INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

AGCO Tractors (Auto Guidance Ready)

- **MT 500 Series:** 525B, 535B, 545B, 555B, 565B, 575B, 585B, 595B, 515D, 525D, 535D, 545D, 555D, 565D, 575D, 585D
  MT 600 Series: 635B, 645B, 655B, 665B, 685B, 645C, 655C, 665C, 675C, 645D, 655D, 665D, 675D, 685D, MT645E, MT655E, MT665E, MT675E, MT685E
  MT 700 Series: 735B, 745B, 755B, 765B, 755C, 765C, 755D, 765D, 755E, 765E, 775E
  MT 800 Series: 835B, 845B, 855B, 865B, 835C, 845C, 855C, 865C, 875C, 845D, 855D, 865D, 875D, 845E, 855E, 865E, 875E
  MT 900 Series: 945C, 955C, 965C, 975C, 945E, 955E, 965E, 975E
  MF 6000 Series: 6465, 6475, 6480, 6485, 6490, 6495, 6497, 6499, 6612, 6613, 6614, 6615, 6616
  MF 7000 Series: 7465, 7475, 7480, 7485, 7490, 7495, 7497, 7499, 7614, 7615, 7616, 7618, 7619, 7620, 7622, 7624, 7626 (Vehicles with Datatronic 5 terminal not supported – 7714, 7715, 7716, 7718, 7719, 7720, 7722, 7724, 7726)
  MF 8000 Series: 8450, 8460, 8470, 8480, 8650, 8660, 8670, 8680, 8690 (Vehicles with Datatronic 5 terminal not supported – 8727, 8730, 8732, 8735, 8737)
  Valtra S Series: Vehicles with Smarttouch terminals not supported – S232, S233, S262, S263, S274, S292, S293, S294, S322, S323, S324, S352, S353, S354, S374
  Valtra N Series: N123, N143, N163 (Vehicles with Smarttouch terminals not supported – N104, N111e, N124, N134, N154e, N174)
  Valtra T Series: T151, T161, T171, T191, T132, T152, T172, T182, T202, T133, T153, T163, T173, T183, T193, T203 (Vehicles with Smarttouch terminals not supported – T144, T154, T174, T174e, T194, T214, T234

AGCO Swathers (Auto Guidance Ready)

- Challenger MF Series, WR97x0, WR98x0

*ALL MODELS ALL BRAND – Machines must have AGCO roof bracket pre-installed and roof top connect available.

Version 10.00
Revision A
February 2025
P/N 54035-6062-E10

PTx Trimble

Legal Notices

Agriculture Business Area

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USA
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Release Notice

This is the February 2025 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-6062-E10. It applies to Version 10.00 and later of the Autopilot automated steering system.

Warranty Exclusions and Disclaimer

These warranties shall be applied only in the event and to the extent that (i) the Products and Software are properly and correctly installed, configured, interfaced, maintained, stored, and operated in accordance with PTX Trimble's relevant operator's manual and specifications, and; (ii) the Products and Software are not modified or misused. The preceding warranties shall not apply to, and PTX Trimble shall not be responsible for defects or performance problems resulting from (i) the combination or utilization of the Product or Software with hardware or software products, information, data, systems, interfaces or devices not made, supplied or specified by PTX Trimble; (ii) the operation of the Product or Software under any specification other than, or in addition to, PTX Trimble's standard specifications for its products; (iii) the unauthorized, installation, modification, or use of the Product or Software; (iv) damage caused by accident, lightning or other electrical discharge, fresh or salt water immersion or spray; or (v) normal wear and tear on consumable parts (e.g., batteries). PTX Trimble does not warrant or guarantee the results obtained through the use of the Product.

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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



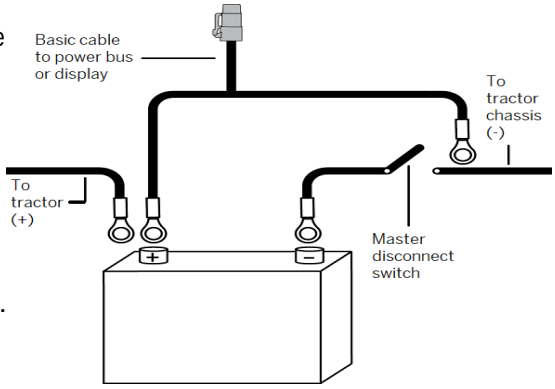
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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 54035-6062	Standard hand tools

Antenna mounting kits

Kits required
P/N 132087: Mounting plate, NAV-960, AGCO adapter

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"

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.

