

TRUESIGHT® 2

INSTALLATION & OPERATION MANUAL



REMOTE DISPLAY

09050703e



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About this Manual

How to use this manual

The instructions in this manual are in the order that they should be completed for new installations. Complete all applicable instructions in each section before proceeding. Note that some sections are labeled to indicate they only apply to certain machines or applications. An index is available in the front of the manual to help find technical information for previously installed systems.



This icon designates information of which you should take note.



This icon indicates a special tool needed for a given task.



This icon designates an important instruction.

Suggestions

If you have any suggestions to improve this manual please call 574-546-5022 or email info@headsight.com.

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Installation



Before working on combine or under header always:

1. Perform all combine and header manufacturer safety precautions for servicing header.
2. Insert stop to prevent movement of header.
3. Set combine parking brake.
4. Turn off combine and remove key from ignition.
5. Disconnect all drive shafts from the header.



Identify the Components

1. Remote controller

- TS-Remote
- Mount kit



Remote Display Wiring

Remote controller

1. Connect the remote controller to Y731 on main trunk harness
 - 4 pin Deutsch
2. Mount controller for ease of operation
 - For all CIH Common Cabs, use provided mounting bracket as pictured below
 - For all others., attach controller to side window of combine using provided suction-cup mount



Calibration

Initial Truesight® Setup



The first time that Truesight is powered up, it will ask a series of questions. Choose the appropriate choice or follow the instruction given.

1. The initial startup screen is:

- Press  enter

```
TRUESIGHT  U1.00R
              U1.00B
```

2. Turn scroll knob to your machine type:

- Combine
- Sprayer

```
System Type
  = Combine
```

3. Press  enter

4. Turn scroll knob to your machine make:

- Varies by choice

```
Machine Make
  = CIH
```

5. Press  enter

6. Turn scroll knob to your steering type:

- OEM
- Aftermarket

```
Steering Type
  = OEM
```

7. Press  enter

8. Turn scroll knob to your steering make:

- Varies by choices

```
Steering Make
  = Case-NH
```

9. Press  enter

10. Turn scroll knob to your steering choice:

- Varies by choices

```
Steering Choice
  = AccuGuide
```

11. Press  enter

12. Turn scroll knob to the correct orientation

- Choose if connector is in front or back

```
40-Pin Connector
Orientation>Back
```

13. Press  enter




14. Initial Setup will continue to “Wheel Angle” & “Deadzone” calibrations.

Skip “Accessing Calibrations” & continue into those sections.

Accessing Calibration From Menus



Truesight will automatically access calibrations after completion of initial setup is complete.



1. Push ape from run screen
2. Turn scroll knob to Main>>Calibrate
 - Press  enter
3. Turn scroll knob to Calibrate>>desired calibration
 - Press  enter

```
Main>Calibrate
```

```
Cal>Center Bump
```

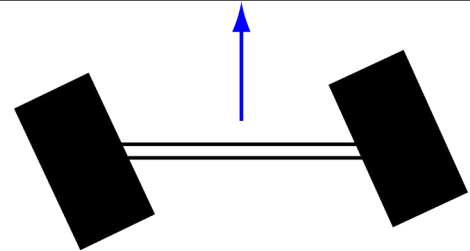
Wheel Angle Sensor Calibration

The wheel angle sensor calibration allows Truesight to learn the orientation of the feedback sensor on the steering axle.



1. To calibrate go to >>Calibration>>Wheel Angle
 - Park in a generally level area
 - press  enter
2. Turn wheels fully to right by using steering wheel.
 - Then press  enter

```
Cal>Wheel Angle
```

```
Turn Wheel Right  
Then Press ENT 4.52U
```







```
Wheel Sensor  
Calibration Complete
```

3. Press  enter once more to accept the wheel angle calibration
4. Press  escape till returned to run screen

Auto Deadzone Calibration

The Auto Dead Zone calibration allows Truesight to automatically detect the minimum voltage outputs that will cause the valve or motor to turn the wheels.

- To calibrate go to >>Calibration>>Auto Detect DZ
 - Park in a generally level area
- Press  enter
- press  enter to start calibration.
- Acknowledge that wheels will move and that all people are clear of machine.
 - Then press  enter
- Steer wheels straight ahead by using steering wheel.
 - Drive directly ahead a short distance to verify that wheels are straight
 - Then press  enter
- Drive forward at approximately 1mph in a clear area free from obstacles.

```
Cal>Auto Detect DZ
```

```
Auto Deadzone
Start Calibration
```




```
Wheels will move
Keep people clear
```

```
Center Wheel Exactly
```

```
Drive forward @ 1MPH
-Don't Steer    OK?
```



After you acknowledge this screen the wheels will steer automatically!

- Press  enter
- Continue driving until calibration is complete.
 - Press  enter
 - Press  escape till returned to run screen

```
Calibration Complete
Left= 25    Right= 25
```

Auto Engage Sensor Calibration

The Auto-Engage sensor calibration learns a feederhouse position at which to engage Truesight.

When the header passes below the chosen height, Truesight will delay a short time and then begin steering. (see Auto-Engage Delay in the Settings section of this manual)


1. To calibrate go to >>Calibration>>Auto Engage HGT


- Park in a generally level area
- Press  enter

```
Cal>Auto Engage HGT
```


2. Choose a feederhouse height ABOVE that which the feeder would be in for ordinary operation. If the combine is equipped with automatic header height control, it may raise head – which would disengage Truesight.

- Press  enter

3. Once Auto-engage is calibrated it needs to be enabled before it will work. To enable Auto-engage, Press and hold  Engage button until screen says “Auto Engage is turned ON”.

4. Turning off Auto-engage by pressing and holding  engage button. Auto-engage will also be disabled after power is turned off or if speed of combine is over 10MPH.

```
Auto Engage  
is Turned OFF
```

5. Push  escape till returned to run screen.


Bump Centering

The bump centering calibration set the current bump offset to zero. It only serves to simplify the display on the remote controller and does not affect the operation of the Truesight system.

