

CONVERSION

INSTALLATION & OPERATION MANUAL



MACDON 974 TILT KIT

09040121c



HEADSIGHT.COM | 574.546.5022

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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:

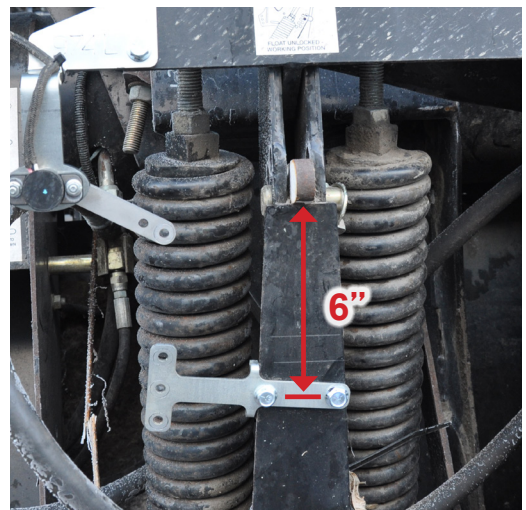
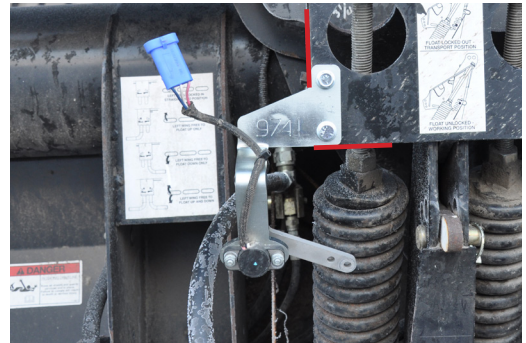
1. Perform all combine and header manufacturer safety precautions for servicing header.
2. Insert stop to prevent movement of header.
3. Set combine parking brake.
4. Turn off combine and remove key from ignition.
5. Disconnect all drive shafts from the header.



Installing Sensors

Left Sensor

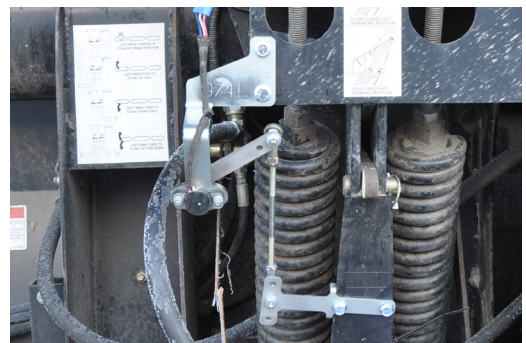
1. Clamp sensor bracket to header frame as shown.
 - Edge of bracket should align with outer edge of frame
 - Brackets are marked 974L for left side and 974R for right side
 - Left/Right considered as sitting in combine seat
2. Drill holes and mount bracket using the 5/16 hardware provided.
 - Tighten hardware
3. Clamp arm bracket to header in location shown.
 - Center of bracket should be 6 inches from top of header brace
4. Drill 17/64 inch holes and mount brackets using the 5/16 self-tapping hardware provided.
 - Tighten hardware



5. Adjust turn buckle arm so there are 7.75 inches eyelet to eyelet.

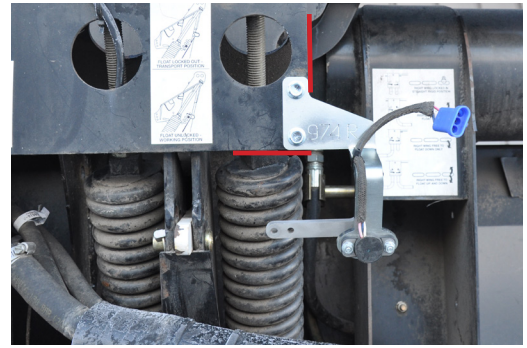


6. Install sensor linkage rod in center hole of arm bracket and outer hole in sensor assembly arm with nuts toward the combine as shown.



Right Sensor

7. Clamp sensor bracket to header frame as shown.
 - Edge of bracket should align with outer edge of frame
 - Brackets are marked 974L for left side and 974R for right side
 - Left/Right considered as sitting in combine seat
8. Drill holes and mount bracket using the 5/16 hardware provided.
 - Tighten hardware



9. Clamp arm bracket to header in location shown.
 - Center of bracket should be 6 inches from top of header brace
10. Drill 17/64 inch holes and mount brackets using the 5/16 self-tapping hardware provided.
 - Tighten hardware



11. Adjust turn buckle arm so there are 7.75 inches eyelet to eyelet.



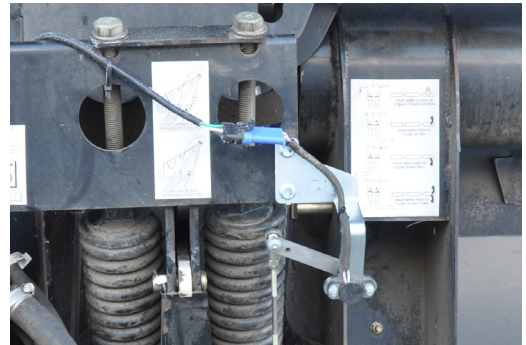
12. Install sensor linkage rod in center hole of arm bracket and outer hole in sensor assembly arm with nuts toward the combine as shown.



Installing Wiring

1. Connect the PFB17 (17') extension harness to the right sensor.

2. Connect the PFB4 (4') extension harness to the left sensor



3. Route right extension harness along the top of the float adapter to the left side of the feederhouse.



4. Carefully route both extension harnesses across the float adapter to the adapter harness (see next section).

- Make sure to leave enough slack that the wires will not get stretched when the header tilts or rocks.



Adapter Harness Wiring



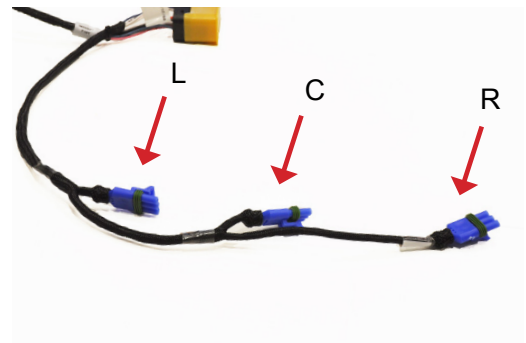
Make sure the adapter harness will reach to the OEM header plug (see combine specific section below).

For Kits w/ Interface Box

1. Install the Insight box near the header connection point using the 2 piece brackets provided.
 - Older vertical style shown, horizontal mount box similar
2. Connect the adapter harness to the Interface Box.
 - Y101 to Insight

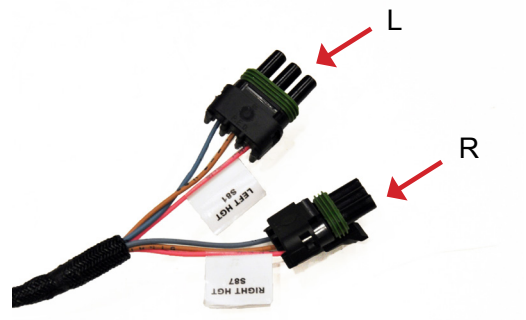


3. Connect sensor extension harnesses.
 - Connect right sensor extension harness to connector marked R on main harness
 - Connect left sensor extension harness to connector marked L on main harness
 - Center is not used



For Kits w/o the Interface Box

1. Install the adapter harness for your combine (see combine specific section below).
2. Connect sensor extension harnesses.
 - Connect right sensor extension harness to connector marked R on main harness
 - Connect left sensor extension harness to connector marked L on main harness



CNH and JD 50 Series Combines

1. Remove the cover cap and nut holding the OEM connector in place.
2. Remove OEM harness from bracket and install Headsight harness.
 - Reinstall retaining nut on Headsight harness.
3. Connect the Headsight main harness plug to the OEM connector.
4. Connect the sensor harnesses to the main harness.
5. Secure all wiring with zip ties.



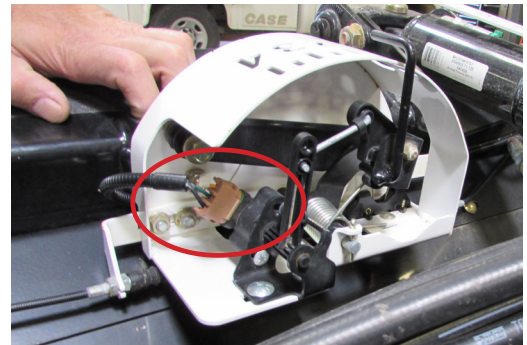
JD 60 Series and AGCO MY2002 and Newer Combines

1. Connect main harness to existing header connector and route opposite connector to combine connection location.
2. Connect Y161 and Y162 inline with MacDon selector harness connection.
3. Secure all wiring with zip ties.
4. Follow sensor adjustment section of this manual then calibrate combine following operators manual instructions.

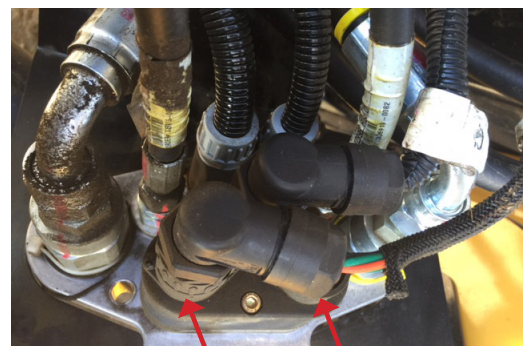


Lexion Combines

1. Identify the OEM MacDon AHHC sensor in center of header frame.
2. Trace the existing harness from OEM MacDon AHHC sensor to the Multilink.



3. Disconnect the OEM harness from the Multilink port VS2. (See note below)
4. Connect the Headsight harness to the Multilink port VS2 in place of the OEM harness.
 - The OEM harness and sensor are not used
5. Secure all wiring with zip ties.
6. Follow sensor adjustment section of this manual then calibrate combine following the operators manual instructions.



VS2

VS3



Some MacDon heads may have the location of Ports VS2 and VS3 reversed. Make sure you trace the harness from the OEM sensor in the middle of the head and replace that harness plug with the Headsight harness connector VS2/Y401.

