HORIZON®

INSTALLATION & OPERATION MANUAL

LEXION

MODELS

4xx, 5xx, 6xx, 7xx

09013501a

HEADSIGHT™

HARVESTING SOLUTIONS

HEADSIGHT.COM|574.546.5022

About Headsight

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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 Installation Guide or 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.

Disclaimers

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Table of Contents

Safety Information

Safety Stop

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.

Installation

Complete the installation portion of the header manual before continuing.

Installation Overview

To install a Horizon system, follow the steps below in order.

1. Install the Header components.
   - See the header model specific Installation Manual
2. Install the Combine components.
   - This combine specific Installation & Operation Manual
3. Find the ISOBUS (VT) application on your display.
   - This combine specific Installation & Operation Manual
4. Use this manual to properly set & adjust your system.
5. Refer to the Horizon Users Manual for more details on settings, etc.

Header - Horizon Base & Main Harness

Factory Prewired Headers

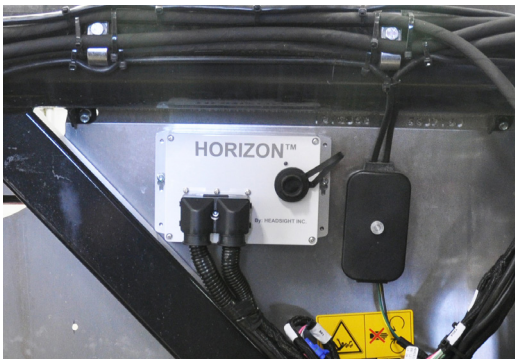
A number of header models are “prewired” for Headsight sensors and controllers.

- Honeybee 4000
- Maya - 2020 & up
- Geringhoff - certain models

1. Mount Horizon box to back side of head according to header installation manual.
2. Connect Horizon adapter harness to Horizon box and connect remaining connectors to the factory installed wiring connectors, see header installation manual.

Horizon® Box Mounting

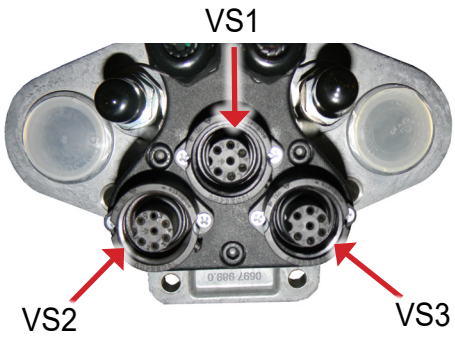
1. Mount Horizon box to back side of head, left of feeder house, with supplied hardware.
   - The box must be mounted horizontally on header
   - Orientation of the Horizon box is critical for header angle display on Drago, Geringhoff, and Capello headers:
     - The box must be mounted flat against the back panel of the header (See header installation manual for specific mounting instructions.)
     - Using a mounting bracket is acceptable for other header brands.
2. Connect main harness to Horizon box.



Combine Interface Harness

A standard Claas or Headsight multilink is shown. Header manufacturer supplied multilinks may or may not follow the Claas standard shown and may require additional components.

- Shelbourne: Request Kit # HT

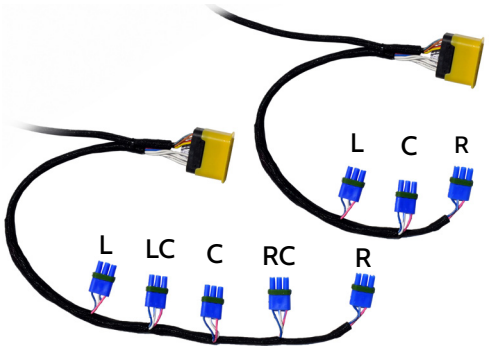


1. AHHC: Connect harness connector Y401/VS2 to VS2 on header side of multilink block.
   - Use Receptacle marked with arrow in picture at right (VS2) (except MacDon)
   - MacDon only: Trace and disconnect OEM Float sensor harness at Multilink. Connect Headsight Adapter to that receptacle
2. Row Guidance: Connect harness connector Y409/VS3 to VS3.
   - Corn heads only
3. If desired, connect harness connector Y410/VS1 to VS1.
   - Some Headsight Multilinks do not have VS1
   - Corn heads: allows deck plate indicator
   - Grain heads: leave original reel functions plug in place
4. If your header does not have a multilink block as shown, contact Headsight or your dealer.

Connecting Sensors

1. Connect sensor wiring to main Headsight harness.
   - Sensor location as viewed from operator's seat

	Left	Left Center	Center	Right Center	Right
2 Sensor	X				X
3 Sensor	X		X		X
4 Sensor	X	X		X	X
5 Sensor	X	X	X	X	X



*L-Left, LC-Left Center, C-Center, RC-Right Center, R-Right

Reel Enable Connection

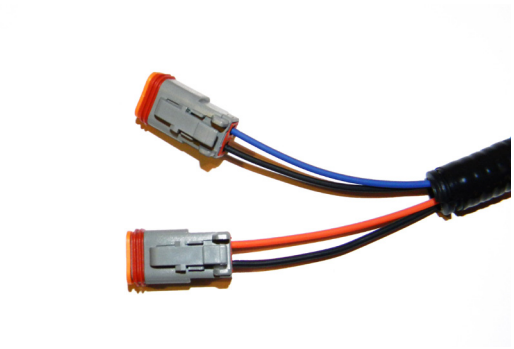
This step is only applicable to Multilink assemblies provided by Headsight®.

1. If your header needs reel drive flow (down corn reel, end augers, etc.), connect the mating 1p Weatherpack connectors, Y517 & Y518.
2. Otherwise leave them disconnected.

Reel/Deck plate/Fold Valve Connection

This step is only applicable to Multilink assemblies provided by Headsight®.

1. The Headsight® Multilink block may be provided with a 12p "Deutsch DT" "hydraulic functions" plug Y407. Several adapters harnesses are available for solenoid wiring, with 2p "DT" solenoid plugs as shown. "Prewired heads" & "Conversions" may have the adapter integrated into the Header adapter harness.
   - HT3804 -For Platforms
     - Y411 - Reel Up
     - Y412 - Reel Down
     - Y413 - Reel Fore
     - Y414 -Reel Aft
   - HT3805 -For Corn Heads
     - Y413 - Deck Open
     - Y414 - Deck Closed
     - Y415 - Unfold
     - Y416 -Fold
   - All black wires are grounds. (Note: for ALL Lexion valve solenoids, Black (ground) must be pin 1)

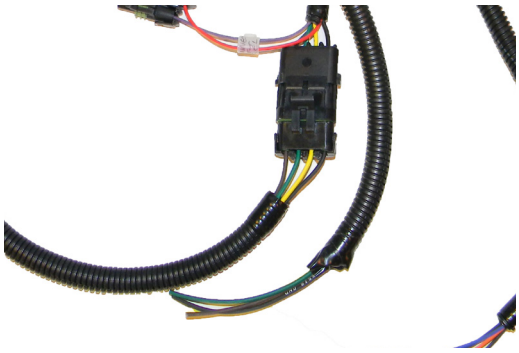


2. If the function operates backwards, switch the appropriate set of connectors to the opposite valves (Y413<->Y414, or Y411<->Y412).
3. VS1 has Reel speed, Reel position, and Deck Plate sensing available. See the Wiring Diagrams.
4. See the Mechanical Diagram for Pressure and Tank plumbing.

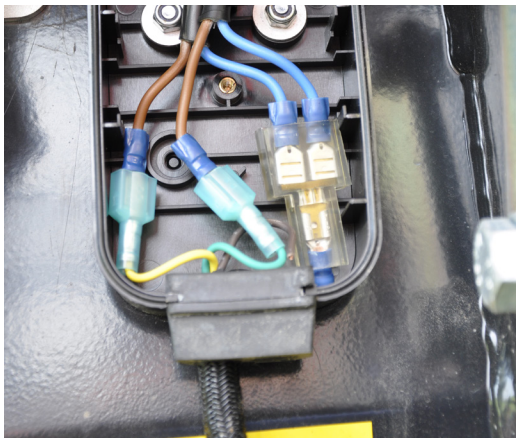
Lights Connection

For Headsight Multilink assemblies

1. If your header needs lights, the Headsight Multilink is wired with a standardized lights plug and a "tail".
   - 4 pin Weatherpack
     - Pin A - Black, Ground
     - Pin B - Yellow, Left Hazard
     - Pin C - Green, RIght Hazard
     - Pin D - Brown, Stubble Lights (if equipped)



   - Aftermarket (unwired) headers:
     - Use HT3802 Lights Tail
     - Terminate/connect bare wires to header as needed
   - Conversions & prewired heads:
     - Typically have lights wiring built into conversion harness



For Geringhoff Multilink assemblies

1. The Geringhoff "black box" Lexion adapter has a EU style "trailer" plug for lights.
2. Headsight has an adapter available for this plug, to our standard 4 pin Weatherpack.
   - Use HT3819
   - For heads with "loose wire connections
     - Connect HT3802 lights tail to HT3819
     - Terminate as above
   - For Patriot headers with connectors for Lights
     - Connect HT3821 adapter to HT3819
     - Connect HT3821 to X10 & X11 on header

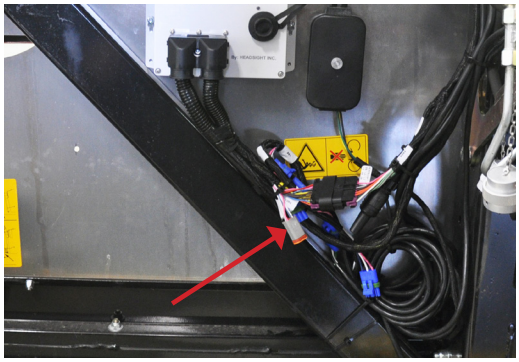
Header Options (if equipped)

This section is for header specific options to control header functions or display header information.

Truesense+

Non-prewired heads

1. Route HT2808 extension harness from crop sensor to Y703 on the Horizon harness.
   - See Header Specific Truesight Installation manual
   - See Truesense+ App manual



Factory prewired heads

Some header models are "prewired" for a Truesight sensor

- Geringhoff - Freedom

1. Connect Horizon adapter harness to the factory installed wiring connectors, see header specific installation manual.

All Other Header Options

Headsight has partnered with some header companies to display operational information for those heads. This information is available as a Horizon header app on the VT. These applications require a specific adapter harness.

Information displayed may include:

- Deck plate spacing
- Deck plate angle
- Shaft speeds
- Hours in service
- Other

If Headsight is controlling any function on the header (example - folding the header), the application will also require a header specific Unlock.

See the appropriate Headsight specific Header App Manual for installation and operation instructions.

Combine - Horizon Bridge

Cebis cannot function as a ISOBUS display. To operate Horizon, you must have a ISOBUS display installed in the combine. The most common displays/systems are listed below. If you have a display or system not listed, contact Headsight.

AgLeader Incommand/Integra w/ integrated AgLeader Display Cable

- Factory equipped on many Lexion combines - "AgLeader Ready"
- See: AgLeader Display w/ integrated AgLeader Display Cable

John Deere GS3/4 w/ Agra-GPS bridge system

- Agra-GPS has several variants. The most common are shown.
- See: JD Display & Globe w/ Agra-GPS Bridge
- NOTE: As well as the normal bridge system using the JD globe, Agra-GPS has an integrated Globe & Bridge available in 2023. For more information on connecting to that system, contact Headsight or AgriGPS.

John Deere GS3/4 w/ Greenfit bridge system

- Reichardt Greenfit Bridge System
- See: JD Display w/ GreenFit

Trimble FMX, GFX, TMX Monitors

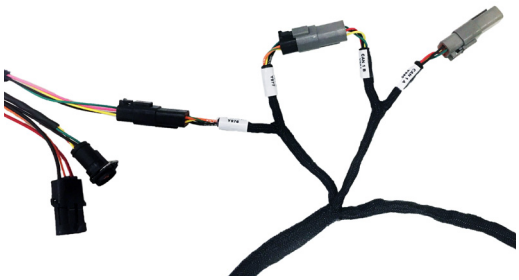
- Please contact Headsight for correct Bridge harness
- Request connection guide - 09063002 Trimble Users manual.

