

Honey Bee



**Grain Belt Plus Header
2007 Operator's Manual**

IMPORTANT NOTICE

ADJUSTMENT SETTINGS ON
LEVELING AND TABLE HEIGHT
SHOULD BE REVIEWED
BEFORE OPERATING THE HEADER.

SEE LEVELING - SECTION 4

WITHOUT PROPER
ADJUSTMENTS DAMAGE TO
HEADER MAY BE
ENCOUNTERED.

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PLEASE WASH EQUIPMENT AFTER TRANSPORTING.

Honey Bee Manufacturing Ltd. will not be responsible for any paint deterioration from salt or harsh chemical corrosion if this equipment is not properly washed after transporting.

Use a mild soap solution, and then rinse.

If equipment is stored through the winter months near salted streets or highways, it should be cleaned each spring.

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Honey Bee Manufacturing Ltd.

Grain Belt Plus Header – Operator's Manual

Purchase Information:

Dealers Name: _____

Address: _____

Phone: () _____

Purchase Date: _____

Model: _____

Serial Number: _____

Delivery Date: _____

MODIFICATION RECORD

DATE	MODIFICATION

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Honey Bee Manufacturing Ltd.

Grain Belt Plus Header – Operator's Manual

Warranty

Honey Bee Manufacturing Ltd. (Honey Bee) warrants your new Grain Belt Plus Header to be free of defects in material and workmanship, under normal use and service. Obligations under this warranty shall extend for a period of 1 year (12 months) following the date of delivery to the original purchaser and shall be limited to, at the option of Honey Bee, replacement or repair of any parts found, upon inspection by Honey Bee, to be defective.

Warranty Claims

The purchaser claiming under this warranty shall report a warranty claim to his Authorized Dealer. The dealer shall complete the claim, on the prescribed form, for inspection by an authorized company representative. Warranty claims must be made within 60 days of warranty expiration.

Limitations of Liability

This warranty is expressly in lieu of all other warranties expressed or implied and all other obligations or liabilities on our part of any kind or character, including liabilities for alleged representations or negligence. We neither assume nor authorize any person to assume, on our behalf, any liability in connection with the subsequent sale of the Grain Belt Plus Header.

This warranty shall not apply to any Grain Belt Plus Header which has been altered outside the factory in any way so as in the judgment of Honey Bee to affect its operation or reliability, or which has been subject to misuse, neglect, or accident.

Operator's Manual

The purchaser acknowledges having received training in the safe operation of the Grain Belt Plus Header and further acknowledges that Honey Bee does not assume any liability resulting from the operation of the Grain Belt Plus Header in any manner other than described in this manual.

Improvements

Honey Bee Manufacturing Limited is continually striving to improve its products. We reserve the right to make improvements or changes when it becomes practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.

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Safety

The following are definitions for terms used in this manual:

Safety Terms

	Indicates a location or situation where potential danger exists. For example: <i>Shields are intended for your protection from moving parts - make sure they are in place before starting the machine.</i>
CAUTION: 	Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
WARNING: 	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to warn against unsafe practices.
DANGER:	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This is limited to the most extreme situations, where typically, machine components cannot be guarded for functional purposes.
ATTENTION:	This term warns of potential damage to the equipment if instructions are not followed.
IMPORTANT	Warns of conditions that will cause inefficient operation or possible damage to the machine.

Please Note:	<i>The terms used for parts of the header in this manual are those in use at the time of design. These terms are subject to change in the future.</i>
---------------------	--

WARNING

THIS MACHINE IS POWERED BY HYDRAULICS.

Caution must be exercised around the machine. Hydraulic fluid under pressure can penetrate the skin, causing serious injury, and even death. When looking for a leak, use a piece of cardboard or other suitable material.

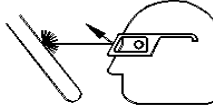


NEVER USE YOUR HANDS TO LOCATE THE LEAK.

Always wear eye protection, gloves and long-sleeve clothing when working with hydraulics. The fluid stream from small leaks can be invisible. Always exercise caution when working around hydraulics.

You can avoid this hazard by relieving the pressure before disconnecting hydraulic lines, and by tightening all connections before applying pressure.

Relieving Hydraulic Pressure - General Procedure:

1. Lower all components, such as the reel and the header, so that their weight is fully supported by the ground or by stable supports;
2. Turn off the engine of the combine;
3. Refer to the combine operator's manual for specific instructions on relieving hydraulic pressure in the system.

	<div style="text-align: center;">  WARNING </div> <p>HIGH PRESSURE FLUID HAZARD TO PREVENT SERIOUS INJURY OR DEATH: 1. RELIEVE PRESSURE IN SYSTEM BEFORE REPAIRING, ADJUSTING OR DISCONNECTING 2. WEAR PROPER HAND AND EYE PROTECTION WHEN SEARCHING FOR LEAKS. USE WOOD OR CARDBOARD INSTEAD OF HANDS. 3. KEEP ALL COMPONENTS IN GOOD REPAIR. 64871</p>
	

WARNING


If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result.

Doctors unfamiliar with this type of injury should reference a knowledgeable medical source.

IMPORTANT	<p>YOU are responsible for the safe operation and maintenance of your Honey Bee Header. You must ensure that you, and anyone else who is going to operate, maintain, or work around the Header be familiar with the operating and maintenance procedures and related SAFETY information contained in this manual.</p> <p>Most accidents are preventable. You are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a part of your daily working practises. Do not risk injury or death by ignoring good safety practices.</p>
	<p>Operating instructions for this header should be reviewed by each operator at least once a year per OSHA regulations 1928.57. The meaning of each decal should be understood prior to operating the header, and the operator must be familiar with the location of all hazards on the machine.</p>

General Safety

1. Keep all hydraulic components and motors clean. Remove all chaff and straw to prevent the possibility of fire.
2. Carry a functional, multipurpose fire extinguisher in the cab, and know how to use it. Check the extinguisher regularly and keep it maintained.
3. Provide a first aid kit in the cab for emergencies and know how to use it.
4. Never wear loose clothing or jewelry around machinery.
5. Wear appropriate protective gear. This includes, but is not limited to:
 - A hard hat,
 - Protective shoes with slip resistant soles,
 - Protective glasses or goggles,
 - Leather gloves,
 - Hearing protection,
 - Respirator or filter mask.
6. Do not allow any one to ride outside the cab of the combine.
7. Make certain that the park brake is engaged, and the combine is in neutral before starting the engine.
8. Clear the area of bystanders, especially small children, before starting the combine.
9. Do not allow anyone to operate machinery who has not been thoroughly instructed in

its correct use.

10. In addition to this manual, all operators should familiarize themselves with all sections of the Combine Operators Manual.

Some pictures or illustrations in this document will not show protective shields in place. This is done to explain clearly the operation of a component. This is in no way intended to condone operating equipment without safety shields.

Always ensure all protective shields are in place before starting the machine.

Safe Operating Practises

1. STOP the combine, engage the parking brake, place the combine in neutral, remove the key, and wait until all moving parts stop before leaving the cab.
2. Lower both the table and the reel onto their respective safety locks, or to their lowest point of travel before leaving the combine, or beginning work on the header. If working under the reel, lower the reel onto the cylinder locks. A loss of hydraulic pressure could cause the header or reel to fall suddenly.
3. NEVER operate the combine and the header while tired, ill, or impaired.
4. DANGER - DO NOT stand between the combine and the header while raising or lowering the header.
5. Do not operate the header in crowded or confined areas.
6. Remember that some models of this header are not centered on the combine feeder housing, but may be offset to the right. This can easily distort your judgment of distances.

Maintenance Safety

1. Before doing any maintenance, shut off the engine of the combine, engage the park brake, lower the reel, and the header to their lowest point of travel, or onto the safety locks. Also make sure that there is no pressure in the hydraulic lines. (Refer to the Combine Operator's manual for specific procedures.)
2. Hydraulic leaks can penetrate the skin causing serious injuries. Small leaks can be invisible and are dangerous. Use some kind of disposable object such as cardboard or wood to find the leak - **DO NOT USE YOUR HAND.**
3. Ensure that all pressure is released from hydraulic lines before attempting repairs. Replace or repair damaged hoses without delay to avoid oil loss, oil contamination, and damage to internal components.

4. Care should be taken when maintaining the knife. The sickle sections are very sharp and can easily cause injury. Use heavy leather or canvas gloves when working with the knife.

Transport Safety

1. Transport the header with a clean SMV (Slow Moving Vehicle) sign displayed on the rear of the header, and use your hazard lights if the law permits. Check local road laws before transporting.
2. When transporting the header on roads, be aware of the width of the header.
3. For long-distance transport put the header into full transport position (see the Dismount section).
4. Do not transport the machine at night, dawn, dusk, or in reduced visibility.
5. Ensure the hitch is firmly attached and secured with hitch pins before moving.
6. Attach the safety chain before moving.
7. Do not exceed 32 km/h (20 mph) during transport.

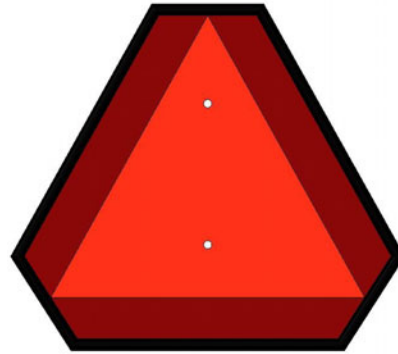


Illustration 1: Slow Moving Vehicle Sign (SMV)

Storage

Store the header on firm ground away from areas of human activity. The header may be stored in the quick dismount position or in the full transport position.

Safety Decal Locations

The following pages show the locations of safety decals on your header. They are intended for your safety, and the safety of those working with you. We strongly recommend that you take this manual, walk around your machine and take note of the content, meaning, and location of these warning signs.

Review these decals and the operating instructions in this manual with your machine operators. Keep these decals legible. If they become obscured or damaged, obtain replacements from your Honey Bee dealer.



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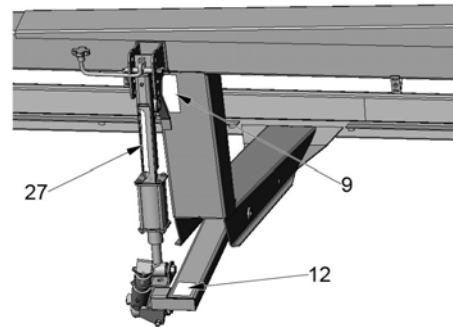
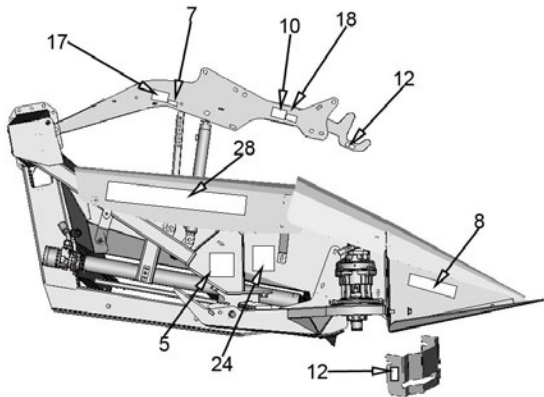
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1. Keep them clean.
2. Know the location and meaning of all decals.
3. Replace damaged safety decals immediately.

If required, you may obtain replacement decals from your dealer.

Decal Location Diagrams

Match the numbers on these diagrams to the Illustration numbers on the following pages to locate specific safety and product labels.



It is strongly recommended that you, and those working with you become completely familiar with the meaning of these labels.

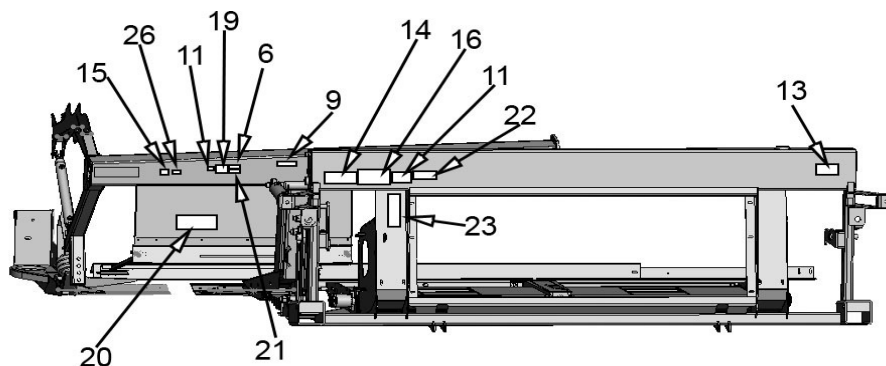
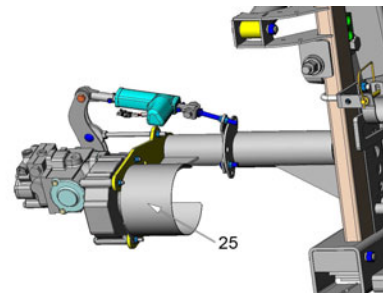


Illustration 2: Red Reflector (2x9)

Illustration 3: Yellow Reflector (2x9)

Illustration 4: Red-Orange Reflector (2x9)

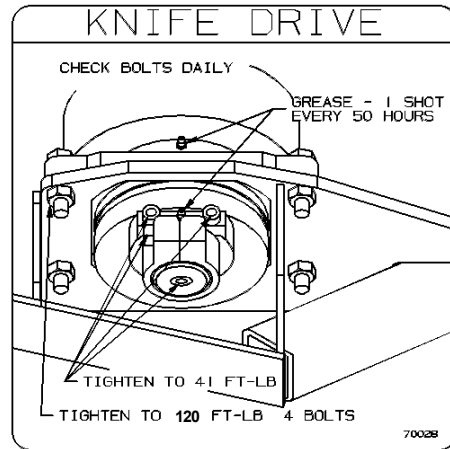


Illustration 5: Knife Drive Service Intervals

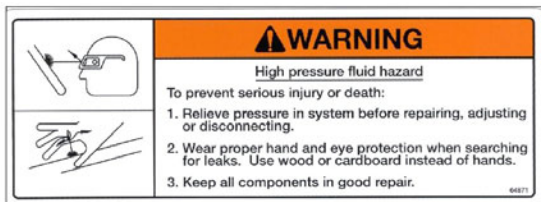


Illustration 6: WARNING - High Pressure Fluid



Illustration 7: Engage Cylinder Locks

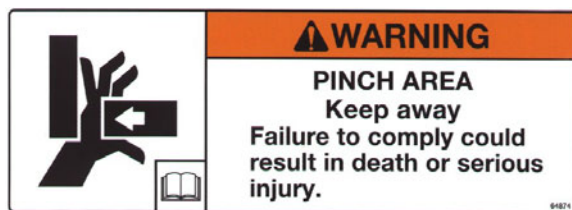


Illustration 9: Pinch Area



Illustration 8: Danger - Sharp Knife Sections



Illustration 10: Rotating Part Hazard



Illustration 11: Warning - Before Servicing

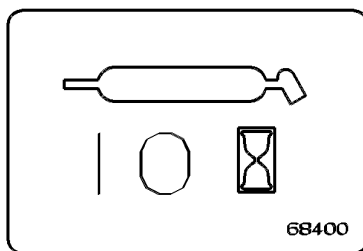


Illustration 12: 10 Hour Grease Point

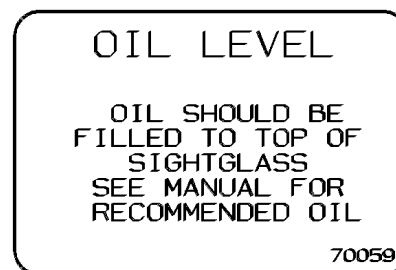


Illustration 13: Oil Level



Illustration 14: Danger - Rotating Driveline

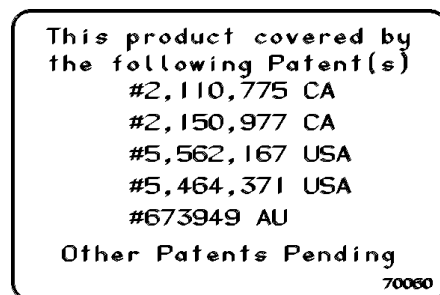


Illustration 15: Product Patents

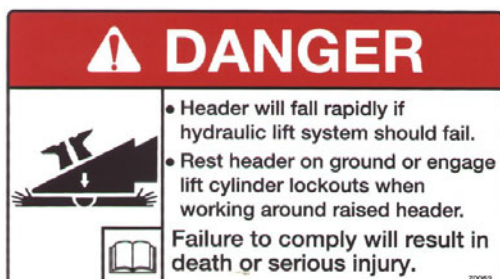


Illustration 16: Danger - Secure Header



Illustration 17: Warning - Cylinder Locks



Illustration 18: Attention - Secure Reels



Illustration 19: Read Operator's Manual

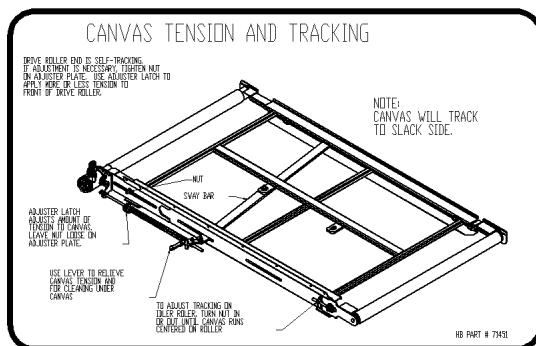


Illustration 20: Draper Tension and Tracking

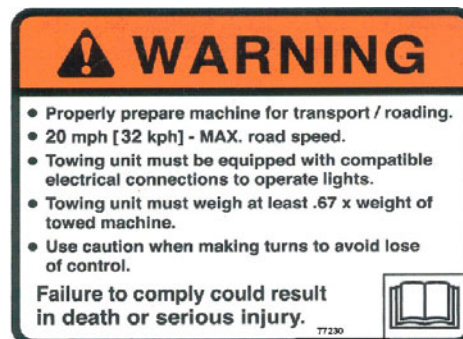


Illustration 21: Warning - Preparation for Transport

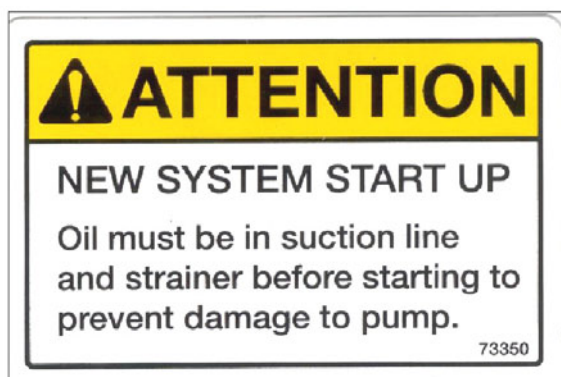


Illustration 22: New System Start-up



Illustration 23: Warning - Possible Loss of Control



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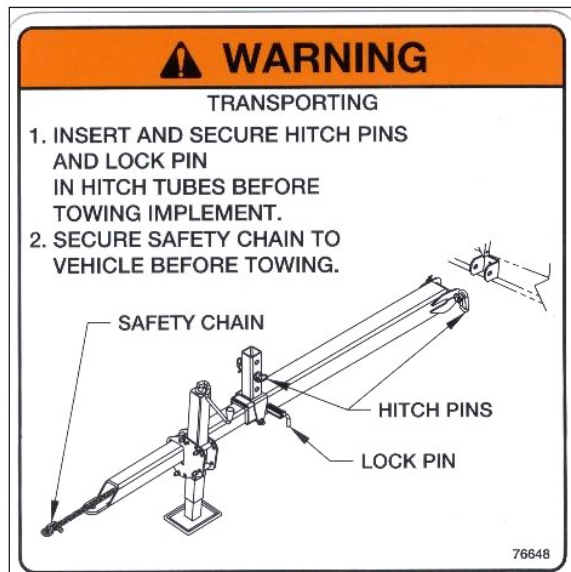


Illustration 24: Warning- Transport Hitch

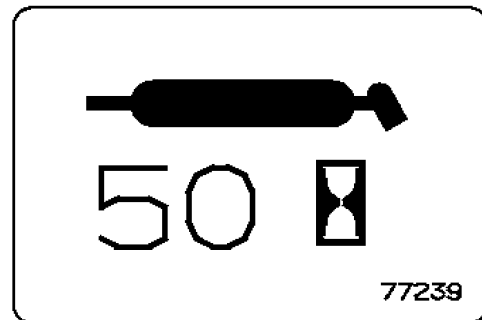


Illustration 25: 50 hour Grease Point

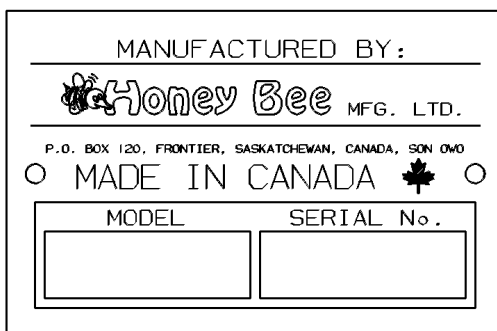


Illustration 26: Serial Number Plate

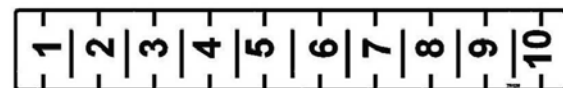


Illustration 27: Gauge Wheel Height Indicator

Grain Belt PLUS

Illustration 28: Product Label



Illustration 29: Honey Bee Logo



Illustration 30: Header Tilt Indicator

Lights and Signals

All Grain Belt Plus headers are equipped with clearance lights; and depending on the particular size and model of header you have, it may also be equipped with signal and brake lights. These lights are located as shown in the photos below. Ensure that all lights are in good working order before transporting the header.



Illustration 31: Transport Mode - Rear View

Pre-Transport Checks

Do a complete walk-around check to be sure there are no unsecured parts or components.

1. Check all reel mount, reel drive and adapter assembly bolts to be sure nothing is loose.
2. Ensure wheel bolts are tight.
3. Check transport tire pressure. Recommended pressure is 50 psi (345 KPa) for 225/75R15 radial, and 8.00/16-10-ply bias tires.
4. Check spindle and hitch lock pins to make sure they are in place and secure.
5. Tie back all wiring and hoses to make sure they will not pinch or drag during transporting.
6. Ensure the hitch, tongue, and safety chain are secured to the header and to the tow-vehicle.



Illustration 32: Transport Mode - Front View



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In-transit Checks

1. If you are towing your header, stop after the first 5 to 10 kilometers (2 to 6 miles) and check to make sure the wheel bolts are tight and the wheel hubs are not hot. Periodic checks 50 to 60 km (31 - 37 miles) should be made if towing the header long distances.
2. Check the hitch bolt and safety chain periodically to make sure they are secure.

In-Field Checks

This operator's manual covers the adjustments which may be required on your Grain Belt Plus header. Read this manual carefully before using your Grain Belt Plus header. Make the necessary adjustments before operating your header, and periodically during use, as required.

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General Information

The Honey Bee Grain Belt Plus header consists of the main components listed below. The adapter and sub-frame attach to the feeder house of the combine. The hydraulic pressure to run the header comes from a hydraulic pump driven from the feeder house of the combine. The knife is driven by a hydraulic motor to provide the power to cut the crop. The cutter bar consists of flexible panels and air-bag cushions which enable it to follow the contour of the ground as it cuts. The pickup reel lays the crop on the drapers. The lateral drapers carry the crop to the feeder draper, which directs it to the finger auger mounted in the subframe. The finger auger completes the delivery of the grain to the feeder house of the combine.

When in the field position, header flotation is achieved through the use of heavy duty leaf springs and castoring gauge wheels; and when in low crop cutting situations, through the pneumatic (air bag) cutter bar suspension system.

Principal Components

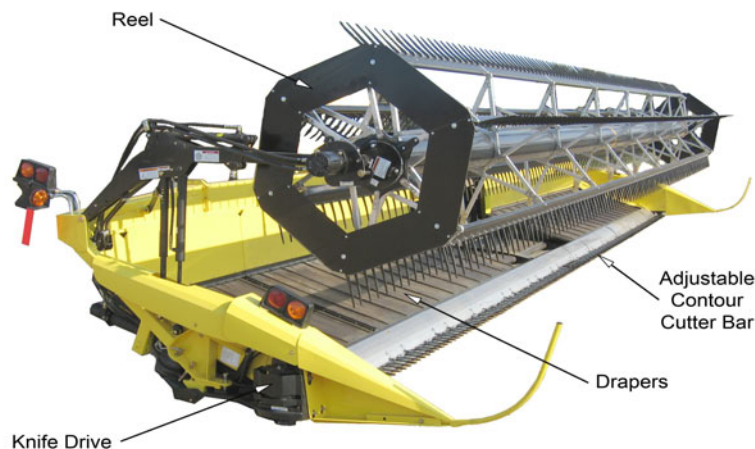


Illustration 33: Grain Belt Plus Header - Main View

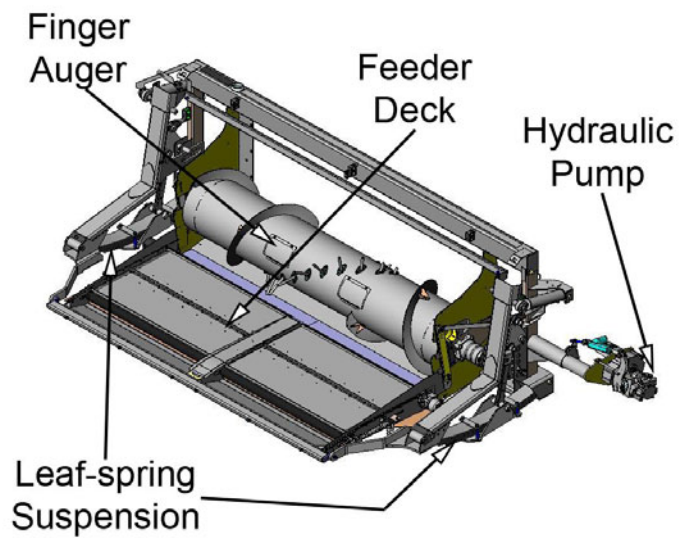


Illustration 34: Header Subframe - Front View

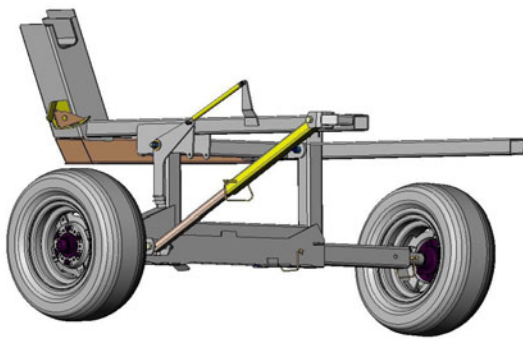


Illustration 35: Transport Axle – 30-36 ft.

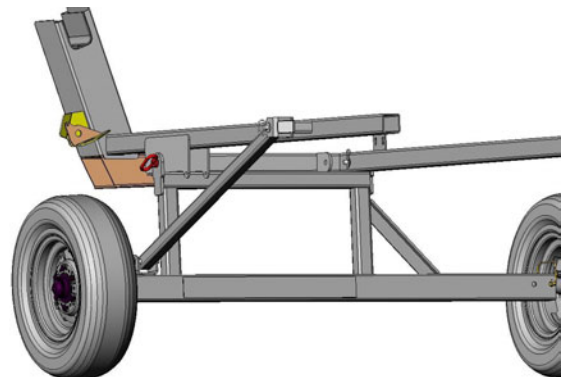


Illustration 36: Transport Axle 42-45 ft.



Illustration 37: Gauge Wheel - Right-hand Side

Serial Number Location

To obtain the fastest service when ordering parts, remember to:

1. Order the part by the correct number.
2. State the model.
3. Include the serial number from the header frame for header parts, and for the subframe, the Subframe Identification Number (SIN).

The serial number is stamped on a metal tag which can be found on the back of the upper tube on the left hand side of the table. The SIN is located on the right-hand side of the subframe. See Illustration 6: WARNING - High Pressure Fluid, page 21.



Serial Number
Plate

Illustration 38: Serial Number Location

In addition to the serial number, a manufacturing code representing the month and day of manufacture is stamped on the serial number plate. e.g. - C27 The letter represents the month (letters "A" up to "L" represent months of the year from January to December), and the two-digit number is the day of the month.

Operation

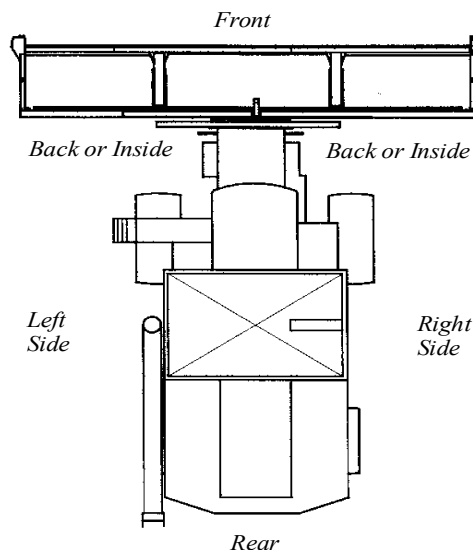
Mounting Instructions

These instructions are designed to help you mount your Grain Belt Plus Header on the combine in a safe and efficient manner. If you follow these instructions in the order they are given, you will avoid many potential difficulties.

It is recommended that you always use the check list at the end of this section to double check that the header is mounted properly and ready for the field.

Mounting and Dismounting Terminology

- COMBINE: FRONT - Feeder house end of the combine.
REAR - Straw spreader/ chopper end of the combine.
RIGHT and LEFT - As seen when sitting in the driver's seat facing the header.
- HEADER: FRONT - Cutter bar side
BACK or INSIDE - Feeder house mount side.
RIGHT and LEFT - As seen when sitting in the driver's seat facing the header when it is mounted on the combine or standing at the back of the header facing toward the cutter bar.





Important!

Remember to always think safety and work safely!

Combine Preparation

1. Remove the factory pickup or auger header from the combine as outlined in your Owners/ Operators manual, supplied by the combine manufacturer.
2. Check the feeder house front and top for straw and chaff. Clean all contact areas thoroughly.
3. Check all locking mechanisms and/ or lock pins on feeder house of combine to ensure they are working properly and will not interfere with the initial mounting of the Grain Belt Plus header onto your combine.
4. Check for leaks and/ or loose fittings on hydraulic lines (hoses) which attach to the header. Repair if necessary.

Grain Belt Plus Header Preparation

1. Check the feeder house adapter area on the Grain Belt header for any obstructions.
2. Be sure the rotating pump mount and attached hoses are clear of the feeder house adapter opening. Slide the telescoping drive shaft back as far as possible and secure into transport cradle. If necessary, lift and lock the rotating pump mount into transport position so it does not interfere with the feeder house as you drive the combine forward.
3. Check hydraulic hoses to be sure the couplers match those on the combine.

NOTE: Some types of couplers may not be supplied with the Grain Belt Plus Header.

4. The header should be placed on flat, hard and level ground.
5. If the transport package was **not** purchased, refer to the TRANSPORT TRAILER MANUAL for Mounting & Dismounting instructions. (***Note:** 30 ft and 36 ft models are available with the option of integral transport package *or* a transport trailer. 42 ft and 45 ft models are available with a *storage axle*).
6. If the optional transport system or storage axle **was** purchased, ensure that the header is sitting level prior to hookup by adjusting the hitch jack up or down as needed.
7. Install the crop dividers and crop divider pipes onto the ends of the table. These items are not installed at the factory. Operators should be aware of the greater transport width of the table with these items installed, and should check local regulations.
8. The crop divider is held in place with (3) 3/8" x 1-1/4" carriage head bolts. Three bolts

are installed through the face of the knife drive paddle, into the back of the crop divider. (see Illustration 39: Crop Divider and Deflectors, Illustration 40: Crop Divider Installed, and Illustration 41: Crop Divider Installed – Inside View.) These are held in place by flange lock nuts. Note that the crop divider overlaps the crop deflector to provide a smooth transition for the crop.

9. Install the crop divider pipe into the crop divider and tighten, checking that it is correctly aligned.

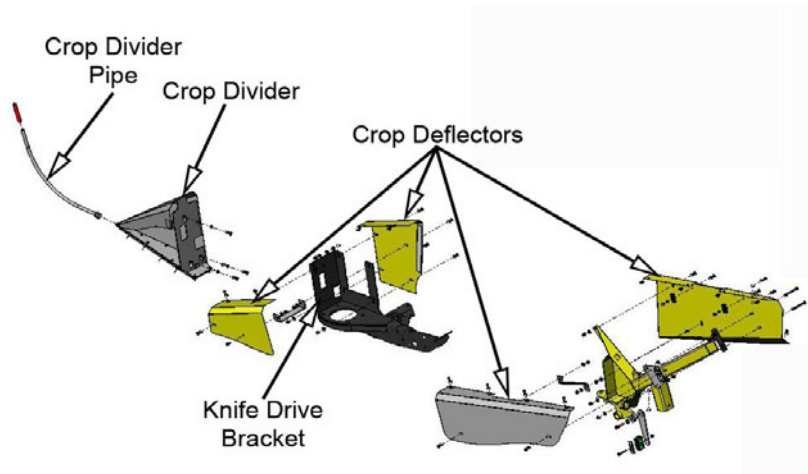


Illustration 39: Crop Divider and Deflectors

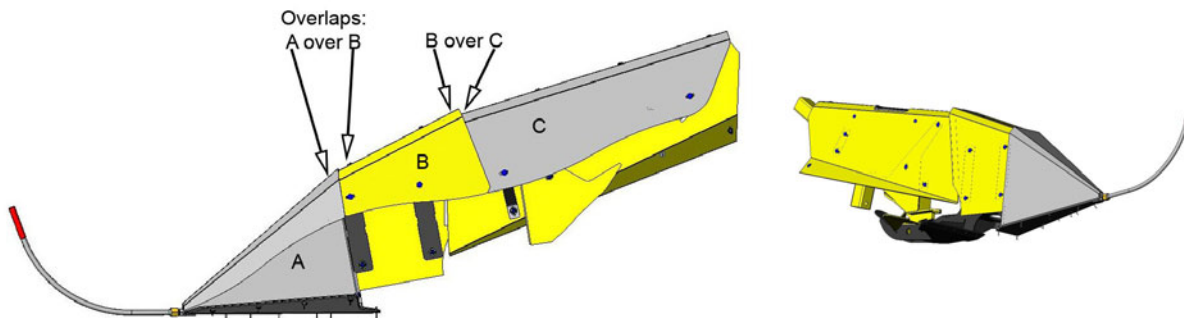


Illustration 40: Crop Divider Installed

Illustration 41: Crop Divider Installed – Inside View

NOTE:

The inside edge of the crop divider and pipe should be aligned so that they are approximately perpendicular to the cutter bar. This will allow the crop to be separated well and helps prevent crop from plugging in the corners.

Adapter Plate

All Grain Belt Plus tables are equipped with the same style of sub-frame and center feed auger adapter. The make of combine that you use will determine the proper adapter plate, which is bolted to the back of the auger adapter.

Ensure that all nuts, bolts, and washers are present and secured properly to the subframe prior to mounting on the combine.

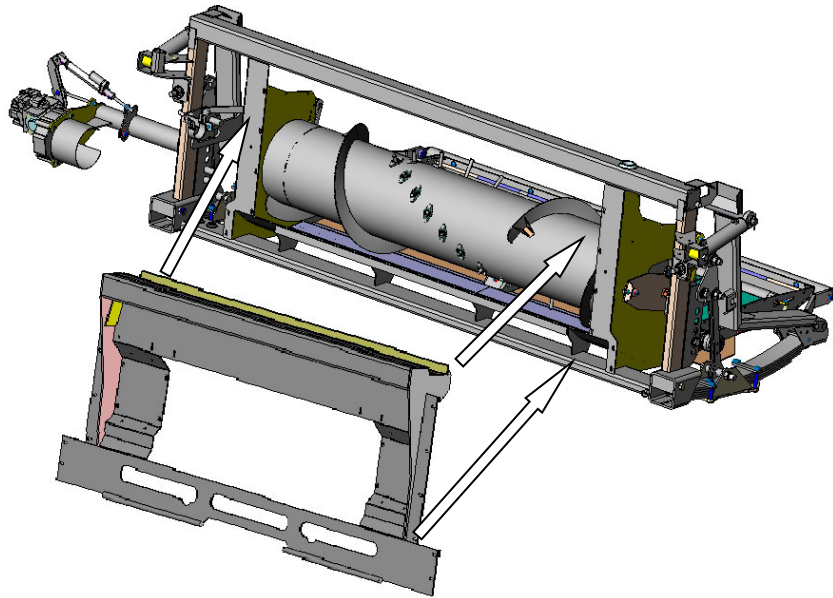


Illustration 42: Combine Adapter Plate

***Keep all bystanders,
ESPECIALLY CHILDREN
away from the machine during this procedure!***

Mounting

1. Place the header and combine on firm, level ground.
2. Position combine directly behind the header, with feeder house aligned as closely as possible to the feeder house adapter which is attached to the header sub frame.

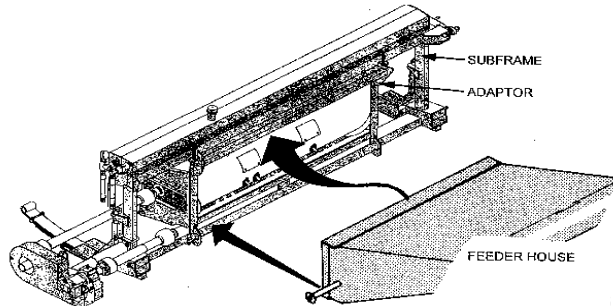


Illustration 43: Feeder House Alignment

3. With the feeder house on the combine lowered, slowly drive the combine forward until it is aligned both vertically and horizontally with the adapter plate on the header. If the feeder house does not align horizontally, adjust the optional hitch jack on the header either up or down to improve alignment. Adjust feeder house height as needed.
4. When the feeder house is properly aligned with the adapter on the header, drive forward slowly until the feeder house of the combine is inserted into the adapter plate. Slowly raise the feeder house until the top of the feeder house makes full contact with the inside top of the feeder house adapter plate.



Engage parking brake on the combine, shut the engine down, and wait for all moving parts to stop before leaving the cab.

4. Check the clearance and alignment of the feeder house to the adapter plate on both sides as well as on the top and bottom. Be sure that nothing is interfering with the alignment of the feeder house to the adapter plate or the finger auger.
5. Inspect the position of the feed auger in the adapter to be sure it is not contacting the shrouds on the front of the feeder house. If required, adjust the feed auger position (see the “**Center Feed Auger**” section of this manual).
6. If feeder house and the feeder house adapter plate ARE NOT properly aligned, repeat steps 2, 3, 4, and 5. If feeder house and the feeder adapter are properly aligned, restart the engine and raise the feeder house (and header) to its full height.



Engage parking brake on the combine, shut the engine down, and wait for all moving parts to stop before leaving the cab. Install feeder house cylinder locks as described in your combine operator's manual.

7. With header in the fully raised position insert all lock pins, hooks and/or bolts as described in your combine operator's manual.




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Be sure these pins are properly aligned and securely in place before proceeding!

Convert Optional Transport Axle to Field Position

WARNING 	<i>Axle and hitch parts are heavy. Care should be taken when handling them to avoid injury.</i>
NOTE:	<i>The transport axle, storage axle, hitch, and gauge wheels are optional equipment. If not purchased, disregard references to them in this manual.</i>

*With the header in fully raised position, and all cylinder locks, lock pins, hooks and/ or bolts in place as described in your owner's manual, proceed as follows:

1. Remove hitch pin (1) from front wheel assembly, and remove wheel assembly from transport axle. Remove front axle hitch pin (2), and slide axle into center axle tube. Pin inner axle in place by re-inserting hitch pin (2) into center axle tube. Install wheel assembly into Left side gauge wheel bracket (see INSTALLATION OF GAUGE WHEELS in this chapter), or store in a suitable location.

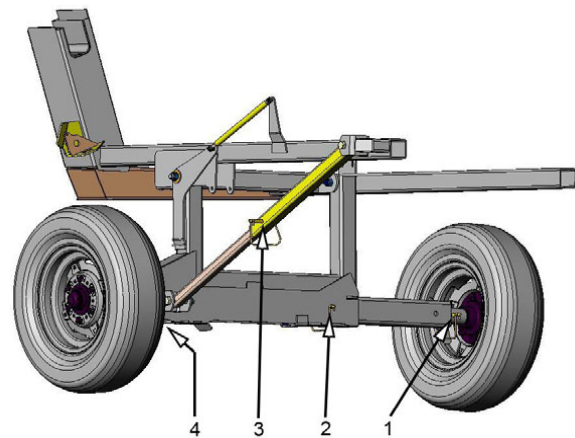


Illustration 44: Hitch Pin Positions

2. Remove hitch pin (4) (Illustration 44: Hitch Pin Positions) from the back wheel assembly, and remove wheel assembly from the transport axle. Install wheel assembly into right side gauge wheel bracket, or store wheel assembly in desired location.

3. Remove hitch pin (3) from axle support bar, and lift transport axle up and to the right to collapse axle assembly. (see Illustration 59: Axle in Transport Position) Insert hitch pin 3 through the now collapsed transport axle, into the frame as shown.

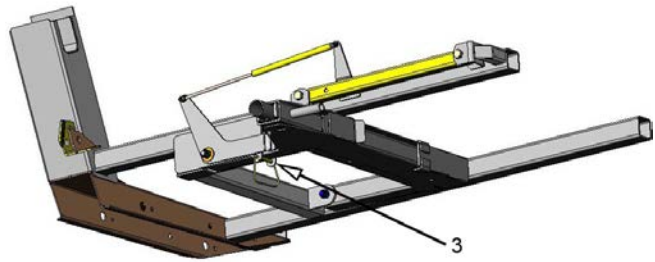


Illustration 45: Axle in Field Position

Removing the Storage Axle

Caution!	<i>Axle components are heavy, exercise caution in handling them.</i>
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Raise the header until the wheels are slightly above ground. With the weight of the header supported by the combine, and suitable blocking in place under the subframe to prevent the header from falling, proceed as follows:

Refer to Illustration 58: Axle in Field Position, page 40, and Illustration 43: Feeder House Alignment, page 35.

Remove pins 5 and 6 and slide the wheel spindles out of the axle ends.

If you have the gauge wheel option, see Illustration 50: Gauge Wheel Installed, page 40.

Remove pin 3 and lower the end of this tube to the ground.

Support the axle, and remove pins 1 and 2.

Lower the axle to the ground.

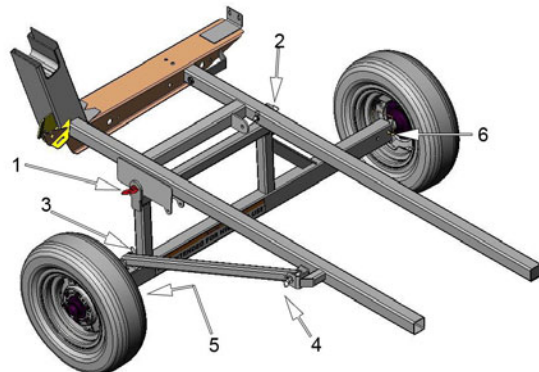


Illustration 46: Storage Axle Assembled

Swing the tubing end 3 up until it parallels the frame, then insert pin three directly below the tubing, in the hole to the right of the location for pin 1.

Store the axle for future use.



Illustration 47: Storage Axle - Exploded View

Store Hitch Assembly

*With header in fully raised position, and all cylinder locks, lock pins, hooks and/ or bolts in place as described in your owner's manual, proceed as follows:

1. Remove safety pin from jack leg.
Using crank-handle on jack, raise jack leg into fully retracted position.
Re-insert safety pin into jack leg.
2. Loosen L-Bolt on side of jack assembly, and remove jack assembly from hitch tube. If necessary, remove safety chain from around jack assembly. See Illustration 56: Disconnecting the Header
3. Disengage lock pin on main hitch assembly, and push hitch tube in to the stop-bolt. Re-engage lock pin so that hitch tube is securely locked in its collapsed position.