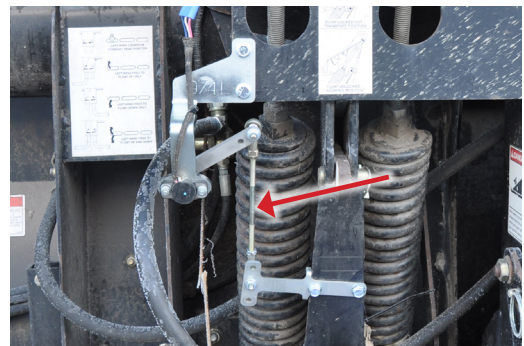
Calibration

Sensor Adjustment (w/o Insight)

When calibrating/adjusting sensors, always:

- Run reel fully forward for maximum “out front” weight
- Ensure Center Link is set to D
- Make sure the head has full motion. The float springs cannot be so tight that the head frame floats up when the head is fully raised
 - If necessary, loosen the springs during calibration, then retighten to desired setting
 - NOTE: Lexion combines in particular have this issue, as they raise the head significantly higher than other combines, causing it to roll back farther and float up more

1. Plug in sensor tester to sensor being adjusted.
2. Loosen sensor tie rod linkage jam nuts.
3. Adjust length of tie rod to proper voltage.
 - Increase length of tie rod to decrease voltage
 - Decrease length of tie rod to increase voltage
 - Header raised voltage = 3.5-4.3V
 - Header lowered voltage = 0.8-1.5V
 - Sensor change must have a range greater than 2.0V
 - Voltage range on left and right sensor should match closely
4. Tighten tie rod linkage jam nuts.
5. Disconnect sensor tester and reconnect extension harness.



Sensor Adjustment (With Insight Box)

1. Start combine to power the Insight box.
2. Setup Insight box (this will only need to be done the first time you power up Insight.)
 - Choose Language
 - Choose Combine Brand
 - Choose Combine Model
 - Choose “Draper” or “Standard” as header type
 - Choose “2” sensors



Before pressing the check button to begin calibrating, be sure to adjust voltages at this screen by adjusting sensors tie rod length.

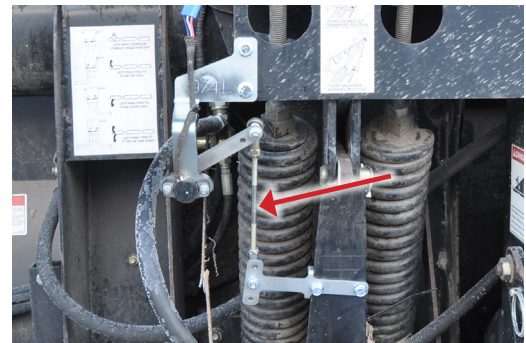
3. Using the Left and Right voltage inputs displayed on the Insights box, raise and lower the header and adjust the tie rod lengths so the voltages are in the correct range.

- Increase length of tie rod to decrease voltage
- Decrease length of tie rod to increase voltage
- Header raised voltage = 3.5-4.3V
- Header lowered voltage = 0.8-1.5V
- Sensor change must have a range greater than 2.0V
- Voltage range on left and right sensor should match close as possible

```

  Raise Header
  Then Press (✓)
  LEFT      RIGHT
  0.0V      0.0V
  
```

4. Tighten tie rod linkage jam nuts.
5. Park the combine on a smooth, level surface, preferably a cement driveway or shop floor.
6. Follow on-screen instructions.
 - “Raise Header” all the way so that NO sensors touch the ground and press  enter
 - “Lower Header” all the way down on the skids and press  enter



Combine Calibration



You may wish to refer to both your MacDon and combine Owners Manuals for details on Setup and Calibration of the AHC. Also, Headsight has much more detailed combine operation information in specific “combine” manuals available on our website at headsight.com/manuals. Use the manual browser to select & download these manuals.

All Makes/Models

When Calibrating, always:

1. Make sure lock pins are UNLOCKED.
2. Roll head pitch forward - Center Link is set to C-D.
3. Make sure that the float optimizer is “level” with the header frame .
 - Tilt faceplate until float optimizer & header frame are level with each other
4. **Make sure the head float has full motion when raising the header. The float springs cannot be so tight that the head frame floats up off the stops when the head is fully raised.**
 - Run reel fully forward for maximum “out front” weight.
 - If necessary, loosen the springs during calibration, then retighten to desired setting
 - NOTE: Lexions in particular have this issue, as they raise the head significantly higher than other combines, causing it to roll back farther and float up more

Combine Calibration Pro-Tip



Many operators of all makes/models claim that “blocking the feederhouse” during combine calibration improves performance in the field, both for the OEM MacDon sensor or the Headsight Tilt sensors.

Required for Lexion, recommended for all combines for best performance.

During the combine calibration process, use blocks under the feeder faceplate to stop further movement downward. The block height should stop the feeder just as the frame of the float optimizer reaches maximum normal operating travel downward (indicator stops moving).

By calibrating only the actual field-usable range, rather than including the range used during detaching the head, the combine AHHC performs better.



1. Park the combine and head on a firm, level surface.
2. Make sure head pitch angle is tilted forward (set to C-D).
3. Make sure lift springs are not so tight head floats up when fully raised.
 - #1 reason for tilt kit service calls - very important!
 - Run reel fully forward for maximum “out front” weight.
 - If necessary, loosen the springs during calibration, then retighten to desired setting
4. Lower the head until the skids contact the ground & level the header/feeder.
 - Tilt combine faceplate until Float Optimizer & Header frames are level with each other
5. Continue to lower the feeder while watching the height range indicator. The indicator should drop toward 0-1.
6. When the indicator stops moving, the float optimizer should have reached maximum “normal” downward travel.
 - Assumes properly adjusted indicator
 - Feeder should not be allowed to lower fully into the “unhooking the header” range
7. NOTE: it might take several cycles to identify the best height to stop the travel at.
8. Place blocks or jackstands under the front feederhouse faceplate to limit float optimizer from lowering further.
9. Perform the combine calibration.
10. Remove the blocking and test operation.



CaseIH & New Holland

Flagship w/ Gen2 Software & NH-CR/CX

For CaseIH Flagship w/ Gen2 Software, Midrange x140, and New Holland CR combines.

If you do not have a “Header” selection under Calibrations, see Gen 1 section

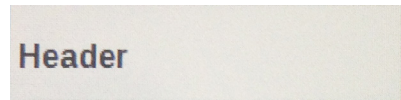
1. Make sure header type under “Toolbox>>Head1” is set correctly.



Head 1

2. Choose Calibrations>>Header.

- Follow the on-screen steps



3. After successful calibration, set initial AHC #1 at lowest height on Macdon indicator.



CaseIH w/ Gen1 Software

For CaseIH Flagship w/Gen 1 Software, 21-25xx, x088, x130, combines.

1. Thresher and header must be off. Lower head fully to ground and hold for 3 seconds. Press and Hold Raise button until head reaches top of motion.
 - Header should pause ~12” off the ground
 - NO “S1” header code should appear in the corner post during or after calibration

John Deere

GS4/4600 - S700 Series

1. Press  Menu.
2. Press  Machine Settings.
3. Press  for calibrations.
4. Select  Header.

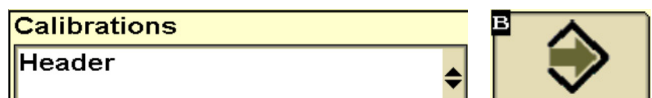


The following calibrations must be done in the correct order as listed below!

5. S780 and S790 machines only: Perform  Feeder House Lateral Tilt Speed Calibration “Tilt Speed Calibration”
6. Perform  Feeder House Raise Speed Calibration Feeder House Raise Speed Calibration.
7. Perform  Header Calibration Header Calibration.

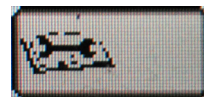
GS3/2630 - S6xx-Series

1. Choose Menu>>Combine>>Service>>Calibrations.
2. Perform Feeder House Raise Speed Calibration.
 - Follow on-screen steps
 - Press Enter to save Calibration
3. For S680, S690: Perform Feeder House Tilt Speed Calibration.
4. Perform Header Calibration.
 - Follow on-screen steps
 - Press Enter to save Calibration



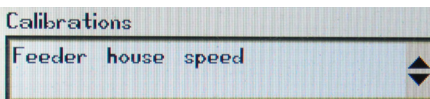
70 Series

1. Choose Service>>Calibrations.



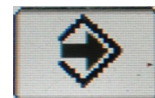
2. Perform Feeder House Speed Calibration.

- Follow on-screen steps
- Press Enter after each step
- Press Enter to save Calibration



3. Perform Header Calibration.

- Follow on-screen steps
- Press Enter after each step
- Press Enter to save Calibration



50 & 60 Series

1. Press  button on cornerpost and then press  until the screen reads "CAL".

2. Press  and then press  until the screen reads "Hdr".

3. Press  screen will read "Hdr - dn" and lower the header completely to the ground.

4. Press  screen will read "Hdr - up" and raise the header to the top of its stroke.

5. Press  screen will read "EOC" and then press .

6. Press  until returned to the main screen.

Lexion



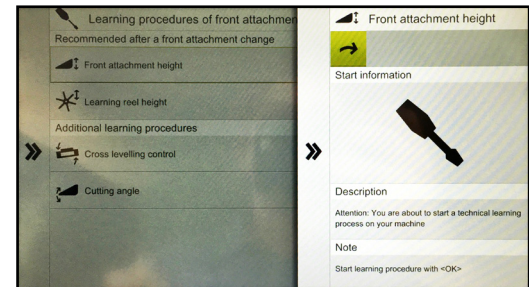
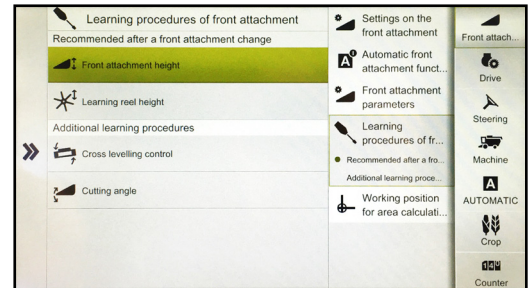
Lexion: You may wish to “block” the feeder on the your Lexion during calibration to improve performance, See Advanced Info

8000 Series

1. Choose “Front Attachment”
2. Choose “Learning Procedures”
3. Choose “Front attachment height”
4. Start Thresher and Header.
5. Set throttle to full speed
6. Perform the “Front attachment height” calibration.