AgLeader Display w/ integrated AgLeader Display Cable

- Integra Display cable 4001608
- May have adapter with Incommand

Many Lexion combines w/AgLeader have this harness installed as OEM. If your Lexion is equipped with a different AgLeader display cable, request 09063001 AgLeader Users Guide for more information.

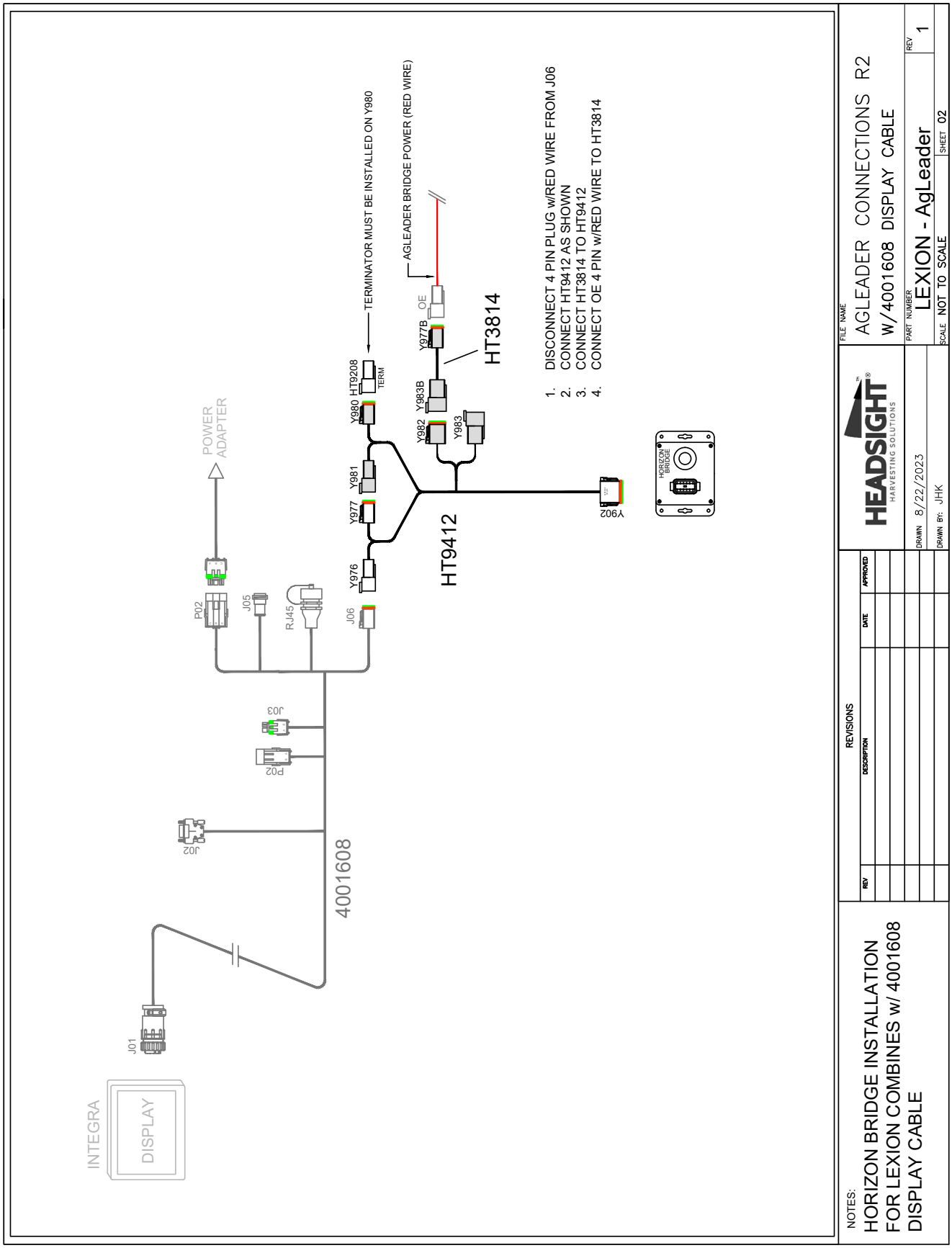
1. Use CAN bridge harness HT9412. May also req. HT3814.
2. Identify the ISOBUS connection on the AgLeader Display cable.
   - 4 pin Deutsch connector
   - This connector has a Pink, Black, Yellow and Green wire.



3. Disconnect any previously connected cable (if any).
   - Typically has a single Red or Red & black wire only
4. Connect Y976 to Ag Leader 4 pin Deutsch connector.
5. Connect Y977 to Y981.
6. Connect supplied Terminator HT9208 to Y980.
7. For installation with a previously disconnected AgLeader cable (see step 3 above),
   - Use adapter HT3814.
   - Connect Y983B to Y982 (6 pin) on HT9412 harness
   - Connect Y977B to existing Agleader cable
   - Typically used on Lexion to route power to AgLeader bridge module

8. Connect Y902 to the Horizon Bridge.
9. Turn on the key. The Horizon Bridge icon should appear under VT on the AgLeader monitor.

Diagram - Horizon Bridge on Lexion w/ 4001608 Display Cable



JD GS3 or GS4 with Agra-GPS Conversion Module (Lexion Only)

The Horizon bridge harness HT9413 must be installed on the JD side of the Agra-GPS bridge. The connections on both side of the Agra-GPS bridge are the same (through 2022). Make sure you are not connecting the HT9413 to the Claas/Lexion CAN side

1. Use Bridge harness HT9413.
2. Complete installation of the Agra-GPS bridge system if not already done.
   - The Agra-GPS is required to connect the Lexion CAN network to the JD Display
3. Make sure the JD display & Agra-GPS system are working properly before attempting to install the Headsight bridge.

Agra-GPS through 2022

1. DO NOT disconnect the Lexion CAN from the Agra-GPS (Connector A).
2. Disconnect the display adapter harness 6 pin Deutsch connector (C) from the Agra-GPS bridge (B).
   - This plug may be buried in the far back corner.
3. Connect Y9036 to the Agra-GPS bridge. (If this is the wrong polarity or CAN wire colors do not match, you are on the Claas/Lexion side, find the JD side).
4. Connect Y9037 to the display cable (C).
5. Connect Y902 to the Horizon Bridge.
6. Turn on the key. The Horizon Bridge icon should appear under ISO or Menu on the JD monitor.

Agra-GPS w/ JD Globe, 2023 ->

1. DO NOT disconnect the Lexion CAN from the Agra-GPS system (6 pin connector).
   - Do not use Y9036/Y9037 on HT9413 harness.
   - New system requires use of HT9413 r3 or newer.
2. Disconnect the 12 pin Deutsch connectors between the Bridge & Display cables shown circled in the Diagram.
   - Note that there are multiple 12 pin connector sets on the Agra-GPS harness, make sure you are disconnecting the Display adapter plug shown.
3. Connect Y947 to the Agra-GPS bridge harness. (If this is the wrong polarity or CAN wire colors do not match, you are on the wrong plug set).
4. Connect Y946 to the display cable.
5. Connect Y902 to the Horizon Bridge.
6. Turn on the key. The Horizon Bridge icon should appear under ISO or Menu on the JD monitor.

Diagram - JD Display w/ Agra-GPS Bridge through 2022

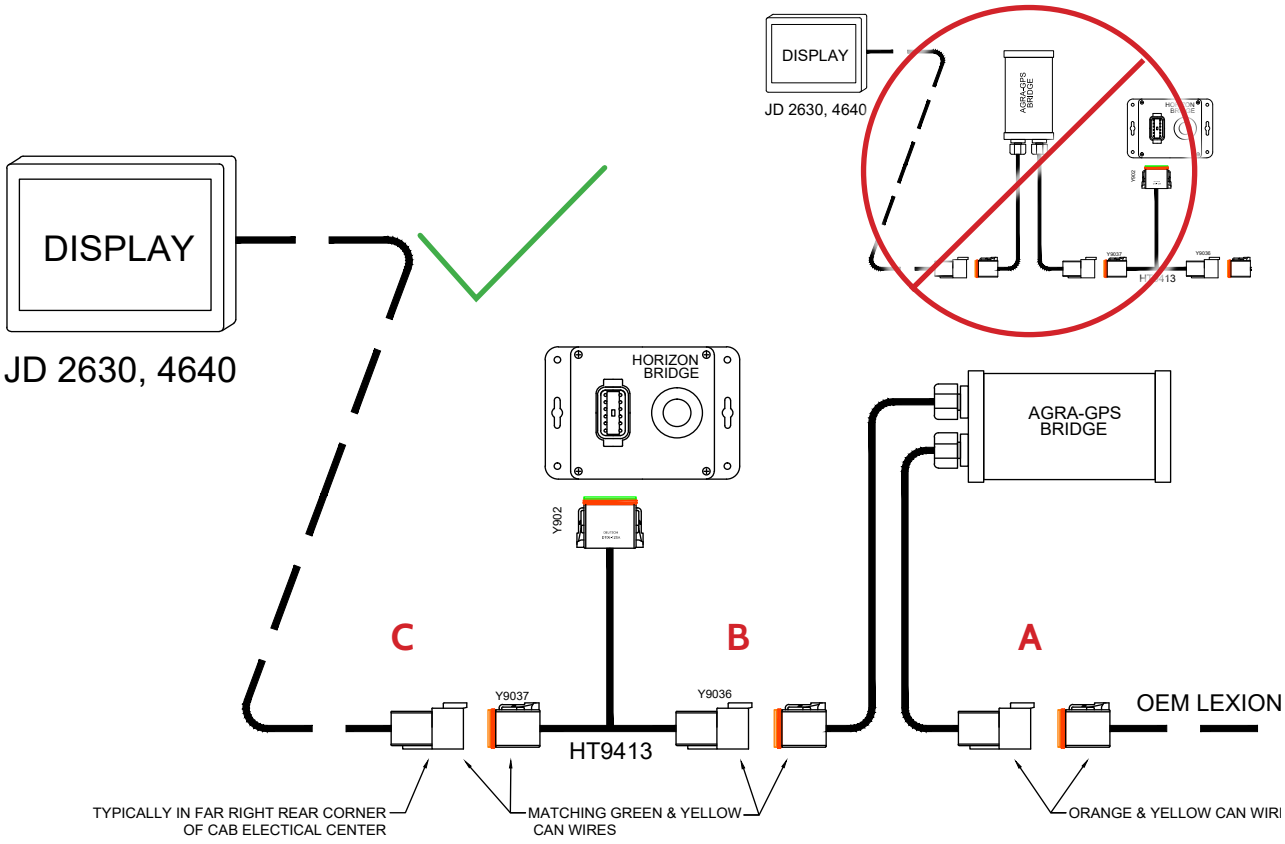
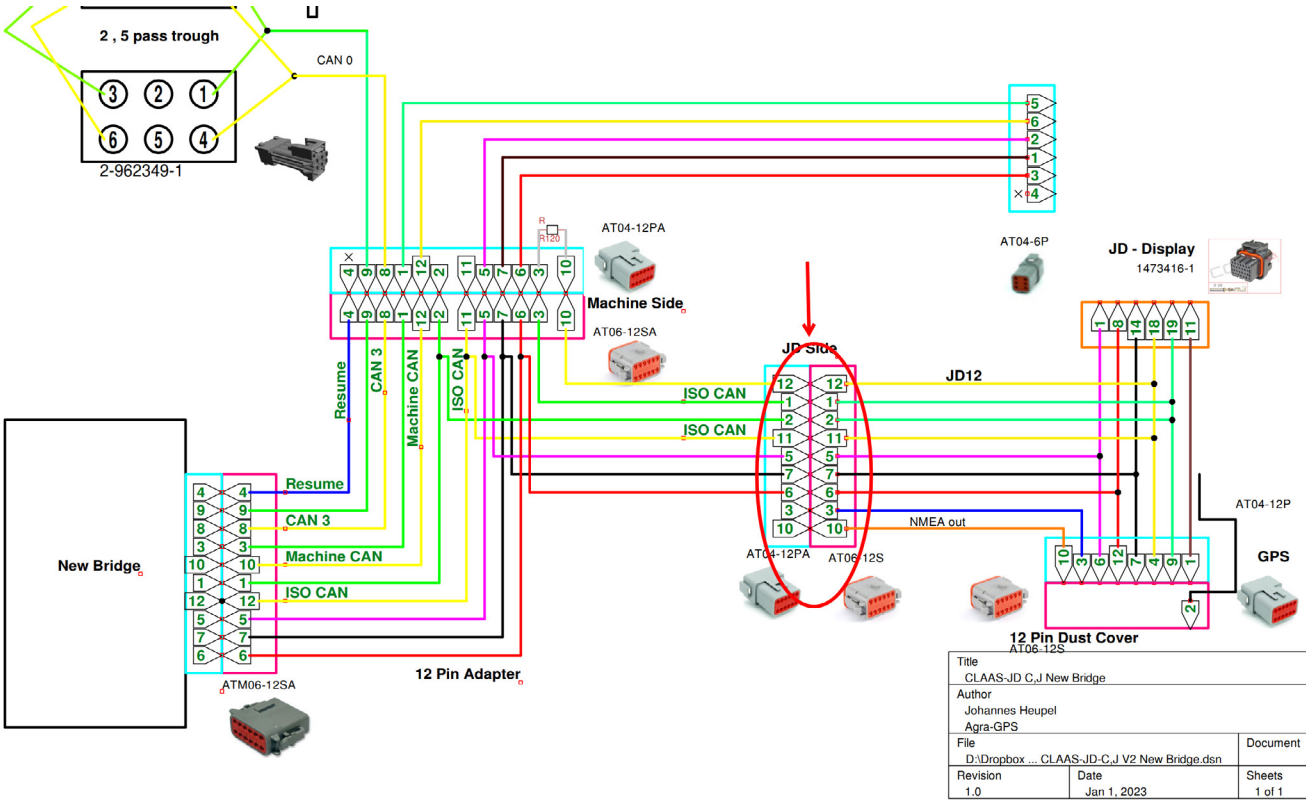


