

Operator's Manual
Model CH9020
Hillside Leveling System
SN CH9020-18001 thru CH9020-18999

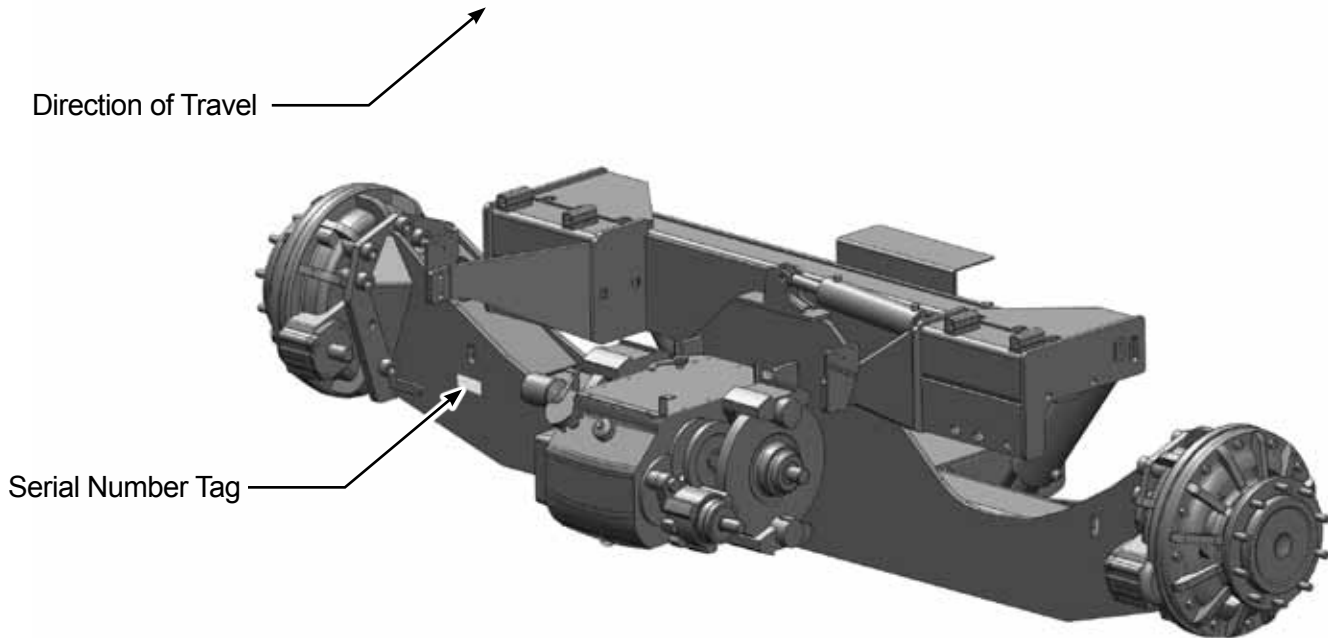
D-170912CMA01A
October, 2017

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Model and Serial Number



Write the serial number and the model number of the leveling system and combine on the lines provided. It is important to reference these numbers when ordering parts or requesting technical support. We suggest that you give the leveling system serial number to your Case IH dealer to be kept with their combine serial number records.

| | |
|-------------------------------|---------|
| Leveling System Model Number | CH9020 |
| Leveling System Serial Number | CH9020- |
| Combine Model Number | |
| Combine Serial Number | |

Maximum Header Weights

| | |
|--------|----------|
| CH9020 | 8510 lbs |
|--------|----------|

Hillco does not guarantee any non Case-IH header applications and will not be responsible for any damage occurring from improper header configurations.

Please call Hillco Technologies if you have any questions regarding the CH9020 or any other header configuration.

Warranty Policy



Statement of Limited Warranty **(North American Harvest Products)**

Hillco Technologies, Inc. (Hillco) warrants its new products to be free from defects in material and workmanship for a period of twelve (12) consecutive months following the warranty start date.

The warranty start date for Hillco products invoiced by Hillco from October 1st through May 31st is the first day of June following the Hillco invoice date, or the first date of use, whichever is earliest. For Hillco products invoiced by Hillco from June 1st through September 30th the warranty start date is the date of invoice. Once the warranty period has begun, it cannot be stopped or interrupted.

Hillco's obligation under this warranty shall be limited to repairing or replacing, free of charge to the original purchaser, any part that, in Hillco's judgment, shows evidence of such defect. Hillco additionally agrees to repair, at no cost to the original purchaser, any physical damage to the product to which the Hillco product is directly attached provided that the damage is directly attributable to a defect in the design or manufacture of the Hillco product, as determined by Hillco, and that the damage occurs during the effective warranty period of the Hillco product.

Hillco warrants genuine Hillco replacement parts and components to be free from defects in material and workmanship for a period of ninety (90) consecutive days following the Hillco invoice date, or the remainder of the original equipment warranty period, whichever is longer.

Limitations to Warranty

This warranty does not cover:

- 1) Any product damaged by accident, abuse, misuse, negligence, or improper maintenance.
- 2) Any unauthorized product alteration or modification.
- 3) Any unauthorized repairs made with parts other than genuine Hillco parts unless specifically authorized by Hillco.
- 4) Any repairs performed by anyone other than Hillco or an authorized Hillco dealer unless specifically authorized by Hillco.
- 5) Any claims directly resulting from improper installation, except those installations performed by Hillco.

Warranty Procedure

A Hillco Warranty Registration Form must be fully completed and returned to Hillco within 30 days of sale of the product to the retail customer or the first day of use, whichever is earlier.

All warranty claims must be submitted on a fully completed Hillco Warranty Claim Form.

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 should be held for a period of sixty (60) days after the warranty claim has been submitted to Hillco.

Hillco reserves the right to either inspect the product at the original retail purchaser's location, or the authorized Hillco dealer's location; or require it to be returned to Hillco, transportation charges prepaid, for inspection.

Limitation of Liability

Hillco 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 media published by Hillco 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 for a particular purpose. This warranty states Hillco's entire and exclusive liability and buyer's exclusive remedy for any claim for damages in connection with the sale or furnishing of Hillco products, their design, suitability for use, installation, operation, or for any claimed defects herein. **HILLCO 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 Hillco nor any dealer associated with Hillco has the authority to change the items of this warranty in any manner whatsoever, and no assistance to purchaser by Hillco in the repair or operation of any Hillco product shall constitute a waiver of the conditions of this warranty, nor shall such assistance extend or revive it.

Hillco 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.

D-041201LJH01

Introduction

Thank you for choosing the Hillco CH9020 Leveling System to compliment your farming operation. This product has been designed and manufactured to meet the needs of a discriminating buyer for increasing the performance of a combine.

Safe, efficient and trouble free use of your Hillco CH9020 Leveling System requires that you and anyone else who will be operating or maintaining the leveling system, read and understand the safety, operation, and maintenance information contained in the Operator's Manual.

If extra copies of the operator's manual are needed, contact Hillco at (800) 937-2461 and ask for the document number found on the front cover page.



Hillco Model CH9020 Hillside Leveling System

This manual covers the Hillco Model CH9020 (for the Case IH 7230/40, 8230/40, or 9230/40 combines) Leveling System. Use the Table of Contents as a guide when searching for specific information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Hillco dealer or Hillco if you need assistance or information at (800) 937-2461.

OPERATOR ORIENTATION – The directions left, right, front, and rear, as mentioned throughout this manual, are as seen from the combine operator's seat and facing in the direction of forward travel.

Safety

SAFETY ALERT SYMBOL



This Safety Alert symbol means
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

The Safety Alert symbol identifies important safety messages on the Hillco Leveling System and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

SIGNAL WORDS

Note the use of the signal words DANGER, WARNING, and CAUTION with the safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER - An immediate and specific hazard, which WILL result in severe personal injury or death if the proper precautions are not taken.

WARNING - A specific hazard or unsafe practice, which COULD result in severe personal injury or death if proper precautions are not taken.

CAUTION - Unsafe practices which COULD result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

OPERATION SAFETY

1. Read and understand the Operator's Manual and all safety labels before operating the leveling system.
2. Make sure that all controls are in the manual position before starting the combine.
3. Clear the area of all bystanders, especially children, before starting the leveling system and during operation.
4. Make sure all safety shields are in place before operating the combine. Never operate the machine with the shields removed.
5. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
6. Stay seated in the cab during operation.
7. Operate controls only when sitting in the seat of the combine.
8. To avoid engine damage, do not run the machine for extended periods of time when it is in the leveled over position.
9. Always travel at a safe speed. Use caution when making turns or traversing ditches.
10. The leveling system is equipped with a maximum level warning lamp. This lamp indicates when the machine has reached its maximum leveling capability. There are restrictions as to tread width and tire selection for combines used in harvesting slopes greater than the maximum leveling capability of the leveling system.
11. The use of after-market grain tank extensions is prohibited from use on combines equipped with the Model CH9020 leveling system.
12. Level Limit Stops should be used on combines that rely on the limit switches to stop the leveling prematurely to prevent sheet metal damage

HYDRAULIC SAFETY

1. Do not search for high-pressure hydraulic leaks without hand and face protection. A tiny, almost invisible leak can penetrate skin, thereby requiring immediate medical attention.
2. Use cardboard or wood to detect leaks – never your hands!
3. Before inspecting the hydraulic system of the leveling system, install the safety stops.
4. Before operating the leveling system, ensure that there are no obstructions between the chassis and the carriage.
5. Maintain proper hydraulic fluid levels.
6. Ensure all fittings and hoses are in good repair.
7. Do not make any repairs to the leveling system hydraulic system including: valves, hydraulic hoses, adapters, pumps, manifolds, or reservoirs without first contacting your authorized Hillco dealer.



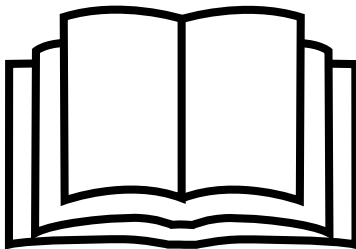
SERVICING AND MAINTENANCE SAFETY

1. Review the Operator's Manual and all safety items before servicing or maintaining the leveling system.
2. Place the Auto/Off/Manual leveling switch in the "Off" position, stop the combine engine, wait for any moving parts to stop, block the tires, the header, and the cylinder areas before servicing, repairing, adjusting, or maintaining the leveling system.
3. Hydraulic oil is under pressure. Use caution when dealing with the hydraulic system.
4. Keep hands, feet clothing and hair away from all moving and/or rotating parts.
5. Clear the area of bystanders, especially children, when carrying out any maintenance, repairs or making any adjustments.

HIGHWAY OPERATION AND TRANSPORT SAFETY

1. Check with local authorities regarding combine transport on public roads. Obey all applicable regulations and laws.
2. Check clearance elevations and widths of combine for travel near power lines, bridges, trees, etc.
3. Make sure the Auto/Off/Manual leveling toggle switch is in the "Off" position for all transport and highway travel situations.
4. Always travel at a safe speed. Use caution when making corners or meeting traffic.

READ OPERATOR'S MANUAL SYMBOL

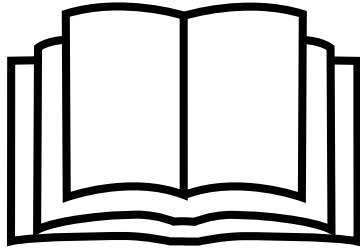


Decals, which display the —Read Operator's Manual symbol, are intended to direct the operator to the Operator's Manual for further information regarding maintenance, adjustments and/or procedures for particular areas of the cob collection system. When a decal displays this symbol refer to the Operator's Manual for further instructions.

