Autopilot

AUTOMATED STEERING SYSTEM

INSTALLATION INSTRUCTIONS SUPPLEMENT

John Deere MFWD, MY 2020+

- 5090R ATR
- 5100R ATR
- 5115R ATR
- 5125R ATR

Version 8.00
Revision A
November 2021
P/N 54035-212-SUP-E08

Trimble

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Agriculture Business Area

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This is the November 2021 release (Revision A) of the Autopilot Automated Steering System Installation Instructions Supplement, part number 54035-212-SUP-E08. It applies to version 8.00 of the Autopilot automated steering system.
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equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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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:

⚠ **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

⚠ **WARNING –** 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 all vehicle attachments to the ground before you begin work.

⚠ **WARNING –** 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.

⚠ **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 –** 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.

Cautions

⚠ **CAUTION –** When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot and can cause serious burns. To avoid burns, allow hot machine parts to cool before you begin working on them.

⚠ **CAUTION –** The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

⚠ **CAUTION –** Battery posts, terminals, and related accessories contain lead and lead compounds, which can cause serious illness. To avoid ingesting lead, wash your hands thoroughly after touching the battery.

⚠ **CAUTION –** 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.

⚠ **CAUTION –** 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.

⚠ **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

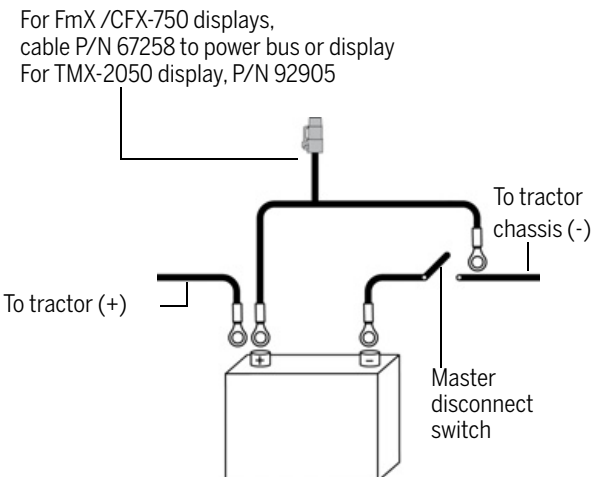


Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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

⚠ **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 damaging the display.



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1

Introduction

This document is a supplement to the John Deere 6xxxM ATR MY2020 manual, part number 54035-212-E08.

Technical assistance

If you have a problem and cannot find the information you need in the product documentation, contact Trimble technical support:

1. Log into http://agpartners.trimble.com.
2. Click the **Feedback** link at the right of the screen.
3. Complete the form and then click **Submit Feedback**.

2

AutoTrac Harness Component Connections

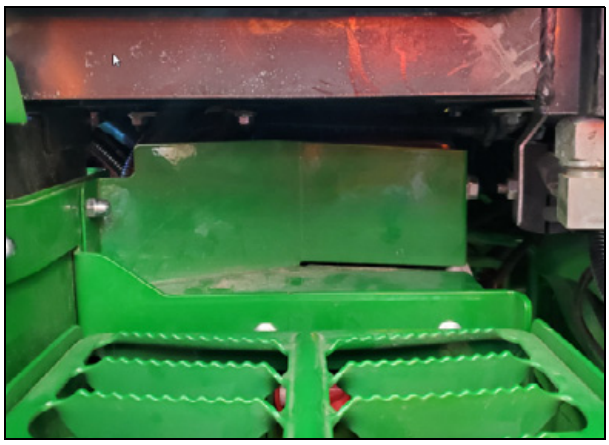
- Introduction
- Valve connections
- Installing the steering sensor adapter cable
- Installing the steering angle Phantom sensor

Introduction

Before you start to connect the AutoTrac components, check that machine has a FEMA steering valve.

The valve is located on the right side of the machine behind the right steps. Remove the cover shown to gain access to the valve.