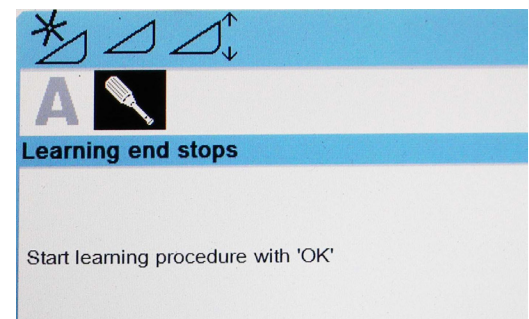
- Press OK  to start calibration
- Follow the instructions on-screen
 - Press and HOLD the selected function until instruction changes

7. Tap  to close calibration screen



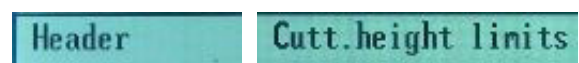
600 & 700 Series

1. Choose Icons shown left to right in top bar.
2. Start Thresher and Header.
3. Set throttle to full speed
4. Perform “Learning End Stops”



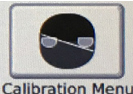
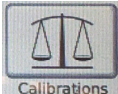
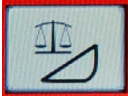
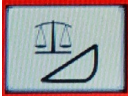
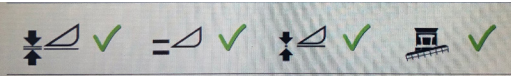
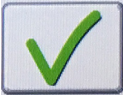
400 & 500 Series

1. Choose Settings>>Header>>Cutt. Height Limits.
2. Start Thresher and Header.
3. Set throttle to full speed.
4. Perform “Cutt. Height Limits”.



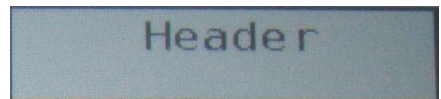
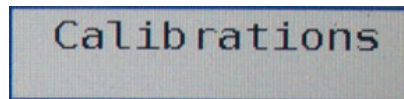
Agco

Gleaner S9 or Fendt Ideal

1. Press  Combine.
2. Press  Calibration Menu or  Calibrations.
3. Press  or  to Select Header Calibration.
4. Press  or  again to start Calibration.
5. Follow the on screen instructions.
6. If calibration is successful, the following  should appear.
7. Press  to finish calibration.

Axial MY 2009 & up - MF, Chal. & Gleaner A Series

1. Choose Diagnostics>>Calibrations>>Header. Follow the on-screen steps.



Gleaner R-S88, Early Axial

1. Refer to Combine Owners manual–multistep process.



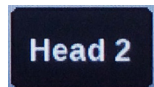
Settings

Enable Combine Lateral Tilt

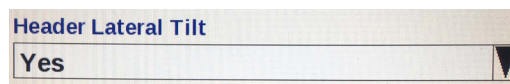
CNH

All 8010 & up

1. Choose Toolbox>>Head2.



2. Enable Lateral Tilt, "Installed" or "Yes".
3. Header Sensors should also be "Installed" (some combines do not have this option).



For all Midrange & Flagship combines post 2588 (X088, 8010, & up), auto Lateral Tilt (Field Tracker) is enabled automatically if the combine calibration sees a valid left & right sensor. It cannot be turn off, except by turning off the entire tilt function (no auto or manual control).

- Certain field operations (cutting out terraces) may benefit from disabling auto lateral tilt, while maintaining manual tilt capability
- Headsight has a special adapter available that allows in-cab disabling of Field Tracker while allowing the Auto height & manual tilt functions to work. Call Headsight & request p/n HT3818

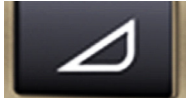
CIH 14-25xx

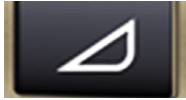
1. Turn on Field Tracker.

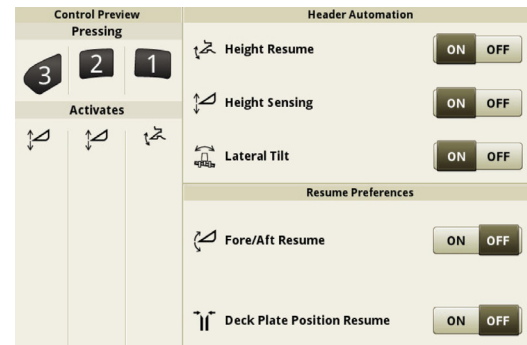


John Deere

GS4/4600 - S700 Series

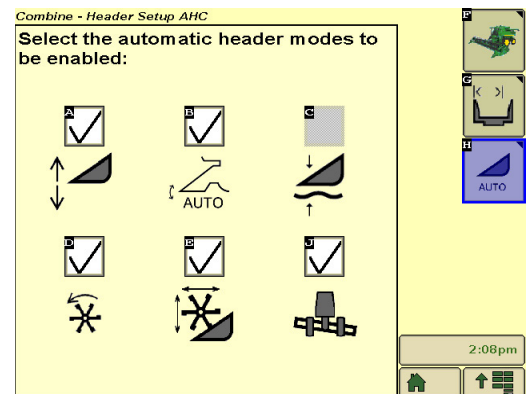


2. Press the  button below the screen
3. Check the settings for AHHC.
 - Height Resume should be ON
 - Height Sensing should be ON
 - Lateral Tilt should be ON



GS3/2630 - S6xx Series

1. Enable on the combine cornerpost.
 - Header height control
 - Header height resume
 - Contour Master



JD 50-70

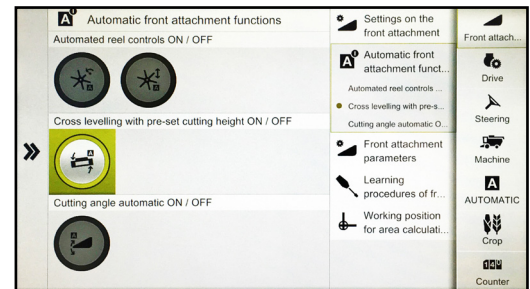
1. Enable on the combine cornerpost.
 - Header height control
 - Header height resume
 - Contour Master



Lexion

8000 Series

1. Choose “Front Attachment”
2. Choose “Automatic front attachment functions”
3. Turn ON “Cross levelling with preset cutting height”



4/5/6/7xx Series

1. Set Selector switch is Lateral Tilt Mode (500 shown, 700 similar.)



Agco

Fendt Ideal

1. Press the Auto Tilt button.



Axial 2009 and Newer - MF, Chal. & Gleaner A & S9x Series

1. Make sure the Lateral Tilt switch is on.
 - S9x similar



Gleaner R-S88, Early Axial

1. Enable the lateral tilt Icon.



Adjust Sensitivity

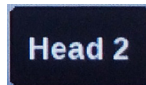


For ALL combines, adjust the sensitivities and/or drop rate as high as possible without causing hunting. This step is **CRITICAL** for proper operation, as many calls are because of sensitivity set to low, especially on CNH combines.

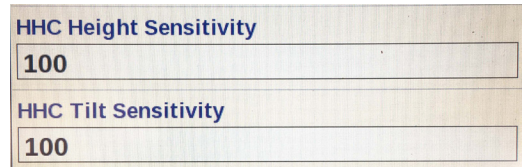
CNH

Flagship, NH-CR, x140

1. Choose Toolbox>>Head2.

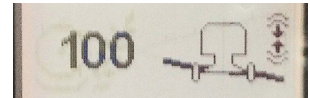


2. Adjust Height and Tilt Sensitivity to maximum (250), then reduce until head does not bounce.



CIH x088, x130

1. Choose Header>>Height or Tilt Sensitivity (Tilt shown).
2. Adjust Height and Tilt Sensitivity to maximum (250), then reduce until head does not bounce.



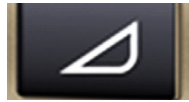
CIH 14-25xx

1. Adjust Balance, Sensitivity, and Gain knobs.

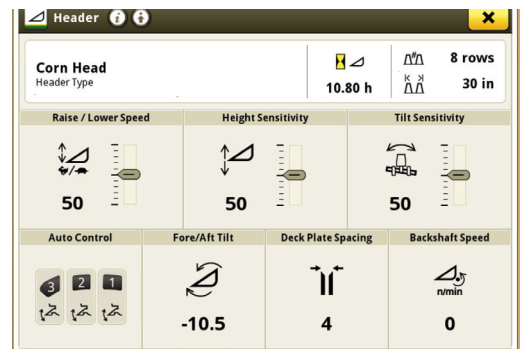


John Deere

GS4/4600 - S7xx Series



2. Press the button below the screen.
3. Drag the sliders to adjust settings as desired.



S600 & 70 Series

1. Set the AHHC height and tilt sensitivity.
 - Press the header button  repeatedly until AHHC sensitivity or contour master sensitivity displays (70 series shown).
 - Use scroll knob to adjust sensitivity.



60 Series STS

Set the automatic drop rate

- Use the knob under the operator's right-hand armrest.



