INSTALLATION MANUAL

Agra-GPS CNH-JD Bridge for AFS/PLM Machines

Version 1.1

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Release Notice

This is Release 1.2 of the
CNH-JD for AFS/PLM Bridge Installation Manual.

Disclaimer

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DO NOT USE THE CNH-JD Bridge IF YOU DISAGREE WITH THE DISCLAIMER.

Important Safety Information

Read this manual and the operation and safety instructions carefully before installing the CNH-JD Bridge.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of your equipment, contact your Agra-GPS for support.
- Follow all safety labels affixed to the system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact Agra-GPS.

When operating the machine after installing the CNH-JD Bridge, observe the following safety measures:

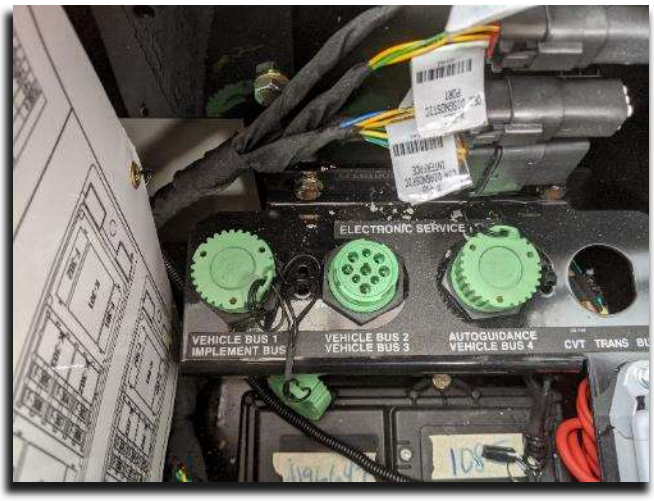
- Be alert and aware of surroundings.
- Do not operate the CNH-JD Bridge system while under the influence of alcohol or an illegal substance.
- Always remain in the operator's position when the CNH-JD Bridge system is engaged.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling the CNH-JD Bridge system when the safe working distance has been diminished.
- Ensure the CNH-JD Bridge is disabled prior to starting any maintenance work on the machine or parts of the CNH-JD Bridge system.
- Follow all safety instructions from the CNH system as well as the JD system.
- The CNH-JD Bridge must only be used in the field, never on the street.

Electrical Safety

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Verify that all cables and connectors are not going over sharp edges and are not pinned, as this could cause power shortages and/or malfunctions.

Step 1: Installing the CNH-JD Bridge

IMPORTANT: The CNH machine must have the 3rd party steering unlock from CNH applied! First, find the following panel located to the right of the operator's seat. The Agra-GPS CNH-JD bridge will be installed into the 9-pin ISO connector at the top right of the panel.	
Connect the smaller 9-pin female connector of the Agra-GPS bridge to machine adapter into the 9-pin male ISO connector of the machine.	

The next connector will be installed into a diagnostic port located under the passenger seat of the machine. First, open the buddy seat exposing the compartment area below, then remove the insert compartment to reveal the diagnostic ports (shown right).	
Insert the larger 9-pin female connector of the Agra-GPS bridge to machine adapter into the middle 9-pin male diagnostic port labelled, 'VEHICLE BUS 2' 'VEHICLE BUS 3' Next, attach the 12-pin male Deutsch of the Agra-GPS bridge to machine adapter into the 12-pin female Deutsch of the Agra-GPS CNH-JD Bridge.	
To install the Agra-GPS bridge to monitor adapter, connect the 12-pin female Deutsch end of the cable into the 12-pin male Deutsch end of the Agra-GPS CNH-JD Bridge. Attach the other end of the same cable into the JD monitor.	

Step 2: Mounting the JD Equipment

The John Deere GPS receiver **MUST** be mounted at the front of the cab. Use the Agra-GPS machine to GPS adapter to connect the JD GPS directly to the machine. Connect the 12-pin Deutsch female connector into the built-in 12-pin male connector of the machine located on top of the roof, at the front of the machine. Connect the 12-pin Deutsch male end of the same cable into the 12-pin Deutsch female end of the JD GPS.	
Mount the JD Monitor somewhere sturdy inside the cab and connect it to the CNH-JD cable. The JD-display may be mounted many different ways. You may use the standard JD mounts or a RAM mount. RAM-270U + 2 * 1.5" balls (RAM-202U) + 4" double socket arm (RAM-201U) http://www.rammount.com/part/RAM-270U	

Operating notes for the Agra-GPS CNH-JD Bridge

For autosteer activation you must follow the "normal" JD steps to be autosteer ready:

- Create an AB-line
- Move from "Steer OFF" to "Steer ON"
(3 sections of the guidance ‘pie’) on the JD display.

NOTE: In order to go from “Steer OFF” to “Steer ON” the user must satisfy all guidance requirements for the John Deere monitor. This includes being close to the AB-line.

Your machine must also be in "autosteer ready" mode, which means you must have a field gear selected, drive at a minimum speed and have moved your steering wheel at least once after engine start.

The autosteer is then enabled by pressing the built-in resume button on the throttle control lever.