Valve connections

Step 1

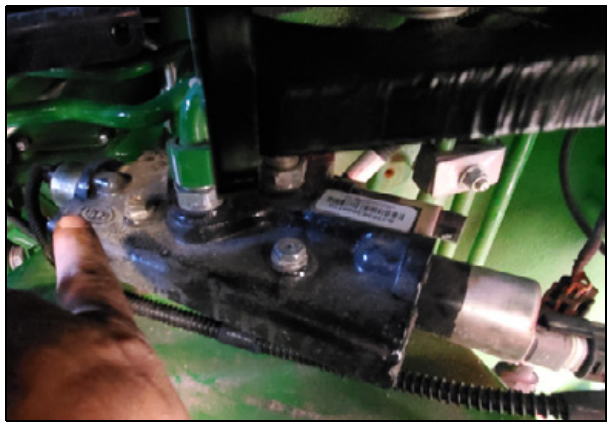
Identify the steering valve interface cables:

- P/N 84253
- P/N 54617
- P/N 84252
- P/N 102252

Step 2

Plug the **R2** connector on cable P/N 84253 into any free connector on the power bus harness P/N 67259.

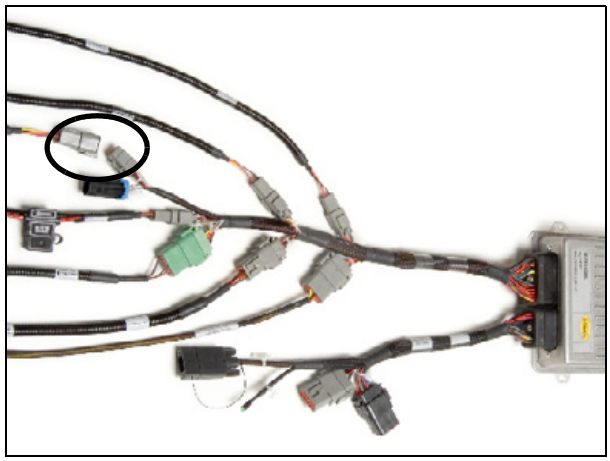
Plug the **R1** connector on cable P/N 84253 into the FEMA valve, on the right-hand side.



Step 3

For steering control:

Plug the **P8** connector on cable P/N 54617 into connector **R8** on the NavController III harness (P/N 54601).



Step 4

Plug the connector labeled **Valve A P2** on cable P/N 54617 into the cable P/N 84252 labeled **Steering Right**.

Plug the other end of cable P/N 84252 into the FEMA valve on the right side.

Plug the connector labeled '**Valve B P3**' on cable P/N 54617 into the cable P/N 84252 labeled **Steering Left**.

Plug the other end of cable P/N 84252 into the FEMA valve on the left side.





Step 5

Terminate the OEM steering harnesses with the following phantoms:

- CO valve: P/N 89231



- CA & CB valves: P/N 102252

Lightly tug the terminators to check that the connectors are fully seated. Use a wire wrap tie to fasten the phantoms securely to a stationary location.



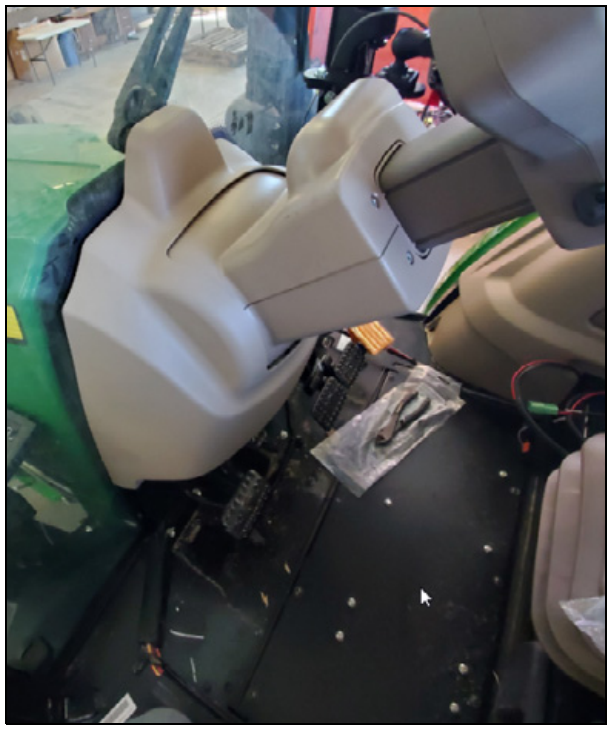
Installing the steering sensor adapter cable

Step 1

The connector for the steering shaft sensor is located under the plastic on the left side of the steering console.

