INSTALLATION INSTRUCTIONS

Autopilot

automated steering system

CLAAS Tractors

- AXION 800/900, MY 2022+, OSI
- ARION 500/600, MY 2022+, OSI

PTx Trimble

Version 10.00
Revision A
March 2025
P/N 54035-6047-E10

Legal Notices

Agriculture Business Area

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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



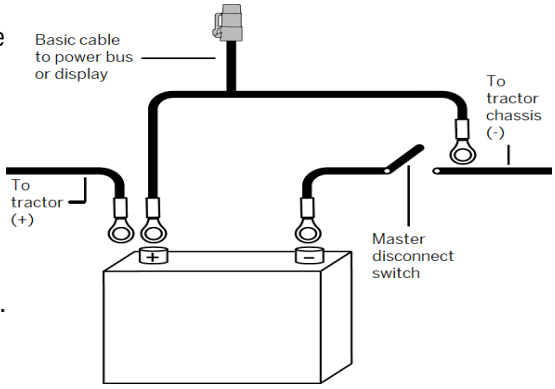
Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

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.



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
Preparing the vehicle for installation 8

Display Installation **9**

GFX series display: Installation 9
GFX series display: Installing the wiring harness 10

Connecting the NAV-960 controller **12**

Installing the NAV-960 guidance controller 12
Connecting the cables 14

Final Machine Check **15**

Tractor configuration 16
Tractor calibration 20
Steering sensor calibration 21
Steering valve calibration 23

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 54035-6047	Standard hand tools
Mount, NAV-900/960, Quick Release, Claas: P/N 131769	

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

Display Installation

- GFX series display: Installation
- GFX series display: Installing the wiring harness

GFX series display: Installation

Mount the display to the mounting bracket on the right side of the cab.



GFX series display: Installing the wiring harness

The GFX series display requires a nominal 12 volt power source.

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.

Connect the display using cable P/N: 131580.

Step 1

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



Step 2

Connect the 4-pin M12 connector to the 4-pin receiver connector. Note the keying and number of pins.





Step 3

Connect the other two ends of cable P/N 131580 to the tractor in-cab connections in the upper right corner of the cab.



3

Connecting the NAV-960 controller

- Installing the NAV-960 guidance controller
- Connecting the cables

Installing the NAV-960 guidance controller

Step 1

Locate the NAV-960 controller bracket P/N 131769.

Locate the three M6 x 25 mm flat head screws and three nylon washers.

Place the screws through the three outer mounting holes on the bracket. Place the three nylon washers on the screws.



Step 2

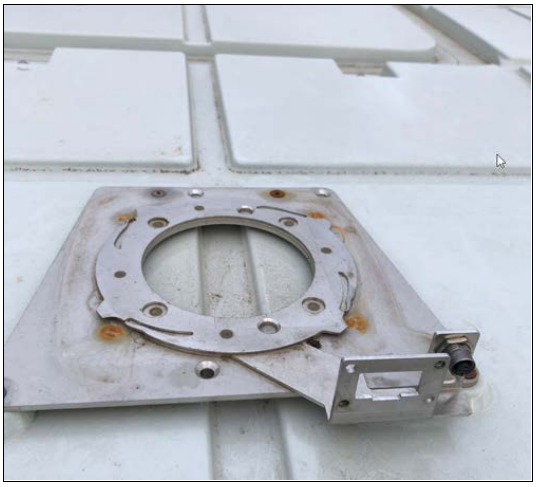
Place the NAV-960 controller on the nylon washers and bracket.

Place the NAV-960 controller on the three M6 mounting screws in the bracket. Tighten the three M6 nuts; do not exceed 10 N-m (88.5lb-in) torque.



Step 3

Locate the CLAAS roof bracket.



Step 4

Place the NAV-960 controller and bracket on the CLAAS roof bracket and twist the NAV-960 to lock it in place.



Connecting the cables

NOTE – NAV-900 pictures used for reference only

Step 1

Connect the existing CLAAS cables to the NAV-960 controller.





4

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. Perform the tractor configuration procedure, below.

Tractor configuration

Step 1

Remove the left-hand rear cab panel trim.

Find the two cables seen here green and yellow heat shrink:

- For OEM, it is yellow to yellow and green to green.
- For Autopilot, unplug these and connect yellow to green and green to yellow.

