INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

Massey Ferguson Tractors

- 8S.xxx Series
- 9S.xxx Series

PTx Trimble

Version 10.00
Revision A
March 2025
P/N 54035-6362-E10

Legal Notices

Agriculture Business Area

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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:

DANGER! ALERTS YOU TO A SITUATION THAT IS LIKELY TO RESULT IN DEATH OR SERIOUS INJURY.

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

DANGER! 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 THE BOOM TO THE LOWEST POSITION BEFORE YOU BEGIN WORK.

DANGER! 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.

DANGER! 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.

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 – 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.

WARNING – 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.

Cautions

CAUTION – Damage will result to the cable if it is not routed correctly. When routing cables be sure to route them free from areas that may result in damage to the cables including pinching, stretching and rubbing.

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



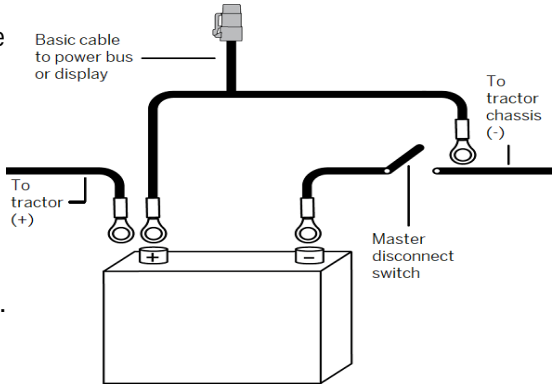
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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

CAUTION – Before you drill any holes, check behind the drilling surface to ensure that you will not damage any hoses, wires, or other equipment. Failure to do so could result in damage to the vehicle.

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 damage to the display.



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Introduction

- Technical assistance
- Manual system upgrade to the Autopilot system
- Preparing the vehicle for installation

This manual describes how to install the platform specific components of the Trimble® Autopilot™ automated steering system.

For installation of the GFX display and NAV-9xx guidance controller please review the separate display and NAV controller installation guide.

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 (trimble.com) for an interactive look at Trimble and GNSS.

Technical assistance

Go to the Ag Resource Center for the latest support information, including:

- support notes detailing support issues
- documentation
- the latest files available for download

If you still cannot find the information that you need, contact your Trimble reseller.

Manual system upgrade to the Autopilot system

Displays

Retain
GFX display: P/N 13x000-01
NAV-960™ guidance controller: P/N 131800-04
Power cable GFX display: P/N 110551 Base power cable: P/N 67258 GFX display to NAV-xxx comms cable: P/N 110540

Required components

Kits required	Special tools
Platform kit: P/N 54035-6362	Standard hand tools
P/N 132085 - NAV-960, Mount, Spar and Quick Release Adapter Plate	
P/N 109314 - NAV-900, Mount, Quick Release Kit	

Preparing the vehicle for installation

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 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.