1. To calibrate go to >>Calibration>>Center Bump

- Park in a generally level area
- Press  enter

```
Cal>Center Bump
```

2. Press  enter to Center Bump.

3. Push  escape till returned to run screen.

```
Press Enter to  
Center Bump
```

```
Truesight ENGAGED!  
BUMP>15
```






```
Truesight ENGAGED!  
=BUMP=
```

Settings



Properly setting the Truesight™ system is essential to having responsive row guidance control. You should become very familiar with the steps in this section.

Access Settings

1. Push  escape from run screen.
2. Turn scroll knob to Main>>Setup.
 - Press  enter
3. Turn scroll knob to Setup>>desired setting.
 - Press  enter

```
Main>Setup
```

```
Setup>Range = 40
```

Change Settings

Range (Default = 40)



The range setting controls the aggressiveness of the Truesight system. Increasing the range increases the angle to which the wheels turn. Combine steering may weave from side to side in the row if the range is set either too high or too low.

Properly adjusting the range is the most important step for optimum steering response.

Increase the Range if:



- You notice a gentle weave from side to side in the row
- The system performs well on straight rows but does not turn sharply enough to go around a curve

Decrease the Range if:




- The rear wheels jerk constantly and suddenly from side to side

1. To change this setting go to >>Setup>>Range in menu.

- Press  enter

2. Turn scroll knob to “desired value”.

- Press  enter

3. Push  escape till returned to run screen.

```
Setup>Range = 40
```

Tilt range (Default = 2)

The Tilt Range setting allows Truesight to automatically ‘bump’ the combine up a slope to compensate for the natural tendency of the combine to slide down. A higher tilt range setting compensates more; a lower tilt range compensates less.

Increase the Tilt Range if:

- The snout is centered on the row when on level ground but crowds the downhill side of the row when on a slope.

Decrease the Tilt Range if:


- The snout is centered on the row when on level ground but crowds the uphill side of the row when on a slope.

1. To change this setting go to >>Setup>>Tilt Range in menu.

- Press  enter

2. Turn scroll knob to “desired value”.

- Press  enter

3. Push  escape till returned to main screen.

```
Setup>Tilt Range=2
```

Right Deadzone (Default = Calibrated Value, 0 if not calibrated)

The Right Deadzone setting allows manual adjustment of the valve/motor deadband. This value is set by the deadzone calibration.

- A higher value will decrease the valve/motor deadband.
- A lower value will increase the valve/motor deadband.

1. To change this setting go to >>Setup>>>Right Dead Zone in menu.


- Press  enter

```
Setup>Advanced Setup
```

2. Turn scroll knob to “desired value”.

- Press  enter

```
Adv>Right Dead Zone
      = 00
```

3. Push  escape till returned to main screen.

Left Deadzone

See Right Deadzone

Auxiliary Engage

The Auxiliary Engage setting allows the auxiliary (foot) switch type to be chosen.

If you choose to use the Headsight provided footswitch – choose “Default”. If you do not wish to use any auxiliary switch – choose “Off”.


1. To change this setting go to >>Setup>>Aux Engage in menu.

- Press  enter

```
Setup>Aux Engage
      = Default
```

2. Turn scroll knob to “desired setting”.

- Press  enter

3. Push  escape till returned to main screen.

Alert Timer

The Alert Timer allows the operator to have an audible alert sound at a preset time after the engagement of Truesight. The setting ranges from off to 20 minutes in 30 second intervals.


1. To change this setting go to >>Setup>>Alert Timer in menu.

- Press  enter

```
Setup>Alert Timer  
= Off
```

2. Turn scroll knob to “desired setting”.

- Press  enter

3. Push  escape till returned to main screen.

LCD Backlight (Default = 10)

The LCD Backlight setting allows the operator to adjust the brightness on the remote display.


1. To change this setting go to >>Setup>>LCD Backlight in menu.

- Press  enter

```
Setup>LCD Backlight  
= 10
```

2. Turn scroll knob to “desired value”.

- Press  enter

3. Push  escape till returned to main screen.

LCD Contrast (Default = 10)

The LCD Contrast setting allows the operator to adjust the contrast (darkness) of the text on the remote display.


1. To change this setting go to >>Setup>>LCD Contrast in menu.

- Press  enter

```
Setup>LCD Contrast  
= 10
```

2. Turn scroll knob to “desired value”.

- Press  enter

3. Push  escape till returned to main screen.

Deadband (Default = 10)

The Deadband setting adjusts the maximum swing of the crop sensor before Truesight issues a steer command.

Decrease the Deadband if:

- The system wanders in the row without even trying to turn the wheels.

Increase the Deadband if:


- The system is steering excessively often even on relatively straight rows.

1. To change this setting go to >>Setup>>ADV Settings>>Deadband in menu.

- Press  enter

2. Turn scroll knob to “desired value”.

- Press  enter

3. Push  escape till returned to main screen.

```
Setup>Advanced Setup
```

```
Adv>Deadband = 8
```

Gain (Default = System Dependent)

The Gain setting controls the speed of steering response for a given error from the center of the row. A higher gain setting will result in a quicker response.

Increasing the gain may improve responsiveness, but will have a tendency to make the system jerky or unstable.

1. To change this setting go to >>Setup>>ADV Settings>>Gain in menu.

- Press  enter

2. Turn scroll knob to “desired value”.

- Press  enter




3. Push  escape till returned to main screen.

```
Setup>Advanced Setup
```

```
Adv>Gain = 6
```

Auto-Engage Delay (Default = 2.5 sec)

The Auto-Engage Delay adjusts the time delay between when the operator lowers the header and Truesight engages when using the Auto-Engage feature. The delay period starts when the feederhouse lowers below the setpoint chosen in the Auto-Engage calibration. The delay allows the operator a few seconds to manually guide the machine to the beginning of the row at the headland.