Safety Labels

Familiarize yourself with the location of all safety labels. Read them carefully to understand the safe operation of your machine.

READ OPERATOR'S MANUAL SYMBOL



Decals, which display the —Read Operator's Manual symbol, are intended to direct the operator to the Operator's Manual for further information regarding maintenance, adjustments and/or procedures for particular areas of the cob collection system. When a decal displays this symbol refer to the Operator's Manual for further instructions.

TO APPLY NEW OR REPLACEMENT LABELS

1. Make sure the label area is smooth by removing any debris such as dirt or old labels.
2. Wash the area with soap and water and then dry it thoroughly.
3. After the area has completely dried, peel the backing off the safety label and place it onto the cleaned area.
4. Make sure all areas of the label have adhered to the machine by pressing down on the entire face of the label, including the corners.

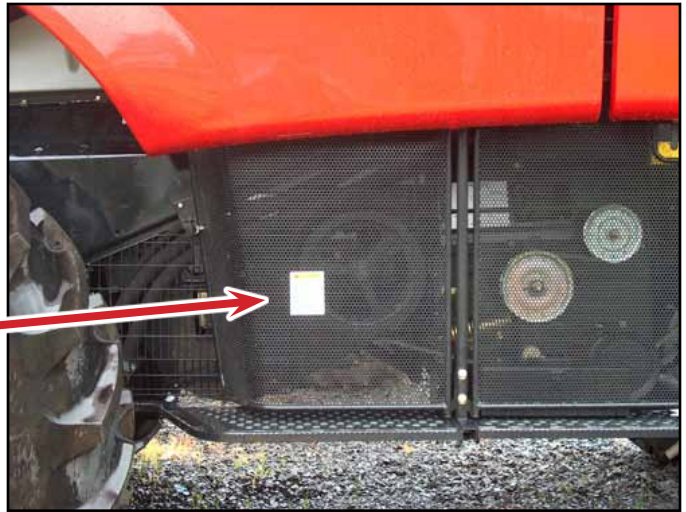
! CAUTION



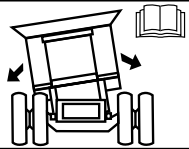
LEVELING SYSTEM HAZARD

- This machine is equipped with a leveling system.
- Combine chassis moves independent of carriage.
- Read operator's manual and be aware of hazardous areas at all times.

LL20-100787



! CAUTION



- This machine is equipped with a Leveling System.
- Make sure the Auto/Manual leveling control switch is in the manual position before starting machine.
- Read operator's manual before operating this machine.

LL20-100782



! DANGER



PINCH POINT HAZARD

- Keep hands, feet and body away from moving parts.
- Do not stand or climb on machine when operating.
- Hazard occurs during leveling and header trim.

LL20-100784



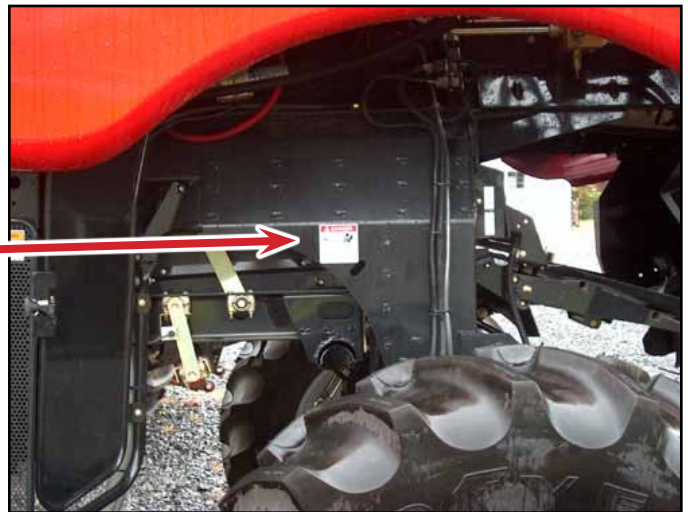
! DANGER



CRUSHING HAZARD
To prevent serious injury or death:

- Keep all persons and objects clear while any part of this machine is in motion.

LL20-100783

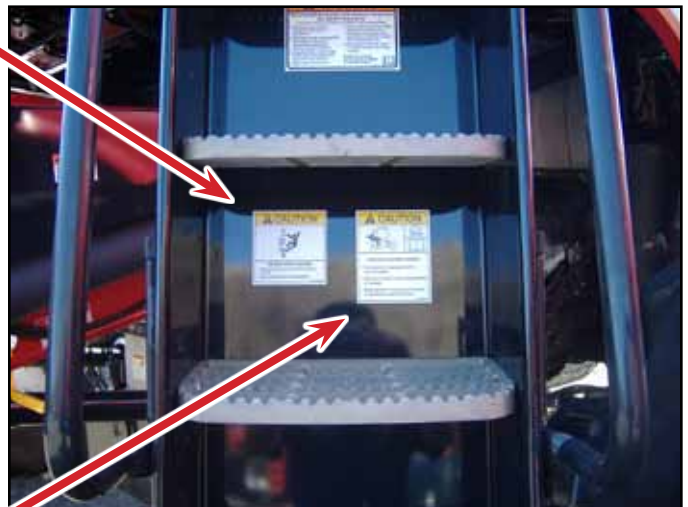


! CAUTION

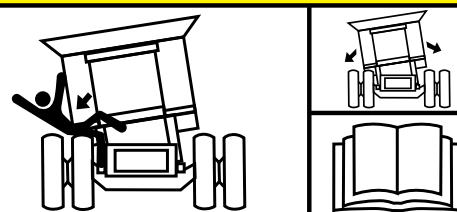


MOVING STEP HAZARD
Bottom step lowers and retracts upward.
Use caution when using ladder.

LL20-100785



! CAUTION



LEVELING SYSTEM HAZARD

- This machine is equipped with a leveling system.
- Combine chassis moves independent of carriage.
- Read operator's manual and be aware of hazardous areas at all times.

LL20-100787

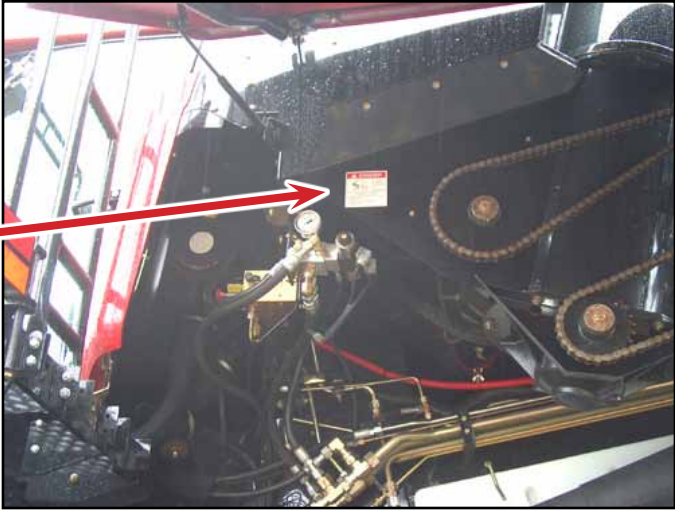
! DANGER



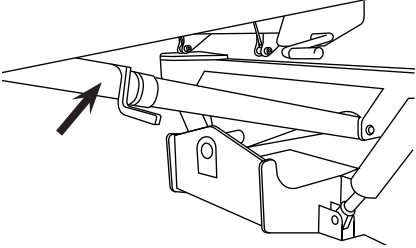
HYDRAULIC HAZARD

- Loss of hydraulic pressure may cause combine to tip.
- Read operator's manual before disconnecting any hydraulic components.

LL20-100788



! WARNING



- When opening rock trap, the feeder house must be in up position with header lock engaged.
- Do not leave rock trap open when lowering feeder house or severe damage will occur.

LL-141012



! DANGER



AVOID CRUSHING INJURY
Install safety stops on the main leveling cylinders before performing repair or maintenance on the leveling system to prevent accidental tipping of combine chassis.



LL-143621

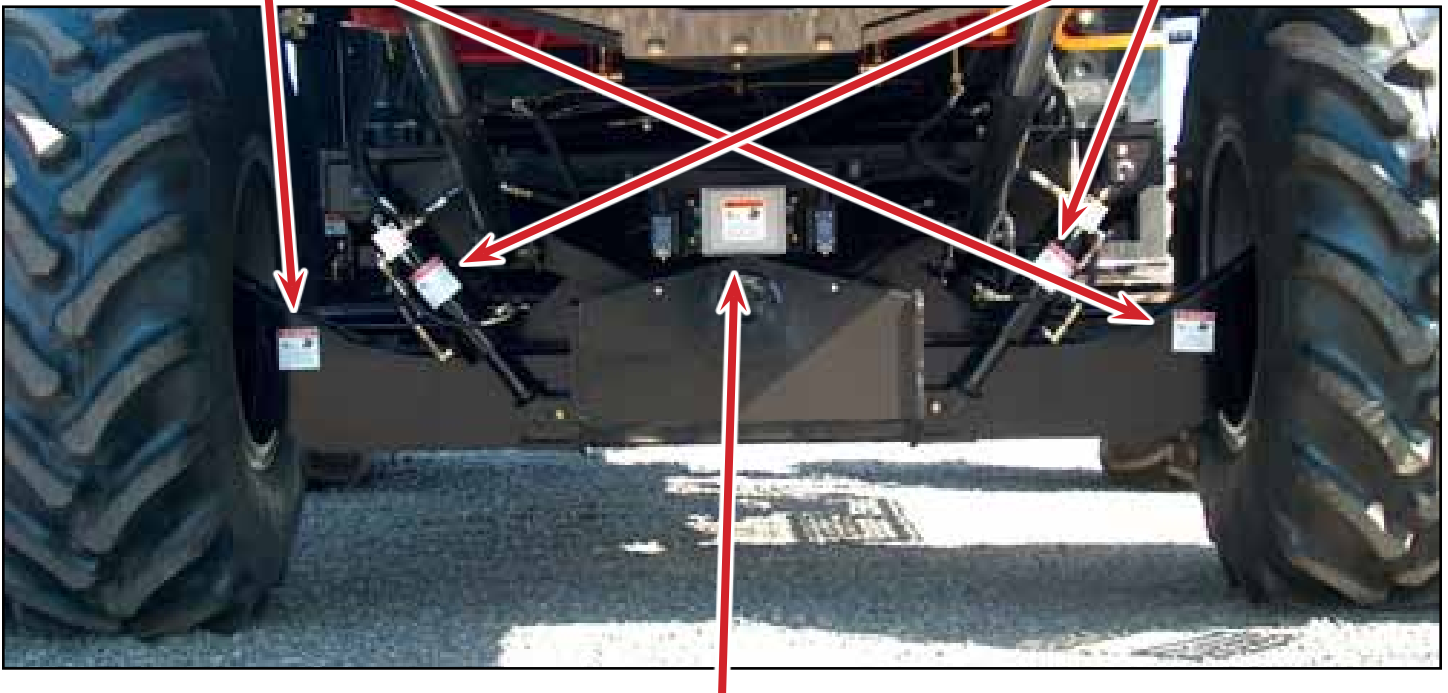
! DANGER



HYDRAULIC HAZARD

- Loss of hydraulic pressure may cause combine to tip.
- Read operator's manual before disconnecting any hydraulic components.