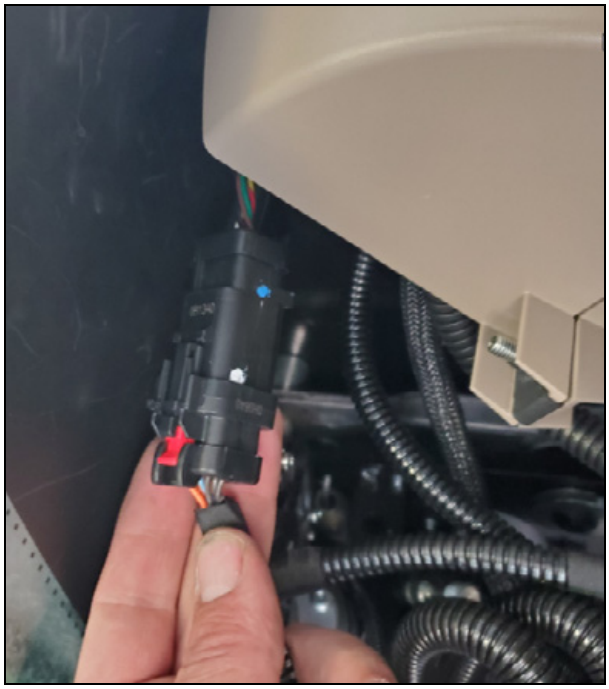
To gain access to this area some of the plastic will need to be removed.

For more information on removing the plastic panels see the John Deere service manual for your machine.



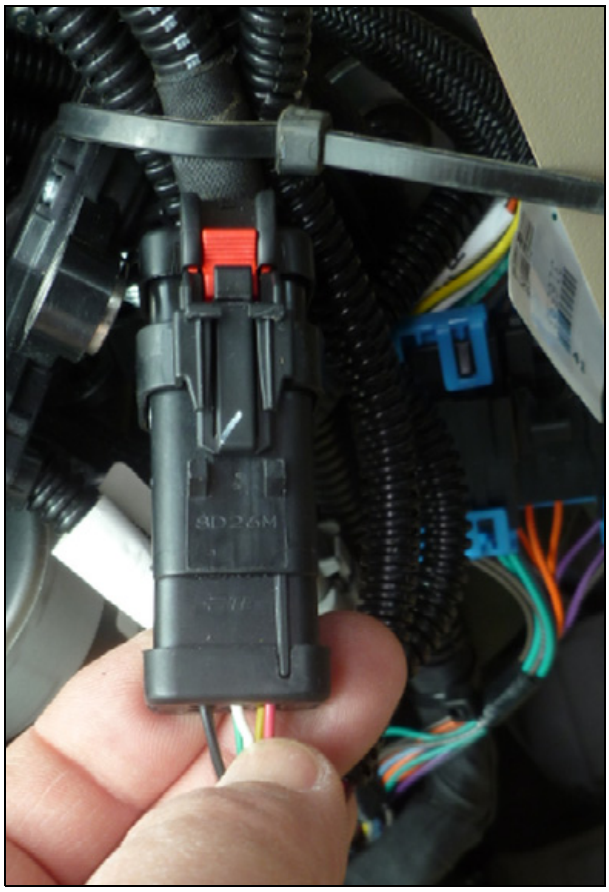
Step 2

On the left side of the steering column, locate the black 6-pin Tyco connector that has a small red locking tab.



Unplug the Tyco connector, and connect the manual override cable (P/N 124408) to the Tyco connector.

Route the cable towards the NavController mounting location.

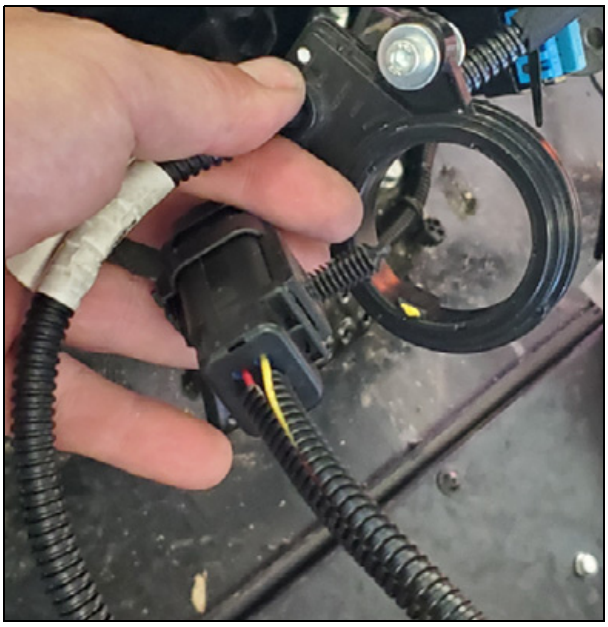


Step 3

Plug the other end of the manual override jumper cable (P/N 124408) into connectors P5 and P13 of the NavController III harnesses.