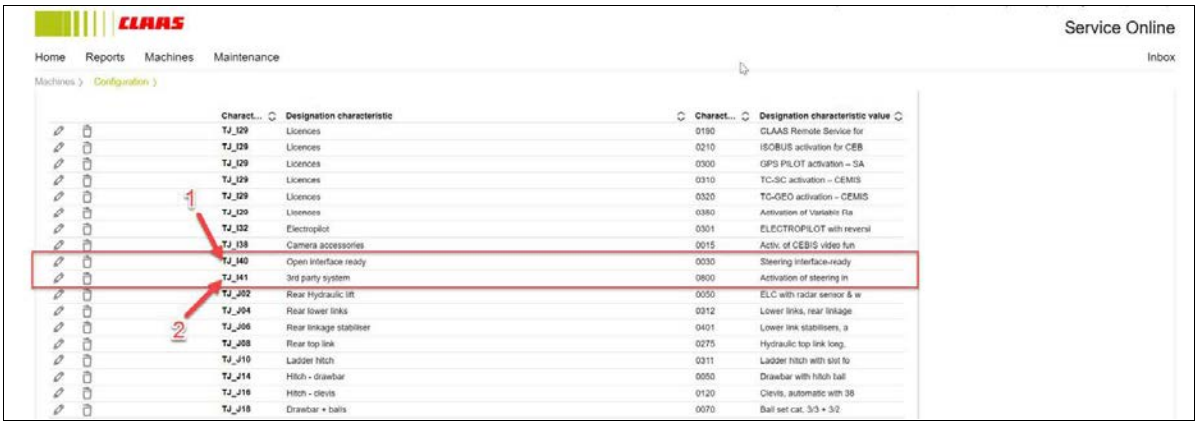


Step 2

Change the configuration in the Configuration change app to **Service Online**.

a. Select **Steering interface-ready** (1) TJ_I40_0030

b. Select **Activation of steering unlocks** (2) TJ_I41_0800



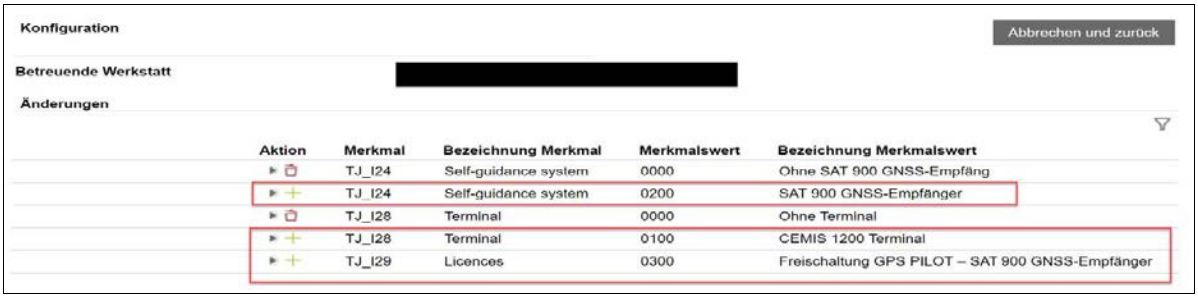
Step 3

From the factory the tractor is configured without GNSS receiver and terminal. You need to change this configuration as follows:

a. TJ_I24_0200 SAT 900 GNSS Receiver

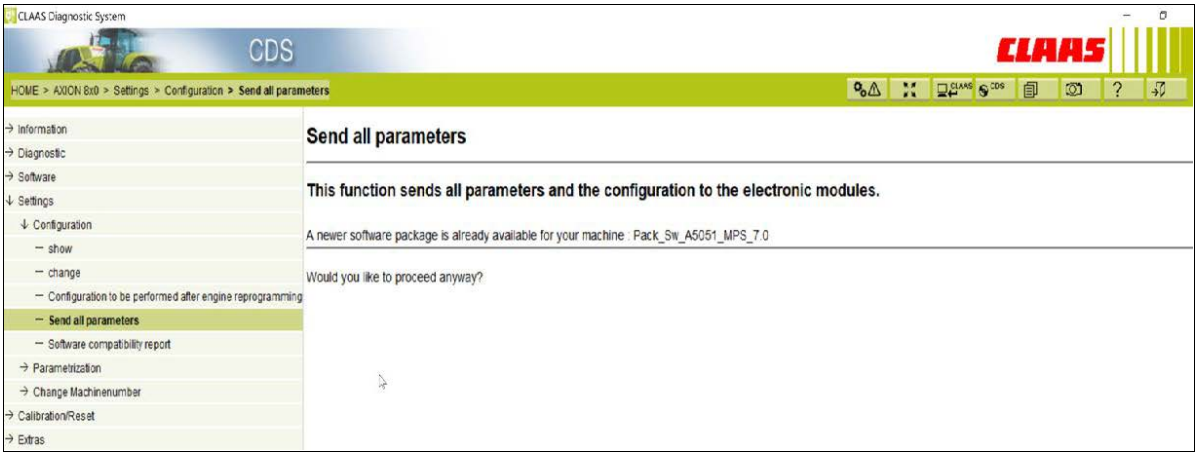
b. TJ_I28_00100 CEMIS 1200 Terminal

c. TJ_I29_Unlock GPS PILOT



Step 4

Connect your CDS to the machine as usual and send the configuration to the machine via MUC Online.



Step 5

Harvest machine verification: Check and update the configuration with CDS:

a. Q07_0430 CEMIS 1200

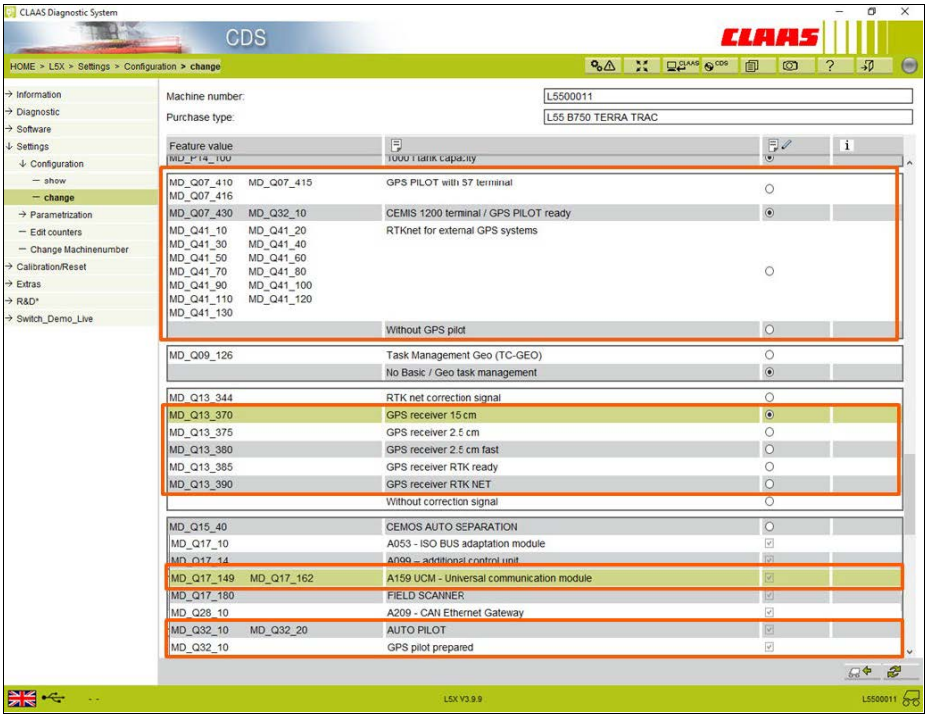
b. Q13_0370 to Q13_0390 – SAT 900

c. Q17_0149 – A159 UCM

d. Q32_0010 – AUTO PILOT

e. Q32_0010 – GPS pilot prepared

These are the most important configuration points.