LL20-100788



! WARNING

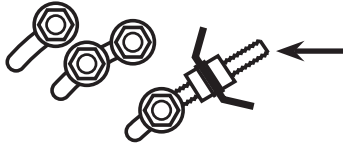


CRUSHING HAZARD

- Electric components control combine leveling and header trim.
- Make sure machine is off and header lock is down before making any adjustments to the electrical system.

LL20-100786

IMPORTANT

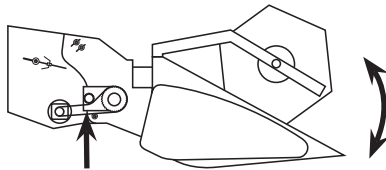


Do Not use Eyebolt to Adjust Header Angle or Threads will Strip.

Refer to Combine Operator's Manual for Adjusting Header Angle.

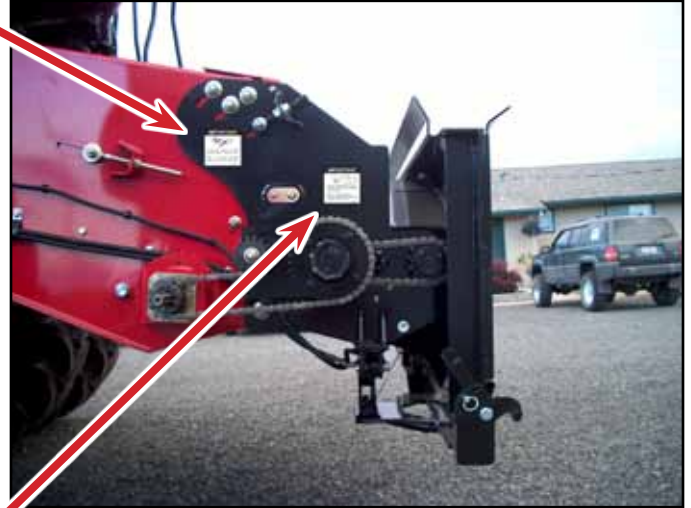
LL-150681

IMPORTANT



- Loosen Transition Drive Chain and disconnect prior to adjusting header angle.
- Refer to Leveling System Operator's Manual for tensioning Transition Drive Chains.

LL-150691



Operation, Setup, and Maintenance

Leveling System Controls

The leveling controls on the Home Screen are shown below. The monitor and controls are located to the right side of the Pro 700 monitor.

The Road/Field Mode (A) must be in the Field selection for leveling functions to work. If it is in the Road Mode then the leveling functions are disabled. Pushing combine's Road/Field button toggles the leveling system between Road and Field.

AUTO: Pushing the Auto/Manual Leveling Button (B) once will toggle between Auto & Manual. When Auto is showing on the display (C), this means automatic leveling operation is engaged. The automatic leveling controller monitors changes in slope and corrects chassis position to maintain a level chassis position. The Manual Left/Right Leveling Buttons (D, E) will override the automatic leveling controller while the switch is depressed. Upon release of the switch, the leveling system will return to automatic leveling mode.

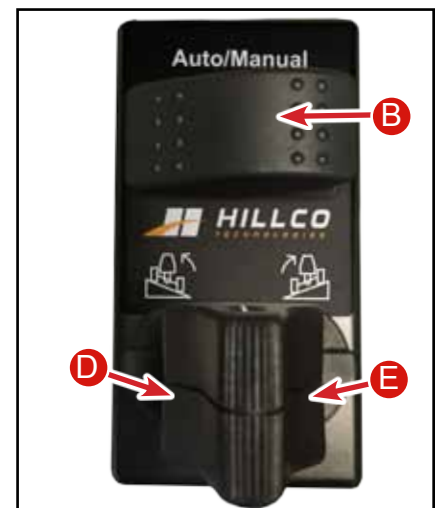
MANUAL: Push the Auto/Manual Leveling Button (B) once to enter the Manual Leveling mode (Manual will be displayed). In Manual mode the Manual Left/Right leveling switches will level the combine left and right. When the switch is released the combine chassis will maintain its current position.

- A - Road/Field
- B - Auto/Manual Switch
- C - Manual Left
- D - Manual Right



IMPORTANT
Monitor defaults to Road Mode each time system is powered up. This is done to prevent any accidental leveling. The Road/Field mode is controlled by the combine's Road/Field switch.

Leveling Controls: Located on the right side of the Pro 700 monitor. These switches allow for Auto/Manual control (B) and Left/Right leveling (C, D).



Maximum Level

The leveling system is equipped with a maximum level warning indicator on the monitor. On the Main Control Screen Max Level will be displayed. This indicates when the machine has reached its maximum leveling capability.



Header Trim Controls

The header trim switch is the four-position header control switch mounted in the combine's SR control lever. It is used to raise and lower the header as well as trim the header left and right.

TILT LEFT: Push the switch to the left to tilt the header counterclockwise.

TILT RIGHT: Push the switch to the right to tilt the header clockwise



Header Trim Switch

4WD Alarm

The 4WD Warning Alarm is located in the Leveling System Control Monitor. It will sound an alarm, a warning light will flash and 4WD Alarm will be displayed on the monitor if the combine is traversing down a slope that is greater than 20% and the 4WD is engaged. Disengage the 4WD and the warning will be cleared. On downhill slopes less than 20%, level ground or uphill slopes the warning will not come up if 4WD is engaged.

See your combine's Operator's Manual to understand how to operate the Rear Wheel Assist (RWA).



4WD Engage/Disengage

4WD Alarm will be displayed.



WARNING!

When the 4WD Alarm Sounds and Warning is displayed IMMEDIATELY DISENGAGE the Rear Wheel Assist or Control of the Combine COULD be lost.

Operator Adjustments

From the Home Screen, Push the Menu button to enter the Main Menu.



Push the up or down arrows to move to the desired function. Once the desired function is highlighted press the Enter button to go into that page. Press the Home button to go to the Home screen.



Operator Settings Menu

Select the desired Function in the Operator Settings Menu. Scroll up and down using the up and down arrows. When the desired function is highlighted select the enter button. To go back to the main menu select the Back button.



Manual Speed

The manual leveling speed can be sped up or slowed down. This setting only affects manual leveling and not auto leveling speed.

The current setting is displayed on the top. When you input a new setting it will be displayed in the white text. If you power off the unit the white text will always read 7000 however the Current Setting will always read was the last user input regardless if it was powered down.

The Range is from 3000-7000 with 3000 being the slowest and 7000 the fastest. These numbers represent what percentage the coil is opening the valve up. 3000 = 30% and 7000=70% of the valve open. Anything over 7000 is an invalid entry as it will level the combine too fast making it very jerky and unsafe.



Invalid Entry

Invalid Entry appears when a value has been entered that is not within the acceptable range.



Display Backlight

The brightness can be adjusted up and down. Use the up and down arrows to adjust the brightness and then hit Enter to save the setting.



Smart Unload

Smart Unload is an optional safety feature that puts the leveling system in manual mode when unloading. This prevents the unloading auger from coming in contact with the grain cart while unloading on the go on changing terrain.

As soon as the unloading auger starts to swing out the system changes from Auto Leveling to Manual Leveling.

When the auger is in all the way the operator must cycle the auto manual switch to go back to auto leveling.

The setting is defaulted to OFF. If you wish to turn it on push the On button (A). The red OFF will turn to a green ON.



Calibration

From the Main Menu select Calibration.

Continued on next page.



After you select Calibration the message to the right appears.

Press Enter (A)



Joystick Calibration

Highlight Joystick and press Enter (B).

WARNING

When in the Calibration Menu screen all limits have been deactivated. The carriage can rotate until the cylinders bottom out.



With the Joystick in the center position press the Enter button (C).



Push the Joystick lever all the way to the right and then press the Enter button (A).



Push the Joystick lever all the way to the right and then press the Enter button (B).



Joystick Calibration is now complete.



Left/Right Clinometer Calibration (Level Zero Point)

From the Home Screen select Main Menu. Then select Calibration Menu.

Highlight Left/Right Clinometer and press Enter (A).



Follow the directions on the screen. When the combine is level side to side press Enter (A).



Carriage Angle Left Limit

This setting sets the maximum tilt to the left.

To set the carriage angle left limit, park the combine on level ground and set the parking brake. Then raise the feeder spout and drop the header lift cylinder safety stop.

Select the Carriage Angle Left Limit and press Enter (A) from the Calibration Menu.

Lean the combine to the left until either the maximum leveling capabilities of the leveling system are reached or there is approximately one inch of clearance between the tires and any metal that may interfere with them.

When maximum level has been achieved select the Enter button (B).



IMPORTANT

With certain tire selections the limit sensors can be used to prevent the need to modify the sheet metal on the left and right side panels of the combine. Installation of level limit stops is recommended to prevent sheet metal damage in the event of a limit switch failure. (See LEVEL LIMIT STOPS section)



If Level Limit Stops are used be sure that the left limit sensor has been calibrated with that stop in place. Damage to the cylinders or other leveling system components may occur if sensors aren't set properly.

Carriage Angle Right Limit

This setting sets the maximum tilt to the right.

To set the carriage angle left limit, park the combine on level ground and set the parking brake. Then raise the feeder spout and drop the header lift cylinder safety stop.

Select the Carriage Angle Right Limit and press Enter (A) from the Calibration Menu.

Lean the combine to the right until either the maximum leveling capabilities of the leveling system are reached or there is approximately one inch of clearance between the tires and any metal that may interfere with them.

When maximum level has been achieved select the Enter button (B).

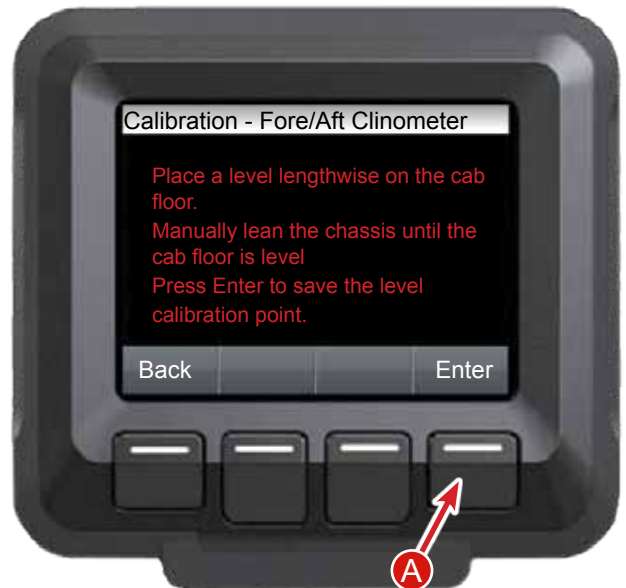


Fore/Aft Clinometer

Highlight Fore/Aft Clinometer and press Enter (A).



When the combine is level front to back press Enter (A).



Diagnostics

From the Main Menu select Diagnostics.



The Diagnostics menu allows the operator to view output information from the electrical system on the leveling system.

Select Clinometers and press Enter (A) to view the output of the clinometers.

