INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

Deutz-Fahr AGR Tractors

- 5 Series: 5100, 5110, 5120, 5130, 5100 TTV, 5110 TTV, 5120 TTV, 5130 TTV
- 6 Series: 6150.4 TTV, 6160.4 TTV, 6160 TTV, 6180 TTV, 6190 TTV
- 7 Series: 7210 TTV, 7230 TTV, 7250 TTV

PTx Trimble

Version 10.00
Revision A
April 2025
P/N 54035-6193-E10

Legal Notices

Agriculture Business Area

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This is the April 2025 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-6193-E10. It applies to Version 10.00 and later of the Autopilot automated steering system.

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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



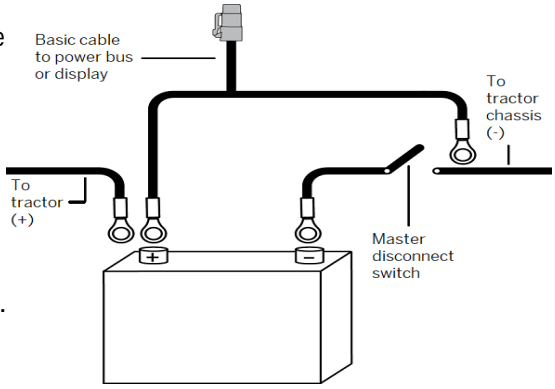
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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 54035-6193	Standard hand tools

Antenna mounting kits

Kits required
P/N 132730-00 - Receiver Mounting Kit, Deutz Fahr AGR TTV 5000 6000 7000 AGR TTV, CAN NAV-960

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.

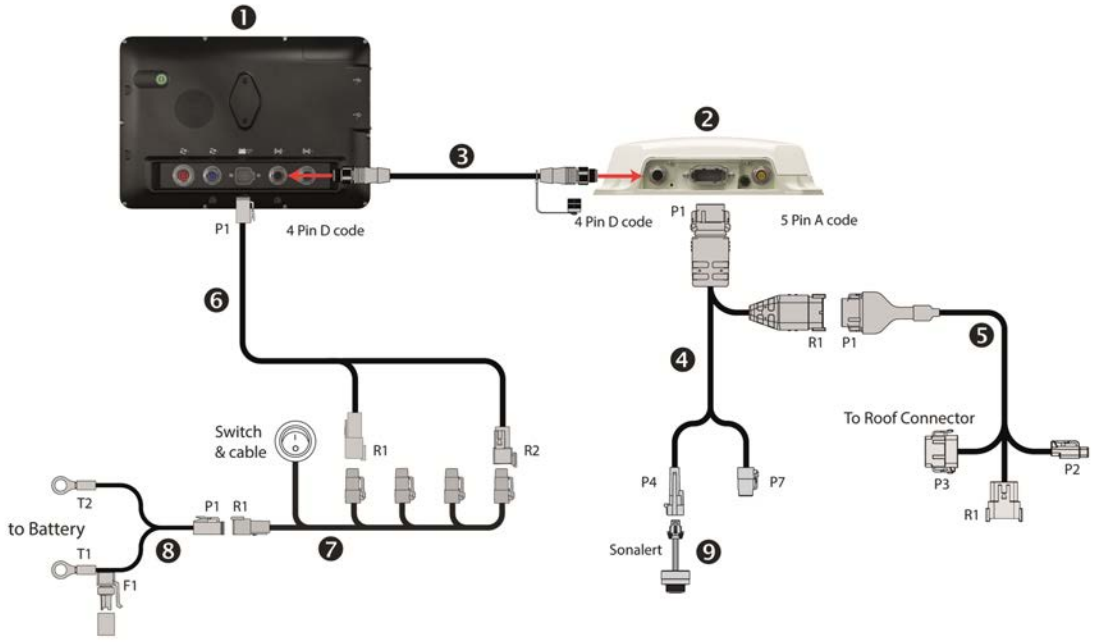
TIP – Read through the steps and make certain you have all the hand tools needed before starting installation.

2

CAN Interface Cable Installation

- System components
- Connecting the CAN interface cable

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, NAV, roof CAN sonalert, NMEA	130738
5	Cable Assy, Autopilot NAV-900, CAN interface, Duetz-Fahr AGR	124251
6	Cable Assy, GFX/XCN, Power to display, CAN, 2.5 m	110551
7	Cable Assy, GFX, Power with Relay and Switch (Acc)	67259
8	Cable Assy, GFX, Power with Relay and Switch (Acc)	67258
9	Sonalert	43104

Connecting the CAN interface cable

Step 1

Remove the cover below the front top of the cab to access the CAN interface connection.



Step 2

Remove the two screws holding the left side of the cover.





Step 3

Remove the two screws holding the right side of the cover.





Step 4

Carefully remove the screw in the center of the cover to access the CAN connector.



Step 5

Connect the R1 connector on cable P/N 124251 to the 12-pin DTM CAN connector.



Step 6

Route the P1 connector on cable P/N 124251 to the NAV-9xx mounting location and then connect it to the NAV-9xx controller.

Step 7

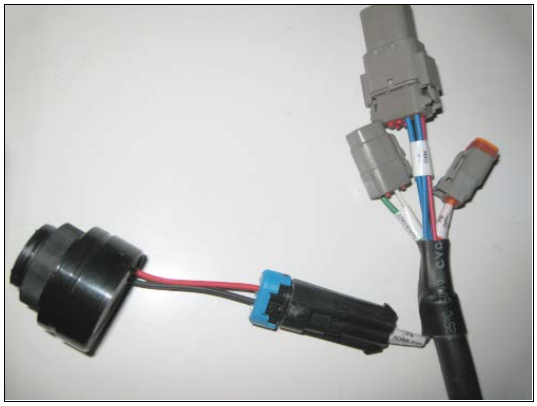
Install the cover removed in the previous steps, after completing the bracket and NAV-9xx controller installation detailed in the next chapter. The remote engage will also need to be connected prior to reinstalling the cover.



