INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

McCormick AGR Tractors

- X7.4 Series: X7.440, X7.450, X7.460
- X7.6 Series: X7.650, X7.660, X7.670, X7.680
- X8.6 Series: X8.660, X8.670, X8.680

Landini AGR Tractors

- 7 Series: 7-200, 7-210, 7-230, 7-240
- 8 Series: 8-310 VS

PTx Trimble

Version 10.00
Revision A
April 2025
P/N 54035-6195-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 54035-6195-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



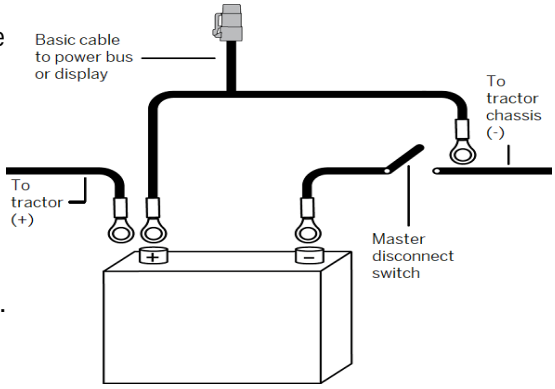
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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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1

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 54035-6195	Standard hand tools

Antenna mounting kits

Kits required
NAV-900, Base Mount, Feet: P/N 109890 (QTY 3)

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.

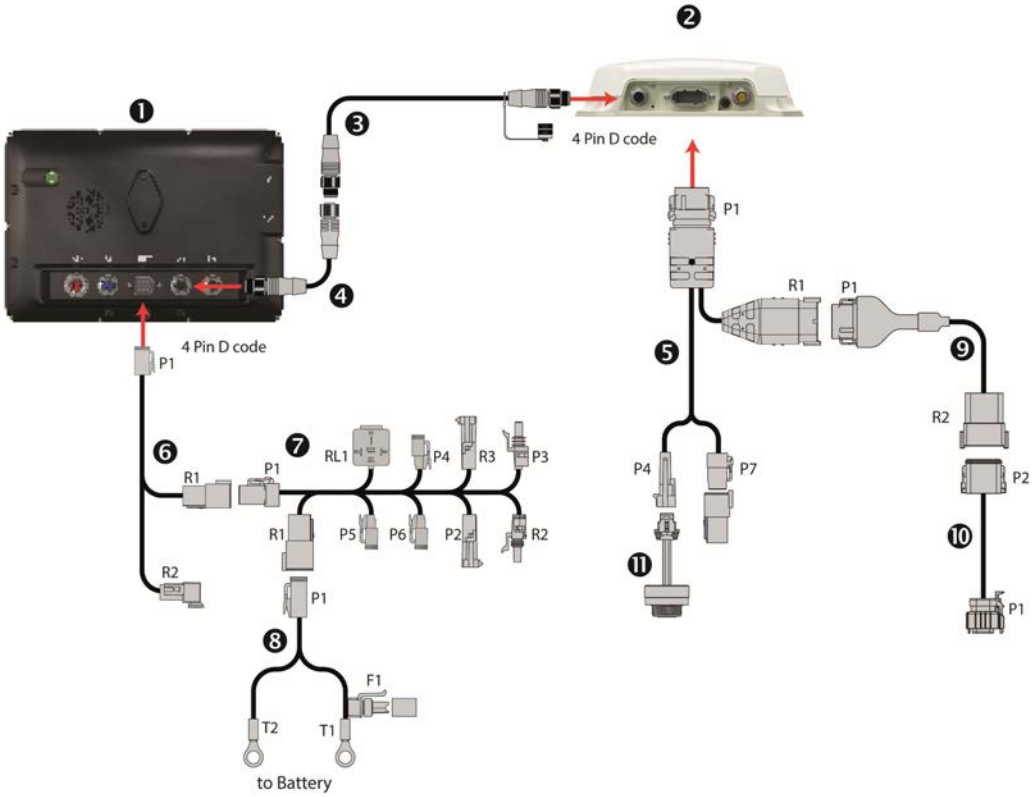
TIP – Read through the steps and make certain you have all the hand tools needed before starting installation.

