibrate the Autopilot system using the Trimble display or Autopilot Toolbox II software. Depending on your machine type, the following items must be calibrated before you can use the Autopilot system:
   - NavController II/III/NAV-900 mounting orientation
   - Antenna height/Antenna axle offset, and Roll offset

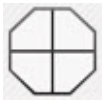
Setting up 3rd party guidance

1. The machine must have a CNHi ISOBUS Class III Steering unlock (CNHi P/N 47645764) installed on the system. This must be done by a CNHi dealer.
2. Set up Pro1200 for 3rd Party Guidance in **Pro 1200 Menu** / **GNSS & Guidance** / **Guidance**:

   Set **Guidance** to **OFF**.



3. CNHi ISOBUS Class III uses a 4 quadrant status symbol to display the status of that ISOBUS Class III function, including 3rd Party CAN Guidance. It is important to understand these symbols and know what they mean.

Icon	Description
	ISOBus Class III is off. This means the tractor controller has not been initialized or the system has been canceled.
	Tractor controller is performing self-checks/not ready to accept commands
	An activation condition on the tractor controller for accepting steering commands is not met. Example: moving steering wheel, Field mode switch is in on-road mode, or the operator is out of the seat.
	Tractor controller has passed internal self-checks and is ready. It is in standby mode, waiting for the external guidance system to be ready.

Icon	Description
	The tractor controller is ready to accept guidance commands and the external guidance system is ready to send guidance commands. The machine and the external guidance system are waiting for the operator to acknowledge and engage the steering. **NOTE –** The following items must be done in order for the status octagon to go to the ¾ green ready state. • 3rd party Guidance Unlock installed (Step 1) • Machine configured for 3rd Party Guidance with ISOBUS Class III (Step 2) • Field mode switch is in the off-road position (Step 4) • ISOBUS Class III is enabled (Step 5) • Be in a field on the Trimble display • Have a guidance pattern created in the field on the Trimble display • Be within an engageable distance to the guidance pattern • No Manual override is active (operator is not manually moving the steering wheel)
	Operator has engaged the steering, and the external guidance system is steering the machine.
	Internal error in the tractor function. The external guidance system will not engage.

The symbol for the external guidance system will appear in the upper-left corner of the Pro1200 display. This area is viewable on all screens.



4. Push the field mode switch to the Up position. This setting can be confirmed in Pro1200 **Menu** / **Tractor** / **Steering**.

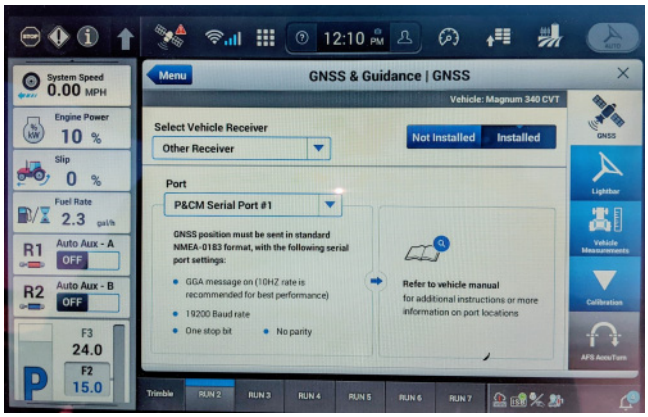




5. Enable CNHi ISOBUS Class III Steering by fully pressing the switch labeled **Auto** up for 3 seconds.



6. To set up NMEA into the Pro1200, navigate to Pro1200 **Menu** / **GNSS & Guidance** / **GNSS**.



   a. Select **Installed**.

   NOTE – If a GNSS signal is not needed by the Pro1200, select **Not Installed** and skip the rest of the steps.

   b. Set **Select Vehicle Receiver** to **Other Receiver**.

   c. Set **Port** to **ISO CAN BUS**.

d. The following PGN's will need to be set in the **Trimble Receiver configuration** settings for CAN Port A:
   - PGN 129029 @ 10 Hz
   - PGN 65267 @ 10 Hz
   - PGN 65256 @ 10 Hz

Enabling the Steering

The following steps will need to be completed with each power cycle of the machine:

1. It is important that the Pro1200 system is powered up *before* the Trimble system. If the Trimble system is powered up prior to the Pro1200, the ISOBUS Class III authentication process will not complete properly and the systems will not communicate with each other.

   Normally powering the Trimble system through key switched power is sufficient to facilitate this timing, but in some instances the Trimble display may need to be manually powered up after the Pro1200 system is fully loaded.
2. The field mode switch (Step 4 from Setting up 3rd party guidance) will need to be cycled from the field (off-road) position to the on-road position, and back to the field position.
3. The Class III ISO switch (Step 5 from Setting up 3rd party guidance) will need to be pressed for 3 seconds to enable ISOBUS Class III steering.

The Trimble steering system can be engaged either through the engage button on the Trimble display, or through the engage button on the machine's joystick.

NOTE – The CNHi ISOBUS Class III status octagon will only go to the ¾ green ready state when the Trimble display's engage button steering wheel goes to green. If the Trimble display's engage button is yellow, the Class III status octagon will be 2/4 orange..

Case IH Engage button



New Holland Engage button



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