1. To change this setting go to >>Setup>>ADV Settings>>Auto Engage in menu.
 - Press  enter
2. Turn scroll knob to “desired time”.
 - Press  enter
3. Push  escape till returned to main screen.




```
Setup>Advanced Setup
```

```
Adv>Auto Engage  
Delay = 2.5s
```

Disengage Value (Default = 8)

The Disengage Value setting allows the operator to adjust how much motion of the steering wheel is required to disengage Truesight. Increasing the override value will make it harder to disengage the system.

If Truesight disengages with only a slight nudge of the steering wheel, the Override Value may be increased to prevent accidental disengagement.

1. To change this setting go to >>Setup>>ADV Settings>>Override Value in menu.
 - Press  enter
2. Turn scroll knob to “desired value”.
 - Press  enter
3. Push  escape till returned to main screen.

```
Setup>Advanced Setup
```

```
Adv>Disengage Value  
= 8
```

Speed Select (Default = GPS)



Speed Select is a Safety Feature of Truesight, disable at your own risk!

The Speed Select setting properly configures Truesight to read the speed sensor. If the Speed Select is set to “OFF”, the minimum and maximum speed limits to engage Truesight will be disabled. If you wish to allow the min and max speed limits, choose the option that best matches your combine.

1. To change this setting go to >>Setup>>ADV Settings>>Speed Select in menu.

- Press  enter

```
Setup>Advanced Setup
```

2. Turn scroll knob to “desired selection”.

- Press  enter

```
Adv>Speed Select
= GPS
```

3. Push  escape till returned to main screen.

Gain Balance (Default = 0)

The Gain Balance setting allows manual manipulation of the right-hand gain value with respect to the base value set by the “Gain” setting. Changing this setting allows the operator to manually adjust the gain when turning right to a value different from the base value.

1. To change this setting go to >>Setup>>ADV Settings>>Gain Balance in the menu.

- Press  enter

```
Setup>Advanced Setup
```

2. Turn scroll knob to “desired value”.

- Press  enter

```
Adv>Gain Balance= 0
```

3. Push  escape till returned to main screen.

Fine Control (Default = 0)

The Fine Control setting is a control used on systems with fast hydraulics to help smooth out the transition when it tries to just start to turn the wheels. This setting is normally unnecessary for systems with steering motors and AccuGuide valves, but a value of 15-20 is recommended for aftermarket steering valve systems.

1. To change this setting go to >>Setup>>ADV Settings>>Fine Control in menu.

- Press  enter

```
Setup>Advanced Setup
```

2. Turn scroll knob to “desired value”.

- Press  enter

```
Adv>Fine Control
      = 00
```

3. Push  escape till returned to main screen.

System Select

The System Select setting allows the configuration of Truesight for use with different valve and motor systems. This value will not be changed for a given system.

1. To change this setting go to >>Setup>>ADV Settings>>System Select in menu.

- Press  enter

```
Setup>Advanced Setup
```

2. Turn scroll knob to “desired system”.

- Press  enter

```
Adv>System Select
      = Accuguide
```

3. Push  escape till returned to main screen.

Curve Range/Range2 (Default = 2)

The Curve setting allows additional compensation for curve aggressiveness after Range has been properly adjusted for straight rows. Range2 should be increased if the tip of the snout favors the outside of the row while going around a curve. Increasing Range2 will bring the tip of the snout back to the inside of the curve. Adjust this setting to the lowest value possible while still getting acceptable performance around curves.

1. To change this setting go to >>Setup>>ADV Settings>>Range2 in menu.


- Press  enter

```
Setup>Advanced Setup
```

2. Turn scroll knob to “desired value”.

- Press  enter

```
Adv>Curve Range = 2
```

3. Push  escape till returned to main screen.



Settings

Requirements for Operation




Turn off TrueSight 2 Remote before entering roadway!




Five requirements must be met before the Truesight 2 system will engage:

1. Seat switch safety must have contact
 - Operator must be sitting in seat to engage system
2. Road mode must be disabled.
3. Speed must be within range
 - Speed must be between 0.8 and 10 mph to engage system
4. Steering wheel rotation must be recognized before engagement.
 - Every power cycle rotate steering wheel at least ½ turn to relearn encoders
5. Steering wheel must be stationary during engagement.

Engaging Truesight

- Press  steering wheel button
- Press Foot Switch (see Setting>>Auxiliary Engage section of this manual)
- Auto engage (see Settings>>Auto Engage section of this manual)

Disengaging Truesight

- Manually turn steering wheel
- Press  steering wheel button
- If foot switch is installed and enabled, press foot pedal
- If Auto Engage is enabled, raise head above auto engage height that was set during the calibration

Bump Steer




- Turn scroll knob clockwise to shift machine to right
- Turn scroll knob counter clockwise to shift machine to left

Overview

Truesight® Navigation



How to Navigate

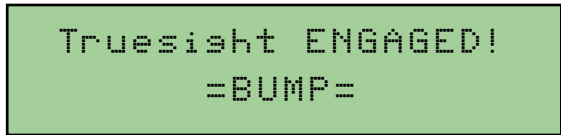
There are four controls on the Truesight remote:

1. Steering Wheel Button 
 - Tapping this button engages/disengages Truesight
 - Holding this button for more than 3 seconds enables/disables the Auto-Engage feature
2. Red X (Escape Command) 
 - Tapping the Red X moves back one level in the menu
3. Black Scroll Knob
 - Raises or lowers the Bump value (see Operation)
 - Scrolls to next or previous value in a menu or list
 - Controls combine during a steering test
4. Green Check Mark (Enter Command) 
 - Tapping the Check Mark selects the options displayed



Main Screens

- During operation, Truesight will normally be in the Run Screen
- Press  the “Red X” to toggle between the Run Screen and the Main Menu Screen
- Proceed through the menu by scrolling with the Knob and selecting with the green  check mark
- See “Menu Layout” of this section for complete menu layout



Truesight Base LED

- Not connected to remote but has power
- Green LED will stay on and have a little “blip” every 3 second:
 - Normal Operation
 - Connected to Remote
- Yellow LED blinks fast (approx. every 0.1 sec):
 - Loading data from USB

Truesight Remote LED

- Truesight Engaged

Updating Software



If you are running Headsight's Horizon header height control, select the WiFi network of the Horizon base unit and it will automatically pass the update to Truesight 2 as well. If you are not running Horizon, select the Truesight 2 WiFi Network.