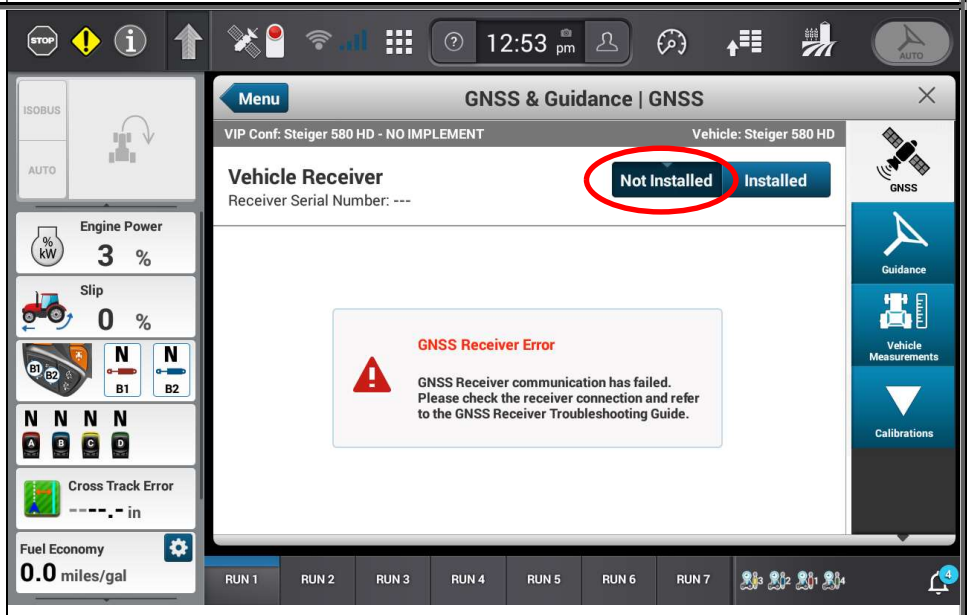
Autosteer settings can be adjusted within the JD display.

Disable Factory Steering

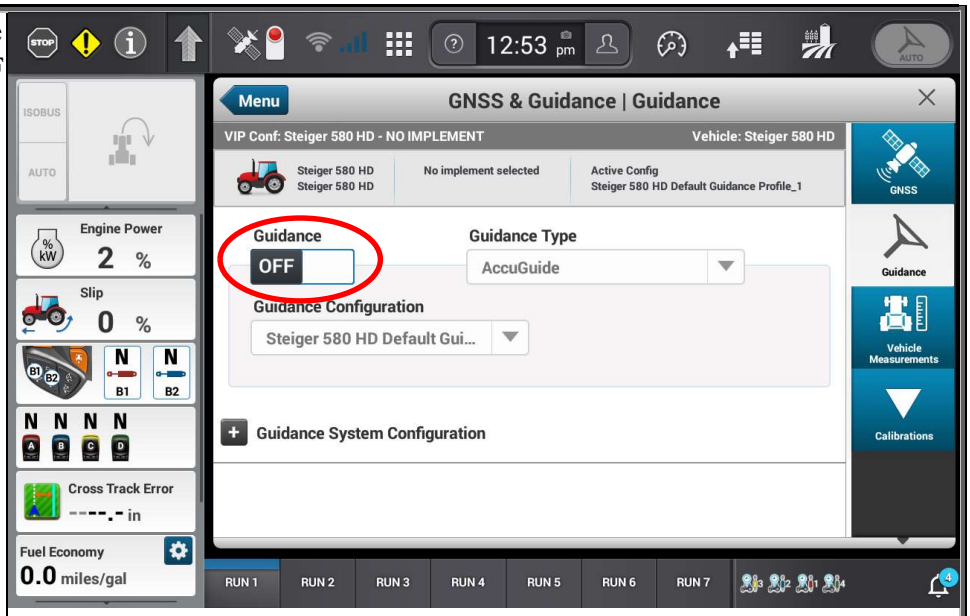
When installing an ISOBUS Class 3 steering system on the following tractors the CNH receiver and guidance may need to be turned off to eliminate fault codes and allow the ISOBUS Class 3 steering system to function.

1. Go to GNSS & Guidance settings page

2. Ensure Vehicle Receiver is set to “Not Installed”

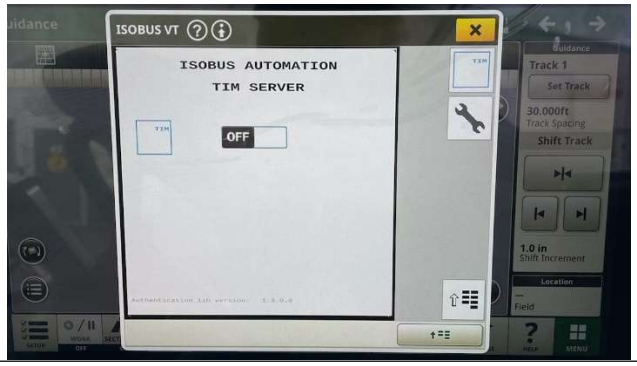


3. Go to the Guidance page and set Guidance to OFF



On certain machines which are TIM enabled, it will be necessary to turn the TIM system off, as the Autosteer Cake on the 1200 will be stuck at 2 orange pieces and will not move to 3 green pieces.

In the 1200 or JD screen find your TIM settings among the ISObus VT apps. Set the TIM server to OFF.



Enable Machine Side Steering

Locate the following panel. It is located on the headliner to the right of the operator's seat. To enable autosteer, toggle the roadmode switch/autosteer switch (rightmost bottom picture) into the off-roadmode position. This will take the Agra-GPS bridge out of roadmode.

Next, hold down the upper part of the ISOBUS auto switch (leftmost bottom picture) for at least a second to enable assignment requests and allow autosteering.

If all conditions are met, the steering 'pie' on both systems should be 3/4, and the user can use the built in engage button located on the throttle to engage autosteering.

Select Correct Machine Type

Select either:

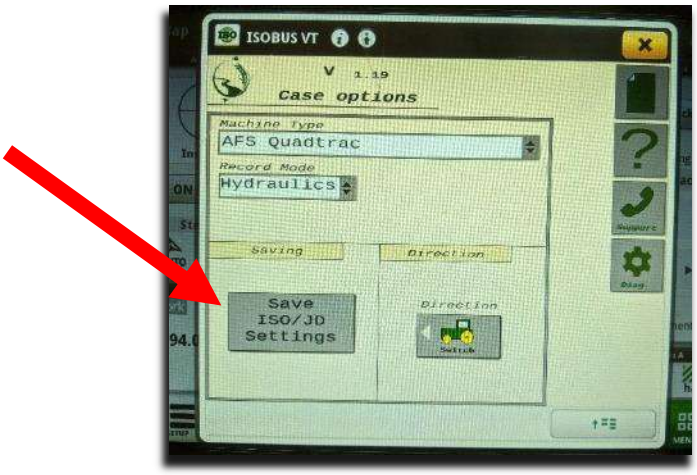
- "AFS/PLM Quadtrac" (for Quadtrac or NH T9), or
- "AFS/PLM Rowcrop" (for Magnum, Puma, NH T8, or NH T7)

Saving Settings and Resetting Steering System

Due to the nature of the steering system, the saving of settings can interrupt the steering system operation. Due to this, whenever JD settings or Agra-GPS ISO application settings are changed, the user must manually save their changes at an appropriate time. To do this, the user must navigate to the Agra-GPS ISO application press the save settings button.