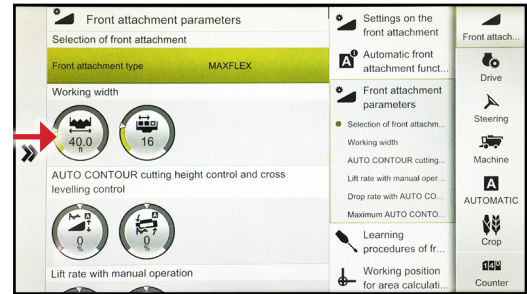
JD 00-10-50-60 Series (Non-STs)

1. Set the automatic drop rate.
 - Use the adjustment on the valve block
2. Set the hydraulic accumulator.
 - Open the accumulator valve 1 full turn (from closed position)
3. Manually move header from full right tilt to full left tilt.
 - The target tilt speed is 5-8 seconds
 - If not correct, download JD 506070S Manual online from our website to for instructions on how to change tilt orifices

Lexion

8000 Series

1. Choose “Front Attachment”
2. Choose “Front Attachment Parameters”
3. Select the desired adjustment
 - If you can not adjust these, see warning about Cebis Mode in Combine Calibration: 8000



4. Adjust Settings as needed during operation.

- Drag caret or tap +/- to change setting
- All Settings have a range of -50 to +50

- Press Enter  to save setting
- Note: the value must be “entered” before taking effect



600 & 700 Series

1. Choose Icons shown Left to right in Top Bar.
2. Choose Sensitivity CAC:
 - Cutting Height Adjustment: This is Height sensitivity
 - Lateral Leveling: Tilt sensitivity
 - Automatic Drop rate–Suggested–40

Sensitivity CAC	
Setting	%
Cutting height adjustment	14
Lateral levelling	0
fast manual raising	0
fast manual lowering	0
Automatic drop rate	0

400 & 500 Series

1. Choose Settings>>Header>>Sensitivity CAC.
 - Adjust to optimize performance



Header

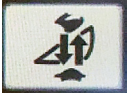
Sensitivity CAC

Agco

Gleaner S9x & Fendt Ideal

1. On the touch screen, press  Combine to get the Combine Main Menu.

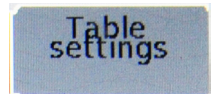
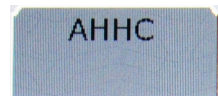
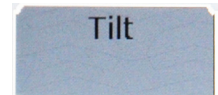
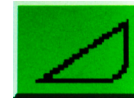
2. On the touch screen, press  Header Settings. Header Settings.

3. Fendt Ideal only, press  Header Rates.

4. Adjust Flow Rates
5. Adjust Sensitivities

Axial 2009 and Newer - MF, Chal. & Gleaner A

1. Choose Header>>Tilt.
 - Adjust Sensitivities
2. Choose AHHC.
 - Adjust Sensitivity
3. Choose Table Settings.
 - Adjust Flow Rates



Gleaner R-S88, Early Axial

1. Adjust sensitivity knobs.
 - If head bounces vertically at minimal sensitivity, the Headsight Flow Rate Kit is recommended



Insight[®] Settings (if equipped)

Tilt Sensitivity

1. To change this setting go to >>Settings>>Tilt Sensitivity in the Insight[™] box. The range is from 5 to 95 with a default setting of 50.
 - If the head is too jumpy from side to side – decrease sensitivity.
 - If you would like the head to be more responsive – increase sensitivity.
 - Adjust the setting as high as possible without rocking.

Tilt Balance

If the head is consistently running higher on one end than the other, Tilt Balance manually tweaks the combine height inputs to level it out. Use tilt balance only after eliminating other possible solutions.

1. Before adjusting tilt balance,
 - Double check to make sure head frame is level to float optimizer
 - Re-calibrate Insight or Horizon box on a flat, level surface
 - Re-calibrate combine on a flat, level surface
2. If head is still not running level, adjust the tilt balance setting.
 - Default tilt balance value is 100
 - Lowering the tilt balance number will lower the left end of the head
 - Raising the tilt balance number will lower the right end of the head
3. Tilt balance setting will only last until the next calibration.
 - Do not recalibrate combine without resetting tilt balance to 100

Operation

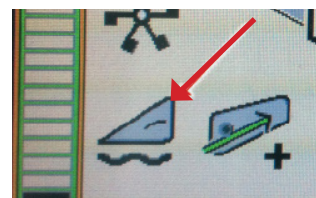


After calibrating Insight, operate the Headsight system exactly like you would use a CIH system.

Setting Automatic Control Height

CNH

1. Start Combine.
2. Enable Machine Separator and Header.
3. Setting automatic control height.
 - CNH all: Manually adjust to lowest height on MacDon indicator
 - CIH: Press and hold #1 for 2 seconds
 - NH-CR: Select # 1, Press and hold Resume for 2 seconds
 - Wavy line mode should engage
4. Adjust the Height point as desired, once Wavy line mode activates.
 - Use the +/- switch to bump the Height setting
 - Manually set desired height and hold button as above



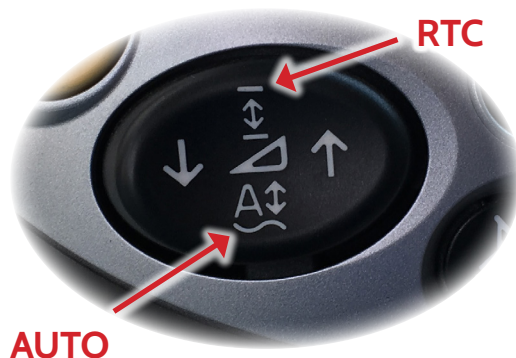
John Deere

1. Start Combine.
2. Enable Machine Separator and Header.
3. Press 2 or 3  resume button on hydro handle to engage AHHC.
4. Turn the  AHC dial on the armrest with header control engaged.
 - Clockwise = higher
 - Counter-clockwise = lower

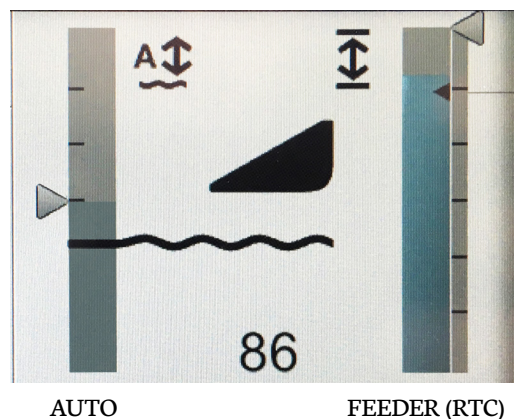
Lexion

8000 Series

1. Engage header and separator clutch
2. Press Auto (A w/wavy line) to enter AHHC.
 - Press again to switch setting.
 - For all heads with height sensors on the head

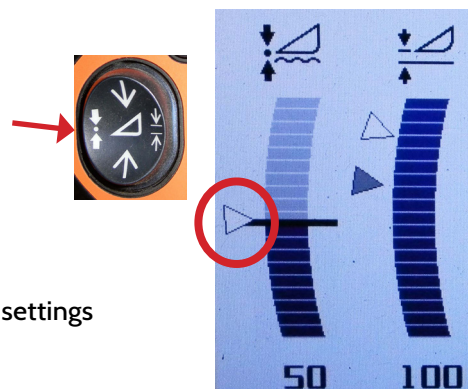


3. Choose desired cutting height setpoints
 - Manually lower the head to the desired cutting height
 - (Must be within the sensor travel range)
 - Press and hold **AUTO** button until the caret resets to the top of the colored bar in the left graph (Active Header Height)



4/5/6/7xx Series

1. Lower head to desired height .
2. Start Separator and Header.
3. Press and hold the LEFT side of the Header Raise/Lower switch for 2 seconds.
 - Marker should set to that height on the Left bar graph
 - Two different heights can be set–tap Left side to toggle between settings
 - Filled marker is active



Agco

Gleaner S9x, Fendt Ideal

1. Turn on separator and header clutches.
2. Enable auto header height mode (A).
 - Fendt shown, Gleaner S9x similar
3. Enable auto tilt (B).



4. Press Auto Header button.
5. Adjust Height as desired with knob (C).



Axial 2009-Up, Except Rxx-S88

1. Start Combine.
2. Enable Separator and Header clutches.
3. Using the Select Switch,  Select Auto Header Height Mode.



4. Enable Auto Tilt
5. Press the header lower button.



6. Adjust Height as desired with knob .

1998-2008, Rxx-S88

Module for MY03-08 is shown, MY98-02 is similar, but a different module used.

1. Start Combine.
2. Enable Separator and Header clutches.
3. Enable AHHC & Auto Tilt modes.
4. Press the header lower button.
5. Adjust Height as desired with knob.



Overview

Insight® Navigation

How to Navigate

When in a menu (selection arrow appears to left side)

-  Enter: chooses the selected menu choice
-  Esc: backs up one menu level
-  Up: moves up within the menu choices displayed
-  Down: moves down within the menu choices displayed

When in a screen which allows setting of parameters

-  Enter: saves value and exits to menu
-  Esc: backs up to last menu level without saving
-  Up: increases the value
-  Down: decreases the value

Meaning of Status Light

● Solid Green:

- System is operating
- No errors detected

● Solid Red:

- System is NOT operating
- No height or tilt signals are sent to combine
- You have changed settings which require calibration of Insight, are currently in a menu which will force a calibration if you make any changes, or are in calibration mode

● Solid Green with Flashing red:

- System is operating
- An error has been detected
- Repair problem then clear errors

● Flashing Red:

- System is operating
- A sensor has been ignored
- See note in Troubleshooting by Error - ER16
- Repair system - Recalibrate Insight

Screen Contrast Adjustment

To change contrast:

- Press and hold Esc  +  Up or  Down to increase or decrease contrast

Resetting Insight[®] to Defaults

To reset all settings hold  +  for 5 seconds

Updating Insight[®] Software with USB Drive



Updating software may cause the Foresight option to be disabled. If you have purchased Foresight, contact Headsight before updating software.

1. You will need:

- USB drive
- Means of loading USB Stick (computer with USB)

2. Load USB drive with new software files.

- Place insightf.hex in the root directory of USB drive (ex. E:\insightf.hex)
- Do not change file names

3. If you do not have the new files you may:

- Download updated software from www.headsight.com
- Order pre-loaded USB drive from Headsight, Inc.

4. Remove cap from USB on front of Insight controller.

5. Insert USB drive card into USB slot on front of Insight.

6. Power Insight.

- Turn on key switch

7. Wait for software to download.

-  Yellow light will blink while download is in progress
-  Green light will turn on solid when download is complete

8. Verify update is successful.

- Go to >>About Insight>>Software Version and read software version number

9. Remove USB drive.

10. Install cap on USB on front of Insight controller.

11. Remove power from Insight.

- Turn off key

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. The Insight box adjusts signals as needed then sends them to combine using the same combine wiring as OEM system would use.
 - All sensors are scaled to an appropriate range for combine
 - Insight will reverse the direction of swing if needed
 - Insight box reads all sensors and sends signals to combine that will cause appropriate height and or tilt response
 - If Foresight is enabled - the Insight box 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 the combine 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.