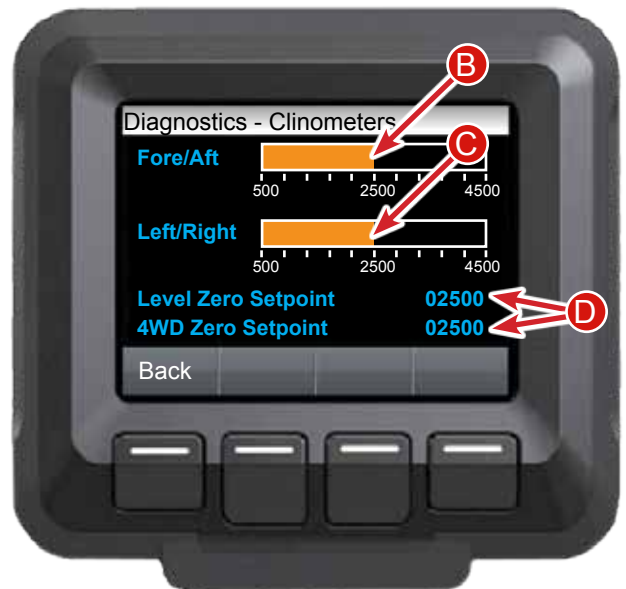


Clinometers

Fore/Aft (B) shows the current clinometer output. By driving up or down a hill this value will change.

Left/Right (C) shows the current clinometer output. By leveling the combine back and forth the values will change.

The value for Level Zero Setpoint and 4WD Zero Setpoint (D) are the current calibration values. These values are set in the Calibration screen under Left/Right Clinometer and Fore/Aft Clinometer.

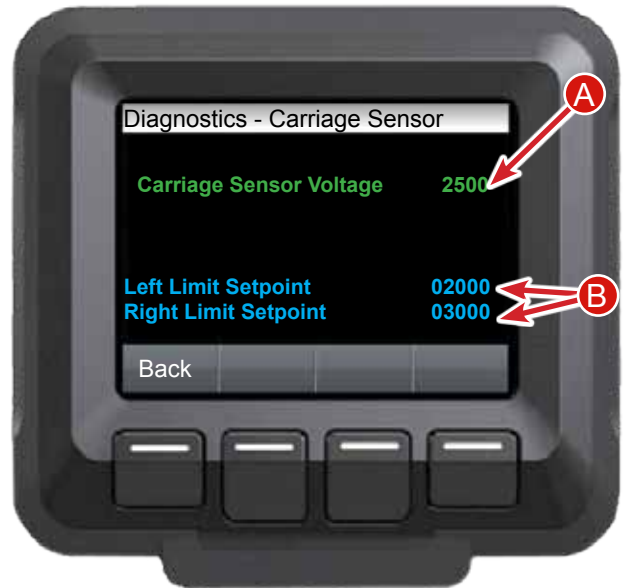


Carriage Sensor

The Carriage Sensor Voltage is the current voltage output at a given carriage position.

Leveling the combine back and forth will change this value. Leveling to the right will increase the value.

The value for Left and Right Limit Setpoint (B) are the current calibration values for maximum level to both sides.



Valve Coils

Range is from 0-18000.

Only one coil will be activated at a time.



Joystick

Range is from 500-4500.



Combine CAN

The Signal can be OFF, ON, or “ - - - “.

“ - - - “ means the display is not receiving the CAN message.



Active Alarms

From the Main Menu select Active Alarms and press ENTER (B).



If you have an Active Alarm the warning icon will appear on the home screen in the upper left corner.



The Active Alarms that will appear are:

- Clinometer Fault
- Potentiometer Fault
- Joystick Fault

If any of the sensors output fall outside of the expected range an alarm will trigger on the screen listing the fault and the current output of the sensor in question. While the alarm screen can be cleared the automatic function of the leveling system may be disabled until the fault is corrected. Once an alarm screen has been cleared the fault condition is denoted by an alert icon in the top left of the screen. If the icon is displayed then the alarms screen in the system menu will show which sensors are in a fault condition.



Potentiometer Fault (Carriage Angle Sensor Fault)



Clinometer Fault



Joystick Fault



Dealer Settings

Dealer Settings is a password protected screen that is for dealers to make adjustments to the leveling system.



Password protected page:



Level Limit Stops

On the Model CH9020 Leveling System a Level Limiting Spacer Kit can be clamped on the main leveling cylinders to mechanically stop leveling if the carriage position sensor were to fail. To determine how many spacers are needed to create a mechanical stop follow these steps:

1. Park the combine on level ground and apply the parking brake.
2. Raise the feeder spout and drop the header lift cylinder safety stop.
3. Lean the combine to the left until either the maximum leveling capabilities of the leveling system are reached or there is approximately one inch of clearance between the tires and any metal that may interfere with them.
4. Shut off the machine and measure the distance between the packing gland on the rod end of the cylinder and the ring that is welded to the rod end.
5. Write down this dimension and repeat the process for the right side. (Both sides must be measured due to the fact that the combine may level further one direction than the other.)
6. The dimensions obtained will determine how many spacers are needed. There is no additional charge for the level limit stops (Call Hillco with dimensions to order).



Cylinder Stops



If Level Limit Stops are used be sure that the max level position sensor is calibrated to stop leveling before the level limit stops make contact. Damage to the cylinders or other leveling system components may occur if the position sensor is not calibrated correctly.

Leveling Controller Function

The Hillco Model CH9020 Leveling System is equipped with a proportional leveling system with manual control and automatic with manual override control. The clinometer, located in the control box, monitors changes in slope and corrects the position of the combine's chassis using proportional leveling. The clinometer maintains leveling accuracy to +/- 1/10th degrees by sending the leveling signal to the proportional leveling control valve on the manifold. As the combine reaches higher degrees of being out of level, the clinometer sends more voltage to the directional control valve's coil and pulls the spool open further to allow oil to flow faster and speed up leveling. As the combine gets closer to +/- 1/10th degrees out of level, less voltage is sent to the coil to slow leveling.

Mechanical Adjustments

Tread Width

The CH9020 Leveling System is designed around a main undercarriage length of 3120mm (122-13/16"), which is identical to the combine's original axle tube length with 265mm (10-7/16") axle extensions. The final drives are mounted directly to the undercarriage and axle extensions are not required.



Dual tires are required on all combines equipped with the CH9020 Leveling System. The dual tire and wheel package sold from Hillco creates a 120"-180" tread spacing.

Tire Selection



Model CH9020 Dual Tires - Combines equipped with the Model CH9020 Leveling System must be equipped with 650/75R32 175A8 (24.5-32 6-star) or 650/65R38 Alliance 550 dual tire and wheel package supplied by Hillco to safely support the weight of the combine.



Model CH9020 Steering Tires – Combines equipped with the Model CH9020 Leveling System must be equipped with rear tires no larger than 28L-26 (710/70R26) for proper rear side panel clearance.

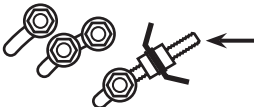
Feeder Adjustment for Tire Size

Adjust the feeder adapter to obtain the proper header angle and cutter bar height as shown in the 7230/40, 8230/40, and 9230/40 Operator's Manual. The chart shown in those manuals will no longer be a correct guide to adjust the feeder adapter due to the height increase created by the leveling system.



Important: When rotating the transition throat to obtain proper header angle, pay special attention to the 60P chain tension. The 60P chain will have to be lengthened when rotating rearward.

IMPORTANT

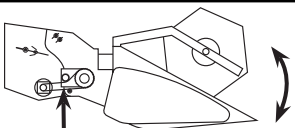


Do Not use Eyebolt to Adjust Header Angle or Threads will Strip.

Refer to Combine Operator's Manual for Adjusting Header Angle.

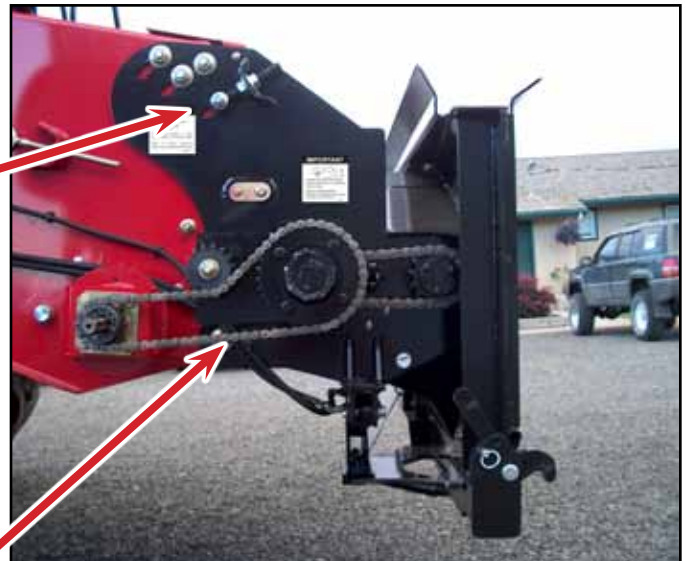
LL-150681

IMPORTANT



- Loosen Transition Drive Chain and disconnect prior to adjusting header angle.
- Refer to Leveling System Operator's Manual for tensioning Transition Drive Chains.

LL-150691



Conveyor Drum Fore/Aft Position

The conveyor drum may need to be repositioned. The position of the conveyor drum should be set fore or aft so that there is approximately a 1-inch distance between feeder chain slat tip and the paddle beater.

Header and Combine Connection

Refer to the 7230/40, 8230/40, and 9230/40 Operators Manual for instructions on connecting the header to the combine. All headers require header kits to function properly on the Model CH9020 Leveling System. Contact your dealer for additional information on these kits.

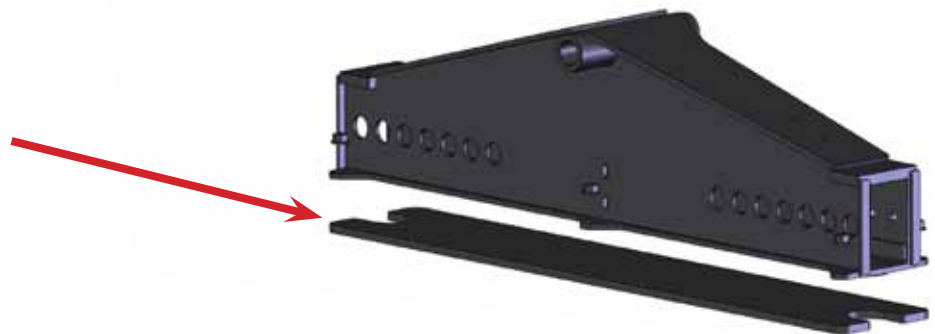
Rear Axle Weighting

Proper rear axle weighting of a combine equipped with a CH9020 leveling system is critical to the performance and safety of operation. Rear axle weighting increases the tip angle of the combine to improve down hill maneuvers. The appropriate weighting is dependent on such items as feeder house length, header selection, and tire selection. Consult your authorized Hillco Leveling System dealer for weighting information.

Weight can be added to the rear axle through:

- 1) Calcium Chloride in rear tires
- 2) Hillco Rear Axle Weight Package (Up to 10 weights at 150 lbs per weight)

150 lbs weights can be added to the bottom of the Hillco drop axle. Maximum of 10 weights.



Use caution when using individual turning brakes. Installation of a Hillco Leveling System transmits additional weight to the rear axle of the combine. Excessive braking to turn can damage your combine chassis.



Important: The responsibility for making the final determination of appropriate rear axle weighting lies with the operator.

When first operating the CH9020 leveling system in hillside conditions, begin operation on gradual slopes and work up to more severe slopes only after you have determined that rear axle weighting is appropriate for downhill maneuvers. The first indication of insufficient rear axle weighting is sluggish or unresponsive steering while traveling down hill. This effect will worsen if the operator decelerates. Make sure rear axle weighting is sufficient for safe down hill maneuvers, under normal deceleration, in your most severe down hill conditions.



Important: Use of grain tank extensions other than those provided by the Combine manufacturer is strictly forbidden. Use of such extensions voids both the Hillco and Case IH NEW Equipment Warranties.

