INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

Kubota Tractors – AutoGuide Ready

- M7-1xx Deluxe
  (M7-134, M7-154, M7-174)
- M7-1xx Premium/Premium KVT
  (M7-131, M7-132, M7-133, M7-134, M7-151, M7-152, M7-153, M7-154, M7-171, M7-172, M7-173, M7-174)

PTx Trimble

Version 10.00
Revision A
April 2025
P/N 54035-6120-E10

Legal Notices

Agriculture Business Area

PTx Trimble LLC
10368 Westmoor Drive
Westminster, CO 80021-2712
USA
ptxtrimble.com

Copyright and Trademarks

© 2025, PTx Trimble LLC.

PTx and associated Logo are trademarks of AGCO Corporation. Trimble and the Globe & Triangle logo are trademarks of Trimble Inc., registered in the United States and in other countries. Autopilot, NAV-960, and Precision-IQ are trademarks of Trimble Inc.

All other trademarks are the property of their respective owners.

Release Notice

This is the April 2025 release (Revision A) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-6120-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.

The warranties above state PTX Trimble's entire liability, and your exclusive remedies, relating to performance of the products and software, except as otherwise expressly provided herein, the products, software, and accompanying documentation and materials are provided “as-is” and without express or implied warranty of any kind by either PTX Trimble or anyone who has been involved in its creation, production, installation, or distribution including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, title, and non-infringement. The stated express warranties are in lieu of all obligations or liabilities on the part of PTX Trimble arising out of, or in connection with, any products or software. Some states and jurisdictions do not allow limitations on duration or the exclusion of an implied warranty, so the above limitation may not apply to you.

PTX Trimble is not responsible for the operation or failure of operation of GPS satellites or the availability of GPS satellite signals.

Limitation of Liability

PTX Trimble’s entire liability under any provision herein shall be limited to the amount paid by you for the product or software license. To the maximum extent permitted by applicable law, in no event shall PTX Trimble or its suppliers be liable for any

indirect, special, incidental or consequential damages whatsoever under any circumstance or legal theory relating in any way to the products, software and accompanying documentation and materials, (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or any other pecuniary loss), regardless whether PTX Trimble has been advised of the possibility of any such loss and regardless of the course of dealing which develops or has developed between you and PTX Trimble. Because some states and jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages, the above limitation may not apply to you.

NOTE – The above limited warranty provisions may not apply to products or software purchased in the European Union. Please contact your PTX Trimble dealer for applicable warranty information.

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



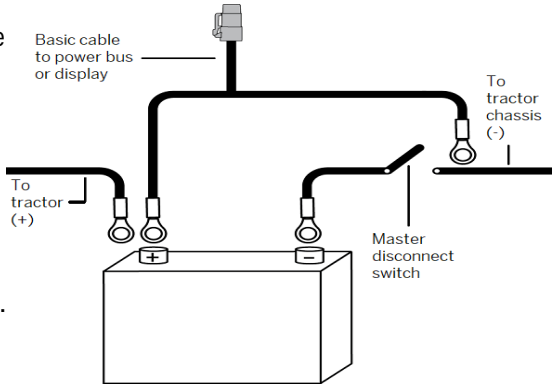
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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.



Contents

Legal Notices **2**

Safety Information **4**

Warnings 4
Cautions 5

Contents **6**

Introduction **7**

Technical assistance 7
Manual system upgrade to the Autopilot system 8
Displays 8
Required components 8
Antenna mounting kits 8
Preparing the vehicle for installation 8

Connecting the NAV-960 controller **9**

System components 10
GFX series display: Installation 11
Installing the remote engage push button (P/N 101250) 13
Mounting the NAV-960 controller 18
Activating the machine AutoSteer switch—M7-1x1, M7-1x2, and M7-1x3 models 24
Activating the machine AutoSteer switch—M7-1x4 models 25
M7-1x4 Deluxe models 25
M7-1x4 Premium models 26

Final Machine Check **28**

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 54035-6120	Standard hand tools

Antenna mounting kits

Kits required
Receiver mounting kit, Kubota M7 CAN NAV-960: P/N 132729-00

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.