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

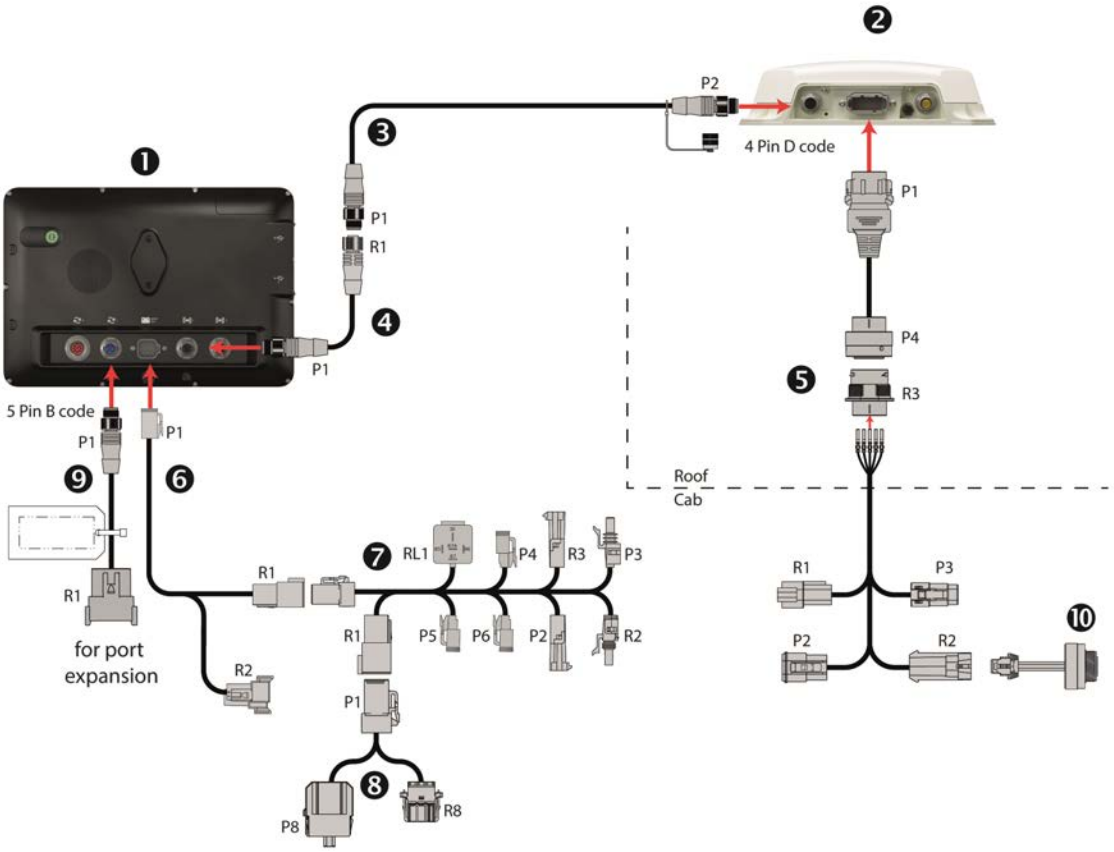
TIP – Read through the steps and make certain you have all the hand tools needed before starting installation.

2

Connecting the NAV-960 controller

- System components
- GFX series display: Installing the power harness
- Controller installation

System components



Item	Description	P/N
1	GFX display, with PIQ App	13x000-01
2	NAV-960 guidance controller	131800-04
3	Cable Assy, GFX to NAV, Power/Ethernet (BRR), 5 m	110540
4	Cable Assy, GFX to NAV, Power/Ethernet (BRR) Extension, 2.5 m (optional extension for large vehicles	112082
5	Cable Assy, Autopilot, 8S, Massey Ferguson, NAV-9x0	129776
6	Cable Assy, GFX, Power to display, CAN, 2.5 m	110551
7	Cable Assy, GFX, Power with Relay and Switch (Acc)	67259
8	Cable Assy, AGCO, FMX, CFX, GFX, TMX Power jumper	118053
9	Cable Assy, Display, Expansion Port, RS232, Dig I/O, 2.5 m	110545
10	Sonalert	43104

GFX series display: Installing the power harness

The GFX series display requires a nominal 12 volt power source. The P/N 67259 cable has ring terminal leads for connecting to a battery or other cable mount point.

WARNING – If the machine has a master electrical disconnect, ensure that the display/receiver is 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 recommended to use 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