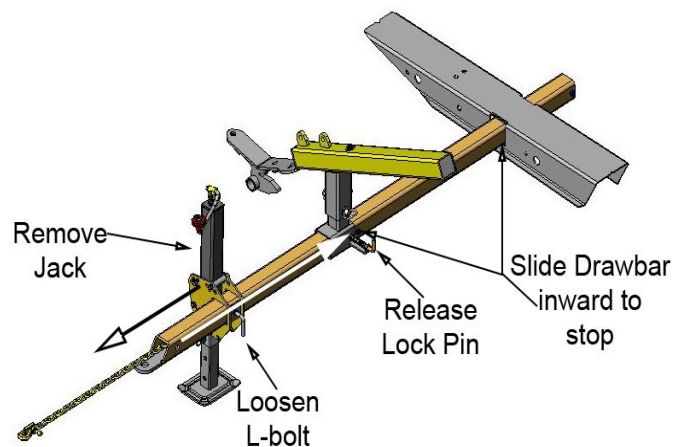


Illustration 48: Store Hitch Assembly

4. Place jack assembly onto storage bracket located to the rear-left-hand side of the header, and secure in place.



Illustration 49: Jack - Stored

Installation of Gauge Wheels

Wheel assemblies removed from the optional transport can be installed as gauge wheels by inserting the spindles into the gauge wheel mounts, and securing with the hitch pin.

The same installation procedure would apply to the wheel assemblies supplied for Grain Belt Plus Headers with only the gauge wheel option. See Illustration 50: Gauge Wheel Installed.



Illustration 50: Gauge Wheel Installed

ATTENTION: The gauge wheels are designed to caster, so it is normally not necessary to raise the header when cornering; however, damage to the gauge wheels could result if header table and gauge wheels are not lifted off the ground when backing up the combine.

Damage to gauge wheels can also result from making sharp turns with the combine. Extremely sharp turns can cause the wheel on the inside of the turn to be dragged

backwards, causing damage to the wheel.

The gauge wheels must be adjusted relative to the height at which the header will be operated in the field. Normal adjustment would allow the weight of the header to compress the spring shaft of the gauge wheel assembly approximately 1.5" (38 mm) to 2.0" (50 mm).

NOTE:	<i>The header should be parked on level ground and should be sitting level before adjusting gauge wheel height.</i>
--------------	--

Gauge Wheel Adjustment:

1. Retract the gauge wheel jacks to their lowest setting, the dial should be at or above the "1" mark.
2. Adjust the header table height until the cutter bar is at an average cutting height for the crop to be cut. (ie. stubble height.) Lower the gauge wheel assembly to the ground using the screw jack.
3. Repeat this procedure on the other gauge wheel assembly.
4. Check the amount of compression on the spring shaft of each gauge wheel assembly (1.5 – 2.0"), if incorrect, repeat steps (1) thru (3) as described above.

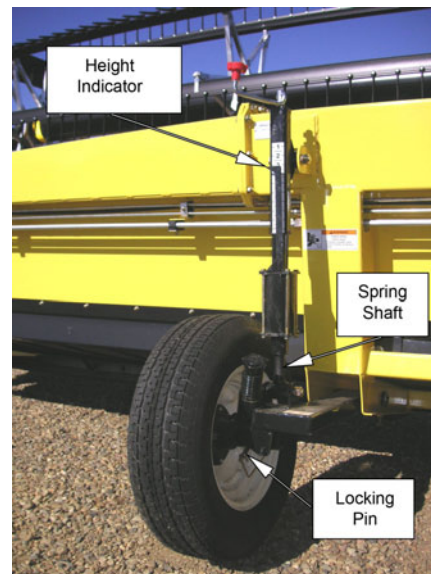


Illustration 51: Gauge Wheel in Position

See Illustration 51: Gauge Wheel in Position.

IMPORTANT:	<i>Too much compression of the spring tubes will stress the top link, causing it to wear prematurely.</i> <i>Gauge wheels are NOT designed to support the weight of the table!</i>
-------------------	---

NOTE:	<i>Adjustments to table tilt, spring flotation, and pitch will affect the amount of compression in the spring tubes. Further adjustments may be necessary.</i>
--------------	---

Hydraulic Pump Alignment

1. Remove lock bolts on each side of rotating pump mount assembly.
2. Lower the rotating pump assembly from the transport position (hole #3), into alignment with hole #1 or #2 on the mounting plate.
3. **For Agco, Case IH, John Deere or New Holland combines use hole #1 (shown here), and for CAT, use hole #2.*
4. Re-install the lock bolts. See Illustration 52: Hydraulic Pump and Illustration 53: Hydraulic Pump - Assembled View.

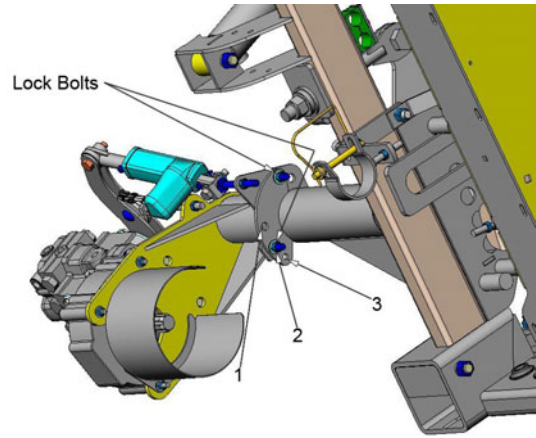


Illustration 52: Hydraulic Pump

Linear Actuator

The linear actuator (see Illustration 53: Hydraulic Pump - Assembled View) is controlled from the cab of the combine (see Combine Operator's Manual). It controls the direction of oil flow from the variable pump to components like the feed auger, drapers and knife motors (see schematics for all systems affected).

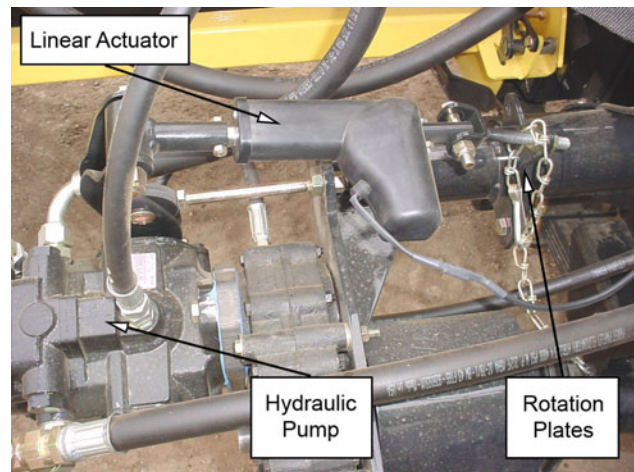


Illustration 53: Hydraulic Pump - Assembled View

This feature allows the operator to clear built up material in the feeder, thus preventing stalling the feeder house. This feature also reduces the need to clear the feeder manually, which can be very difficult, and dangerous.

Coupling the Drive shaft

1. Unhook telescoping drive shaft from the storage bracket.
2. Couple the drive shaft to the feeder house shaft.
3. Align the pump to minimize the amount of angle in the drive shaft universals.

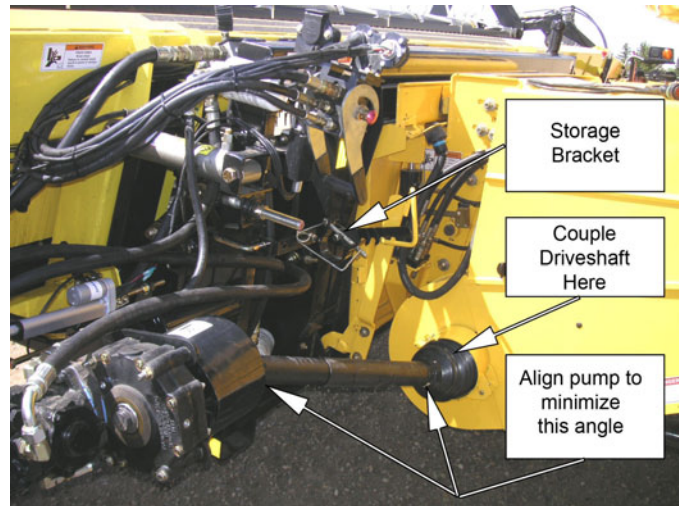


Illustration 54: Drive shaft Installed

Hydraulic Hoses

The hydraulic lines from the combine to the header are connected through the multi-link system (A). Connect the multi-link coupler (as described in your combine owner's manual), ensuring that the coupler is aligned properly and the connection is securely locked in place with the locking lever.

NOTE: This illustration may not exactly match your application.

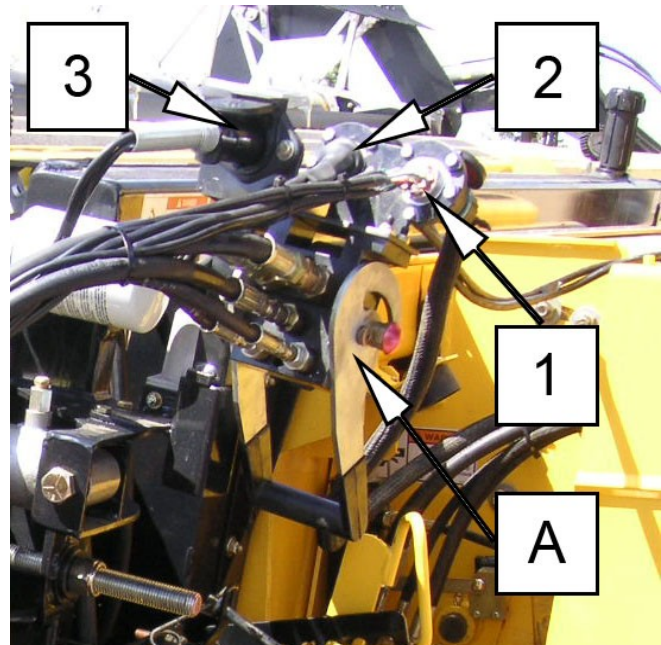


Illustration 55: Hydraulic and Electrical Connections



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Electrical Connections

Refer to Illustration 55: Hydraulic and Electrical Connections page 43 as an example. Ensure that all electrical connections have been made. This includes two connections from the combine to the multi-link electrical bracket (1 & 2), and one from the subframe to the multi-link electrical bracket (3). When connecting these lines be sure to align the electrical pins with their corresponding receptacles.

Interrupt Harness Connection



*Refer to Insert "A", provided with this manual.



Mounting Checklist

<input type="checkbox"/>	Crop dividers and crop divider pipes installed?
<input type="checkbox"/>	Header adapter plate properly fitted to the feeder house of the combine?
<input type="checkbox"/>	Feeder house pins and/or bolts in place, properly locked and/or tightened?
<input type="checkbox"/>	If applicable, transport axle / hitch tube collapsed and secured in field position?
<input type="checkbox"/>	If applicable, storage axle removed?
<input type="checkbox"/>	Gauge wheels installed?
<input type="checkbox"/>	Pump assembly aligned for your combine?
<input type="checkbox"/>	Drive shaft aligned and connected to the combine?
<input type="checkbox"/>	All hydraulic lines (quick couplers and/ or multi-link couplers) connected?
<input type="checkbox"/>	Checked for leaks and loose connections?
<input type="checkbox"/>	All electrical connections completed?
<input type="checkbox"/>	Header Flotation Restrainer Pins adjusted for desired header flotation?
<input type="checkbox"/>	Feed auger adjusted? (Auger fingers clear the front of the feeder house.)
<input type="checkbox"/>	Header is level?

Combine Start-up

CAUTION 	BEFORE PROCEEDING, BE SURE YOU HAVE BEEN THROUGH THE MOUNTING CHECK LIST TO ASSURE THE HEADER IS SECURELY MOUNTED.
WARNING 	<p><i>Keep bystanders, especially small children, away from the machine during this procedure.</i></p> <p><i>If the unit is equipped with automatic reel-height control, the reel may move up or down at any time without operator input.</i></p>

1. Remove the feeder house cylinder locks, start the combine and lower the header to the ground. Shut combine down and wait for all moving parts to stop before exiting cab.
2. With header in the lowered position (in contact with the ground), inspect the header for any damaged or loose parts. Repair or replace any such parts immediately.
3. Check oil level in hydraulic reservoir of the header. Oil level should be filled to the top of the reservoir sight – glass, which is located at the top right side of the reservoir. If it is low, add oil as specified in the Lubrication section of this manual.
4. Insure that all protective shields are in place and secured properly.
5. Check that the tires are filled to recommended pressure. 50 psi (345 KPa) for transport, and for field operation.
6. Check all hydraulic hoses and fittings to be sure they are tight and that no hose damage has occurred during mounting. If damage has occurred or if leaks are present, repair or replace the damaged parts before re-starting machine.
7. LUBRICATE THE HEADER - see instructions as outlined in the LUBRICATION section of this manual.
8. Restart the combine and ENGAGE PARKING BRAKE. Locate reel height control switch and raise reel to its full height (cylinders fully extended). Hold switch on momentarily at the full height position then drop the reel to its lowest position (cylinders fully retracted). Complete the cycle at least twice to ensure that all air is worked out of the circuit and that the system is working properly.
9. Engage platform drive switch (see Combine Operator's Manual for instruction) with combine at an idle. The platform draper, knife and reel should begin to turn.

CAUTION!	<i>IF OIL LEAKS APPEAR, SHUT COMBINE DOWN IMMEDIATELY AND REPAIR BEFORE RESTARTING.</i>
-----------------	--

10. Increase idle speed. When the engine is at high idle RPM check and set the following:

- a. Reel speed.
- b. Draper speed.
- c. Knife Speed. (set at 580 to 600 RPM)

(If adjustments are required refer to the REEL, DRAPER, OR KNIFE section of this manual as appropriate.)


11. With header lowered to approximately 2 inches (5 cm) from the ground, STOP COMBINE, SHUT ENGINE DOWN and check the following:

- a. Header is level (end to end).
- b. Header cutting angle.
- c. Strut and spring saddle separation 3" to 5" recommended.
- d. Gauge wheel height.
- e. Reel mount bolts.
- f. Knife head section bolts and bearing block bolt.
- g. Knife head bearing bolt.
- h. Knife drive support/ crank bolts.
- i. Connector bar bolts on knife back. *(applies to 45 ft headers only)
- j. Knife drive mounting bolts.
- k. Reel Fore & Aft is even from one end of header to the other.

12. Potential problems you may encounter during start-up and break-in period are listed below, with the most common causes:

- a. High Hydraulic Pressures:
 - Cold Oil
 - Sticky Draper
 - Sticky or Tight Knife
 - Draper Too Tight
- b. Reel Will Not Raise:
 - Low Oil Volume from Combine
 - Defective Cylinders
 - Line Restriction
 - Quick Couplers Not Tight
 - Reel Height Control not in "Manual" mode.
- c. Fore & Aft does not work
 - Selector switch is set for tilt, not Fore & aft
 - Low Oil Volume from Combine
 - Defective Cylinders
 - Line Restriction
 - Quick Couplers Not Tight

13. Raise and lower the header.

IMPORTANT!	<i>If the combine will not raise the header, see the Troubleshooting section of this manual.</i>
WARNING 	<i>Make certain no-one is standing near the machine while you are raising or lowering the header.</i>

14. Move the combine to an open area away from people, other machinery, and buildings.
15. Engage the header drive with the engine at idle. The header knife and drapers should operate.
16. Activate the reel.
17. Slowly increase engine speed until normal operating RPM has been reached.
18. With the header raised, select header reverse, and ensure all systems perform properly.
19. Select header forward, ensure all systems resume normal operation, and the clean-out door has closed.
20. Practice operating the complete unit until you are confident with all controls and the clearances required from your surroundings.

Clearing Obstructions - Reversing the Header

This feature allows the operator to reverse the header, and clear built-up material from the center feed auger/drafter area. This feature reduces the need to clear obstructions manually, which can be difficult, and dangerous.

While selected, this function will reverse the following components:

1. Center-feed auger,
2. Center-feed draper,
3. Drafter,
4. Knife,
5. Cross-auger (if equipped).

In addition, a trap-door under the center-feed drafters will open.



The trap-door under the center-feed drafter opens when header reverse is selected, and remains open until header forward is selected.

If this door contacts the ground while open, it will be damaged.

Always follow these important steps when reversing the header:

1. ***Raise the header, and gauge wheels at least two feet above ground.***
2. ***Back away from the crop if desired.***
3. ***Select, and hold down the header reverse button, and observe whether the blockage clears.***
4. ***Select header forward, and ensure the trap-door under the center-feed drafters has closed.***
5. ***Resume normal operations.***

Dismounting the Header from the Combine

It is very important to dismount the draper table properly from the combine for the following reasons:

- Safe storage.
- Ease of remounting.
- Readiness for transport.
- To avoid damage to the draper table and combine.

IMPORTANT: Park the combine on hard, level ground. Engage parking brake.

1. With the combine running, lower the reel completely. Raise the draper table to its fully raised position. Retract the reel until it is fully to the back of its travel, and fully retract the hydraulic tilt cylinders.



Engage parking brake on the combine, shut the engine down, and wait for all moving parts to stop before leaving the cab.

2. Engage feeder house cylinders locks with feeder house in raised position as described in your Combine Operator's Manual.
3. Disconnect the telescoping drive shaft from feeder house shaft. Secure the drive shaft in the storage bracket as shown in the example to the right.

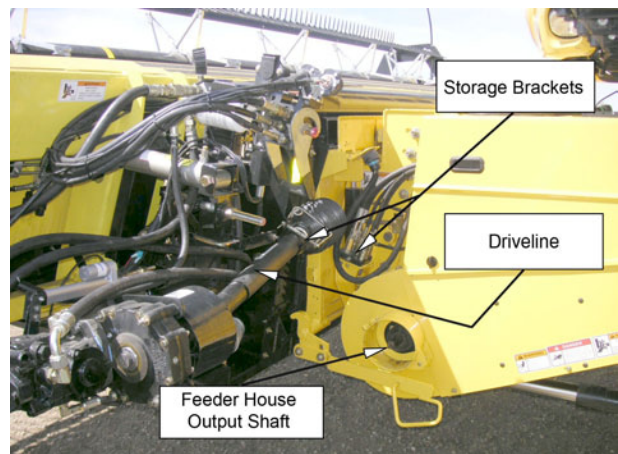


Illustration 56: Disconnecting the Header

4. Uncouple the multi link (hydraulic lines) connecting the draper table to the combine, and store it in the bracket provided on the combine.

5. Disconnect all electrical wires running from the combine to the draper table (Locations 1 and 2). Secure the combine hoses and electrical plugs as shown, for example, in Illustration 54: Drive shaft Installed
6. Retract or remove all lock pins, hooks or bolts which secure the auger adapter to the feeder house of combine.

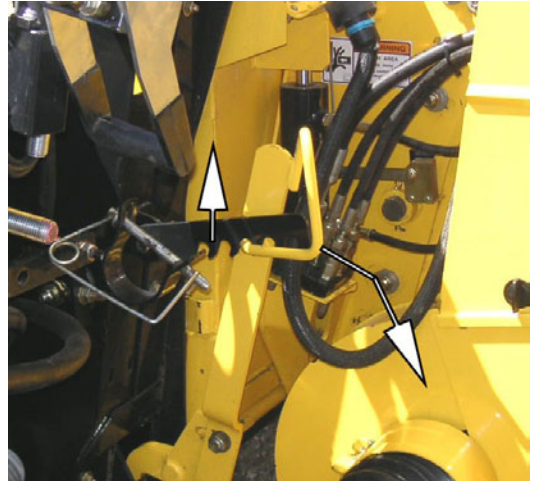


Illustration 57: Release the Header Locks

Convert Integral Axle to Transport Position

1. Remove hitch pins from gauge wheel spindles, and remove left and right gauge wheels from gauge wheel assemblies.
2. Remove hitch pin (3) from collapsed transport axle, allowing axle to drop down into transport position.

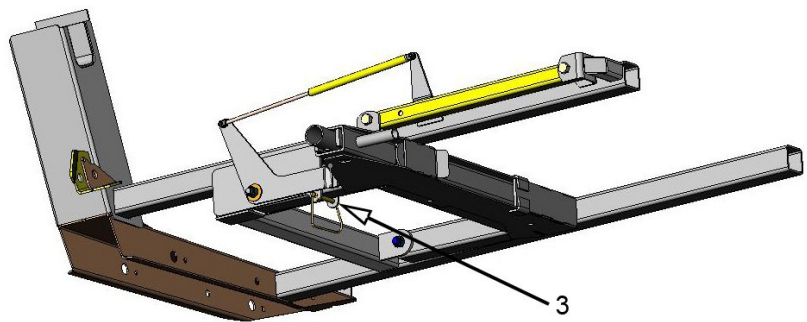


Illustration 58: Axle in Field Position

NOTE:

For instructions on installing the storage axle, see ***Removing the Storage Axle***, and reverse the procedures shown there.

For the Transport Trailer option, see that operator's manual.

3. Insert Hitch Pin (3) as shown here to secure the axle in transport position.
4. Remove Hitch Pin (2) from the front axle tube, slide the inner axle out to the extended position, line up the holes, and reinsert pin (2).
5. Insert the gauge wheel spindles into the transport axle as shown. Line up the holes, and secure them with hitch pins (1 & 4.)

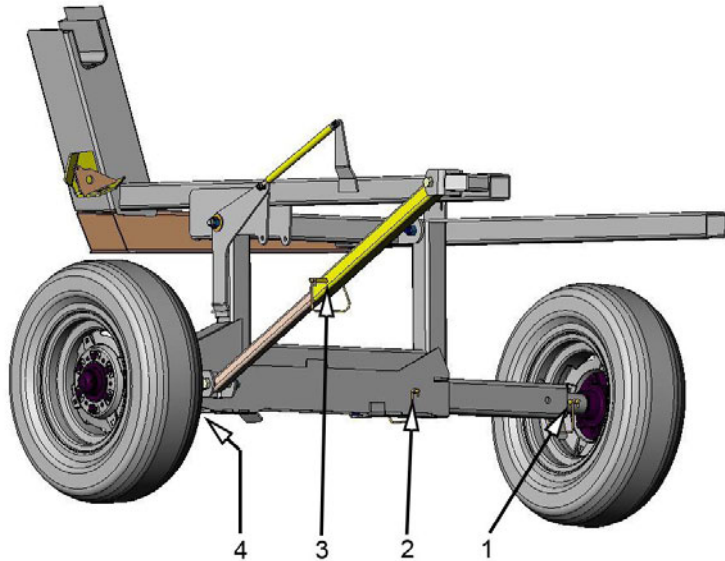


Illustration 59: Axle in Transport Position

Convert Hitch Assembly for Transport

1. Extend the hitch tube assembly by disengaging the lock pin, and sliding the hitch tube out to its extended position.
2. Secure in this position by re-engaging the lock pin.

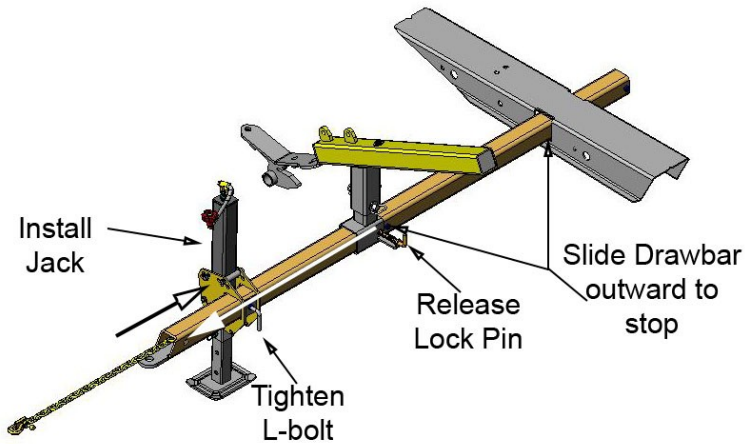


Illustration 60: Hitch Expanded for Transport

3. Remove the jack assembly from storage by loosening the L-bolt, removing the hitch pin and sliding the jack from the storage tube. (Jack is located at the rear left side of the header.) Replace the hitch pin into the storage tube.



Illustration 61: Removing Jack from Storage Position

4. Install jack assembly onto hitch tube, and secure in place by tightening L-Bolt and re-attaching safety chain. (See Illustration 42: Combine Adapter Plate, page 34.
5. Release the feeder house cylinder locks. Restart the combine. Lower the header until transport wheels make light contact with the ground. Turn combine off and dismount.

7. Remove safety pin from jack leg, and lower jack leg to the ground. Raise the hitch end of the table using the jack until the draper table is sitting level. Once level, re-insert safety pin into jack leg.

CAUTION!

Be sure safety lock pin and safety clip are properly in place so the hitch jack is securely fastened to the hitch tube.

Separating the Header from the Combine

1. Restart the combine and lower the draper table until the full weight of the table is on the transport axle and hitch jack.



Engage parking brake on the combine, shut the engine down, and wait for all moving parts to stop before leaving the cab.

2. Check the position of the draper table to be sure that it is level, and that the hitch jack and transport axle tires are all making solid ground contact. Block the transport axle tires so that the draper table will not move once the combine has been removed from the table.
3. Restart combine, and continue to lower the feeder house until it is separated from the auger adapter plate. Back combine slowly away from the header. Be sure that header does not move backwards with the combine. If it does, shut combine down completely. Recheck to be sure all connections have been removed. If they have not, repeat dismounting procedures.



Illustration 62: Header Dismounted from the Combine

Header Leveling

The sub-frame is attached to the table by the hydraulic header tilt cylinders and two horizontal leaf spring assemblies. The header tilt assembly adjusts the forward angle of the table. This adjustment affects the guard angle to the ground. Two adjuster bolts connect the horizontal leaf spring assemblies to the sub-frame, and adjust the leveling left to right and the spring height up and down. Turning the adjuster bolts will change the amount of clearance between the ground and the back of the subframe. The adjustment of these bolts determines how stiffly the table will be suspended, and affects the total range of movement.

Forward Angle Adjustment:

The forward angle of the cutter bar can be adjusted using the hydraulic header tilt, which is controlled from within the cab of the combine. Extending the hydraulic cylinders on the header tilt will increase the guard angle, while retracting the hydraulic cylinders will reduce the angle, causing it to “level out”. *(See **Examples A, B, C** and **D** pages 57 and 58.)

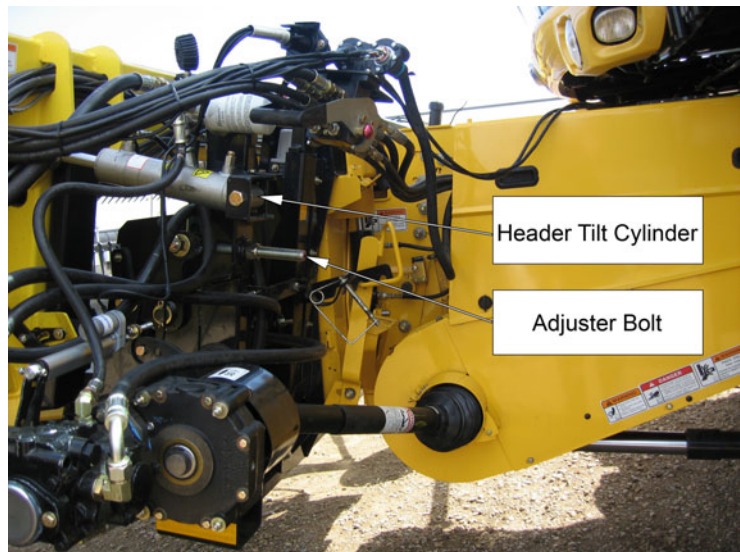


Illustration 63: Header Tilt - Left side View

Leveling & Table Height Adjustment:

Reducing the amount of exposed threads at the back of the adjuster bolts will lower the table, Increasing the amount of exposed thread will raise table.

To level the table, adjust the amount of exposed thread depending on which side needs to be raised or lowered.

To turn the adjuster bolts, lower the table to the ground. This will take weight off the bolts making them easier to turn.

Refer to the photo on the right. Decreasing the number of threads exposed above the nut will increase header floatation, and improve the operation of the header height control system.

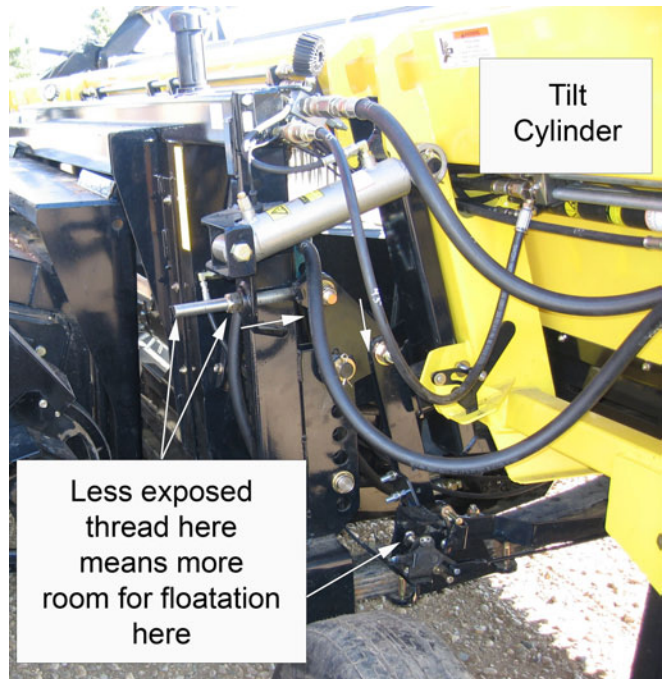


Illustration 64: Header Tilt – Right side View

To lower the cutter bar relative to the sub-frame, extend both adjuster bolts. This adjustment will provide more clearance between the sub-frame and the ground; and will also provide more clearance between the center deck and the ground. This setting will bring the cutter bar closer to the ground. *(See **Examples A, B, C and D**)

ATTENTION:	<i>Avoid a condition where no threads are exposed above the adjusting nut. In this case, the threads may disengage from the lift link, causing the table to drop suddenly.</i>
	<i>In addition, care must be taken when lengthening the adjusting bolts, as this action will decrease the size of the opening leading to the finger auger. The finger auger is stationary in the sub-frame, and as the table lowers with the adjusting bolts, the hydraulic lines under the upper tube get closer to the fingers in the auger. To see that the fingers do not contact the hydraulic lines, disconnect the drive line, lift the finger auger and rotate the drum while checking the clearance.</i>

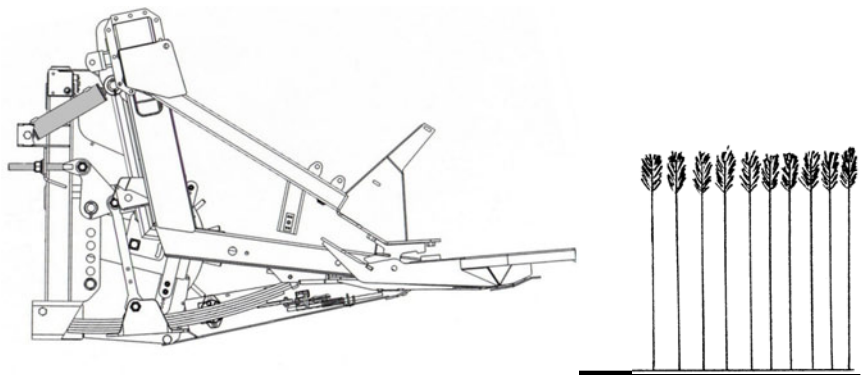
Header Height Control: (Optional Equipment)

*For information on the optional header height control, please refer to the “MISC./ OPTIONAL EQUIPMENT” chapter in this manual.

The following side views of the Grain Belt Plus Header are presented to give a visual picture of what happens when adjustments are made to the leveling (adjuster) bolts and the hydraulic header tilt cylinders. In each of the side views, the sub-frame has been maintained at a constant distance from the ground. **These examples depict the extremes in adjustment.**

Example A

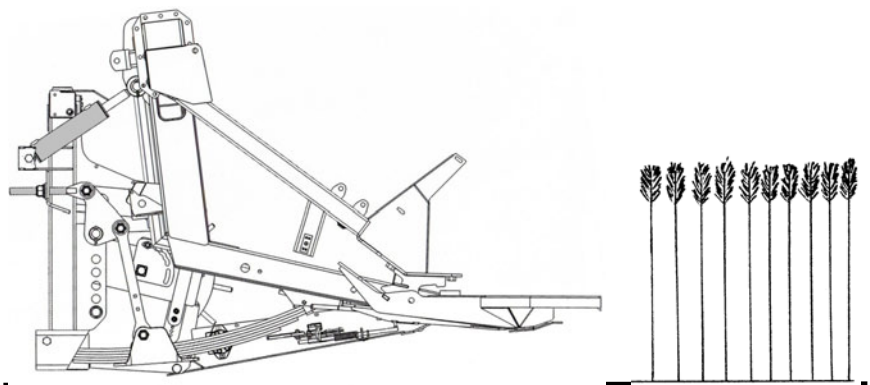
The adjuster bolts shortened (maximum amount of exposed thread at the back) causing the cutter bar to be lifted, and the header tilt cylinders shortened causing the table to be tipped back.



*Illustration 65: Adjuster Bolts Shortened,
Tilt Cylinders Retracted*

Example B

The adjuster bolts shortened (maximum amount of exposed thread at the back) with the header tilt cylinders extended. Notice how the hydraulic tilt cylinders tilt the table forward.



*Illustration 66: Adjuster Bolts Shortened,
Tilt Cylinders Extended*

***NOTE:** In both of these examples, if the feeder house is lowered to bring the cutter bar closer to the ground, **the sub-frame and center deck may contact the ground first.**

Example C

Shows the adjuster bolts extended (minimum amount of exposed thread at the back) with the header tilt cylinders shortened. The extension of the adjuster bolts allows the table to drop in relation to the sub-frame.

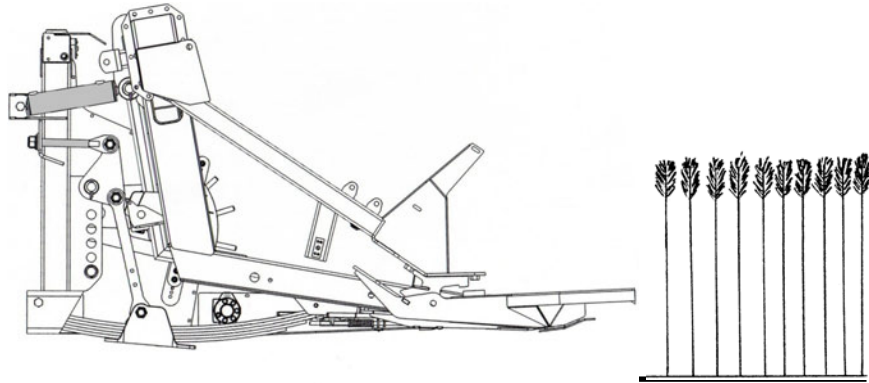


Illustration 67: Adjuster Bolts Extended, Tilt Cylinders Retracted

NOTE: This adjustment may cause interference between the finger drum and the upper square-tube beam. Before you operate the equipment under power, make certain adequate clearance exists between these points.

Example D

Shows the adjuster bolts extended (minimum amount of exposed thread at the back) with the header tilt cylinders also extended. The header tilt cylinders tilt the table forward bringing the cutter bar closer to the ground.

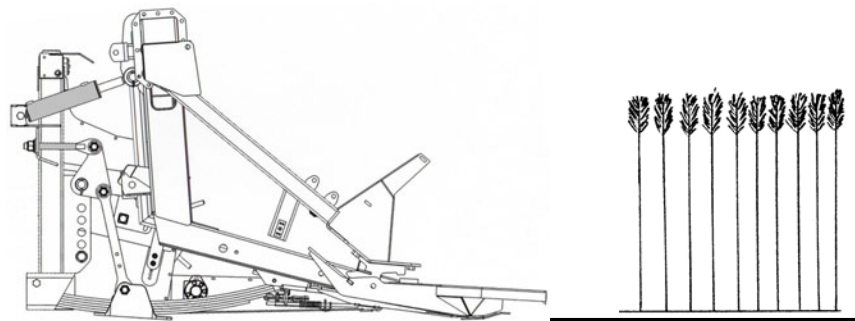


Illustration 68: Adjuster Bolts and Tilt Cylinders Extended

NOTE:	<i>These examples show the extremes of adjustment. It is neither suggested nor recommended that you adjust your header to these limits. Experiment within the range of settings shown here to determine which will be best for your crop cutting conditions.</i>
HINTS:	In rocky conditions, with a short crop you may want to keep the guard tips up. Try shortening the header tilt cylinders.
	In bushy crops such as mustard, tilt the header forward using the header tilt cylinders to maximize the opening.

The stiffness of the header floatation can be adjusted by loosening or tightening the 4 bolts on the clamp plates of the spring saddles. When the header is lifted fully off the ground, the clamp plates will be loose. This condition is acceptable. Tighten clamp plates only if a stiffer floatation is desired.

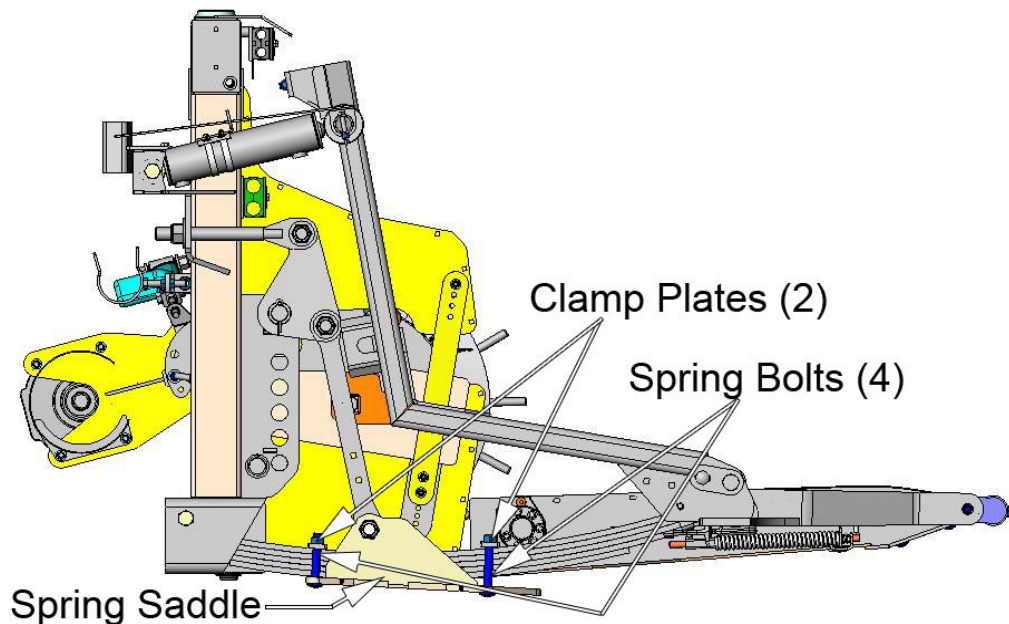


Illustration 69: Spring Clamps and Saddle

Header floatation Restrainer Plate

The header floatation restrainer plates, pins, and arm allow the operator to adjust the amount, and the direction of header floatation.

Placing a pin through the restrainer plates so that the upper (1) side of the arm comes into contact with the pin will restrict the amount the header can float upward. A pin placed below

side (3) will limit the degree of motion downward. Lastly, a pin placed through the center (2) of the arm will lock the header in that position.

To obtain maximum end-to-end floatation when in field position, the restrainer pins may be removed and placed into the storage hole provided at the lower rear area of the restrainer plate. To make adjustments to the floatation restrainer plates, proceed as follows:

With the header raised, feeder house cylinder locks on and combine shut down, locate the header floatation restrainer plates on the bottom left and the bottom right of the header adapter frame.

(See Illustration 67: Adjuster Bolts Extended, Tilt Cylinders Retracted, page 58, and Illustration 66: Adjuster Bolts Shortened, Tilt Cylinders Extended, page 57.)

Remove the restrainer pin and place it in the desired hole on the restrainer plate. Repeat this procedure for the other side, placing the pin at the same height. Be sure to secure restrainer pins in place by replacing the washers and pin locks.

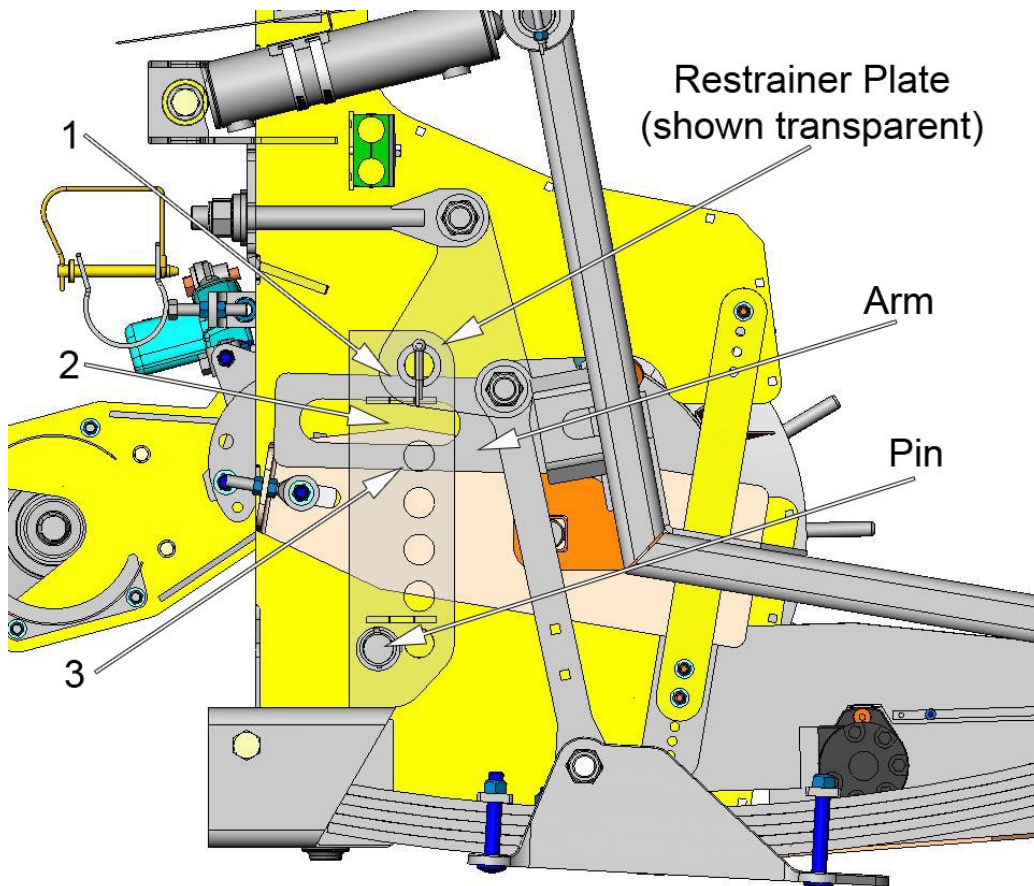


Illustration 70: Restrainer Plate Adjustments

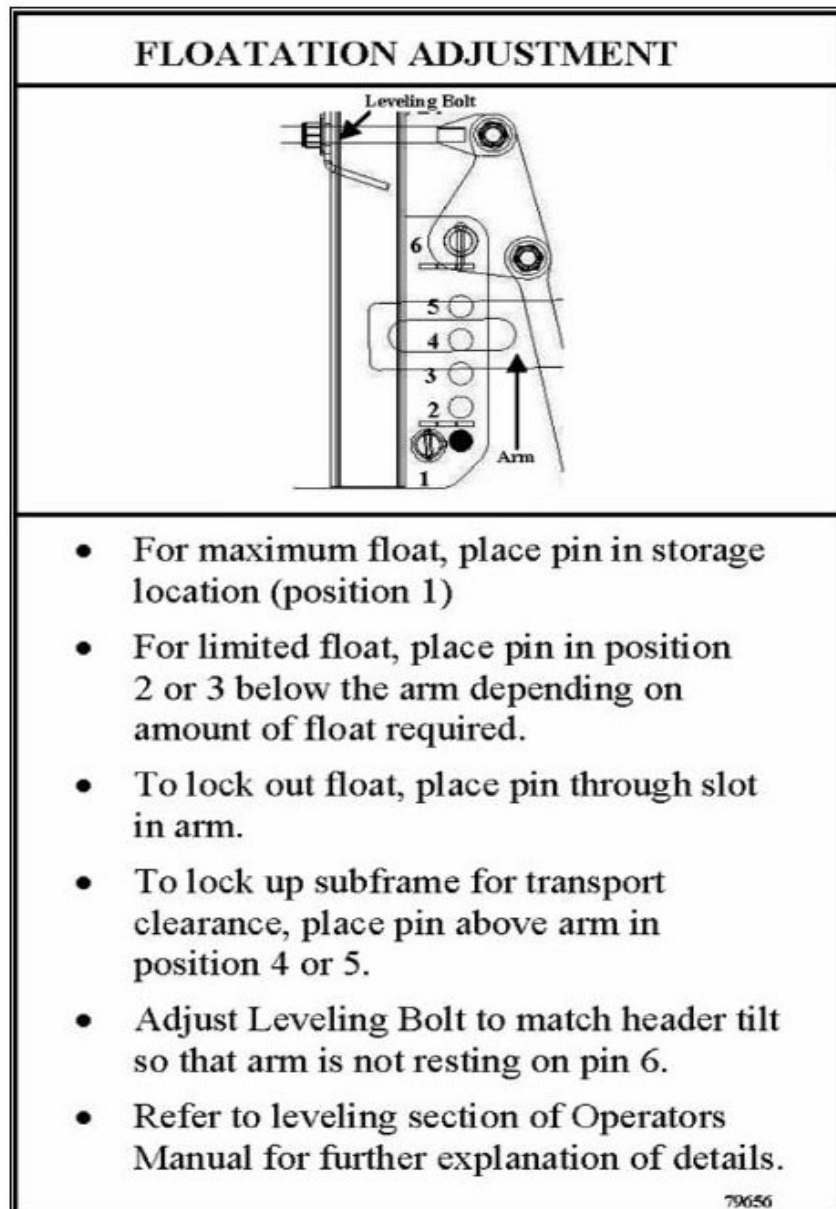


Illustration 71: floatation Adjustment Decal

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Hydraulics

This section describes the hydraulic system which drives the Grain Belt Plus Header. The hydraulic components, as well as the plumbing of the various hydraulic systems, are detailed in this section.