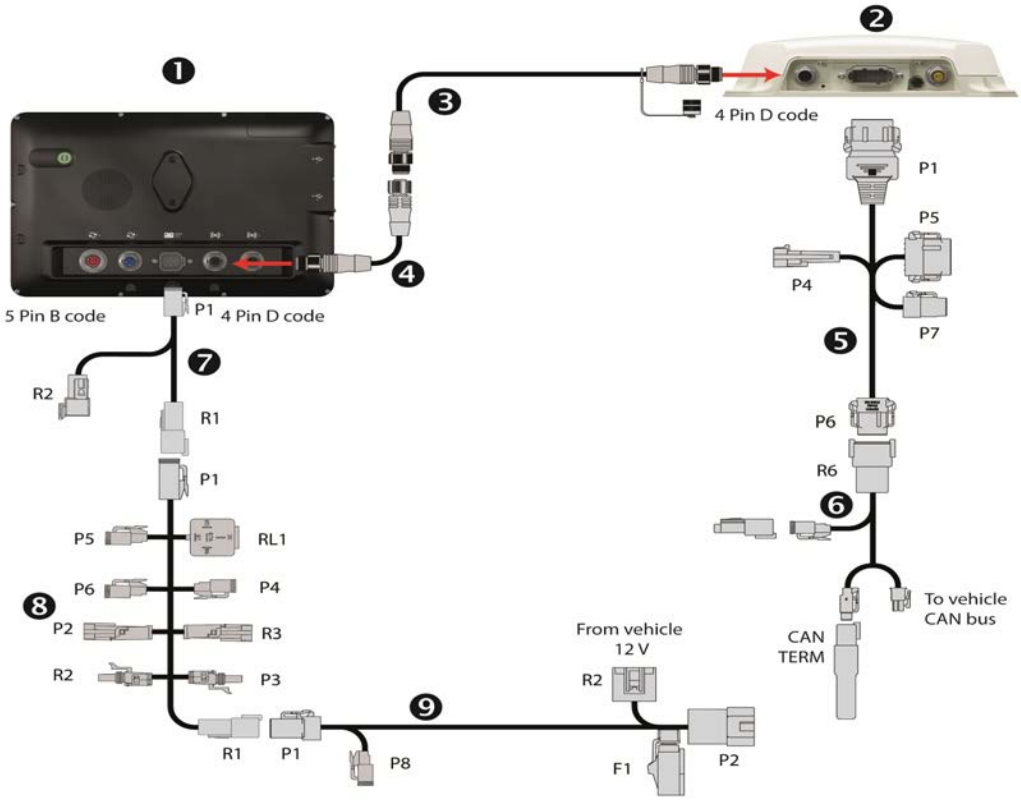
TIP – Read through the steps and make certain you have all the hand tools needed before starting installation.

2

Connecting the NAV-960 controller

- System components
- GFX series display: Installation
- Installing the remote engage push button (P/N 101250)
- Mounting the NAV-960 controller
- Activating the machine AutoSteer switch—M7-1x1, M7-1x2, and M7-1x3 models
- Activating the machine AutoSteer switch—M7-1x4 models

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, CAN ISO to cab Guidance, 4 m	110550
6	Cable Assy, NAV in-cab to Kubota M7	115415
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, Autopilot, Kubota M7 power adapter	115414

GFX series display: Installation

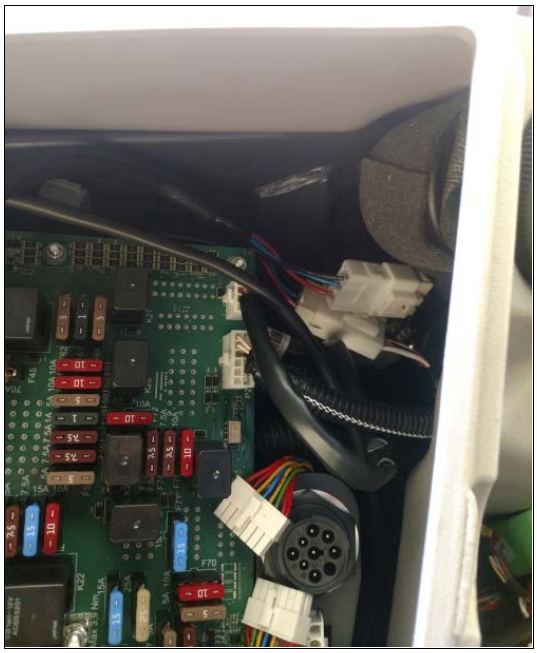
Step 1

Locate the Kubota power adapter cable (P/N 115414).