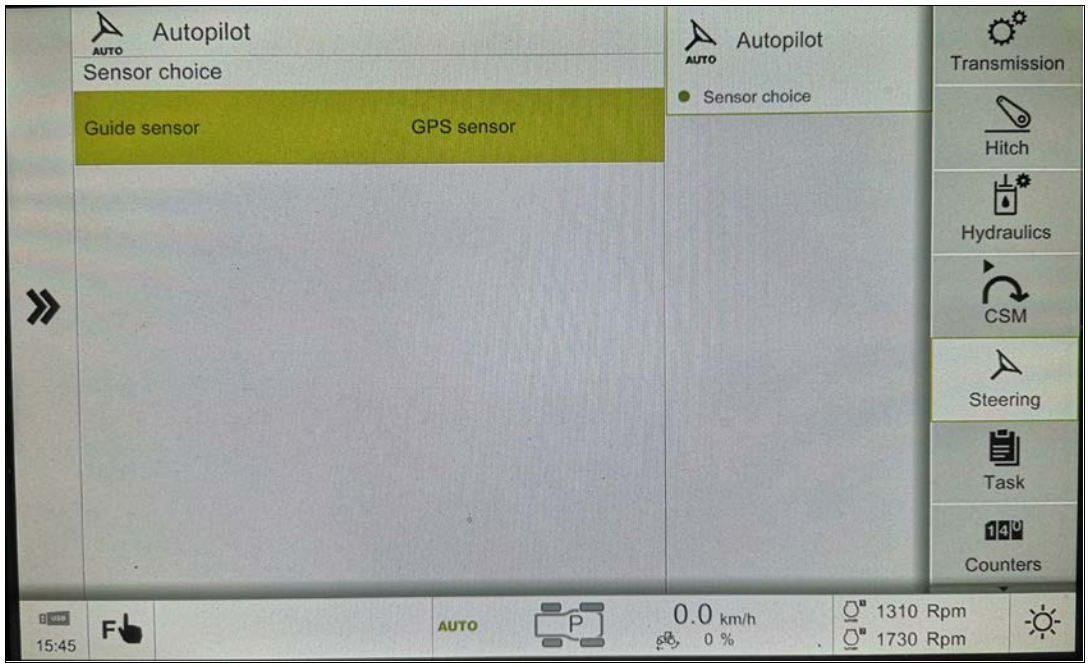
Step 6

To use the Trimble GFX display, the main switch AUTOPILOT must be switched on.



Step 7

The third-party steering system must be selected as the active guide sensor in CEBIS. Select **Steering** / **AUTOPILOT** / **Active guidance sensor** / **Third-party steering system**.

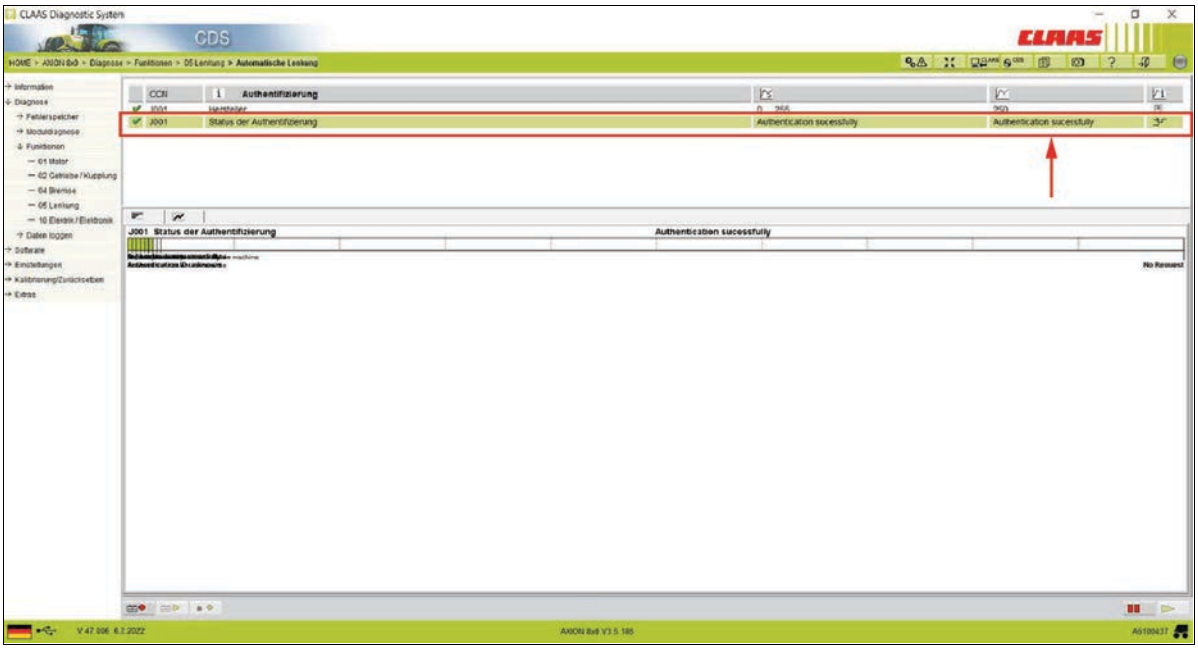


Step 8

Check the authentication has been done successfully: Select **Diagnosis** / **Functions** / **05 steering**.