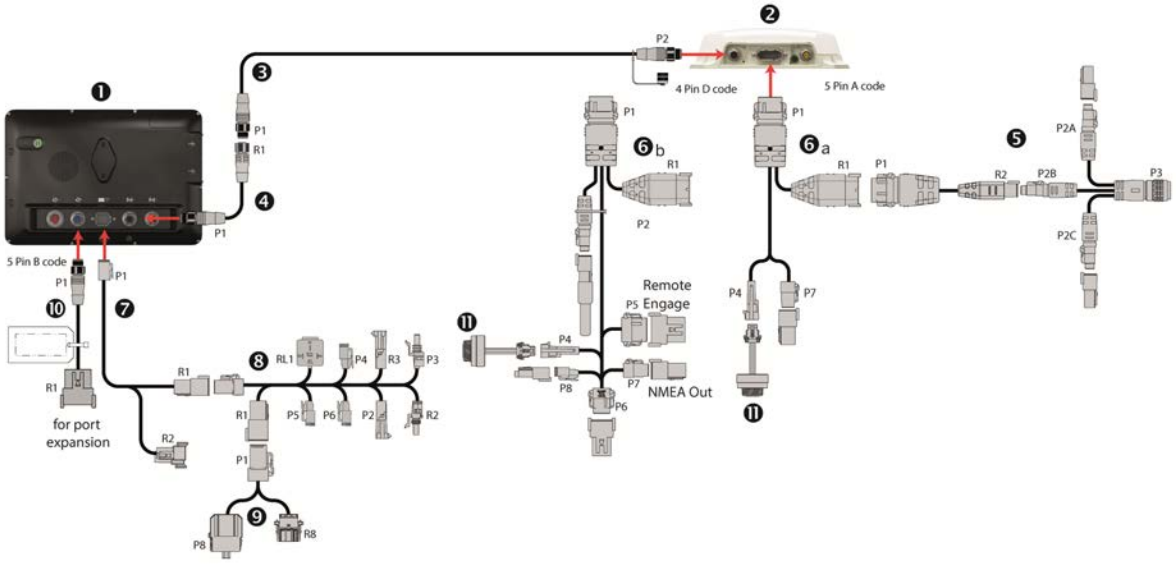
2

Connecting the NAV-960 controller

- GFX series display: Components
- GFX series display: Installation
- GFX series display: Installing the power harness
- Connecting the cables (P/N 124773 harness)
- Using the P/N 118856 harness
- NAV-9xx accessory extension cable – P/N 130738 or 122387
- Connecting accessories