Step 2

Locate the factory power connector in the fuse panel in the back right corner of the cab. The power connector is a white rectangular connector pair with 3 contacts. Unplug this connection, and plug in the connector pair from the Kubota power adapter cable (P/N 115414).



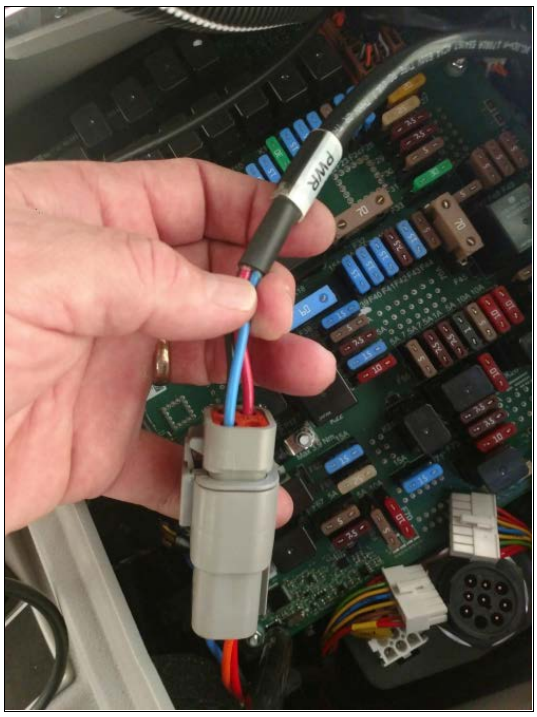
M7-1x1, M7-1x2 and M7-1x3 models



M7-1x4 models

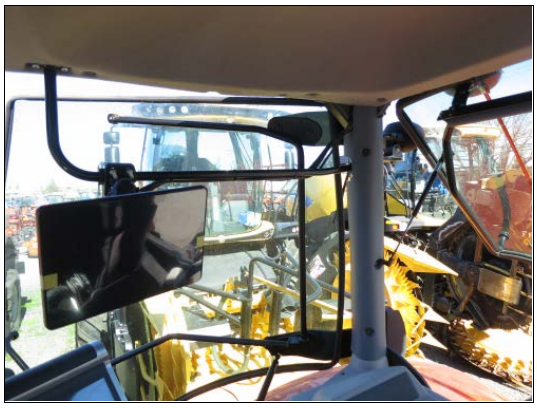
Step 3

Plug the remaining free end of the Kubota power adapter cable into the supplied GFX display power cable (P/N 110551) or optional power bus cable (P/N 67259).



Step 4

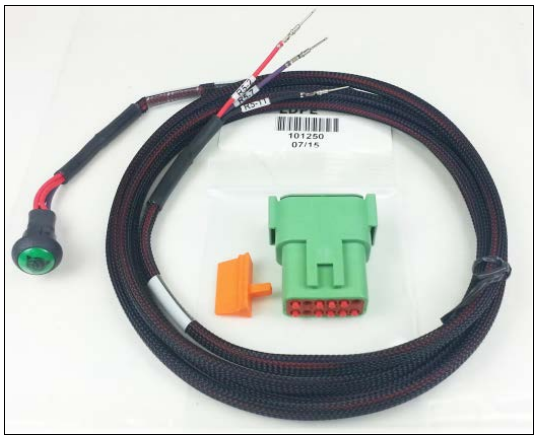
Connect cable P/N 110551 to the GFX display. Securely zip-tie the excess cabling underneath the plastic trim panels.