All Grain Belt Plus Headers have a self contained hydraulic system, as well as specific components controlled using combine hydraulics. In the self contained header hydraulic system, the output shaft of the gearbox drives the variable speed displacement pump. The charge pump, which is part of the displacement pump, draws oil from the reservoir and supplies oil to the displacement pump. This oil is then pumped to the feed auger motor assembly, which evenly divides the oil flow between the left and right sides of the header.

On the left side circuit, the oil flows from the feed auger motor to the knife motor, then to the left draper motor and the feeder deck motor before returning to the pump assembly.

On the right side circuit, the oil flows from the feed auger motor to the knife motor, then to the right side draper motor and the feeder deck motor, with a built-in loop flush system for hot oil and a check-valve system (for the feeder deck trap door cylinder), before returning to the pump.

The reel drive, reel lift, reel fore & aft and hydraulic header tilt systems are directly controlled with the combine hydraulics.

*Please refer to the corresponding hydraulic schematics in this section for further routing details.

Pump Operating Pressure

The hydraulic pressures for the left and right sides of the self-contained hydraulic system are individually monitored with pressure gauges, located on the upper left and right corners of the hydraulic reservoir. While operating the combine at full engine rpm, the pressure gauges should indicate a pressure range between 1,000 and 1,500 psi.

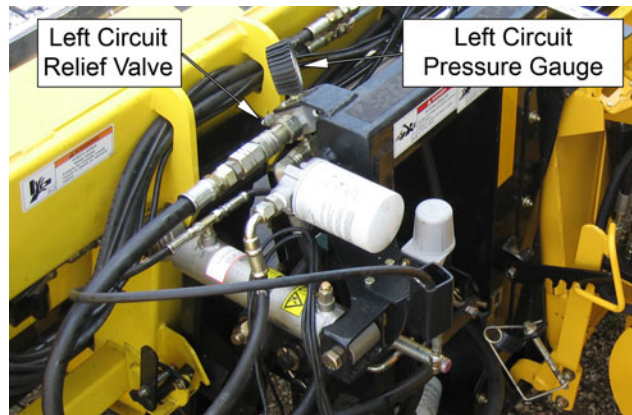


Illustration 72: Header Subframe - Left-hand Side

New units will tend to have higher pressures than those that have completed their break-in period.

The pressures can also fluctuate during normal cutting operations, as crop conditions, the condition of the cutting system, draper speed and ground speed change. The relief valve is factory set at 2,800 psi. Upward adjustment of the relief pressure is NOT RECOMMENDED without consulting your dealer or factory representative.

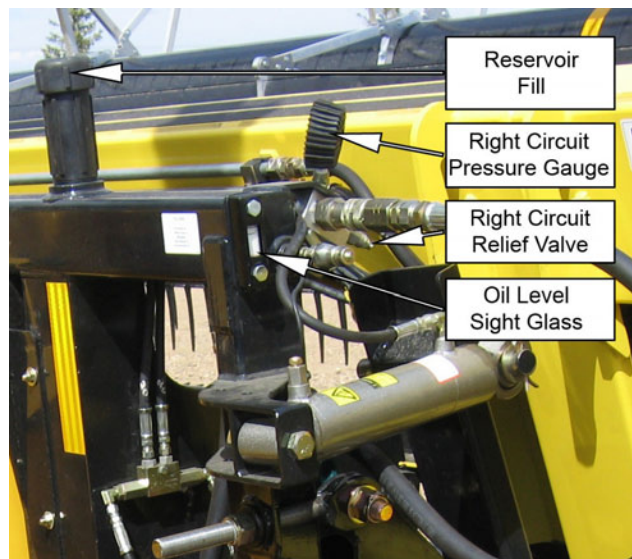



Illustration 73: Header Subframe - Right-hand Side

ATTENTION:	<i>COLD WEATHER START UP (TEMPERATURES BELOW 10 °C/ 50 °F) It is a good practice to allow the oil to warm up prior to any cutting, and in cold weather it is <u>absolutely necessary</u>.</i>
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To warm the oil, engage header drive with the engine at idle. Allow the header some time to warm the oil before increasing the engine to normal operating rpm.

High Pressure Checks

The relief valves are factory set at 3,000 psi. When the pressure in the hydraulic system exceeds 3,000 psi, oil is passed through the relief and routed back to the hydraulic reservoir. As this happens, the oil passing through the relief will generate heat and cause an audible “squeal”. If you observe on the pressure gauges or hear the relief valve, check the following:

WARNING 	<i>Never attempt to inspect or adjust any part of the header with the combine running. Shut the combine down, and ensure that all moving parts have come to a stop before attempting to inspect or adjust moving parts.</i>
---	--

Knife Drive & Cutting System:

- Check for material gumming or binding on the knife. Clean as required.
- Check for broken and dull sickle sections. Replace as required.
- Check for bent or broken guards. Replace as required.

Inspect knife head bearings:

- Unbolt knife head block and pull knife back at least 12" (300 mm). *(Refer to Knife Section in this manual for procedures.) Turn knife head block and bearing by hand, if bearing is rough or noisy, replace bearing. Repeat procedure for other side of header.

NOTE:	<i>Handle the knife head with caution, the bearing may be hot!</i>
--------------	---

Inspect bearings and gears:

- Leaving the knife pulled out, insert a bar into the knife drive fly wheel and turn flywheel. Feel for roughness or binding in bearings or gears. **Remove bar!** Start the combine and engage the header drive. Check knife drive pressure. Normally it takes 100 psi to 150 psi to drive the knife motor with the knife disconnected. If pressure has dropped significantly, the problem is likely in the knife. If pressure is still high the problem may be in the knife drive, the knife drive motor, draper motor circuit or the hydraulic lines.

Draper Drive and Drapers:

- Ensure the draper tension is not excessive. Material wrapping onto the rollers will cause increased draper tension. Adjust, or clean the rollers as required.
- Check pressure with tension on draper released.
- Check bearings in drive rollers and idler rollers. Replace as required.
- Check for faulty draper motor. Replace as required.

If a faulty draper motor is suspected:

- Let the system cool down.
- Start up and run draper at full speed. Record the pressure on the pressure gauge.
- Check if any motors seem to be running slower.
- Check temperature of each motor to see if one motor is hotter than the others.
- SHUT COMBINE DOWN.
- Grab the drive roller of a deck with both hands and rock the roller back and forth. If motor is hard to turn, disconnect hoses and install a fitting to bypass the motor.
- Record the difference in pressure, and draper speed of the other decks. If the difference is significant, replace the motor.

Other possible causes for excessive pressure:

- Check the header's hydraulic system for hydraulic lines or hoses that have been pinched or kinked. Replace any damaged hydraulic lines or hoses. Do not attempt to repair or replace leaking hydraulic lines or hoses without proper safety equipment and clothing, as high pressure fluid leaks can puncture the skin causing injury or death.
- Above normal pressure may also result if the pump is not adjusted to the shaft RPM. Check that the knife is in the proper RPM range.

NOTE:	<i>In certain harvesting conditions (such as a tough or heavy crop), the operating pressure of the header will be higher than usual. In cases such as this, it may be necessary to reduce the ground speed of the combine (in order to reduce the demand for overall operating pressure of the header). An alternate procedure would be to increase the pressure setting of the relief valves. <u>Do not</u> adjust the relief valves to pressures above 3,000 psi.</i>
--------------	---

Adjusting the Relief Valve:

In certain harvesting conditions, it may be necessary to adjust the relief valves in order to increase the output and allow for efficient harvesting of the crop. If you are harvesting in tough or heavy crop conditions, and an audible squeal can be heard coming from the relief valve, this may be the case.

The relief valves are factory set at 2,800 psi, and can be adjusted up to a **maximum** of 3,000 psi. To increase the pressure setting of the relief valve, proceed as follows:

1. Loosen the lock nut on the relief valve.
2. Insert an Allen wrench into the screw on the top of the relief cartridge, and gently turn clockwise. (One full revolution of the screw will give an increase of approximately 500 psi, so **turn no more than 2/5 of a full revolution.**)

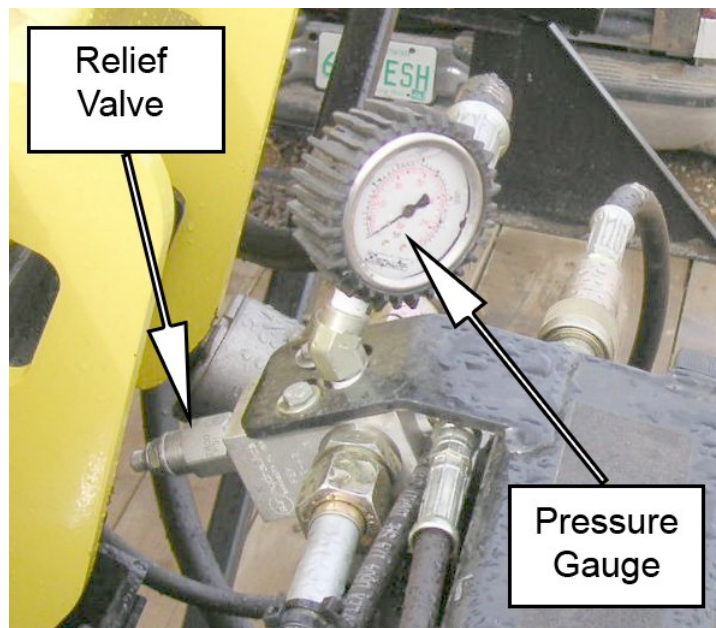


Illustration 74: Relief Valve Right-hand Side of Reservoir

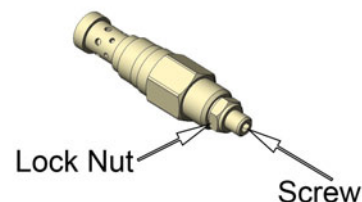


Illustration 75: Relief Valve

3. With Allen wrench still inserted, hold the screw in place and retighten the lock nut. Repeat the above procedures for the other relief valve. *To reduce the pressure later, repeat above procedures with a counter-clockwise motion on the screw.

IMPORTANT:	<i>The relief valve screw has safety stop rings installed on its threads to prevent the valve from being over-adjusted.</i> <i>It is important to not force the screw past its stop points, turn the Allen wrench using only your fingers; paying special attention to any resistance you encounter.</i>
-------------------	---

NOTE:	<i>If you wish to verify the pressure setting for the relief valves, disconnect the 3/4" quick couplers. This creates a dead-end for the oil flow. When the knife drive encounters this resistance, pressure will build in the hydraulic circuit, activating the relief valve. The pressure shown on the pressure gauge will indicate the setting of the relief valve.</i>
--------------	---

Low Pressure Checks

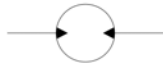
If the pressure at the main pressure gauge is low or is fluctuating, shut the combine down, and check the level of oil in the hydraulic tank. The oil level should be at the top of the sight glass.

- If oil pressure drops when making a right hand turn or on a side hill, shut the combine down and check the oil level.
- If the knife stalls while cutting, check for:
 - low oil level;
 - leaking relief valve;
 - worn pump.

NOTE:	If low oil level is not the cause of low oil pressure, it will be necessary to install a flow meter to determine the cause. Contact your dealer for assistance.
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Hydraulic Schematics

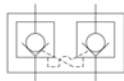
Hydraulic Schematic Symbols – Main Table Hydraulic Circuit



Hydraulic motor – fixed displacement, reversible.



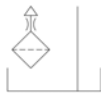
Double – acting hydraulic cylinder (1 ½" x 4").



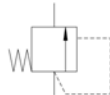
Double "pilot – to open" check valve assembly.



Oil Filter (pressure or return; 10 micron, 24" NPT, 25 GPM).



Vented hydraulic reservoir.



Pressure relief valve.



Pressure gauge (0 – 4,000 PSI).



Flat – faced hydraulic couplers.



Primary oil flow direction.



Case drain/ bypass flow.

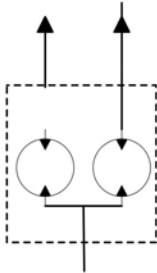


Junction/ Intersection.

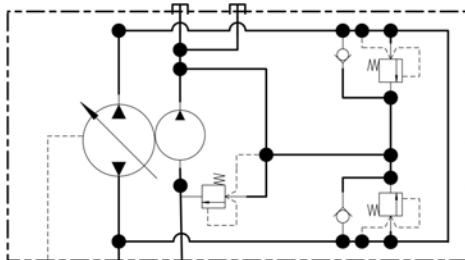


Primary motor rotation.

Hydraulic Schematic Symbols – Main Table Hydraulic Circuit



Feed auger motor assembly (White RE500 with internal flow divider - 195 RPM).



Eaton variable pump assembly with 4,000 psi forward relief, 3,000 psi reverse relief and charge pump adaptor (24 GPM nom. setting, maximum 25.1 GPM @ 520 RPM).

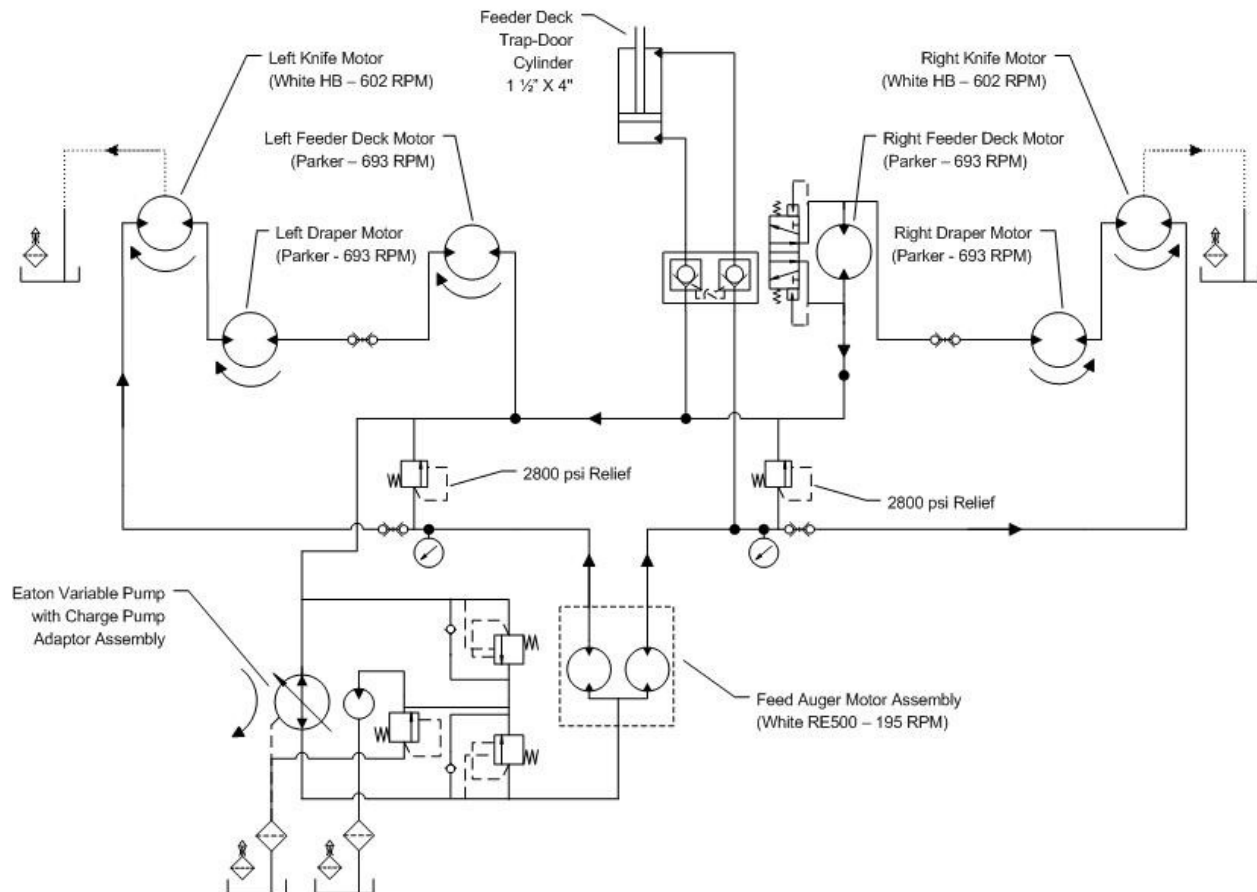
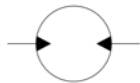
Main Table Hydraulic Circuit – Grain Belt Plus Header


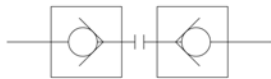
Illustration 76: Main Table Hydraulic Circuit - Grain Belt Plus Header

Hydraulic Schematic Symbols – Reel Lift; Reel Drive



Hydraulic motor – fixed displacement, reversible.

***Note:** All our motors are reversible, but in instances where motor rotation is indicated with a single arrow - head, they are intended to run in one direction only due to uni-directional oil flow.



Hydraulic coupler



Double - acting hydraulic cylinder assembly



Primary motor rotation



Oil flow (bi - directional)

*used in schematic diagrams where uni-directional oil flow is also present.



Oil flow (uni - directional)

Solid – Reel Lift Circuit with Single Reel Drive (30 and 36 ft Headers)

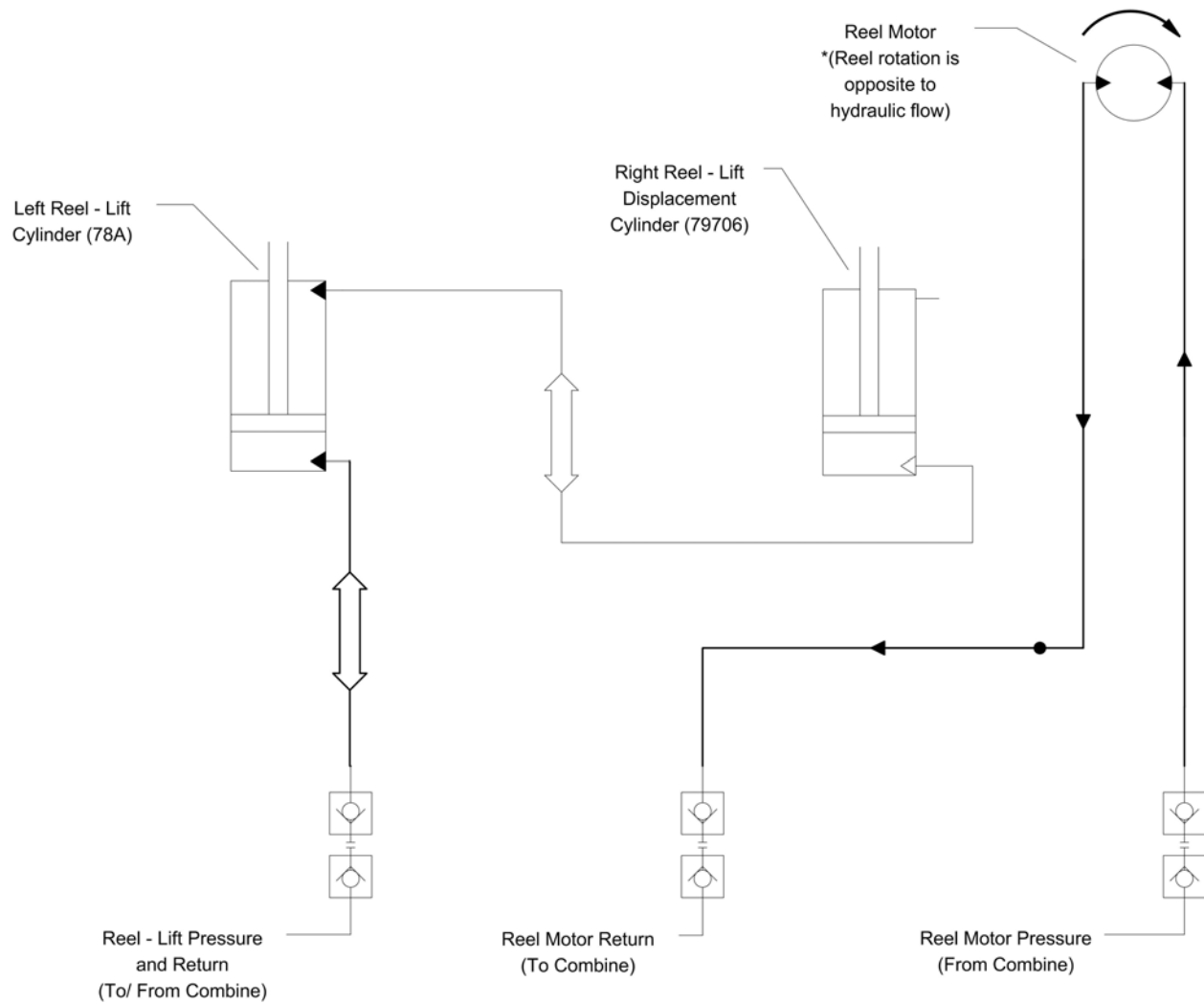


Illustration 77: Solid-Reel Lift Circuit with Single Reel Drive (30 and 36 ft Headers)

Split – Reel Lift Circuit with Double Reel Drive (42 and 45 ft Headers)

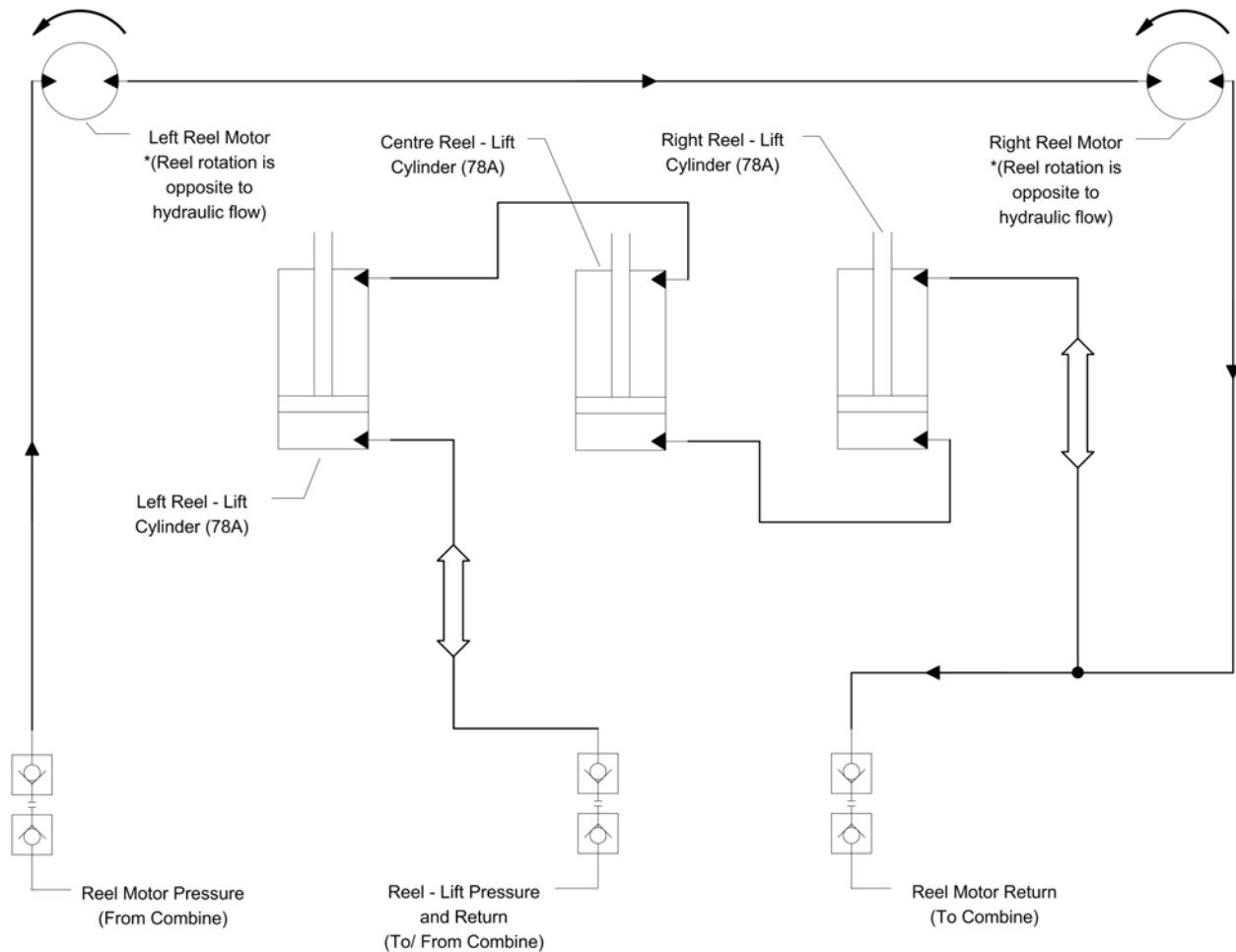
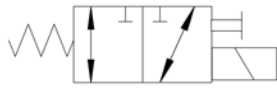
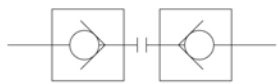


Illustration 78: Split-Reel Lift Circuit with Double Reel Drive (42 and 45 ft Headers)

Hydraulic Schematic Symbols – Reel Fore/ Aft; Hydraulic Header Tilt
--



3 - way, 2 - position, direct - acting, solenoid - operated directional poppet valve



Hydraulic coupler



Double - acting hydraulic cylinder assembly



Oil flow (bi - directional)

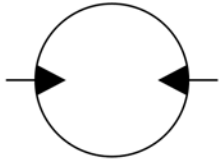


Junction



Breather - cap

Hydraulic Schematic Symbols – Reel Fore/ Aft; Hydraulic Header Tilt
--



Hydraulic motor – fixed displacement, reversible.

***Note:** All our motors are reversible, but in instances where motor rotation is indicated with a single arrow - head, they are intended to run in one direction only due to uni-directional oil flow.



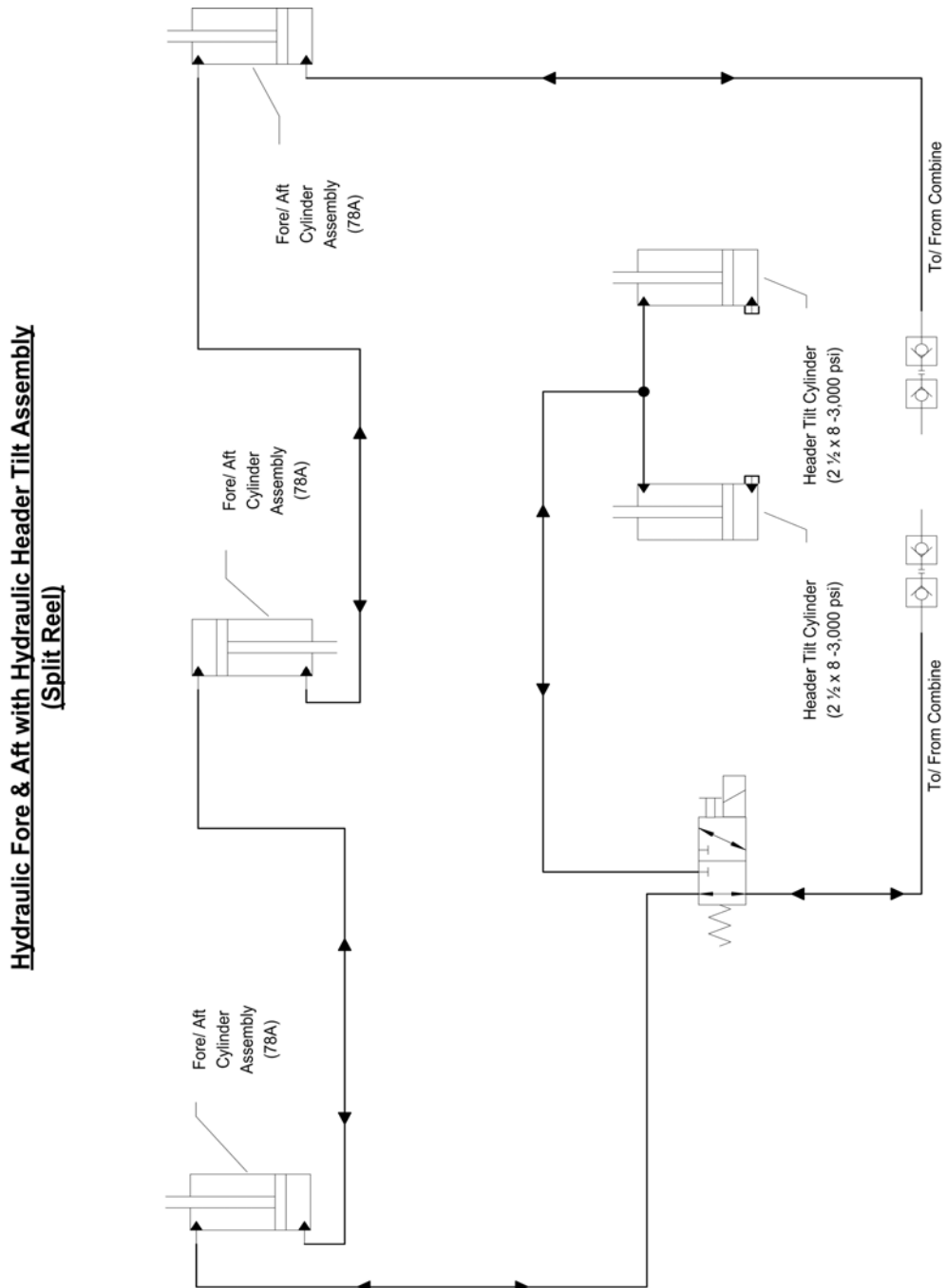
Adjustable needle valve assembly.



Primary motor rotation



Oil flow (uni - directional)



*Illustration 79: Hydraulic Fore & Aft with Hydraulic Header Tilt Ass'y
 (Split Reel)*

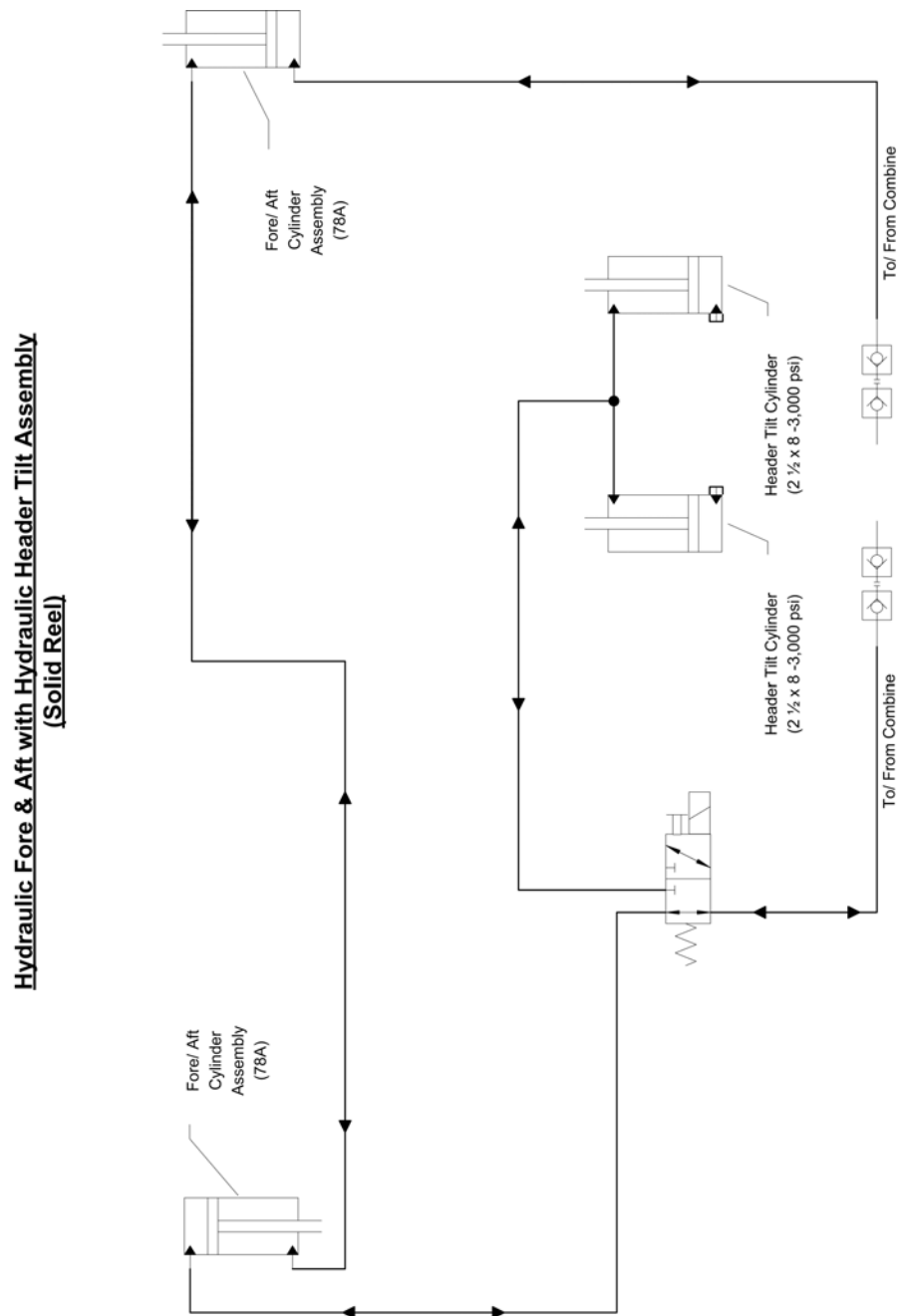


Illustration 80: Hydraulic Fore & Aft with Hydraulic Header Tilt Assembly (Solid Reel)

Grain Belt Plus – Cross Auger Assembly

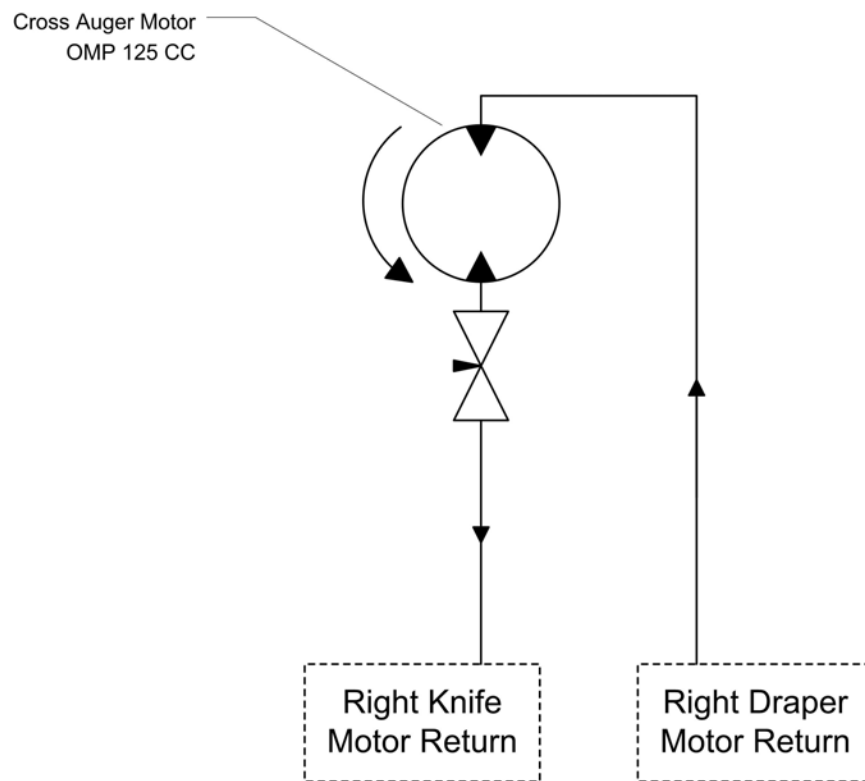


Illustration 81: Grain Belt Plus - Cross Auger

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Sub-Frame Removal

In some cases, removal of the header sub-frame may be required for access to certain components. Some operators also find the combine is better balanced during transport with the sub-frame in place. This chapter details mounting and dismounting the sub-frame from the header.

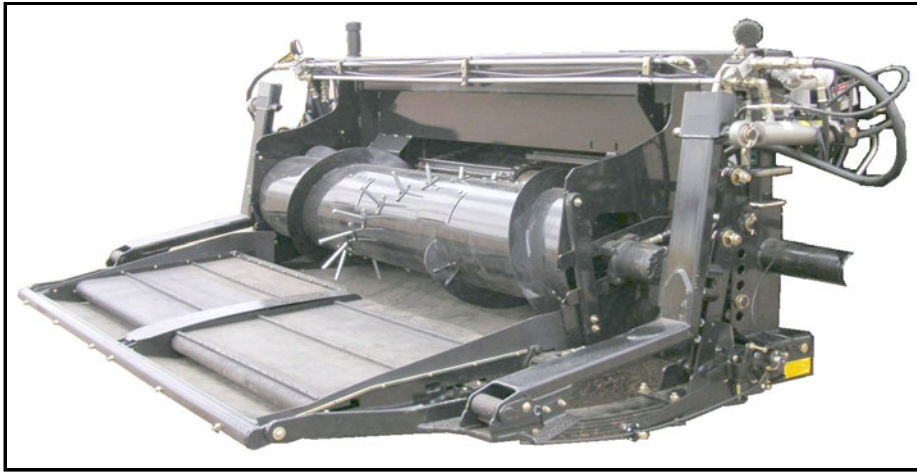


Illustration 82: Sub-frame

Removal of the Header Sub-frame

1. Ensure the header and combine are parked on hard, level ground; with the header in transport configuration, properly leveled, and supported by the transport axle and hitch (refer to Dismounting section of OPERATION chapter in this manual), or properly mounted and secured on the transport trailer (*refer to the Transport Trailer Manual).
2. With the combine shut down, the emergency brake engaged and the feeder house securely attached to header sub-frame, disconnect all electrical and hydraulic connections from the combine to the header. (refer to “Hydraulic Hoses” and “Electrical Connections” sections in the OPERATION chapter in this manual)

Note:	If your combine hydraulics hook to the header through a Multi-Link hydraulic coupling, be sure to place the header's Multi-Link bracket into its storage bracket on the header frame, as shown on the following page.
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Disconnect left side pressure and return lines between sub-frame and frame.

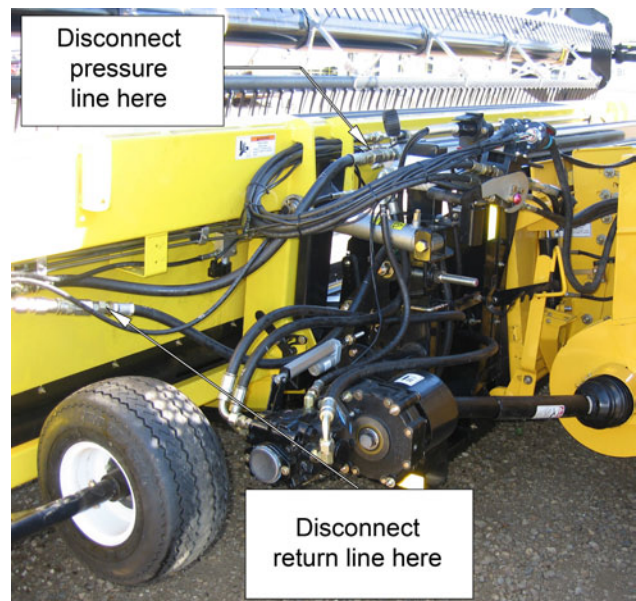


Illustration 83: Hydraulic Disconnects

To ensure that disconnected lines are out of the way and couplings are kept clean, connect the pressure line on the frame to the steel return line (both ends should now be attached in a loop to the header frame,) and likewise connect the return line in a loop on the sub-frame into the pressure port on the sub-frame.

Set the Multi-link into the bracket as shown here.

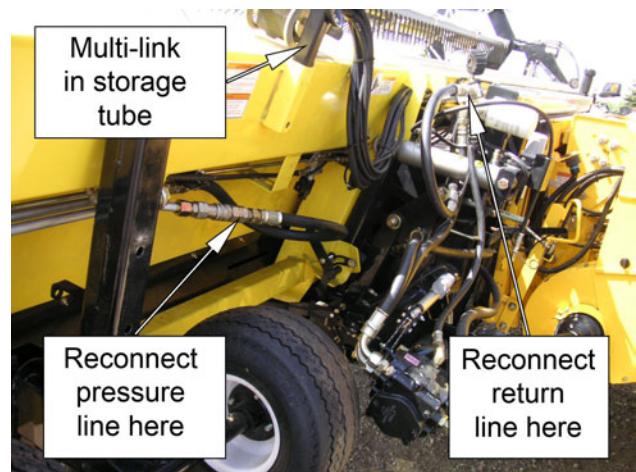


Illustration 84: Hydraulic lines - Storage

The pressure and return line couplers are equipped with a sleeve - locking mechanism. When disconnecting the hydraulic couplers, be sure that the ball and notch on the sleeve of the female coupler are aligned. (See photo to the right.) This will allow the sleeve to be compressed, and the coupling to be disconnected.

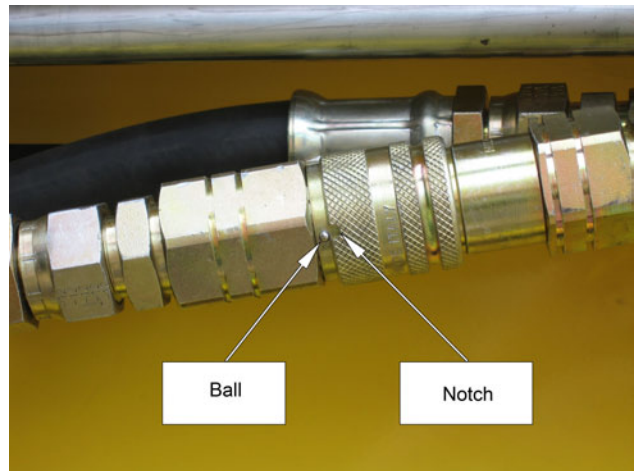


Illustration 85: Sleeve-locking Coupler

Locate the left side header tilt cylinder control valve, (see photo to the right,) and turn to “off” position (turn lever to the left). Disconnect the pressure line for header tilt cylinder. (See below.)