Step 4

Locate the manual override phantom cable P/N 124436 and plug it into the open Tyco connector that was disconnected in step 2.



Secure the phantom in the steering console and reassemble the plastic housing.



Installing the steering angle Phantom sensor

Step 1

Locate the John Deere steering sensor on the front left axle.

Disconnect the steering sensor harness connector.



Step 2

Connect the steering sensor Phantom P/N 124863 to the tractor harness.



Step 3

Connect the mating plug found in P/N 124863 to the steering sensor.



3

IMD-900 Steering Device Installation

- IMD-900 steering device components
- Installing the IMD-900 steering device
- Connecting the IMD-900 harness to the 54602 harness

This chapter describes how to install the IMD-900 steering device.

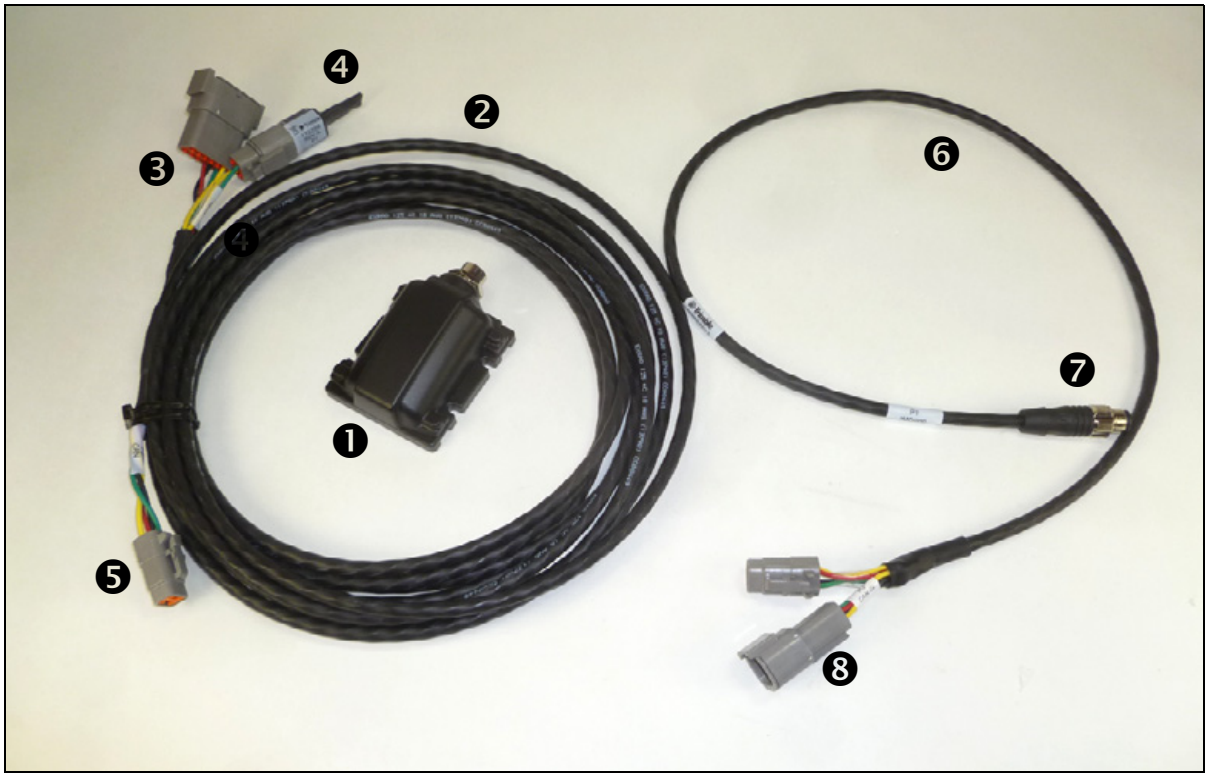
If the described mounting location is not accessible, chose a different place. To ensure proper function, the IMD-900 device must be located where it is free of obstructions and can rotate with the wheels when they turn.