In the event that the saving of settings interrupts the steering system operation, the steering system may go into automation faulted mode (shown right).

To re-enable automation, simply hold down the upper part of the ISOBUS auto switch for at least a second. The user will also be prompted to perform this action when the saving of settings results in an automation timeout.

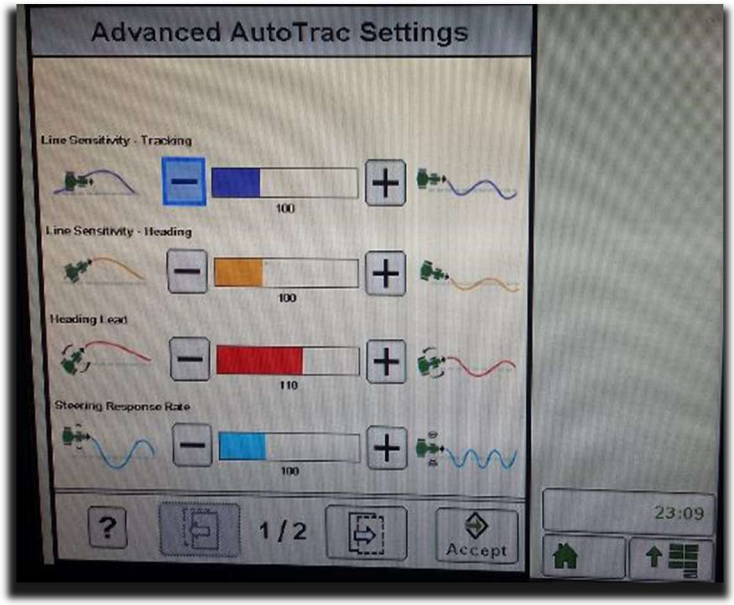


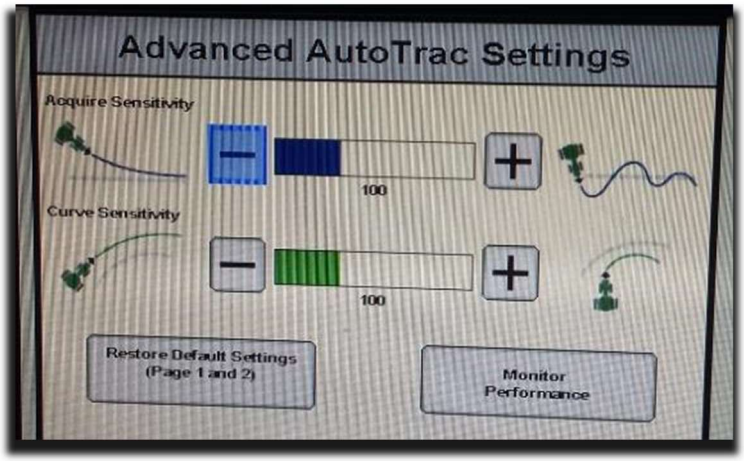
Automation faulted

Adjusting JD Steering Settings

Using the JD display you may adjust your steering performance. Most machines will perform optimally with all JD settings at 100.

If a change is required, find an open area where you can travel at target speed and adjust one parameter at a time until you are satisfied with the steering performance.