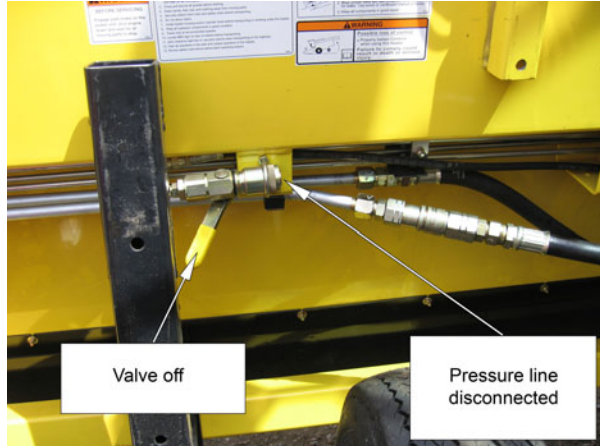


Illustration 86: Header Tilt Valve - Closed

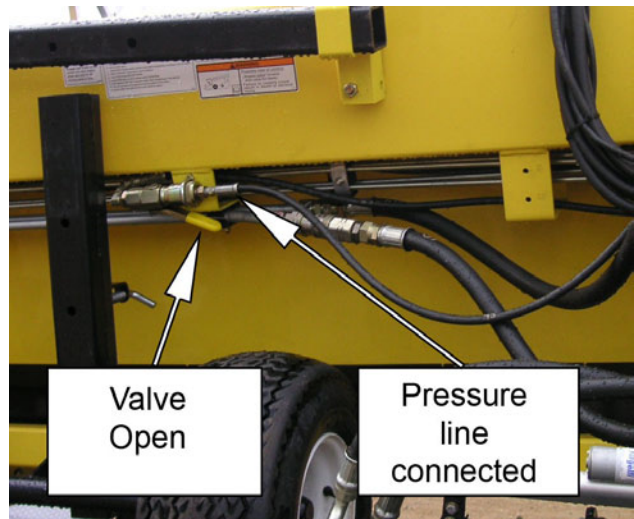


Illustration 87: Header Tilt Valve - Open

Disconnect right side pressure and return lines between sub-frame and frame. Disconnect the pressure sensitive drain line from the reservoir.



Illustration 88: Hydraulic Disconnects - Right Side

In the same manner as on the left side, connect the pressure line on the frame to the steel return line on the frame, and connect the return line on the sub-frame into the pressure port on the sub-frame. Also, connect the pressure sensitive drain line to the mounted coupler on the back of the header frame.

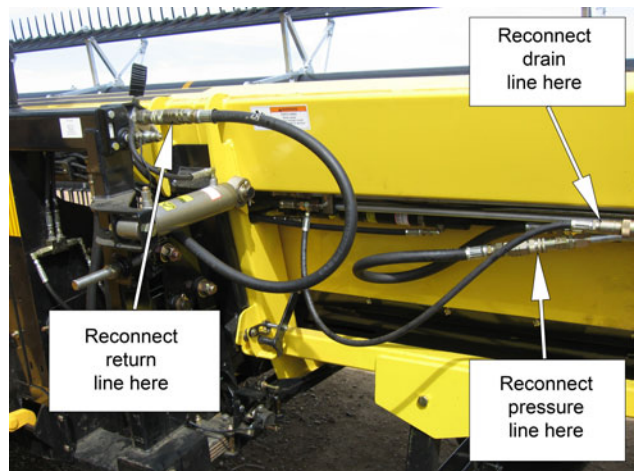


Illustration 89: Hydraulic Lines - Storage

Locate the sub-frame to frame lock pin on the right side of the sub-frame. (See photos to the right, and below.) Lift the retaining latch (1), and pull the locking lever back (2). Disengage the pin by sliding it to the right (3). (See the photo below.) Repeat the same process for the lock pin on the left side of the sub-frame, lifting the latch, pulling the locking lever back and sliding the pin to the left.

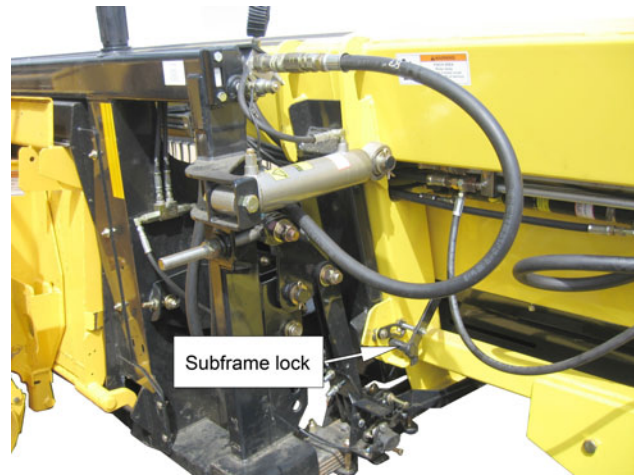


Illustration 90: Sub-frame Lock

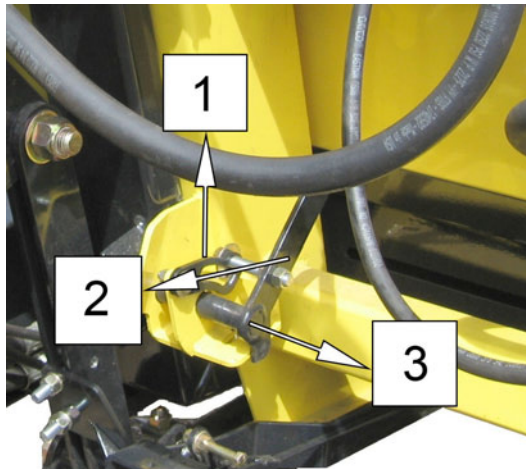


Illustration 91: Sub-frame Lock - Closeup



Honey Bee Manufacturing Ltd.

Grain Belt Plus Header – Operator's Manual

Start the combine, and slowly lower the feeder house, only enough for the header tilt cylinder pins to clear the bottom of their mounting plates. (If lowered too much, the sub-frame assembly may make contact with the transport tire or other components when backing up.)

When adequately lowered, slowly back up the combine removing the sub-frame from the header.



Illustration 92: Removing the Sub-frame

Remounting the Sub-frame to the Header

Ensure that the header is parked on hard, level ground, with the header in transport configuration and properly leveled using the transport axle and hitch (if necessary, refer to Dismounting section of OPERATION chapter in this manual), or on the transport trailer (*refer to Transport Trailer Manual)..

Start the combine, and slowly drive toward the header. As you approach, center the sub-frame assembly vertically and horizontally with the center opening in the header frame. Align the right and left lift frames with the corresponding frame struts; and the right and left header tilt cylinder pins slightly below the lower lips of the mounting plates. (See the photo below.)

Attention:	<i>It is important to accomplish this alignment prior to inserting the sub-frame assembly in the center opening, otherwise, the sub-frame can make contact with the transport tire and other components.</i>
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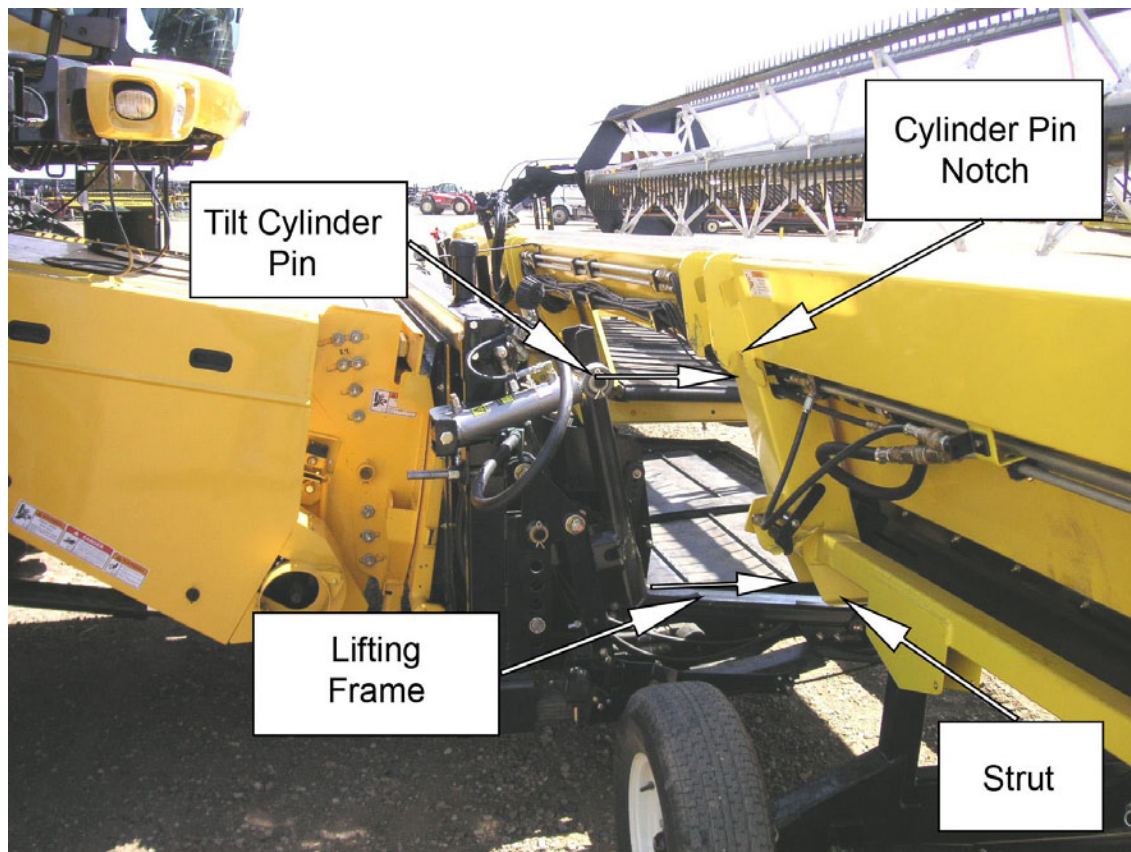


Illustration 93: Sub-frame alignment

Move forward slowly, paying special attention to the alignments mentioned above. Ensure that the tilt cylinder pins will barely clear the bottoms of the mounting plate notches. If the sub-frame is too much lower than this, you may encounter interference between the guide plate sides and the mounting plate notches.

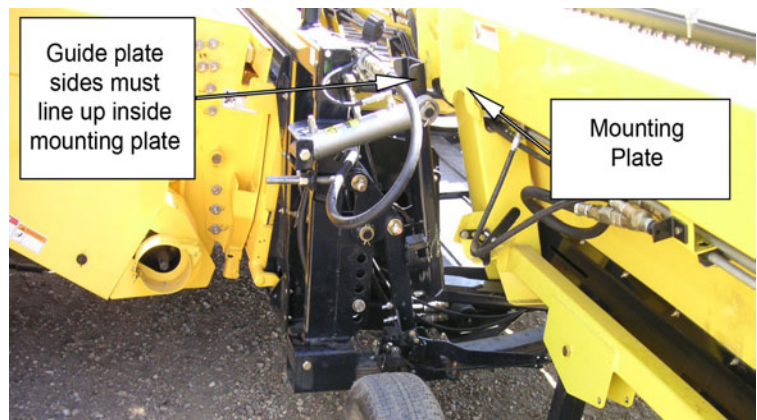


Illustration 94: Guide Plate alignment

When the tilt cylinder pins are directly below the mounting plate notches and the lift arms are fully inserted into the frame struts, slowly raise the sub-frame until the tilt cylinder pins are fully seated in the mounting plate notches.



Illustration 95: Sub-frame installed

Shut combine down, engage the emergency brake, and wait for all moving parts to stop before leaving cab.

Locate the left sub-frame to frame lock pin, and insert it fully into the sub-frame (1). Push the locking lever forward (2) Ensure that bottom leg of lever is inserted into slot on bottom (4), and that the locking pawl has dropped into place (3). Repeat this process for the right side lock pin. (See photo at right for the right-hand side.)

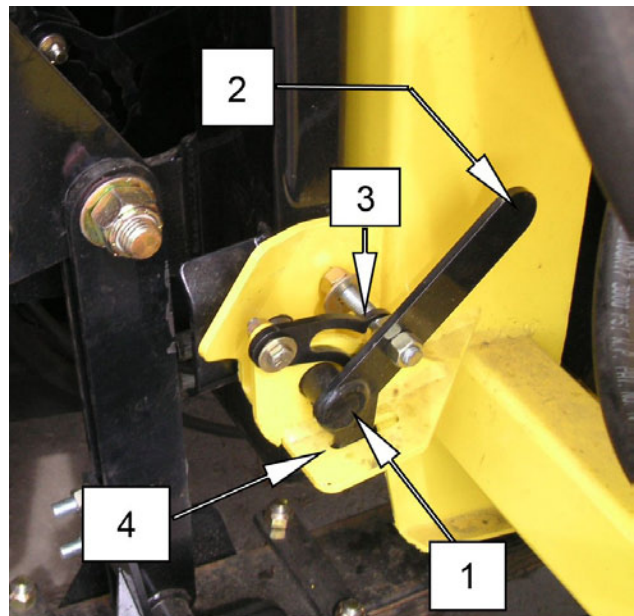


Illustration 96: Sub-frame to frame lock - Right-hand Side

Align the ball and notch on the sleeve of the female coupler. This will allow the sleeve to be compressed, and the coupling to be connected.

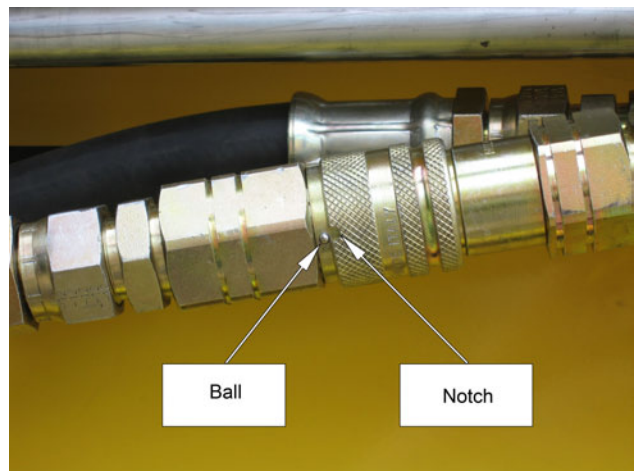


Illustration 97: Hydraulic Coupler Connection

With lift frames, header tilt cylinders, and lock pins secured in place, hook up the right side hydraulic lines. First disconnect right side pressure, return and drain lines, from their storage locations, then reconnect these lines to their corresponding locations indicated in the photo to the right.



Illustration 98: Connecting Right-hand Side Hydraulics

IMPORTANT!

When connecting couplers with sleeve-locking mechanisms, it is important to turn the sleeve until the ball and notch are off-set. This locks the latching mechanism, preventing the coupling from accidentally separating. It also assists with preventing dirt and debris from entering the connection.

Repeat this process for the left side of the header and sub-frame, disconnecting the pressure and return lines, and reconnecting them to the pressure coupler (1), and the return coupler (2) as shown here.

Connect the Multi-link, and move the handle into the fully locked position (A).

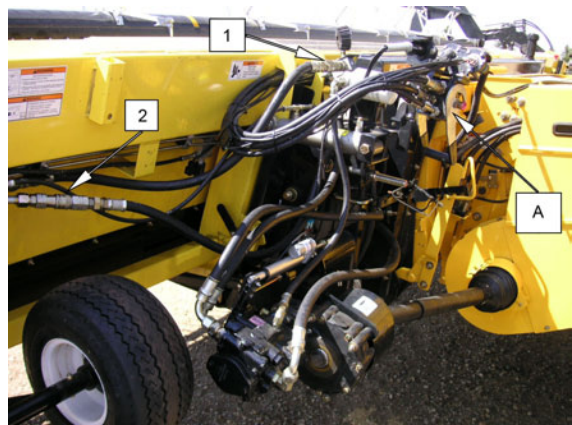


Illustration 99: Hydraulic Connections - Left-hand Side

Locate the header tilt cylinder valve on the left side of the frame, and connect the pressure line for the header tilt cylinders here. When connected, turn the valve to “on” position by moving the lever to the right.

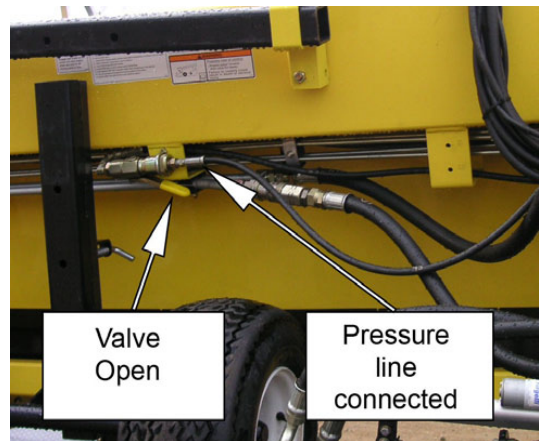


Illustration 100: Hydraulic Tilt Pressure Line

Reconnect the electrics (1, 2, and 3), taking care to line up the connector guide-pins.

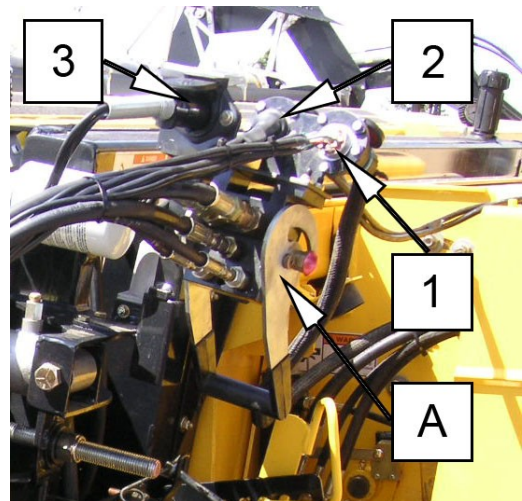


Illustration 101: Electrical Connections

Note: If your combine hydraulics hook to the header through a Multi-Link hydraulic coupling, be sure to store the header's Multi-Link bracket in the tube on the header sub-frame. See Illustration 82: Sub-frame, page 79.

Your header sub-frame has now been reinstalled. To convert the header from transport position to field position please refer to the “Mounting” section of the OPERATION chapter in this manual, or refer to your Transport Trailer Manual (if applicable) for instructions.

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Lubrication & Maintenance

Lubrication

BE SURE TO USE HIGH QUALITY, GENERAL PURPOSE GREASE

Grease every 10 Hours:

- Reel bearings
- Gauge Wheels

Grease every 50 Hours:

- Knife Drives (1 shot, every 50 hours)
- Grease knife head bearing (zerk is on bottom crank shaft).
- Grease main bearing and gear (zerk is on side of knife drive).
- Universal Joints
- Pump drive line (3 locations)
- Guard (one per cone)
- Telescoping members

Other Lubrication Maintenance:

- Knife: If knife is gumming, soak with water first, as alternative soak with diesel fuel.
- Gear Box - Speed Increaser: Gravity filled from hydraulic tank. Check daily that no leaks occur.
- Hub and Spindle: Re-pack annually.

ATTENTION: COLD WEATHER START UP (TEMP. BELOW 10 °C/ 50 °F)

It is a good practice to allow the oil to warm up prior to any cutting, and in cold weather it is **absolutely necessary**.

To warm the oil, engage header drive when engine is at idle. Allow the header some time to warm the oil before increasing the engine to full operating rpms.



Hydraulic Oil

- Use one of the compatible oils listed below.
- Optimum Temperature Operating range -30 C to 80 C (-22 F to 176 F)
- Exchange hydraulic oil every 3 (three) years or every 1000 hrs (whichever is first).

Compatible Hydraulic fluids:	Co-Op Trans-Hydraulic Esso Hydraul 56 Chevron 1000 ATF Petro-Can Duratron Shell Donax TD UFA THG Ultra
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Pressure and Return Line Filters:

Change the pressure and return line hydraulic filters after the first 50 hours of operation and seasonally thereafter.

Pressure and Return Line Filters (10 micron)

- Stauff SF6520
- Fleetguard HF6510
- LHA SPE15 - 10
- Gresen K-2202
- Fram P1653A
- NAPA 51551

Maintenance:

Finger Auger:

High wear parts such as the finger guides should be checked carefully. Remove the inspection cover on the drum to examine the inside. Check the finger bearings. Each one should be free of any binding. Examine the rivet or roll pin in the finger bearing. It must be tight. If roll pin is working its way out, install a wire in the center of the roll pin.



Hydraulic System:

- Check for leaks at pump, motors, hoses, steel lines, and cylinders. Tighten, repair, or replace as required.
- Check pressure gauges for proper operating pressure.

Crop Dividers and Crop Deflectors:

- Check for damage; abrasive wear on the shoe of the crop divider. Repair as required.
- Check for stress cracks. Repair as required.

Cutting System:

- Check knife head and knife drive bearings. Grease as required.
- Check all cutting parts carefully for damage and wear. Worn knives and guards can cause higher cutting pressures and increased stalling. Sickle sections are considered worn if the cutting edges are chipped, broken or dull.
- The cutting edge of the guard gets rounded and wider as the guards wear. When the gap is approximately the thickness of two sickle sections, it is time to replace the guards.
- Check knife back and roller bars.
- Check connector bar joints. The center of the connector bar should be directly under the middle of a sickle section.
- Oil knife and guards for storage.

Decks:

- See deck maintenance in the Draper section of this manual.

Drive Shaft:

- Check each yoke and cross kit for wear. Replace as required.
- Grease slide tubes, yokes and shield bearing.

Reel:

- Inspect reels for missing, damaged or broken fingers.



- Inspect bearing joints; service or replace as required.
- Inspect arms and braces; bent, broken, missing parts.
- Inspect reel drive couplers and reel joints (split reel).
- Inspect reel drive motor.
- Check poly skid under the cutter bar. Replace as required.

Transport and Hitch System:

- Check tires for wear, cuts, and abrasions. Replace as needed.
- Ensure that all bolts and pins are securely in place.
- Ensure that all wheels are turning freely.
- Check wheel bolt torque frequently. **All** wheel bolts are to be maintained at a torque rating of 120 ft-lbs/ 163 Nm.
- Check tire pressures frequently, and maintain at the pressures specified below.
- 225/ 75-R15 (STD transport & gauge wheel tire) – Maximum 50 psi (cold)
- 20.5/ 8.0 X 10 (HD slow speed transport tire) – Maximum 70 psi (cold)

Service Locations

Drive Shaft:

*(4 locations)

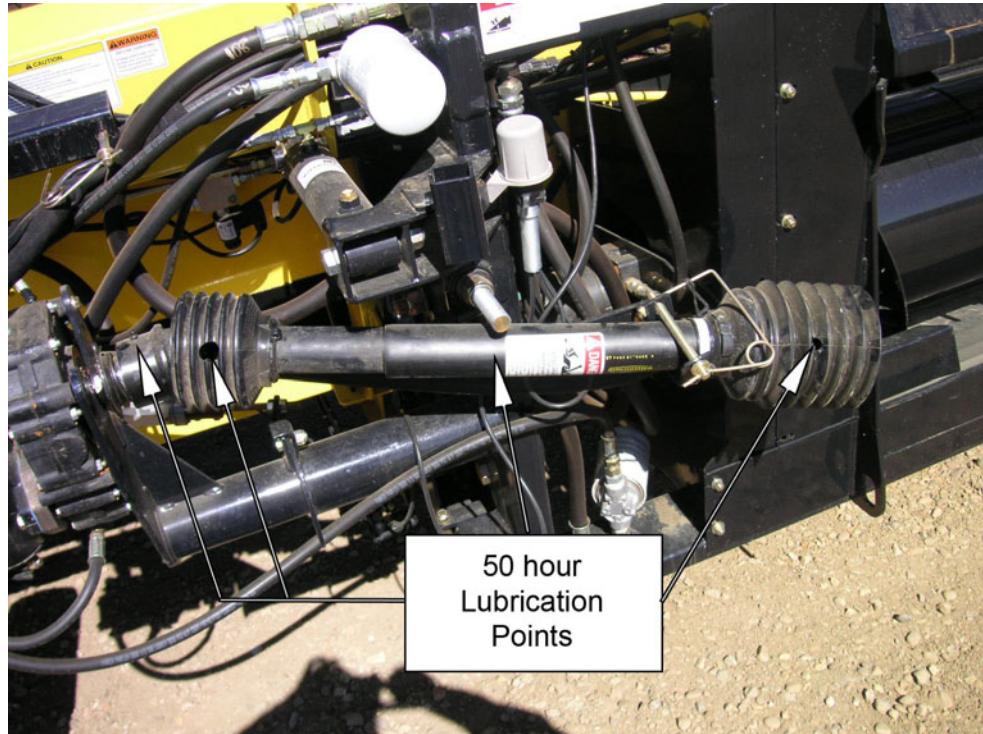


Illustration 102: Drive shaft Lubrication

NOTE:

The center drive-shaft joint will need to be taken apart and manually greased. Refer to **OPERATING THE PTO – Lubrication** portion of the **CENTER FEED AUGER** section in this manual.

Castering Gauge Wheels:

*(1 location per wheel)



Illustration 103: Gauge Wheel Lubrication Point

Knife Drive:

*(2 locations per Knife drive.)

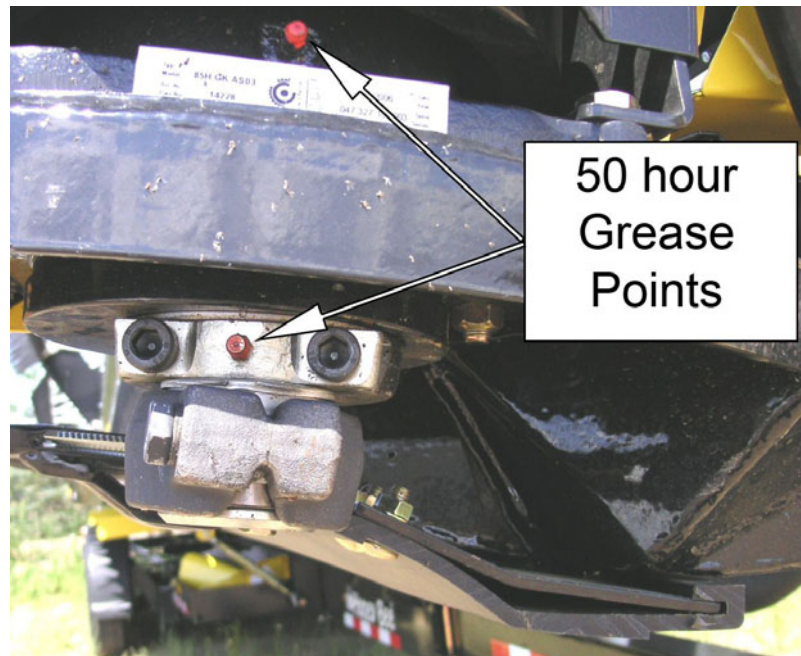


Illustration 104: Knife Drive Lubrication

Reel Drive:

*(1 location per reel end)

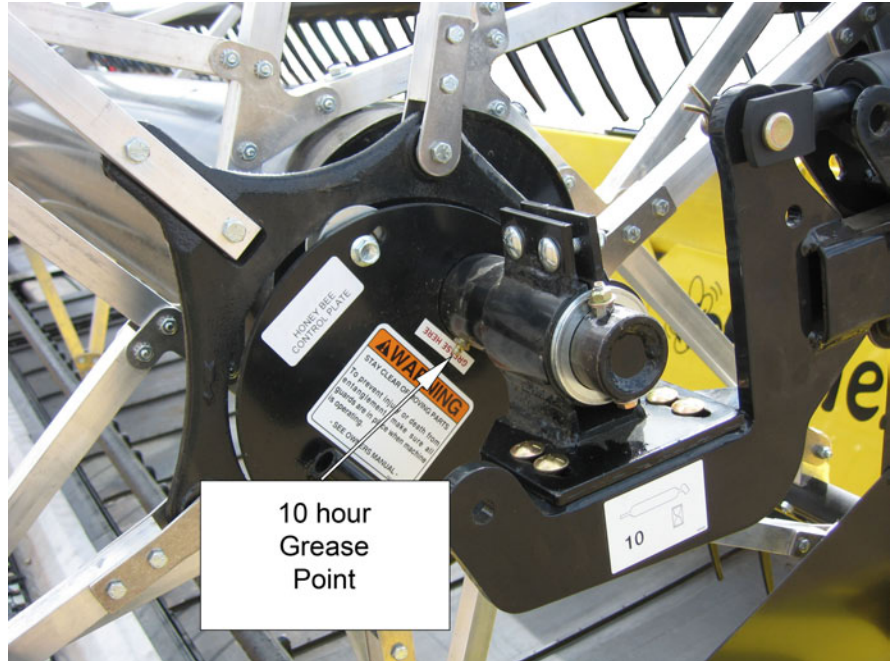


Illustration 105: Reel Lubrication

Double Reel Drive - Split Reel:

*Two center locations.

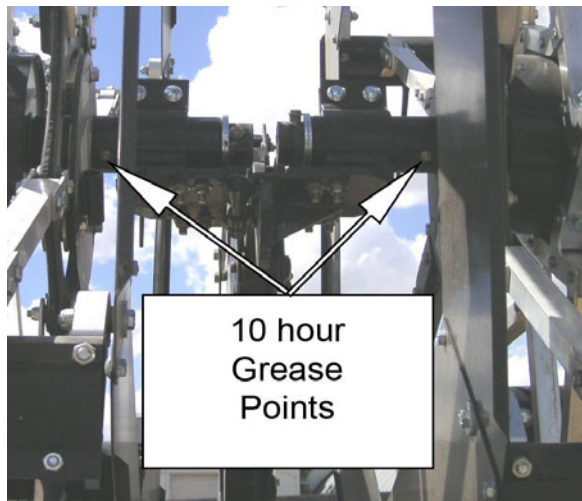


Illustration 106: Dual-Drive Reel Center Lubrication

Reel

Reel Drive

Depending on the model of header, the reel is driven by either one (30 and 36 ft) or two (42 and 45 ft) hydraulic motors with a direct drive coupler to the reel.

Check coupler bolts and motor mount bolts regularly for tightness. Check alignment of motor to reel tube, and shim the mounting bolts if needed.

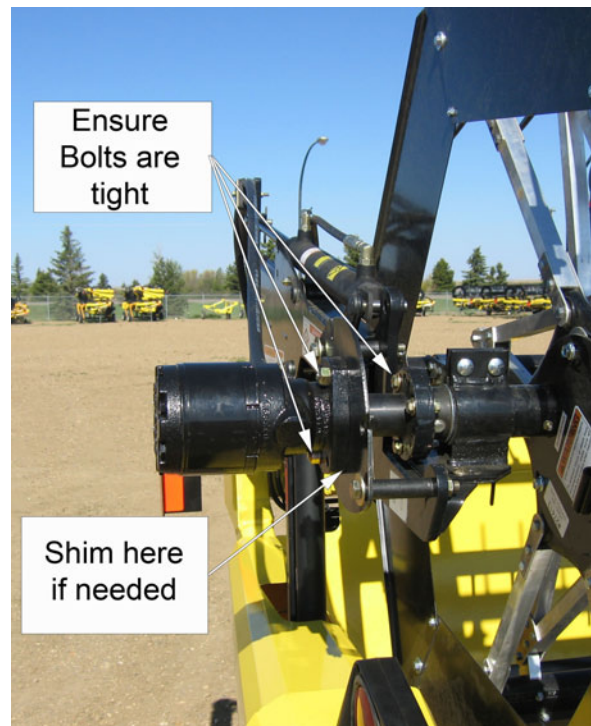


Illustration 107: Reel Lines and Motor

Attention!	<i>Reel motors are capable of bi-directional operation. As installed on the header they run in one direction only and are supplied with unidirectional hydraulic oil flow. For this reason, it is important to mark the lines and their corresponding motor ports whenever you are removing hydraulic lines.</i>
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Reel Speed Adjustment

Reel speed should normally be set 10% to 20% faster than the ground speed of the combine (approximately 8 – 10 rpm for every 1 mph of machine ground speed, for a 52" diameter reel). "Down" crops will require a somewhat higher speed than standing crops. Reel speed is determined by a control in the combine. Adjust the reel speed so that the reel has the appearance of "pulling" the combine through the field.

- If reel speed is set too slow, the crop will not be pushed against the cutter bar and

swept onto the draper. This can result in a portion of the cut crop being pushed forward onto the ground. Slow reel speed may also cause a wrapping of the reel with cut crop, as it bunches along the front of the cutter bar. It is very important that the reel gently guides the crop onto the cutter bar, then sweeps it onto the draper.

- If reel speed is too high, the crop may be stripped or shelled out by the impact of the reel. The crop may also be pushed down before it can be cut, leaving uncut grain in the field. Excessive reel speed may also cause cut crop to wrap onto the reel, as the crop does not get a chance to fall onto the draper.
- In general, hay crops can be cut using higher reel speeds.

Reel Position

Hydraulic Fore & Aft:

All Grain Belt Plus Header reels are equipped with hydraulic fore and aft, controlled from the combine. This feature allows the operator to move the reel assembly forward and backward.

The combine must be equipped with the fore/aft control to make this option functional.



Illustration 108: Reel Adjustment - Fore & Aft

Split-Reel Lift Hydraulic Circuit

Pressure from the combine feeds the barrel end of the left cylinder. As the cylinder piston rises, oil on the top side of the piston is forced out of the rod end port, into the barrel end port on the center cylinder. The same process happens to the center cylinder, causing the cylinder piston to rise and oil from rod end port of center cylinder is forced out into the barrel end of right cylinder. As right cylinder piston rises, once again oil is forced out of the rod end port into the reel return line, and routed back to the combine hydraulic reservoir. To lower the reel, a check valve assembly located on the combine, allows the oil flow to be reversed, and gravity forces the reel down (See Illustration 120: Reel Positioning Measurements, Illustration 116: Safety Pin and Clasp, Illustration 117: Center Reel Height Control, page 102.).

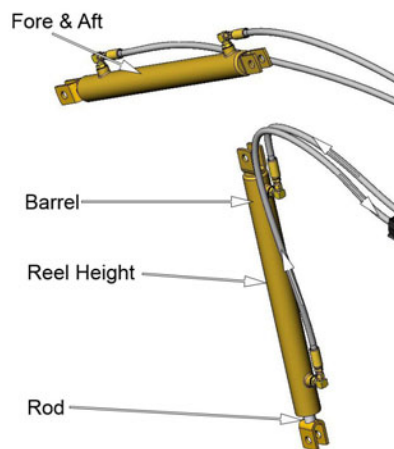


Illustration 109: Split Reel Left-hand Side

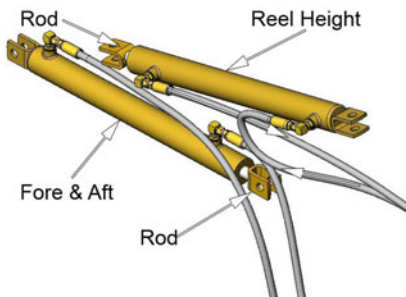


Illustration 110: Split Reel Center

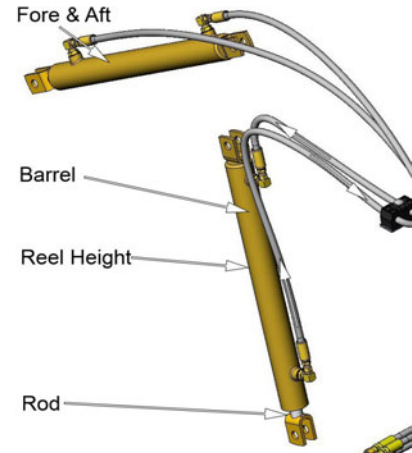


Illustration 111: Split Reel Right-hand Side

Solid Reel Hydraulic Circuit

Pressure from the combine feeds the barrel end of the left-hand cylinder. As this cylinder rises, oil on top of the piston is displaced. The volume of the barrel on the left cylinder matches the volume of the right-hand cylinder. The displaced oil causes the right-hand cylinder to raise. This cylinder has a vent to bleed air from the system.

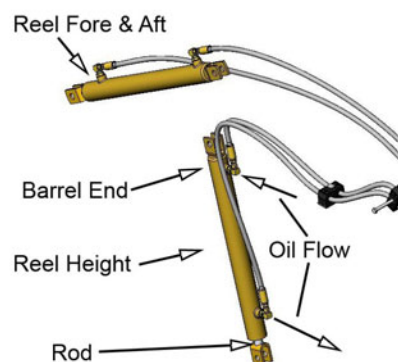


Illustration 112: Solid Reel Left-hand Side

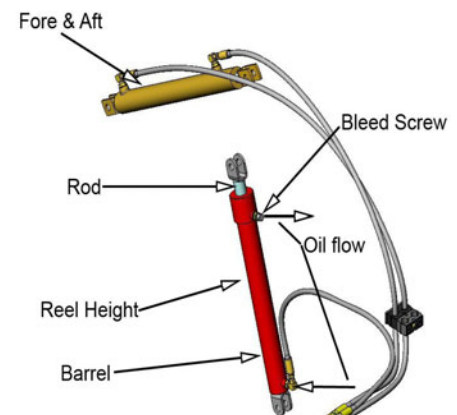


Illustration 113: Solid Reel Right-hand Side

Reel Arm Leveling and Height Adjustment

Reel Lift Circuit:

Operation: To raise the reel, pressure from the combine feeds the hydraulic circuit in series, starting on the left, to the center, and finally to the right-hand cylinder. From the right-hand cylinder, the oil is returned to the reservoir.

To lower the reel, a check valve assembly allows oil to bleed from the circuit, and gravity forces the reel down.

Reel Height Control Arms

Grain Belt Plus Headers are equipped with reel height control arms, which limit how much the reel can be lowered, and thus, how close the reel can come to the table. These arms are located behind the reel-lift cylinders.

To adjust the height limits:

1. Start the combine, and with the header fully lowered, raise the reel to maximum height.
2. Engage emergency brake, shut combine down, and allow all moving parts to come to a complete stop before exiting the cab.

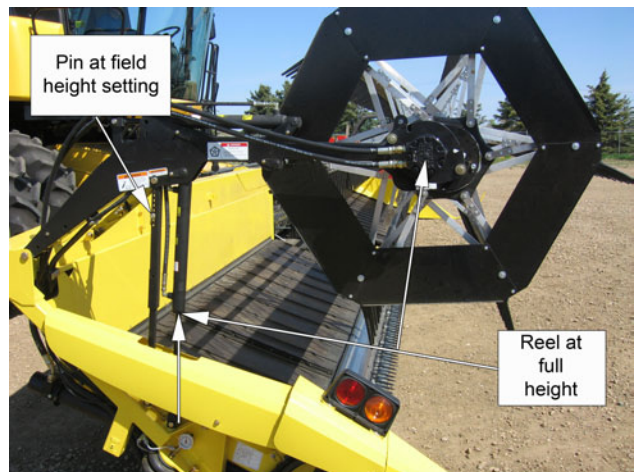


Illustration 114: Reel Fully Elevated

3. Remove lock pin from left side reel height control arm, and replace into the desired location (hole) . Ensure that pin is fully engaged and locked in place with safety clasp. Take note of the exact location of the pin.
4. Repeat this procedure for right side of the header, ensuring that this pin is inserted at the same height as the left side.

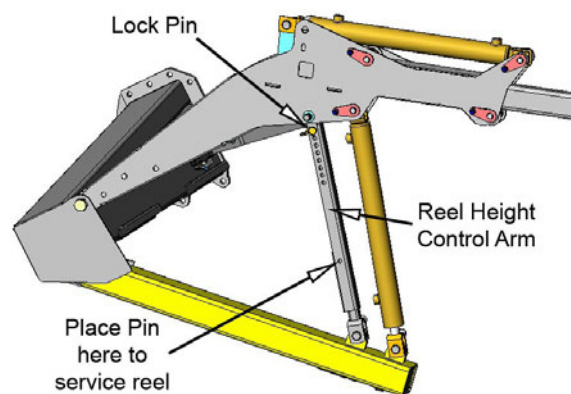


Illustration 115: Reel Height Control Arm

5. Ensure the pin is fully inserted, and secured with the safety clasp.

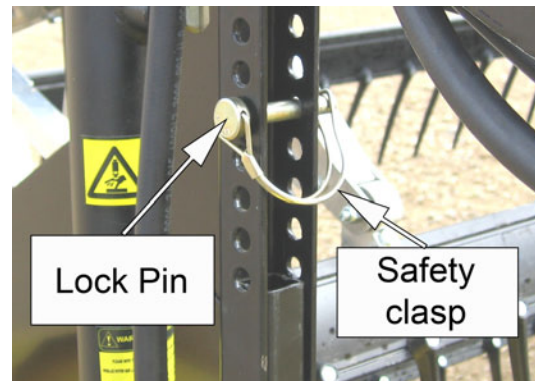


Illustration 116: Safety Pin and Clasp

If your header has a split (double) reel, the center reel height control arm will also need to be adjusted. The holes for the center arm, however, do not correspond with the outside arms. For this reason, it must be adjusted visually, using the primary holes first, then the secondary, if required, in order to obtain a level reel. For safety purposes, all adjustments to the center reel arm should be made from the rear of the header.

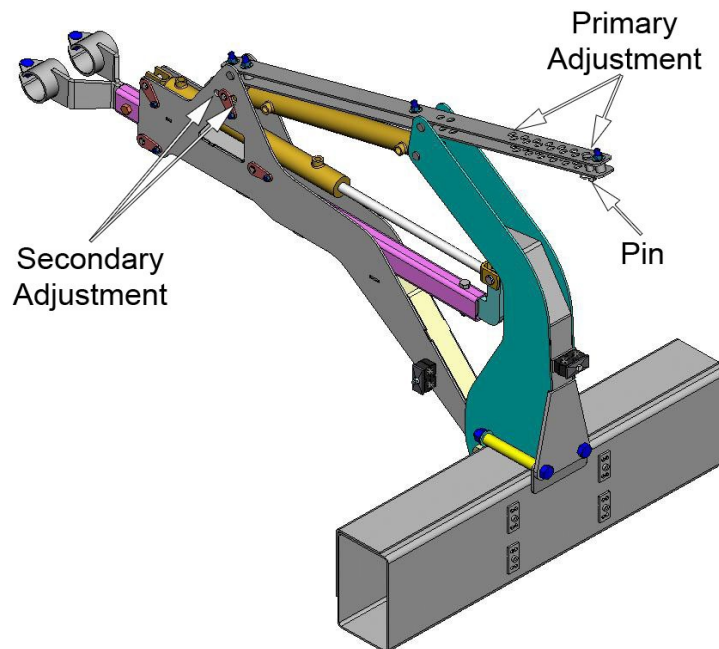


Illustration 117: Center Reel Height Control

Restart combine, and slowly lower the reel to it's lowest position. Ensure the reel tines will not contact any part of the deck, draper, or cutter bar. (If the lock pin is properly inserted in any of the holes provided, the reel should not make contact with any part of the header when in it's lowest position, provided that the cutter bar remains level).

*Refer to “MINIMUM REEL HEIGHT” later in this chapter.

IMPORTANT!	<i>When servicing the reel, it is absolutely necessary to have the reel <u>locked</u> into the servicing (highest) position, with the lock pins securely in place and safety locks engaged.</i>
	<i>When the reel is set for short crops, and the fore-aft control is retracted, the reel will contact the feather plates, and draper, causing increased wear.</i>

Reel Height Control Sensors (Optional Equipment)

*For information on the optional reel height control sensors, please refer to the “MISC./OPTIONAL EQUIPMENT” chapter in this manual.

Reel Centering

Measure the clearance from the end shield on the reel to the crop divider on each end of the swather. See Illustration 115: Reel Height Control Arm

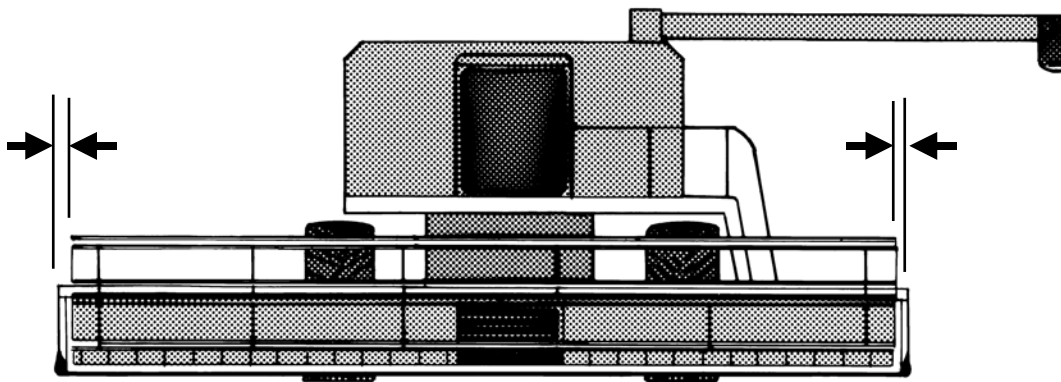


Illustration 118: Reel Centering

If the reel is not centered on the header, proceed as follows:

1. Fully lower the table and reel, and engage parking brake.
2. Turn combine off and allow all moving parts to come to a complete stop before exiting the cab.
3. Loosen the carriage bolts that secure the reel arm braces on both ends of the reel.
4. Push the reel arms until reel is centered.
5. Tighten bolts when centered. (See Illustration 114: Reel Fully Elevated).