Updating with Techlink™ App

1. Download Headsight Techlink App on your iDevice or Android from the App store.
 - Must have Horizon 2.10.0 or later software
 - Login in following on screen instructions
 - Then go to Help Info to learn how to use app

Updating Truesight 2 with USB

2. Download latest version of Truesight 2 from website.
3. Unzip files, copy file insght2.bin onto root directory on USB flash drive.
 - If you are using Truesight remote display you will need to place agreremote.hex file on a SDcard that is 2GB or less.
4. Plug USB flash drive into USB port on Truesight 2 unit in combine cab.
 - If unit is not yet powered up, cycle key on combine
 - It should start blinking yellow shortly after applying power. If this doesn't happen, unplug and plug the Truesight 2 power.
 - Press accept on VT (Update Firmware) to start software update.
5. Wait until Truesight 2 unit has a green indicator light (should be no longer than 5 min)
 - If you have Truesight Remote Display attached, power cycle Truesight Remote Display unit.



If the Remote display light is rapidly flashing red, then Truesight Remote Display is updating. Don't cycle power while it is updating. If display flashes "COMM FAILED", call Headsight.

6. You can now safely remove the USB flash drive.
 - Be sure to replace USB cover cap
7. Wait for Truesight 2 to appear on VT.
 - A power cycle might be needed after update
8. Your Truesight 2 is now updated. Please verify that your Truesight 2 initial settings are correct.



If your Truesight 2 units fail to update you must do a complete format on USB drive to a (FAT) file type and then recopy insght2.bin to the root directory.



Updating Truesight Remote Display with SD card (2GB or less)

1. Remove the left-hand cover of the Truesight remote and retain the 4 attaching screws.
2. Insert the SD card into the slot on the remote with the Power already turned ON.
3. With the SD card already in the slot, cycle Power to the Truesight Remote Display to begin updating software.
4. Wait until the yellow “loading” light stops flashing.
 - The yellow light is behind the SD card in the Truesight remote
5. Verify that the update was successful by reading software version displayed on the startup screen.
 - Software versions should match between Truesight 2 Base (B) and Truesight Remote Display (R) when both are updated.
6. Remove SD card and reinstall the cover on the remote.
7. Follow Initial Truesight Setup and Calibration instructions of manual.



```
TRUESIGHT V1.00R
                V1.00B
```

Menu Layout

Setup

- Range
- Tilt Range
- Right Dead Zone
- Left Dead Zone
- Aux Engage
- Alert Timer
- LCD Backlight
- LCD Contrast
- Advanced Setup
 - Deadband
 - Gain
 - Auto Engage Delay
 - Disengage Value
 - Speed Select
 - Speed Value
 - Gain Balance
 - Fine Control
 - System Select
 - Algorithm Type
 - Curve Range (Range2)
 - Range3

Calibrate

- Center Bump
- Wheel Angle
- Auto Engage Height
- Speedometer
- Tilt Sensor
- Auto Decect Dead Zone

Diagnostics

- Inputs/Outputs
 - Crop
 - Crop2
 - Wheel Angle
 - Tilt
 - Steering Wheel
 - Disengage
 - Safeties
 - Auto Engage
 - Motor L/R
 - Valve L/R
 - Speedometer
 - Last Disengage
- Steering Test
- Error Codes
- Clear Errors

About Truesight

- Hardware
- Software
- Headsight
- Box Timers
- Bootload Base
- Reset Defaults





Advanced Information

Theory of Operation

Truesight 2 systems use a single Hall Effect crop sensor assembly mounted on the head to sense the corn rows and return a voltage to the combine (1-4 volt output). If centered in the row, the crop sensor output voltage should be 2.5 volts; when stalks fully push the right side wand, the voltage should raise to 4 volts; when stalks fully push the left side wand the voltage should drop to 1 volt. The output voltage from both the crop sensor and the combine wheel angle sensor are used by the Truesight 2 controller to determine the direction the combine needs to be steered. The controller communicates the steer command by sending a voltage to the autosteer valves or steering motor on the combine (factory or aftermarket). The operator's primary interface with the Truesight 2 system is through a VT display, used for setup, calibration, adjusting settings and running the system. The Truesight 2 controller also receives information from the operator through the various safeties and sensors. Truesight's safeties can include the seat switch, GPS speed sensor, and steering wheel motion sensor. The system can be disengaged by: rotating the steering wheel, pressing the steering wheel button on the VT, raising the feederhouse (auto-engage mode), or pressing the foot switch. The system can be engaged by: pressing the steering engage button on the VT display, lowering the feederhouse (auto-engage mode), or pressing the foot switch.