Rear Axle Toe In

If the rear tire and wheel size changed after the proper sized rear tires were installed the toe in should be checked. Consult your combine's operator's manual on the correct toe in for your tire and wheel size.

Feeder Conveyor Slip Clutch

The feeder conveyor slip clutch should be adjusted yearly to make sure it will protect all of the feeder drive components. Consult your combine's operator's manual on the correct procedure for adjusting the slip clutch.

Transition Drive Chain

Check to see that the transition drive chain is in proper alignment and has proper tension. Misalignment of these sprockets will cause premature wear of the sprockets and chain. Chain tension is maintained on the 60-pitch chain with an idler sprocket and on the 80-pitch chain by moving the jackshaft assembly. Both are located on the right side of the transition.

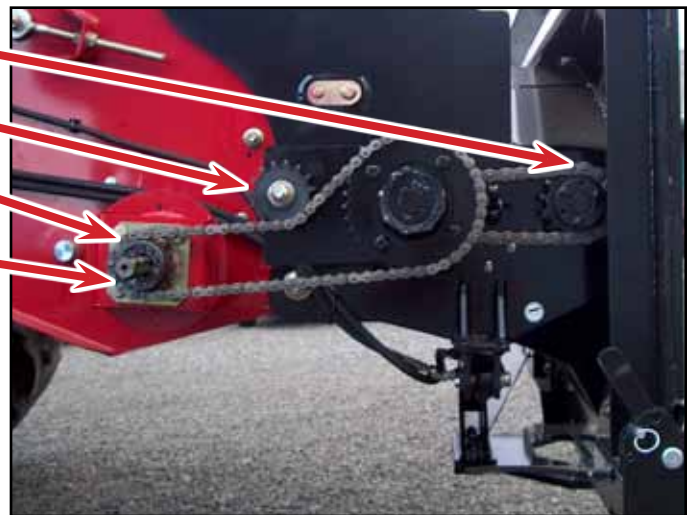
80-Pitch is adjusted by moving jackshaft assembly

60-Pitch chain tightener

Make sure sprockets are in alignment

60-Pitch chain will have to be lengthened when rotating rearward

Do not over tension chain or premature chain and sprocket wear will occur.



Transition Slip Clutch

The transition slip clutch is preset at the factory so that damage will not occur to any of the transition drive components. It is not adjustable. To prevent premature wear it is imperative that it is greased according to the lubrication schedule in the maintenance section.

Ladder

If the ladder doesn't extend and retract properly check the fasteners in all of the pivot locations and make sure they aren't over tightened. Over tightening of these fasteners will cause the ladder to bind.

Make sure that the gas-charged struts keep the ladder fully retracted. Replace the struts if they appear to be weak. If the ladder doesn't fully retract permanent damage may occur during field operation.



Leveling Cylinder Safety Stops

When the leveling cylinder safety stops are installed on the leveling cylinders, the carriage cannot rotate. The stops must be installed before working on or around the leveling system and also when hauling the combine. It is recommended that the stops be used during long term storage. When the stops are not being used, they should be stored on the mount next to the leveling cylinder.

Leveling Cylinder Stop



Cylinder Stop Holder



General Shielding

Before operating the combine all shields must be in place and in working condition. Shield to tire clearance needs to be checked once the correct tires are installed on the combine. Check to see if the clearance is correct by having someone watch the tire and shields as the operator leans the combine to the far right and far left. Some tire selections require limit switches to be set slightly early to allow enough tire clearance between the left and right front side panels.

Hydraulic Settings

Refer to the Hydraulic Safety section located on page 6 for precautions regarding the hydraulic system.

The Model CH9020 Leveling System utilizes the existing auxiliary combine hydraulic system for their hydraulic requirements with the exception of the addition of a stand-alone leveling manifold located behind the left shield to the rear of the operator's platform. The hydraulic schematic located in the rear of this manual covers the leveling system circuitry. Consult your combine's operator's manual or contact your Case-IH dealer for diagnostics and maintenance regarding the remainder of the hydraulic system.



Important: All adjustments on the hydraulic system are preset at the factory for optimal leveling and header trim performance. **DO NOT MAKE ANY ADJUSTMENTS TO THESE SETTINGS WITHOUT FIRST CONTACTING YOUR AUTHORIZED HILCO DEALER.**

Hydraulic Hoses

Inspect hydraulic system for leaks, damaged hoses, improper routing, and loose fittings. Hydraulic hoses that are not routed correctly could become worn from working against abrasive edges or moving parts. If abrasions or holes do occur, the hydraulic hoses can only be repaired by replacement. Do not attempt repairs with tape or cements. High pressure will burst such repairs and cause system failure and possible injury. Hydraulic Hose Connections – When tightening loose hoses on the cylinders, pump, etc., always use one wrench to keep the hose from twisting and another wrench to tighten the union. Excessive twisting will shorten hose life and allow the fitting to loosen during operation. Do not over-tighten fittings or adapters. Refer to the 7230/40, 8230/40 and 9230/40 Operator's Manual for information regarding hydraulic oil check intervals, and reservoir fluid levels. Leveling and header trim speeds are preset at the factory. If different speeds are desired please contact your Hillco dealer.

Hydraulic Cylinder



Important: Each leveling cylinder is equipped with a safety valve (counterbalance valve) that is in place to prevent unintentional leak down of the cylinder. These safety valves are preset at the factory, and should not be adjusted.

DANGER

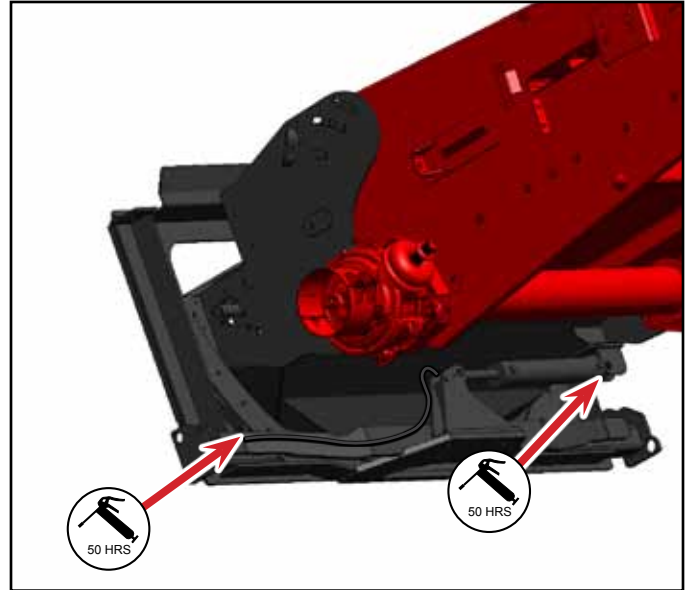


Do not make any repairs to the cylinders, disconnect valves, or disconnect any hoses connected to the cylinders, counterbalance valves, bulkhead mount or manifold without first contacting your authorized Hillco dealer. These hydraulic components stabilize the chassis of the combine. Improper repair or replacement of these components could lead to uncontrolled leveling of the combine's chassis. The leveling cylinder safety stops can be used to prevent accidental tipping of the combine during repair.

Grease Locations

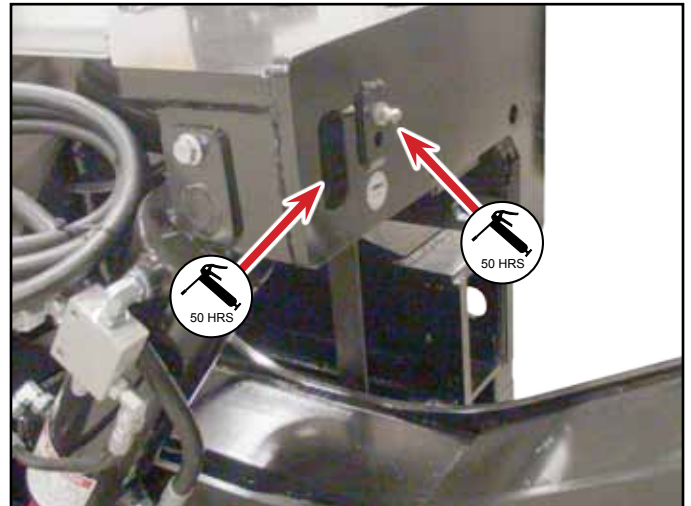
Use Case-IH 251H EP or equivalent NLGI #2 Multi-Purpose Lithium Grease.

Slave Cylinder
(base and rod ends)
50 hrs.
2 Zerks



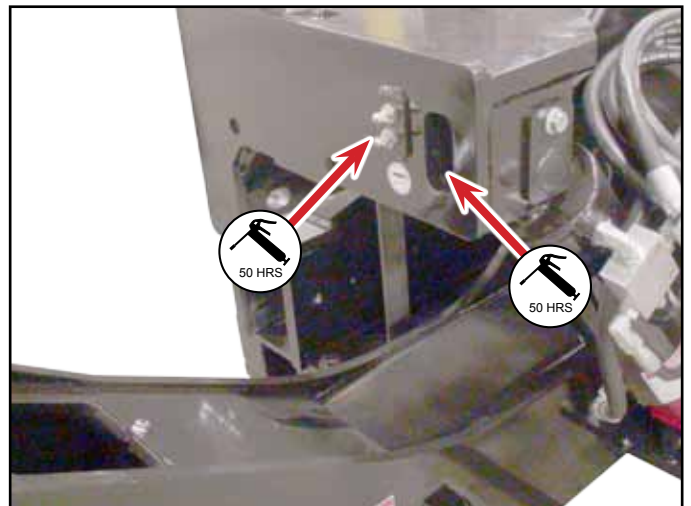
Main Pivot Pin
50 hrs.
1 Zerk

Left Leveling Cylinder Base
50 hrs.
1 Zerk

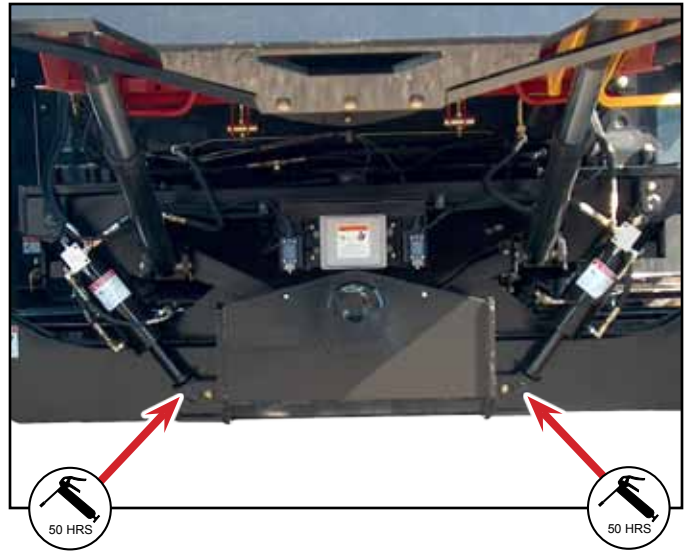


Master Cylinder
(Base and Rod)
50 hrs.
2 Zerks

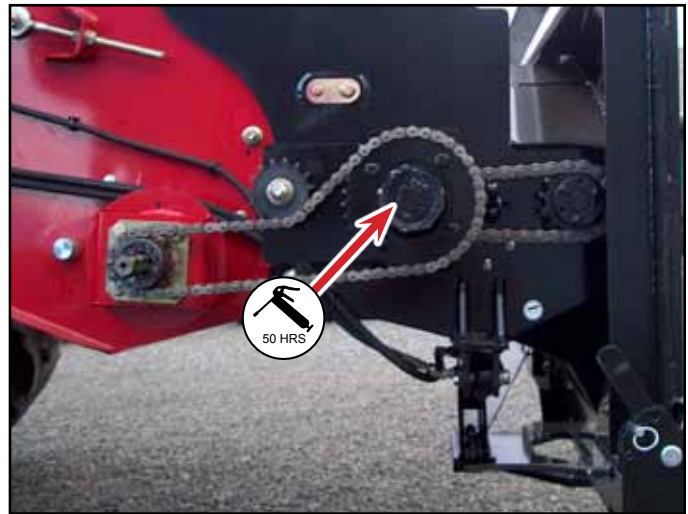
Right Leveling Cylinder Base
50 hrs.
1 Zerk