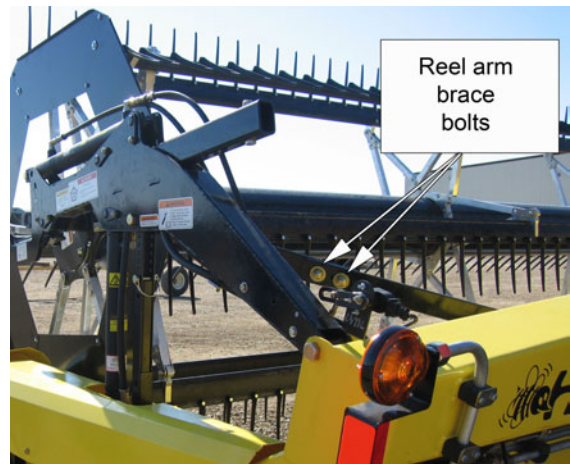


Illustration 119: Reel Arm Brace

Placement of the Reel on the Grain Belt Plus Header

The distance from the tip of the knife section to the center of the reel can be adjusted from 0" to 12" (300 mm) depending on the crop.

- Normally the more “down” the crop, the further ahead the reel should be set.
- Setting the reel too far ahead will not deliver the crop against the knife while being cut, nor will it efficiently deliver it onto the draper.
- Set the centerline of the reel the same distance from the cutter bar on both ends.

Adjust the reel arms so that the tine tips will miss the guards and sickle by at least 1" (25 mm) to avoid cutting tines, and breaking knife sections.

1. Normally the more “down” the crop; the closer the tines will need to be placed to the cutter bar, down to this 1” minimum.

ATTENTION!

Minimum reel height is determined by the setting of the reel height control arms. The automatic Reel Height Control option is designed to sense the tine-to-knife distance, and adjust the reel height accordingly. If the header you are using is not equipped with this option, it will be necessary to pre-adjust the minimum tine-to-knife distance based on the variability of the terrain over which you will be operating the header.

Bear in mind that the cutter bar on the Grain Belt Plus header is designed to flex over uneven ground. Setting the reel height too low for the amount of flexing you will encounter may result in damage to knife sections, guards, and reel tines.

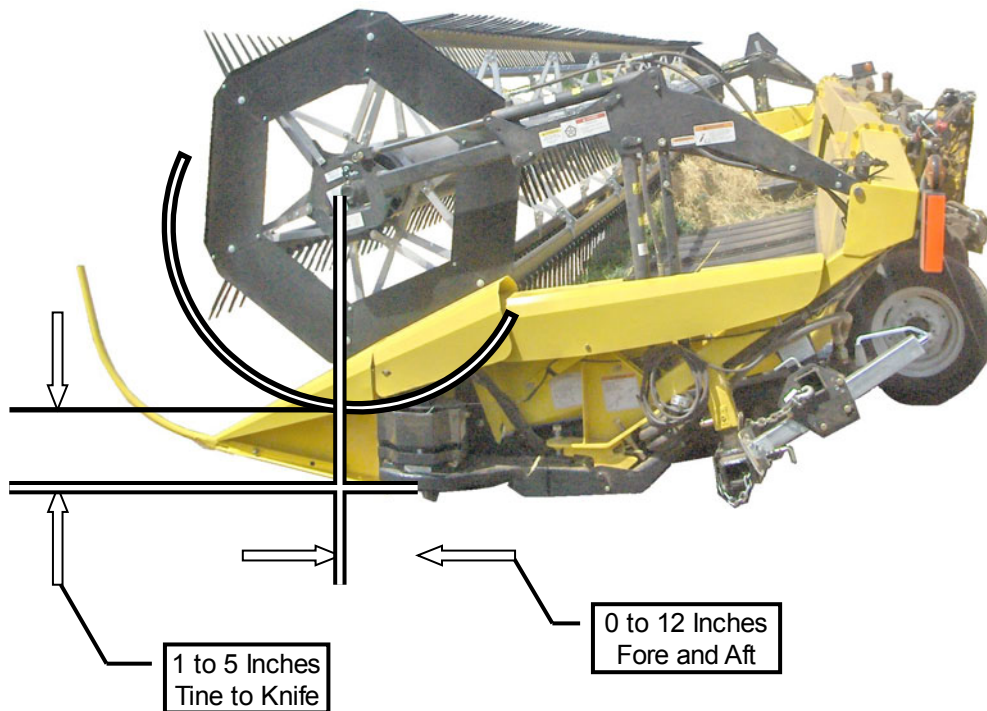


Illustration 120: Reel Positioning Measurements

Reel Position in Down Crops

- The reel height in down crops should be low enough that the tines can lift the crop up and onto the cutter bar.
- The tines should be adjusted so they pick up the crop and lift it onto the cutter bar with a minimum of the crop carrying around the reel.
- The fore and aft position of the reel should be adjusted so the reel center tube is about 12 inches (300 mm) in front of the cutter bar so the crop is lifted before it gets to the cutter bar.

IMPORTANT!	<i>Care must be taken to assure that the reel tines do not come in contact with the cutter bar. Tine contact will cause damage to the tines, knife sections, guards, and other cutter bar parts. At no time should the reel tines contact the ground. Contact with the ground or with rocks will cause damage to the tines, pivot points and stars.</i>
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Reel Position in Standing Crops

- The reel height on standing crops is usually correctly adjusted when the reel bats contact the crop about midway between the cutoff point and the top.
- The reel should be adjusted fore and aft so the reel center tube is slightly ahead of the cutter bar. If the reel is too far forward, the crop will not be pushed against the cutter bar and a portion of the cut crop will fall to the ground. If the reel is too far back, the crop is pushed down too low when it is cut and some of the heads will be missed.

Universal – Ull Pick-Up Reel: Tine Pitch Adjustment

Plastic (Delrin) reel tines are attached to the leading side of the reel bats with 1/4" bolts and nuts. To adjust the pitch of the tines , proceed as follows:

1. Loosen the bolts (Shown here) at BOTH ends of the reel and insert a suitable tool into the tube.
2. Partially rotate the control ring assembly, noting the change in the angle of attack in the tines nearest the cutting bar.
 - To increase the pitch of the tines, turn the ring in the direction of reel rotation.
 - To decrease the pitch of the tines, turn in the opposite direction to reel rotation.
3. Re-tighten bolts at BOTH ends of the reel.

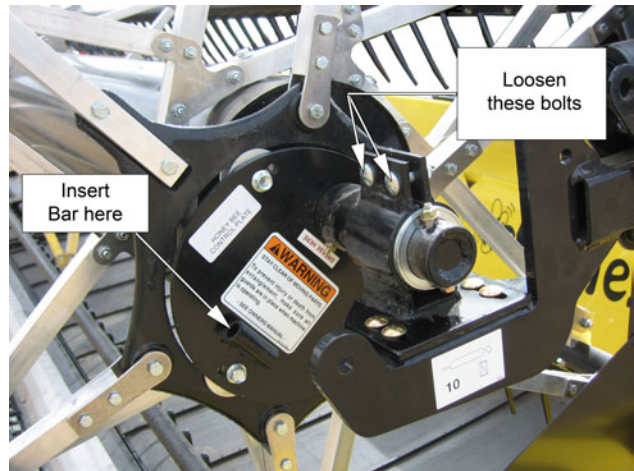


Illustration 121: Adjusting the Reel Tines

Adjust tine pitch initially so tines are perpendicular to the cutter bar. Too great a pitch may cause the cut crop to be scooped up and carried around the reel.

For crops that are down or lodged, adjust reel so that center of reel is ahead of cutter bar, and adjust tines to be more aggressive, lifting the crop, yet dropping it onto the draper decks after cutting.

If the crop starts to wrap around reel, this indicates the need to adjust the tines to a less aggressive setting.



Illustration 122: Tine Pitch - Less Aggressive

Tine pitch is critical to the operation of the header. Adjust the tines to suit your individual needs and make note of the best settings for each of the crop conditions you encounter.

IMPORTANT!	<i>Tine pitch must be the same at both ends of the reel.</i>
Note:	<i>If crop is building up in the center of a split reel, the fingers/ tines may be heated and bent slightly to ensure the crop does not build up at the gap.</i>

Hart-Carter (HCC) Reel

The HCC reels supplied with the Grain Belt Plus header are 6-bat reels, with plastic tines and wings.

The tines are fastened around steel bat tubes using 7/32" metal screws. The bats pivot within plastic bearings that are located at the ends of each reel arm (spoke).

To adjust the pitch of the tines, refer to the illustrations and instructions below.



Illustration 123: HCC Reel-bat Bearings

HCC Reel – Tine Pitch Adjustment

Locate the tine pitch adjustment levers, and tine-pitch adjustment bolts, located at both ends of the reel. (See Illustration 108: Reel Adjustment - Fore & Aft, page 99.)

Loosen the adjustment bolts, and then move the adjustment levers accordingly to set the desired pitch. (***Hint:** Start reel with a pitch of about 5° as shown.)

Retighten the adjustment bolt, securing the pitch setting.

Note:	<i>Ensure that the adjustment bolts & levers are set to the same relative position for each side. Too great a pitch causes reel to wind with cut crop because the tines do not release the crop after it is cut.</i>
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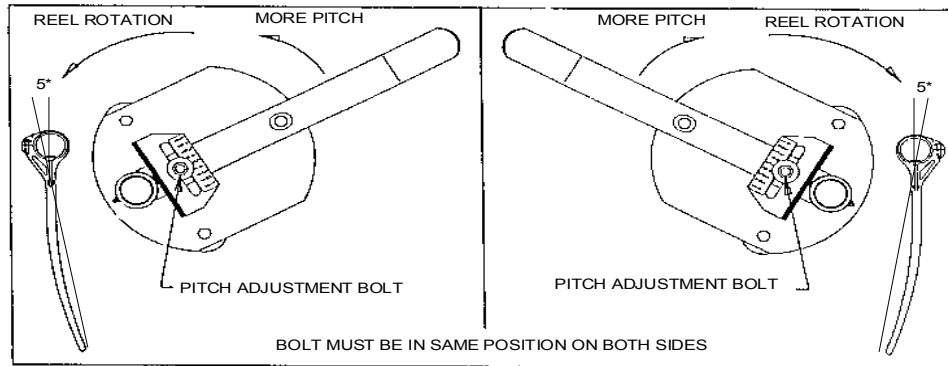


Illustration 124: HCC Reel Tine Pitch Adjustment

Lubrication – Reel Shaft Bearings

Lubricate every 10 hours of operation (or daily) with multi-purpose lithium base type grease. Lubricate the grease fitting at each end of the reel shaft, and also at the center on double reel models.

Annually, remove and examine the polymer liners in the control plate tubes. Replace if worn.

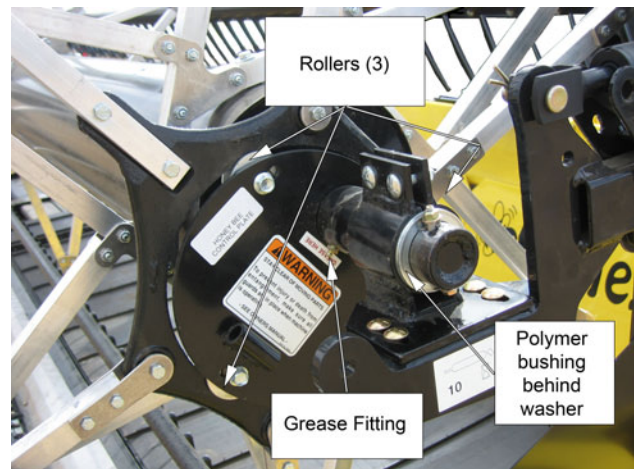


Illustration 125: Reel Shaft Bearings and Rollers

NOTE:	<i>Initial lubrication of the plastic bat bearings (HCC Reels only) with a light film of oil will improve the break-in and service life of the bearings. See Illustration 107: Reel Lines and Motor</i>
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Control Rings (U-II Reels only)

The control ring assemblies each have three rollers mounted in adjusting slots. (See




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Illustration 107: Reel Lines and Motor.) To compensate for wear to the control ring, the rollers may be adjusted outward in the slots so that all three rollers are lightly in contact with the control ring.

NOTE:	<i>All three rollers at each end of the reel must be moved the same amount relative to each other, so that all three roller bolts are in the same position in the slot. DO NOT move only one roller.</i>
--------------	---

Check - Points Before Operation:

CAUTION 	<i>Always engage reel lift cylinder locks and table lift cylinder locks before working under or around raised reel. Do not rely on the combine hydraulic system for support. A rupture or a leak in any part of the system will allow the table to lower if the proper stops Are not in place.</i>
---	---

	All bolts are tight.
	Reel turns, by hand, without binding. (With some resistance from hydraulics.)
	Tines uniformly clear the knife.
	Reel arms are aligned. (No bow in the bat shaft or pivot bracket bat assemblies.)
	Auxiliary fingers have adequate clearance with side shields (HCC Reels only).
	Tine pitch has been set for the current application, and is uniform across header.
	Hydraulic cylinders are functioning smoothly.
	Minimum reel height has been set correctly on the reel height control arms.
	Fore & aft hydraulic cylinders extend and retract fully.
	Vertical distance from the knife to the reel center is set for the current application.
	Reel is horizontally centered in the header opening.

Draper

The Grain Belt Plus Header is equipped with two lateral drapers, and two rearward feeding center drapers. The lateral drapers move the material from the cutter bar toward the center. The center drapers move the material toward the finger auger which, in turn, directs the crop into the feeder house of the combine. All drapers must be set properly, and in good condition to perform well. Quick release adjusters with spring tensioning allow for easy cleaning of internal parts and facilitate maintaining proper draper tension.

WARNING


Combine must be fully shut down, with park brake on, feeder house, and reel lift cylinder locks engaged before installing drapers!

Draper Installation

Unpack draper, and verify that it is the correct size for the header. Place draper bundle on the top of deck runners, and unroll with the slats facing up, and with the tracking rib closest to the back panels, facing down.



Illustration 126: Unrolling the Draper

From one end, wrap draper down and around one of the rollers and pull draper along the top side of the lower runners of the deck. On the underside of the deck, the lower runners should support the draper, preventing it from hanging down. Ensure the draper remains on top of the lower runners during the installation process.



Illustration 127: Wrapping Draper onto Rollers

Continue to pull draper until it can be wrapped up around the other roller. (See photos on previous page.) Pull the ends of the draper together. Install connector bars to each side of the draper join using the pre-punched holes. The heads of the screws should be installed from the center deck opening side. This helps to prevent the crop being caught on the threads. Next, ensure that the extruded “V” tracking rib is seated in the corresponding groove on the roller. (Refer to the **Alignment** section of this chapter) Complete the installation by adjusting the tension. (refer to **Lateral Drapers – Tension** section in this chapter.)

Lateral Drapers - Tension:

Proper tension must be maintained on the draper to prevent the drive rollers from slipping. Tension is changed by adjusting the drive roller of each deck.

ATTENTION!	<i>Draper should only be tight enough to prevent slipping. Do not over-tighten as this may cause premature failure of bearings, draper rollers and/or draper belts.</i>
-------------------	--

1. Lower the header to the ground and engage parking brake.
2. Raise the reel to its maximum height and lock reel height control arms in the servicing position to prevent reel from falling in the event of a hydraulic failure.
3. Turn combine off, and wait for all moving parts to come to a complete stop before leaving the cab.
4. To adjust the draper tension, loosen the lock nut (located at the back of the header, next to the draper drive motor).
5. Release the tension with the quick release lever. Pull the roller from side of header to stretch the draper. Slide the adjuster clevis to compress the tension spring.
6. Complete tightening by over-centering the quick release lever. Leave the lock nut on the motor mount plate loose to allow the spring to maintain tension.

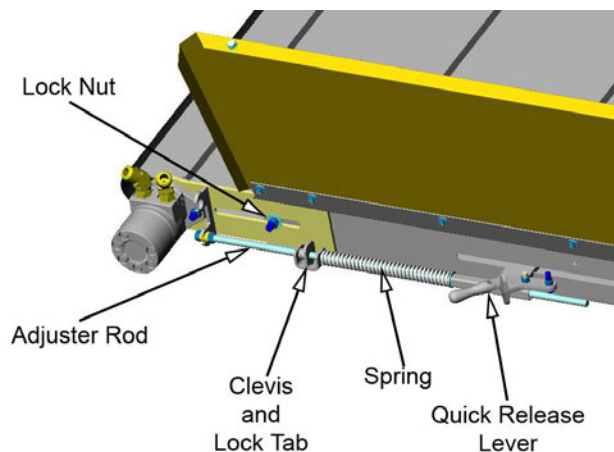


Illustration 128: Lateral Draper - Tension Adjustment

Lateral Drapers Alignment:

The draper must track properly on the rollers to avoid damage to the draper edges. The decks allow approximately 1/4" of clearance on each side. With the "V-guided" draper, it is not necessary to set the tracking or alignment of the draper, provided that the roller extrusion on the underside of the draper is seated in the groove on the motor end of the drive – roller, much as a V-belt rides in a pulley. (See illustrations below.)

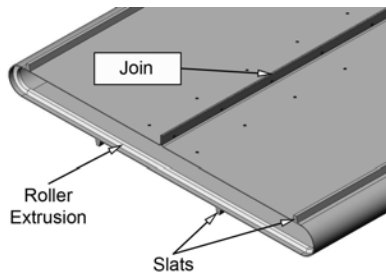


Illustration 129: Draper - Motor End View

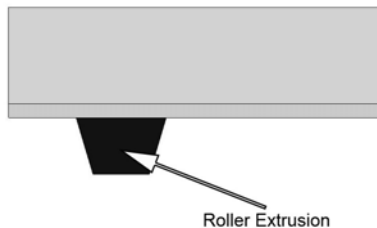


Illustration 130: Roller Extrusion - End View

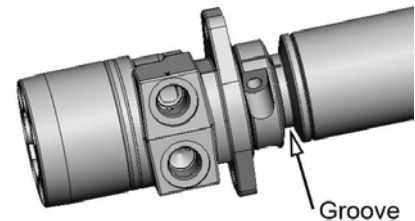


Illustration 131: Drive Roller - Groove

Draper Speed:

Proper draper speed is critical to the performance of your Grain Belt Plus Header. The draper drives are part of a closed hydraulic circuit and are not adjustable. Their operating speed is linked to the speed of the knife drive, which, in turn is controlled by the speed of the Eaton variable pump. This pump should be set specifically for your combine type in order to ensure the Grain Belt Plus header functions properly.

Center Drapers (Feeder Deck)

Proper tension must be maintained on the center drapers to prevent the drive rollers from slipping. As there are two separate drapers on the feeder deck, the tension is independently adjusted for each side by changing the positioning of the idler rollers at the front of the feeder deck.

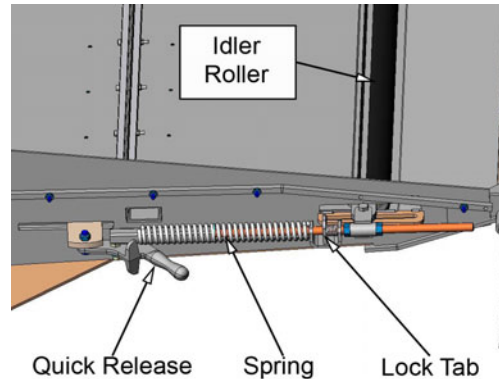


Illustration 132: Center Draper - Left Side View

1. Raise the header, and engage parking brake.
2. Raise the reel to its maximum height. Shut the engine down, and wait for all moving parts to stop. Set the header cylinder locks in place, and lock reel height control arms in servicing position to prevent reel from falling in the event of a hydraulic failure.
3. Release the tension on the draper to be adjusted with the quick release lever. (See above illustration.) Pull the idler roller towards the cutter bar to stretch the draper. Slide the adjuster clevis to compress the tension spring. Complete tightening by over-centering the quick release lever. Repeat the process for the other draper if needed.

Attention!

Do not overtighten the drapers. Excessive tension may cause premature failure of bearings, rollers, and/or draper belts.

Normal adjustment of the center draper would provide 1.5" - 2.0" (3.8 cm - 5.0 cm) of slack in the center of the draper (when measuring vertically from the top of the draper runner on the inside of the deck, to the top of the draper).

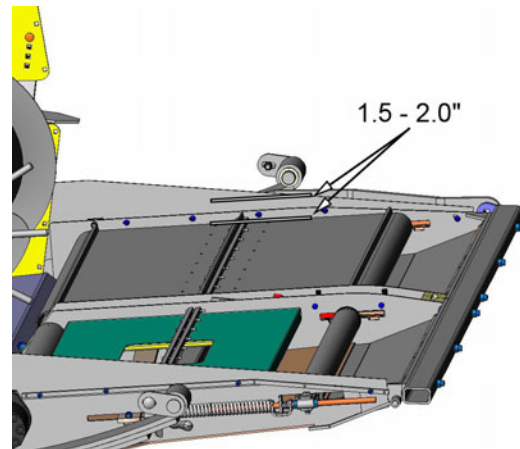


Illustration 133: Center Draper - Normal Tension

Alignment:

In the same fashion as the lateral drapers, the feeder deck drapers are self tracking, with an extruded “V” on the draper, and a slotted groove (“V” recession) on the roller. With the “V–guided” draper, it is not necessary to set tracking or alignment, provided that the extruded “V” on the underside of the draper is properly seated in the groove on the motor end of the drive roller. (See Illustration 126: Unrolling the Draper, Illustration 130: Roller Extrusion - End View, and Illustration 131: Drive Roller - Groove, page 114.)

Draper Splicing

Honey Bee Mfg. strives to use top quality draper or draper material on their headers and swathers. Our draper is made from rubberized polyester with fiberglass reinforced slats. Regular draper maintenance will help to ensure maximum life-span and minimal problems with your draper. Checking tension and tracking on a regular basis is very important. If material is allowed to get inside the draper deck it tends to wrap around the idler and drive rollers causing the draper to tighten. As the the draper tightens, increased stress is placed on the motor, bearings, and the draper belt. Premature failure of the motor or bearings, or tearing of the draper can result. Damage to the draper can arise from a mechanical failure or field hazards. It is important to identify and correct the condition(s) that caused the failure, before attempting to repair the draper. If only a portion of draper is damaged, a splice can be installed to repair it.

Before beginning any repairs you will need two sets of connector bars (including. machine screws and nuts) and a length of draper 6 inches longer than the section to be removed. (To determine this length, refer to step #8)

1. Engage parking brake, raise header table and install locks on the feeder house lift cylinders. (If table height is too high for working, table can be set on blocks or right on the ground)
2. Raise the reel to its maximum height and lock reel height control arms in servicing position to prevent reel from falling in the event of a hydraulic failure.
3. Turn combine off, and wait for all moving parts to come to a complete stop before leaving the cab.
4. Loosen the tension on the draper.
5. The squareness of the cut is critical to the tracking of the draper. The draper should be cut between two slats. With a measuring tape, measure and mark a line six inches from a slat on a good portion of the draper. Place a board under the draper and with a utility knife and a straight edge cut the draper along the marks. Repeat this procedure on the other side of the damaged area, cutting this section out.
6. Lay the removed section flat and measure it's overall length. Take this measurement and add 6 inches to determine the total length of the replacement piece required.
7. Using a sharp utility knife, trim back and remove 2" of the "V" extrusion from both ends of the spliced draper, as well as both ends of the old draper.
8. Mark draper pieces for connector bar holes: From the end (cut edge) of each draper, measure and mark a $\frac{3}{4}$ " line parallel to the end cut. On each line mark the first hole 1-1/8" from the edge. Drill 3/16" holes through each of these marks. (See diagrams on the following page.) Placing back sides of draper together, line up drilled holes and place a connector bar on each side and secure with a machine screw and nut. Line up the edges of the draper and drill a hole at the opposite end on the $\frac{3}{4}$ " line using the connector bar as a template. Insert a screw and secure in place. Ensuring that the draper edges remain lined up, drill the rest of the holes, insert screws and secure.
9. Repeat procedure for the other join.
10. Adjust draper tension. Trim draper lip to no more than $\frac{1}{2}$ " above connector bar.
11. Start combine, run draper, and inspect spliced piece to ensure that installation was successful.

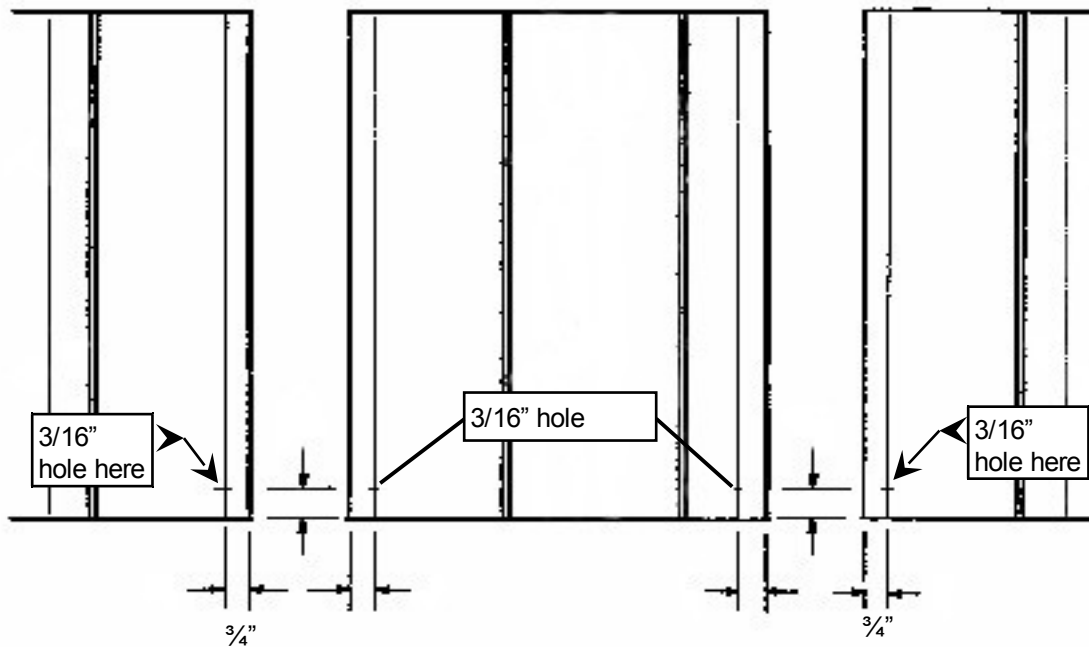


Illustration 134: Draper Splicing Measurements

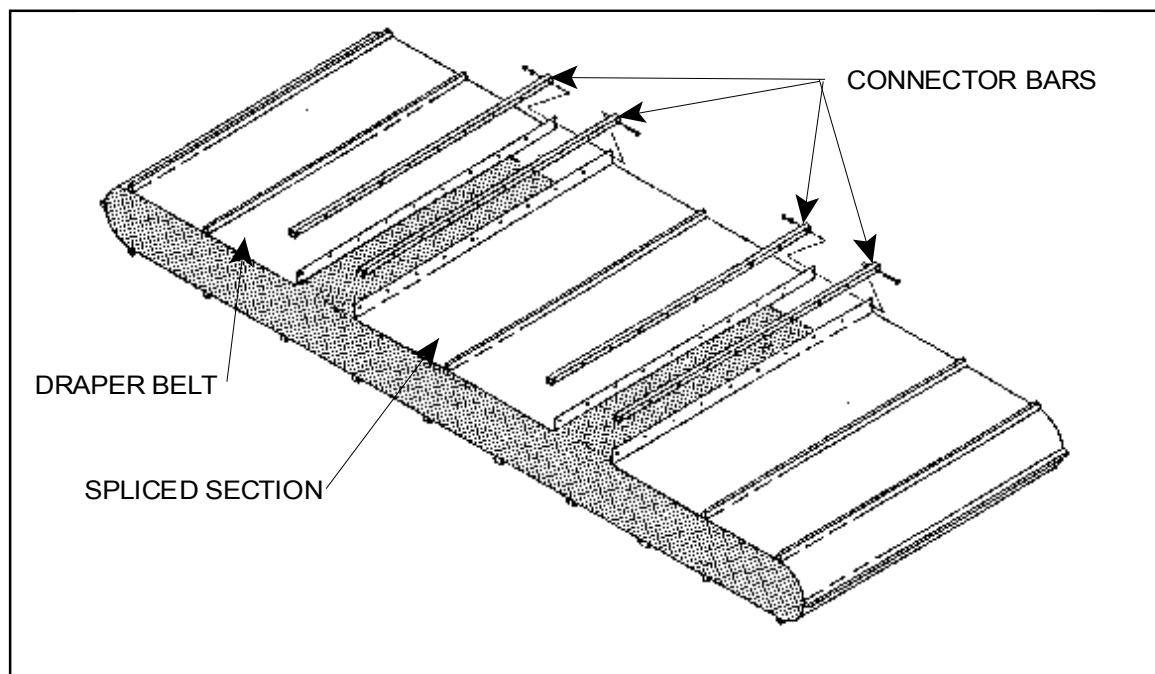


Illustration 135: Draper Splice - Diagram

Idler Roller Removal

1. Relieve the tension from the draper. (See **Lateral Drapers – Tension** section in this chapter).
1. Remove the nut that holds the eye bolt and the draper idler plate in place.
2. Remove idler plate from deck.
3. Remove spacer from bolt (behind eye-bolt head).
4. Pull idler roller out of deck.
5. Check bearings on each end and remove any material build up on roller.
6. Re-assemble in reverse order.

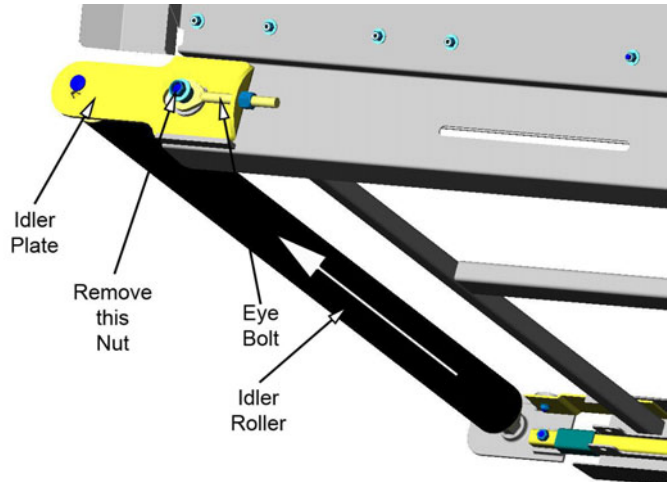


Illustration 136: Idler Roller - (Draper removed for detail)

NOTE:	Spacer must be re-installed for idler plate to function properly.
--------------	--

Drive Roller Removal

1. Check lock nut on the motor mount adjuster plate to see that it is loose.
2. Relieve tension from draper with quick release tension lever (See **LATERAL DRAPERS – Tension** section in this chapter).
3. Loosen lock nuts on adjuster rod. Back off nuts about 3/4". Slide sleeve and spring down adjuster rod. Lift adjuster rod out of adjuster plate.

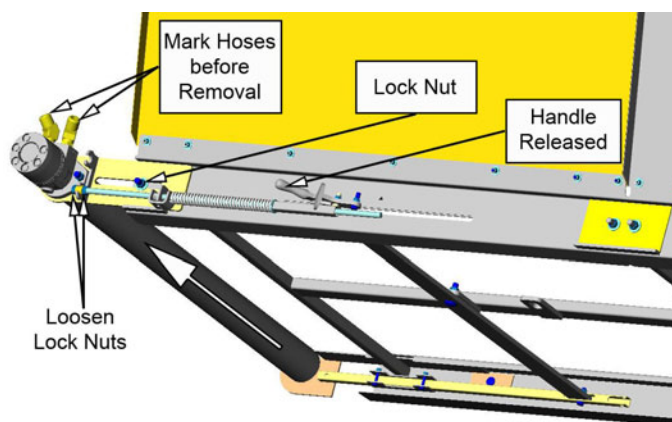


Illustration 137: Drive Roller - (Draper removed for detail)

4. Mark hydraulic hoses on draper motor. Remove hoses. Insert plugs into hoses and

caps on the motor to reduce oil loss and to prevent contamination.

5. Remove the lock nut from the adjuster plate.
6. Pull adjuster plate, motor, and drive roller out of deck.
7. Check bearing in end of roller, and remove any build up of material on roller.

NOTE:	<i>Check and remove any buildup of material from draper deck runners. If necessary, split draper at connector bar to gain access to the inside of the deck.</i>
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To re-install drive roller, reverse above procedure. (Ensure that extruded “V” on back of draper is properly seated into recessed “V” on drive roller; adjust tension.)

Center deck Idler Roller Removal

Refer to Illustration 129: Draper - Motor End View, page 114, Illustration 128: Lateral Draper - Tension Adjustment, page 113, and Illustration 127: Wrapping Draper onto Rollers, page 112.

1. Separate the sub-frame from the header.
2. Relieve tension from draper with quick release tension lever. (refer to **Draper Tension** section in this chapter)
3. Remove connector bar from draper. Open draper to expose idler roller.
4. Remove the Outside wind guard to access the idler axle bolt.
5. Remove the bolts that connect the idler axle to the adjuster rods. (In order to access the inside bolts, it will be necessary to remove the cleanout cylinder cover, located at the center of the feeder deck. This is accomplished by removing the nut at the back of the shield, and lifting the shield up and out.)
6. Disconnect the adjusters from the axle, and move the roller assembly backward, to the end of the guide channel.
7. Slide the outer axle out of the idler roller.
8. Remove the roller by lifting the outer end up, and sliding it off of the axle.
9. Check bearings in each end of roller, and remove any build up of material on roller.
10. To re-install drive roller, reverse above procedure. (Ensure that extruded “V” on the inside of the draper is properly seated into recessed “V” on drive roller; adjust tension.)

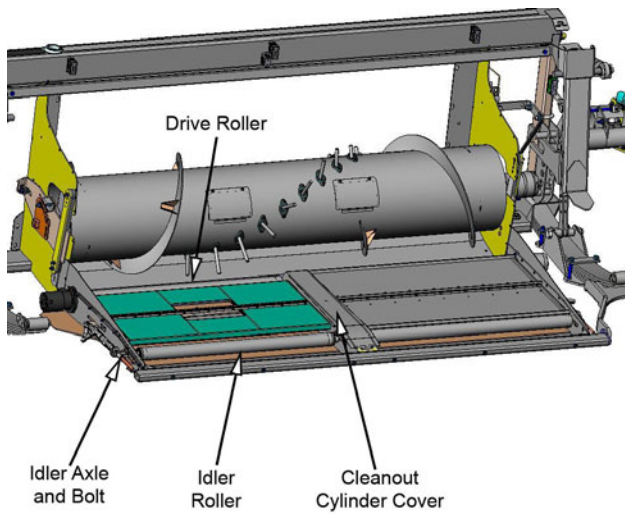


Illustration 138: Subframe - Idler Roller

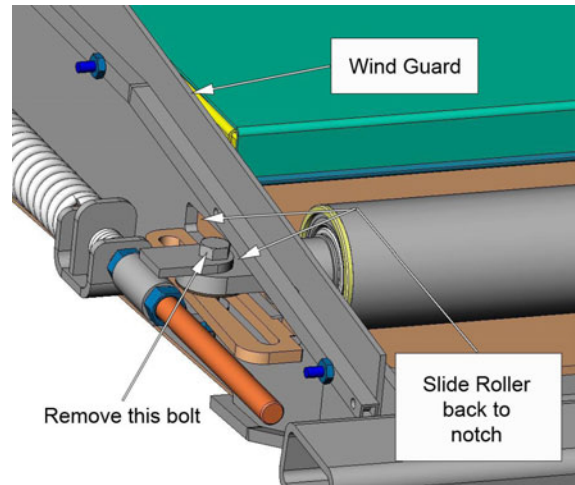


Illustration 139: Idler Axle and Bolt - Close-up

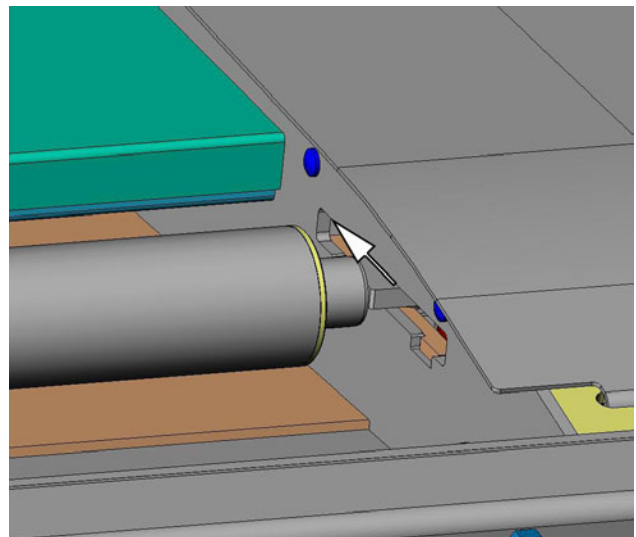


Illustration 140: Idler Roller - Center Axle Close-up

Center Deck Drive Roller Removal

1. Relieve tension from draper with quick release tension lever. (refer to **Draper Tension** section in this chapter)
2. Mark hydraulic hoses on draper motor. Remove hoses. Insert plugs into hoses and caps on the motor to reduce oil loss and to prevent contamination.
3. *This step is optional unless it is necessary to clean inside the deck:* Remove draper connector bar, and open the draper to expose the drive roller.
4. Remove the 2 bolts (top and bottom) that fasten the motor mount plate to the feeder deck.
5. Slide motor and drive roller assembly out of deck.
6. Check bearings in end of roller, and remove any build up of material on the roller.
7. Repair or replace parts as needed.

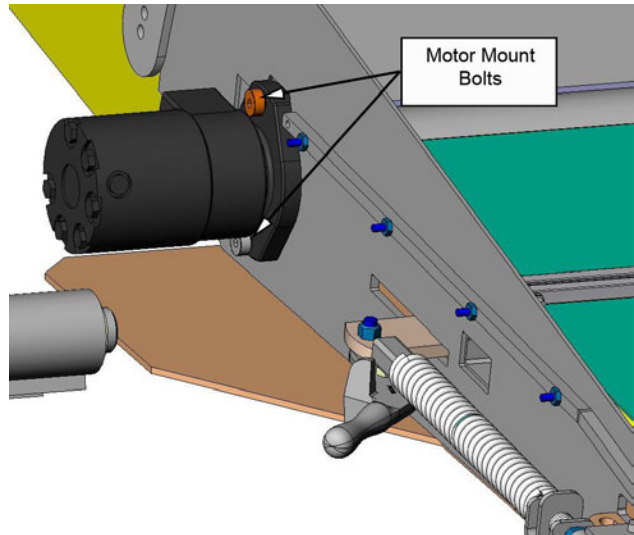


Illustration 141: Center Draper - Motor Mount Bolts

To re-install drive roller, reverse the above procedure, and adjust tension.

Installation of Center Deck Draper

1. To install the center deck draper:
2. Wrap draper around rollers.
3. Insert bolts into connector bar.
4. Line up bolts and connector bar along the flap of draper.
5. insert bolts into holes of both flaps, then into the second connector bar.
6. Secure with nuts.

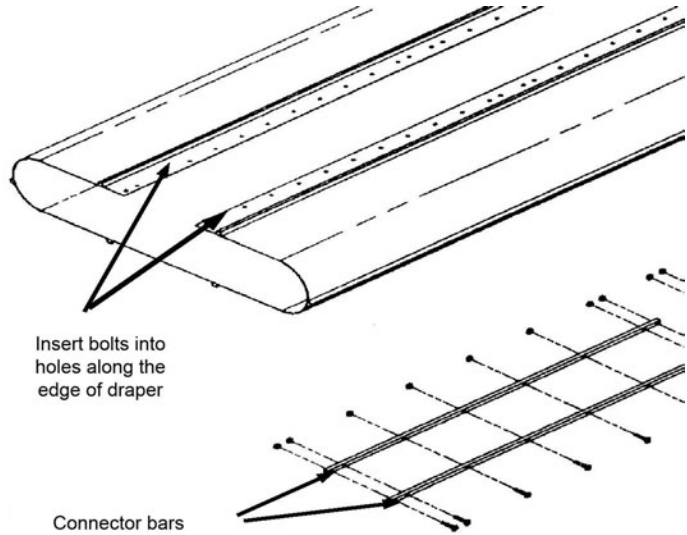


Illustration 142: Center Deck Draper - Exploded View

Center Deck Cleanout

The center deck has provision for cleaning debris from the underside of the deck. This item is activated by a double acting hydraulic cylinder, located between the two feeder deck drapers, which is part of the main table hydraulic circuit.

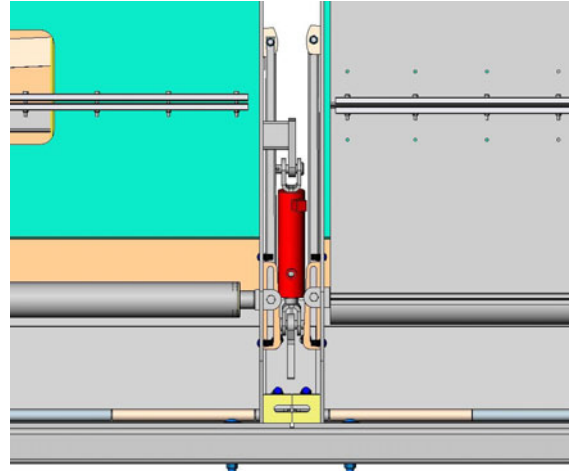


Illustration 143: Clean-out Cylinder - Top View

When the operator reverses the main table hydraulic flow, the draper drives, feeder decks and feed auger are all reversed. The center deck clean-out cylinder opens the clean-out doors, located at the forward edge of the underside of the center deck.

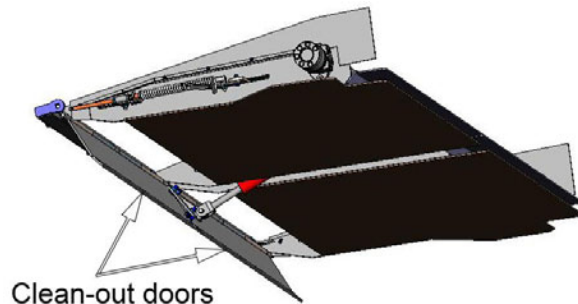


Illustration 144: Center Deck - Bottom View

When the operator selects forward hydraulic flow, all draper, feeder deck and auger drives return to normal operating direction, and the center deck clean-out closes.

Attention!	<i>Raise the header at least two feet above ground before engaging the header reverse. Engage header forward, and ensure the clean-out door has closed before lowering the header.</i>
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Bearing Removal – Idler Roller

To remove bearing:

1. Remove idler roller.
2. Remove snap rings at both ends of the roller.
3. Tap the axle sleeve on the opposite end of the idler roller using a rubber mallet or block of wood (soft material to avoid damaging the axle sleeve). Bearing should pop out, along with steel insert and seal.

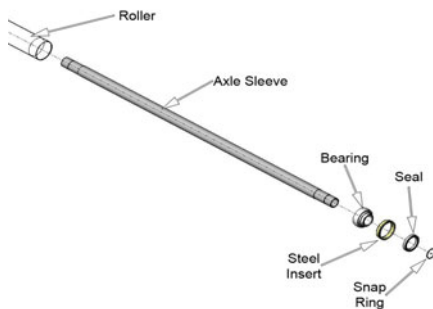


Illustration 145: Idler Roller - Exploded View

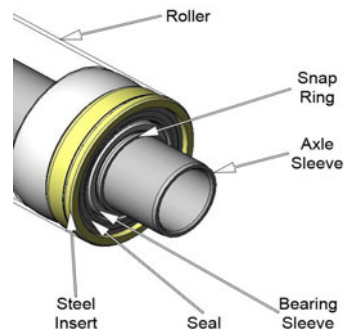


Illustration 146: Idler Roller - Assembled View

Bearing Installation – Idler Roller

To reinstall bearing:

1. Insert bearing onto axle sleeve (ENSURE THAT SIDE OF BEARING WITH WIDE SHOULDER IS FACING OUT.).
2. Install snap – ring to hold bearing in place.
3. Apply a film of grease to the bearing, where it makes contact with the steel insert.
4. Tap in steel insert, using a rubber mallet, or hammer and block of wood. (only softer materials should be used to avoid damaging the parts)
5. Install seal, using the same method as in #4.
6. Fill the bearing with grease using a needle syringe between the seal and the bearing.
7. Reinstall idler roller.

Bearing Removal - Drive Roller

1. To remove the bearing:
2. Remove the drive roller.
3. Remove the rubber seal. (See illustration below.)
4. Remove the split ring.
5. Pull the bearing with a slide hammer bearing puller, or, Insert a rod through the roller from the other end, and tap the bearing out. (This method would require removing the draper motor. Refer to **Remove Draper Motor** section in this manual.)