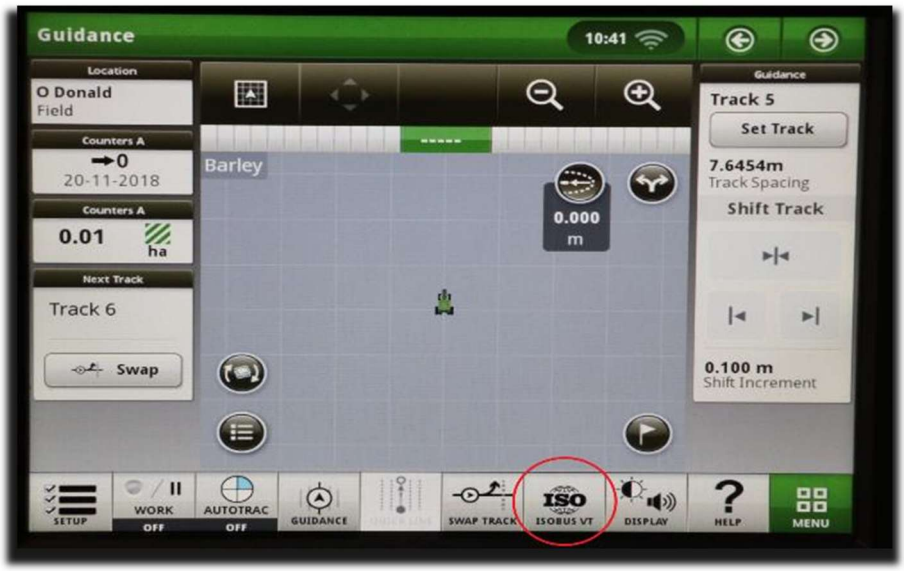


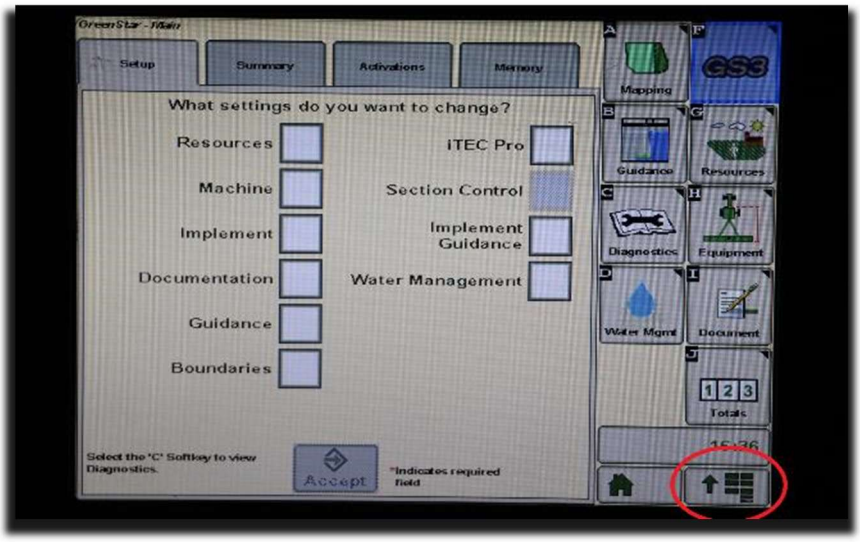
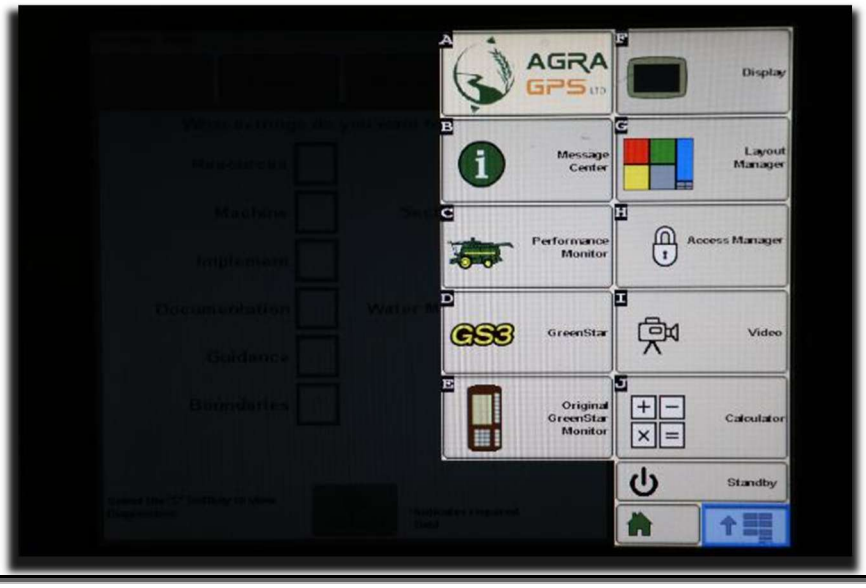
ISO Application

The CNH bridge comes with an ISO application that will be loaded onto the John Deere monitor. The app should automatically store itself on the monitor after the first few minutes of the initial startup. On subsequent runs the app will load itself from memory as soon as possible. The CNH app includes:

- Option to change the machine type
- Help page
- Support page
- Diagnostic page

Where to find the CNH ISO application on the John Deere monitor:

On a John Deere 4640 the application will be loaded in the ISOBus VT section on the main page of the display.	 

On John Deere 1800, 2600, 2630 the application will be shown in the side menu of the John Deere display. The side menu is opened by clicking the button on the bottom right of the display.	
NOTE: John Deere 1800 and 2600 monitors do not show a loading bar for ISO applications, while 2630,4240 and 4640 monitors do.	

If the ISO application is not loaded:

- Try clearing the monitor's memory. On 2630 monitors this can be done in the Message Center in the side menu. Go to the Cleanup tab, check controllers, then Begin Cleanup. On 4640 monitors this can be done in the info page of the ISOBus VT. Navigate to the ISOBus VT window and click the info button at the top of the page, then press Clean Up ISO Bus VT.

- Do a hard reset of the John Deere monitor (Unplug it, then plug it back in).

- Do a full restart of the machine. Remember the app may take a few minutes to load.

APPENDIX A

The following are directions for using external guidance systems on CNH tractors (the original version of this document was supplied by CNH)

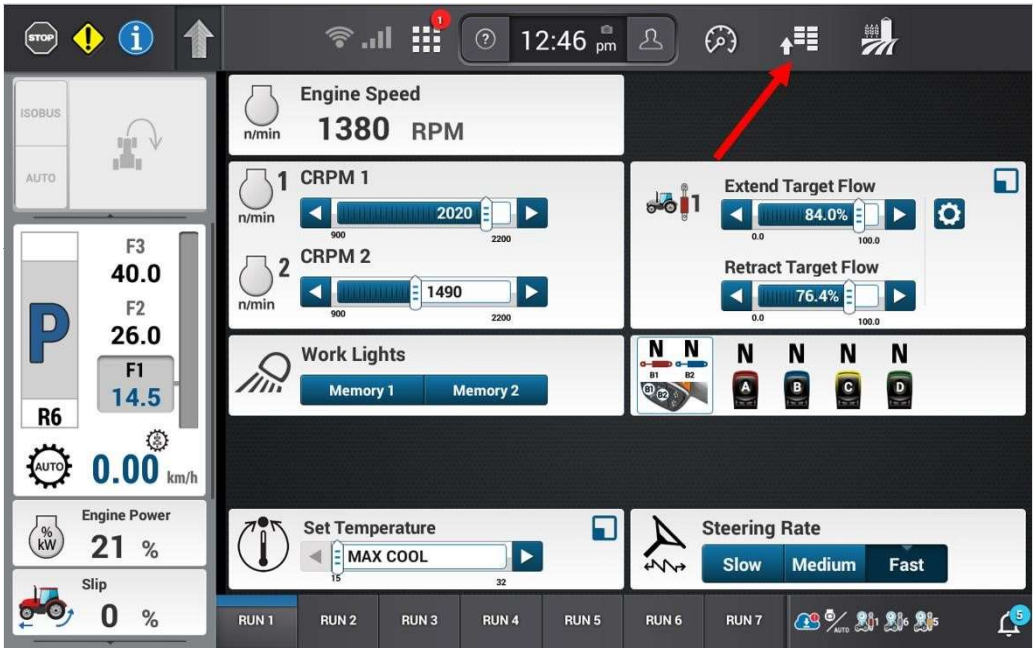
The external guidance system communicates via ISObus Class 3 Steering interface.

