INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

John Deere Tractors

- 6R Series: 6R 110, 6R 120, 6R 130, 6R 140, 6R 145, 6R 155, 6R 165, 6R 175, 6R 195, 6R 215
- 7R Series: 7R 210, 7R 230, 7R 250, 7R 270, 7R 290, 7R 310, 7R 330, 7R 350
  7200R, 7215R, 7260R, 7280R, 7210R, 7230R, 7250R, 7270R, 7290R, 7310R
- 8R Series: 8R 230, 8R 250, 8R 280, 8R 310, 8R 340, 8R 370, 8R 410
  8235R, 8260R, 8285R, 8310R, 8335R, 8360R, 8245R, 8270R, 8295R, 8320R, 8345R, 8370R, 8400R
- 8RT Series: 8RT 310, 8RT 340, 8RT 370, 8RT 410
  8310RT, 8320RT, 8335RT, 8345RT, 8360RT, 8370RT
- 8RX Series: 8RX 310, 8RX 340, 8RX 370, 8RX 410
- 9R Series: 9R 390, 9R 440, 9R 490, 9R 540, 9R 590, 9R 640
  9360R, 9370R, 9410R, 9420R, 9460R, 9470R, 9510R, 9520R, 9560R, 9570R, 9620R
- 9RT Series: 9RT 490, 9RT 540, 9RT 590
  9460RT, 9470RT, 9510RT, 9520RT, 9560RT, 9570RT
- 9RX series: 9RX 490, 9RX 540, 9RX 590, 9RX 640
  9470RX, 9520RX, 9570RX, 9620RX

PTx Trimble

Version 10.00
Revision A
December 2024
P/N 54035-6042-E10

Legal Notices

Agriculture Business Area

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Release Notice

This is the December 2024 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-6042-E10. It applies to Version 10.00 and later 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:

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



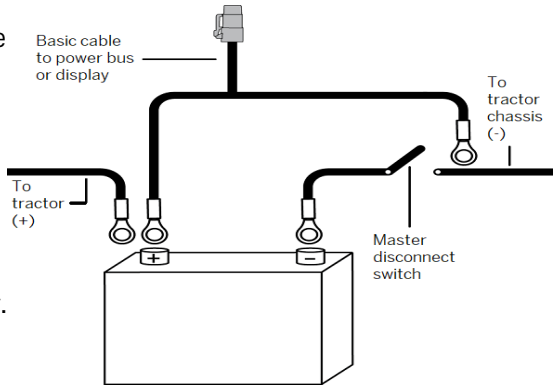
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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 54035-6042	Standard hand tools

Antenna mounting kits

Kits required
P/N 132086: Mounting plate, NAV-960, JD adapter

For the 2020 and newer John Deere 7R and 8R series tractors that do not have an antenna mount in the center of the cab, you can purchase the following parts from John Deere to mount the antenna in the center of the cab:

- John Deere P/N PF81190 – Antenna Plate
- John Deere P/N RE588540 – Bracket adapter
- John Deere P/N R572090 (QTY 8) – Screws



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.

Required installation time: 4 hours

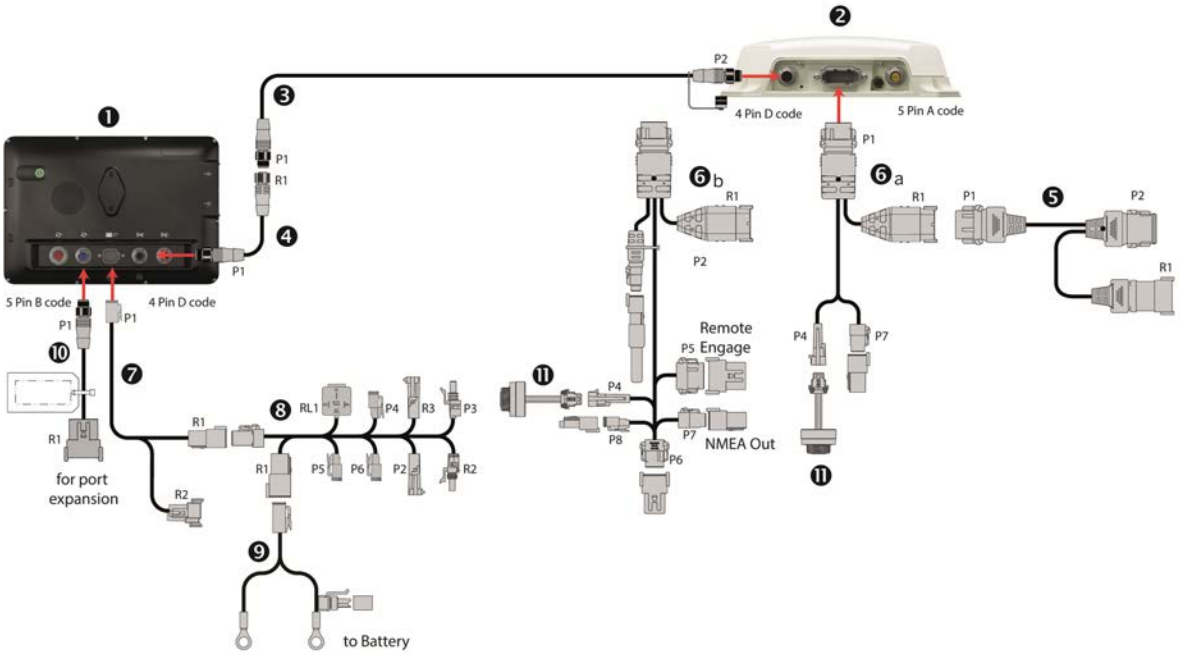
TIP – Read through the steps and make certain you have all the hand tools needed before starting installation.