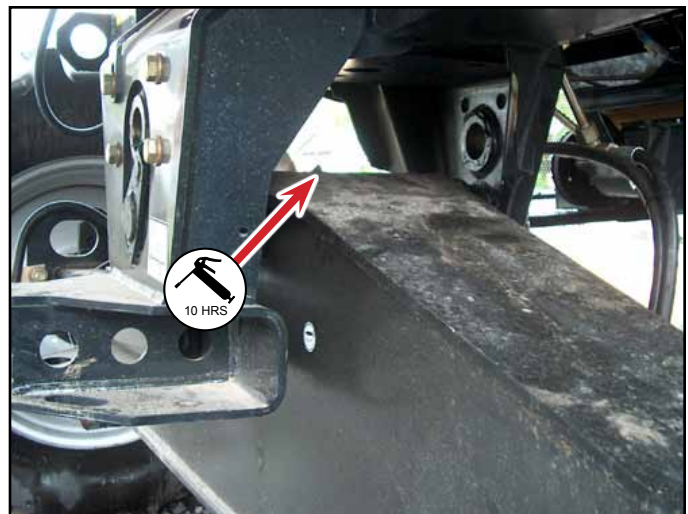
Leveling Cylinders Rod End
50 hrs.
2 Zerks



Transition Slip Clutch
Grease on 50 hour interval with
little to no slippage. Grease daily in
adverse feeding conditions where
slippage may occur more often.
Pump until grease comes out.

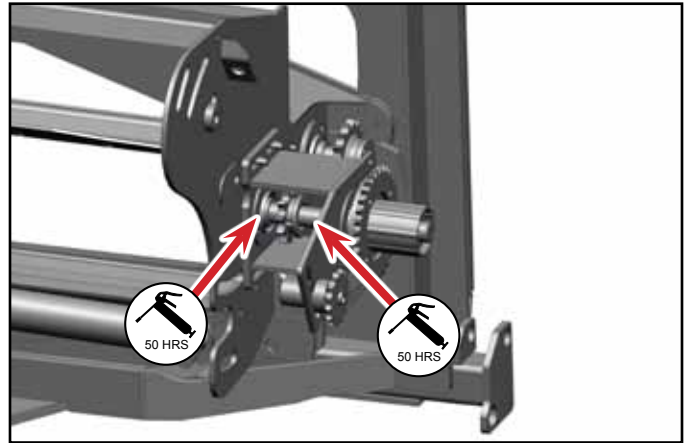


Steering Axle Pivot
10 hrs.
1 zerk



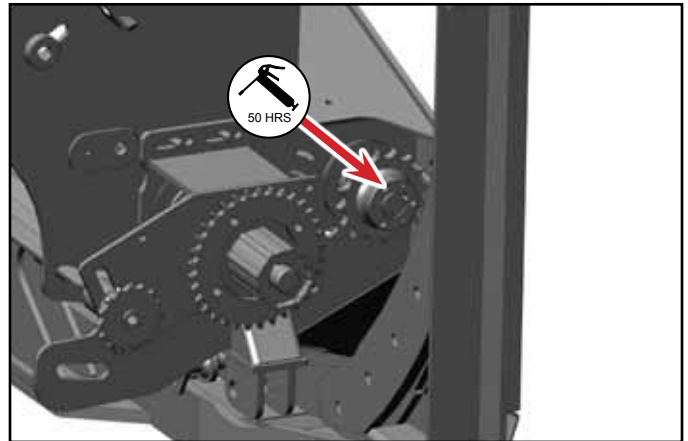
Paddle Beater Jackshaft

50 hrs.
2 Zerks



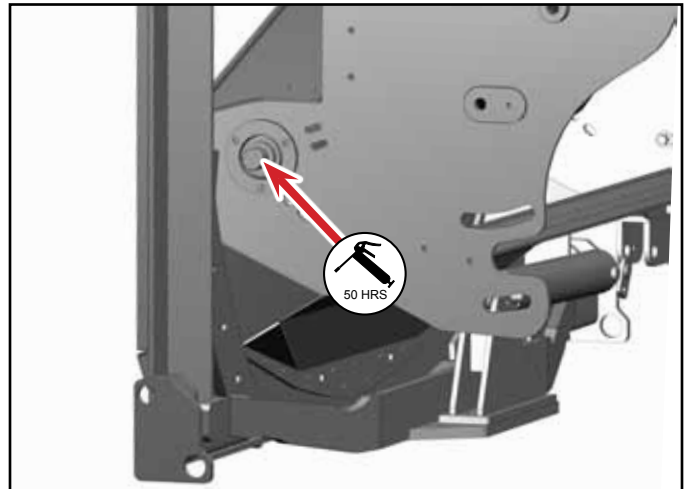
Bearing on Right Side
Paddle Beater

50 hrs.
1 Zerk



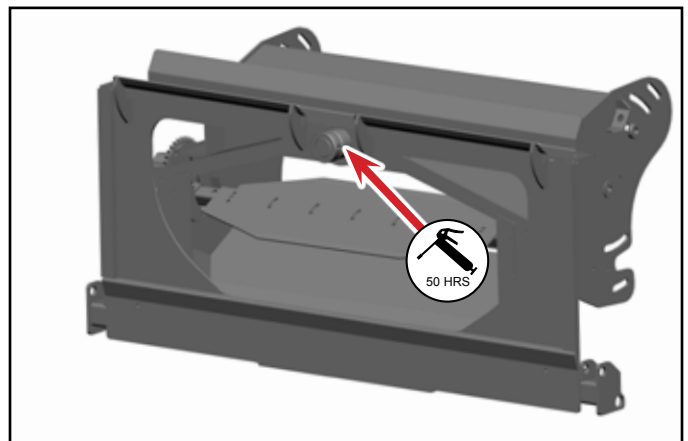
Bearing on Left Side
Paddle Beater

50 hrs.
1 Zerk



Transition Pivot Pin

50 hrs.
1 Zerk



Fasteners

Check Bolt Tightness

After the first 10 hours of operation
Every season

The following bolts are torqued to special specifications because of the application in which they are used:

Transmission Mounting Bolts: Case IH® torque specifications
(Medium Strength Loctite is Used on These Bolts, Check for Looseness ONLY)

Final Drive Housing Bolts: Case IH® torque specifications
(Medium Strength Loctite is Used on These Bolts, Check for Looseness ONLY)

Drive Wheel Hub Bolts: Case IH® torque specifications

Steering Wheel Hub Bolts: Case IH® torque specifications

Important:

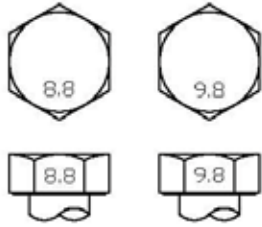
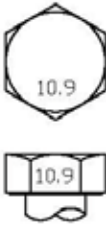
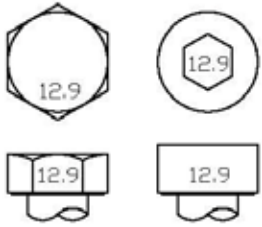
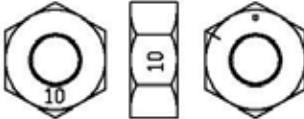

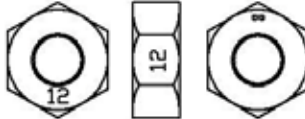
Consult your Case IH 7230/40, 8230/40 and 9230/40 Operator's Manual to verify that correct bolts and spacers are used for the Rear Wheel Application.

The following two pages shows torque charts for metric and standard fasteners. Use these charts for checking torques on bolts not shown above.

Metric Torque Chart

SI Bolt and Cap Screw Torque Values

(For Hillco Leveling Systems Only)

| | | | |
|---|---|--|---|
| Property Class and Head Markings |  |  |  |
| Property Class and Nut Markings |  |  |  |

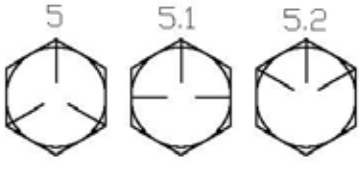
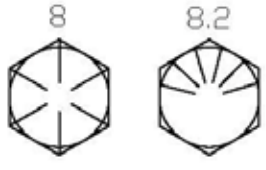
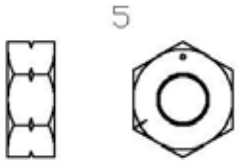
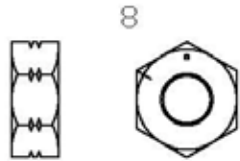
| SIZE | Class 8.8 or 9.8 | | | | Class 10.9 | | | | Class 12.9 | | | |
|------|------------------|-------|--------|-------|---------------|-------|--------|-------|---------------|-------|--------|-------|
| | Lubricated(1) | | Dry(2) | | Lubricated(1) | | Dry(2) | | Lubricated(1) | | Dry(2) | |
| | N*m | lb-ft | N*m | lb-ft | N*m | lb-ft | N*m | lb-ft | N*m | lb-ft | N*m | lb-ft |
| M6 | 9 | 6.5 | 11 | 8.5 | 13 | 9.5 | 17 | 12 | 15 | 11.5 | 19 | 14.5 |
| M8 | 22 | 16 | 28 | 20 | 32 | 24 | 40 | 30 | 37 | 28 | 47 | 35 |
| M10 | 43 | 32 | 55 | 40 | 63 | 47 | 80 | 60 | 75 | 55 | 95 | 70 |
| M12 | 75 | 55 | 95 | 70 | 110 | 80 | 140 | 105 | 130 | 95 | 165 | 120 |
| M14 | 120 | 88 | 150 | 110 | 175 | 130 | 225 | 165 | 205 | 150 | 260 | 190 |
| M16 | 190 | 140 | 240 | 175 | 275 | 200 | 350 | 255 | 320 | 240 | 400 | 300 |
| M18 | 260 | 195 | 330 | 250 | 375 | 275 | 475 | 350 | 440 | 325 | 560 | 410 |
| M20 | 375 | 275 | 475 | 350 | 530 | 400 | 675 | 500 | 625 | 460 | 800 | 580 |
| M22 | 510 | 375 | 650 | 475 | 725 | 540 | 925 | 675 | 850 | 625 | 1075 | 800 |
| M24 | 650 | 475 | 825 | 600 | 925 | 675 | 1150 | 850 | 1075 | 800 | 1350 | 1000 |
| M27 | 950 | 700 | 1200 | 875 | 1350 | 1000 | 1700 | 1250 | 1600 | 1150 | 2000 | 1500 |
| M30 | 1300 | 950 | 1650 | 1200 | 1850 | 1350 | 2300 | 1700 | 2150 | 1600 | 2700 | 2000 |
| M33 | 1750 | 1300 | 2200 | 1650 | 2500 | 1850 | 3150 | 2350 | 2900 | 2150 | 3700 | 2750 |
| M36 | 2250 | 1650 | 2850 | 2100 | 3200 | 2350 | 4050 | 3000 | 3750 | 2750 | 4750 | 3500 |

- (1) "Lubricated" Means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.
- (2) "Dry" means plain or zinc plated without any lubrication.