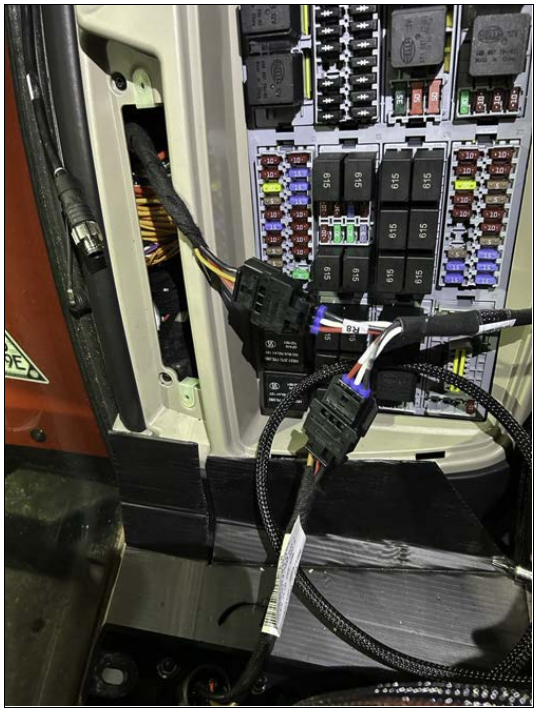
Locate the AGCO power adapter P/N 118053.



Step 2

Remove the auxiliary power panel and blank cover to route power via the P/N 118053 cable as shown.





Step 3

Connect P1 on cable P/N 118053 to the R1 connector on the display cable P/N 110551.



Step 4

Route the power cable 110551 to the display as shown.



Step 5

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



Controller installation

Step 1

Locate the NAV-960 quick release bracket P/N 132085.

Place the NAV-960 controller on the three M6 mounting studs on the bracket P/N 132085.

Tighten the three M6 nuts; do not exceed 10 N-m (88.5lb-in) torque.





Step 2

Place the four mounting brackets (P/N 109890) on the roof as shown.



Step 3

Install the NAV-960 controller with the attached quick release bracket (P/N 109314) to the predesignated place on the roof.



NAV-900 shown as reference only

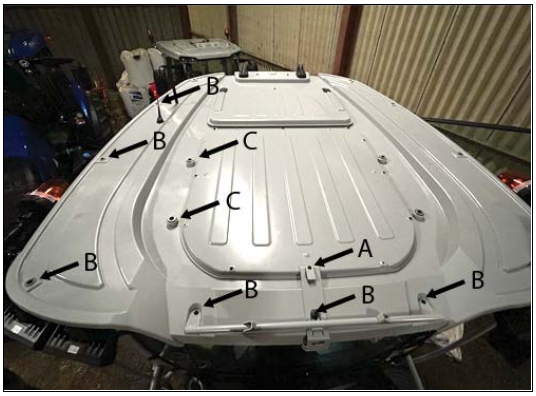
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Cable Installation

Connecting the cables

Step 1

Remove the screws holding the roof panel down on the front right corner using T25 (**A**), T30 (**B**), and T40 (**C**) tools.



Step 2

Use a block of wood or something similar to hold the corner of the roof panel up.



Step 3

Locate the access panel, radio, and storage box in the headliner trim.



Step 4

Locate radio removal tool, supplied with the tractor.



Step 5

Gently remove the radio bezel to access the radio removal slots on each side.



Step 6

Gently insert the radio removal tool to release each side of the radio.



Step 7

Gently remove the storage box to the right of the radio.



Step 8

Unplug the OEM controller under the access panel as shown. This should remain unplugged to avoid conflicts with the NAV-960 controller.



Step 9

From inside the cab, locate the antenna wires passing through the black plastic behind the radio and storage box. Push the surrounding grommet out of the hole from the inside or outside of the cab.



Step 10

From outside the cab, remove the grommet behind the front right light and cut one side if necessary, as shown.



Step 11

Route the BroadR-Reach cable from the NAV-960 controller towards the display through this hole and then push the grommet back into place.



Step 12

Route the BroadR-Reach cable into the cab through the hole next to the antenna wires identified in step 9, page 19.