On articulated vehicles, mount the device on the opposite side of the pivot point to the Autopilot controller.

Mount the device base down or base up so that it maintains a level orientation. Do not mount it on its side. An angle of up to 10° in any direction is acceptable, but as flat as possible is preferred.

To avoid stretching the cable, leave adequate length on the service loop.

IMD-900 steering device components



Item	Description
1	IMD-900 steering sensor (P/N 109256-00)
2	Cable (P/N 114675)
3	R1-CAN connector
4	CAN terminal (× 2)
5	P3 CAN connector
6	Cable (P/N 112759)
7	P1-IMD-900
8	P3/R3 CAN out/CAN in

Installing the IMD-900 steering device

⚠ **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.

Step 1

The IMD-900 steering device is shown on the right. Install it using the following steps.

Identify the location where you will install the device.



Step 2

Install the IMD-900 using the provided hardware.



Step 3

Mount the unit so the connector is in the most protected position. Fasten the cap screws.

Step 4

Route the steering cable to the steering device along the frame rail and then connect it to the steering device.

Turn the steering wheel to the full left and the full right positions to ensure that there is enough spare harness.

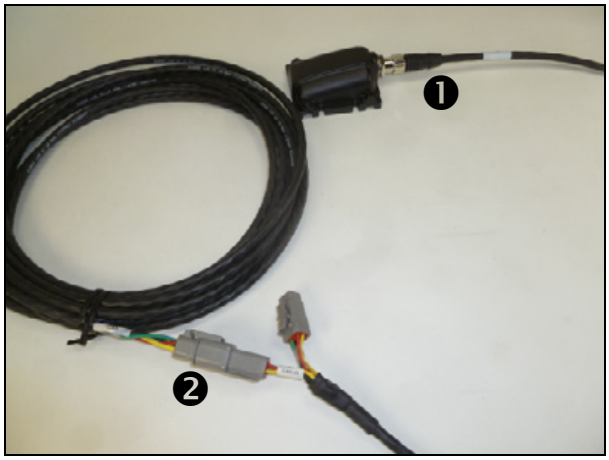


Connecting the IMD-900 harness to the 54602 harness

Step 1

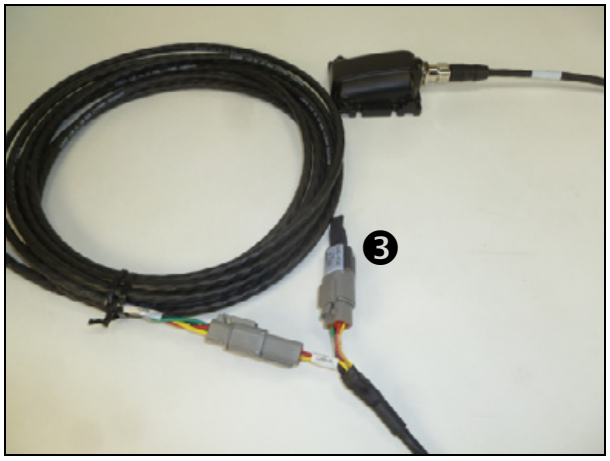
Connect the P1 connector of the 112759 cable to the IMD-900 ❶.

Connect the R3 connector to the 114675 cable ❷.



Step 2

Connect the CAN terminal to the P3 connector of the 112759 cable ❸.



Step 3

With the cable routed to the NavController, the R1 connector will connect to the P12 connector on the 54602 harness on the NavController as shown.

NOTE – There should be a terminator next to the P12 connector as well as on the 112759 cable.



4

Controller Installation

- Installing the controller
- Controller connections

Installing the controller

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.

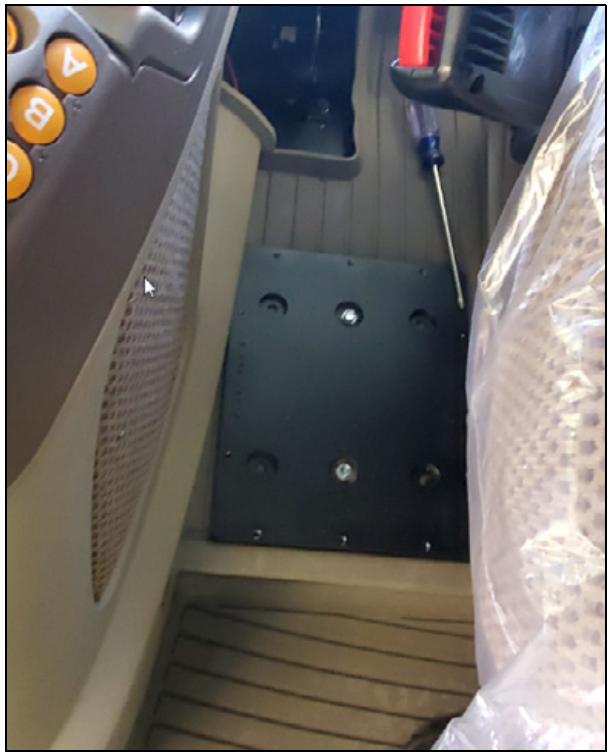
Mount the NavController III next to the seat, along the wall of the machine.