Accessing Diagnostics

1. Push  escape from main screen.
2. Turn scroll knob to Main>>Diagnostics.
 - Press  enter
3. Turn scroll knob to Diag>>Inputs/Outputs.
 - Press  enter
4. Turn scroll knob to “desired Input/Output”.
 - Press  enter

```
Main>Diagnostics
```

```
Main>Inputs/Outputs
```

Viewing Diagnostics

I/O>Crop= 0.00V

- Main crop sensor voltage
- 2.5V centered 1-4V range
- Voltage decreases when stalks push left side of wand
- Voltage increases when stalks push right side of wand
- To view, go to Accessing Diagnostic section of manual

```
I/O>Crop= 0.00V
```

I/O>Crop2= 0.00V

- Optional second crop sensor voltage
- 2.5V centered 1-4V range
- Voltage decreases when stalks push left side of wand
- Voltage increases when stalks push right side of wand
- To view, go to Accessing Diagnostic section of manual

```
I/O>Crop2= 0.00V
```

I/O>Wheel Angle= 0.00V

- Steering angle sensor
- 2.5V centered 1-4V range (2.7 centered OEM sensor)
- Voltage decreases when turned one way
- Voltage increases when turned opposite way
- To view, go to Accessing Diagnostic section of manual

```
I/O>Wheel Angle
      = 0.00V
```

I/O>Tilt= 0.00V

- Combine tilt voltage
- 2.5V centered 1-4v range
- 1 volt when fully tilted one way
- 4 volts when fully tilted other way
- To view, go to Accessing Diagnostic section of manual

```
I/O>Tilt= 0.00V
```

I/O>Steering Wheel= 0

- Combine steering wheel encoder
- Number count increases with steering motion
- To view, go to Accessing Diagnostic section of manual

```
I/O>Steering Wheel
= 0000
```

I/O>Disengage= 0.00V

- Systems with pressure or flow switch (mainly Trimble)
- To view, go to Accessing Diagnostic section of manual

```
I/O>Disengage =0.00V
```

I/O>Safeties

- 12V = OFF 5V = OFF
- To view, go to Accessing Diagnostic section of manual

```
I/O>Safeties
12V=OFF 5V=OFF
```

I/O>AT Engage = 0.00V

- Cal Set Point = 0.00V
- To view, go to Accessing Diagnostic section of manual

```
I/O>AT Engage=0.00V
```

I/O>Motor L/R

- Left = 0% Right = 0%
- To view, go to Accessing Diagnostic section of manual

```
I/O>Motor L/R
Left= 0% Right= 0%
```

I/O>Valve L/R

- Output = 0.0V
- To view, go to Accessing Diagnostic section of manual

```
I/O>Valve L/R
Output = 0.0V
```

I/O>Speedometer

- No GPS Signal
- Actual speed
- To view, go to Accessing Diagnostic section of manual

```
I/O>Speedometer=
No GPS Signal
```






I/O>Last Disengage

- None
- Auto engage
- Steering Wheel
- Speed out of range
- To view, go to Accessing Diagnostic section of manual

```
I/O>Last Disengage
None
```

Error Codes






Accessing Codes

1. Push  escape from run screen
2. Turn scroll knob to Main>>Diagnostics
 - Press  enter
3. Turn scroll knob to Diag>>Error Codes
 - Press  enter
4. Turn scroll knob to go through error codes
5. Press  escape till returned to run screen

```
Main>Diagnostics
```

```
Diag>Error Codes
```

Clearing Codes

1. Push  escape from run screen
2. Turn scroll knob to Main>>Diagnostics
 - Press  enter
3. Turn scroll knob to Diag>>Clear Errors
 - Press  enter
4. Turn scroll knob:
 - “Yes” if you are sure you want to delete codes
 - “No” if you do not want to delete the codes
 - Press  enter
5. Press  escape till returned to run screen






```
Main>Diagnostics
```

```
Diag>Clear Errors
```

Steering Test



Must be in Operator Seat to proceed with Steering Test.

1. Push  escape from run screen
2. Turn scroll knob to Main>>Diagnostics
 - Press  enter
3. Turn scroll knob to Diag>>Steering Test
 - Press  enter
 - Scroll to yes if you want to continue
 - Scroll to no if you do not want to continue
 - Press  enter
4. Turn scroll knob:
 - clockwise to percentage to turn right
 - counterclockwise to percentage to turn left
5. Press  escape till returned to run screen

```
Main>Diaenostics
```

```
Diag>Steering Test
```



Diagnostics



Before working on combine or under header always:

1. Perform all combine and header manufacturer safety precautions for servicing header.
2. Insert stop to prevent movement of header.
3. Turn off combine and remove key from ignition.
4. Set combine parking brake.
5. Disconnect all drive shafts from the header.



Troubleshooting Overview

Several Troubleshooting Sections are available, depending on the type of problem or symptoms.

1. Troubleshooting -Sensors & Harnesses
 - Use this section to troubleshoot a specific sensor that is not working or out of adjustment.
 - Typical symptom:
 - Sensor fault code displayed - example: "Err XX, Left sensor > 0.3V"
2. Troubleshooting by Symptom
 - Use this section to diagnose poor operation symptoms
 - Not usually accompanied by an Error message or Fault Code
 - Typical Symptoms
 - Weaving in row
 - Won't engage
3. Troubleshooting by Error Code
 - Use this section to help determine the problem when a fault code has been displayed.

Troubleshooting—Sensors and Harnesses



To properly test the wiring and sensors on the header, follow the steps below in order. Use a Volt Meter as needed.

The sensor connector pattern is as follows:

- Pin A is Ground (Black or Lt Blue)
- Pin B is Signal (White)
- Pin C is 5V (Green or Pink)



A very common problem during install is to reverse the wires at the connector after removing the plug to route the cables. Make sure that the wires/voltages are as shown. If A & C are reversed, the sensor output voltage will be 4.7V and not change.

The following requirements must be met before testing:

- Key on, combine engine running
- Header connected

Error Code	Problem	Solution
Bad Harness Wiring Disconnect Sensor Plug (Measure voltage on harness plug at sensor)	Measure C to Frame Ground Voltage should be 5V	If not, check harness for continuity or short on 5V wire Check Combine 5V source
	Measure C to A Voltage should be 5V	If not check harness for continuity on ground wire Check combine sensor ground source
	Jump C to B in harness plug “Sensor” voltage should be 5V (For Insight systems, see “Diagnostics/ Display Sensor Voltages”. For all others, use Combine Diagnostics*)	If not check signal wire for broken harness or bad connection
	All of the above are correct	Harness & combine connections pass test.
If you have a Headsight Sensor tester, use it to test the sensor. For all other:	Verify sensor is connected to extension harness Sensor voltage should be 0.5- 4.5V (For Insight systems, see “Diagnostics/ Display Sensor Voltages”. For all others, use Combine Specific Diagnostics)	If sensor cannot be adjusted to achieve a voltage within the range, replace sensor.