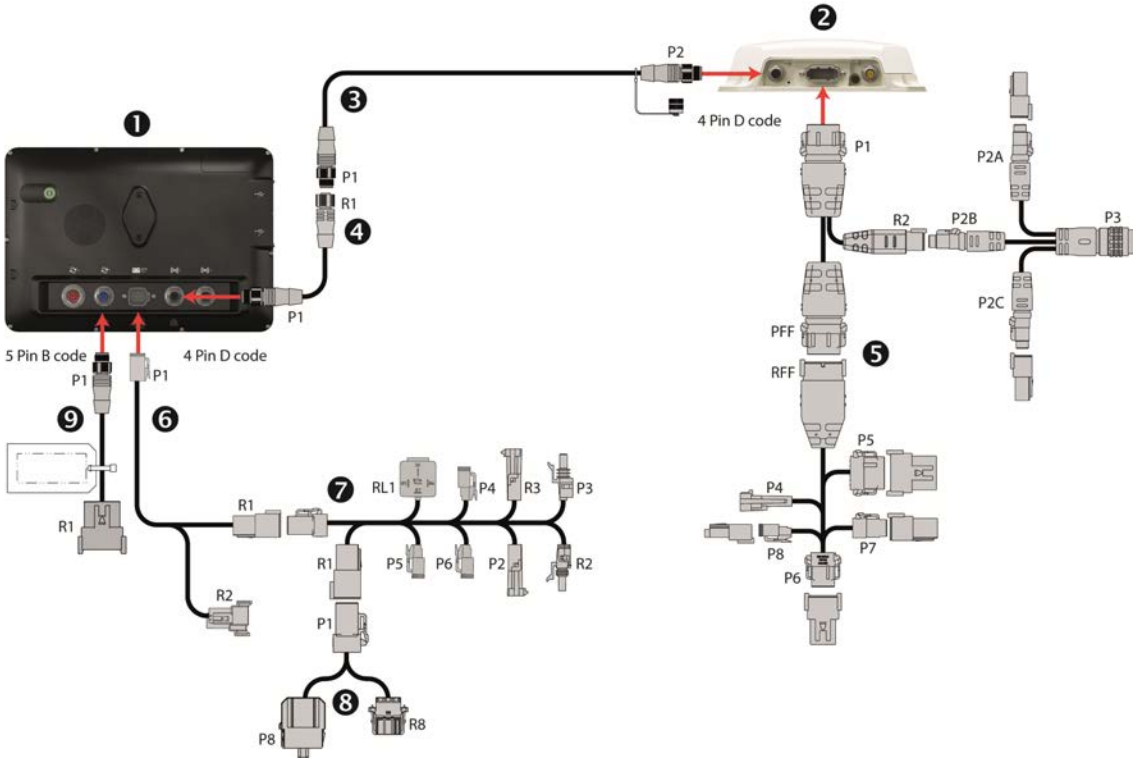
GFX series display: Components

Machines using P/N 124473 harness



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 AGCO TopDock	124773
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, AGCO, FMX, CFX, GFX, TMX Power jumper	118053
10	Cable Assy, Display, Expansion Port, RS232, Dig I/O, 2.5 m	110545
11	Sonalert	43104

Machines using P/N 118856 harness



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 AGCO TopDock	118856
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

GFX series display: Installation

Step 1

Start by determining where the display will be located in the vehicle and mount the base end RAM mount ball.



Step 2

Loosen the clamp arm sufficiently to get over both the ball on the display, as well as the ball on the base mount.



Step 3

Position the display as desired for good visibility by the operator, and then tighten the handle to secure it in place.



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

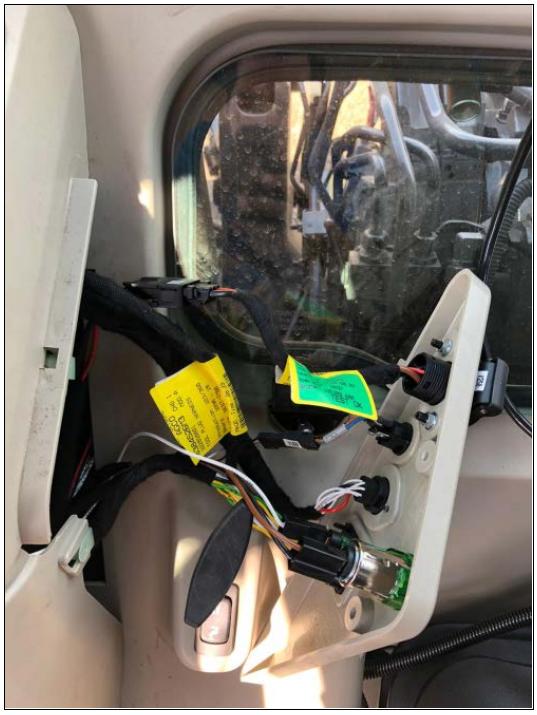
Locate the AGCO power adapter P/N 118053.



Step 2

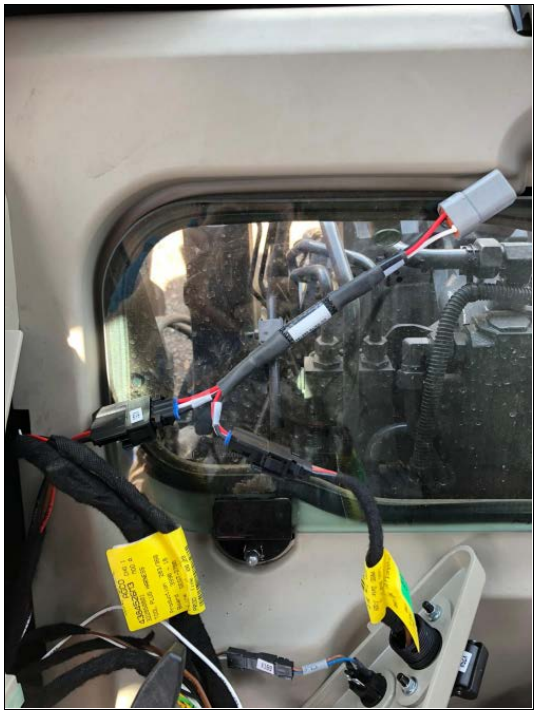
Remove the power panel near the lower right side of the console to access the Tyco connectors and attach the power cable P/N 118053.