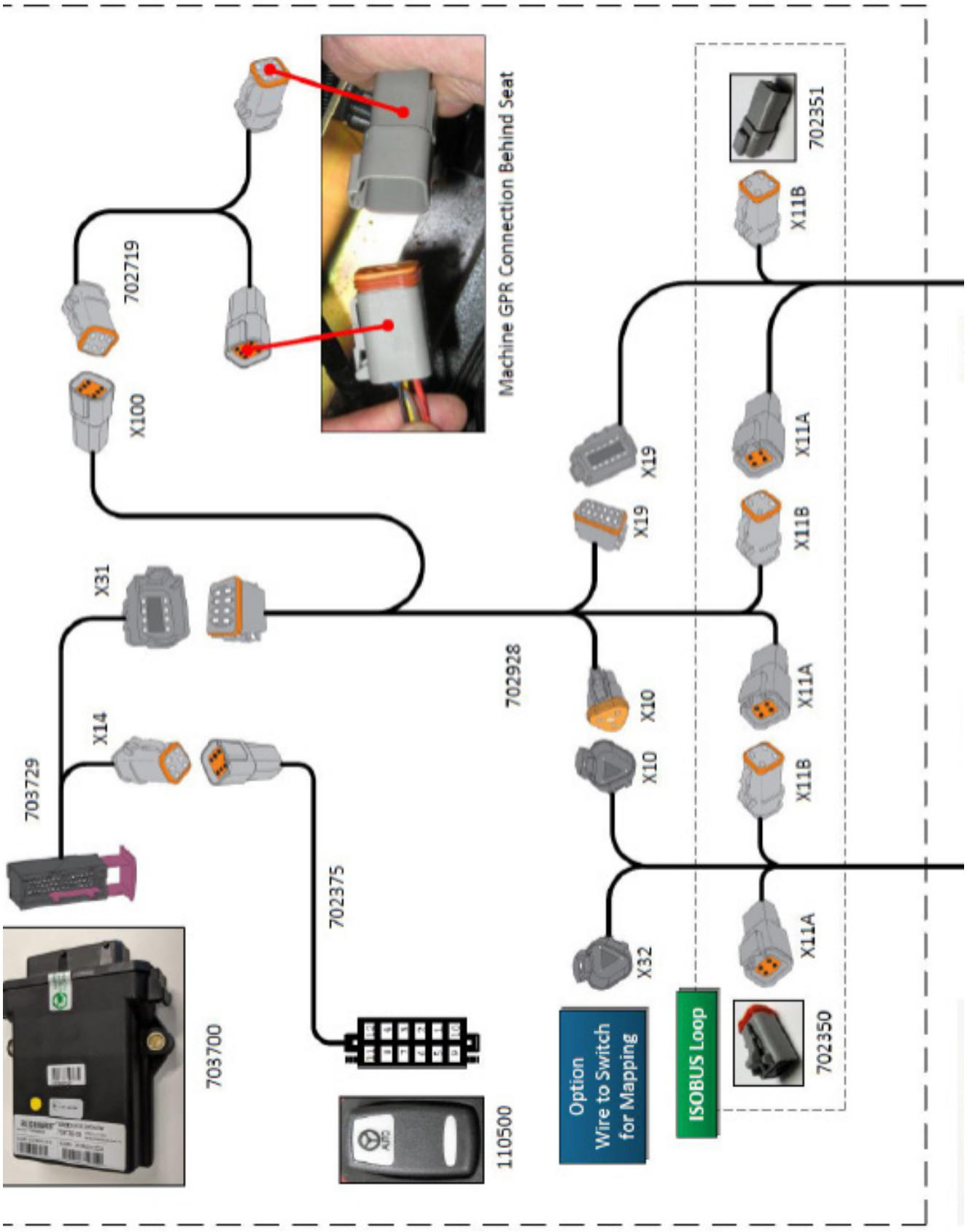
Diagram - JD Display & Globe w/ Agra-GPS Bridge 2023 ->



JD Display w/ GreenFit

1. Use CAN bridge harness HT9423.
2. Identify the connections X10 & X11A on the Greenfit JD Display cable.
   - X11A - 4 pin Deutsch w/ Terminator
   - X10 - 3 pin Deutsch connected to Lexion adapter cable
3. Disconnect Terminator from X11A.
   - Re-install terminator on Y981
4. Connect Y980 to X11A.
5. Wye Y759, Y760 into X10.
6. Connect Y902 to the Horizon Bridge.
7. Turn on the key. The Horizon Bridge icon should appear under ISO or Menu on the JD monitor.

Diagram - JD Display w/ Reichardt GreenFit



Setup & Calibration

Headsight ISOBUS Application Guide

The following is a guide to the Headsight ISOBUS Applications you may see.

Horizon Bridge

Horizon Base (Main)

Horizon - Header App

Truesight2

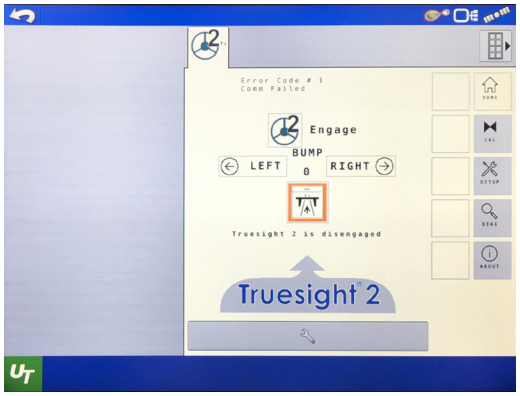
Truesense +

Finding ISOBUS Applications

AgLeader InCommand/Integra

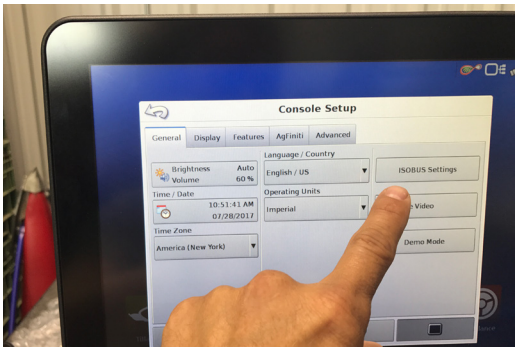
1. Check monitor for VT software installation.
   - Turn on key
   - If the UT icon appears on the home screen, VT should be enabled. If not, skip to step 3 below to enable VT on the monitor.
   - Note: Integra shown, Incommand similar

2. See if Truesight icon appears under VT tab.
   - If Truesight VT application does not appear, check the wiring and terminator installation (if required)



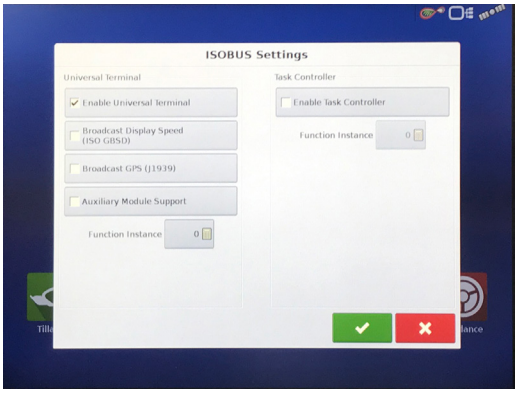
3. Enable "Universal Terminal" on the monitor.
   - On the Home page, choose the Setup (wrench) icon
   - Choose the Console (screen) tab

4. Choose Isobus Settings.



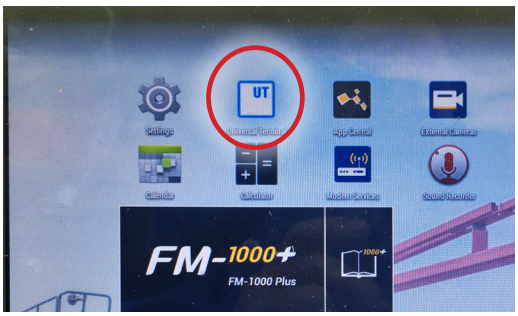
5. Enable Universal Terminal.
   - Check the UT box
   - Press Check to enable

6. Cycle power to the monitor.
   - Return to the home page
   - Check Step 2 above

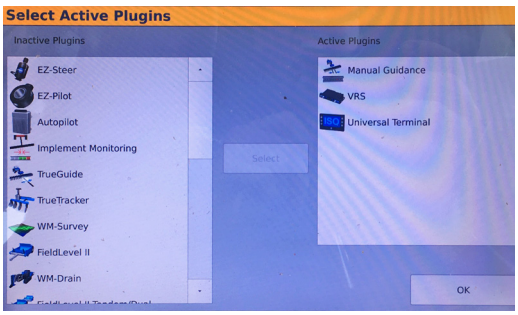


Trimble FMX, GFX, & TMX

1. Check monitor for VT software installation.
   - Turn on monitor
   - If the VT/UT icon appears on the home screen, VT should be enabled
   - 2050 shown, FMX similar



2. If not, add VT to the list of Active Plug-ins.
   - Settings>>Configuration>>Add/Remove
   - Chose correct Port for CAN



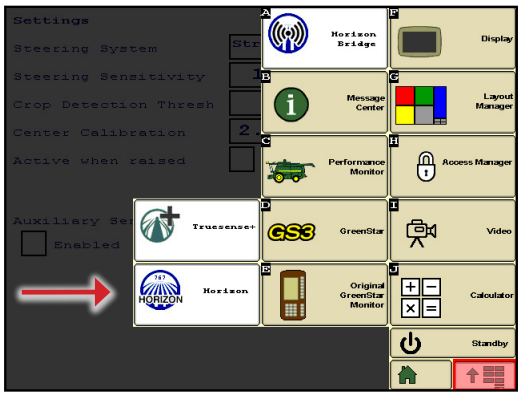
John Deere GS4/4600

1. Press 

Menu.
2. Choose 

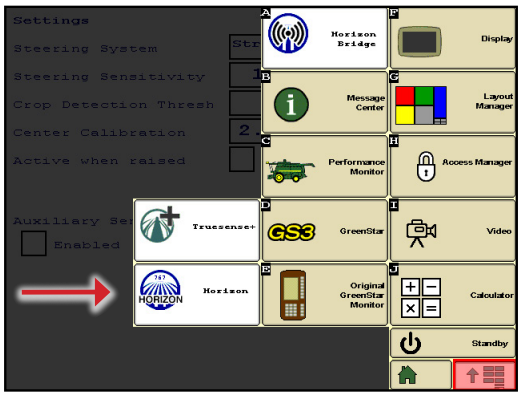
Applications.
3. Select 

ISOBUS VT.
4. Choose the Horizon icon.
    - If there is another ISO application already open,
        - Press the menu button  in the lower right corner to return to the main ISO page



John Deere GS3/2630

1. Press display menu button, all VT icons will show up in this menu.



Linking Horizon

Horizon only needs to be linked at initial setup or any time a unit is replaced.