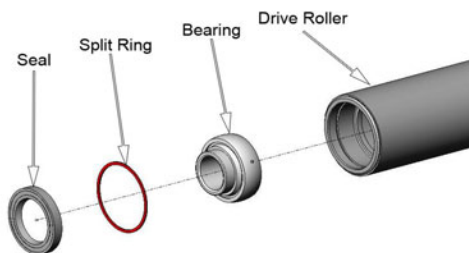


Illustration 147: Drive Roller – Exploded View

Bearing Installation – Drive Roller

1. Insert bearing into drive roller (Ensure that the side of the bearing with wide shoulder is facing out.).
2. Install snap ring to secure bearing into place.
3. Apply a film of grease to the inside lip of the drive roller and outside of rubber seal. Tap rubber seal into place using a rubber mallet, or hammer and a block of wood. (only softer material should be used to avoid damaging the parts)
4. Fill the bearing with grease using a needle syringe between the seal and the bearing.
5. Reinstall drive roller. (See above illustration.)

Remove Draper Motor

1. Remove drive roller assembly.
2. Remove hex – bolts from drive roller.
3. Remove draper motor from drive roller.
4. If required, insert two pry bars one on each side of motor, and pry motor out of drive roller. **Do not use a hammer on the housing flanges of the motor. Impact damage to motor will void warranty.**
5. If motor still does not move, insert a 7/8" or 3/4" rod through the center of drive roller and apply force to the end of the motor shaft.

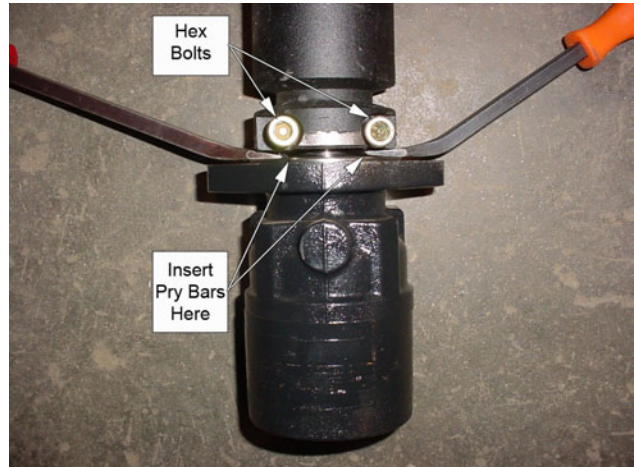


Illustration 148: Draper Motor - Placement of Pry Bars

Installing Draper motor

1. Clean motor shaft and hub of drive roller. Apply anti-seize to shaft.
1. Insert key in motor shaft.
2. Ensure that key in motor shaft is aligned with key way in drive roller, and fully insert motor shaft into hub.
3. Tighten hex bolts.

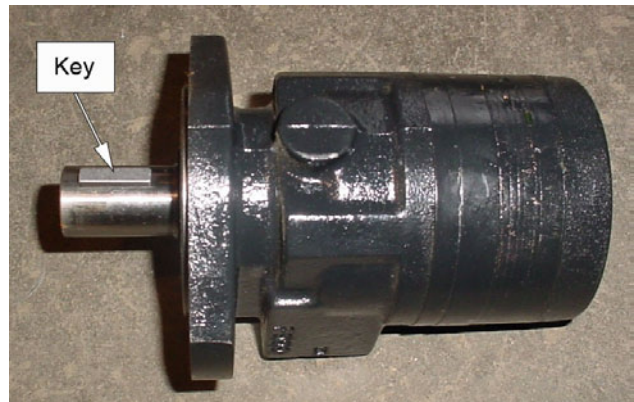
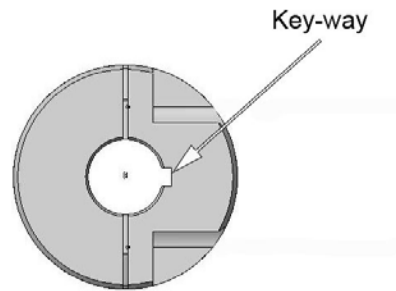


Illustration 149: Draper Motor - Woodruff Key

Do not use a hammer on the motor mounting flange. Impact damage of this type to the motor will void the warranty.

Use a soft block or rubber hammer to apply force to end of motor. Rocking motor up and down or side to side may also help.



***Illustration 150: Drive Roller
Shaft Key Way***



Year – End Draper and Deck Maintenance

1. Remove draper connector bar.
2. Remove draper - clean draper of debris, both sides.
3. Clean debris from rollers.
4. Clean debris from deck channels and runners.
5. Check and bend down corners of deck runners so draper does not get caught.
6. Clean adjusters; lubricate guide tubes and adjuster tubes. Adjusters should be able to move freely inside the guide tube.
7. Check idler roller bearings, they should spin freely.
8. Check drive roller bearings.
9. Check bearing stubs.
10. If storing header outside with draper installed on decks, position the connector bar on the underside to allow water to drain from decks. Water build up may cause draper to stretch.
11. Repeat these steps on the center deck also.

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Center Feed Auger

The center feed auger is designed to receive the material from the feeder deck drapers, and then propel it into the feeder house of the combine. The adjustment of the auger fingers, as well as the height of the auger, is critical to the proper feeding of the material into the combine feeder house. **Adjust the auger fingers to clear the pan or pan inserts by approximately ¼" (6mm) to ½" (13mm). This is a recommended minimum adjustment.** Some crops may require raising the drum higher. Experiment with different settings to suit crop conditions.


<p>WARNING</p> 	<p><i>Before making the following adjustments, lower the combine header completely to the ground, or raise header to its full height and engage feeder house cylinder locks.</i></p>
	<p><i>Engage parking brake on the combine, shut the engine down, and wait for all moving parts to stop before leaving the cab.</i></p>

Auger Drum Height Adjustment

The feed auger floats in the adapter frame. Vertical adjustment bars located at the front of the auger adapter frame restrict the minimum and maximum height. The clearance between the fingers, flighting of the auger drum and the pan of the adapter frame can be adjusted as follows:

1. Loosen lock bolts (1) on the auger vertical adjustment bar, at both ends of the adapter frame.
2. Re-install bolts in desired hole positions, and tighten.

Moving these bolts up will increase the maximum height of auger-drum float, and moving these bolts down will decrease the maximum height. **Ensure that both top bolts are in the same relative hole position on each side of the adapter frame.**

<p>CAUTION</p> 	<p><i>Increasing the maximum height can cause the auger drum to contact the upper tube of the header in some situations. Always check this clearance when any adjustment is made to the header.</i></p>
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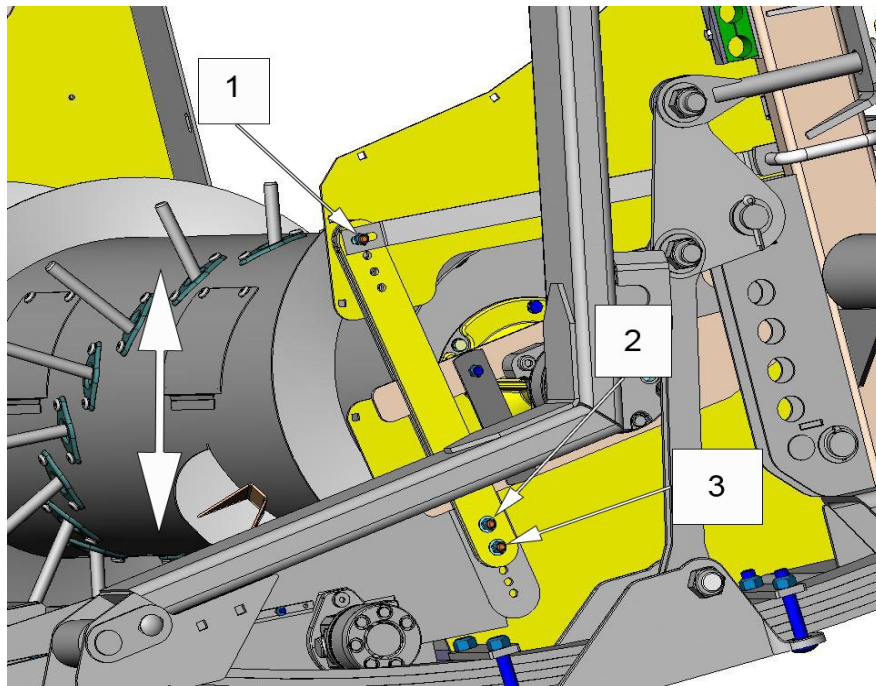


Illustration 151: Auger Drum Height Adjustment

To Decrease Minimum Clearance:

1. Remove pressure from the carrier arms on each side of the adapter frame by lifting auger drum, and inserting wood blocks under each side.
2. Loosen and remove lock bolts (2) and (3) on the auger vertical adjustment bar at both ends of the adapter frame. (See above illustration, and following page.)
3. Lower adjuster plates to desired position, and then secure in place by re-installing bolts in the closest hole positions. Tighten bolts and remove wood blocks.
4. Turn auger drum by hand for a minimum of one full rotation, ensuring that all auger fingers and flighting clear the pan and pan inserts. If necessary, increase the auger's minimum clearance.

IMPORTANT:	Adjust both ends the same so full length of auger will run parallel to the adapter pan.
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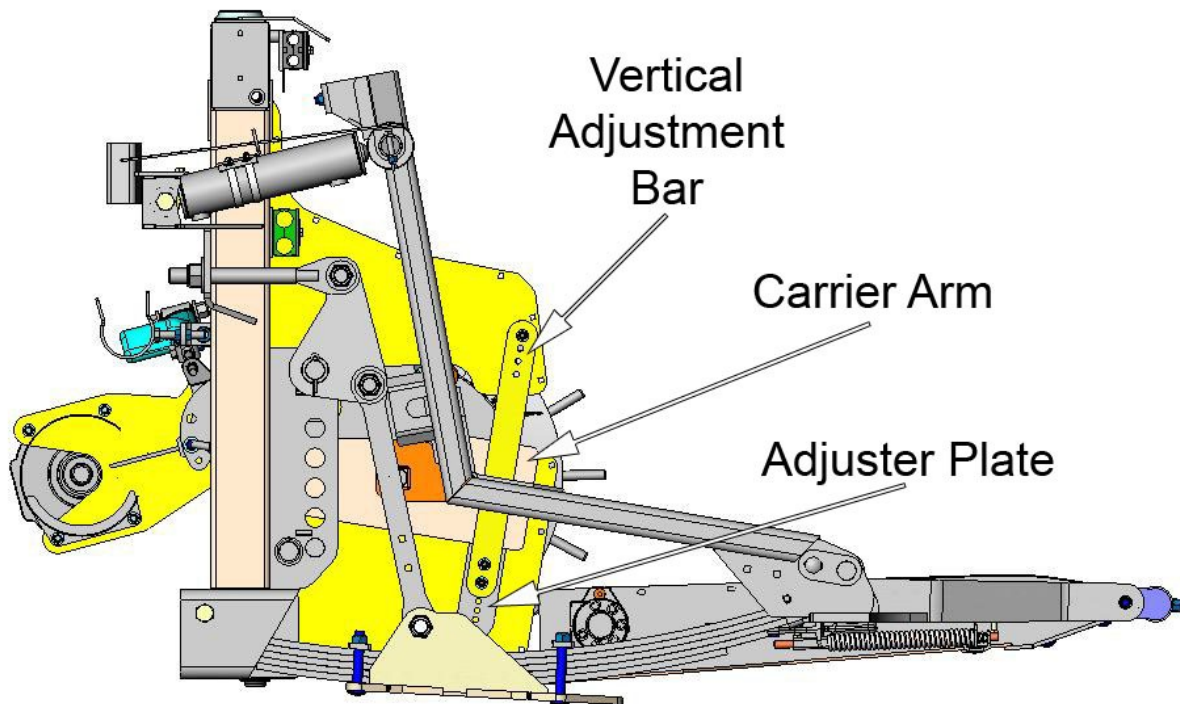


Illustration 152: Drum Height Adjustment - Right-hand View

To Increase Minimum Clearance:

1. Use wood blocks to block up each side of the auger drum, to provide slightly more than the desired minimum clearance.
2. Loosen and remove lock bolts (2) and (3) on the auger vertical adjustment bar at both ends of the adapter frame.
3. Lift adjuster plates to desired position, and then secure in place by re-installing bolts in the closest hole positions. Tighten bolts and remove wood blocks.
4. Turn auger drum by hand for a minimum of one full rotation, ensuring that all auger fingers and flighting clear the pan and pan inserts. If necessary, increase the auger's minimum clearance.

IMPORTANT:	<i>Adjust both ends the same so full length of auger will run parallel to the adapter pan.</i>
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Fore and Aft Adjustments of the Finger Auger

The auger drum can be adjusted forward and backward by moving the carrier arm. The slotted hole in the carrier arm allows about 2" (50 mm) of travel. Both sides should be adjusted equally. **When moving the auger drum check to see that the auger flighting and/or the auger fingers do not contact the feeder chain on the combine, or the draper on the feeder deck.**

1. Locate adjustment bolt (1) on each end of the auger adapter frame.
2. To decrease the clearance between the adapter frame and the auger; loosen lock nut (2) and turn lock nut (3) clockwise. To increase the clearance, turn lock nut (3) counter-clockwise.
3. When the desired clearance has been attained, re-tighten lock nuts (2) and (3). For proper performance, each end of the finger auger should be adjusted with the same amount of clearance.

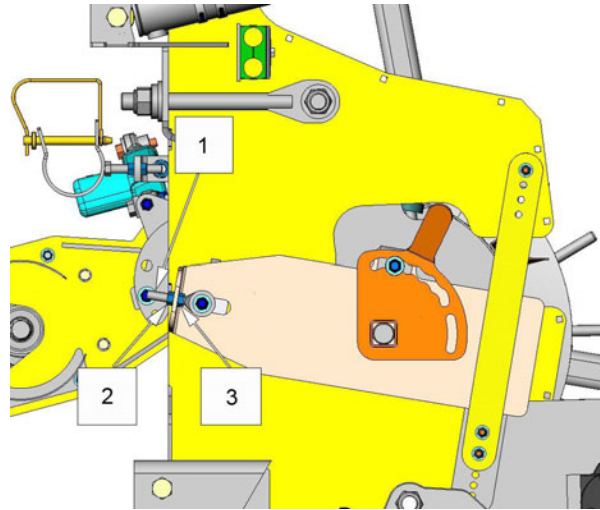


Illustration 153: Drum Fore-Aft Adjustment

Attention:	<i>After making height, and/or fore-aft adjustments to the auger, rotate the finger auger slowly by hand to be sure the flighting and the fingers do not contact the feeder house, shrouds, feeder chain, drapers, or header decks. Damage to the combine or header parts from improper adjustment will not be covered by warranty.</i>
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Finger Extension Timing Adjustment

The extension and retraction action of the fingers may be adjusted in order to suit the type of crop being harvested.

To adjust the extension/ retraction of the fingers, locate timing plate arm on the right-hand side of the auger adapter:

1. Loosen lock bolt.
2. Pull the timing plate arm backward to increase the finger extension toward the top and back of the auger drum.
3. Push the timing plate arm forward to increase the finger extension toward the front of the auger.
4. When proper indexing is achieved, re-tighten lock bolt.

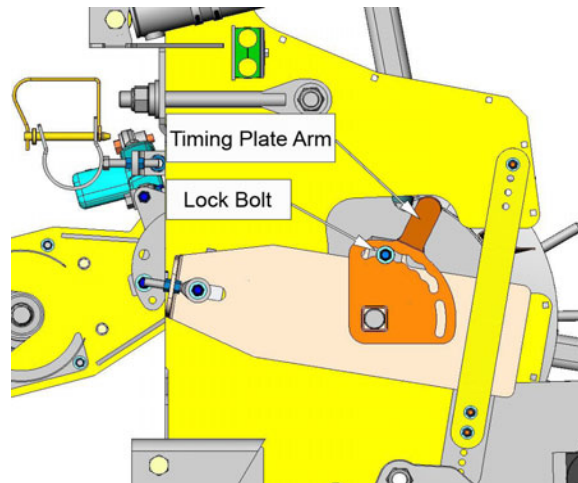


Illustration 154: Finger Extension Timing Adjustment

Normal adjustment of the fingers is to have them fully extended at the two or three o'clock position (viewing the auger from the right-hand end of the tube.).

Refer to this decal for recommendations for heavy/light crop conditions.

IMPORTANT: Under all situations, adjust the auger fingers so that they clear the pan or pan inserts by approximately $\frac{1}{4}$ " (6 mm) to $\frac{1}{2}$ " (13 mm).

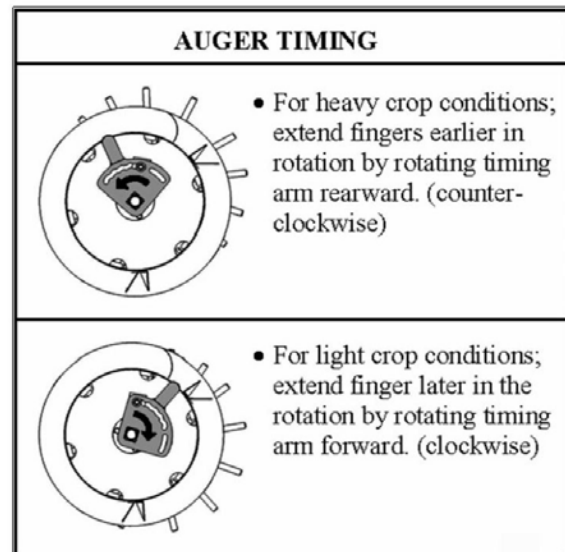


Illustration 155: Auger Timing Decal

Auger Drive Assembly

Power is transferred from the combine to the header via the header drive shaft. As the drive shaft turns, power is transferred through the gear box, to the Eaton variable pump assembly. This pump assembly has a charge pump adapter, which uses the combine's power to pressurize or "charge" the hydraulic circuit for the header.

Hydraulic oil is drawn out of the header's reservoir, and then sent through the hydraulic circuit, where it is used to power the auger, knife, draper, and feeder deck motors.

The linear actuator enables the operator to reverse the flow in the hydraulic circuit for clean-out purposes.

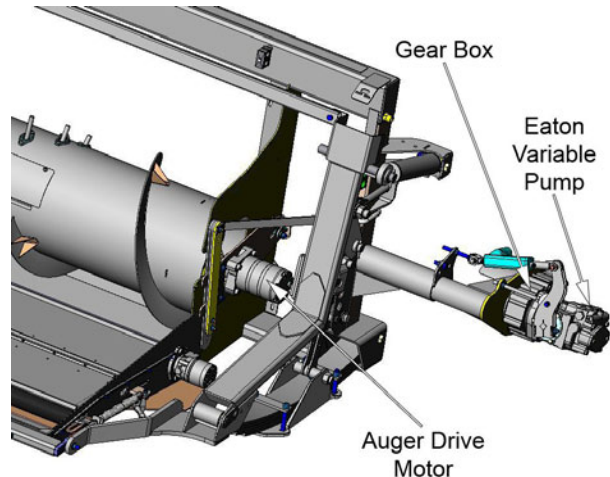


Illustration 156: Sub frame Assembly - Auger Motor

For further details on hydraulic routing, refer to the "HYDRAULICS" chapter in this manual.

Drive shaft – Walterscheid

For complete operating information on the installation, service, and safety instructions for input drive lines and clutches, refer to the operator's manual shipped with each drive shaft. These instructions are intended to point out some of the basic safety situations which may be encountered during the normal operation and maintenance of your machine and to suggest possible ways of handling these situations.

Read the manufacturer's operator's manual before operating the equipment. If there are no manuals with the machine, request them from the manufacturer. **Study them before you start work.** If you don't understand any of the material in the manuals, ask your supervisor or equipment dealer to explain it to you.

Operating the PTO

When closing down operation of PTO driven equipment, shift the PTO control to neutral, shut off the engine and wait for the PTO (feeder house) to stop before getting off the combine.

DANGER!

Do not wear loose fitting clothing or long, free hanging hair when operating the power take-off, or when near rotating equipment.

To avoid injury do not clean, adjust, unclog, or service PTO driven equipment when the combine engine is running.

Never exceed the recommended operating speed for the particular equipment in use. Implement input drive lines, clutches and freewheels are designed for specific machine types and power requirements. They must not be replaced by any shaft other than that recommended by the implement manufacturer. Ensure that the implement input drive shaft is securely connected at both ends.

Only use a completely guarded drive system! See the illustrations on the following page.

PTO systems with complete guarding include the combine master shield, the implement input drive shaft guard and the implement shielding. **These guards and shields must be installed at all times.** If any component of the guarding system has been removed for any reason, it must be replaced or repaired prior to operation of the machine.

WARNING

Do not exceed the maximum operating length of the drive shaft!

In all working positions the implement input drive shaft should never be extended by more than half the available overlap of the telescoping (overlapping) segment.

To determine this length:

1. Fully compress the drive shaft to its shortest length,
2. Measure the total length,
3. Extend the drive shaft until it separates.
4. Measure this total length,
5. Calculate the difference. One-half of this value is the maximum recommended extension of the drive shaft.
6. Add this calculated distance to the shortest drive shaft length, which you obtained earlier, to determine the maximum recommended length.

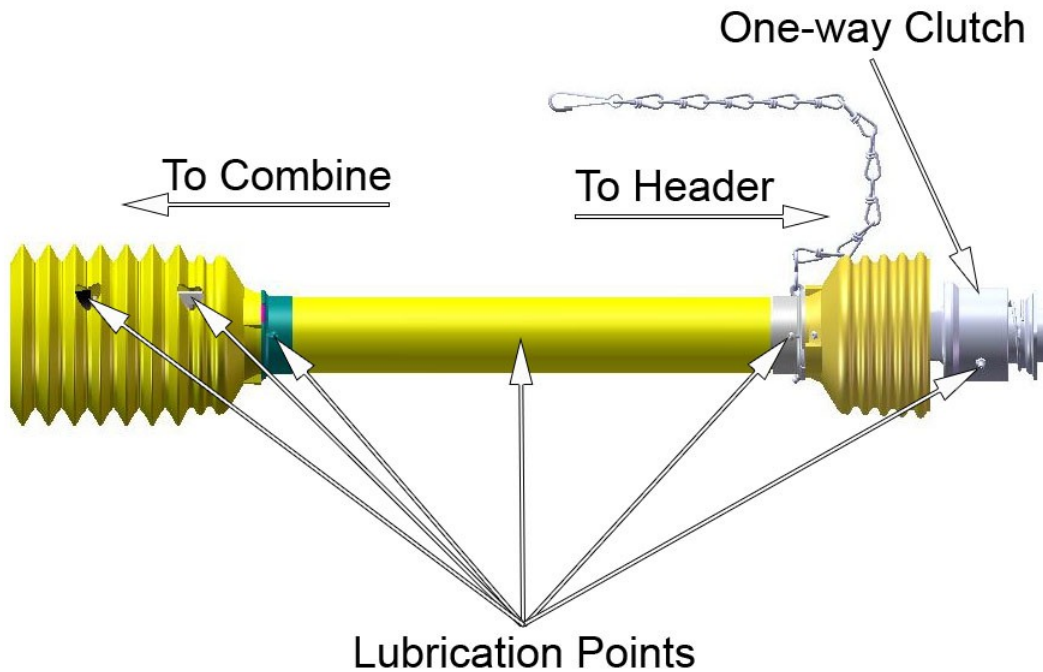


Illustration 157: Waltersheid Drive Shaft - Guards in place

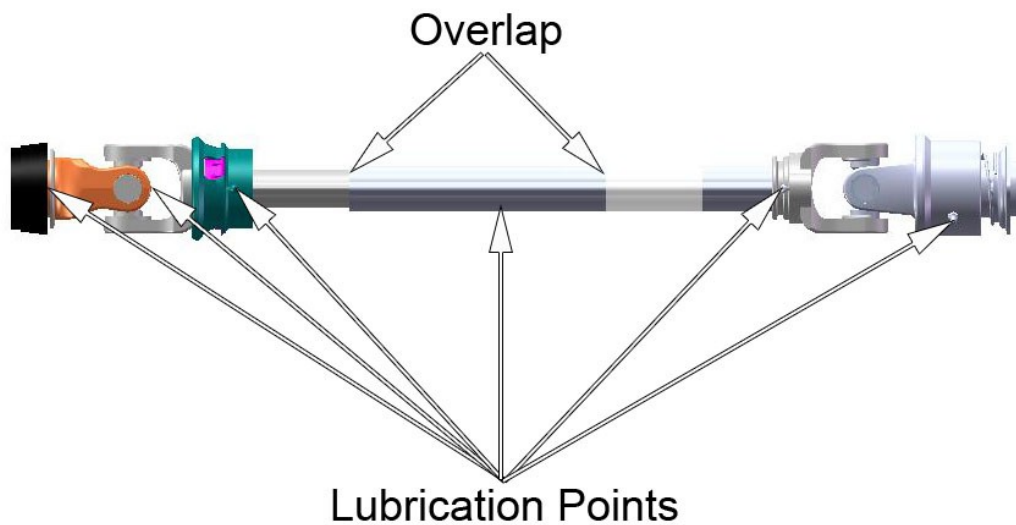


Illustration 158: Waltersheid Drive Shaft - Guards Removed

Lubrication:

In “as-delivered” condition, Walterscheid PTO drive shafts are greased and ready for operation. For subsequent lubrication of the PTO drive shafts, use lithium base samponified high quality grease with E.P. additives.

ATTENTION:	<u>Do not</u> use grease agents containing MoS₂!
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Regardless of the operating hour total, the system should be lubricated at the end of every season. Especially when a high-pressure cleaner has been used, lubrication is required immediately after cleaning in order to press out any water that might have penetrated into the joint.

Lubricate with high quality grease before starting work, and every 50 operating hours. Clean and grease the implement input drive shaft before each prolonged period of non-use.

Moulded nipples on the guard near each guard bearing are grease fittings and should be lubricated every 50 hours of operation if the guard is chained so that it does not rotate.

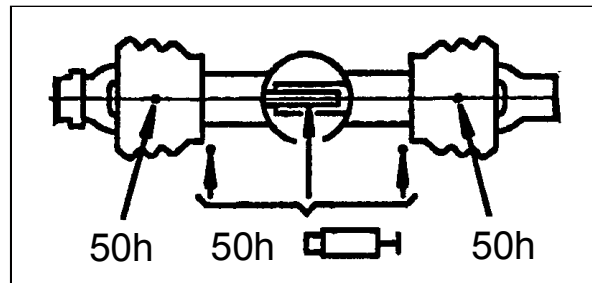


Illustration 159: Drive Shaft Lubrication Points

Telescoping members must have regular lubrication to operate successfully.

Telescoping members without grease fittings should be pulled apart and greased manually.

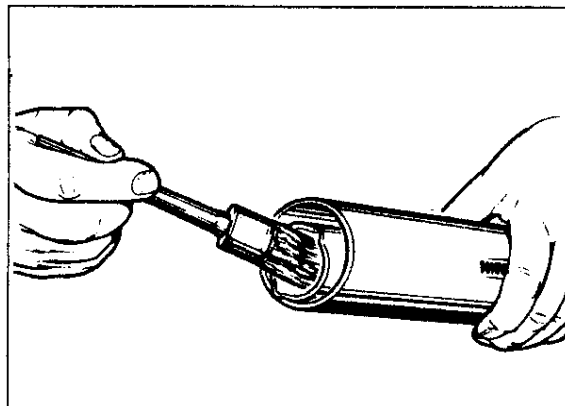


Illustration 160: Lubricating Telescoping Section of Drive Shaft

Check and grease the guard tubes at the end of each season to prevent seizing.

Coupling the implement input drive shaft.

Clean and grease the PTO and the implement input connection.

AS-Lock:

Pull locking collar and simultaneously push implement input drive shaft onto PTO shaft until the locking device engages.

WARNING

Ensure all safety locks are securely in position before starting work on the implement input drive shaft.

Drive-Line Guard Restrainer Chain:

The chain prevents the guard from rotating against stationary parts, reducing the potential for damage, and accelerated wear. A properly installed and maintained chain will increase the service life of the guard.

1. Chains must be attached to allow sufficient articulation of the shaft in all working positions. Care must be taken to be sure that chain does not become entangled with drawbar hitch or other restrictions during operation or transport of machine.
2. The chain **is not** designed to carry the weight of the implement input drive shaft. Damage will occur if suspended by chain.

Drive Shaft Guard Disassembly:

1. Remove locking screw.
2. Align bearing tabs with cone pockets.
3. Remove half-guard.
4. Remove bearing ring.

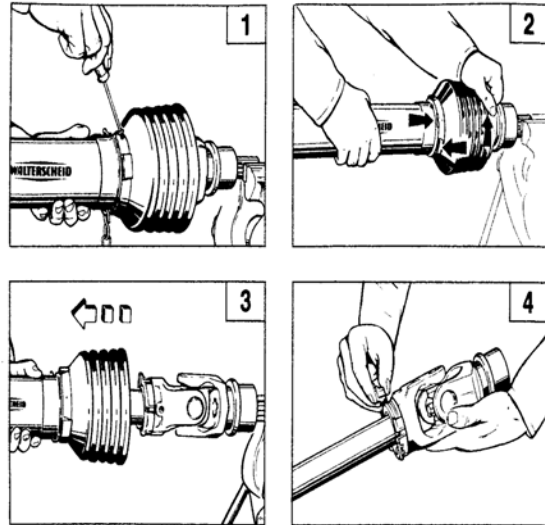


Illustration 161: Driveshaft Guard Disassembly

Drive Shaft Guard Assembly

1. Grease yoke groove and inner profile tube.
2. Fit bearing ring in groove with recesses facing profile tube.
3. Slip on half-guard.
4. Turn cone until it engages correctly.
5. Install locking screw.

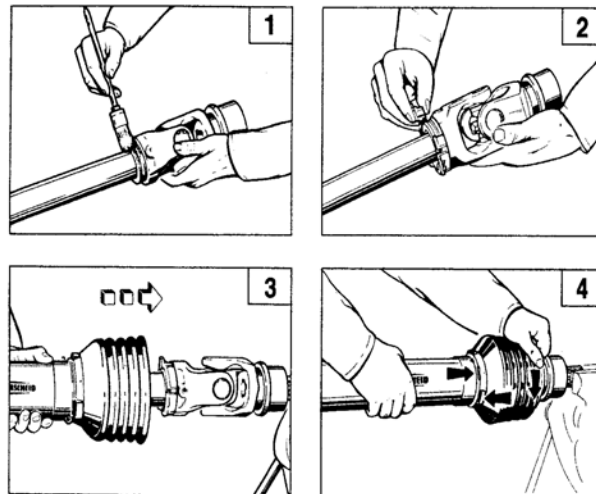



Illustration 162: Drive Shaft Guard Assembly

Replacing Drive Shaft Guard Cone:

Disassemble guard. See the previous illustrations. Remove old cone (i.e. cut open with knife). Remove chain. Place neck of new cone in hot water (approx. 80 C/180 F) and pull onto bearing housing.

1. Turn guard cone into assembly position. Follow the assembly instructions listed in the above illustration.
2. Reconnect chain, if applicable.

WARNING 	<p><i>Guards are designed to protect the user.</i></p> <p><i>Defective and damaged guards must be repaired immediately. Only original Waltersheid Agraset spare parts should be used.</i></p> <p><i>For further information, contact your dealer.</i></p>
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Drive Shaft Clutch:

The drive shaft on the Grain Belt Plus header has an over-running clutch, which ensures uni-directional orbiting of the drive shaft. There is no torque setting for this particular style of clutch, as the relief valves in the header's hydraulic circuit replace any need for clutching.

NOTE:	<p><i>This drive shaft will provide power in only one direction of rotation. The clutch end of drive shaft should be installed onto the gearbox of the header, <u>not</u> the feeder house of the combine.</i></p> <p><i>Reversal of the drive shaft connections will result in no power reaching the header.</i></p> <p><i>This feature will aid installation, since the shaft may be easily rotated in reverse to line up with the splines on the feeder house.</i></p>
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No field servicing is required with this drive shaft, other than basic inspection of the safety components (shields), and lubrication (as detailed in **Lubrication**).

Maintain drive shaft in accordance with the manufacturer's recommendations.

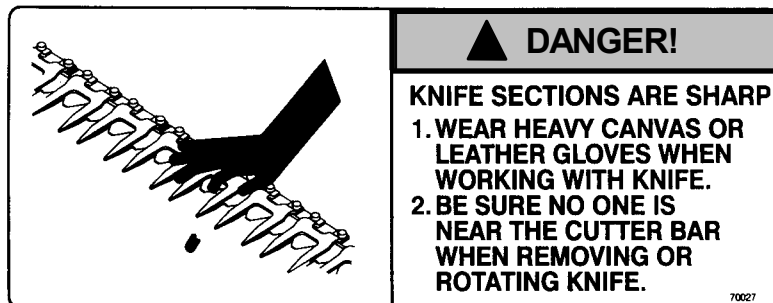
Cutting System

In order to obtain optimum performance from your Grain Belt Plus Header, all cutter bar components must be maintained in good working condition. Inspect the cutter bar daily for damaged and broken parts before starting work. Repair or replace parts as required.

WARNING

When working near the knife, the following procedures are recommended to prevent serious injury or death to yourself or others nearby.

- Raise the header table, raise the reel, stop the engine, set the park brake, and remove the ignition key before dismounting.
- Install the feeder house lift cylinder locks & reel lift cylinder locks.
- Clear the area of bystanders, especially children.
- Wear heavy canvas or leather gloves when working with the knife.



Knife Removal

1. Remove the two socket head cap screws on the knife head block
2. Slide the knife out of the cutter bar.
3. Reverse the procedure when installing the knife. Apply a small amount of thread lock solution to cap screws before installation. Torque bolts to the recommended specifications of 59 ft - lb (80 Nm).

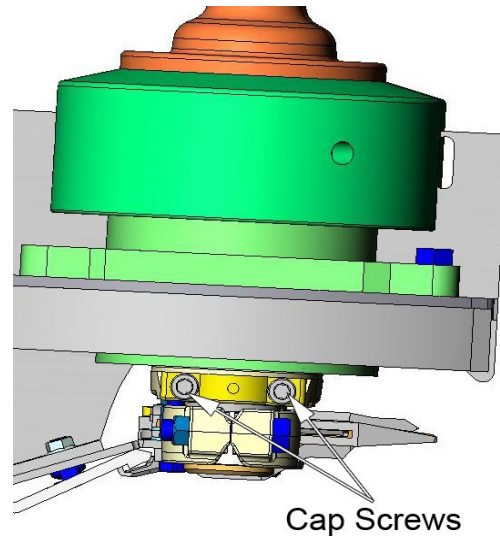


Illustration 163: Knife Removal

Guards

EasyCut guards are manufactured from heat treated spring steel. The guards have beveled cutting edges at the top and bottom, which enable them to cut better and last longer.

1. When replacing guards always mount the new guard with the **SCH** stamp to the top. Be sure the cutter bar is on top of the roller spacer. The crimp lock nut on the guard bolt should always be on the top.
2. Alignment of the guards is critical. Before tightening the guard bolts, push the spacer bar as far back on the cutter bar as possible, and pull the guard ahead as far as possible. Sight down the cutter bar to be sure all of the guards are aligned. Tighten guard bolts.

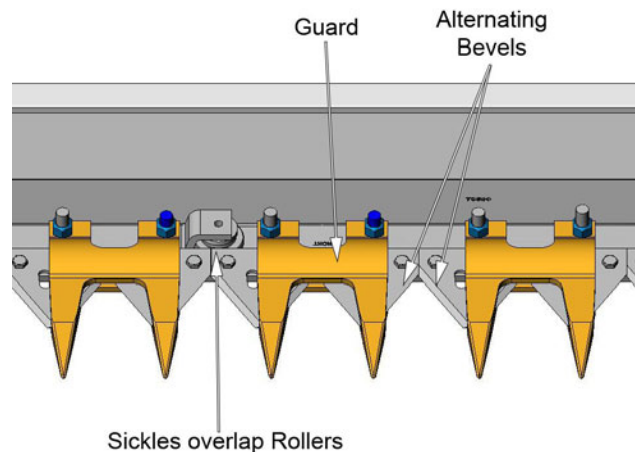


Illustration 164: Guards - Detailed View

Roller Spacer Bar

The roller spacer bar aids in guiding the travel of the cutter bar. This item consists of roller spacers, which allow the knife to slide freely back and forth as it cuts, without any friction to the back of the cutter bar. The sickles should rest on top of the spacer lip at the base of the roller. The backs of the sickles should be in firm contact with the center body of the roller. (See “Guards - Detailed View,” above.)

Sickle Sections

The sickle sections of the knife are installed with alternated cutting surfaces. One section will have the cutting bevel facing up, and the next will have the cutting bevel facing down. The edges must be in good condition to obtain proper cutting.

To Replace a Section:

1. Remove the guard to expose the section.
2. Unbolt the section and install a new one.
3. Tighten the section bolts and nuts.
4. Re-install the guard. **or:**
 1. Turn the knife by hand until one section bolt is exposed. This can be done by inserting a metal rod into the hole on the knife drive flywheel, and pushing or pulling in the desired direction.
 2. Remove the bolt.
 3. Continue turning the knife drive until the other bolt is exposed.
 4. Remove second bolt along with the section. Install a new section and first bolt, and tighten. Turn knife back, and tighten other bolt.

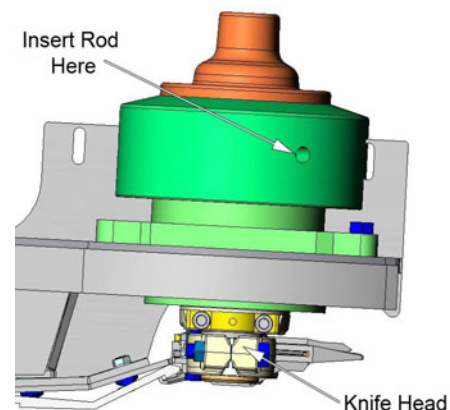


Illustration 165: Knife Drive Flywheel

IMPORTANT: When installing sections, remember to rotate the beveled serrations, one facing up and the next one facing down (See “Sickle Installation Detail” below).

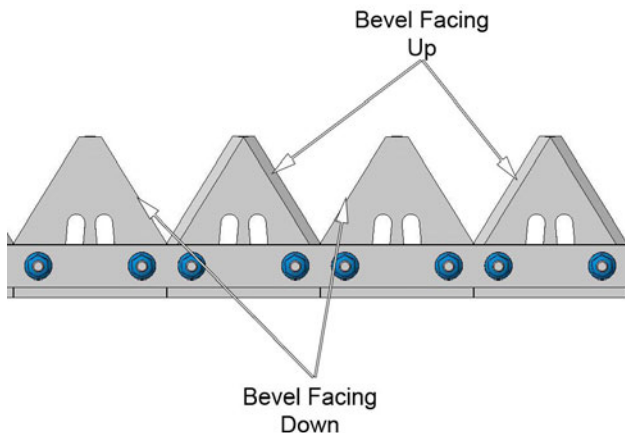


Illustration 166: Sickle Installation Detail

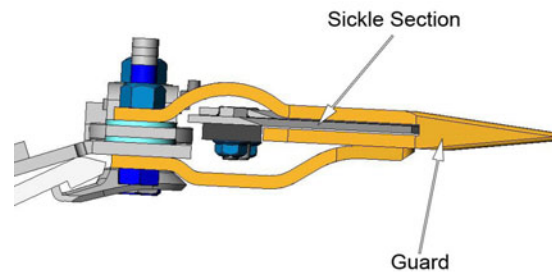


Illustration 167: Guard - Side view

Knife Drive/ Knife Head

Proper care and maintenance of the knife drive and knife head is critical to the performance of your Grain Belt Plus Header. Refer to the **Lubrication** section of this manual for lubrication points and procedures. The photo below shows the critical check points.

1. Check the tightness of the knife drive hold-down bolts daily. Torque to 120 ft-lb. (163 Nm).
2. Check the knife head bearing daily. If the bearing is loose, check the tightness of the lock bolt (59 ft-lb.- 80 Nm). If the lock bolt is tight, check the condition of the bearing and steel sleeve. If any parts are defective, replace them to avoid damage to the drive.
3. Check the socket head cap screws daily (59 ft-lb. - 80 Nm). Rotate the knife drive by hand to be sure the knife head bearing is rotating freely.

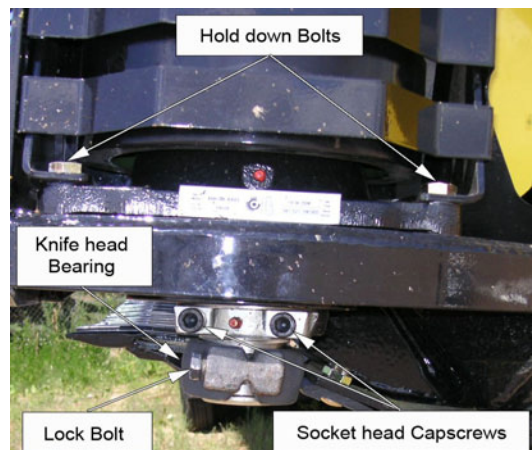


Illustration 168: Knife Head Details

4. Daily, check the knife head bolts which attach the knife head to the knife back. The bolts should be tightened to 120 in-lbs, (9.96 ft -lbs); (13.5 Nm).

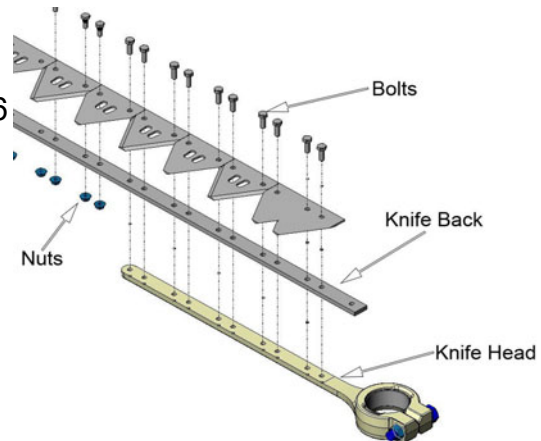


Illustration 169: Knife Head Assembly

Knife Speed Sensor

The Grain Belt Plus Header has a standard Knife Speed monitoring sensor system. This connects to the monitor system in properly equipped combines, allowing the operator to monitor the knife speed. Recommended knife speed is between 560-600 RPM, adjusted using the procedure outlined in Knife Speed Adjustment

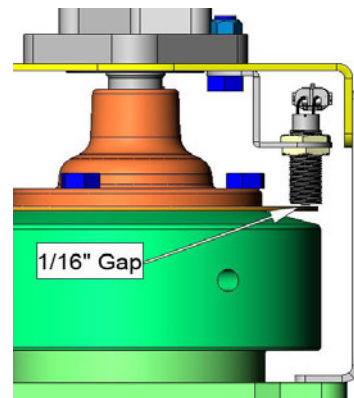


Illustration 170: Setting Knife Speed Sensor

Knife Speed Adjustment

If the knife speed, indicated on the in-cab readout, is not correct, the linear actuator, located on the main hydraulic pump, will need to be adjusted.

1. Raise the header, shut down the engine, and wait for all moving parts to come to a complete stop before exiting the cab. Insert the safety lock(s) on the header lift cylinders.
2. Loosen the stop-bolt, and ensure it will not contact the pump actuating arm during this adjustment.
3. Ensure the linear actuator rod is fully retracted into the housing. If it is not, return to the cab, select the key on, and select header forward. When the rod is fully retracted, select key off.