Standard Torque Chart

Unified Inch Bolt and Cap Screw Torque Values

(For Hillco Leveling Systems Only)

| | | |
|-----------------------------|--|---|
| SAE Grade and Head Markings |  |  |
| SAE Grade and Nut Markings |  |  |

| SIZE | Grade 5, 5.1, or 5.2 | | | | Grade 8 or 8.2 | | | |
|-------|----------------------|-------|--------|-------|----------------|-------|--------|-------|
| | Lubricated(1) | | Dry(2) | | Lubricated(1) | | Dry(2) | |
| | N*m | lb-ft | N*m | lb-ft | N*m | lb-ft | N*m | lb-ft |
| 1/4 | 9.5 | 7 | 12 | 9 | 13.5 | 10 | 17 | 12.5 |
| 5/16 | 20 | 15 | 25 | 18 | 28 | 21 | 35 | 26 |
| 3/8 | 35 | 26 | 44 | 33 | 50 | 36 | 63 | 46 |
| 7/16 | 55 | 41 | 70 | 52 | 80 | 58 | 100 | 75 |
| 1/2 | 85 | 63 | 110 | 80 | 120 | 90 | 150 | 115 |
| 9/16 | 125 | 90 | 155 | 115 | 175 | 130 | 225 | 160 |
| 5/8 | 170 | 125 | 215 | 160 | 240 | 175 | 300 | 225 |
| 3/4 | 300 | 225 | 375 | 280 | 425 | 310 | 550 | 400 |
| 7/8 | 490 | 360 | 625 | 450 | 700 | 500 | 875 | 650 |
| 1 | 725 | 540 | 925 | 675 | 1050 | 750 | 1300 | 975 |
| 1-1/8 | 900 | 675 | 1150 | 850 | 1450 | 1075 | 1850 | 1350 |
| 1-1/4 | 1300 | 950 | 1650 | 1200 | 2050 | 1500 | 2600 | 1950 |
| 1-3/8 | 1750 | 1250 | 2150 | 1550 | 2700 | 2000 | 3400 | 2550 |
| 1-1/2 | 2250 | 1650 | 2850 | 2100 | 3600 | 2650 | 4550 | 3350 |

(1) "Lubricated" Means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.

(2) "Dry" means plain or zinc plated without any lubrication.

Tire Inflation

| Tire | Load Index | PSI |
|--|------------|-----|
| Drive (650/75R32) R1 & R3 Tread | 175A8 | 46 |
| Drive (650/65R38) 550 Tread | 175A8 | 46 |
| Steer (28LR-26) R1 & R3 Tread | 173A8 | 36 |
| Steer (28LR-26) 390 Tread | 178A8 | 36 |
| For all other steer tires see the combine's operator's manual for correct pressure | | |

All Hillside combines are required to follow the Wheel and Tire Association Standards which states that the tire pressure must be such that the tire has adequate load carrying capability for the maximum possible weight (counting head weight and full grain tank). Both under-inflation and over-inflation are detrimental to tire life. Don't reinflate a tire that has been run flat or when there is obvious or suspected damage to the tire or wheel components. Check the tire pressure weekly or after 50 hours of operation.



WARNING

When inflating tires, use a clip on air chuck and extension hose long enough to allow you to stand to one side and NOT in front or over the tire assembly. Use a safety cage if available.



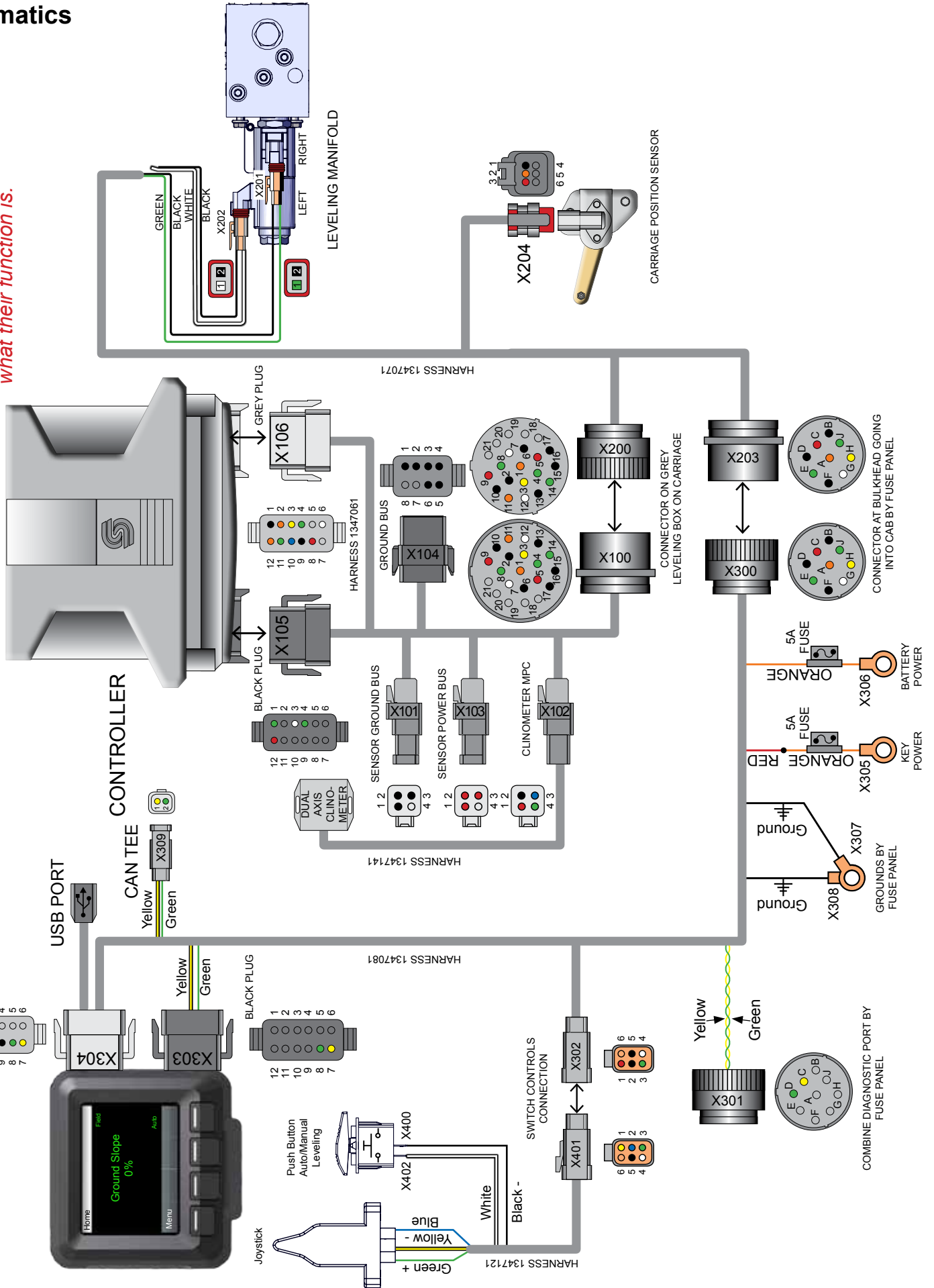
WARNING

A tire can explode during inflation and cause serious injury or death. Never increase air pressure beyond 35 PSI to seat the bead on the rim. Replace a tire if it has a defect. Replace a wheel rim, which has cracks, wear or severe rust. Make sure that all the air is removed from a tire before removing the tire from the rim. Never use force on an inflated or partially inflated tire. Make sure the tire is correctly seated before inflating.

Schematics

CH9020 Electrical Leveling Schematic SN (18001-18999)

Reference the to from tables on the following pages to trace wires and what their function is.



CH9020 Electrical Leveling Schematic
SN (18001-18999)

| X100 - Box Bulkhead | | | To | |
|---------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Orange | Controller Power | X106 | 2 |
| 2 | Black | Ground Bus Supply | X104 | 1 |
| 3 | Yellow | CAN High | X106 | 3 |
| 4 | Green | CAN Low | X106 | 4 |
| 5 | Red | Joystick Power | X103 | 2 |
| 6 | Black | Joystick Ground | X101 | 2 |
| 7 | White | Auto Switch Signal | X106 | 6 |
| 8 | Green | Joystick Signal | X105 | 1 |
| 9 | Red | UC Sensor Power | X103 | 3 |
| 10 | Black | UC Sensor Ground | X101 | 3 |
| 11 | Orange | UC Sensor Signal | X106 | 12 |
| 12 | White | Left Valve Power | X105 | 3 |
| 13 | Black | Left Valve Ground | X104 | 4 |
| 14 | Green | Right Valve Power | X105 | 4 |
| 15 | Black | Right Valve Ground | X104 | 5 |
| 16 | Black | Auto Switch Ground | X104 | 6 |
| 17 | - | - | - | - |
| 18 | - | - | - | - |
| 19 | - | - | - | - |
| 20 | - | - | - | - |
| 21 | - | - | - | - |

| X101 - Sensor Ground Bus | | | To | |
|--------------------------|------------|----------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | Sensor Ground Supply | X106 | 9 |
| 2 | Black | Joystick Ground | X100 | 6 |
| 3 | Black | UC Sensor Ground | X100 | 10 |
| 4 | - | - | - | - |

| X102 - Clinometer MPC | | | To | |
|-----------------------|------------|------------------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Red | Clinometer Power | X105 | 12 |
| 2 | Black | Clinometer Ground | X104 | 3 |
| 3 | Blue | Clinometer Left/Right Signal | X106 | 10 |
| 4 | Green | Clinometer Fore/Aft Signal | X106 | 11 |

| X103 - Sensor Power Bus | | | To | |
|-------------------------|------------|---------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Red | Sensor Power Supply | X106 | 8 |
| 2 | Red | Joystick Power | X100 | 5 |
| 3 | Red | UC Power Supply | X100 | 9 |
| 4 | - | - | - | - |

| X104 - Ground Bus | | | To | |
|-------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | Ground Bus Supply | X100 | 2 |
| 2 | Black | Controller Ground | X106 | 1 |
| 3 | Black | Clinometer Ground | X102 | 2 |
| 4 | Black | Left Valve Ground | X100 | 13 |
| 5 | Black | Right Valve Ground | X100 | 15 |
| 6 | Black | Auto Switch Ground | X100 | 16 |
| 7 | - | - | - | - |
| 8 | - | - | - | - |

| X105 - Controller B Black Connector | | | To | |
|-------------------------------------|------------|-------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Green | Joystick Signal | X100 | 8 |
| 2 | - | - | - | - |
| 3 | White | Left Valve Power | X100 | 12 |
| 4 | Green | Right Valve Power | X100 | 14 |
| 5 | - | - | - | - |
| 6 | - | - | - | - |
| 7 | - | - | - | - |
| 8 | - | - | - | - |
| 9 | - | - | - | - |
| 10 | - | - | - | - |
| 11 | - | - | - | - |
| 12 | Red | Clinometer Power | X102 | 1 |

| X106 - Controller A Grey Connector | | | To | |
|------------------------------------|------------|------------------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | Clinometer Ground | X104 | 2 |
| 2 | Orange | Controller Power | X100 | 1 |
| 3 | Yellow | CAN High | X100 | 3 |
| 4 | Green | CAN Low | X100 | 4 |
| 5 | - | - | - | - |
| 6 | White | Auto Switch Signal | X100 | 7 |
| 7 | - | - | - | - |
| 8 | Red | Sensor Power Supply | X103 | 1 |
| 9 | Black | Sensor Ground Supply | X101 | 1 |
| 10 | Blue | Clinometer Left/Right Signal | X102 | 3 |
| 11 | Green | Clinometer Fore/Aft Signal | X102 | 4 |
| 12 | Orange | UC Sensor Signal | X100 | 11 |