Step 3

Disconnect the 3-position Tyco power connector on the vehicle and then tee in the R8 and P8 connectors on cable P/N 118053.



Step 4

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



Step 5

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



Connecting the cables (P/N 124773 harness)

Step 1

Locate the CAN adapter cable P/N 124773.



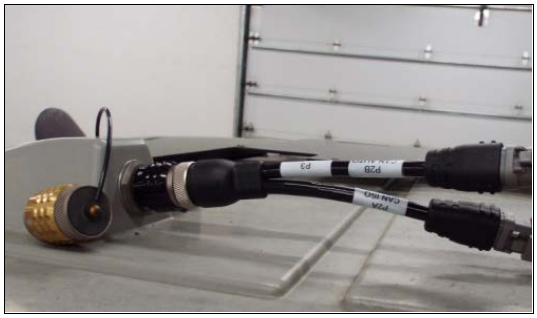
Step 2

Plug the P1 connector into the back of the NAV-960 guidance controller.



Step 3

Connect P3 of the interface cable into the 12-pin connector on top of the vehicle's roof.

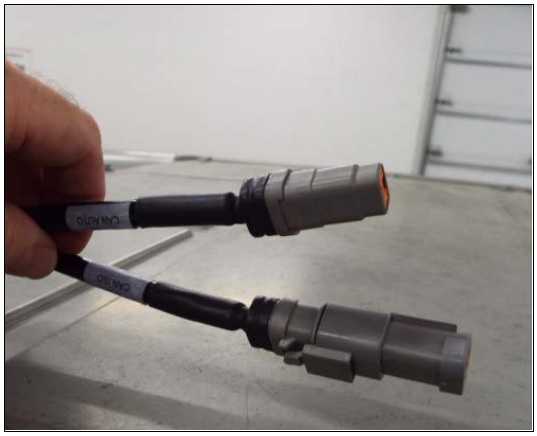


MF 8680



Step 4

Locate the P2A (CAN ISO) and P2B (CAN Auto) connectors on cable P/N 124473.

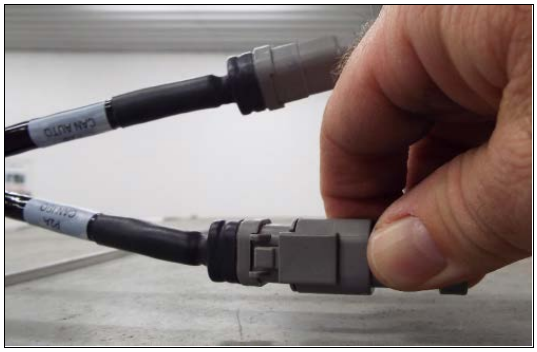


Step 5

If necessary, move the 2-pin DT plug from P2A to the P2B connector on cable P/N 124473.

> **NOTE** – If no CAN communications are observed in **Autopilot Diagnostics** on the display, switch the R2 connector to the opposite P2 connector.

For the following tractors plug connector R2 on cable P/N 124473 into the P2B (CAN AUTO) connector.





Make	Series	Models
Challenger	500	MT525B, MT535B, MT545B, MT555B, MT565B, MT575B, MT585B, MT595B, MT515D, MT525D, MT535D, MT545D, MT555D, MT565D, MT575D, MT585D
	600	MT635B, MT645B, MT655B, MT665B, MT685B, MT645C, MT655C, MT665C, MT675C, MT645D, MT655D, MT665D, MT675D, MT685D, MT645E, MT655E, MT665E, MT675E, MT685E
	700/800	MT735B, MT745B, MT755B, MT765B, MT755C, MT765C, MT755D, MT765D, MT755E, MT765E, MT775E MT835B, MT845B, MT855B, MT865B, MT835C, MT845C, MT855C, MT865C, MT875C, MT845D, MT855D, MT865D, MT875D, MT845E, MT855E, MT865E, MT875E
	900	MT945C, MT955C, MT965C, MT975C, MT945E, MT955E, MT965E, MT975E

Make	Series	Models
Massey Ferguson	6000	6465, 6475, 6480, 6485, 6490, 6495, 6497, 6499, 6612, 6613, 6614, 6615, 6616
	7000	7465, 7475, 7480, 7485, 7490, 7495, 7497, 7499, 7614, 7615, 7616, 7618, 7619, 7620, 7622, 7624, 7626, 7714, 7715, 7716, 7718, 7719, 7720, 7722, 7724, 7726 Vehicles with Datatronic 5 terminal not supported: 7714, 7715, 7716, 7718, 7719, 7720, 7722, 7724, 7726
	8000	8450, 8460, 8470, 8480, 8650, 8660, 8670, 8680, 8690 Vehicles with Datatronic 5 terminal not supported: 8727, 8730, 8732, 8735, 8737
Valtra	S	Vehicles with Smarttouch terminals not supported: S232, S233, S262, S263, S274, S292, S293, S294, S322, S323, S324, S352, S353, S354, S374

For the following tractors, plug R2 of the P/N 124473 cable into the P2A (CAN ISO) connector.