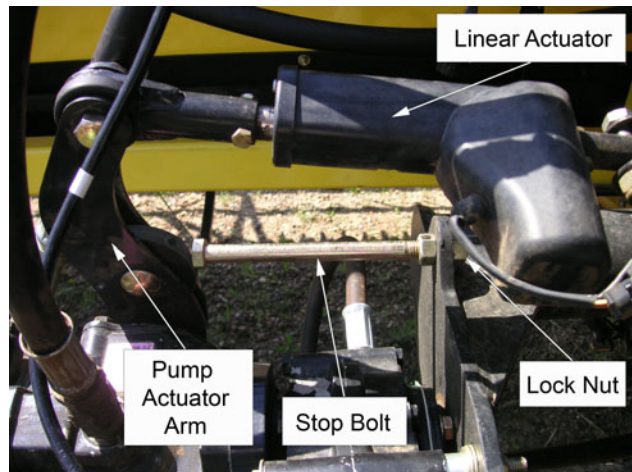


Illustration 171: Linear Actuator - Main Components

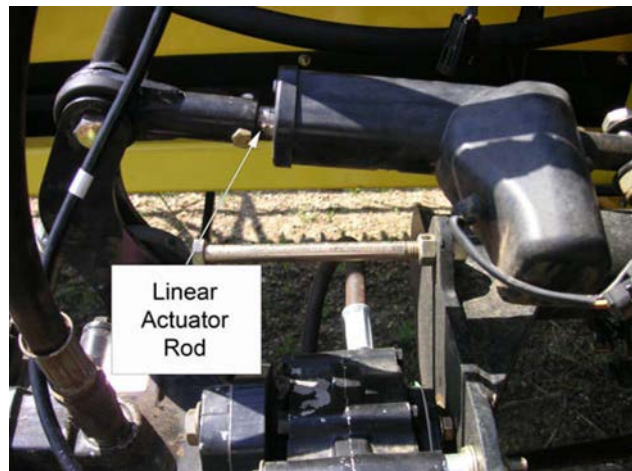


Illustration 172: Linear Actuator - Rod Retracted

4. Adjust the length of the threaded rod at the rotation plate by loosening the lock nut, and shortening (to increase knife speed) or lengthening (to reduce knife speed) the distance between the linear actuator and the rotation plate.
5. Restart the combine, operate the header at normal working RPM, and observe the knife speed on the in-cab readout.
6. Repeat the above steps as necessary until the correct speed is reached.
7. Re-set the stop-bolt so that it just contacts the pump actuating arm, and lock it in position with the lock nut.

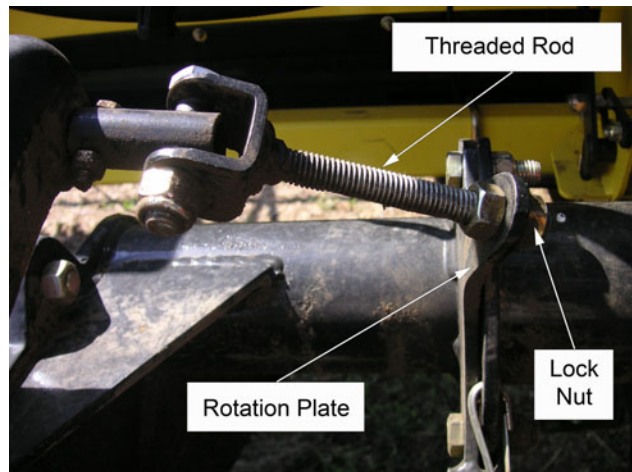


Illustration 173: Linear Actuator - Threaded Rod Adjustment

Connector Bar

On the 45 ft models of Grain Belt Plus headers, a connector bar is used to connect two sections of knife back. The knife back is the part of the knife that the sickle sections are bolted to. The connector bar is installed on the underside of the knife back. The connector bar has eight threaded inserts installed into the bar, which protrude slightly on the (upper) side which contacts the knife back. The knife back is punched with holes to accommodate the sickle sections and the holes are slightly tapered on the bottom side.

The knife sections must be installed on the top side of the knife back (the side with the SCH Logo) so that the protruding inserts of the connector bar will fit snugly into the tapered section holes. As the section bolts are tightened, the inserts in the connector bar are drawn into the knife back forcing the threads to tighten on the bolt. The bolts should be tightened from 120 - 150 in-lbs, (13.5 - 17 Nm).

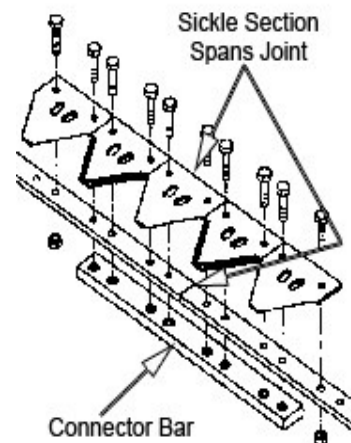


Illustration 174: Connector Bar - Exploded View

Important:	<i>Do not grind the inserts off, as this will make them ineffective in securing the knife. Failure of the knife may result.</i>
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Cross section of shoulder insert, connector bar, knife back, sickle section, and bolt. Notice how the shoulder insert protrudes slightly into the knife back. **Check tightness of bolts daily; replace broken and worn sections as required.**

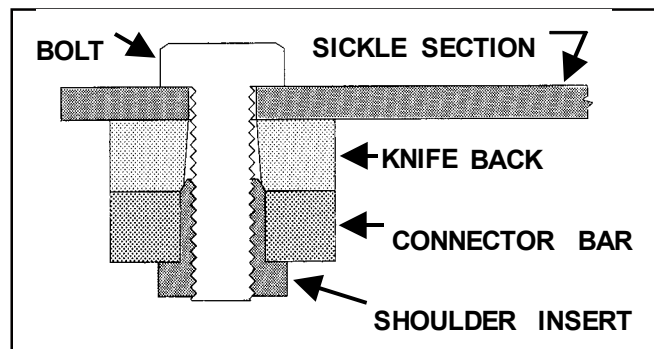


Illustration 175: Shoulder Insert Detail

Overlap Kit

The overlap kit is used on all Grain Belt Plus headers, and is a necessary item with double knife drives. The knives overlap at the center of the table.

In this portion of the knife, the sickle sections have countersunk bolt holes to provide a smooth cutting surface. The overlap guards are open on top, and are designed to provide for the extra thickness in the knife. The overlap strap bolted to the left-hand knife will offset the countersunk sections to allow the knives to overlap.

NOTE:	<i>If knives are noisy or are over heating, check to see if the overlap guards have been properly installed.</i>
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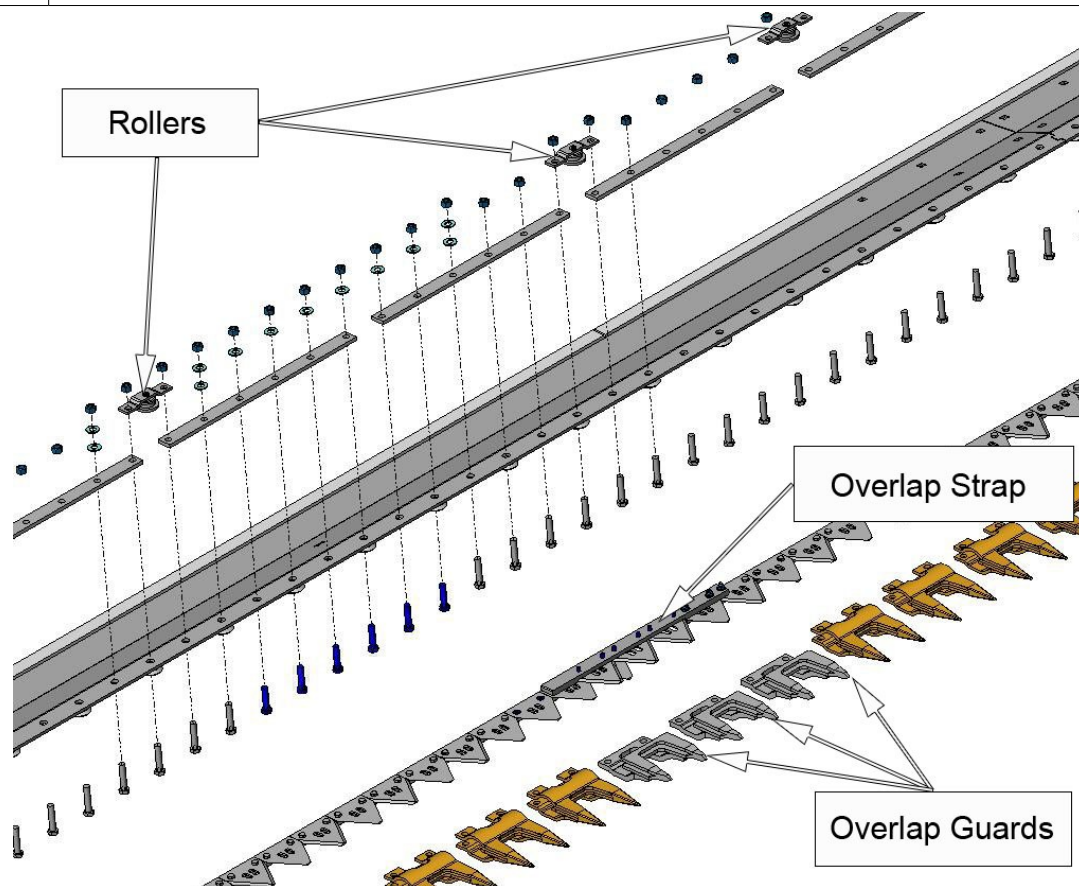


Illustration 176: Knife Overlap Section - Exploded View

The overlap sections (on the overlap strap), and the right hand knife back should be tight to each other when the counter sunk bolts are tight.

If the sections are loose:

Remove the counter-sunk bolts.

Inspect the knife back or overlap strap for a counter - sunk depression to allow for the thickness of the head of the counter-sunk bolt.

If depression is not present, () make a slight indentation into the bar about 1/32" deep with a 9/32" drill bit.

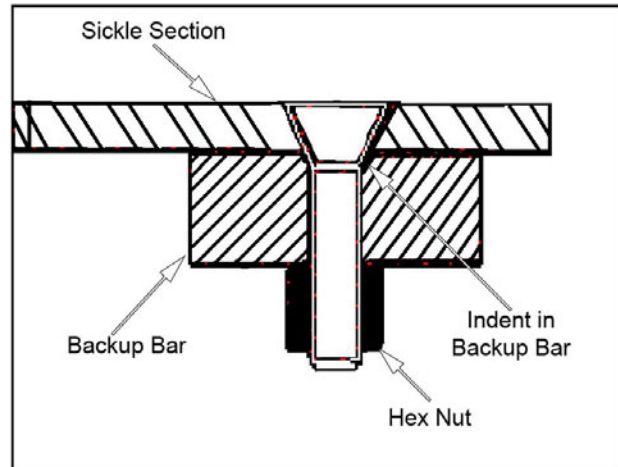


Illustration 177: Backup Bar Indentation

To repair a broken knife back:

If the knife breaks during use, repairs can usually be made with a connector bar. Most often the knife back will break across a bolt hole that holds a sickle section in place. To use the connector bar properly, the damaged section needs to be cut out and/ or a section of knife removed. If the knife breaks close to the knife head end, remove that section of knife, reconnect the knife head, and then add another piece to the far end of the knife where there is less cutting stress on the knife.

The joint in the two knives must be centered under a full sickle section, with the connector bar centered underneath the joint.

(DO NOT place the joint where two sickle sections join)

Check the knife for dull/ damaged guards and sections, replacing as necessary.

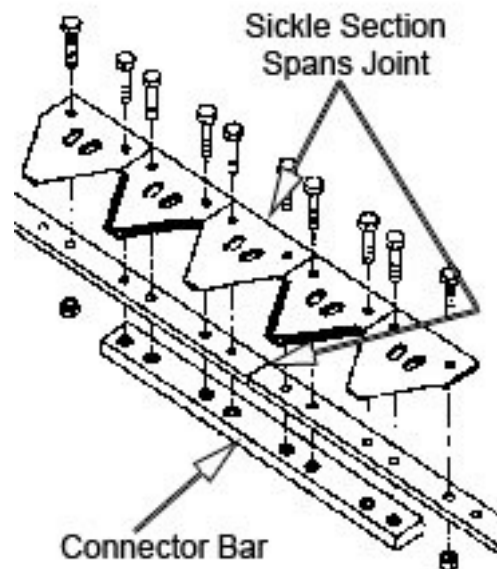


Illustration 178: Knife Back - Exploded View

Feather Plates

The Grain Belt Plus header is equipped with feather – plates that span the width of the cutter bar. The function of the feather plates is to provide a transition for the cut crop traveling from the knife to the draper. As these items are fastened individually to the guards, they are allowed to travel in unison with the guards and cutter bar in uneven terrain.



Illustration 179: Feather Plates

Pneumatic Table Suspension

Grain Belt Plus headers are equipped with a pneumatic table suspension.

This system is designed to assist the table with flotation in low crop cutting situations. In total, there are 6 locations equipped with suspension paddles and air-bags – one on each side of the header, and one on each of the frame struts under the header.

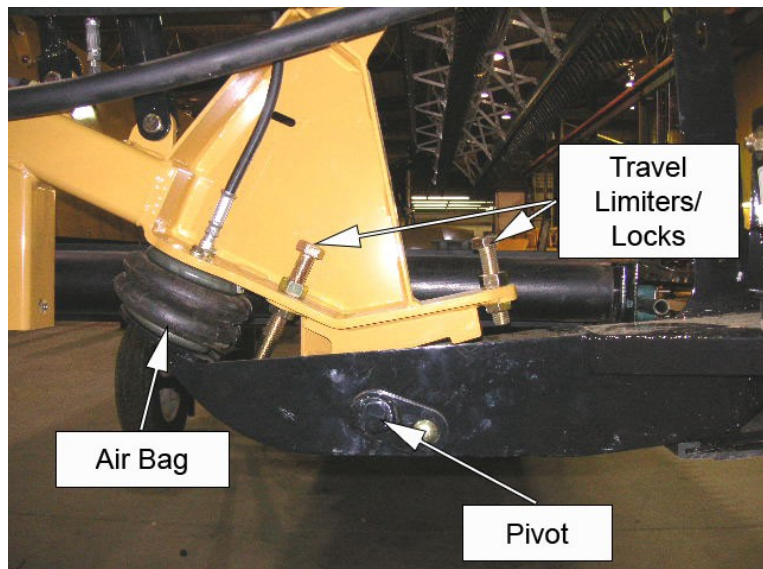


Illustration 180: Pneumatic Suspension – Outer arms

Air Pressure Management

The air pressure for the pneumatic suspension system is contained in two mid-frame tubes on underside of the header, adjacent to the sub frame struts. Refer to the following photos for the location of the reservoirs.



Illustration 181: Air Reservoir - Left-hand Side



Illustration 182: Air Reservoir - Right-hand Side

The reservoirs are filled through a standard air nipple, located on the main frame to the left of center, beside the air pressure gauge. The pressure in the tubes should be maintained at 20 psi for average cutter bar flotation. This pressure can be varied, depending on the desired amount of float. If the tube becomes over-pressurized, air may be released by depressing the needle in the center of the air nipple.

Paddle Travel

The travel of the suspension paddle is limited by two adjustment bolts: one in front of the pivot point, and one behind. These bolts act as “stoppers” when they make contact with the arm. One bolt is located on each side of the pivot point. To adjust the amount of travel, loosen the lock nuts, and then turn the bolt either clockwise (to reduce travel), or counter clockwise (to increase travel). Tighten the lock nuts when desired travel is attained. The forward bolt on the mid-frame paddles is adjusted by removing/inserting shims.

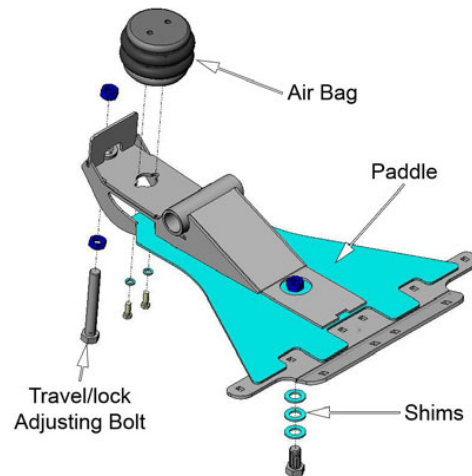


Illustration 183: Mid-frame Paddles - Exploded View

NOTE:	<i>This system is also useful to “lock” the paddles in a full-up position. A second method of limiting upward movement of the paddles involves increasing the air pressure until the desired resistance is obtained.</i>
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Maintenance

As with other components on the Grain Belt Plus header, the pneumatic table suspension system should be regularly inspected to ensure that it is in good working order.

1. Check pressure gauges for proper air pressure in reservoirs.
2. Observe any excessive loss of air pressure, and locate the cause.
3. Inspect the air lines and air bags to ensure they are free of cuts, scrapes, splits, and gouges. Replace damaged parts.
4. Ensure that the air lines are not loose or dangling, and that they are in no danger of being pinched in other parts of the header. Restrain lines as necessary.

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Miscellaneous, and Optional Equipment

Header Storage Trailer

For information on the optional Header Transport Trailer, please refer to the "HEADER STORAGE TRAILER" operator's manual (supplied with trailer).

SCH Crop Lifters

Crop lifters are a valuable tool for harvesting situations involving "downed" or lodged crop. Follow these instructions to install the optional Schumacher crop lifters.

Install the lifter spools to the underside of the guards using the longer bolts supplied in the kit. The spools should be spaced equally along the cutter bar, one per foot is recommended.

Insert the "V" at the back of the runner into the center recession on the spool.

With the pin removed from the guard pocket, lift up on the crop lifter, and insert the guard tooth into the guard pocket.

Next, install the locking pin. The guard pocket of the lifter has three locking pin holes, which allow for three different lifter angles. Install the locking pin in the hole which best suits your harvesting needs, snapping it forward and down to secure.

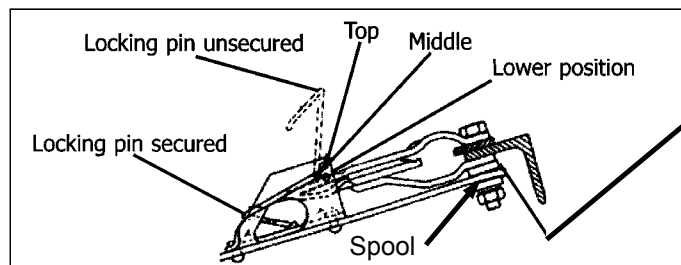


Illustration 184: SCH Crop Lifter - Locking Pin

For additional adjustment, flat washers can be added between the guard and the crop lifter mounting spool.

For crop lifters to work properly the bottom runners must be parallel to the ground when the platform is in cutting position. The diagram to the right illustrates positioning of a standard crop lifter.

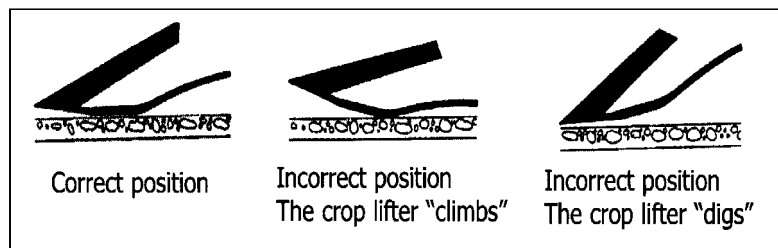


Illustration 185: Crop Lifter Alignment - Correct and Incorrect

Special Series Lifter

The bottom runner of the Special Series lifter should be parallel to the ground. To find the correct mounting position of the lifters for a given platform, drive the combine onto a flat surface (concrete, asphalt).

Mount one lifter in the middle of the platform. Lower platform until crop lifter just touches the ground. The runner of the lifter should be parallel to the ground. If it is not, change lock pin positions and if necessary, vary number of flat washers until the correct position is found.

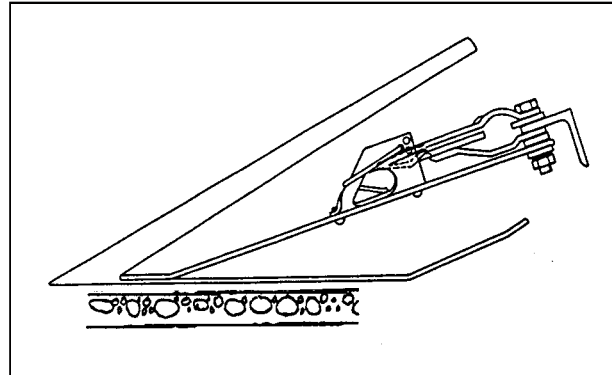


Illustration 186: Special Series Lifter

Adapter Plate

All Grain Belt Plus tables are equipped with the same style of sub-frame and center feed auger adapter. You will require the proper adapter plate for the make of combine that you use which is bolted to the back of the auger adapter. Adapter plates are available for combines included in the following chart.

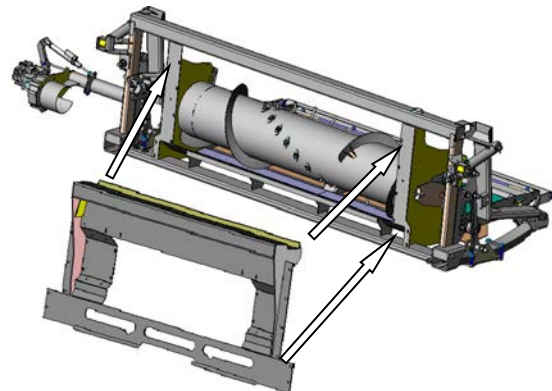


Illustration 187: Adapter Plate and Sub-frame

Ensure that all nuts, bolts, and washers are present and secured properly to the sub-frame prior to mounting on the combine.

Agco Bezels

Depending on the combine that you use, the Agco style of auger adapter has a series of combinations of bezel layouts that must be followed. These bezels change the size of the feeder house opening, so that it matches the make and model of combine being used.

Grain Belt Plus headers leave the factory with all bezel pieces and hardware attached. Depending on the make and model of your Agco combine, some or all of these components may be required. Use the following chart, and corresponding layouts to determine which one is correct for your combine.

Combine	Model	Lateral Tilt	Non Lateral Tilt	Note
Gleaner	R75/65/72/62	Layout 2	Layout 1	
	C62	N/A	Layout 5	Use 3/16 tab as spacer at top of web.
Massey Ferguson	9790, 9895	Layout 4	Layout 4	Use 3/16 tab as spacer at top of web.
	9690	Layout 3	Layout 3	
	8780 XP/W	Layout 3	Layout 3	
	8680	N/A	Layout 5	
Challenger	670, 6808	Layout 4	Layout 4	
	660	Layout 3	Layout 3	
Gleaner	A85/75	Layout 4	Layout 4	Use 3/16 tab as spacer at top of web.
	AGS	Layout 3	Layout 3	

Terms used for the Agco Bezels

Left and right sides are shown here with terminology used in this manual:

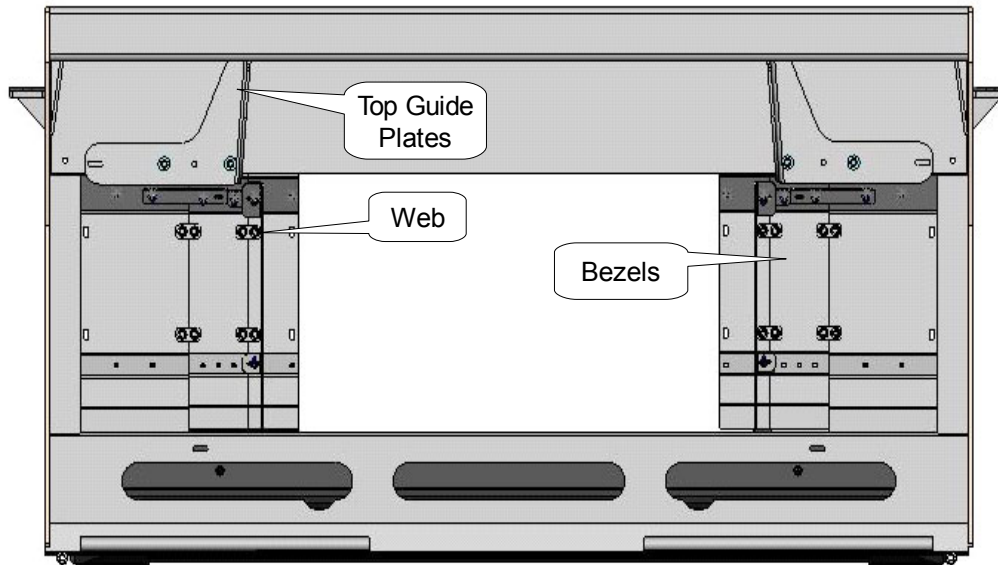


Illustration 188: Bezel Components

Layout #1

All hardware used.

Note the position of the top guide plate.

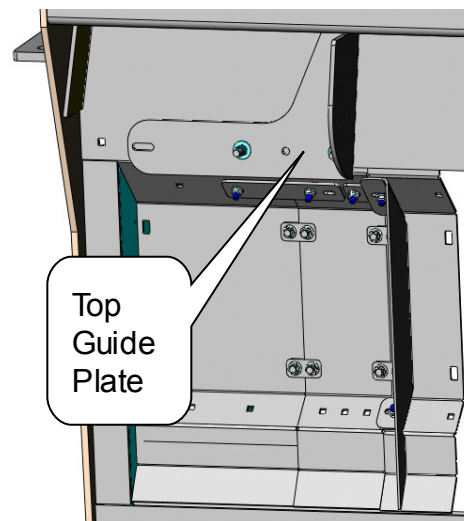


Illustration 189: Bezel Layout #1

Layout #2

All hardware used.

Note the orientation of the guide plate to the holes provided.

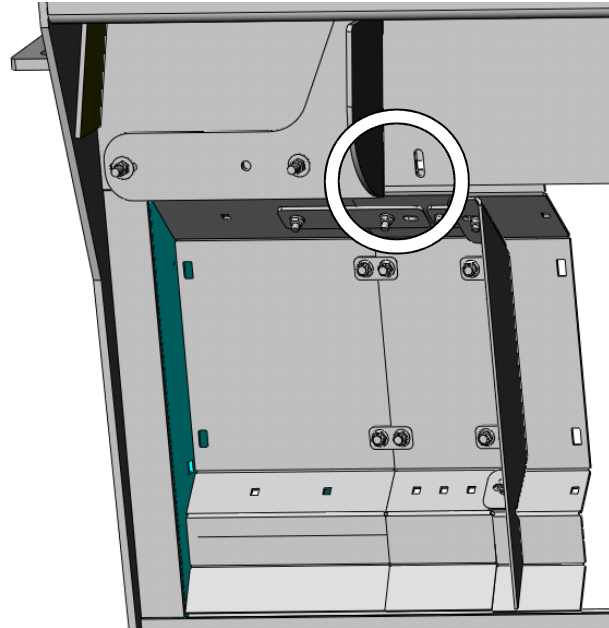


Illustration 190: Bezel Layout #2

Layout #3

Guide plates have been removed, along with some hardware and the short support bar.

The first bezel is removed and the web is repositioned.

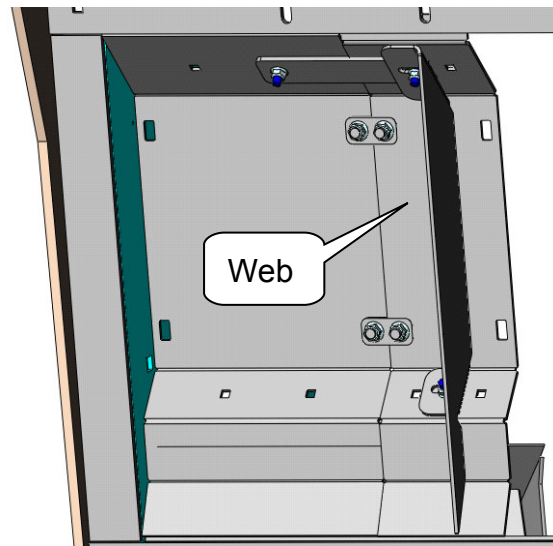


Illustration 191: Bezel Layout #3

Layout #4

No guide plates, both bezels are removed and note the position of the web.

Shorter support bar is used at the top



Illustration 192: Bezel Layout #4

Layout #5

Guide plates and both bezels are removed.

Note the position of the web.

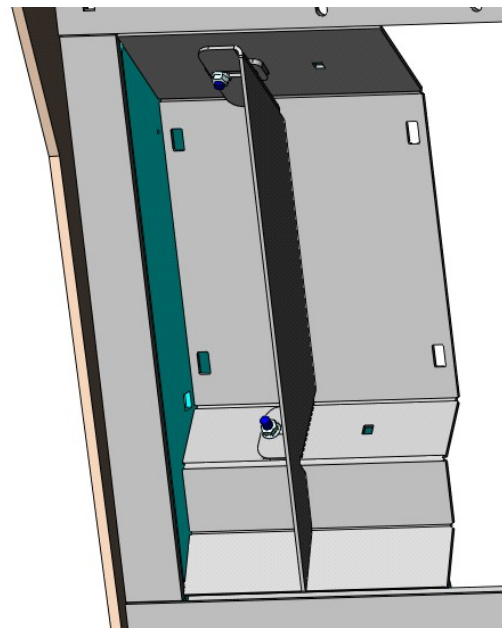


Illustration 193: Bezel Layout #5

Layout #6

All hardware used.

Note the position of the guide plates. They will have to be cut to fit properly.

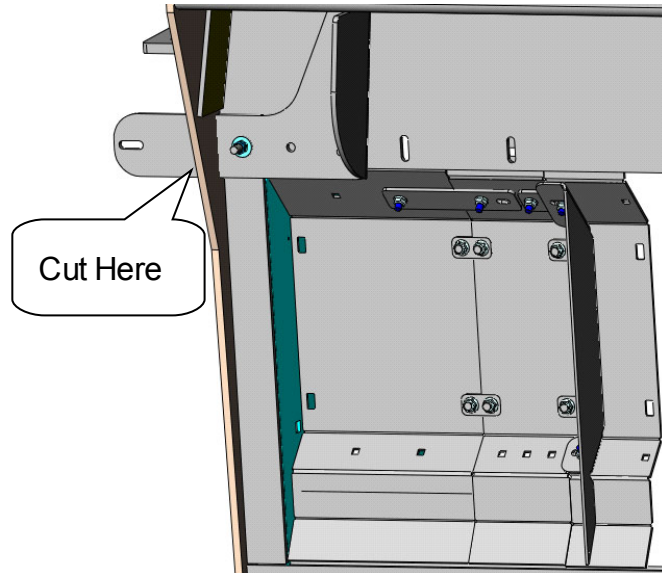


Illustration 194: Bezel Layout #6

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Grain Belt Plus Header Height Control

Installation and Adjustment

The header height control option uses a sensor assembly to measure changes in the vertical displacement of the leaf springs (caused by varying terrain). These changes are electronically relayed to the combine's header height control, which compensates accordingly.

Initial Physical Adjustment and Set-up

1. Remove the feeder house cylinder safety lock, lower the header to its normal operating height, and set the header tilt to the desired angle.
2. Raise the header, shut down the engine and wait for all moving parts to stop before leaving the cab.
3. Set the feeder house lift cylinder safety locks in place.

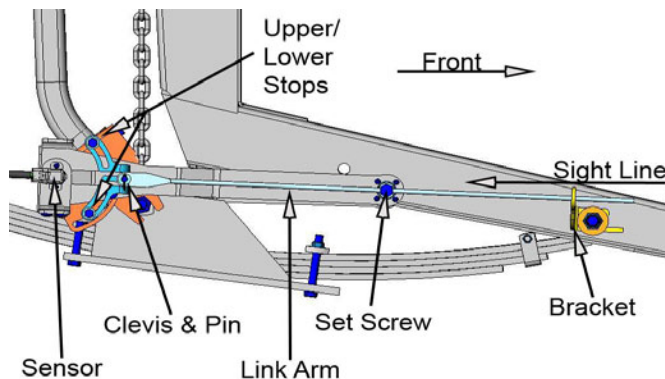


Illustration 195: Header Height Sensor – Main Components

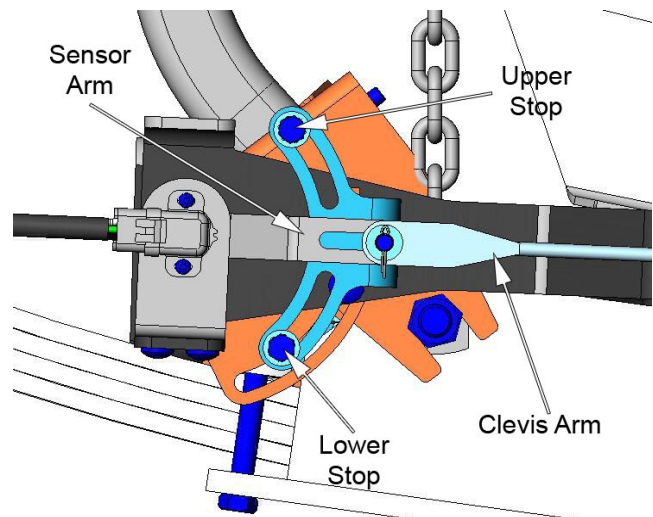


Illustration 196: Header Height Sensor - Close up-View

4. With light pressure, manually move the sensor arm down to the center of its range of motion. Check that the clevis arm pin is set fully to the rear of the sensor arm while it is in this alignment.
5. With the upper and lower stops at their outer limits, move the sensor arm to its upper and lower limits of travel. These distances should be equal.
6. If the type of sensor installed is adjustable, and the sensor is in need of adjustment, see items 7 and 8.

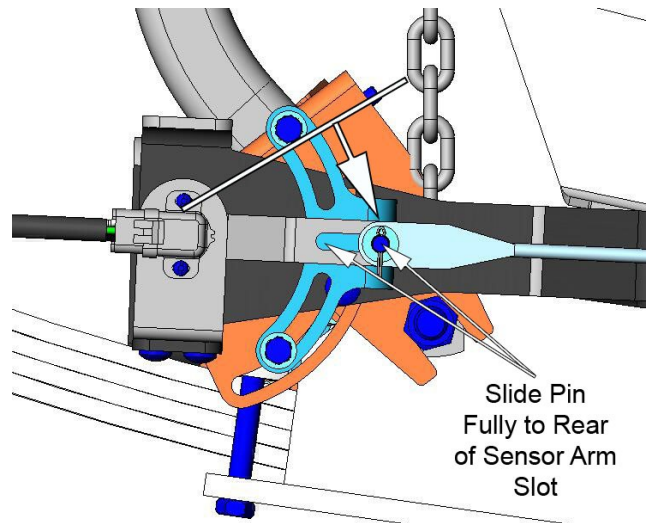


Illustration 197: Clevis Pin Adjustment

This type of sensor is not adjustable.

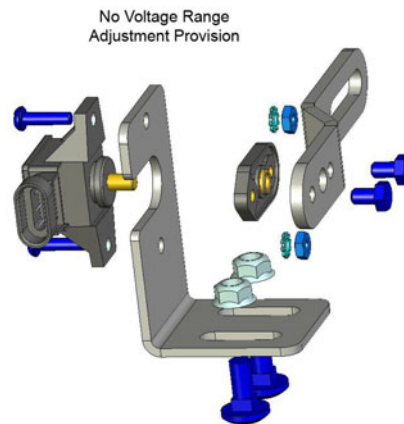


Illustration 198: Non-adjustable Sensor

7. This type of sensor is adjusted by loosening the set screw on the sensor arm locking collar, and moving it until equal travel up and downward is available.

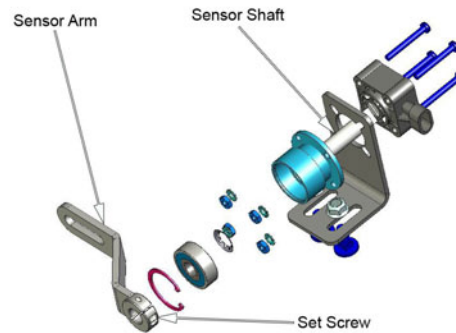


Illustration 199: Adjustable Sensor - Type 1

8. This type of sensor is adjusted by loosening the two screws shown here, and turning the body of the sensor until equal travel up and downward is available.
- 9.

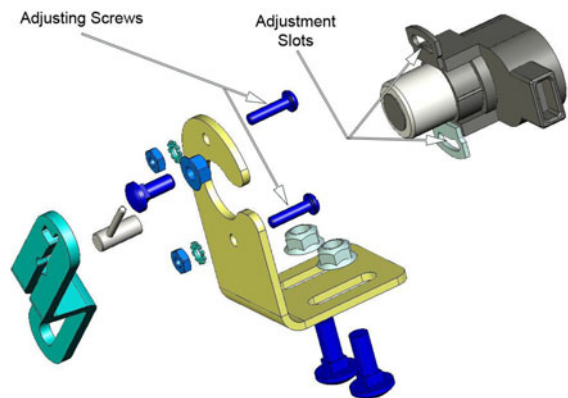


Illustration 200: Adjustable Sensor - Type 2

9. With the header fully raised, the sensor arms on both sides of the subframe should be resting lightly against the upper stop. If this is not the case, loosen the lock and pivot bolts and adjust. When the sensor is set correctly, re-tighten the bolts.

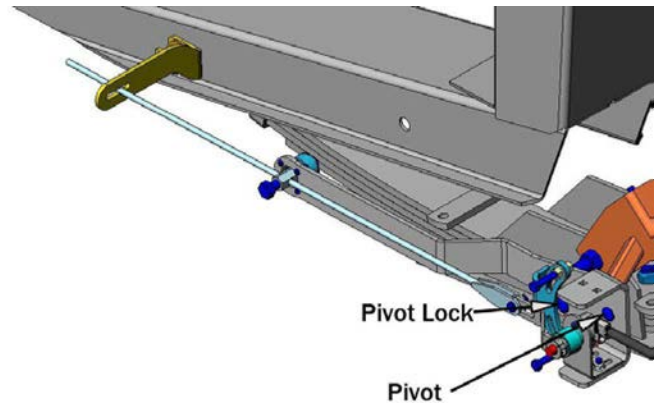


Illustration 201: Header Height Sensor - Left-hand Side

10. Move the sensor arm down with your finger. If it does not reach the lower stop, loosen the link arm set screw, hold the sensor arm at its center of travel, and set a straight line of sight through these parts.

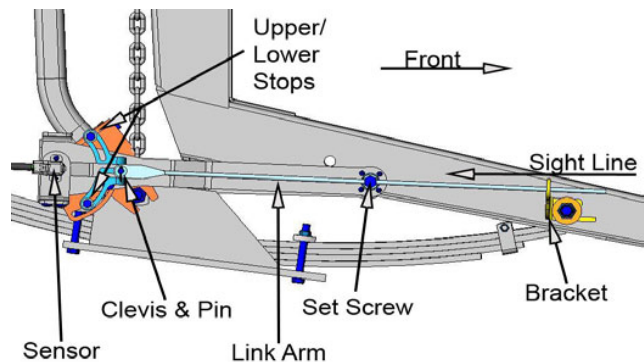


Illustration 202: Header Height Control – Line of Sight Adjustment

11. If the sensor arm reaches the end of its travel before contacting either the top, or the bottom stops, loosen the stop, and move it into light contact with the arm, then re-tighten.

Setting Header Height Control in the Field

If significant adjustments are made to the cutting angle and float of the header, it will be necessary to re-calibrate the header height control. Sensor arm assemblies are located on either side at the base of the sub-frame.

Depending on the particular make of combine, the following chart gives a list of appropriate voltage ranges for the header height control.

NOTE:	<i>Variation refers to the total voltage used, and is determined by subtracting the voltage reading at the lowest position, from the voltage reading at the highest position. For example, if the voltage at the highest position is 7.0, and the voltage at the lowest position is 4.0, then the Variation (or total voltage used) is 3.0 volts.</i>
--------------	--

	New Holland	AFX John Deere	CAT Lexion	Challenger MF 9790 Gleaner R Series	AGCO with Multi-coupler
High (Raised)	7.5 Volts Max	4.5 Volts Max	4.5 Volts Max	4.5 Volts Max	3.8 Volts Max
Low (Lowered)	2.5 Volts Min	0.5 Volts Min	0.5 Volts Min	0.5 Volts Min	1.5 Volts Min
Min. Variation	2.5 Volts	2.5 Volts	2.5 Volts	2.5 Volts	1.5 Volts

Once you have established the correct header float and angle of cut for a particular harvesting application, proceed as follows:

Calibration of Sensors

1. Turn the key on in the cab of the combine, and wait for the display screen to activate.
2. Proceed to the header diagnostics section of the digital menu.
3. Begin recording the voltage readings for the maximum upward (raised) and maximum downward (lowered) ranges of the left sensor arm assembly.
4. Continue recording the voltage readings for the maximum upward (raised) and maximum downward (lowered) ranges of the right sensor arm assembly.
5. If the ranges recorded are within the chart ranges specified above, then proceed with header height control calibration in your combine operator's manual.

6. If the ranges are not within the ranges specified above (either too high or too low), then proceed to Manually Adjusting the Sensors.

Manually Adjusting the Sensors

NOTE:	The following steps are best performed with two people – one in the cab of the combine, and one on the ground with the header height control sensors.
--------------	---

1. Determine the sensor, or sensors not properly calibrated.
2. On the sensor arm assemblies, locate the pivot lock and pivot bolts.
3. Loosen the nuts on both of these bolts, so that the sensor arm assembly can pivot.
4. Adjust the sensor arms up or down in small increments, re-testing the voltage from the cab of the combine each time.

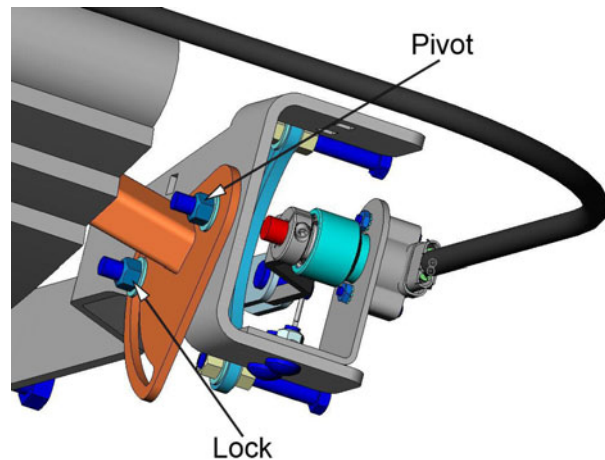


Illustration 203: Header Height Sensor - Rear Inside View

5. Once the sensor arm provides the required voltage ranges, tighten the pivot lock and pivot bolt. If the sensor arm travel no longer reaches the upper or lower stop, move the stop into light contact with the arm.
6. Complete the header height control calibration, as detailed in your combine operator's manual.

Adjusting the Overall Setup

If the initial physical setup procedure did not bring the voltage readings within range, and if the total voltage available is too low (less than the Min. Variation listed for your combine), then there may be a problem with the physical setup of the header. One of two situations are commonly responsible for this problem. Please refer to Scenario 1, and Scenario 2 for possible problems, and corrective actions.

Once the appropriate corrective action has been taken, repeat Calibration of Sensors.

Scenario 1:

The flotation restrainer pins are set too high and need to be either lowered, or removed altogether and placed into the storage hole, to allow a full range of flotation. (See Illustration 8: Sub Frame - Right-hand Side, page 6.)

To change the position of the flotation restrainer pins, refer to the “Header Flotation Restrainer Plate” subsection in the LEVELING chapter of this manual.

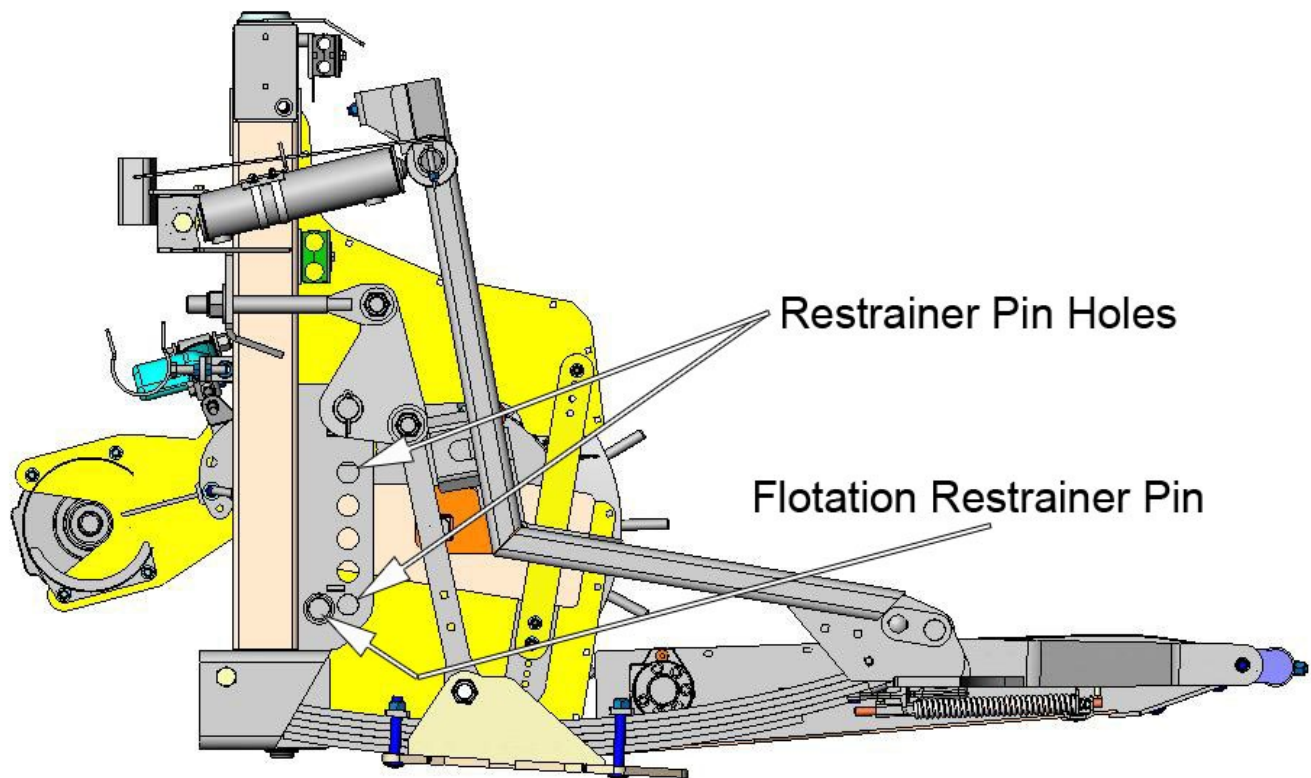


Illustration 204: Header Subframe - Right-hand Side

Scenario 2:

The link arm is set up too short (not pushed far enough in to the clevis pin slot). The clevis end of the sensor rod must be pushed to the rear, into the slot of the sensor arm. If it is not, you will get a very short or small voltage range.