Reading Voltages

Before you Start



The Insight box can display both the input voltages it receives from each sensor and the output voltages it is sending to the combine.



Sensor voltage =
Insight box input voltage



Insight box output voltage =
Combine sensor input



Insight box scales voltages
received to what combine
needs to function

On the Insight® Box : Sensor Voltages

1. From main menu, go to >> Diagnostics>>Display Voltages

- This shows real-time voltage coming from each sensor.

L	LC	CTR	RC	R
0.0	0.0	0.0	0.0	0.0
Sensors^ L C R				
Outputs> 0.0 0.0 0.0				

2. For more information about sensor history and status see >>Diagnostics>>Detailed Diagnostics>>(parameter of interest)

- Sensor = signal from sensor in volts
- Max = the maximum voltage sent to Insight box from sensor since last calibrated
- Min = the minimum voltage sent to Insight box from sensor since last calibrated
- Enabled = is this sensor enabled to control height? Yes or No
- SetH = the “header raised” voltage set-point recorded during calibration
- SetL = the “header lowered” voltage set-point recorded during calibration
- Reversed = is the polarity of this sensor reversed? Yes or No

Left Sens	=0.00V
Max=0.00V	SetH=5.00V
Min=0.00V	SetL=0.00V
Enabled=N	Reversed=N

On the Insight[®] Box : Output Voltages

1. From main menu, go to >> Diagnostics>>Display Voltages

- This shows real-time voltage sent to the combine
- See Height Signal Output section below for voltage details
 - 2.0-3.0V with head fully lowered
 - 5.0-6.0V with head raised

```

L   LC   CTR   RC   R
0.0 0.0  0.0  0.0 0.0
Sensors^ L   C   R
Outputs> 0.0 0.0 0.0

```

2. Alternately: From main menu, go to >> Diagnostics>>Detailed Diagnostics>> (parameter of Interest).

- Shows actual voltage/signal being sent to the combine
- Available selections depend on combine model

```

Pressure/aux Sensor
→Height Sig. Out
Tilt Signal Out
Tilt Sens. In

```

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.



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
 - Header won't tilt
 - Header 'hunts'

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

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 (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 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

Sections

- Insight Status Light Diagnostics
- AHHC Diagnostics
- Lateral Tilt Diagnostics
- General Insight Problems

Symptom	Problem	Solution
Insight Status Light Diagnostics (Status not green)		
No light	Power wire not installed	Verify Y302 pin D is 12V and pin E is ground.
	Insight harness defective Measure Y101 pin 4 to pin 6 Should be 12V	Replace harness
	Insight defective	Replace Insight
Solid red	Wiring is not connected properly or calibration has not been completed	See Installation and Calibration sections of manual
Flashing Red or Green/Red	Insight box has detected an error	Correct problem, clear error codes, and recalibrate Insight box

Symptom	Problem	Solution
AHHC Diagnostics		
Combine will not calibrate header No automatic operation height or tilt (If the Insight box does not have a green status light, go to "Insight Status Light Diagnostics")	Head is floating up on float springs when raised	Make sure springs are not too tight during calibration
	Sensors incorrectly installed or adjusted	Correct in accordance with the Installation section of this manual Make sure voltage ranges are correct
	OEM MacDon sensor failure (CNH only)	Test repair OEM MacDon Sensor
	Wiring is not connected properly	Check wiring from sensor to combine
	Incorrect Insight calibration (where applicable)	Calibrate Insight
	Header control is not enabled with cab controls	See Operation section of this manual
	Wrong HHC mode selected	Turn on HT, see Operation section of this manual
	Combine problem	Contact your service technician
Header is too jumpy	Combine is improperly set	See - Setting section of this manual Reduce Auto Drop Rate Decrease sensitivity
	Insight or combine needs to be re-calibrated	See Calibration section of this manual
	Discharged accumulator	Test accumulator as described in combine owner's manual, replace or recharge as necessary
Header responds to slowly	Insight or combine needs to be re-calibrated	See Calibration section of this manual
	Combine is improperly set	See - Setting section of this manual Increase Auto Drop rate Increase sensitivity
Head will not Lower Head raises all the way to top	Error detected	Find and repair error
	Wiring not connected, or calibration not completed	See Installation/ Calibration/ Settings sections of manual
	Float optimizer locked up	Release lock pins
	Sensor failed or misadjusted.	If voltage not correct:
	>>Diagnostics>>Display Sensor Voltages.	Adjust sensor
	1-4V as optimizer travels through stroke (see Theory of Operation)	Replace sensor Repair wiring on head
	OEM Sensor failure (CNH only)	Test repair OEM MacDon Sensor

Symptom	Problem	Solution
AHHC Diagnostics		
Head will not Raise	Wiring not connected, or calibration not completed.	See Installation/ Calibration/ Settings sections of manual
Head drops all the way to ground	Height/tilt sensor failure	If voltage not correct:
	>>Diagnostics>>Display Sensor Voltages.	Adjust sensor
	1-4V as optimizer travels through stroke (see Theory of Operation)	Replace sensor Repair wiring on head
Cannot operate head high enough	Calibration not properly completed	Perform Insight and Combine calibration on flat level surface
	Header floating up on lift springs	See Advanced Info
Cannot operate head low enough	Calibration not properly completed	Perform Insight and Combine calibration on flat level surface
	Feeder blocked too high during calibration	Recalibrate with fewer blocks
Header dives to ground and recovers entering crop	Lower Rate set too High	See Combine Specific Settings
	Lexion Cal Problem	See Advanced Info
Center Sensor Error (CNH only)	OEM MacDon sensor or linkage failed	Test/repair OEM Sensor

Symptom	Problem	Solution
Lateral Tilt Diagnostics		
Height works but not Tilt	Increase Tilt Sensitivity.	Adjust tilt sensitivity & gain settings
	Tilt function not enabled on combine	Correct in accordance with the Settings section of this manual
	Insight not calibrated (if applicable)	Calibrate Insight
	Combine not calibrated	Correct in accordance with the Calibration section of this manual
	Wiring not installed correctly	See Installation Section
Head rocks back and forth	Tilt Sensitivity too high	Adjust tilt sensitivity & gain settings
	Insight/Combine not calibrated properly (do Cal on flat surface)	See Calibration Section
Head tips all the way off to one side when raised	Sensors misadjusted	Readjusted sensors to be equal when raised
	Head is floating up on float springs when raised	Make sure springs are not too tight during calibration
	Insight not calibrated correctly	Recalibrate Insight
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.

Symptom	Problem	Solution
Lateral Tilt Diagnostics		
Head tips all the way, always in one direction	Improperly adjusted sensors	Adjust the sensors to all 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>>Detailed Diagnostics>>Tilt Signal Out 4.0V with sensors level (on or off ground)
	Combine problem	Test combine on a different header
Header runs slightly out of level	Not calibrated correctly	Recalibrate on flat surface
	Float optimizer not level to header frame during calibration	Recalibrate with float optimizer level to header
	Frame floating up during calibration	Loosen springs as necessary

Symptom	Problem	Solution
General Insight Problem		
Display dim, blank, or hard to read	Screen contrast improperly adjusted	See Insight Settings
	Weak power supply to Insight™ box	See Installation, 12V Power Test
	Short in sensors/wiring powered by Insight box (Reversed polarity to hall-effect sensors may cause this symptom)	Individually disconnect sensors to isolate problem – screen will regain contrast when faulty sensor is disconnected. Correct short in wiring Insight will need reset after correction of wiring short
	Control box failure	Contact Headsight
Insight does not respond to buttons	Control box or overlay failure	Contact Headsight

Schematics

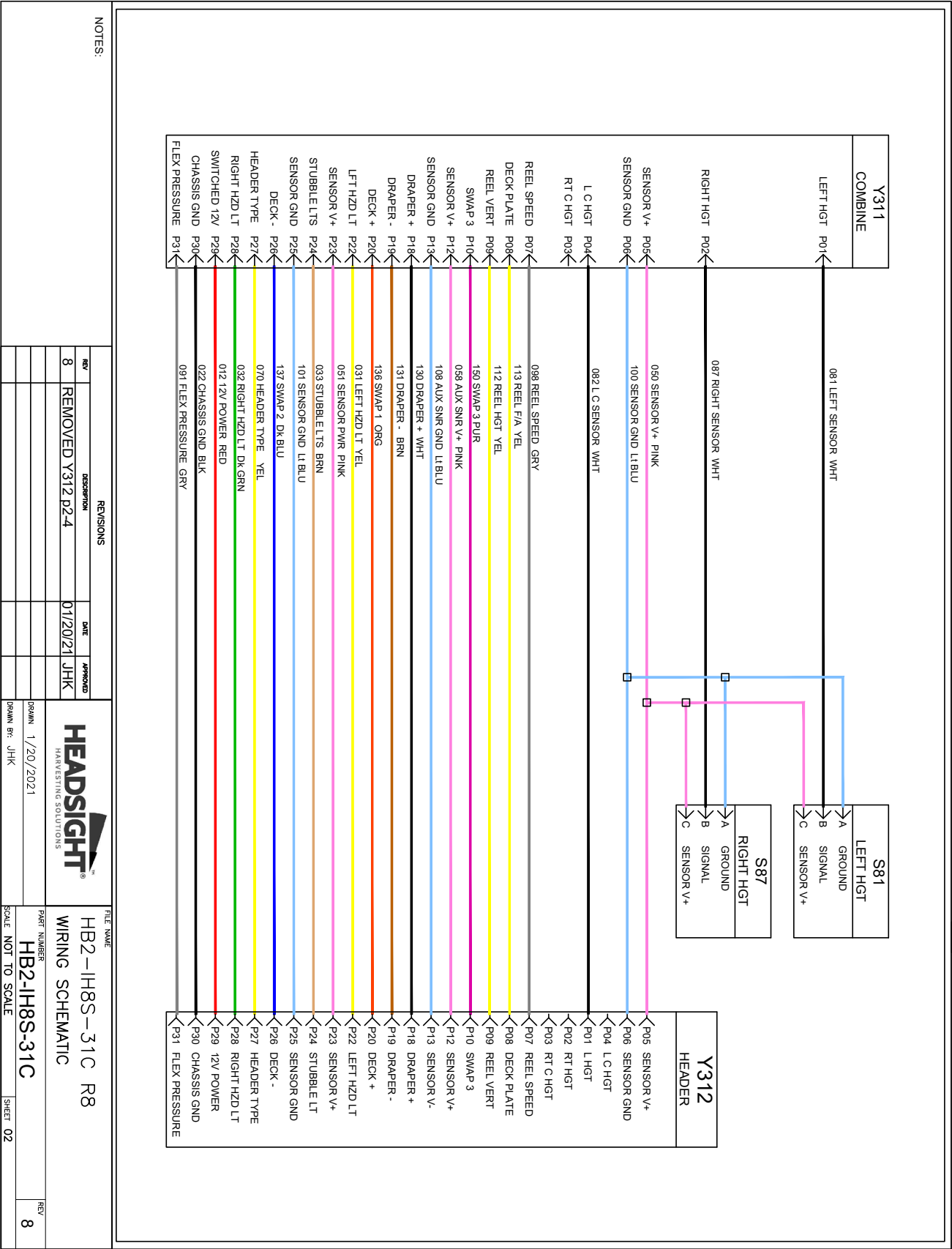


The Insight Harness schematic is the main harnesses used for all applications in this manual, each uses one of the following valve harnesses depending on your steering device.