The values should be:

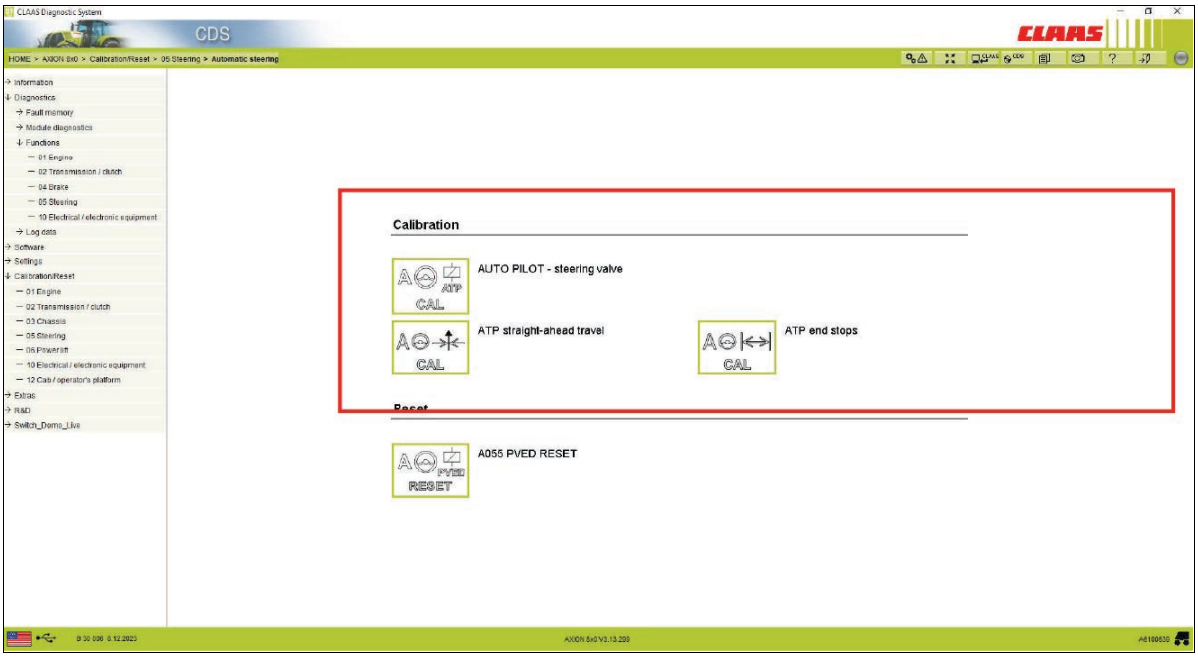
- 0510 automatic steering
- Authentication successfully



Tractor calibration

NOTE – The oil in the steering valve must be at operational temperature (65° Celsius) before doing the calibration. Prior to calibration, make sure the hydraulic oil temperature is at least 65° C.

For optimal steering performances certain parameters must be calibrated on the machine in A009 ATP before using the steering system:



In **CDS** menu, select **Calibration**/**Reset** / **05 Steering**. The values should be:

– 0510 Automatic Steering

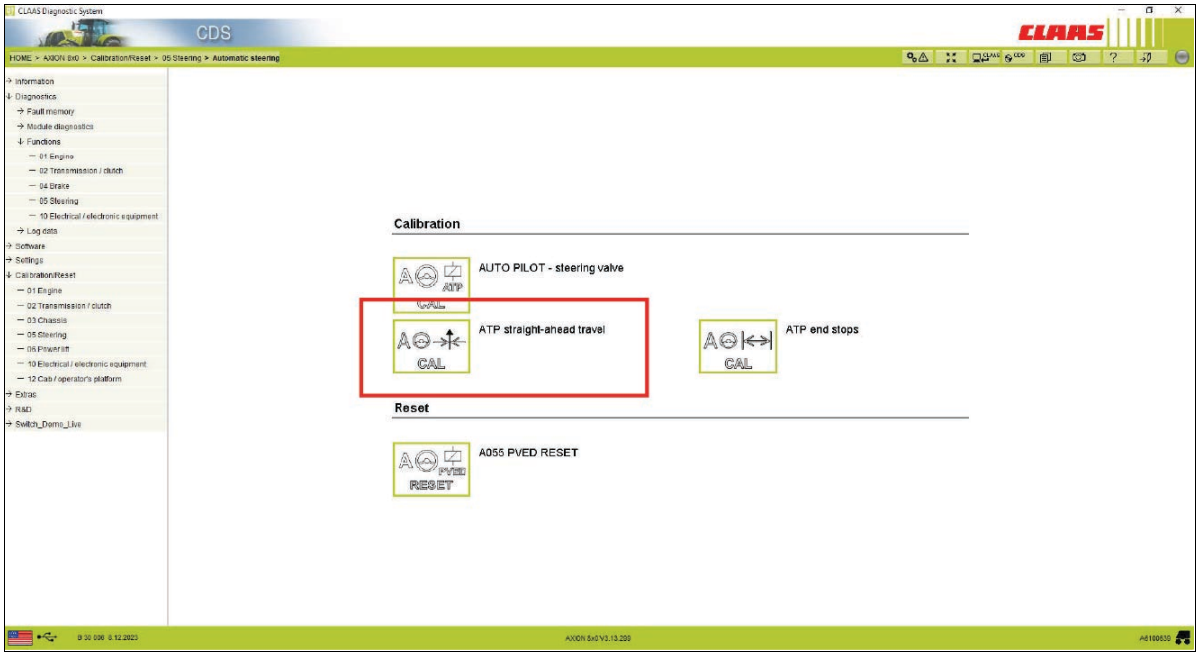
– Steering sensor – AUTO PILOT

– AUTO PILOT – Steering valve

The new calibration values will be saved in ATP A009, overwriting previous values.