Step 1

Verify no wires or tractor components are below the mounting location.

Mount the NavController plate using self-tapping screws.



Step 2

Before you install the controller, attach the main and auxiliary cable harnesses. Use an Allen wrench to secure the connectors to the controller.



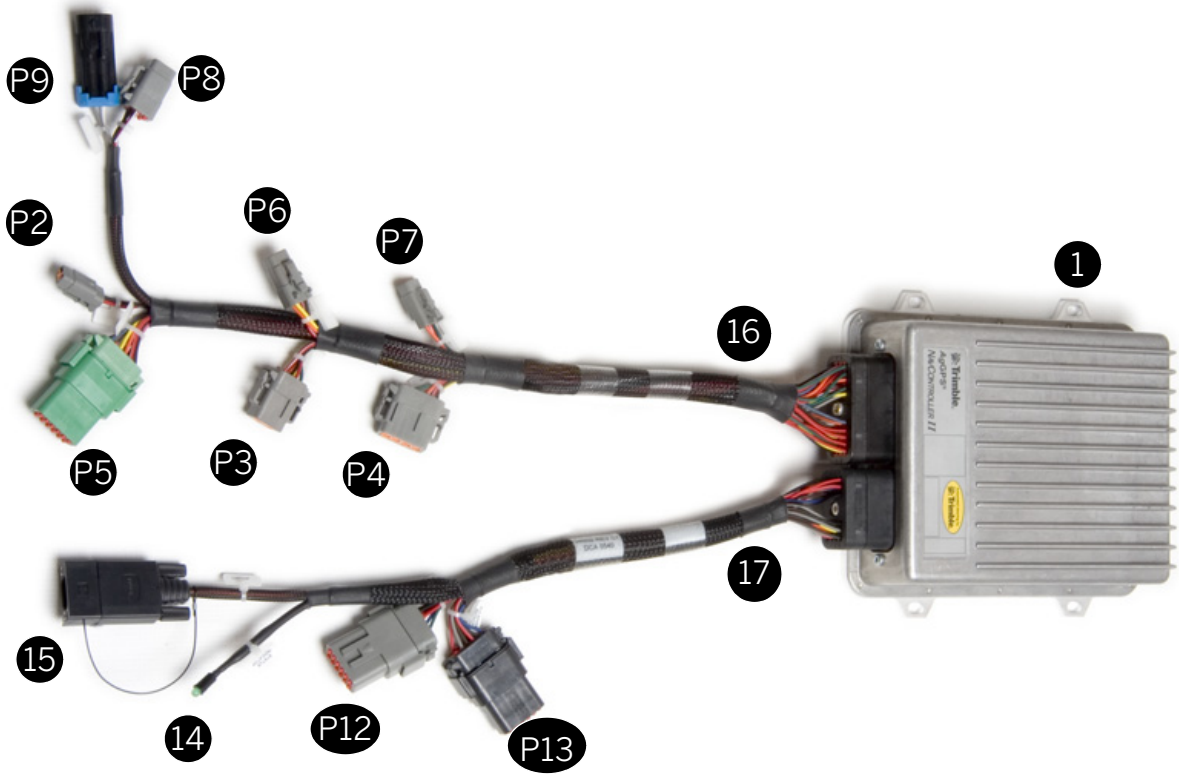
Step 3

Use the four provided 10-32 screws to attach the NavController to the mounting bracket.

The label should be facing to the right, and connectors pointing to the rear of the vehicle.