2

Connecting the NAV-960 controller

- System components
- Installing the NAV-9xx guidance controller
- VHB (double-sided tape) style mounting
- Installing the NAV-9xx guidance controller using using the tractor antenna mount - if present
- Connecting the cables—prior to MY 2023
- Connecting the cables—MY 2023 and later

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, NAV, Roof CAN, Sonalert, NMEA	130738
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, GFX, Basic Power, 4 m	67258
9	Cable Assy, Autopilot NAV, McCormick X Series AGR, Landini 6/7 Series AGR	124442
10	Cable Assy, Autopilot NAV, McCormick AGR, Landini AGR, MY 2022+ (optional)	131452
11	Sonalert	43104

Installing the NAV-9xx guidance controller

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

NOTE – NAV-900 controller shown for reference.





VHB (double-sided tape) style mounting

The VHB tape option is standard with some display system kits and can be used if no factory-fitted mount or Spar mount option is available.

VHB tape – 3M application guidelines

- **Mating surfaces**: (tractor roof) are best prepared by cleaning with a 50:50 mixture of isopropyl alcohol (IPA) and water prior to applying 3M™ VHB™ tapes.
- **Heavy Oils**: A degreaser or solvent-based cleaner may be required to remove heavy oil or grease from a surface and should be followed by cleaning with IPA/water.
- **Temperature**: Ideal application temperature range is 70°F to 100°F (21°C to 38°C). Pressure sensitive adhesives use viscous flow to achieve substrate contact area. Minimum suggested application temperatures: 50°F (10°C).
- **Pressure**: Bond strength is dependent upon the amount of adhesive-to-surface contact developed. Firm application pressure develops better adhesive contact and helps improve bond strength. Typically, good surface contact can be attained by applying enough pressure to insure that the tape experiences approximately 15 psi (100 kPa) pressure.
- **Time**: After application, the bond strength will increase as the adhesive flows onto the surface. At room temperature approximately 50% of ultimate bond strength will be achieved after 20 minutes, 90% after 24 hours and 100% after 72 hours.
- **Dis-assembly and removal of residue**: To remove: If the assembled area can cope with an elevated temperature, a hand-held heat gun can soften the tape for ease of removal. Additionally, cutting through the adhesive bond-line is an effective method of removal. Use an appropriate saw or tool. A soapy water solution can be effective to help ease of cutting. Remove adhesive residue using a 3M citrus-based cleaner, Automotive Bug and Tar remover, or other commercial adhesive removers. (Follow manufacturers instructions and safety precautions).

Step 1

Start by putting the height adjustment nuts on the VBH plate stud.



Step 2

Insert the stud through one of the three outer mounting holes on the main mounting plate.

Place the flat washer and lock washer on the stud. Loosely thread the remaining nut onto the stud.



Step 3

Repeat for the other two stud mounts.



Step 4

Verify the vehicle is sitting in a level location.

Step 5

Find a suitable location on the top of the tractor cab with minimal flex and height variation.

Step 6

Before removing the VHB protective covers, place and mark the location on the cab ensuring it is on the center-line of the vehicle. Mark each VHB foot.



Step 7

Peel the covers from the VHB tape and place the feet in the marked locations.

Step 8

Adjust the height of the nuts on the studs to level the guidance controller.

Tighten the three top nuts once level, do not exceed 10 N-m (88.5lb-in) torque.

Installing the NAV-9xx guidance controller using using the tractor antenna mount - if present

If the tractor antenna mounting bracket is present, the NAV-9xx controller can be attached to the bracket as shown, using the M6 hardware provided.



NOTE – NAV-900 controller shown for reference.

Connecting the cables—prior to MY 2023

Step 1

Locate the P/N 124442 adapter cable.



Step 2

Plug the P1 connector of cable P/N 130738 into the back of the NAV-9xx guidance receiver.

NOTE – NAV-900 controller shown as reference.



Step 3

Plug the P1 connector on P/N 124442 to the R1 connector on cable P/N 130738.



Step 4

Connect P2 on cable P/N 124442 into the 12-pin DT connector on the vehicle's roof.