See "Finding ISOBUS Applications" above to find Horizon ISOBUS applications.

Setting Truesight 2 as Horizon Bridge

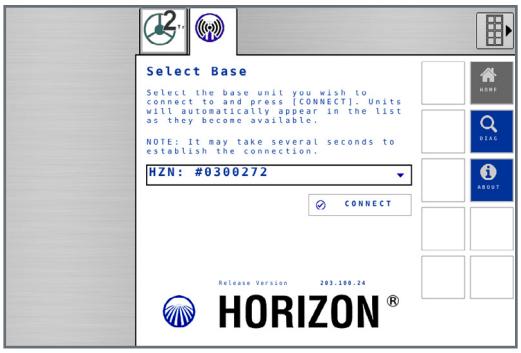
Use this section ONLY when using Horizon with Truesight 2. If using standalone Horizon Bridge module, skip this section. Before proceeding, complete the initial setup and calibration in the Truesight 2 manual (if not already done).

1. Select ISOBUS application "Truesight 2".
2. Select "Setup".
3. Select "WIFI".
4. Select "Mode" and switch the mode to "Bridge".
5. Cycle power, be sure that both VT monitor and Truesight 2 power cycle to save changes.
6. Follow the directions for "Linking Horizon to Horizon Bridge" below.

Linking Horizon with Horizon Bridge

This section must be completed before proceeding to setup Horizon system.

1. Start combine engine.
2. Select ISOBUS application "Horizon Bridge".
3. Select serial number of Horizon base unit to which you want to connect.
   - If no base s/n appears in box, check power/LED on Horizon base. See Advanced Info>>12V Power Test
4. Wait until screen says "Linked" and Loading of Pools has completed.
5. Go back to main menu and select ISOBUS application "Horizon".

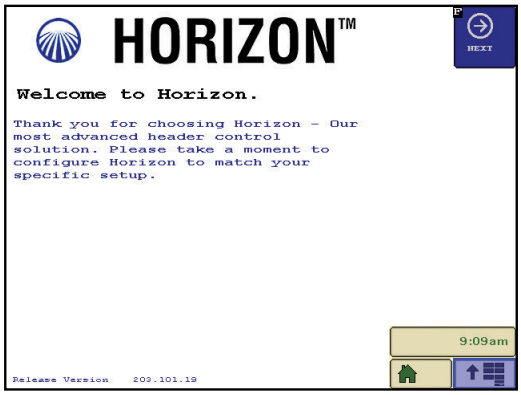


Initial Horizon Setup

If Horizon does not appear, temporarily remove any USB memory attached to the display monitor and cycle power.

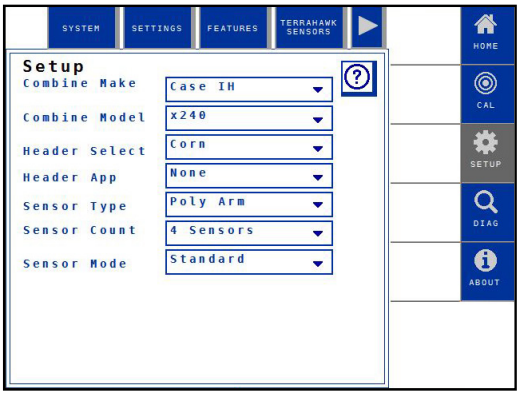
Most Screens include Help pages that can be accessed by pressing the ? button. These pages contain further information about the items displayed on the current screen.

1. Power up Horizon by starting combine engine.
2. Select VT application "Horizon".
   - See Operation section of this manual to find Horizon ISOBUS Applications



Follow on screen choices, and setup for your specific Horizon kit.

- Combine Make = Lexion
- Combine Model = Select model of combine from list
- Head Select - Choose best option from list
  - Corn
  - Platform
  - Pickup
  - Draper
  - Stripper
  - Other
  - None
- Header App - Choose specific head if applicable
  - Options depend on Header Select
  - See header specific App manual for more details
- Sensor Type - Choose Poly Arm unless using Terrahawk
- Sensor Count - Number of Height Sensors
- Sensor Mode
  - Options depend on Header Select
  - Standard
  - Foresight - Corn only, see Settings/Foresight in Horizon Users manual
  - Feathersight - Grain only, see Settings/Feathersight in Horizon Users manual
  - Other special applications (choose only if specifically stated in application manual)
- Options: Enter Row Spacing (corn) or Header Width (grain)
- Options: Enter # or Rows (corn)
- See the Horizon Owner's Manual for further details on these options

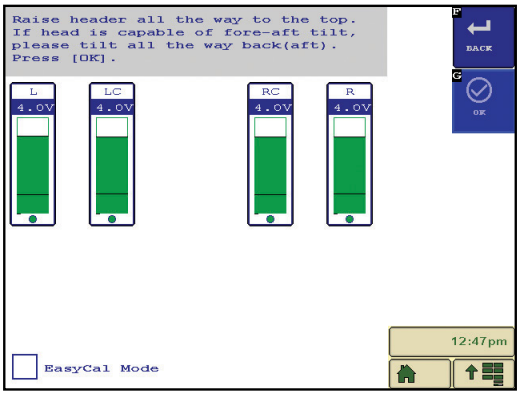


Initial Setup appears until all the initial requirements are met.

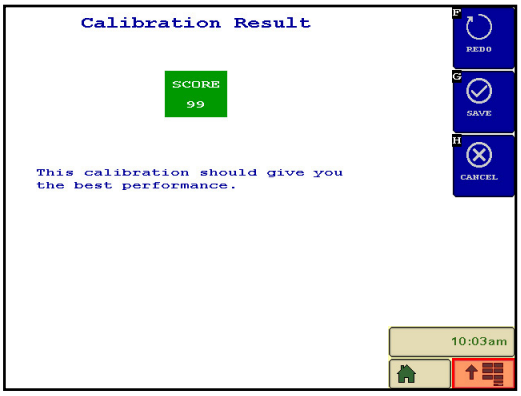
Horizon Calibration

For the best header control and calibration score, always make sure the header f/a angle is set correctly. For corn heads, there should be 4-6" between skids and ground when snout tips touch, and snout tips must be adjusted even & level to header frame. Calibrate on a hard level surface such as a driveway or shop floor.

1. Select Horizon ISOBUS application.
2. Level header to the ground.
3. Select CAL(ibrate) on the display.
4. Select EasyCal Mode (Corn Only).
5. Raise header and select OK.
   - Follow on screen prompts
   - Calibration score will be calculated at end
   - Save Calibration if satisfied with score, if not satisfied with score repeat Calibration - See chart below
6. Calibrate header to combine (next section).



Calibration Score	
Best Performance	90-100
Good Performance	80-89
Fair Performance	70-79
Unreliable Performance	11-69
Error, see below	0-10



Note: A score of <10 indicates Horizon has identified a specific problem, which should be displayed directly below the score. The problem must be corrected before calibration can be completed.

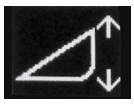
If a desired calibration score is not attained and all the above recommendations were completed, try a calibration without EasyCal Mode checked. This will add calibration steps and not automatically set Foresight® gain.

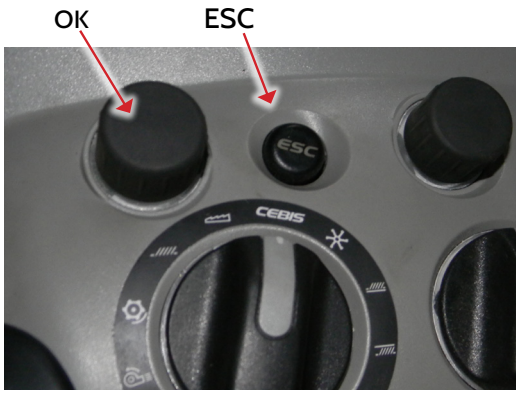
Combine Calibration

A full combine calibration must be completed on new installations or if a component of the header control system is changed on the combine. See combine operators manual for details.

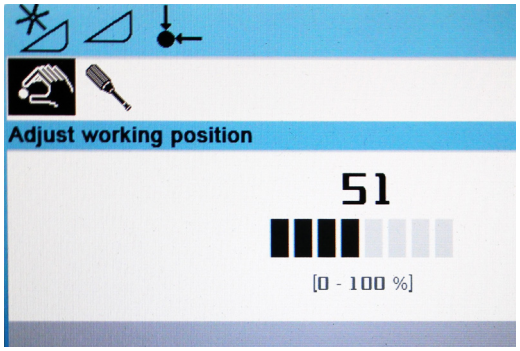
600 & 700 Series

To ensure a proper calibration, make sure your combine has the latest Lexion recommended software and the feeder to header latching mechanism is tight with minimal play. See Appendix for more information.

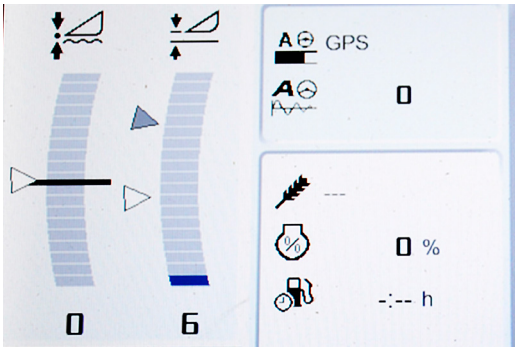
1. Start combine.
2. Use the Scroll knob and ESC to navigate the menus as shown:
3. Get to the HHC "Learning End Stops".
   - Choose  on the main display – Press the Scroll knob to **OK**
   - Choose  – Press **OK**
   - Choose  – Press **OK**
   - Choose  – Press **OK**



4. The screen should read "Start learning procedure with "OK".
5. Follow the on-screen instructions.
6. You may also wish to calibrate other relevant items such as "Lateral Float End Stops" and "Deck Plate End Stops". See your Lexion Owners' Manual.
7. Also adjust working position to about 50%.



8. After calibration, the right bar graph should read 0-100 as the head is moved full stroke.

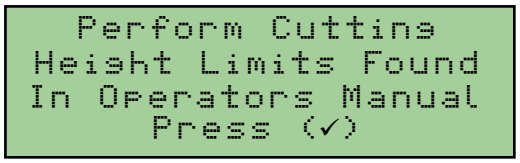


9. Reading the left graph:
   - 0-49 is the header lift pressure
   - 50-100 is the header AHC sensors
10. After calibration, the left graph should read:
    - 0 with the head all the way down
    - 50 as the header frame begins to lift off the ground
      - On spring mounted heads such as the MacDon, this can vary somewhat
    - 100 as the header sensors (or cutterbar) clear the ground
11. If the numbers on the graphs are close to this, the calibration is good.