Troubleshooting by Symptom



Nearly every problem with the Truesight 2 may be resolved by one of the following simple steps:

- Make sure each sensor meets the basic requirements discussed above
- Properly calibrate Truesight system
- Enable Truesight
- Properly set the Truesight performance settings

Symptom	Problem	Solution
System will not engage	Still in Road Mode	Exit Road Mode
	Seat switch not ON	Sit on seat or repair switch
	Safety Enables not connected	See Installation
	Steering wheel not turned since last key cycle	Rotate steering wheel
	Setup & Calibration not completed	Complete calibrations.
	Not moving 1-12 mph	Drive forward at at least 1 mph
	Sensors out of range	Check Diagnostics
System is engaged but does not steer	Steering device not working or installed incorrectly	Correct in accordance with the installation section of this manual
	Wheels do not steer while driving but do work during steering test (Go to>>Diag>>Tab Right>>Steering Test)	Adjust Range, Deadband, Gain and other settings in accordance with Settings section of this manual.
	Steering System Failure (Steering device does not work with intended system. Example: EZ-Steer with Trimble controller.)	
	Truesight Controller Failure (Steering device works with intended system but not with Truesight installed.)	Contact local dealer to fix steering device. Contact Headsight to repair or replace controller.
Truesight is weaving in rows	Blue wands on sensor are not spaced 2 inches wider than corn row width	Correct spacing of corn arms
	Settings are not correct	Go to Settings section of manual and adjust

Symptom	Problem	Solution
When system is engaged, it steers fully to the right or left	Wheel Angle Sensor linkage broken or installed incorrectly (visually inspect wheel angle sensor and installation based on the manual)	Correct or replace broken or incorrectly installed parts
	Wheel Angle Calibration not done correctly	Go to>>Cal>>Wheel Angle and complete calibration
	Steering system is connected backwards (Diag>>Tab Right>>Steering Test)	Reverse the steering system if possible (for example, swap the right and left solenoid connectors).
	Crop sensor is reversed (Diag>>Overview>>Crop Sensor, Swing sensor toward main door side of cab. If voltage increases, wiring is reversed)	Rotate sensor body 180 degrees on sensor assm.
Truesight does not auto-engage when the head is lowered	Auto engage is turned off	Go to >>Setup>>Advanced>>Auto Engage
	Auto engage height chosen during the calibration is lower than the run height, or auto engage needs to be calibrated"	Redo the auto engage calibration, make sure the auto engage height set during the calibration is between the run height and the height the header is raised to at the end of the field.

Troubleshooting by Truesight 2 Error Codes

Error Code	Problem	Solution
ER2 Wheel Angle Calibration Incomplete	The Wheel Angle calibration has not been completed.	Go to >>Cal>>Wheel Angle, and redo calibration
ER11 Crop Sensor > 4.7V Description: The crop sensor is a 5V hall effect sensor (works like a potentiometer) that sends an analog voltage to the Truesight controller. This error is caused when the analog voltage coming from the crop sensor is greater than 4.7V. To read the current voltage, go to >>Diag>>Overview >>Crop Sensor	The crop sensor voltage remains stuck at 4.78 ± 0.05 volts when the crop sensor is moved.	Switch wires A & C in the harness that connects to the crop sensor to reverse polarity.
	The crop sensor voltage remains stuck above 4.9 volts when the crop sensor is moved.	The signal wire (B) may be shorted to the power wire (C). Find short and correct.
ER12 Crop Sensor < 0.3V Description: The crop sensor is a 5V hall effect sensor (works like a potentiometer) that sends an analog voltage to the Truesight controller. This error is caused when the analog voltage coming from the crop sensor is less than 0.3V. To read the current voltage, go to >>Diag>>Overview >>Crop Sensor	There is not 5V between pins A & C of the sensor harness (Unplug sensor under snout tip to measure)	Unplug square 4 pin Deutsch connection at feederhouse (Y703) and measure voltage between pins 1 & 3 of wire coming from combine. If 5V, there is a problem with extension harness under header. If not 5V, continue to follow the wiring up toward the cab and unplug square 4 pin Deutsch connection Y7004/Y7003 and measure voltage of pins 1 & 3 of connector Y7003. If 5 volts, there is a problem with the extension harness that runs up the feederhouse, or in the CIH feeder wiring. If not 5V, there is a problem with main TS harness. Repair or replace appropriate harness to supply power to sensor.
	Sensor is receiving 5V but there is not $2.5V \pm 1V$ between pins A & B of crop sensor (back probe with sensor centered and harness connected)	Crop sensor failure, replace sensor
	Sensor is receiving 5V but there is not signal voltage on pin 11 of large connector on Truesight base in cab (check with back probes, Reference pin 2 for ground)	With crop sensor centered and harness connected, back probe 4 pin Deutsch connection at feederhouse (Y703) and measure voltage between pins 1 & 2. If not 2.5V, there is a problem with extension harness under header. If 2.5V, continue to follow the wiring up toward the cab and back probe pins 1 & 2 of the 4 pin Deutsch connector Y7003. If not 2.5V, there is a problem with the extension harness that runs up the feederhouse, or in the CIH feeder wiring. If 2.5V, there is a problem with main TS harness. Repair or replace appropriate harness so signal voltage returns to Truesight 2.