Controller connections

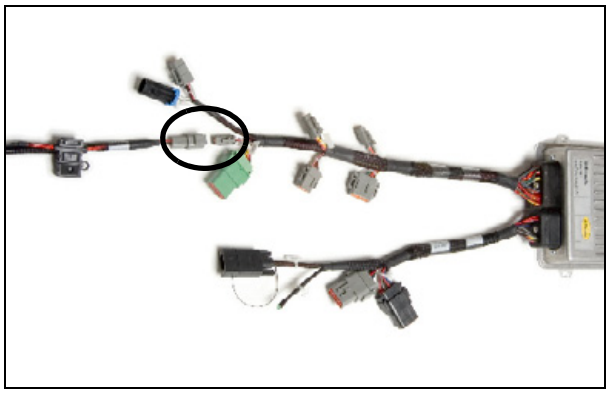


Item	Description	Item	Description
1	NavController III	**P9**	Sonalert connector
P2	Power connector	**P12**	Lightbar/spare connector
P3	GNSS connector	**P13**	Spare sensors connector
P4	Display connector	**14**	Status indicator
P5	Vehicle sensors connector	**15**	Laptop connector
P6	Steering sensor connector	**16**	Main harness
P7	Manual override connector	**17**	Auxiliary harness
P8	Hydraulic valve connector		

Step 1

Connect the power cable connection to P2, which is labeled **Power**. P2 is located on the main wiring harness.

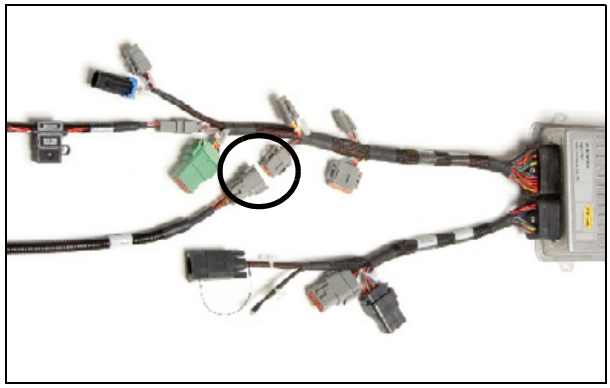
NOTE – The power connection supplies power through the controller to all connected devices, including GNSS and displays.



Step 2

Connect the GNSS cable connection to P3, which is labeled **GPS**. P3 is located on the main wiring harness.

NOTE – If you are installing a CFX-750 display, plug the display in here.

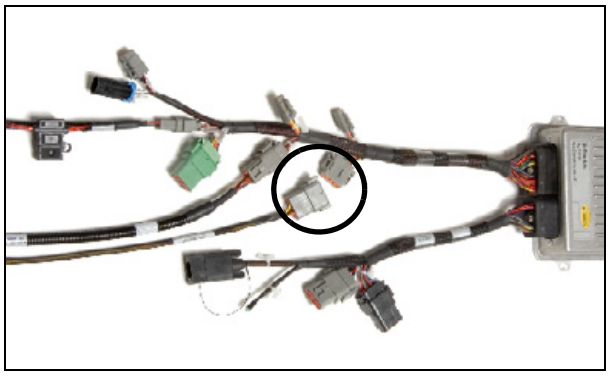


Step 3

Connect the primary display cable connection to P4, which is labeled **Display**. P4 is located on the main wiring harness.

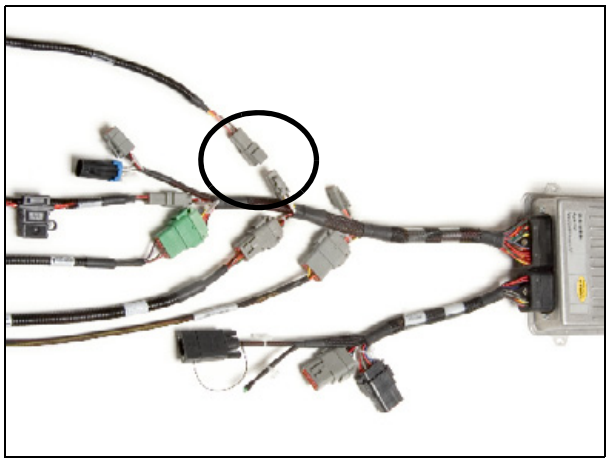
NOTE – *Do not* connect the cable to the connector labeled **Spare** on the auxiliary harness.

NOTE – *Do not* use this connection for CFX-750 display installations.