The graphs may not respond exactly as noted for all heads and types. If the AHC appears to work correctly, the system can still be considered properly set and calibrated.

400 & 500 Series

1. Start combine.
2. For Type 3:500A combines only (accumulator w/o update):
   - If the Insight box displays the screen shown on right, Perform "Cutting Height Limits" in the combine
     - This screen will be displayed at the end of the Insight calibration
   - If not, Choose >>Setup >>Combine Cal Mode in the Insight menu

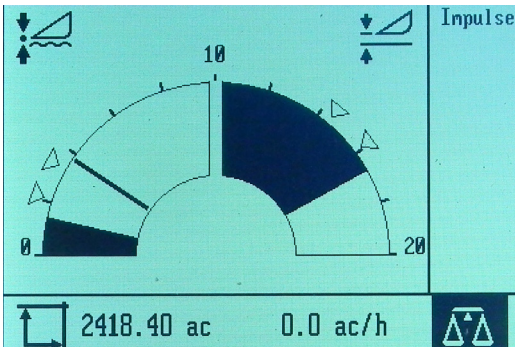


3. Set "Sensitivity CAC".
   - Choose  on the harvest display – Press **OK**
   - Choose "Header" – Press **OK**
   - Choose "Sensitivity CAC" – Press **OK**
   - For Off-Ground sensing (corn or wheat sensors): change setting to:
     - 50% for Type1: 400 & Type 2: 500S combines with lift springs (Do not adjust)
     - 61-100% for Type 3: 500A & Type 4: 500U combines with lift accumulators
   - Raising the Sensitivity CAC will make the system more responsive
4. Engage the thresher and header clutches.
5. Raise head almost up, and speed up motor.
6. Choose  on the harvest display – Press **OK**.
7. Choose "Header" – Press **OK**.
8. Choose "Cutt. Height Limits" – Press **OK**.
9. Follow on-screen instructions.
   - Raise header / Lower header, etc
   - If head drops too fast, see Operation section of manual.
10. **For Type 3:500A combines only,** on Insight box:
    - Press ✓ Enter until you have exited the "Cal Mode" Screen

11. (All) After calibration, the right bar graph (feeder position) should read "empty" to "full" as the feeder is moved full stroke.

12. After calibration, the left graph should read:
    - Nearly "empty" with the head all the way down.
    - Nearly "full" as the header sensors (or cutterbar) clear the ground

13. If the graphs operate as suggested, the header sensors are working properly and the calibration is good.



The graphs may not respond exactly as noted for all heads and types. If the AHC appears to work correctly, the system can still be considered properly set and calibrated.

Settings

Horizon Settings

See the 09010003 Horizon Users Manual/Setup for information on settings available in Horizon.

Combine Settings

Properly setting the combine is essential to having responsive header control. You should become very familiar with the steps in this section.

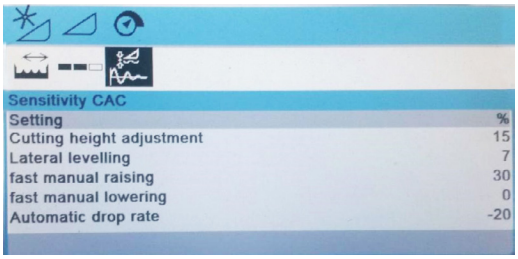
Always perform the Horizon calibration(s) before adjusting settings. Set each sensitivity setting by increasing till header bouncing occurs then decreasing till header becomes stable.

600 & 700 Series

Properly setting the combine is essential to having responsive header control. You should become very familiar with the steps in this section.

1. Perform "Learning End Stops" calibration before attempting fine tuning.
2. Start combine.
3. Use the scroll knob and ESC to navigate the menus as shown:
4. Get to the HHC "Sensitivity CAC".
   - Choose  on the main display – Press the Scroll knob to **OK**
   - Choose  – Press **OK**
   - Choose  – Press **OK**
   - Choose  – Press **OK**

5. All Settings have a range of -50 to +50.
6. "Cutting Height Adjustment" is actually height sensitivity. It should be adjusted just below the point the head will "hunt".
7. Adjust the "Lateral Leveling" to increase/decrease lateral response. It should be adjusted just below the point the head will "rock" side to side.
8. Set "fast manual raising" to 5-6 seconds full down to full up.
9. Set "fast manual lowering" to 8-10 seconds full up to full down.
10. Set "Automatic Drop Rate" slow enough to eliminate "hunting".
11. Suggested starting values are shown at right. Your values may vary.
    See your Lexion Owner's manual for more information.



400 & 500 Series

Properly setting the combine is essential to having responsive header control. You should become very familiar with the steps in this section.

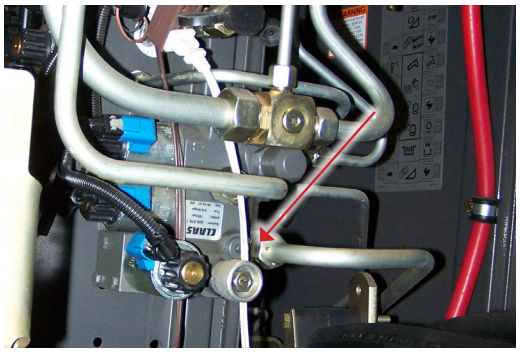
1. Perform "Cutting Height Limits" calibration before attempting fine tuning.
2. Set CAC setting.
   - For on-Ground operation of a flex head:
     - Do not install the pressure bypass
     - Adjust the CAC to an appropriate setting exactly as if you were operating a Lexion header (see Lexion Owner's Manual)
3. Choose  on the harvest display – Press **OK**.
4. Choose "Header" – Press **OK.**
5. Choose "Sensitivity CAC" – Press **OK.**
6. For off-ground sensing only (corn or wheat sensors): change setting to:
   - 50% for Type 1: 400 & Type 2: 500S combines with lift springs (Do not adjust)
   - 61-100% for Type 3: 500A & Type 4: 500U combines with lift accumulators

Raising the Sensitivity CAC will make the system more responsive.

- Always redo "Cutting Height Limits" calibration after changing Sensitivity CAC. Insight must be in ››Setup ››Combine Cal Mode

4/500 High Speed Drop Rate

1. Use the high speed drop rate valve adjustment knob on the main valve block (indicated by arrow).
   - Turn OUT (counterclockwise) to slow down, IN (clockwise) to speed up
   - If the speed is too fast, hunting will occur
   - If the speed is to slow, the system will not be responsive enough
2. Common range is 8-10 seconds from header full up to full down in automatic mode.



Operation

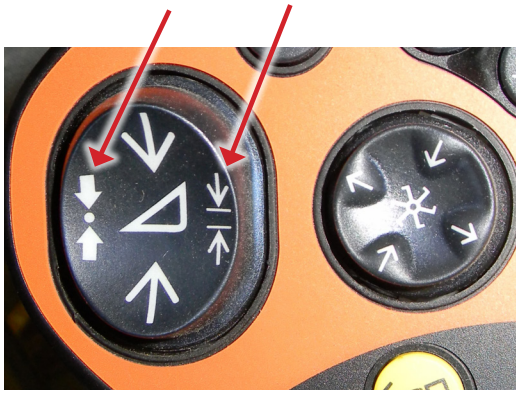
Overview

1. Be sure you have the initial settings entered and have calibrated Insight.
2. Operate the Headsight system exactly like you would use your combine OEM height control system.
3. Fine tune all combine speed and sensitivity adjustments for best performance.

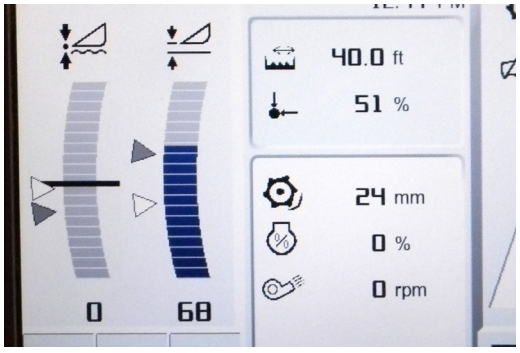
Engaging AHHC

1. Engage header and separator clutch (700 Series shown, 400 & 500 similar).

2. Press left side of header raise/lower button to enter AHHC. Press again to switch setting.
   - The "Left Side" button (arrows to dot) is Active Header Height (AHHC)
     - For all heads with height sensors on the head
   - The "Right Side" button (arrows to lines) is "Feeder Position" (Return to Cut or RTC)
     - Only for heads with NO height sensors
     - Or to raise the head to a preset height if needed



3. Choose desired cutting height setpoints (700 Series shown, 400 & 500 similar).
   - Manually lower the head to the desired cutting height
     - (Must be within the sensor travel range)
   - Press and hold the AHHC (left)button until the caret resets to the top of the dark bar in the left graph (Active Header Height)
     - Tap button once and redo above to set 2nd position
     - The "grayed" caret is selected
   - To set a higher "feeder position," press and hold the RTC (right) button until the caret resets to point to the top of the dark bar in the right graph (feeder position)
     - Tap button once and repeat to set 2nd position
     - The "grayed" caret is selected



Advanced Information

Theory of Operation

A review of the following points will help the service technician to understand the complete system, which will help diagnose specific problems.

1. Each sensor returns a variable voltage depending on header height.
    - High header height = high voltage (approximately 4 volts)
    - Low header height = low voltage (approximately 1 volt)
2. Each sensor has 3 wires:
    - black or lt blue = ground
    - white = signal returned to combine (varies 1-4 volts)
    - green or pink = 5 volt power
3. Horizon adjusts signals as needed then sends them to combine using the Header CAN bus.
    - All sensors are scaled to an appropriate range for combine
    - Horizon reads all senors and sends signals to combine that will cause appropriate height and or tilt response
    - If Foresight is enabled - Horizon magnifies the voltage change below the point where the snout tips touch the ground
4. The voltages the combine sees are exactly like what it would see with an OEM system. All existing combine controls and settings may be used.

Basic Requirements

Each sensor must meet basic requirements for Horizon to accept the calibration. If any sensor does not meet the requirements below, you must correct it and then recalibrate the Insight box.

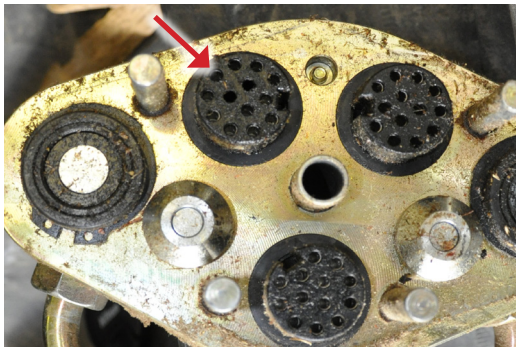
- See the header manual for sensor adjustment instructions
- Sensor output voltage must always be between .3 and 4.7 volts
- Sensor output voltage must change more than 1.0 volts from raised to lowered position for each sensor

12V Power Test

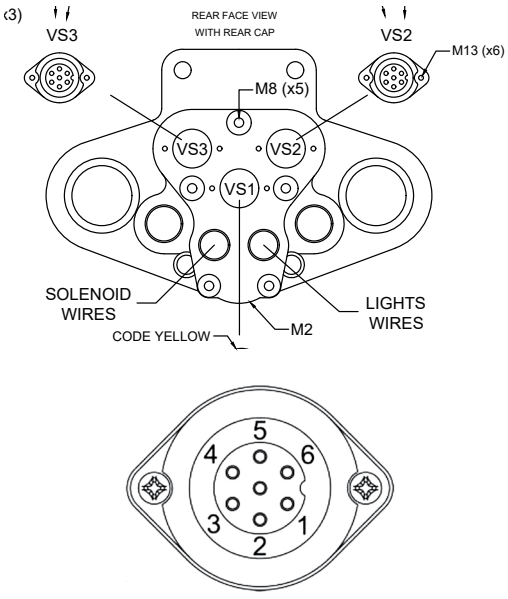
Due to common failure of the 12V supply from the combine, the following section is included to assist in troubleshooting the "no power" complaint.