Error Code	Problem	Solution
<p style="text-align: center;">ER21 Wheel Angle Sensor > 4.7V</p> <p>Description: The wheel angle sensor is a 5V hall effect sensor (works like a potentiometer) that sends an analog voltage to the Truesight controller. This error is caused when the analog voltage coming from the wheel angle sensor is greater than 4.7V. To read the current voltage, go to >>Diag>>Overview >>Feedback Input</p>	<p>The wheel angle voltage remains stuck at 4.78 ±0.05 volts when the wheel angle sensor is moved.</p>	<p>Switch wires A & C in the harness that connects to the wheel angle sensor to reverse polarity.</p>
	<p>The wheel angle voltage remains stuck above 4.9 volts when the wheel angle sensor is moved.</p>	<p>The signal wire (B) may be shorted to the power wire (C). Find short and correct.</p>
<p style="text-align: center;">ER22 Wheel Angle Sensor < 0.3V</p> <p>Description: The wheel angle sensor is a 5V hall effect sensor (works like a potentiometer) that sends an analog voltage to the Truesight controller. This error is caused when the analog voltage coming from the wheel angle sensor is less than 0.3V. To read the current voltage, go to >>Diag>>Overview >>Feedback Input</p>	<p>There is not 5V between pins A & C of the Wheel angle harness (Unplug sensor near rear axle to measure)</p>	<p>Unplug connector Y705 near the cab and measure voltage between pins 1 & 3 of wire coming from combine. If 5V is present, there is a problem with extension harness that runs toward the rear axle. If 5V is not present, there is a problem with main harness. Repair or replace appropriate harness to supply power to sensor.</p>
	<p>Sensor is receiving 5V but there are not more than 0.3 volts between pins A & B of wheel angle sensor (back probe with sensor connected)</p>	<p>Crop sensor failure, replace sensor</p>
	<p>Sensor is receiving 5V but there is not signal voltage on pin 13 of large connector on Truesight base in cab (check with back probes, Reference pin 2 for ground)</p>	<p>With harness connected and wheels steering straight, back probe pins 1 & 2 of Y705 connector near cab. If 2.5V±1V is not present, there is a problem with extension harness that runs toward rear axle. If 2.5V±1V is present, there is a problem with main harness. Repair or replace appropriate harness so signal voltage returns to Truesight 2.</p>
<p style="text-align: center;">ER23 Wheel Angle Swing < 1V</p> <p>Description: During “Wheel Angle” calibration, Truesight asks you to center rear wheels and press Enter, then turn all the way to the right and press Enter. It must see at least a 1V swing to learn which way is right and proceed with calibration.</p>	<p>Wheel angle changes less than 1V when turning steering wheel from straight to fully right. Check on VT display, go to >>Diag>>Overview >>Feedback Input</p>	<p>Check that wheel angle sensor is correctly attached to axle to maximize sensor movement.</p>
	<p>Steering wheel was not fully turned to correct location during calibration.</p>	<p>Redo the Wheel Angle calibration per calibration instructions in this manual and turn the steering wheel as instructed</p>

Error Code	Problem	Solution
<p>ER24 Wheel Angle Not Found</p> <p>Description: Wheel Angle sensor voltage doesn't change during the Wheel Angle calibration. Check feedback on VT display, go to >>Diag>>Overview >>Feedback Input</p>	Wheel angle displayed on VT display changes when turning steering wheel.	Go to >>Cal>>Wheel Angle, and redo calibration
	Wheel angle displayed on VT display stays at 0 when moving steering wheel.	See Problem/Solution for Error 22.
	Wheel angle displayed on VT display stays at 4.87V when moving steering wheel.	See Problem/Solution for Error 22.
	Linkage or wheel angle sensor is visually broken or installed incorrectly.	Correct or replace.
<p>ER31 Feederhouse > 4.7V</p> <p>Description: Signal voltage from feederhouse position sensor is above 4.7V during the "Auto Engage Height" calibration. To view feederhouse voltage being sent to Truesight system, go to >>Diag>>Disengage >>AT Engage</p>	Feederhouse sensor voltage viewed on VT display changes when moving feederhouse.	Set the feederhouse at the height you want to auto engage, verify the feederhouse voltage displayed on the VT display is not above 4.7V, press the green check mark to select.
	Feederhouse sensor voltage viewed on VT display does not change when moving feederhouse.	Check to see if combine sees the feederhouse voltage change. If not, contact your local dealership to have feederhouse sensor replaced.
<p>ER32 Feederhouse < 0.3V</p> <p>Description: Signal voltage from feederhouse position sensor is below 0.3V during the "Auto Engage Height" calibration. To view feederhouse voltage being sent to Truesight system, go to >>Cal>>Auto Engage Height</p>	Feederhouse sensor voltage viewed on VT display changes when moving feederhouse.	Set the feederhouse at the height you want to auto engage, verify the feederhouse voltage displayed on the VT display is not below 0.3V, press the green check mark to select.
	Feederhouse sensor voltage viewed on VT display does not change when moving feederhouse. The feederhouse voltage is not changing when viewed on the combine	Contact your local dealership to have feederhouse sensor replaced.
	Feederhouse sensor voltage viewed on VT display does not change when moving feederhouse. The feederhouse voltage is changing when viewed on the combine	Check that all connectors are connected and pins are fully seated. Check for shorts or breaks in harness.
<p>ER46 or ER47 Speed out of Range</p> <p>Description: Combine ground speed is supplied to Truesight through the GPS receiver provided by Headsight. If Truesight is engaged and combine ground speed is not in the range of 0.8-10 mph, it will automatically disengage for safety. To disable this safety, go to >>Setup>>Advanced >>Speed Select Type and set it to "Off", then clear all errors. Note that you are actively removing a safety feature by doing this.</p>	Speed type is not set correctly,	Go to >>Setup>>Advanced >>Speed Select and set to GPS
	GPS receiver blocked	Move GPS antenna to area with clear shot to sky
	GPS receiver defective or disconnected	Make sure GPS receiver is plugged in to Y725 and wiring is good