Installing the remote engage push button (P/N 101250)

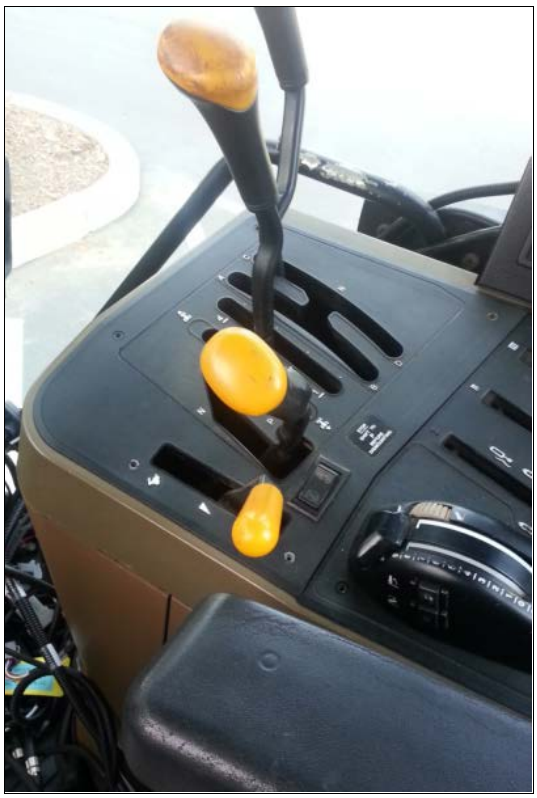
Step 1

Locate the push button cable assembly (P/N 101250) and verify that the 12-pin green Deutsch connector, wedgelock, and seal are included in the small Ziploc bag.



Step 2

Locate a convenient location on the machine to install the switch. It should be easily accessible while driving but should not interfere with any other machine controls.



Step 3

Remove the panel from the desired installation location to verify that there is adequate clearance for the switch and cable. Take care that the cable will not interfere with any gear levers.



Step 4

Drill a 1/2" hole for the switch.



Step 5

Thread the cable through the clear round seal, and slide it up until it reaches the switch.



Step 6

Thread the cable through the hole in the instrument panel.



Step 7

Push the button down until it seats. The locking tabs will hold it securely in place.



Step 8

Route the cable as desired, and insert the contacts into the 12-pin connector as labeled.



Step 9

Reinstall the panel and secure loose cables with wire ties.



Mounting the NAV-960 controller

You can use the optional quick release bracket P/N 110308 to attach the NAV-960 controller to the spar.

Step 1

Align the four holes on the base mounting plate with the four holes in the spar. Install the supplied 1/4 -20 × 1/2" countersunk bolts and tighten appropriately.



Step 2

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



Step 3

Loosen and remove the large bolts of the sunroof.



Step 4

Place the spar over the holes and insert the bolts. Tighten appropriately.



Step 5

Route the antenna cable between the roof and the headliner.

To access this space, you must temporarily remove the bolts for the roof so that the headliner can be flexed down to route the antenna cable.

Remove the screws shown.





Near the B pillar, remove the screws shown.



Step 6

Remove the nut on the top of the roof.



Step 7

Route the P/N 110550 under the right side of the fender cover.

Remove the fasteners shown.



Step 8

Gently pull down the headliner and feed P1 connector of P/N 110550 up in between the headliner and roof cap.



Step 9

Route cable P/N 110550 towards the front of the cab.



Step 10

Route the P1 connector of cable P/N 110550 out the front of the cab (to the right side of the light) to the NAV-9xx controller.





Step 11

Back in the cab, route cable P/N 110550 under the rear fender.



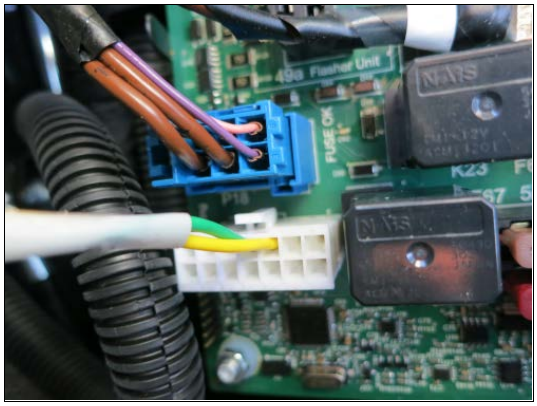
Step 12

Connect R6 on cable P/N 115415 to P6 on cable P/N 110550.