1. Start combine engine. Make sure the roading switch is in field mode.
   - If the Horizon box turns on (LED) - 12V supply OK.
   - If the Horizon box does not turn on
     - Make sure the Adapter harness is plugged into VS2. Then continue with step 2.

2. Disconnect the Combine Multilink and use a voltmeter to measure pin 9 of the B housing on the Combine Multilink.
   - There is no 12V on pin B9
     - Find and repair 12V supply problem on combine (most likely issue!)
   - There is 12V on pin B9
     - Go to Step 3.



3. Connect the combine multilink to the header, and start the engine. Measure power on VS2, pin 6.
   - There is 12V on VS2, pin 6
     - STOP. Do NOT disassemble multilink. Check for Insight adapter harness fault.
   - There is no 12V on VS2, pin 6
     - Disassemble Multilink to install or repair the multilink power wire
   - Reassemble the multilink assembly:
     - Reassembly of housing is easier if you remove the screws holding the VS1-3 plugs onto the housing, and temporarily pull excess wiring out through the housing
     - Make absolutely sure no wires are pinched under the housing. Wires like to get pinched in the "center" of the housing, and around the pin insert pegs
     - The housing should sit snug against the plate without drawing up the bolts.



600 & 700 Series Calibration Issues

Symptom

When the CAC system is engaged, the header dives into the ground, then recovers to the preset height.

Cause

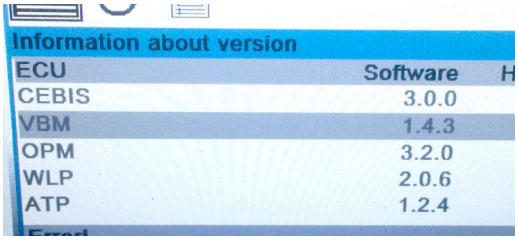
For machines with 2011-2014 OEM Lexion software, play in the connection between the header and feeder house can cause the calibration process to not work correctly. If your feeder can drop more than ½" after the header solid frame (not flex cutterbar skids) touches the ground, it is recommended that you use one of the two following solutions.

Stubble stompers mounted so they contact the ground during calibration can also cause this issue.

Solutions

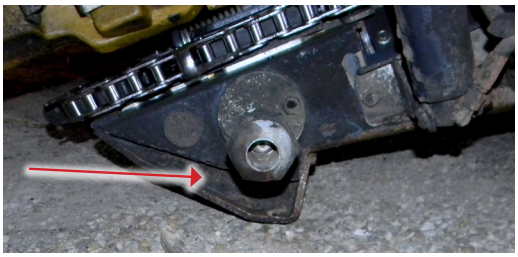
Solution 1 – s/n C67, C68, C69

6/700 series combines with SN's starting with C67, C68, or C69 and later should have the software updated to at least VBM 3.6.3 to eliminate this issue. For earlier machines, see solution 2.



Solution 2 – Earlier Models

1. Note: this procedure works for all 6/700 combines on all headers.
2. Remove or chain up any stubble stompers so they do not carry header weight during calibration.
3. Use blocks under the feeder faceplate to stop further movement downward during the calibration process.
   - The block height should be enough to stop the feeder just as the solid frame of the head contacts the ground (not flex cutterbar skids). See arrows.



NOTE: Some heads with floating adapters (for example draper heads) can also experience this symptom in flex mode. Limiting downward over-travel on the float adapter during calibration (Solution 2 above) may solve or reduce this issue.

NOTE: For off-ground (rigid) operation, make sure float mode is locked out.

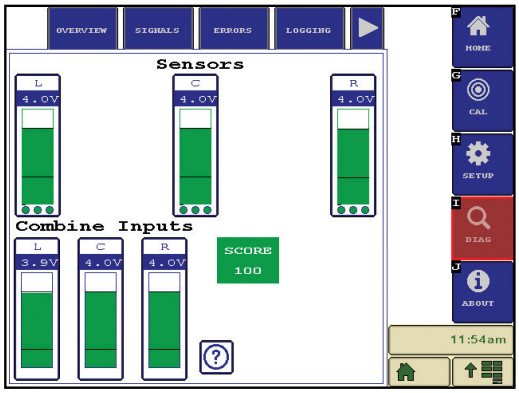
Diagnostics

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. Set combine parking brake.
4. Turn off combine and remove key from ignition.
5. Disconnect all drive shafts from the header.

Horizon Diagnostics Screens

- Overview - displays voltages from sensors and voltages being sent to combine
- Calibration Score
- General reference to calibrated range - black lines on sensor graphs are high and low calibration points, middle hash mark is Foresight® calibration point when being operated on a corn head with Foresight® turned on
- Dots on graphs: Green - no codes, Yellow - had code but working, Red - code active



More detailed troubleshooting & error information available in the Horizon Users Manual

Combine Diagnostics

1. You must have a Claas service tool plugged into the diagnostic ports to read voltages on a Claas combine.
2. To visually determine if the sensor voltages are getting to the combine, watch the left bar graph on the display while raising and lowering the header. See the appropriate “Combine Calibration” section for details.

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 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

Symptom	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 Voltage should be 5V	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	If sensor cannot be adjusted to achieve a voltage within the range, replace sensor.

Troubleshooting by Symptom

Nearly every problem with the header control system may be resolved by one of the following simple steps:

- Make sure each sensor meets basic requirements discussed in Advanced Info section
- Properly calibrate Insight box
- Properly calibrate combine AHHC ("Header Cal")
- Enable appropriate AHHC functions on combine
- Properly set combine electronics and/or hydraulics

Symptom	Problem	Solution
General Horizon Problem		
Horizon box does not power up No LED or Wifi Test for 12V on Y901 pin 30 (red wire), ground on pin 38 (black wire)	No 12V power on Y901 pin 30 & 28 (red wires)	Test for 12V on pin VS2 Pin 6 B9 in Header Multilink OK - Check Horizon Harness No - See next step below
	No 12V on pin VS2 Pin 6 in Header Multilink	Test for 12V on pin B-9 in Combine Multilink (see Advanced Info>>12V Test) OK - Check Header Multilink for broken wire No - Test/Repair combine, replace Road Travel Fuse
	No Ground on Y901 pin 38 (black wire)	Test for Ground on VS2 pin 1 of header Multilink OK - Check Horizon Harness No - See next step below
	No Ground on pin VS2 Pin 1 in Header Multilink	Test for Ground on pin B-2 of header connector OK - Check Header Multilink for broken wire No - Test/repair combine wiring
	Shorted 12V supply to Header	Disconnect Y910 & Y903 (if Equipped) LED comes on - Check Header Aux or Terrahawk harness(es)
	Horizon box failure	Contact Headsight

Symptom	Problem	Solution
AHHC Diagnostics		
No automatic operation height or tilt (If the Horizon box does not have a green status light, go to "Advanced Info>>12V Power Test")	Wiring is not connected properly	Check wiring from sensor to combine
	Header control is not enabled with cab controls	See Operation section of this manual
	Wrong HHC mode selected	Turn on AHHC, see Operation section of this manual
	Sensors are out of range (Direct Wire Systems only)	Correct sensor voltages to between 0.5V < xx < 4.0V, low on ground.
	Power supply from combine less than 10V to Horizon.	Roading switch on, set to field mode. See Installation, 12V Power Test
	Horizon box/wiring failure	>>Diagnostics>>Overview>>Combine Inputs 0.8-1.2V head fully lowered 3.8-4.2V sensors off ground
Header is too jumpy	Combine is improperly set	See - Setting section of this manual 4/500 Decrease Fast Drop 6/700 Reduce Auto Drop Rate Decrease sensitivity
	Horizon or combine needs to be re-calibrated	See Calibration section of this manual
Header responds to slowly	Horizon or combine needs to be re-calibrated	See Calibration section of this manual
	Combine is improperly set	See - Setting section of this manual 4/500 Increase Fast Drop 6/700 Increase Auto Drop rate Increase sensitivity
Combine Header Cal Fails (Cutting Height Limits) or (Learning End stops)	Header not properly connected	Verify that Horizon harness is attached to VS2, and Horizon box has power.
	Horizon Has Errors	Repair error, clear error codes Cycle key Recalibrate Horizon
	Insight Outputs are not correct >>Diagnostics>>Overview>>Combine Inputs 0.8-1.2V head fully lowered 3.8-4.2V sensors off ground	Recalibrate Horizon on flat surface. Reset Horizon Horizon defective
	Combine computer needs to be reset (4/500 Series only)	Disconnect header Multilink with key on, motor running. Turn off key/motor. Reconnect Header Turn on key, start engine.

Symptom	Problem	Solution
AHHC Diagnostics		
Cannot operate head high enough	Calibration not properly completed	Perform Horizon and Combine calibration on flat level surface
	Sensors too short	Install extensions on corn sensors.
Cannot operate head low enough	Calibration not properly completed	Perform Horizon and Combine calibration on flat level surface
	Special software needed	Contact Headsight regarding optional products Foresight and/or Feathersight
Header dives to ground and recovers entering crop	Lower Rate set too High	See Combine Specific Settings
	6/700 Series: To much play in feeder to header coupling	See Advanced Info>>600 & 700 Series Calibration Issues
Header works upward, then dives to ground . (400 & 500 Series only)	Slow Lower non-functional	Test combine manual slow lower mode. Turn OFF Thresher & Header Use RTC and AHC buttons to test slow raise/lower modes. Head should raise and lower slowly. If not, repair OEM header lift valve assm.
Head Jumps and Jerks whole combine	Drop rate too fast	See Combine Settings section of this manual)
	Discharged accumulator	Test accumulator as described in combine owner's manual, replace or recharge as necessary
Combine will not calibrate	Horizon not calibrated	Calibrate Horizon
	Horizon Outputs incorrect	See: >>Diagnostics>>Overview>>Combine Inputs
	Combine Problem	Repair Combine

Symptom	Problem	Solution
Lateral Tilt Diagnostics		
Height works but not Tilt	Increase Tilt Sensitivity.	››Setup››Settings››Tilt Sensitivity Increase Tilt sensitivity
	Rare combine problem	››Setup››Advanced››Increase Combine Max Tilt to 3.0V.
Head rocks back and forth	Tilt Sensitivity too high	Adjust sensitivity in combine ››Setup››Settings››Tilt Sensitivity Decrease Tilt sensitivity Press Check
	Insight/Combine not calibrated properly (do Cal on flat surface)	See Calibration Section
Header tips wrong way (Once head is moved off level, it continues all the way in either direction)	Left and Right sensor harnesses reversed	Connect sensor harnesses to correct plugs on adapter harness.
Head tips all the way one direction	Improperly adjusted sensors	Adjust the sensors to both be about 1-1.2V when sitting flat on the ground
	Sensor harness improperly wired	See Diagnostics: Sensor and Harness Spec: Note about reversed wires in connectors.
	Poor connection	Check harness and connectors for cut/torn wire or loose terminals Make sure terminals are properly latched, not "pushed back", in connector body
	Sensor or harness fault	See Diagnostics: Sensor & Harness
	Insight box failure	››Diagnostics››Overview›› Combine Inputs 1.0V head fully lowered 4.0V sensors off ground
	Multilink wiring failure	Check AHHC sensor voltages in CEBIS (Lexion Service tool only)
	Combine problem	Test combine on a different header