Step 13

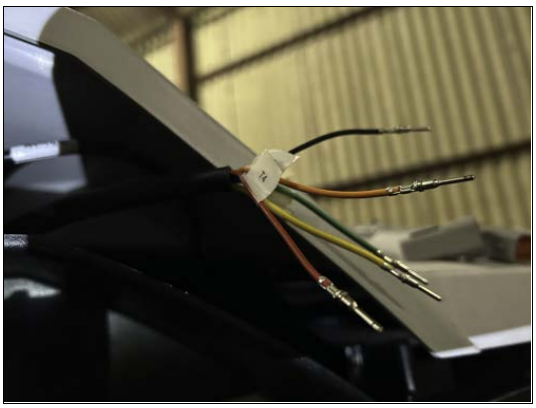
Use the grommet supplied with cable P/N 129776 to protect the antenna wires, BroadR-Reach cable, and 129776 cable. In order to make the installation easier, this grommet should be installed into the hole prior to passing cable 129776 through the hole.

Feed the terminals TA, TB, TC, TD, and TE on cable P/N 129776 through this hole from the inside of the cab to the outside of the cab.



Step 14

From the outside of the machine, pull cable P/N 129776 through towards the front of the machine.



Install the included bulkhead connectors into position, as per the table below:

Bulkhead connector	Position
TA	A
TB	B
TC	C
TD	D
TE	E



Plug the open holes using the provided Deutsch wire cavity plugs.

Step 15

Remove the steel panel above the center of the front window with a T20 tool, to reveal an empty bulkhead cutout.





Step 16

Secure the bulkhead R3 connector on cable 129776 using the included washer and jam nut as shown.



Step 17

Replace the metal panel so that the R3 bulkhead on cable P/N 129776 is visible and the OEM connector is concealed.



Step 18

Attach the sonalert to R2 on cable 129776.

If NMEA needs to be supplied to other devices, it can be accessed on connector P3 on cable 129776.



Step 19

Locate the CAN bus connector X230 under the headliner access panel. The VDO controller can be moved out of the way using a T30 tool.

Remove the installed terminator.

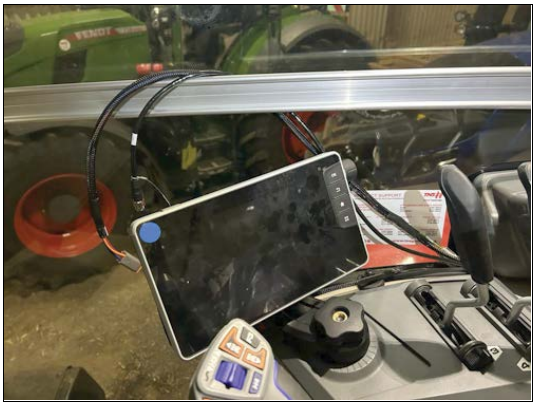
Attach the terminator to P2 on cable 129776.

Attach R1 on cable 129776 to connector X230.



Step 20

Route the BroadR-Reach cable and display power cable near the right window, where the display will be mounted.



Step 21

Replace the metal panel so that the R3 bulkhead on cable P/N 129776 is visible and the OEM connector is concealed.





Step 22

Reinstall the radio, storage box, and access panel in the cab.



Step 23

Remove the spacer block inserted in Step 2 and then reattach the roof corner using the screws removed in Step 1.



Connecting the power communication cable P/N 110540

Connect P2 of the power/communication cable (P/N 110540) to the 4-pin M12 connector on the left side of the NAV-960 controller.

Connect P1 of the power/communication cable to the display.

For long runs, extension cable P/N 112082 (sold separately) may be required.



4

Final Machine Check

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

To perform the final machine check:

1. Connect the battery.
2. Update the Trimble display and the NAV-9xx controller to the latest firmware from Ag Resource Center.
3. Load the correct configuration file into the Autopilot NAV-9xx controller for the vehicle model being used. Download the latest set of configuration files from Ag Resource Center.
4. Calibrate the Autopilot system using the Trimble display. Depending on your machine type, the following items must be calibrated before you can use the Autopilot system:
   - NAV-9xx mounting orientation
   - Antenna height/Antenna axle offset, and Roll offset

Machine Operation:

The Autopilot system is engaged through the button on the armrest. The signal is sent as a CAN message and received by the guidance controller.


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