Prerequisites:

- Must have one of the following models:
    - CaseIH AFS Connect Magnum
    - CaseIH AFS Connect Steiger/Quadtrac
    - New Holland Genesis T8 with PLM Intelligence
    - New Holland T9 with PLM Intelligence
    - New Holland T7 with PLM Intelligence (tested by AgraGPS as of 2024-11-20)
- Tractor must be activated for ISObus Class 3 Steering (obtain from CNH dealer)
- Must have external guidance system kit (from a supplier that is supported by CNH) installed
- Tractor must have no active steering faults
- Wheel Angle Sensor and Steering Valve calibration have been performed

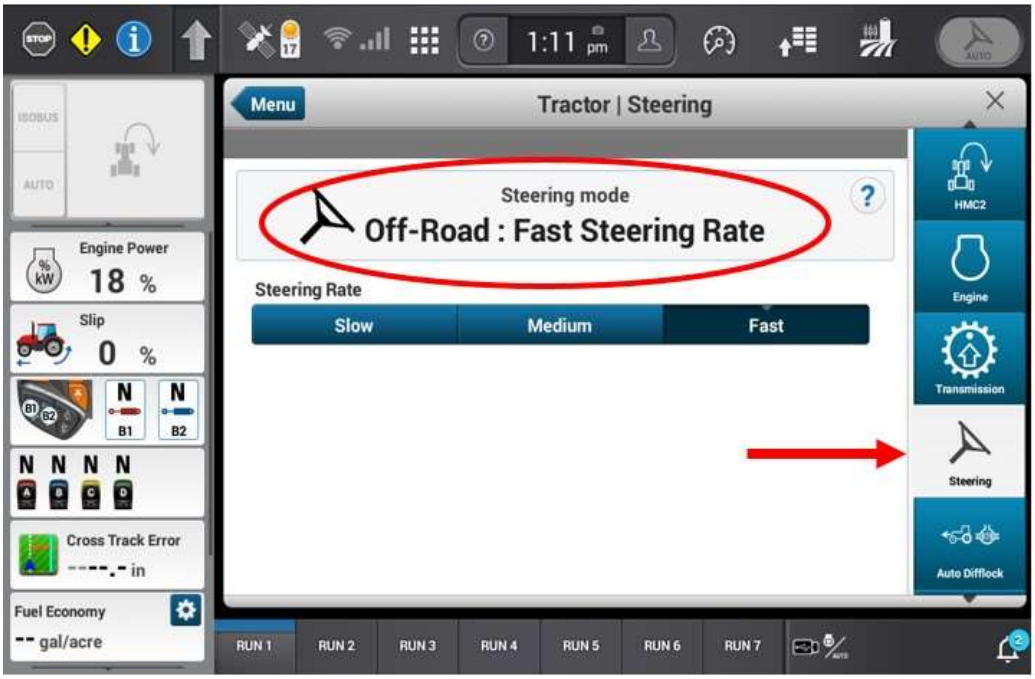
Directions:

1. Turn on tractor
2. Startup external guidance system (automatic after the AgraGPS Bridge is installed)
3. Go to ISObus diagnostic page on Pro 1200 display
    a. Select the “Menu” icon where the red arrow is

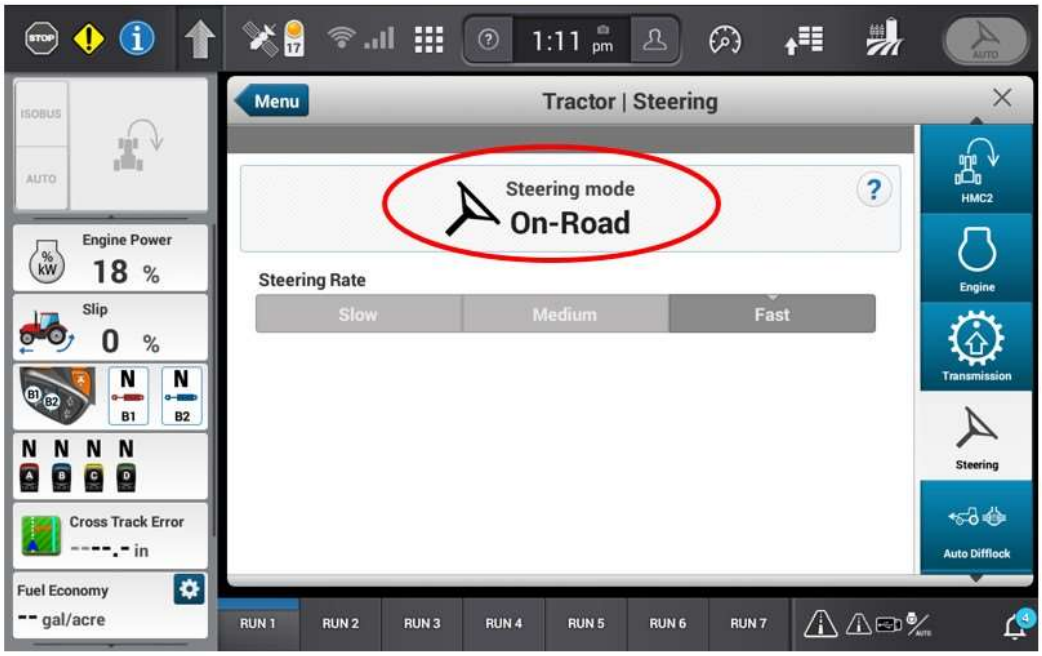


b. Select Tractor settings

c. Scroll down on the right side to the steering page and check to make sure the steering mode is in off-road mode. The tractor must be in off road mode for external guidance to work.