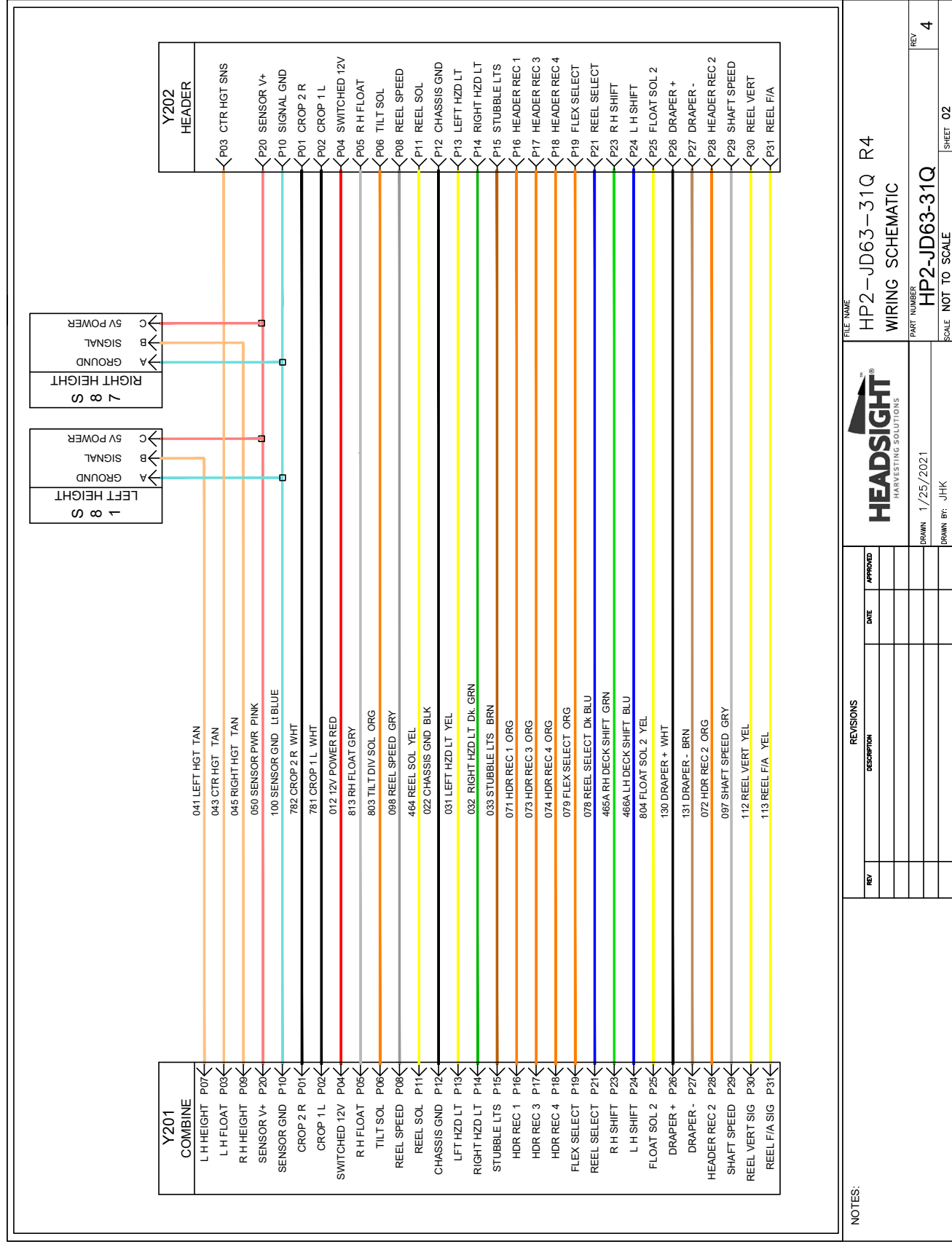


The following schematics are provided for troubleshooting and installation purposes only. Unauthorized uses, such as using them to replicate harnesses for resale, are strictly prohibited under copyright law.

HB2-IH8S-31C



HP2-JD63-31Q - Pg. 1



HP2-JD63-31Q & HB2-AG31-31A - Pg. 2

Y161	
SWAP EXT	
L H HEIGHT P01	
L H FLOAT P02	
R H HEIGHT P03	
REEL F/A SIG P04	

136 SWAP 1 ORG
137 SWAP 2 DK BLU
150 SWAP 3 PUR
157 SWAP 4 BRN

Y162	
SWAP EXT	
P01 CTR HGT SNS	
P02 CTR HGT SNS	
P03 SIGNAL GND	
P04 REEL F/A	

NOTES:

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



DRAWN 1/25/2021
DRAWN BY: JHK

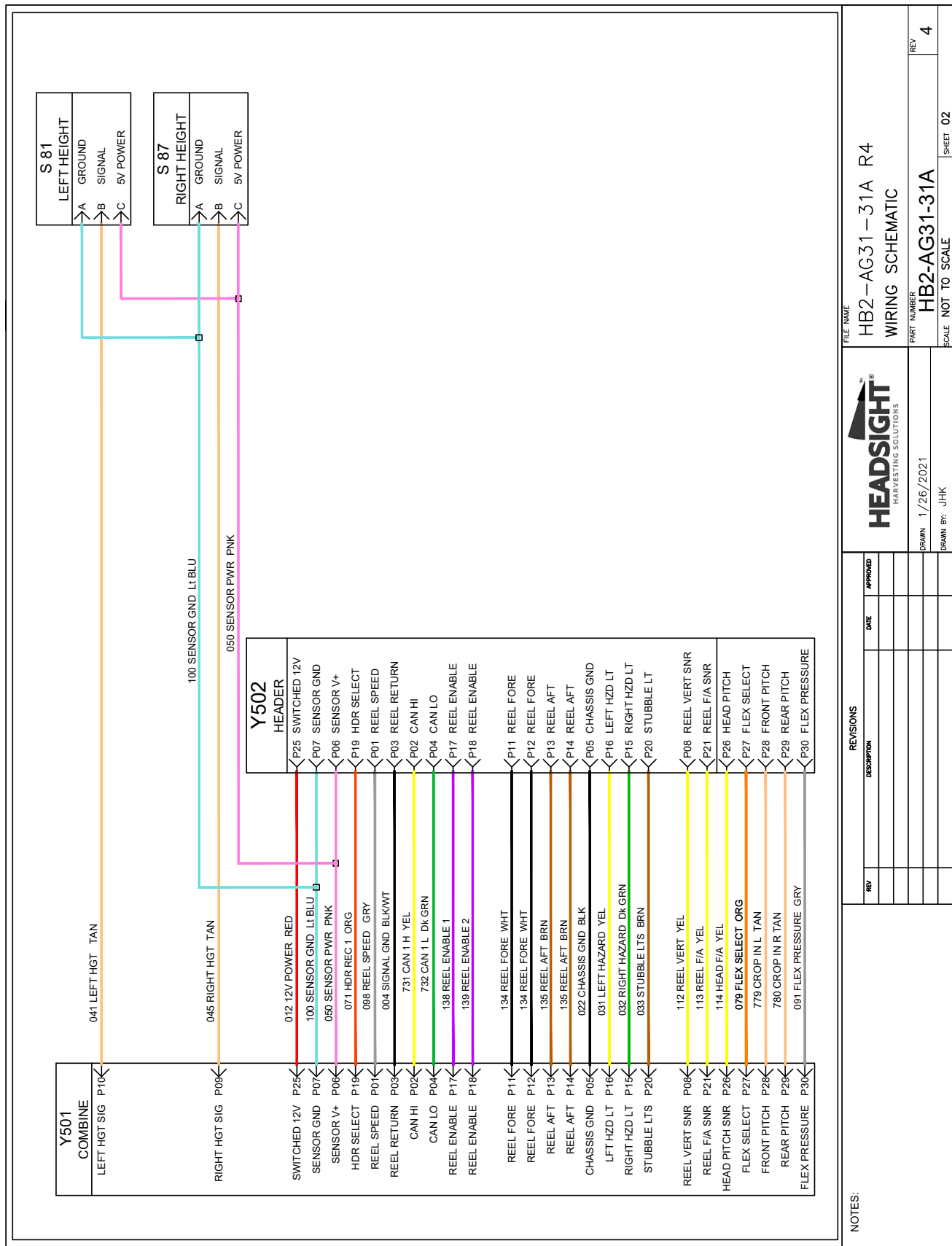
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HP2-JD63-31Q R4
WIRING SCHEMATIC