2

Connecting the NAV-960 controller

- GFX series display: Components
- Connecting the cables (P/N 124774 harness)

GFX series display: Components

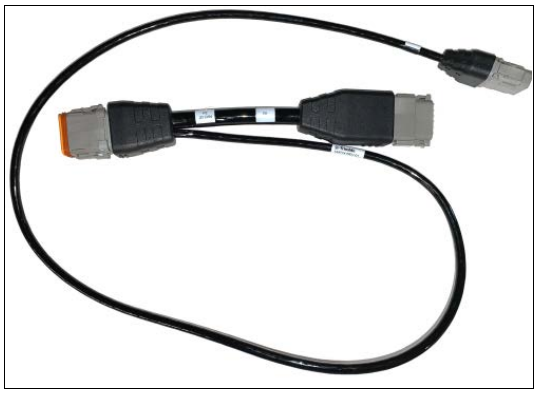


Item	Description	P/N
1	GFX display, with PIQ App	13x000-01
2	NAV-960 guidance controller	131800-04
3	Cable Assy, GFX to NAV, Power/Ethernet (BRR), 5 m	110540
4	Cable Assy, GFX to NAV, Power/Ethernet (BRR) Extension, 2.5 m (optional extension for large vehicles	112082
5	Cable Assy, NAV, Roof CAN - to JD, R series	124774
6a	Cable Assy, NAV, Roof CAN, Sonalert, NMEA	130738
6b	Cable Assy, NAV, Roof CAN, Sonalert, NMEA, R.E., IMU Extension (optional)	122387
7	Cable Assy, GFX, Power to display, CAN, 2.5 m	110551
8	Cable Assy, GFX, Power with Relay and Switch (Acc)	67259
9	Cable Assy, GFX, Basic Power, 4 m	67258
10	Cable Assy, Display, Expansion Port, RS232, Dig I/O, 2.5 m	110545
11	Sonalert	43104

Connecting the cables (P/N 124774 harness)

Step 1

Locate the John Deere R series CAN adapter cable P/N 124774.



Step 2

Connect P2 of the interface cable into the 12-pin DT connector in the front of the vehicle's roof.



Step 3

If the vehicle is using a Greenstar receiver, plug it into R9 of the harness. If not, leave the plug in R9 and use a cable tie to secure the connector. You can also use the plug removed from the receptacle at the bottom of the cab to secure the expansion connector.





Step 4

Connect the P1 connector on cable P/N 130738 or 122387 to the 12-pin connector on the NAV-960 controller.



Step 5

Connect the P1 connector on cable P/N 130738 or 124774 to the R1 connector on cable P/N 122387.



Step 6

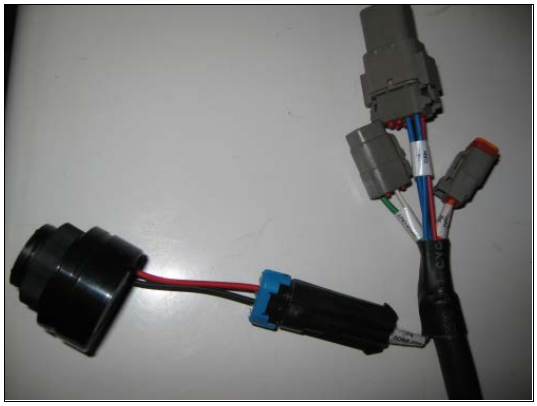
Locate a pass-through at the bottom of the cab and feed both the interface cable and the power/communication cable (P/N 110540) into the cab. For long runs, you may need the extension cable P/N 112082 (sold separately).

(R model shown)

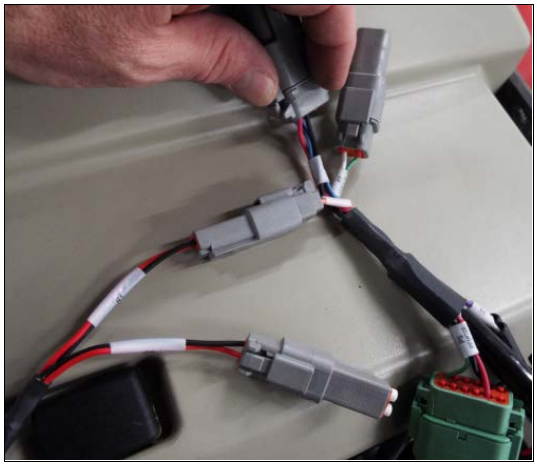


Step 7

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



Connect the NMEA output, if needed.



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-960 controller to the latest firmware from Ag Resource Center.
3. Load the correct configuration file into the Autopilot NAV-960 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-960 mounting orientation
   - Antenna height/Antenna axle offset, and Roll offset
   - Make sure the machine has the proper licensing from CLAAS to be steered. This is region and model year dependent. Contact the CLAAS dealer for the specific requirements for the installed on year/model.
   - NAV-900 mounting orientation
   - 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)
   - Antenna height/Antenna axle offset, and Roll offset

   NOTE – The Autosteer enable button must be cycled for each power cycle of the machine. Engagement is only from the button on the armrest/handle.


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