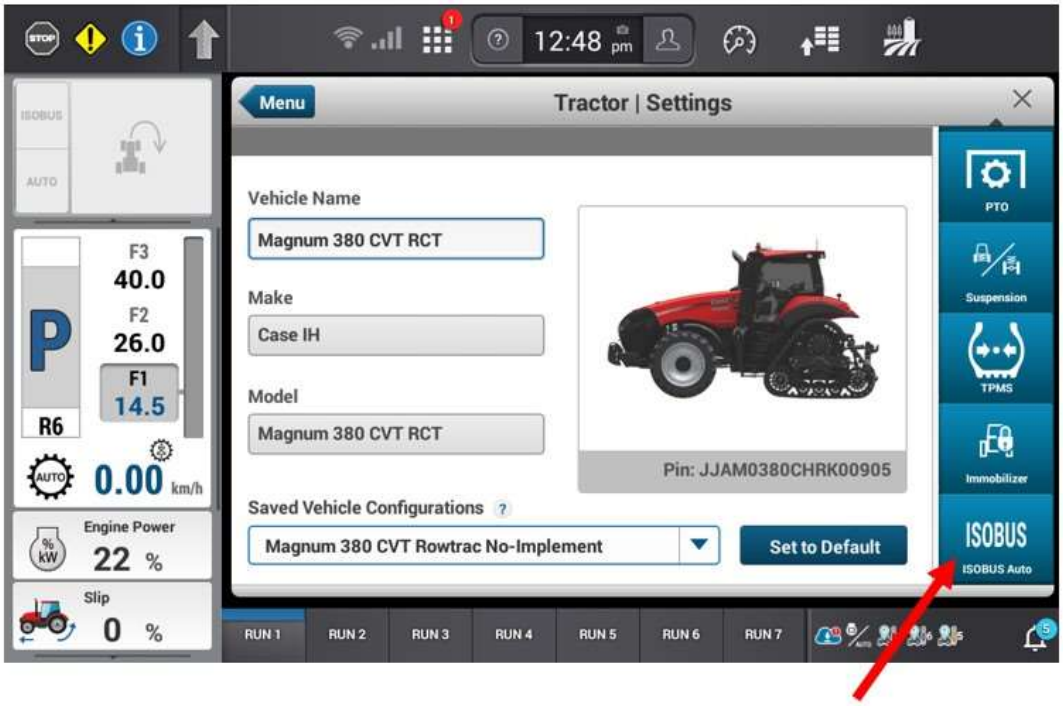


d. If the page is in on-road mode (as seen below), select off road mode by pressing the road switch in. This will set it to off-road mode

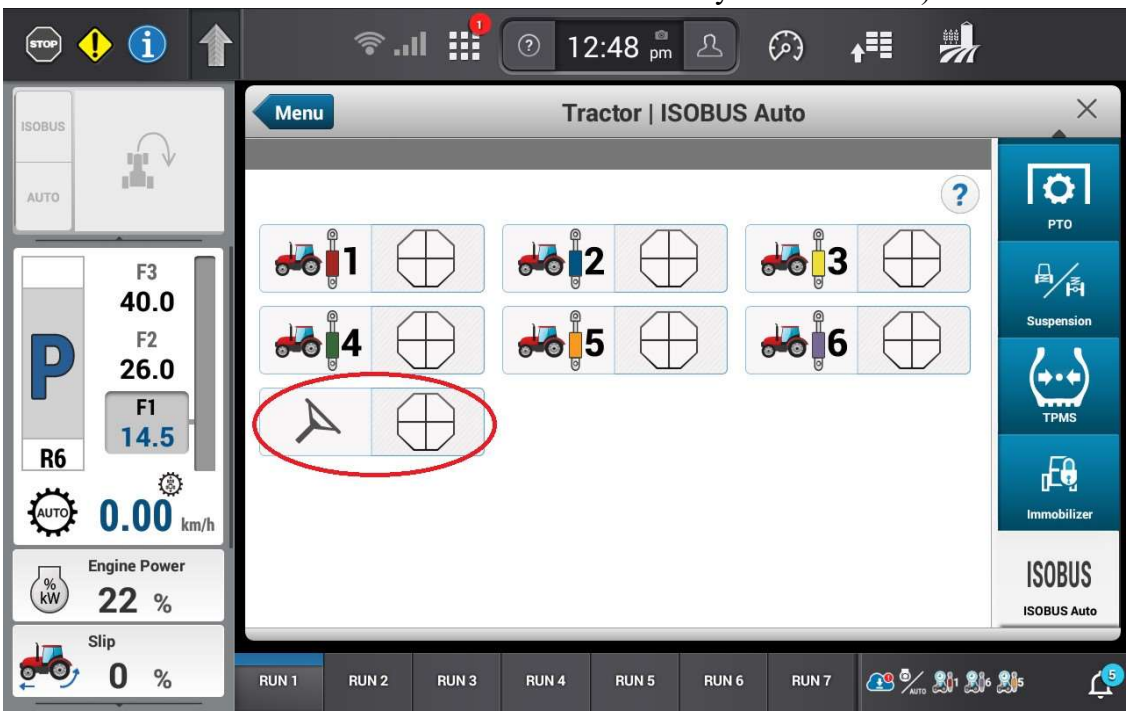


Headliner Road Switch

e. Scroll to the ISOBus diagnostic page.



f. Depending on what ISOBus Class 3 activations the tractor has, this page may have different icons on it. For external guidance, look for the icon with the steering wheel, as shown below. (If the icon is not present, the tractor does not have ISObus Class 3 activated. It will have to be activated by a CNH dealer.)



4. View the status cake symbols– Refer to Appendix A.1 for more information on what the symbols mean

5. Press the top side of the headliner switch labeled “AUTO”. This button needs to be fully pressed for at least a full second for it to register.

Headliner "AUTO" Switch

   a. If the tractor controller is ready to receive guidance commands and the external guidance system is ready to send guidance commands, the status cake should go to three green pieces
   b. If the external guidance system is not ready, the status cake will go to two orange pieces.
   c. If the tractor controller is not ready, the status cake will go to two orange pieces with an exclamation point.

6. Verify that the steering cake has 3 green pieces filled in. This will only occur when the JD-side “pie” also has 3 pieces.