PART NUMBER
HP2-JD63-31Q
SCALE NOT TO SCALE

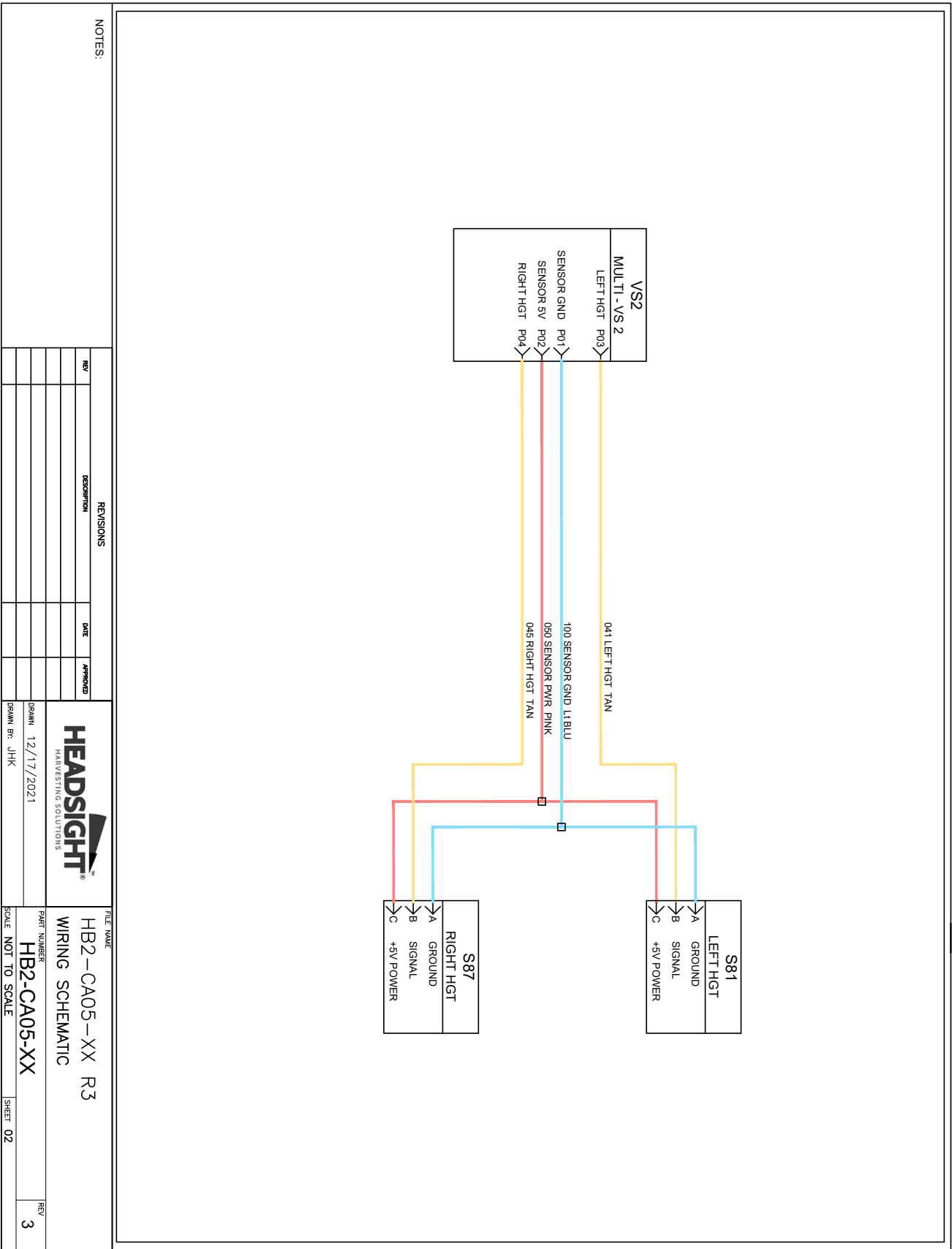
SHEET 02

REV
4

HB2-AG31-31A - Pg. 1



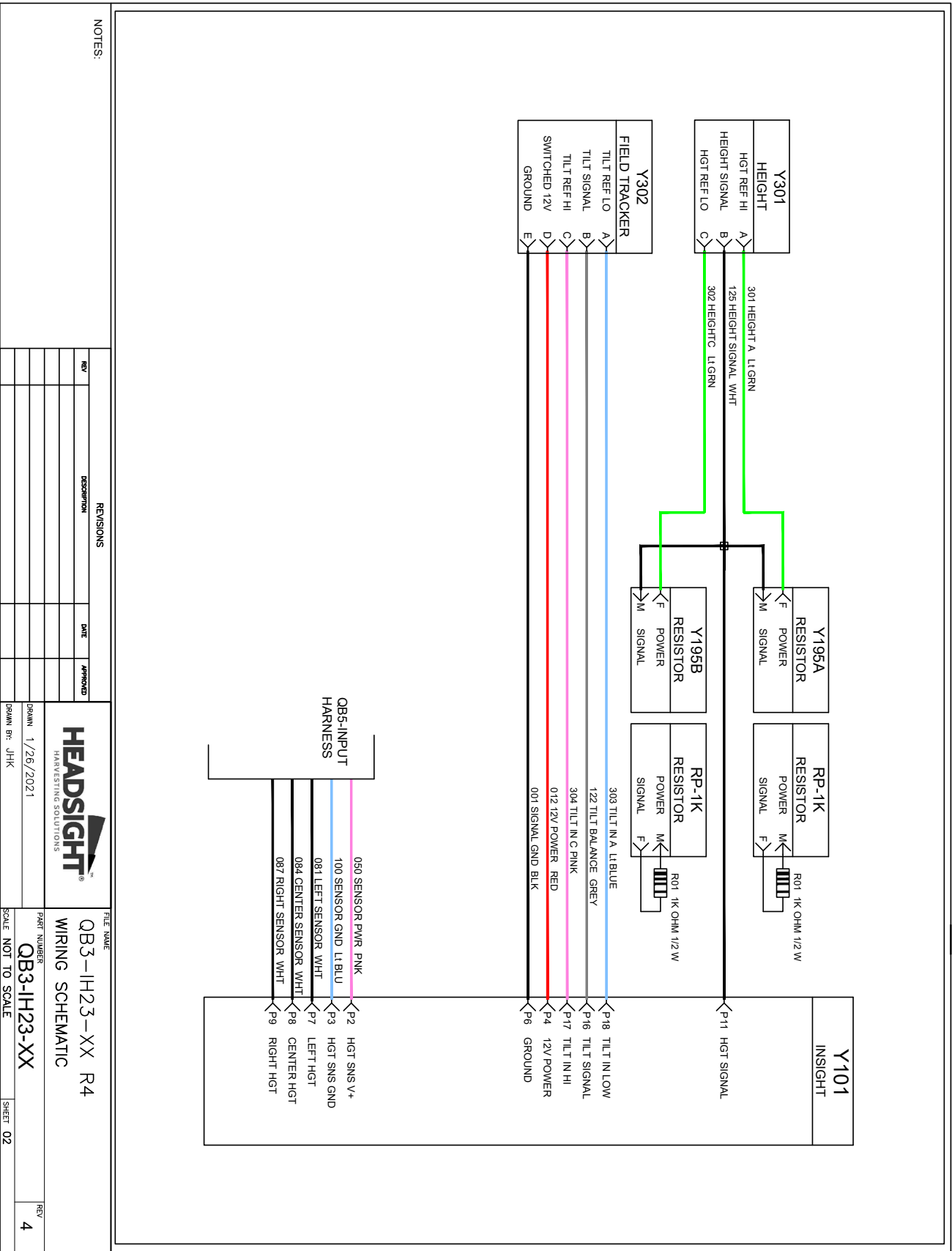
HB2-CA05-XX



Schematics

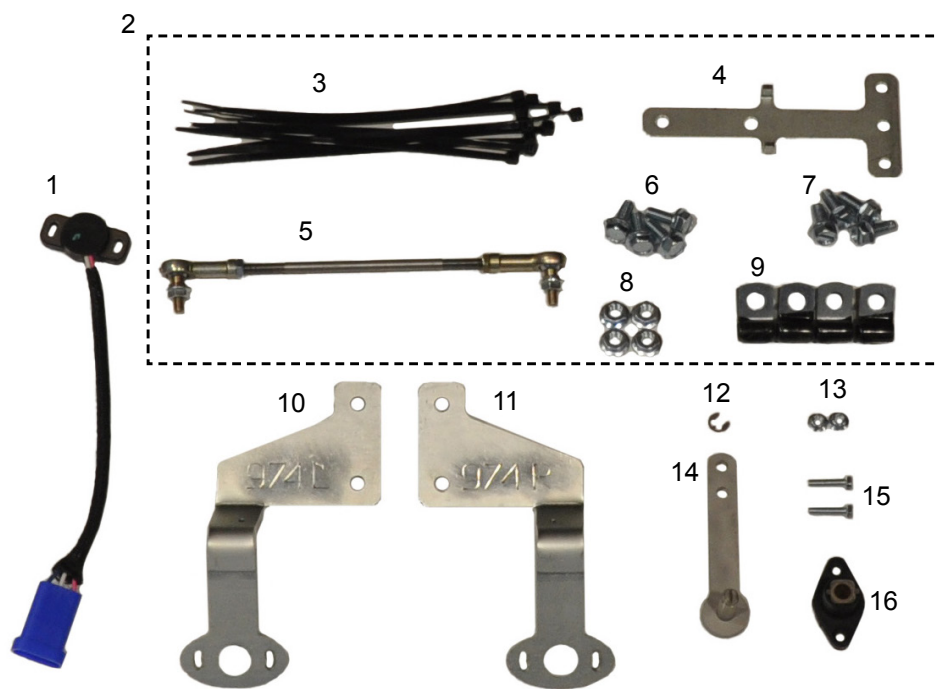


QB3-IH23-XX



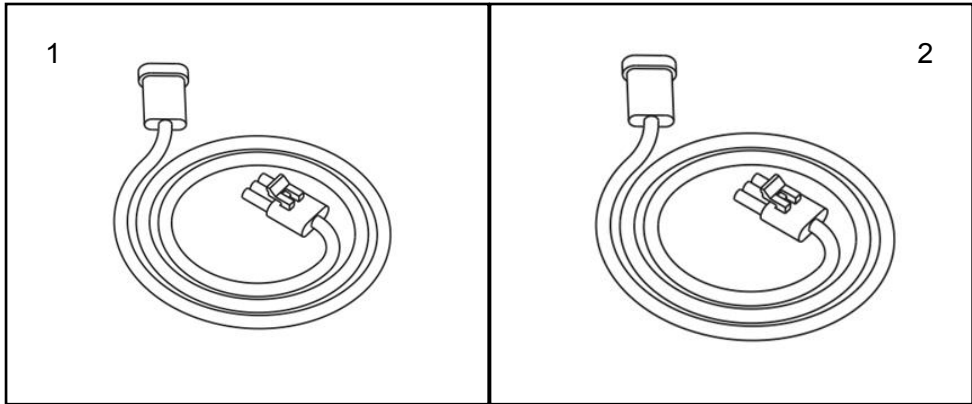
Parts

Tilt Sensor Kit



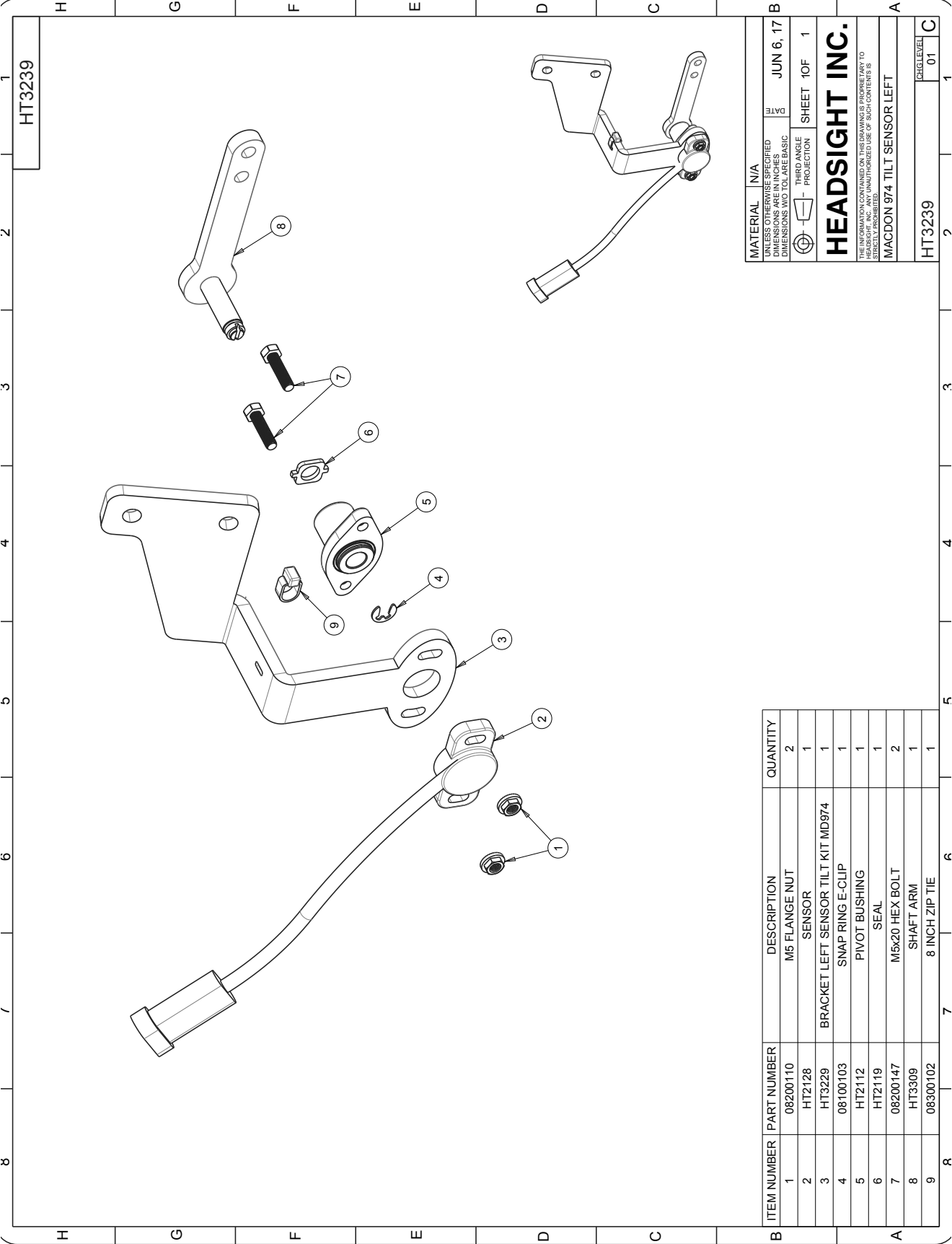
<u>ITEM</u>	<u>QTY.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	2	HT2128	Sensor
2	1	B3240	Hardware kit
3	10	08300102	Zip ties
4	2	HT3233	Arm bracket
5	2	HT3357	Tie-rod
6	4	08200126	Flange bolt
7	4	08200101	Flange bolt
8	4	08200145	Flange nut
9	4	08100102	Clamp
10	1	HT3229	Left tilt bracket
11	1	HT3230	Right tilt bracket
12	2	08100103	E-clip
13	4	08200110	Flange nut
14	2	HT3309	Sensor arm
15	4	08200147	Bolt
16	2	HT2112	Bearing block

Wiring

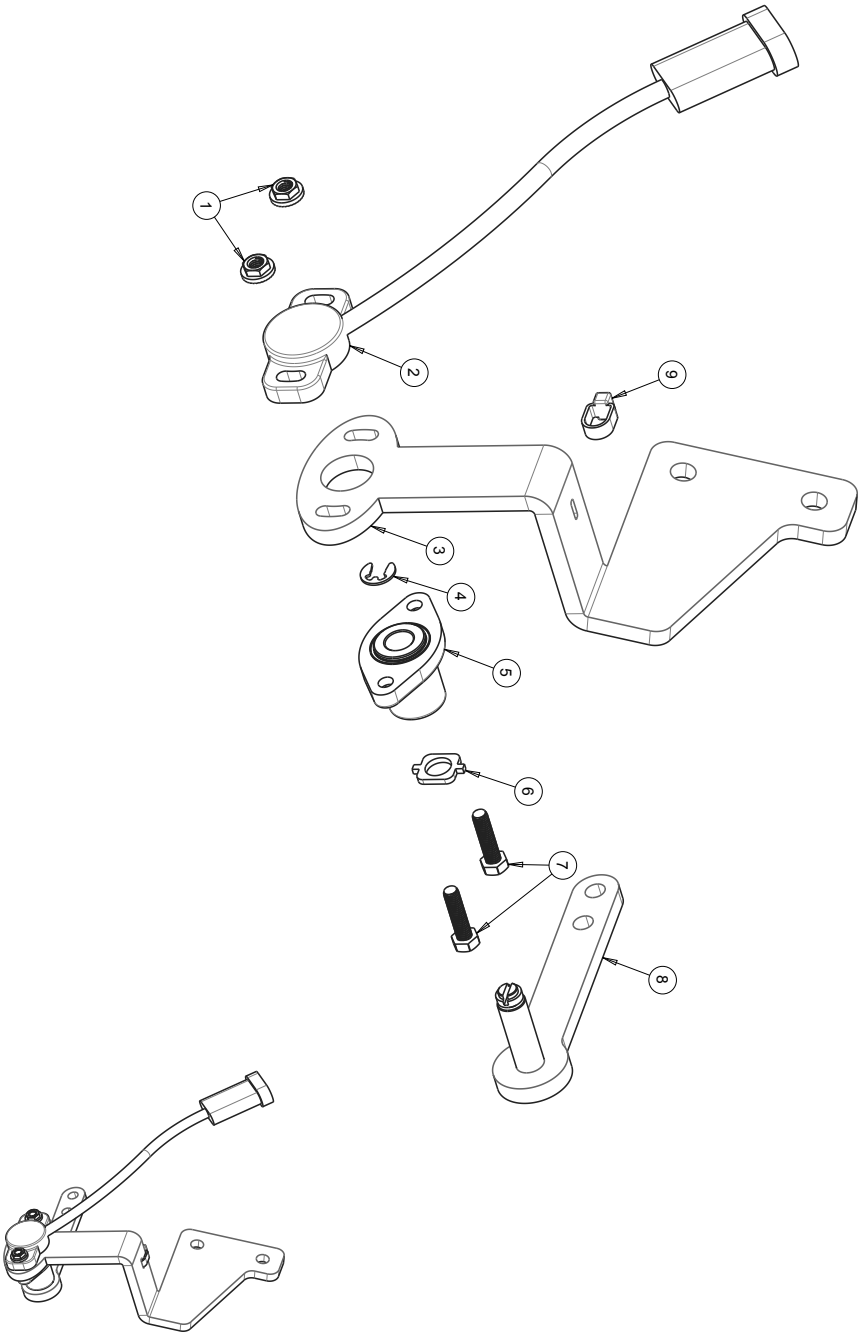


<u>ITEM</u>	<u>QTY.</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	AR	PFB4	Left Harness
2	AR	PFB17	Right Harness

Sensor Explosion - Left 974



Sensor Explosion - Right 974



ITEM NUMBER	PART NUMBER	DESCRIPTION	QUANTITY
1	08200110	M5 FLANGE NUT	2
2	HT2128	SENSOR	1
3	HT3230	BRACKET RIGHT SENSOR TILT KIT MD974	1
4	08100103	SNAP RING E-CLIP	1
5	HT2112	PIVOT BUSHING	1
6	HT2119	SEAL	1
7	08200147	M5x20 HEX BOLT	2
8	HT3309	SHAFT ARM	1
9	08300102	8 INCH ZIP TIE	1

MATERIAL	N/A	DATE	JUN 6, 17
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DIMENSIONS WHO TOL ARE BASIC	THIRD ANGLE PROJECTION	SHEET	10F 1
HEADSIGHT INC.			
THE INFORMATION CONTAINED ON THIS DRAWING IS PROVIDED BY HEADSIGHT INC. ANY UNAUTHORIZED USE OF SUCH CONTENTS IS STRICTLY PROHIBITED.			
MACDON 974 TILT SENSOR RIGHT			
HT3240	01	C	

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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