Step 13

Connect R4 on the CAN interface cable (P/N 115415) to the white, rectangular 14-pin connector on the fuse panel in the back right corner of the cab.



M7-1x1, M7-1x2 and M7-1x3 models

NOTE – For M7-1x4 models, the autoguidance CAN connector may be occupied with a telematics connections. There will be a tee connection located on the telematics harness to connect the CAN connection to the NAV-x00 controller.



M7-1x4 models

Step 14

Gently pull down the headliner and then feed the P2 connector of cable P/N 110540 up in between the headliner and roof cap.



Step 15

Route cable P/N 110540 between the headliner and roof cap towards the front of the cab (same as cable 1105510) to the NAV-9xx guidance receiver.



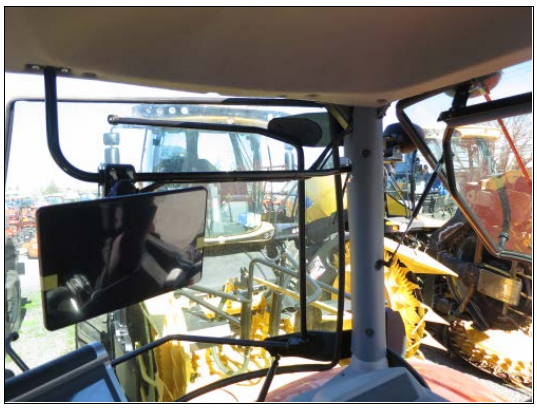
Step 16

Plug the P1 connector on cable P/N 110540 into the back of the NAV-9xx guidance receiver.



Step 17

Back in the cab, route cable P/N 110540 along the bracket to the GFX display.



Activating the machine AutoSteer switch—M7-1x1, M7-1x2, and M7-1x3 models

Step 1

For the Autopilot system to function, you must activate the AutoSteer switch on the machine.

Locate the AutoSteer switch—this is the rearmost switch in the group of switches, shown.

If a switch is not present, you need to purchase the switch (Kubota P/N 3J032-74860) from a Kubota dealer.

Install the switch to the machine's wiring harness at the connector labeled S37. If the machine is not equipped with a factory AutoSteer switch, connect the wiring harness to the blank-out switch.



Step 2

When auto-steering is required in the field, set this switch so that it is in the position with the steering wheel down / switch light illuminated.

Activating the machine AutoSteer switch—M7-1x4 models

M7-1x4 Deluxe models

Step 1

For the Autopilot system to function, you must activate the AutoSteer switch on the machine.

Locate the AutoSteer switch—this is the rearmost switch in the group of switches, shown.

If a switch is not present, you need to purchase the switch (Kubota P/N 3J032-74860) from a Kubota dealer.

Install the switch to the machine's wiring harness at the connector labeled XR31. If the machine is not equipped with a factory AutoSteer switch, connect the wiring harness to the blank-out switch.



Step 2

When auto-steering is required in the field, set this switch so that it is in the position with the steering wheel down / switch light illuminated.



M7-1x4 Premium models

Step 1

For the Autopilot system to function, you must activate the AutoSteer switch on the machine.

Locate the AutoSteer switch—this is the rearmost switch in the group of switches, shown.

If a switch is not present, you need to purchase the switch (Kubota P/N 3J032-74860) from a Kubota dealer. Alternatively, you can use the Hella switch P/N 354120391 (350- Alternative Steering Wheel Image). The switch should be installed to the wiring harness present on the machine, connector labeled XR31. The wire harness should be connected to the blank-out switch if the machine is not equipped with a factory AutoSteer switch.









Step 2

When auto-steering is required in the field, set this switch so that it is in the position with the steering wheel down / switch light illuminated.