7. Press the “auto” button on the joystick to engage external guidance
    a. The display does not have to be on the ISObus diagnostic page to engage guidance. This page is only to monitor the status of the external guidance. Any other page on the display can be selected. The left-hand area has an ISOBus status icon that is viewable on any page on this display (shown green below). See Appendix A.2 for more information about the left-hand area.

    b. While the external guidance system is engaged, the steering settings page will display “GPS – ISO” as the steering mode.

Case IH Joystick Auto Button

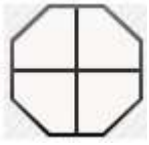
New Holland Joystick Auto Button

8. There will be an audible beep and the status cake should move to full green with swirl inside. If the tractor is stationary, the wheels will not turn. It is only when the tractor starts moving that the external guidance system will begin to command vehicle direction.

9. If the external guidance is cancelled, check the status cake
    a. If the status cake goes to three green pieces after being cancelled, press the Auto button on the joystick to re-engage. Examples of when this would happen:
        i. Moving the steering wheel
        ii. Operator being out of seat
        iii. Cycling the roading switch
    b. If the status cake goes to white after kicking out, the headliner Auto switch will have to be pressed again before engaging with the joystick Auto button. Examples of when this would happen:
        i. Going over 25 kph

Appendix A.1

These symbols will appear next to each function that can be activated for ISOBus Class 3. There are 4 pieces to the cake. When the cake is full and green, the external guidance system is commanding the tractor.

a.  ISOBus Class 3 is off. This means the tractor controller has not initialized or the system has been cancelled.

b.  Tractor controller is performing self-checks/ not ready to accept commands.

c.  An activation condition on the tractor controller for accepting steering commands is not met. Example: moving steering wheel, roading switch is switched on, or operator out of seat

d.  Tractor controller has passed internal self-checks and is ready. It is in standby mode, waiting for the external guidance system to be ready.

e.  The tractor controller is ready to accept guidance commands and the external guidance system is ready to start sending guidance commands. The tractor and the external guidance system are ready are waiting for the operator to acknowledge

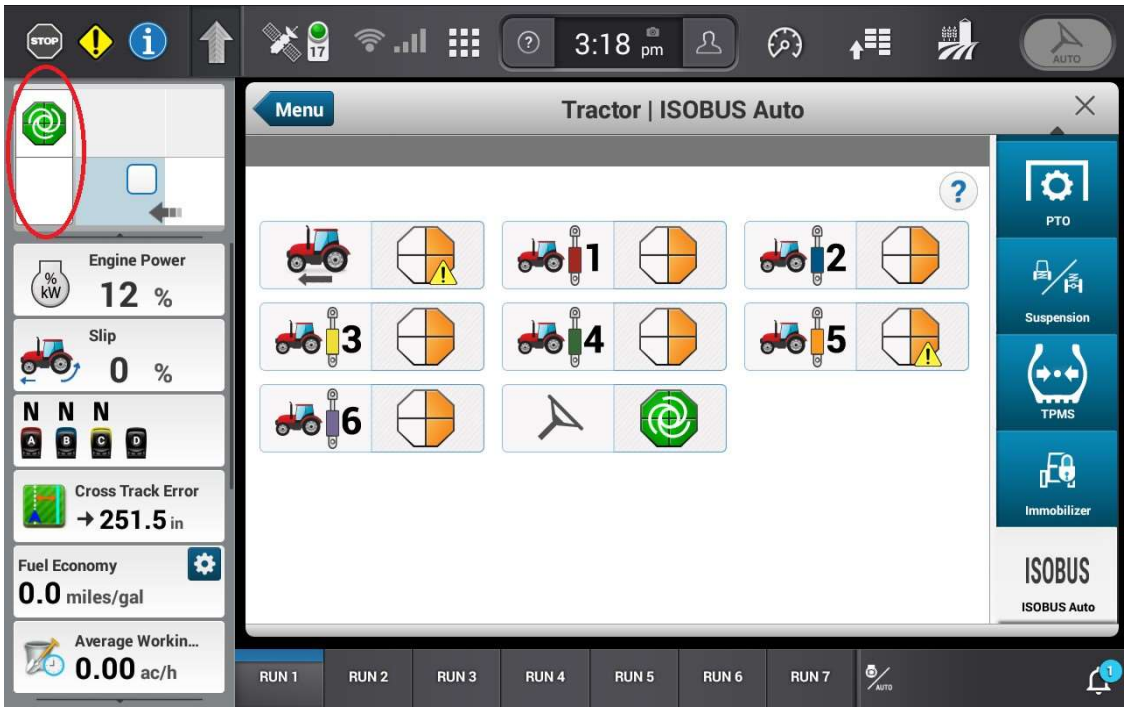
f.  Operator has pressed the Auto engage button on the joystick. The external guidance system is currently steering the tractor.

g. 

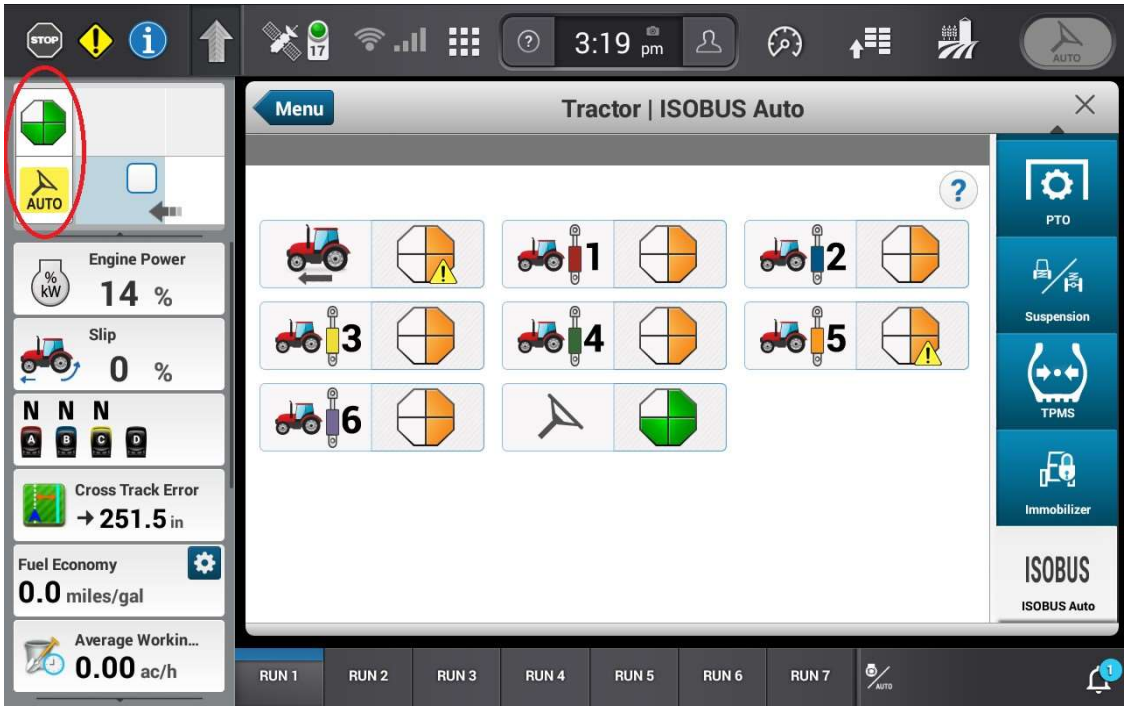
Internal error in tractor function. The external guidance system will not engage.