Step 5

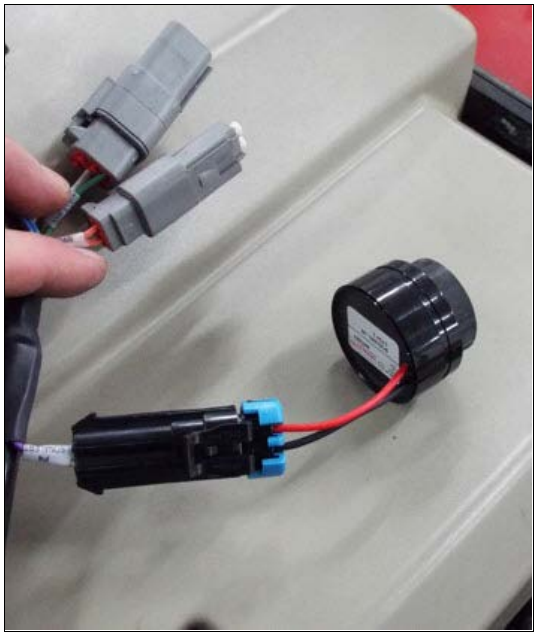
Connect P2 of the P/N 110540 cable to the 4-pin M12 connector on the left side of the NAV-9xx controller.



Step 6

Route the remaining portion of cables P/N 130738 and P/N 110540 into the cab.

Connect the sonalert to P4 on cable P/N 130738.



Connecting the cables—MY 2023 and later

Step 1

Locate the P/N 124442 adapter cable.



Step 2

Plug the P1 connector of cable P/N 130738 into the back of the NAV-9xx guidance receiver.

NOTE – NAV-900 controller shown as reference.



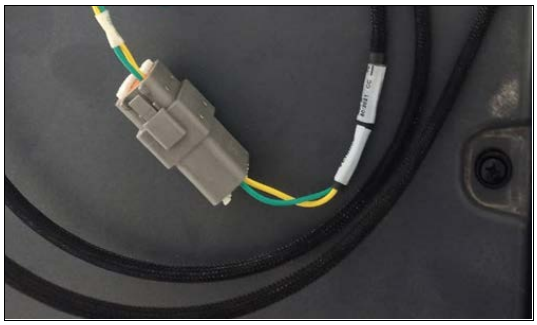
Step 3

Plug the P1 connector on P/N 124442 to the R1 connector on cable P/N 130738.



Step 4

Locate the MY 2023+ CAN adapter cable P/N 131452 and connect the P2 connector on cable 131452 to P2 on cable P/N 124442.





Step 5

Connect the P1 connector on cable P/N 131452 to the tractor's rooftop connector.



Step 6

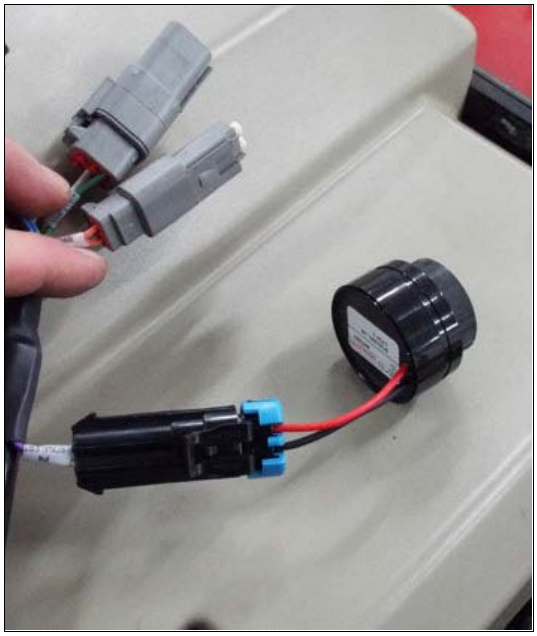
Connect the P2 connector on cable P/N 110540 to the 4-pin M12 connector on the left side of the NAV-9xx controller.



Step 7

Route the remaining portion of cables P/N 130738 and P/N 110540 into the cab.

Connect the sonalert to P4 on cable P/N 130738.



3

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
5. To enable the guidance system, switch the steering wheel switch near the radio so that the blue light turns on.



6. Press and hold the auto enable button for 5 seconds, until button shows green, to enable the auto steer system.




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