CH9020 Electrical Leveling Schematic
SN (18001-18999)

| X200 - Box Bulkhead | | | To | |
|---------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Orange | Controller Power | X203 | 1 |
| 2 | Black | Controller Ground | X203 | 2 |
| 3 | Yellow | CAN High | X203 | 8 |
| 4 | Green | CAN Low | X203 | 9 |
| 5 | Red | Joystick Power | X203 | 3 |
| 6 | Black | Joystick Ground | X203 | 4 |
| 7 | White | Auto Switch Signal | X203 | 7 |
| 8 | Green | Joystick Signal | X203 | 5 |
| 9 | Red | UC Sensor Power | X204 | 3 |
| 10 | Black | UC Sensor Ground | X204 | 1 |
| 11 | Orange | UC Sensor Signal | X204 | 2 |
| 12 | White | Left Valve Power | X202 | 1 |
| 13 | Black | Left Valve Ground | X202 | 2 |
| 14 | Green | Right Valve Power | X201 | 1 |
| 15 | Black | Right Valve Ground | X201 | 2 |
| 16 | Black | Auto Switch Ground | X203 | 6 |
| 17 | - | - | - | - |
| 18 | - | - | - | - |
| 19 | - | - | - | - |
| 20 | - | - | - | - |
| 21 | - | - | - | - |

| X201 - Right Valve | | | To | |
|--------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Green | Right Valve Power | X200 | 14 |
| 2 | Black | Right Valve Ground | X200 | 15 |

| X202 - Left Valve | | | To | |
|-------------------|------------|-------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | White | Left Valve Power | X200 | 12 |
| 2 | Black | Left Valve Ground | X200 | 13 |

| X203 - Cab Bulkhead | | | To | |
|---------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| A | Orange | Controller Power | X200 | 1 |
| B | Black | Controller Ground | X200 | 2 |
| C | Red | Joystick Power | X200 | 5 |
| D | Black | Joystick Ground | X200 | 6 |
| E | Green | Joystick Signal | X200 | 8 |
| F | Black | Auto Switch Ground | X200 | 16 |
| G | White | Auto Switch Signal | X200 | 7 |
| H | Yellow | CAN High | X200 | 3 |
| J | Green | CAN Low | X200 | 4 |

| X204 - UC Sensor | | | To | |
|------------------|------------|------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | UC Sensor Ground | X200 | 10 |
| 2 | Orange | UC Sensor Signal | X200 | 11 |
| 3 | Red | UC Sensor Power | X200 | 9 |
| 4 | - | - | - | - |
| 5 | - | - | - | - |
| 6 | - | - | - | - |

| X300 - Cab Bulkhead | | | To | |
|---------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| A | Orange | Key Power | X304 | 3 |
| B | Black | Controller Ground | X308 | 1 |
| C | Red | Joystick Power | X302 | 1 |
| D | Black | Joystick Ground | X302 | 2 |
| E | Green | Joystick Signal | X302 | 3 |
| F | Black | Auto Switch Ground | X302 | 5 |
| G | White | Auto Switch Signal | X302 | 4 |
| H | Yellow | CAN High | X304 | 7 |
| J | Green | CAN Low | X304 | 8 |

| X301 Diagnostic MPC | | | To | |
|---------------------|------------|-------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| A | - | - | - | - |
| B | - | - | - | - |
| C | Yellow | CAN1 High | X303 | 7 |
| D | Green | CAN1 Low | X303 | 8 |
| E | - | - | - | - |
| F | - | - | - | - |
| G | - | - | - | - |
| H | - | - | - | - |
| J | - | - | - | - |

| X302 - Switch Box | | | To | |
|-------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Red | Joystick Power | X300 | C |
| 2 | Black | Joystick Ground | X300 | D |
| 3 | Green | Joystick Signal | X300 | E |
| 4 | White | Auto Switch Signal | X300 | G |
| 5 | Black | Auto Switch Ground | X300 | F |
| 6 | - | - | - | - |

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| X303 - Display B | | | To | |
|------------------|------------|-------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | - | - | - | - |
| 2 | - | - | - | - |
| 3 | - | - | - | - |
| 4 | - | - | - | - |
| 5 | - | - | - | - |
| 6 | - | - | - | - |
| 7 | Yellow | CAN1 High | X301 | C |
| 8 | Green | CAN1 Low | X301 | D |
| 9 | - | - | - | - |
| 10 | - | - | - | - |
| 11 | - | - | - | - |
| 12 | - | - | - | - |

| X304 - Display A | | | To | |
|------------------|------------|----------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Red | Battery Power | X305 | 1 |
| 2 | Black | Display Ground | X307 | 1 |
| 3 | Orange | Keyed Power | X300 | A |
| 4 | - | - | - | - |
| 5 | - | - | - | - |
| 6 | - | - | - | - |
| 7 | Yellow | CAN0 High | X300 | H |
| 8 | Green | CAN0 Low | X300 | J |
| 9 | Black | USB Ground | USB | |
| 10 | White | USB Data + | USB | |
| 11 | Green | USB Data - | USB | |
| 12 | Red | USB Power | USB | |

| X305 - Keyed Power | | | To | |
|--------------------|------------|-------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Orange | Keyed Power | X300 | A |
| | | | X304 | 3 |

Note: Orange wire with Ring terminal connects to 5 amp fuse. That then T's and one leg goes to X300 pin a and the other leg goes to X304 pin 3.

| X306 - Battery Power | | | To | |
|----------------------|------------|---------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Red | Battery Power | X304 | 1 |

Note: Red wire connects to orange wire 5 amp fuse.

| X307 - Display Ground | | | To | |
|-----------------------|------------|----------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | Display Ground | X304 | 2 |

| X308 - Controller Ground | | | To | |
|--------------------------|------------|-------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | Controller Ground | X300 | B |

| X309 - CAN Tee | | | To | |
|----------------|------------|----------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Yellow | CAN O High Tee | X300 | H |
| | | | X304 | 7 |
| 2 | Green | CAN O Low Tee | X300 | J |
| | | | X304 | 8 |

Yellow wire tees with legs going to X300 pin H and X304 Pin 7. Green wire tees with legs going to X300 pin J and X304 Pin 8.

| X400 - Auto Switch Signal | | | To | |
|---------------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | White | Auto Switch Signal | X401 | 4 |

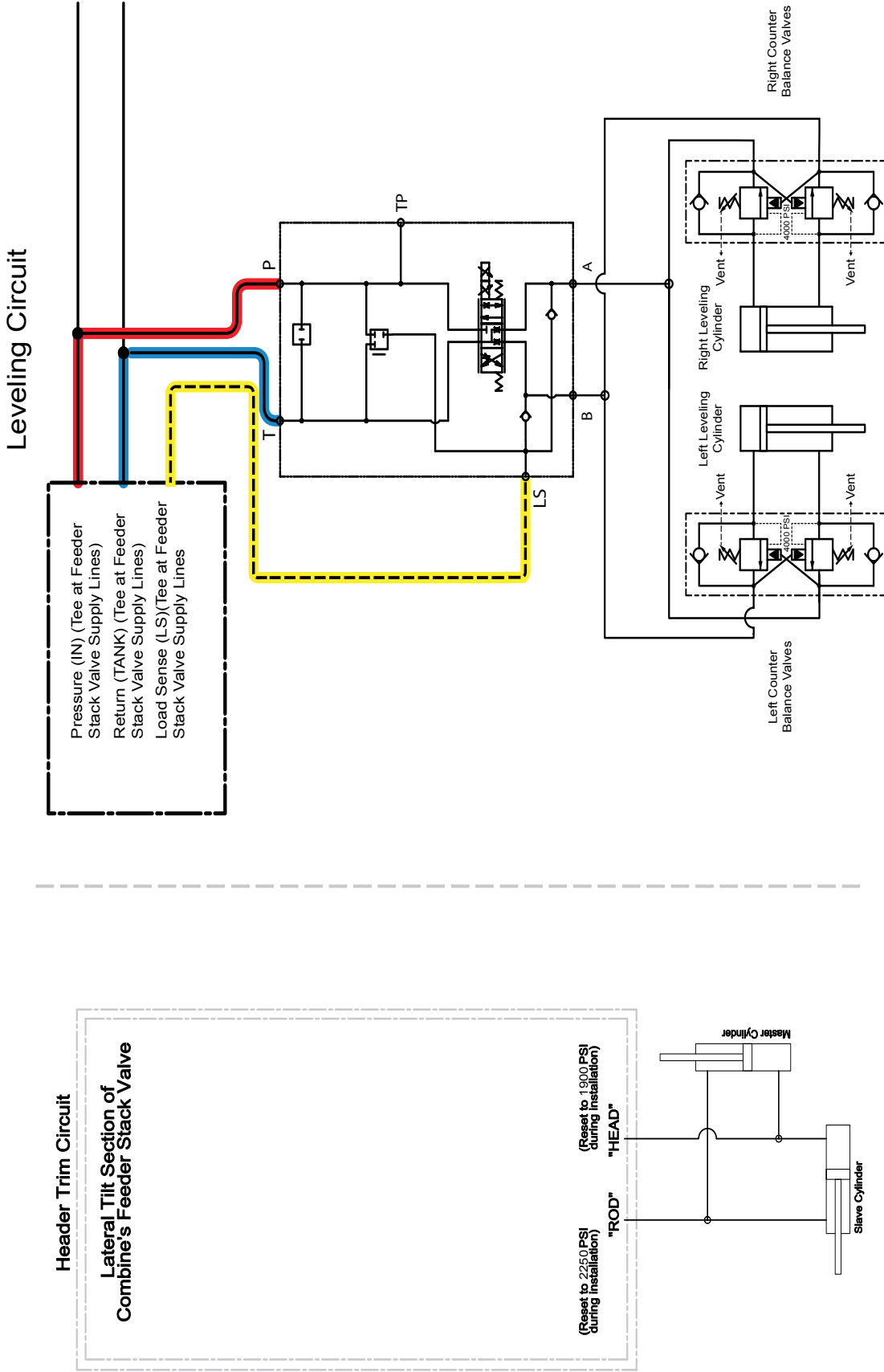
| X401 - Switch Box | | | To | |
|-------------------|------------|--------------------|------------------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Yellow | Joystick Power | Joystick Pigtail | |
| 2 | Blue | Joystick Ground | | |
| 3 | Green | Joystick Signal | | |
| 4 | White | Auto Switch Signal | 400 | 1 |
| 5 | Black | Auto Switch Ground | 402 | 1 |
| 6 | - | - | - | - |

| X402 - Auto Switch Ground | | | To | |
|---------------------------|------------|--------------------|-----------|-----|
| Pin | Wire Color | Description | Connector | Pin |
| 1 | Black | Auto Switch Ground | X401 | 5 |

Model CH9020 Leveling Hydraulic Schematic

FOR ALL 7230, 7240, 8230, 8240, 9230 & 9240 Case-IH Combines

HILLCO S/N 18001 Thru 18999



Notes