Appendix A.2

The left-hand area can be used as a quick reference to view the status of the communication with the external guidance system. It follows the same status symbols that are in Appendix A.1. This area is viewable on all screens.



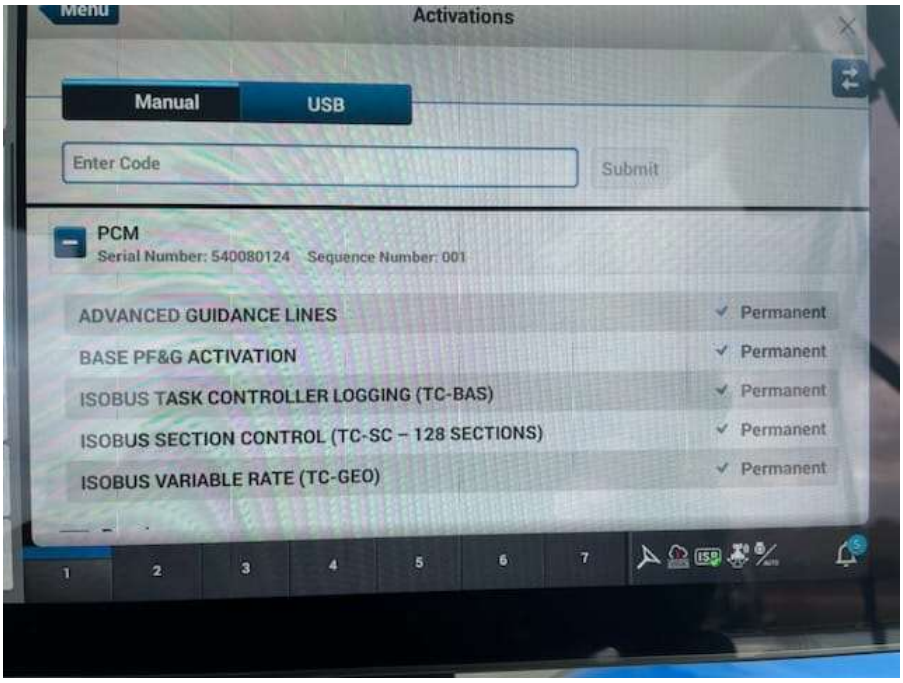
In the picture above, the external guidance system is steering the tractor.



In the picture above, the external guidance system is ready to steer the tractor. The operator just needs to press the Auto button on the joystick.

Appendix A.3 - Troubleshooting

1. To determine if the tractor has Class 3 ISO steering enabled, check the Activations page. If it is missing, it needs to be obtained from a CNH dealer.



ISO Class 3 Unlock is missing in this image

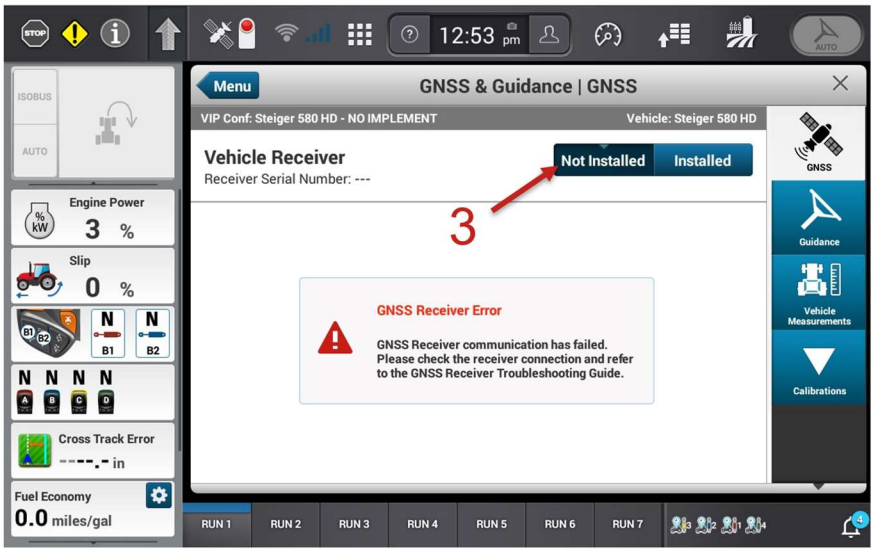
2. GNSS Warnings/Errors on 1200 Display: these may cause the 1200 pie status to get stuck at 2 orange pieces. GNSS and Guidance on the 1200 monitor must be disabled

Turning off the CNH GNSS Receiver and Guidance

1. Select Menu.
2. Select GNSS & Guidance.

Turning off the CNH GNSS Receiver and Guidance

3. On the GNSS screen select Vehicle Receiver Not Installed.



Turning off the CNH GNSS Receiver and Guidance

4. On the Guidance screen set guidance to OFF.