Make	Series	Models
Valtra	N	N123, N143, N163 Vehicles with Smarttouch terminals not supported: N104, N114e, N124, N134, N154e, N174
	T	T151, T161, T171, T191, T132, T152, T172, T182, T202, T133, T153, T163, T173, T183, T193, T203 Vehicles with Smarttouch terminals not supported: T144, T154, T174, T174e, T194, T214, T234

Step 6

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



Using the P/N 118856 harness

Step 1

Locate the P/N 118856 adapter cable (3 parts).



Step 2

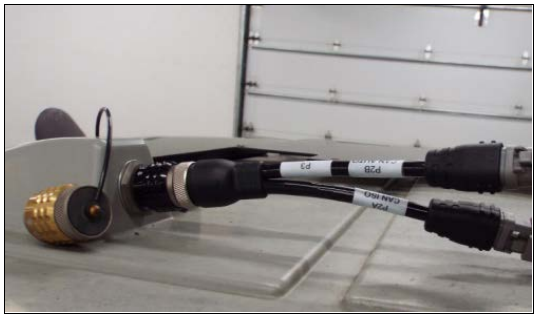
Plug the P1 connector into the back of the NAV-9xx guidance controller.





Step 3

Connect P3 of the interface cable into the 12-pin connector on top of the vehicle's roof.



MF 8680



Valtra T214

Step 4

Connect the RFF and PFF connectors together on P/N 118856 cable and route the remainder of the cable across the cab to the right rear-corner post.



Step 5

Follow step 4 to step 6 in previous section, page 20 to connect the P2A and P2B connectors.

NAV-9xx accessory extension cable – P/N 130738 or 122387

Step 1

Locate the accessory extension cable P/N 130738 or 122387.



Step 2

Connect P1 on cable P/N 130738 or 122387 to the 12-pin DTM connector on the NAV-9xx guidance controller.



Step 3

Connect P1 on cable P/N 124473 to the R1 connector on cable P/N 130738 or 122387.



Step 4

Connect P3 on cable P/N 124473 to the vehicle TopDock connector, as described in the earlier steps.



Connecting accessories

Step 1

Locate a pass through on the back of the cab and feed the interface cable P/N 130738, 122387 or 118856 and the power/communication cable P/N 110540 into the cab. For long runs, extension cable P/N 112082 (sold separately) may be required.



MF 8680 model



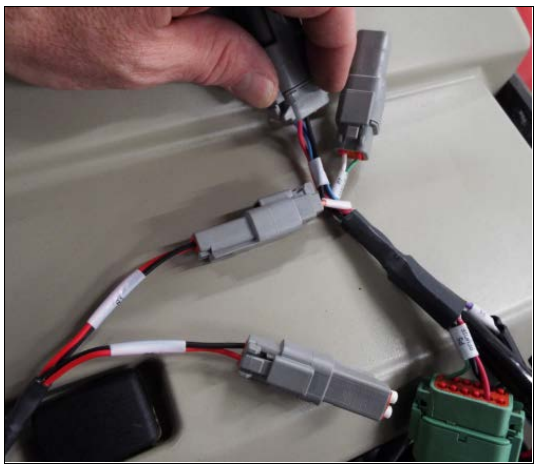
MF 8680 model

Step 2

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



Connect the NMEA output, remote engage, and modem power as 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-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. For Massey Ferguson tractors, verify that the steering wheel button and the button below are ON prior to starting calibration or operation. Failure to do so will result in a fault in the Autopilot system.



For Valtra tractors, verify that the steering two buttons on the right are ON prior to starting calibration or operation. Failure to do so will result in a fault in the Autopilot system.



NOTE – Power buttons may vary between machine models. Consult the vehicle's operator manual for how to correctly enable the switch.

5. 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
   - Manual override
   - Steering sensor calibration – Done with the AGCO EDT tool
   - Valve deadzone – Done with the AGCO EDT tool
   - Autopilot P-gain – Done with the AGCO EDT tool
   - Antenna height/Antenna axle offset, and Roll offset


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