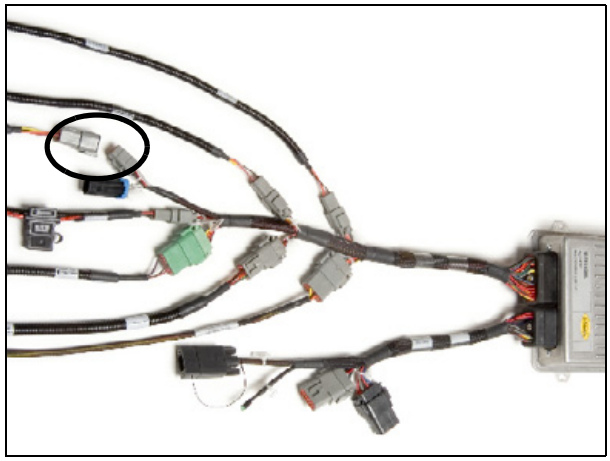
Step 4

Connect the steering sensor cable connection to P6, which is labeled **Steering Sensor**. P6 is located on the main wiring harness.



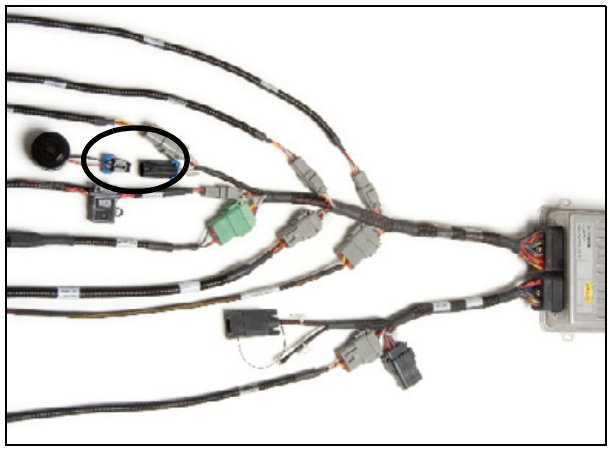
Step 5

Connect the hydraulic steering valve cable connection to P8, which is labeled **Hydraulic Valve**. P8 is located on the main wiring harness.



Step 6

Connect the Sonalert P9 to the two-pin Delphi connector on the main wiring harness. Route the cable so the Sonalert warning device is in a position that is audible to the operator.

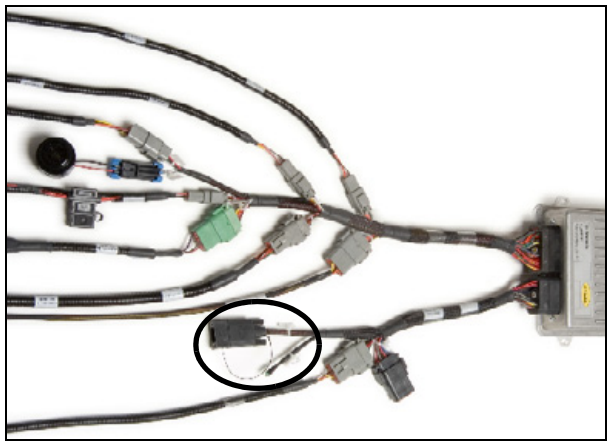


Step 7

Route the LED and laptop lead, which is located on the auxiliary wiring harness, to a location that allows the operator to determine the controller status. See controller LED status for status determination. Six flashes per second indicates a correctly functioning controller.

Step 8

Use the provided sleeving to secure the harness cables with tie wraps. Cover and route the cable bundle to avoid damage to connectors and strain on wire connections.



5

Final Machine Check

Performing the 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.

1. Update the Trimble display and the Autopilot NavController III to the latest firmware from http://agpartners.trimble.com.

   You can use FlashLoader 200 software version 3.19 to update the Autopilot controller: Download it from http://agpartners.trimble.com.

2. Load the correct configuration file into the Autopilot NavController III for the sprayer model being used.

   Download the latest set of **External Vehicle Profile** files from http://agpartners.trimble.com.

   You can use Autopilot Toolbox II software version 4.01 to load the configuration file into the Autopilot controller. You can download the Autopilot Toolbox II software from http://agpartners.trimble.com.

3. Calibrate the Autopilot system using the Trimble display or Autopilot Toolbox II software version 4.01. Depending on your machine type, the following items must be calibrated before you can use the Autopilot system:
   - NavController II/III mounting orientation
   - Antenna height/Antenna axle offset, and Roll offset