3

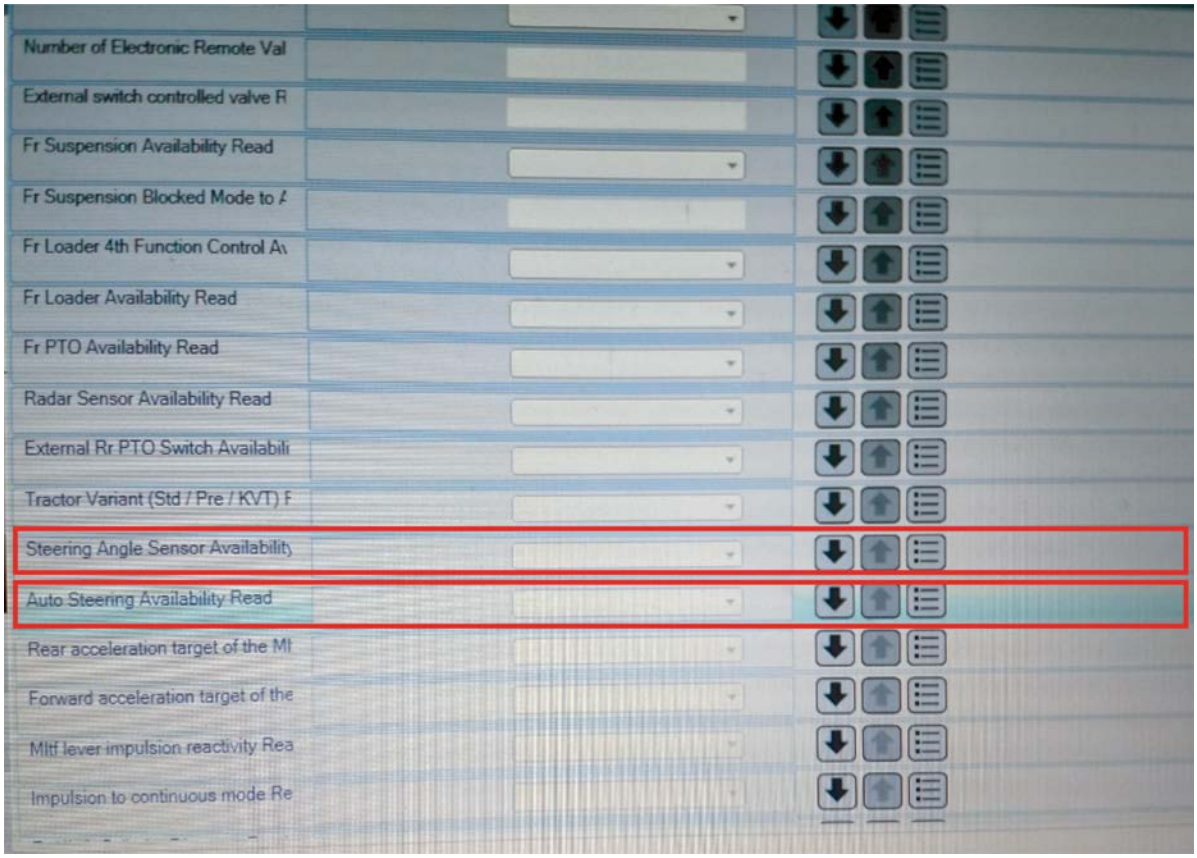
Final Machine Check

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. Configure the vehicle using the Trimble display and selecting the correct configuration for the vehicle model being used.

4. For all M7 models, verify that the Kubota dealer has enabled the options **Auto Steering Availability Read** and **Steering Angle Sensor Availability**. If not, the Kubota dealer will need to connect the Kubota OBD Tool and change the **Auto Steering Availability Read** and **Steering Angle Sensor Availability** settings, shown below, to **Installed**. If not, the tractor steering will not accept steering commands from the NAV-xxx controller.



NOTE – For the 2 and 3 series these settings will be set to **OFF**.

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
   - Antenna height/Antenna axle offset, and Roll offset


PTx
Trimble