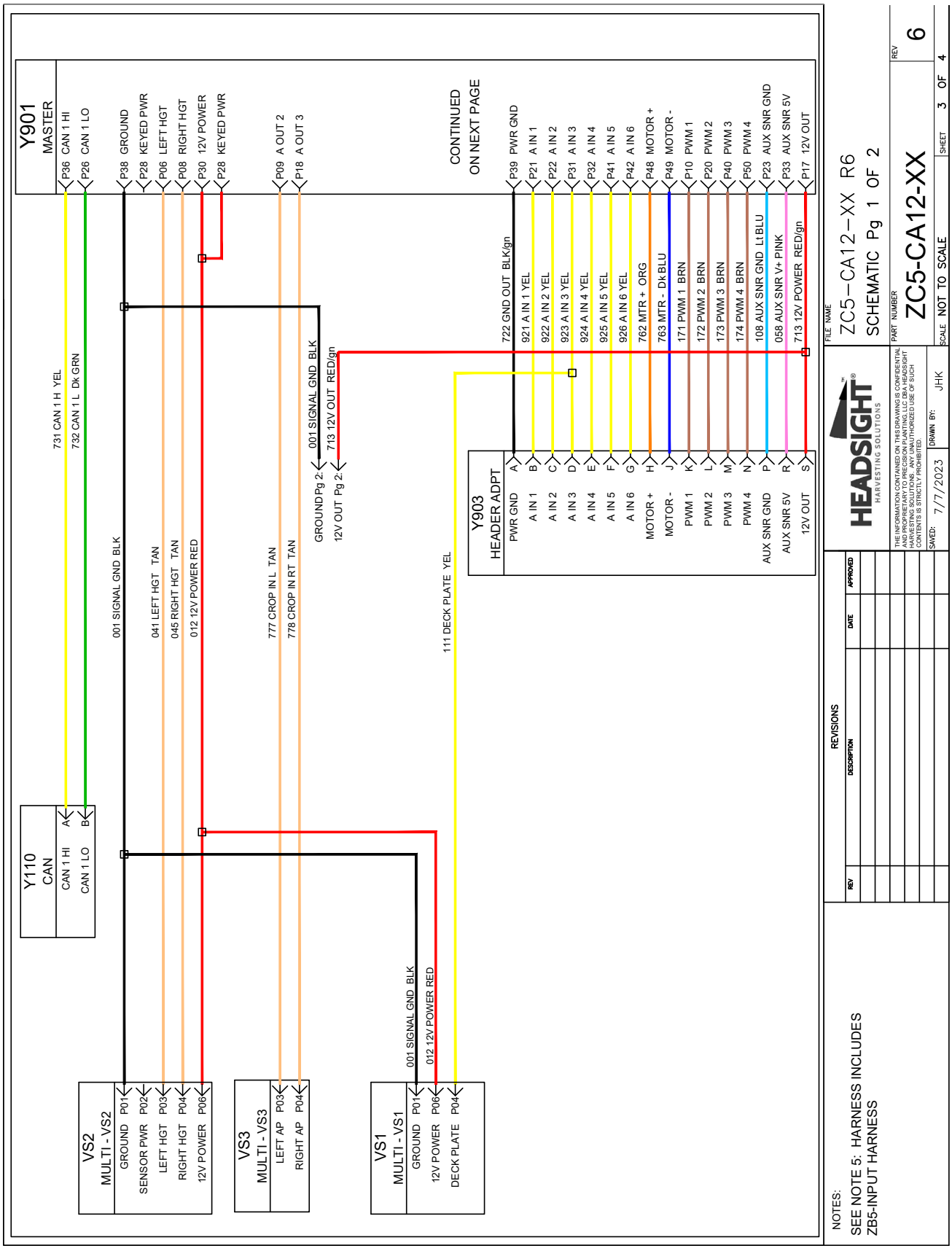
Symptom	Problem	Solution
Lateral Tilt Diagnostics		
Header runs slightly out of level	Horizon or combine not calibrated correctly	Recalibrate Horizon and combine on flat surface
	Sensor physically misadjusted	Make sure both end sensors mount the same and hang at the same angle
	Header not adjusted correctly	Make sure the frame to snoot angle adjustment is the same across the width of the head Lower and tilt head until snoot tips just touch on a flat surface. Make sure frame is level to ground within 1" from left to right. Readjust snoots if necessary.
	All the above fails to correct problem:	››Setup››Settings››Tilt Balance Adjust balance to level Head (Must be reset to 100 before calibrating combine)

Schematics

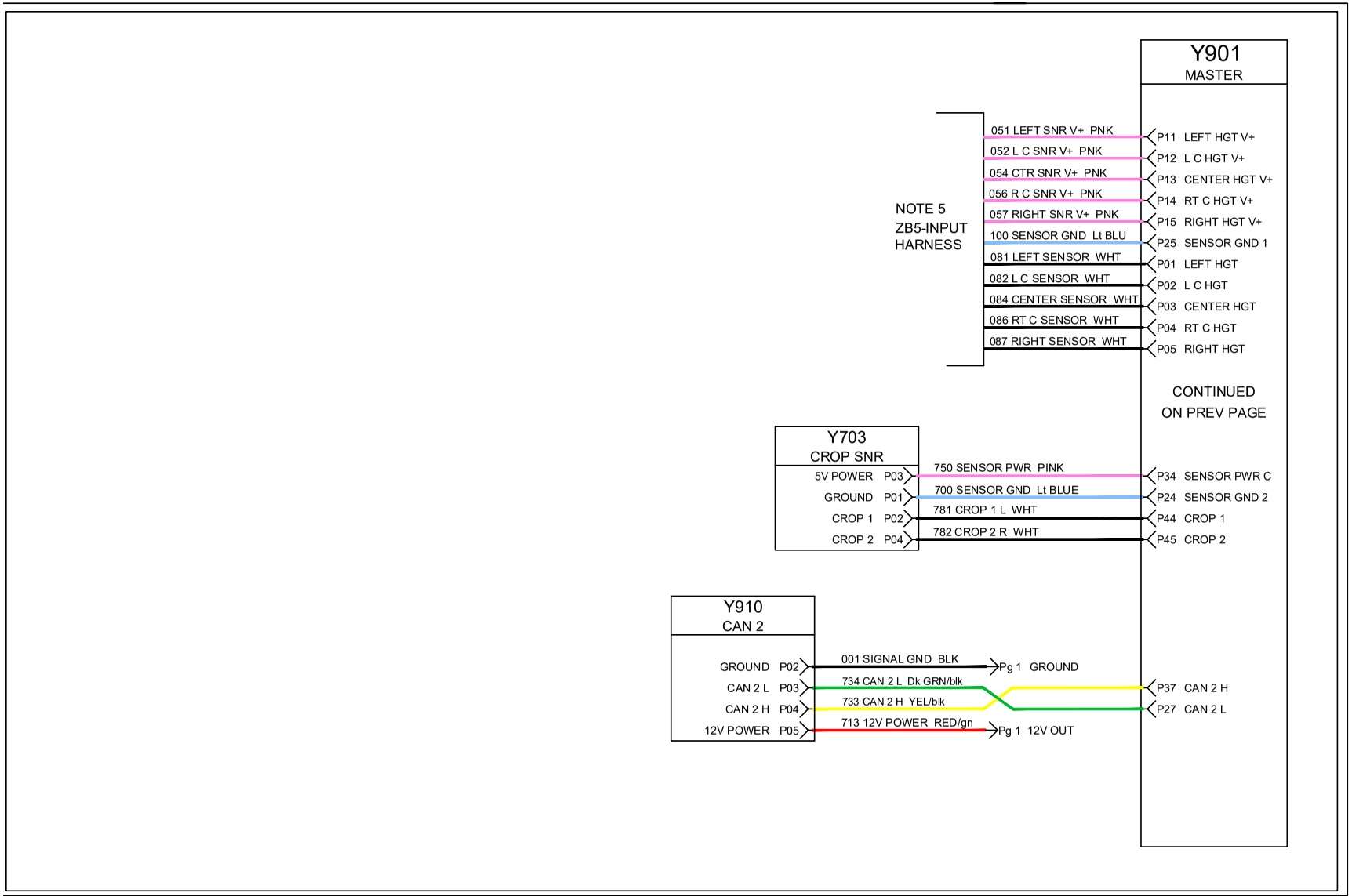
The Horizon Harness schematic is typical of harness used for all applications in this manual. A number of variations are available. Some heads have prewired harness that use integrated Horizon.

The following schematics are provided for troubleshooting and installation purposes only. Unauthorized uses, such as using them to replicate harnesses for resale, are strictly prohibited under copyright law.

Horizon Harness (typical) -Pg 1



Horizon Harness (typical) - Pg 2



NOTES:

SEE NOTE 5: HARNESS INCLUDES ZB5-INPUT HARNESS

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

HEADSIGHT HARVESTING SOLUTIONS

SAVED: 7/7/2023 DRAWN BY: JHK

FILE NAME: ZC5-CA12-XX R6

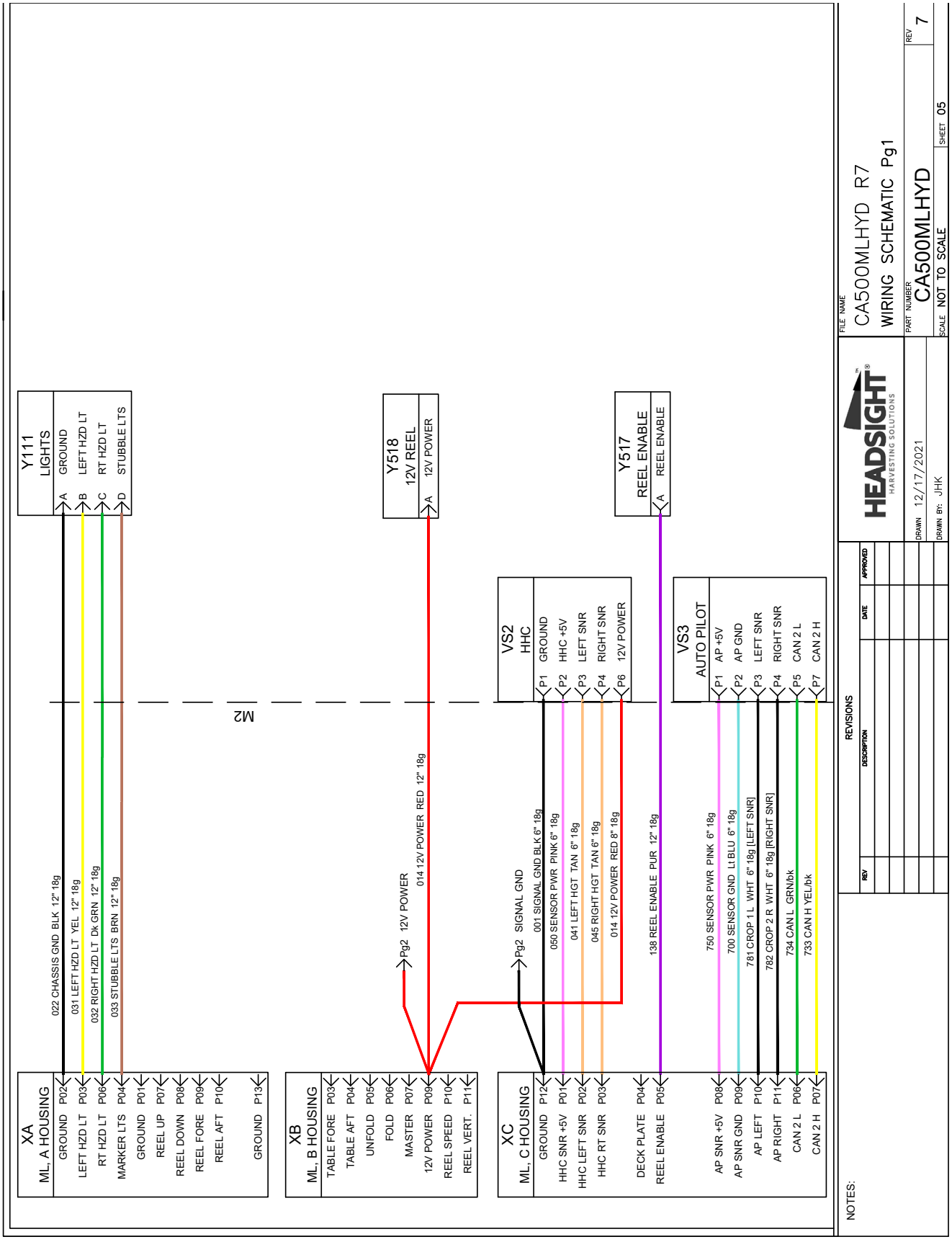
SCHEMATIC Pg 2 OF 2

PART NUMBER: ZC5-CA12-XX

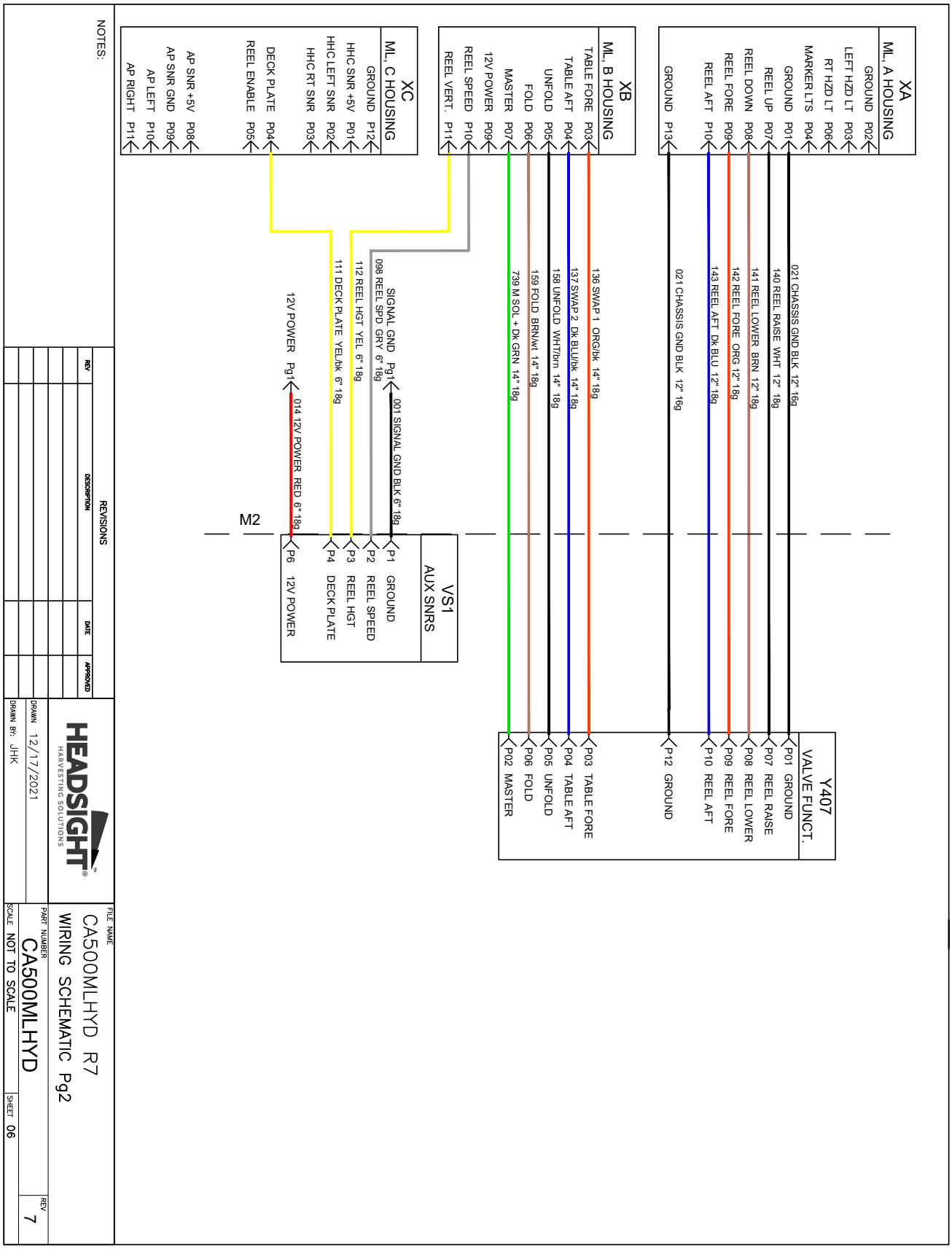
REV: 6

SCALE: NOT TO SCALE SHEET 4 OF 4

Header Multilink - Internal Schematic Pg 1



Header Multilink - Internal Schematic Pg 2



NOTES:

REV	DESCRIPTION	DATE	APPROVED

REVISIONS

HEADSIGHT HARVESTING SOLUTIONS

DRAWN: 12/17/2021

DRAWN BY: JHK

FILE NAME: CA500MLHYD R7

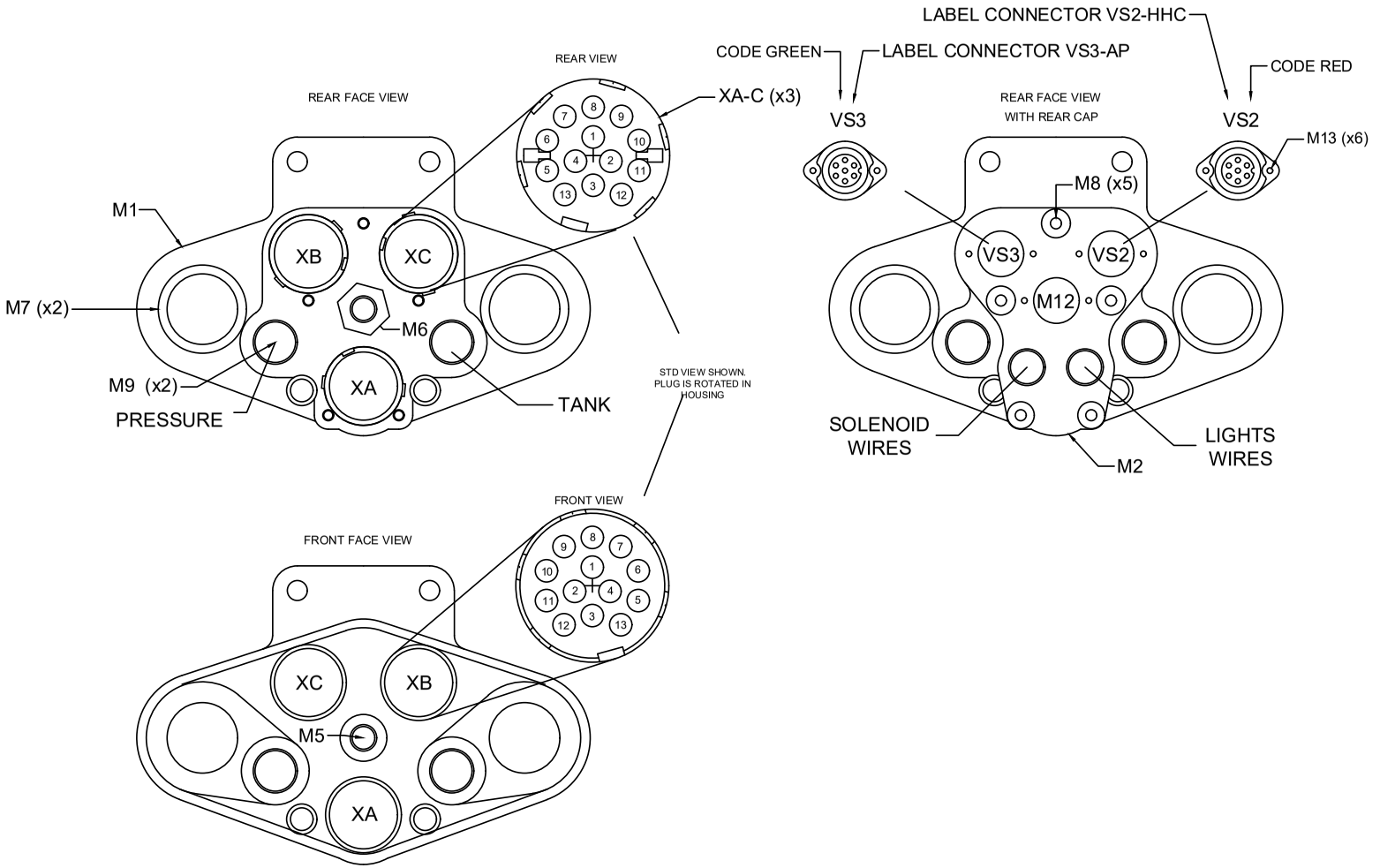
WIRING SCHEMATIC Pg2

PART NUMBER: CA500MLHYD

REV: 7

SCALE: NOT TO SCALE

SHEET: 06



NOTES:

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
7	HEATSHRINK ON CABLES, CAN	12/17/21	JHK

HEADSIGHT HARVESTING SOLUTIONS

DRAWN 12/17/2021

DRAWN BY: JHK

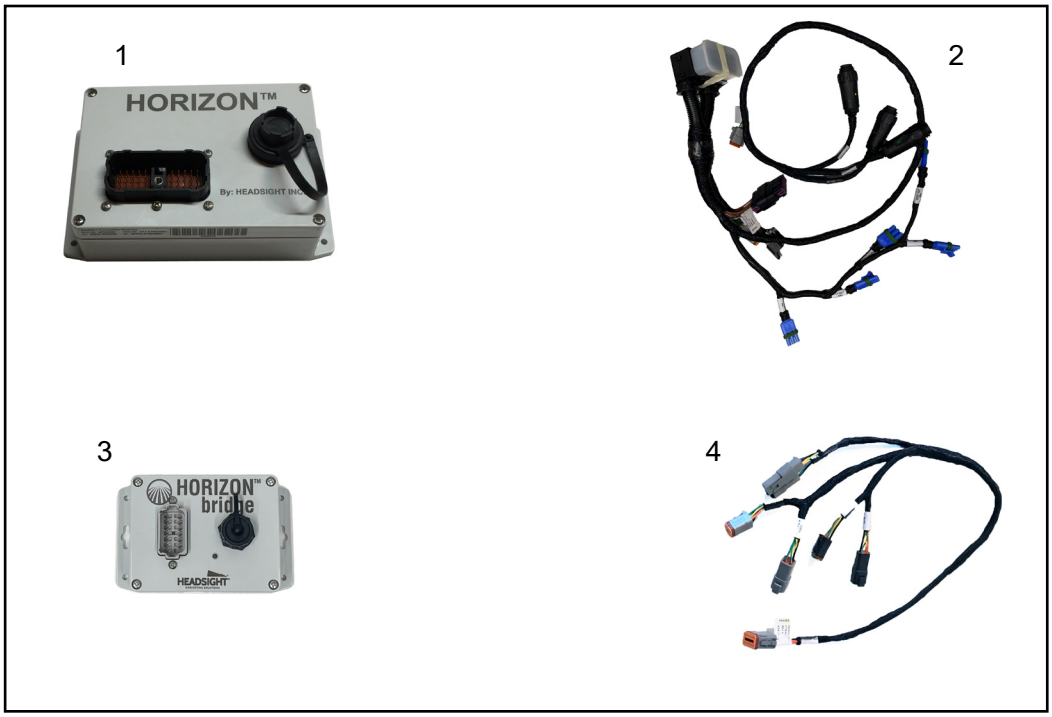
FILE NAME
CA500ML R7
MECHANICAL LAYOUT

PART NUMBER CA500MLHYD | REV 7

SCALE NOT TO SCALE | SHEET 01

Parts

Horizon & Harnesses



ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	Horizon Base	Header Interface
2	1	ZC5-CA12-XX	Main Header Harness
3	1	Horizon Bridge	ISOBUS Interface
4	1	By Model:	Bridge ISOBUS Harness
	Shown	HT9412	AgLeader
		HT9413	JD w/AgraGPS
		HT9423	JD w/GreenFit

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 of 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: **1/2023**

HEADSIGHT™
HARVESTING SOLUTIONS

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