Error Code	Problem	Solution
<p style="text-align: center;">ER54</p> <p style="text-align: center;">Encoder Not Detected:</p> <p style="text-align: center;">Description: The first time Truesight is engaged after power up, it will throw this error if it has not received signal from the steering wheel encoders (steering wheel shaft rotation sensors).</p>	Encoder has not yet sensed location	Turn steering wheel 2 or 3 full turns
	The wrong steering system is selected. To check go to >>Setup>>Settings>>System	Select the correct steering system
	Bad connection in harness	See ""ER46 or ER47"" for diagnostics and solution
<p style="text-align: center;">ER66</p> <p style="text-align: center;">Steering Wheel Moving</p> <p style="text-align: center;">Description: For systems that use a hydraulic pressure transducer for manual override, a significant change in the transducer output voltage disengages the Truesight system. The amount of change required is measured during the Auto Deadzone calibration. This error occurs when the system senses that the steering wheel is being moved while trying to engage Truesight.</p>	Steering wheel is being turned while try to engage system.	Retry engaging Truesight while you are not turning the steering wheel
	Truesight incorrectly senses that the steering wheel is being turned.	Redo the Auto Deadzone calibration
	Wrong system is selected.	If Truesight is tied to an encoder on the steering column instead of a pressure transducer, select the correct steering system. Go to >>Setup>>Settings>>System
	Wiring connection problem (Check by going to >>Diag>>Disengage >>Disengage, if voltage is 0.0V there is probably a wiring problem)	Check wire and connections and fix problem
	Hydraulic pressure transducer problem	Contact local dealer to fix or replace transducer
<p style="text-align: center;">ER74 or ER78 or ER88</p> <p style="text-align: center;">No 12V or 5V Safety</p> <p style="text-align: center;">Description: Truesight has 2 safety circuits that need to be satisfied before Truesight will engage or complete some of the calibrations.</p>	One or both of the safeties are not connected (To check go to >>Diag>>Disengage>>Safeties to check if they are ""ON"")	Follow installation instructions in this manual to properly connect safeties
	Seat switch is not sensing a person	Sit in operators seat before engaging or calibrating
<p style="text-align: center;">ER99</p> <p style="text-align: center;">Outputs are Reversed</p> <p style="text-align: center;">Description: During the Deadzone calibration, Truesight turns the wheels to learn how much power it takes to turn them and what direction they turn. This error is thrown when the wheels turn the wrong direction.</p>	Steering system is connected backwards (Right turns the wheels left and Left turns the wheel right).	Reverse the steering system if possible (for example, swap the right and left solenoid connectors).
	Combine received wrong signal during calibration.	Redo the "Wheel Angle" calibration and turn the steering wheel all the way to the right when prompted.

Statement of Limited Warranty

For Headsight® Products

Precision Planting DBA Headsight Harvesting Solutions (Headsight) warrants its new products to be free from defects in material and workmanship for a period of twelve (12) consecutive months following the date of purchase by the retail purchaser.

Headsight warrants its new corn sensors assemblies for a period of thirty-six (36) months.

Headsight warrants genuine Headsight replacement parts and components to be free from defects in material and workmanship for a period of six (6) consecutive months following the date of purchase or the remainder of the original equipment warranty period, whichever is longer.

Headsight's obligation under these warranties shall be limited to repairing or replacing, free of charge to the original purchaser, any part that, in Headsight's judgment, shows evidence of such defect.

Limitations to Warranty

This warranty does not cover:

- Warranty claims directly resulting from improper installation of the product.
- Any product damaged by accident, abuse, misuse, or negligence after shipment from Headsight.
- Any unauthorized product alteration or modification.
- Any unauthorized repairs made with parts other than genuine Headsight parts.
- Any repairs performed by anyone other than Headsight or an authorized Headsight dealer unless specifically authorized by Headsight.

Warranty Procedure

- Troubleshooting should be done between farmer/dealer and Headsight through our technical assistance @ **574.220.5511**.
- Labor reimbursement will occur only pre-arranged through Headsight technical assistance and be scheduled to a flat rate basis or reasonable time allowance in Headsight's judgment.
- There is no mileage reimbursement.
- Diagnostic time will not be reimbursed except in pre-arranged circumstances.
- Warranty claims should be on typical dealer service work order with a number and name to be attached for any future correspondence.
- All warranty work must be performed, and claims submitted, within thirty (30) days of the occurrence of the claim and within the warranty period.
- All parts removed during warranty repair must be returned to Headsight with Headsight's Return Form within thirty (30) days of the occurrence of the claim and within the warranty period.
- Headsight reserves the right to either inspect the product at the original retail purchaser's location or require it to be returned to Headsight for inspection.

Limitation of Liability

Headsight makes no express warranties other than those, which are specifically described herein. Any description of the goods sold hereunder, including any reference to buyer's specifications and any descriptions in circulars and other written material published by Headsight is for the sole purpose of identifying such goods and shall not create an express warranty that the goods shall conform to such description.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. There are no implied warranties of merchantability or fitness of a particular purpose. This warranty states Headsight's entire and exclusive liability and buyer's exclusive remedy or any claim for damages in connection with the sale of furnishing of Headsight products, their design, suitability for use, installation or operation, or for any claimed defects herein. **HEADSIGHT WILL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER, NOR FOR ANY SUM IN EXCESS OF THE PRICE RECEIVED FOR THE GOODS FOR WHICH LIABILITY IS CLAIMED.**

No representative of Headsight nor any dealer associated with Headsight has the authority to change the items of this warranty in any manner whatsoever, and no assistance to purchaser by Headsight in the repair or operation of any Headsight product shall constitute a waiver of the conditions of this warranty, nor shall such assistance extend or revive it.

Headsight reserves the right to make improvements in design or changes in specifications at any time, without incurring any obligation to owners of units previously sold. Warranty: **1/2022**



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