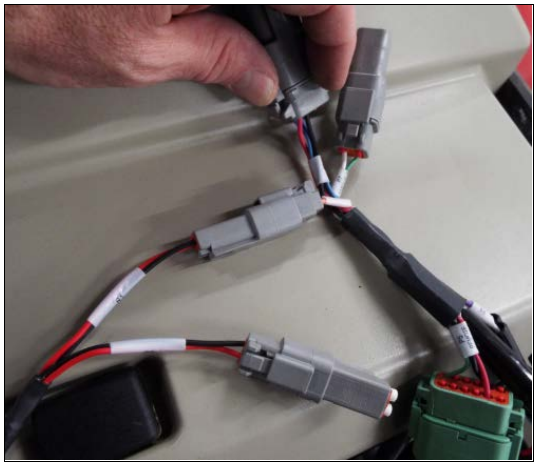
Step 8

Route the other end of cable P/N 130738 into the cab.

Connect the Sonalert to the cable once it is inside the cab.



Connect the NMEA output, if needed.



3

Installing the NAV-960 Controller

The NAV-960 controller must be mounted on the roof.

Use the following steps to install the controller and bracket to the front of the cab.



NOTE – NAV-900 controller shown for reference.

Attaching the base mounting plate

The guidance controller has a base mounting plate (P/N 132085) for adapting to other mounting fixtures.

Place the NAV-960 controller on the three M6 studs in the mounting plate and install the provided M6 lock washers and nuts. Tighten the three M6 fasteners to 10 N-m (88.5 lb-in) maximum. Take care not to over-tighten the fasteners as damage may result.





Step 1

Locate the NAV-960 spar bracket mounting location at the front of the cab. The two hinge points for the roof window are used to secure the bracket to the cab roof.



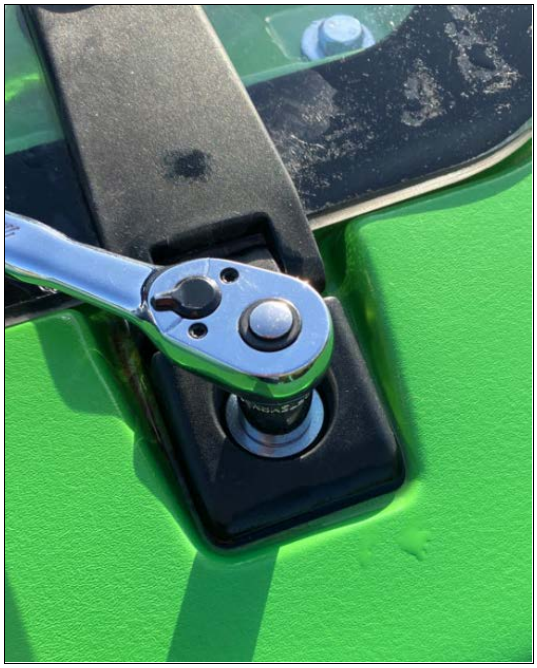


Step 2

Use a common screwdriver to remove the plastic cap to access the hex nut.



Use a 13 mm socket to remove the nut.



Step 3

Use a 13 mm socket to remove the two bolts holding the roof window hinge in place.

The bolt is accessible below the cab roof in the same area that the CAN connection is made.



NOTE – It is recommended to do one bolt at a time so that the roof window hinges stay in place.



Step 4

Locate the bolts provided in the bracket hardware kit and move the washer from the shorter bolt to the new longer bolt.

Use a 13 mm socket to thread and tighten the new bolt in the hinge location where the shorter bolt was removed.



Step 5

With the new bolt tightened from below the cab roof, install the provided spacer.





Step 6

Install the provided flat washer.



Step 7

Install the spar bracket and second flat washer.



Step 8

Verify the bracket and NAV-9xx controller are centered on the cab.

Use a 13 mm socket to tighten the provided lock nut and washer to secure the bracket in place.



Step 9

Complete the previous steps to secure the second mount point.

Connect the quick release bracket P/N 110308 to the spar bracket using the provided hardware.



Step 10

Secure the NAV-9xx controller to the quick release bracket.

NOTE – NAV-900 controller shown for reference.



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.

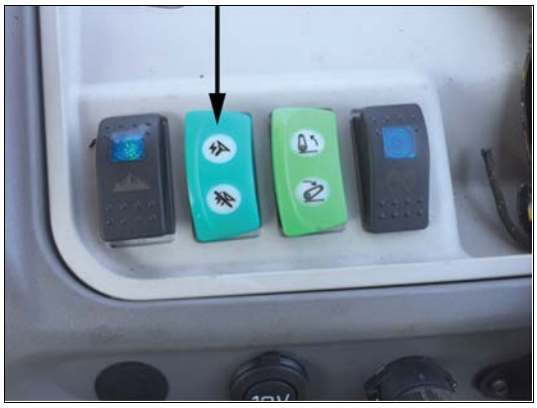
To perform the final machine check:

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
   - Valve deadzone (done using the OEM service tool or per tractor operators manual/service manual)
   - Autopilot P-gain (done using the OEM service tool or per tractor operators manual/service manual)
5. Enable the guidance on the tractor (see below).

Enable guidance on the tractor

Step 1

Turn the Roading Lockout Switch off.



Step 2

With the tractor engine running, press and hold the circular steering wheel button switch closest to you for 5 seconds to arm the autoguidance system and the fast steer system.



Step 3

When the system is armed and ready to work, the steering wheel symbol appears on the dashboard.




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