Steering sensor calibration

1. In **CDS** menu, select **Calibration**/**Reset** / **05 Steering**. The values should be:

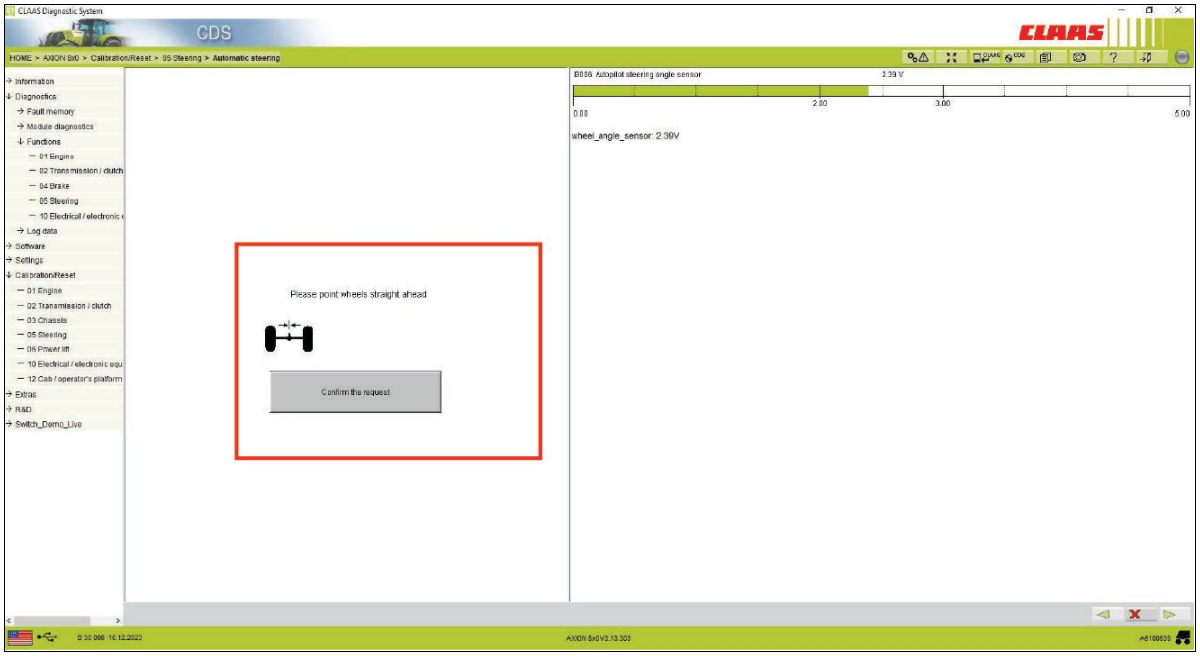


– 05 Steering

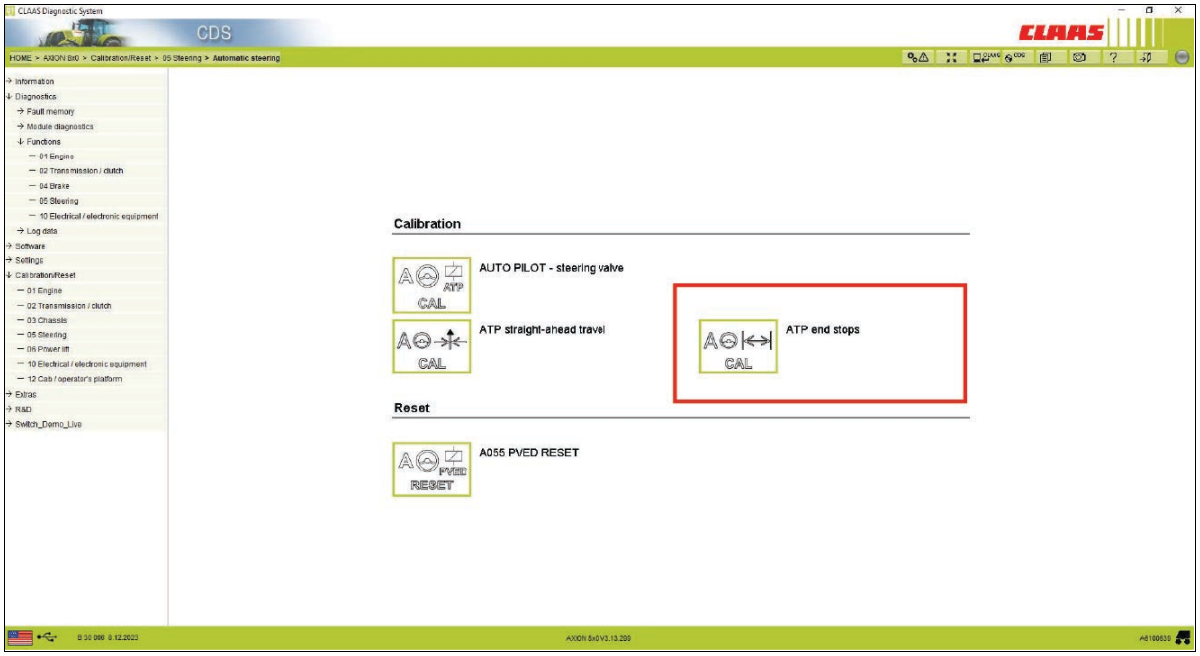
– 0510 Automatic steering

– Steering sensor – AUTO PILOT

2. Calibrate the centered straight position:



3. Open the menu again in CDS to calibrate the end stops positions:

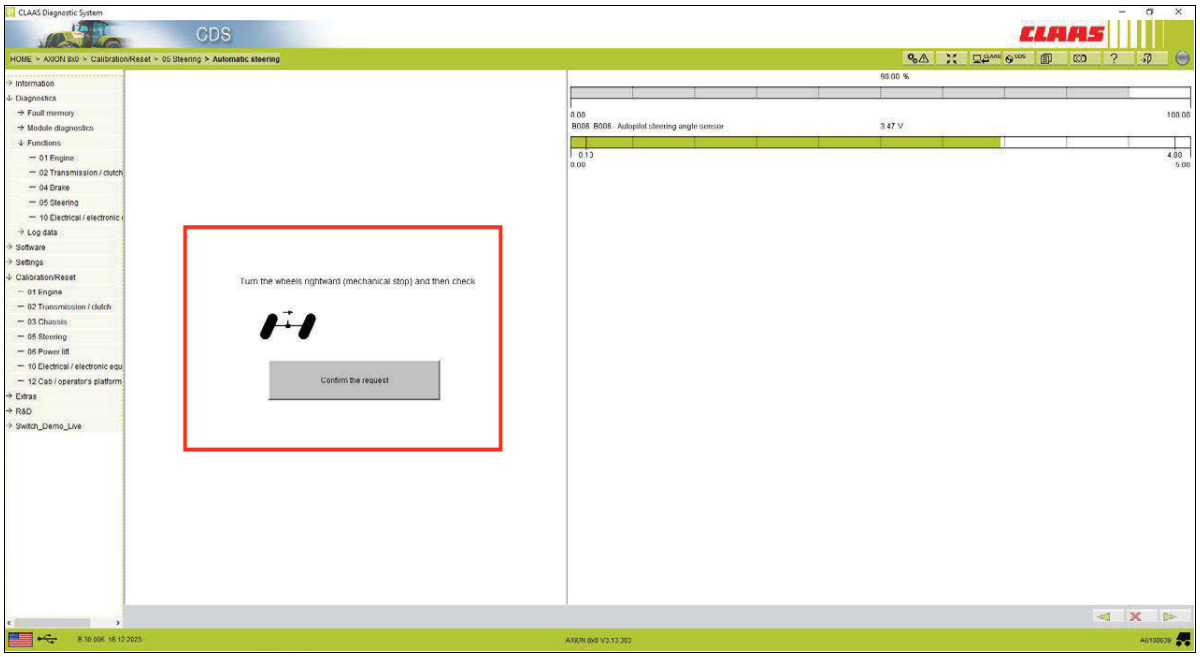


a. Select symbol.

b. Confirm with arrow.

c. Put the wheels full lock left or right according to the screen.

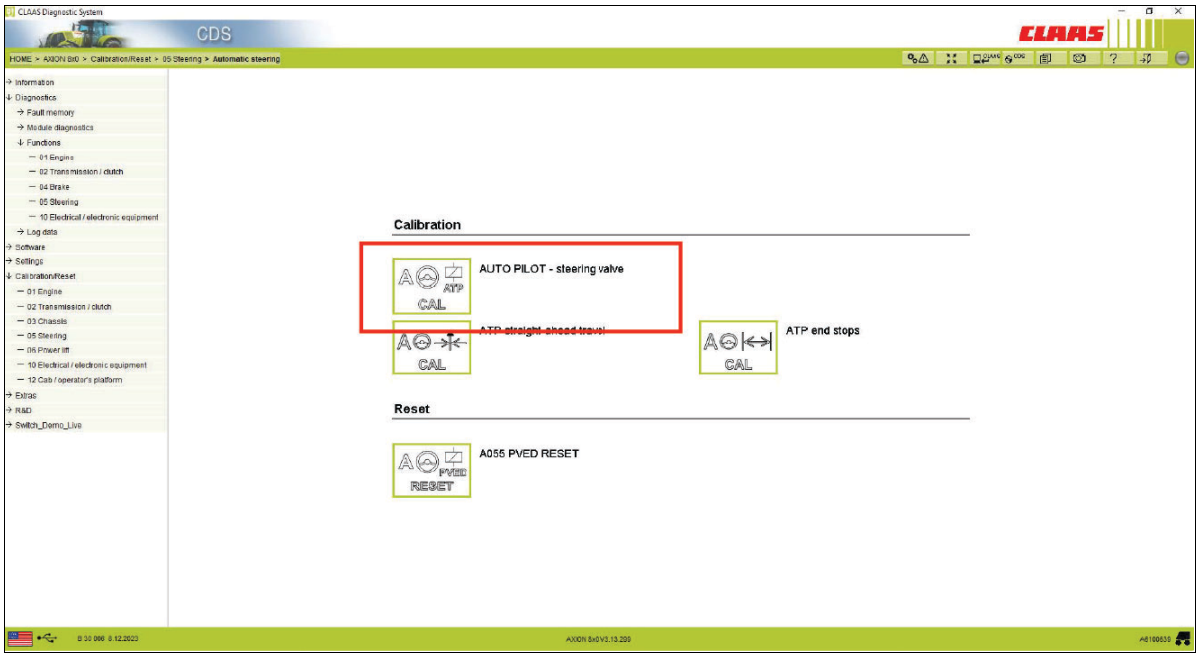
d. Confirm.



Steering valve calibration

NOTE – Prior to calibration, make sure the hydraulic oil temperature is at least 65° Celsius.

1. To calibrate the steering valve in CDS, open the calibration menu again and select **AUTO PILOT - steering valve**:



   a. Check the conditions are met before running the test.

   b. If the message is confirmed, the vehicle now drives forward with steering movements.

   c. The behavior of the vehicle is identical to the valve calibration in GPS PILOT.

   d. When the process is complete, the determined values are displayed.

2. If both calibrations have been carried out successfully, the third-party steering system can be put into operation.


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