To change this distance, see Illustration 198: Non-adjustable Sensor, page 162, and proceed as follows:

1. Loosen the link arm set screw, located at the pivot.
2. Slide the clevis end of the link arm as far back as possible into the slot of the sensor arm while in its mid (horizontal) position.

NOTE:	<i>It is important to keep the rod and sensor arm in line with each other when performing this procedure. If they are not in line when securing the clevis pin into the sensor arm slot, the assembly will bind as it approaches horizontal.</i>
--------------	---

3. Re tighten the rod locking coupler nut.

Tips for smooth operation of the Header Height Control Sensors.

As discussed in **Note of Scenario 2**, ensure that the sensor arm is in it's mid (horizontal) position, and that the sensor rod and sensor arm are parallel with each other when tightening the rod locking coupler nut. (See the following photographs.)

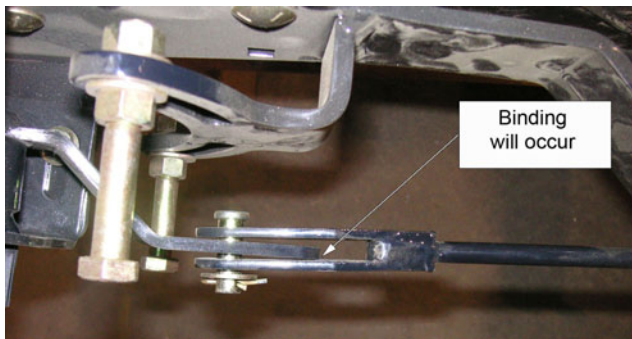


Illustration 205: Clevis Binding

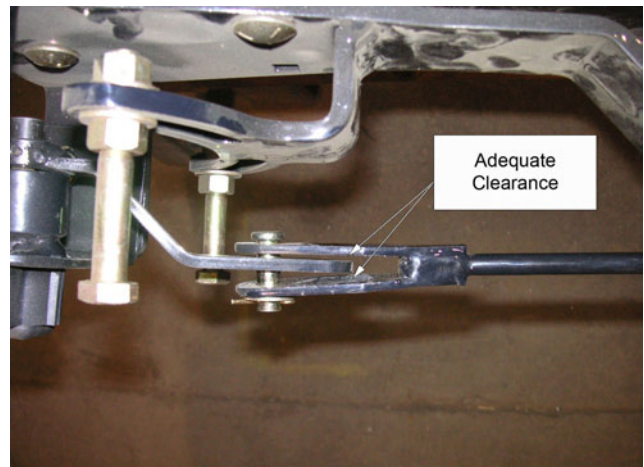


Illustration 206: Clevis Free

Ensure that the link arm is adequately spaced from the bearing assembly on the sensor mount, so that it moves freely and does not rub against the sensor mount.

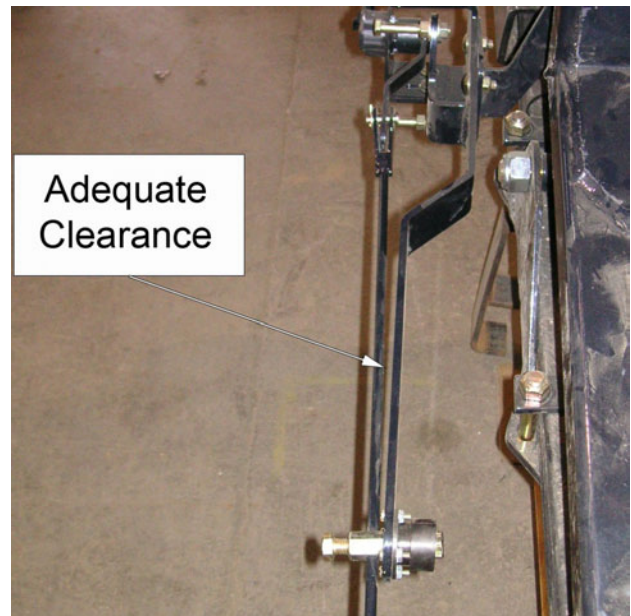


Illustration 207: Link Arm Clearance

If the sensor arm is too close or rubs on the sensor mount, it may be necessary to install one or more spacers (washers) behind the rod locking collar. Do this by first loosening the bolt on the inside of the sensor mount, then removing the rod locking collar. Next add spacer(s) into the pocket behind the locking collar, and re-assemble. Re-check the alignment and spacing between the sensor rod and sensor arm.

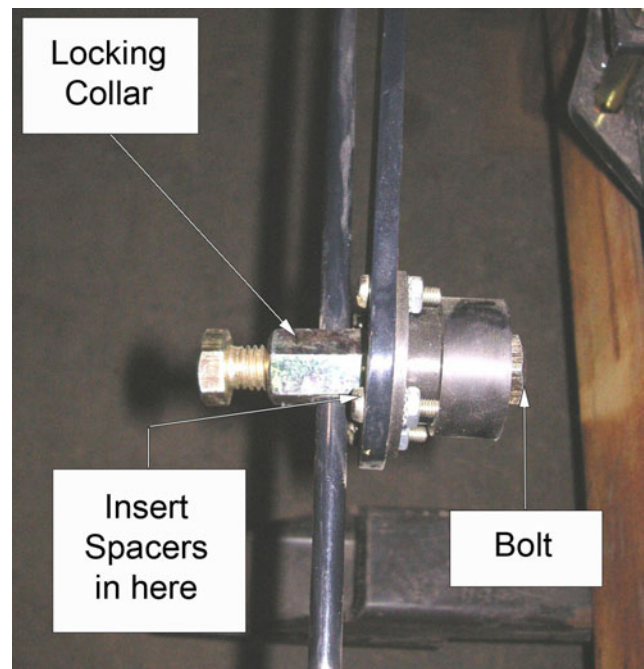


Illustration 208: Adding or Removing Spacers

Ensure the sensor rod is free to move through the slot in the front sensor mount. (See the



Honey Bee Manufacturing Ltd.

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bracket in Illustration 199: Adjustable Sensor - Type 1, page 163.) If it is not moving freely, the sensor rod, sensor mount or sensor arm may be bent; or too many or too few spacers may have been installed in the previous adjustment.

Ensure you have a good line of sight down the link arm to the sensor arm. Some adjustment of the sensor arm may be required, and is acceptable, so long as it does not cause the voltage range to exceed the established limits.

Automatic Reel Height Control

WARNING

The automatic reel height control may cause the reel to move unexpectedly on start-up. Ensure everyone is, and will remain well clear before turning the ignition key.

The reel height control operates in response to knife movement as it follows ground contours. The minimum distance ("Safety Set Point") between the cutter bar and the reel is selected from the combine. The sensors then monitor the reel's height and changes in distance from the cutter bar; and activate the reel height hydraulics to compensate for any changes that would compromise this minimum distance. Compensation is made directly by the reel height control as it electronically controls the valve responsible for the hydraulic flow to and from the reel lift cylinders.

Operation: Reel Height Control System

Power-On Test:

When the system is first powered up, it will perform a self-test and initialization procedure for approximately 10 seconds, prior to commencing normal operation. During this time, the cab Reel Height Control console will cycle through each indicator to test its operation.

Automatic and Manual Modes:

The operator can switch the system between *Automatic Mode* and *Manual Mode* using the *Control Mode* button on the cab console. The current mode will be shown in the lower left of the display.

Manual Mode Operation

In this mode, the combine reel height switch is active. The operator must monitor the reel height, and adjust the distance between the reel, and the knife.

Automatic Mode Operation

In *Automatic Mode*, the controller will automatically maintain the set distance (*Safety Set Point*) between the reel and the knife.

Up and *Down* input signals are transferred to the *Up* and *Down* outputs according to the controller logic, but a *Down* request will be blocked if it would cause the reel to go lower than the *Safety Set Point*. This is called the *Block* function, and the *Block* indicator is lit on the console when it is active.

If interference actually occurs between the reel and cutter bar, the *Up* output is activated to

move the reel out of the way. This is called the *Clear* function, and the *Clear* indicator is lit on the console when it is active.

After a period of time, the controller will activate the *Down* output signal to return the reel to its set height. This is called the *Return to Set* function. The *Return to Set* indicator will be lit on the console when it is active.

Sensitivity:

The sensitivity of the control system can be adjusted using the multi-position rotary switch on the console. This may be used by the operator to adjust for different machine response, or crop conditions. The current sensitivity is shown in the upper right of the display.

When operating the reel close to the knife, a higher sensitivity will cause the reel to respond more quickly to small movements in the knife. Similarly, when the distance between the reel and knife can be set at a higher value, the sensitivity may be reduced, allowing the sensors to tolerate greater movement in the knife before responding.

Setting the Automatic Reel Height (Safety Set Point)

The *Safety Set Point* can be programmed when the control system is in *Manual Mode*.

NOTE:	<i>The cutter bar must be unlocked (floating) for this operation.</i>
--------------	--

To program the *Safety Set Point*, select *Manual Mode* using the *Control Mode* button.

1. Use the combine controls to place the reel at a safe distance from the cutter bar, then press and hold the *Set* button for four seconds. The display shows the message, "Set Point Stored," to indicate the result of the programming.
2. Select *Automatic Mode*, using the *Control Mode* button to return to normal operation.
3. Use the combine controls to raise the reel until the "Block" light goes out.
4. If the Automatic Reel Height control operation is not satisfactory, refer to ***Adjusting Cutter Bar Sensors for Reel Height Control.***

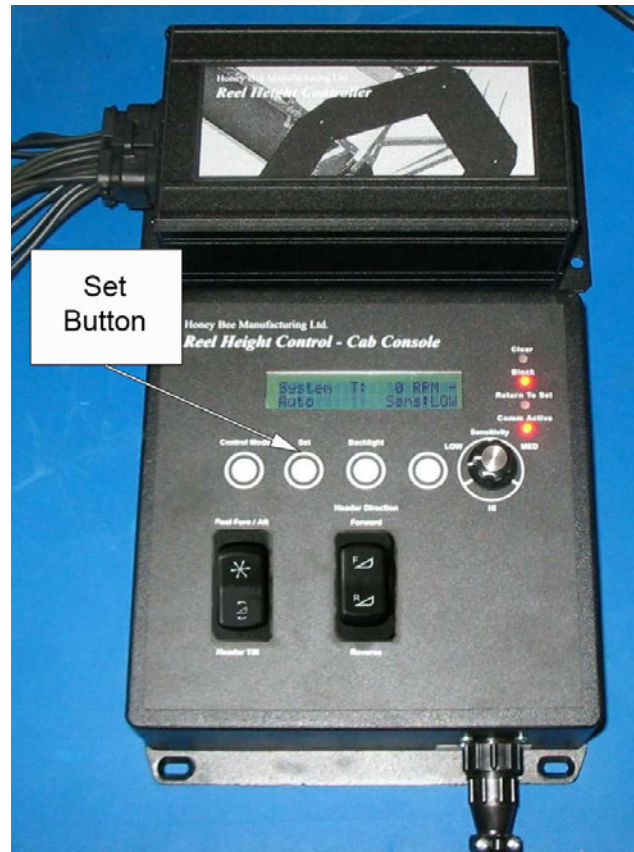


Illustration 209: Cab Console - Reel Height

CAN Communication:

The cab console and the controller use an advanced system called CAN to communicate. When CAN communication is operating properly, the "Comm Active" indicator will be lit on the cab console. If the communication link fails, this LED will be extinguished. Depending on the type of failure, a diagnostic message may also be shown on the display.

Adjusting Cutter Bar Sensors for Reel Height Control

In certain situations, it may be necessary to adjust or re-align the cutter bar sensors for the reel height control. Should these sensors become misaligned or require adjusting, proceed as follows:

1. With the header and reel fully raised, set the parking brake, reel lift locks and feeder house cylinder locks. Shut combine engine off and wait for all moving parts to come to a complete stop.
2. Remove the feather plates from the header by first removing the guard nuts that secure the feather plate tabs; then lift the whole feather plate out.
3. Loosen the clamp bolts that secure the sensor paddles to the torsion bar. The sensor paddles should now be free to move up and down without moving the sensor rod.

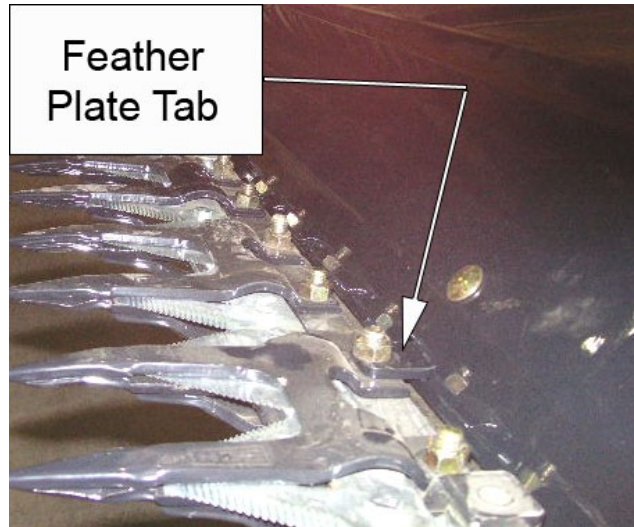


Illustration 210: Feather Plate Tab

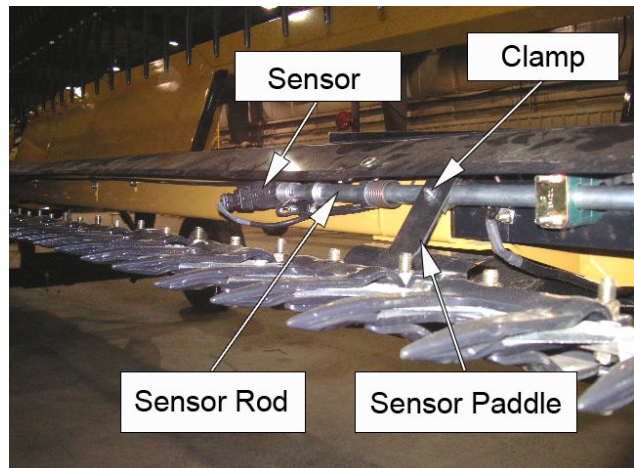


Illustration 211: Reel Height Sensor, Rod and Paddle

4. Next, verify that the cutter bar is set level. From the side of each suspension paddle, measure the distance between the back of the cutter bar and bottom of the deck. This measurement should be consistent.

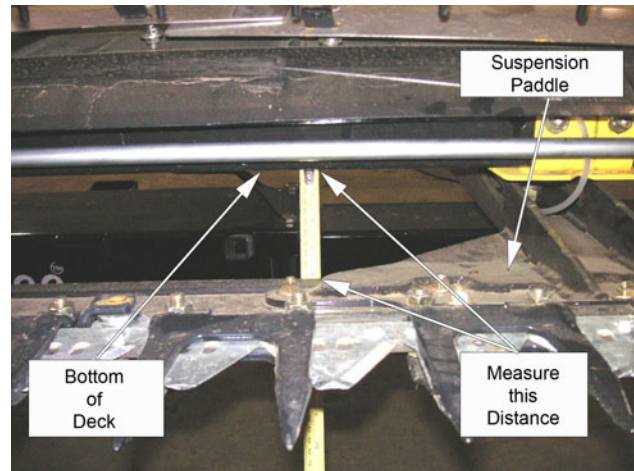


Illustration 212: Leveling Cutter Bar

5. If the distance needs to be adjusted, do so by loosening the lock nut on the front or rear bolt on the suspension paddle, as required, and turn the adjustment bolt to attain the required distance. Re tighten the lock nut once the required spacing is achieved.

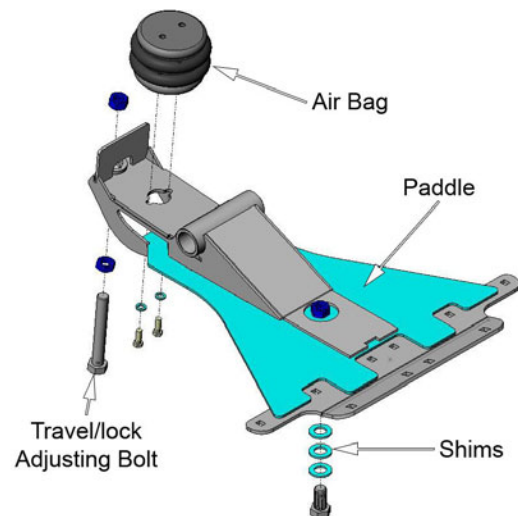


Illustration 213: Knife Suspension Paddle

6. Set the height sensor paddles at the front of the deck. This is done by rotating the paddle until it is resting on the paddle stop. As the clamp bolts were loosened earlier, it will be necessary to tighten them once the paddle is properly set. This will hold the paddle in place. Repeat this process with each sensor paddle. See the following photograph.

7. Locate the resistance spring on each sensor rod. Loosen the bolt securing the spring, and rotate the spring so that the tines push against the deck, causing a “downward pressure” on the sensor paddles.



Illustration 214: Sensor Rod - Resistance Spring

8. Re-tighten bolt to hold the resistance spring in this position. This should hold all the sensor paddles, with moderate pressure, to the paddle stops. Repeat this process for the other sensor rod.
9. If all sensor paddles are flush and snug against their corresponding paddle stops, and all bolts have been re-tightened, the feather-plates can be reinstalled. Start with the center feather plate (if removed), and build out from either side of it with the remaining feather plates.

Skid Plates

All Grain Belt Plus headers are equipped with UHMW/ Poly-Skid plates, which protect the cutter bar from abrasive contact with the ground during field-use.

These plates are located on the bottom of the cutter bar, held in place with “hold-down” clips bolted to the guard sections of the knife.

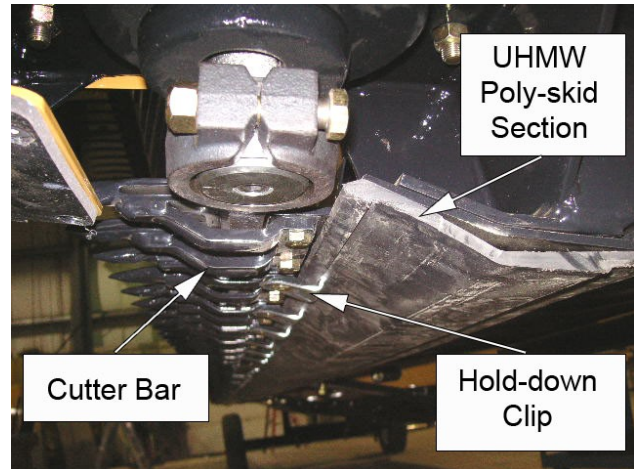


Illustration 215: UHMW Poly-skid

Changing the Skid Plates

To change worn out or damaged skid-plates: (refer to Illustration 210: Feather Plate Tab, page 174.)

1. Loosen or remove the hold-down clips from the portion of skid plate to be removed.
2. Remove the old section of skid plate by tapping it on the front edge, toward the back of the header.
3. If necessary, measure and cut new skid plate to correct length.
4. Using a rubber mallet, tap the rear lip of the skid plate over the back of the cutter bar.
5. Reinstall and tighten hold-down clips.

Slow Speed Transport

The Slow Speed Transport reduces the tongue weight of the header on the towing vehicle. This enables towing the header behind a truck or combine.



Illustration 216: Slow Speed Transport - Side View



Illustration 217: Slow speed Transport - Isometric View

Towing with the Slow-Speed Transport

IMPORTANT! The header and slow speed transport are designed for transport speeds no greater than 32 km/h (20 mph). Exceeding this speed may result in damage to the equipment, serious injury to yourself or others, and could even result in loss of life.

1. Ensure the header is fully dismantled from the combine, (*refer to the DISMOUNTING section of the OPERATION chapter in this manual).
2. Ensure the header is sitting level, on hard, flat ground, and the tires are blocked both in front and rear.
3. Using the jack on the header hitch, raise the hitch enough to clear the slow speed transport assembly as you roll it under the hitch.
4. Remove the quick pin and washer from the mounting pin on the top of the slow speed transport frame. Roll the slow speed transport assembly under the header hitch.

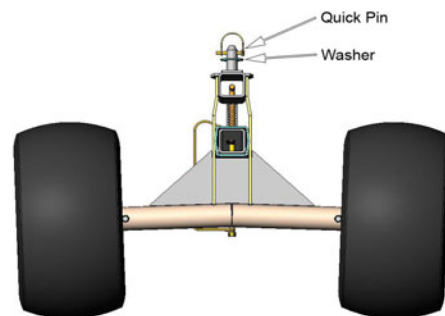


Illustration 218: Slow-Speed Transport - End View

5. Using the jack, lower the header hitch onto the mounting pin on the top of the slow speed transport. Replace the quick pin and washer (Illustration 211: Reel Height Sensor, Rod and Paddle, page 174.) to secure.
6. Connect the safety chain between the header and the frame of the slow speed transport.
7. Connect the wiring harness on the header to the harness that runs through the draw-bar of the slow speed transport. Ensure that wires are not dangling or dragging, but that there is adequate slack to allow for turning.
8. Align the draw bar hitch with the towing vehicle's hitch, and engage the parking brake on the towing vehicle. Attach the draw bar hitch to the towing vehicle with a hitch pin, and secure in place.
9. Test the brake and signal lights to ensure they are working properly.
10. Attach the safety chain from the slow speed transport to the rear of the towing vehicle.
11. Crank the jack handle counter-clockwise to raise the jack leg off the ground.
12. To obtain maximum clearance between the foot of the jack and the ground, remove the hitch pin from the jack leg, and slide the jack leg up into the outer tube. Re-insert the hitch pin to secure the jack leg in it's highest position, then lock it in place using the lynch pin.
13. Inspect the towing vehicle, slow speed transport, and header to ensure everything is secure.
14. Remove blocks from front and back of trailer wheels.
15. Begin towing header. A smooth, steady driving style will reduce abrupt shocks to the equipment.

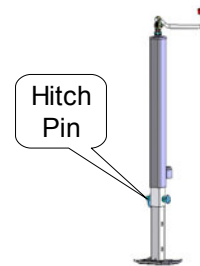


Illustration 219: Jack

Storing the Slow-Speed Transport

The Grain Belt Plus Header is equipped with mounting brackets for storing the slow speed transport. This feature retains the transport equipment with the header while working in the field.

With the header fully mounted to the combine (see the **MOUNTING** section in the **OPERATION** chapter of this manual), and the slow speed transport detached from the header:

1. Remove ½" hitch pin from the draw bar, and disengage (lift) lock pin. (See Illustration 212: Leveling Cutter Bar, page 175)
2. Remove the draw-bar from the slow speed transport frame. Wrap the ends of the safety chain and wiring harness around the hitch end of the draw-bar. Ensure the rest of the wiring harness remains inside the draw-bar.

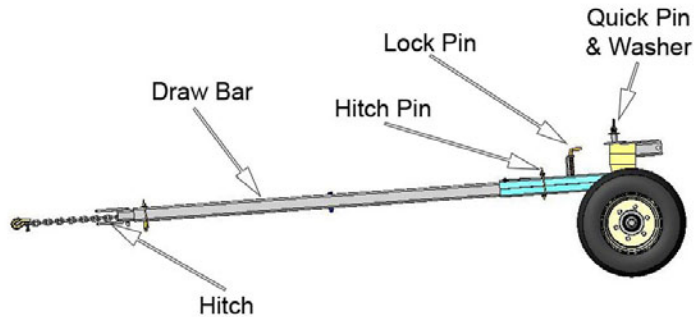


Illustration 220: Slow-Speed Transport - Storing

3. Set the draw-bar onto the back of the header frame by sliding the rear end of the draw-bar into the square bracket provided. Secure the draw-bar in the front mounting bracket using the ½" hitch pin.

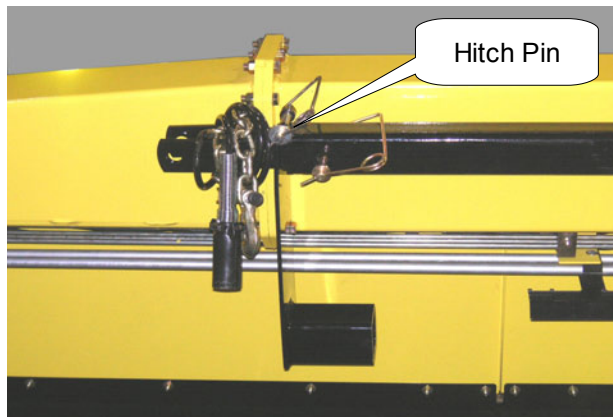


Illustration 221: Draw Bar Mounting Bracket

4. Attach the storage tube on the back of the slow speed transport frame to the storage bracket on the back of the header. Secure using the hitch pin provided.
5. Remove the washer and quick pin from the mounting pin on the slow speed transport. (See Illustration 211: Reel Height Sensor, Rod and Paddle, page 174.)



Illustration 222: Slow Speed Transport Frame

6. Lift the front of the slow speed transport frame into its storage position against the back of the header. Push the mounting pin through the hole provided in the storage bracket. Secure the mounting pin to the back of the storage bracket using the hitch pin and washer.



Illustration 223: Slow Speed Transport - Stowed Position

Cross Auger Assembly

The Grain Belt Plus Header is available with a cross-auger. This option is beneficial when harvesting light, or bulky crops that tend to bunch up on the table due to their bushy texture. The cross auger improves the flow of cut product toward the feeder decks.

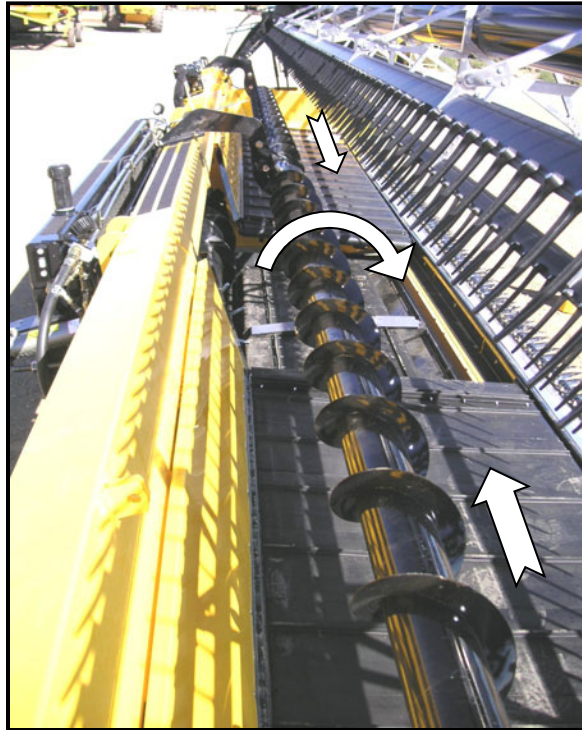


Illustration 224: Cross Auger Assembly

The cross auger is powered by a hydraulic motor that is fed from the right draper motor return port. The oil from the cross auger motor then feeds back into the main return line, just past the right draper motor. You can adjust the speed of the cross auger by turning the needle valve, located on the manifold mounted to the cross auger motor.

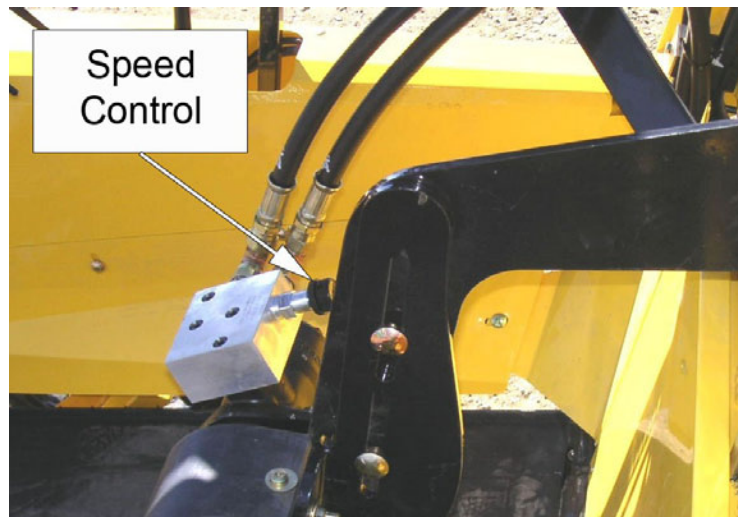


Illustration 225: Cross Auger Speed Control

Reel Speed Sensor

The reel may be equipped with an optional reel speed sensor. This component provides the ability to set the reel speed, and to monitor that speed when cutting. The sensor employs a pulse wheel, from which it reads the reel speed. This pulse information is relayed back to the combine electronically (through the multi-link).

The sensor should be positioned so that there is a gap of 1/16" to 1/8" between the pulse wheel and the sensor.

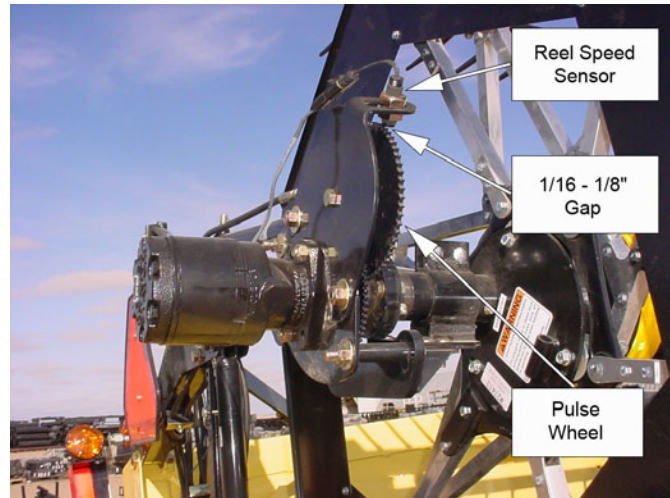


Illustration 226: Reel Speed Sensor

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Trouble Shooting

<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
<i>Adapter</i>		
Combine will not hook into top of adapter.	Feeder house adjustment on combine set wrong.	See Combine Manual.
	Header tilted back/ forward too far.	Run low-side tire onto a block.
	Subframe not level with combine	Adjust hitch jack.
<i>Draper</i>		
Draper not tracking straight.	V-guided draper not properly installed.	Ensure extruded “V” on draper is properly seated into recession on drive roller.
	Draper splice not cut straight.	Using a square, re-punch connector - bar holes in draper.
	Material buildup on rollers.	Clean rollers.
Draper slipping.	Draper too loose.	Adjust draper tension.
	Roller polished, loosing traction	Roughen drive roller.
	Draper is snagging.	Ensure that extruded “V” on draper is properly seated into groove in drive roller.



<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
Draper not turning.	Draper too loose.	Adjust draper tension.
	Faulty drive motor.	Repair or replace.
	Failed bearing(s) in idler or drive rollers.	Replace.
	Material build-up on rollers.	Clean rollers.
	Rock or material under draper.	Clean under draper.
	Draper is snagged or caught.	Check for interference.
	Oil flow going over the relief.	Check relief setting. Remove and clean relief cartridge; check spring.
System oil pressure excessively high. (>3,000 psi)	Material buildup on rollers.	Clean rollers.
	Faulty bearing on roller.	Replace bearing.
	Faulty draper motor.	Check motor temperature. Check for oil leaking from shaft seal.
		Replace motor.

Decks

Deck lifts out of position.	Bolts on front edge loose or missing.	Tighten or replace.
	Bolts on back panel are loose or missing.	

Feed Auger

Auger stops when full of material.	Auger is plugged.	Raise header, reverse system and engage center deck cleanout.
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Problem	Possible Cause	Solution
Material wrapping on auger.	Narrow feeder house opening.	Ensure that proper pan inserts and bezels (Agco only) have been installed.
	Indexing of fingers is incorrect.	Adjust finger indexing.
	Fore/ aft adjustment is incorrect.	Adjust auger position.
Material will not feed under auger.	Indexing of fingers is incorrect.	Adjust finger indexing.
	Auger is plugged.	Raise header, reverse system and engage center deck cleanout
	Auger is not floating.	Auger float is seized or binding on side plates.
	Fingers on drum not extending low enough.	Adjust finger indexing.

Knife

Knife stalls easily.	Crop too heavy for ground speed.	Reduce ground speed.
	Knife speed not set properly.	Adjust.
	Low hydraulic pressure at knife motor.	Check system pressure.
	Bent guards or cutter bar.	Repair or replace.
	Dull or wrong type of sections.	Replace sections.
	Faulty knife drive.	Check for loose crank shaft.
	Seized knife head bearing.	Replace.
	Knife head out of alignment.	Adjust alignment on knife.
	Unloaded system pressure too high.	Check for faulty draper motor.
		Check that each draper is running freely.
	Relief valve stuck open.	Remove and clean cartridge.

Problem	Possible Cause	Solution
Knife running too slow or too fast. (<580/ >600 rpm)	Low hydraulic oil.	Add oil
	Relief valve stuck open.	Clean/ replace cartridge.
	Worn pump or knife motor.	Repair or replace.
	Pump set incorrectly for combine.	Adjust pump setting.
Knife will not run.	Low hydraulic oil.	Add oil. Determine cause of low oil.
	Faulty drive motor.	Repair or replace motor.
	Faulty knife drive.	Repair or replace.
	Faulty hydraulic pump.	Repair or replace.
	Cutter bar jammed.	Check for damaged guards or sections.
Excessive Vibration.	Knife running too fast.	Check speed. (580-600 rpm)
	Loose bearings in drive.	Replace bearings.
	Loose knife head bolts.	Tighten.
Excessive Noise.	Loose or damaged sections and/or guards.	Replace or tighten.
	First guard bent or out of alignment.	Straighten or replace.
	Knife drive bearing faulty.	Replace.
	Knife drive loose.	Tighten bolts and check for damage to housing.
	Knife drive running too fast.	Slow down to 580 - 600 rpm.
	Knife head positioned too high or too low.	Loosen clamp bolt on knife-head bearing and adjust.
	Guards don't match.	Check that all guards are the same. (12 mm required).

Problem	Possible Cause	Solution
Connector bar breaks.	Damaged sections or guards.	Repair or replace.
	Knife gummed up.	Soak with diesel fuel.
	Section bolts not tight.	Tighten and/ or replace.
	Sections on knife back installed on wrong side.	Remove sections; turn knife back over and replace sections.
Knife head breaks.	Section bolts not tight.	Tighten and/ or replace bolts.
	Knife gummed up.	Soak with diesel fuel.
	Damaged sections or guards.	Repair and/ or replace.
	Sickle sections dull.	Replace sections.
	Tough crop.	Reduce ground speed.
	Knife drive running too fast.	Check speed w/ photo tach.
	Guards don't match.	Check that all guards are the same (12 mm req'd).
Knife leaves strip of crop standing.	Bent or broken guard.	Straighten or replace.
	Broken knife section.	Replace.
	Plugged guard.	Clean.

Leveling

Header not level.	Leveling adjustment bolts not set properly.	Adjust bolts.
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Pump

Oil running hot.	Excessive oil going over relief.	Clean or replace relief cartridge.
	Faulty pump or motor(s).	Repair or replace.
	Hot oil dump on right-hand deck motor not functioning properly.	Clean or replace.
	Draper too tight.	Adjust draper tension.

<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
Oil leaking between pump and gear box.	Silicone seal broken.	Re-seal pump.
	No silicone between pump and gear box.	Apply silicone.
Pump vibrating.	Faulty universal joint bearings.	Replace.
	Incorrect angle on drive-line.	Verify that rotating pump mount assembly is in correct alignment for combine make.

Raising Header

Header will not lift.	Inadequate combine lift capacity. Check system pressure.	
		Add hydraulic cylinder to feeder house. (*Refer to Combine Manual.)

Reel

Reel will not raise.	Hydraulic couplers don't match.	Install correct couplers.
	Hydraulic couplers not engaged.	Re-couple properly.
	Faulty combine hydraulics.	Refer to Combine Manual.
Reel raises slowly.	Elbow in master cylinder too tight.	Loosen fitting.
	Hydraulic couplers not engaged.	Re-couple quick couplers.
Reel does not raise.	Air in system.	Bleed slave cylinder.
Right side goes up slowly.	Air in system.	Bleed slave cylinder.
Reel will not hold height.	Leaking hose or fitting.	Repair or replace.
	Valve in combine leaking.	Refer to Combine Manual.



<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
Reel will not hold level.	Leaking hose or fitting.	Repair or replace.
	Air in system.	Bleed slave cylinder.
	Faulty master cylinder.	Repair or replace.
	Leaking cylinder seal.	Replace seal.
Reel raises or lowers erratically.	Reel cylinders binding.	Replace cylinder.
	Arms bent or binding.	Repair or replace.
	Low hydraulic oil.	Refer to Combine Manual.
Right side cylinder does not fully extend.	Air in system.	Bleed slave cylinder.
	Lift cylinders out of phase.	Install spacer inside center master cylinder. (Check w/ manufacturer.)
Ends lift before center.	Center master cylinder "O" ring damaged.	Replace seal.
Right hand cyl. goes out of phase.	Air in system.	Bleed slave cylinder.
	System losing residual pressure.	Install spacer inside center master cylinder. (Check w/ manufacturer.)
Damaged/ cut reel tines.	Tines of reel catching in the knife.	Raise reel to allow more clearance from reel tines to cutter bar.
Damage to center of reel.	Reel set too low.	Adjust height.
Reel hitting at end.	Reel not centered.	Adjust centering.
Reel will not turn, or turns erratically.	Seized bearing(s).	Replace bearing(s).
	Faulty drive motor.	Replace motor.
	Reel tied down.	Release reel.
	Hydraulic couplers not engaged.	Re-couple properly.

<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
Reel speed can not be adjusted.	Poor connection in electrical wires or cable.	Check connections and condition of cable.
<i>Sub Frame</i>		
Too close to the ground with cutter bar down.	Leveling adjustment bolts too tight.	Loosen bolts.
	Tilt cylinder adjusted too short.	Adjust tilt cylinder.
<i>Table</i>		
Draper running too flat or too steep.	Tilt cylinder out of adjustment.	Adjust tilt cylinder.
Suspension/ float feels soft.	Clamp plates on spring saddles are loose.	Tighten clamp plates to stiffen suspension.

Miscellaneous

Material builds up at ends of cutter bar.	Pick-up reel tines not sweeping crop off cutter bar.	Heat and bend the tines on reel ends to reach into corners.
Heads shattering or breaking off.	Reel speed too fast.	Reduce reel speed.
	Ground speed too fast.	Reduce ground speed.
	Crop too ripe.	Cut earlier in season, or late at night when humidity is higher.
Cut grain falling off cutter bar.	Reel set too high.	Lower reel.
	Table set too high.	Lower table.

<i>Problem</i>	<i>Possible Cause</i>	<i>Solution</i>
Does not pick up lodged crop.	Reel set too high.	Lower reel.
	Table set too high.	Lower table.
	Reel set too far back.	Move reel forward.
	Ground speed too fast for reel speed.	Reduce ground speed or increase reel speed.
	Crop laying too flat for guards to pick up.	Install optional SCH Crop Lifters.

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Specifications

WEIGHT: Includes header assembly w/ decks, subframe, center deck, auger drive, double knife drive, hydraulic pump w/ pump mount, hydraulic tank, gauge wheels, and attached hydraulic components. All weights are approximate and are subject to change.

Model	<u>3055</u>	<u>3655</u>	<u>4255</u>	<u>4555</u>
Size	30'	36'	42	45'
(Lbs/Kg)	6290/2859	6487/2948	TBA	7300/3318
Pickup Reel – UII Universal (6 Bat – Plastic/ Delrin Teeth)				
(Lbs/Kg)	803/365	964/438	1138/517	1221/555
PICKUP REEL- HART CARTER (HCC) (6 Bat – Plastic Teeth)				
Lbs/ Kg	734/334	909/413	1065/484	TBA
TRANSPORT AXLE/HITCH TUBE PACKAGE				
Lbs/ Kg	303/137	303/137	303/137	303/137
CROSS AUGER KIT (3 Piece)				
Lbs/Kg	TBA	TBA	TBA	TBA
SLOW SPEED TRANSPORT				
Lbs/Kg	211/96	211/96	211/96	211/96



Standard Equipment

- Knife Drive - SCH epicyclic 3 5/16" stroke, hydraulically driven, 1160-1200 strokes per minute. (580-600 RPM)
- Knife Speed Sensor.
- Cutting System - SCH Easy Cut, spring steel guards and bolted sections. Adjustable contour cutter bar.
- Lateral Deck/ Drapers - 42" wide, V-guided draper, w/ rubberized polyester, fiberglass reinforced slats and tie bar connectors. Draper Speed: non-adjustable, fixed speed.
- Center Deck/ Drapers – 2 x 42" wide, V-guided drapers w/ rubberized polyester, fiberglass reinforced slats and tie bar connectors. Speed non-adjustable. Same hydraulic circuit as lateral draper drive and knife drive.
- Reel - hydraulically driven using combine hydraulics.
- Header Flotation - lateral and vertical leaf spring float system; air bag suspension.
- Cutting Angle - hydraulically adjustable on all models.
- Warning light kit.

*SPECIFICATIONS ARE SUBJECT TO CHANGE
WITHOUT NOTICE OR OBLIGATION.

Options:

- Header transport trailer.
- Cross auger assembly.
- SCH Crop Lifters for cereals and/or specialty crops.
- Automatic reel height control.
- Automatic header height control.
- 6 bat Universal (U-II) reel or 6 bat Hart-Carter (HCC) reel.
- Combine adapter plates- Available for most models of self propelled combines; each make listed here requires a unique adapter plate.

Massey Ferguson	John Deere
Challenger	Case IH
Gleaner	New Holland
	Lexion (CAT)



Bolt Torque

The tables shown below give correct torque values for various bolts and cap screws. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt.

UNIFIED TORQUE SPECIFICATIONS

METRIC TORQUE SPECIFICATIONS

Bolt Torque

<u>Size</u>	<u>SAE 5</u>	<u>SAE 8</u>	<u>Size</u>	<u>8.8</u>	<u>10.9</u>
	Nm (lb-ft)	Nm (lb-ft)		Nm (lb-ft)	Nm (lb-ft)
1/4"	12 (9)	17 (12)	M6	11 (8.5)	17 (12)
5/16"	25 (19)	36 (27)	M8	28 (20)	40 (30)
3/8"	45 (33)	63 (45)	M10	55 (40)	80 (60)
7/16"	72 (53)	100 (75)	M12	95 (70)	140 (105)
1/2"	110 (80)	155 (115)	M14	150 (110)	225 (165)
9/16"	155 (115)	220 (165)	M16	240 (175)	350 (255)
5/8"	215 (160)	305 (220)	M18	330 (250)	475 (350)
3/4"	390 (290)	540 (400)	M20	475 (350)	675 (500)
7/8"	570 (420)	880 (650)	M22	650 (475)	925 (675)
1"	915 (675)	1320 (970)	M24	825 (600)	1150 (850)

***** Torque figures indicated above are valid for non-greased or non-oiled threads and heads. Do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.**



Hydraulic Fitting Torque

Tightening Flare-type Tube Fittings

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one on the connector body, and with the other, tighten the swivel nut to the torque shown.

***** The torque values shown are based on lubricated connections as in reassembly.**

Tube Size (OD)	Nut Size	Torque Value **		Turns to Tighten (After Finger Tight)	
		(Nm)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

Tightening O-ring Fittings

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
3. Tighten fitting by hand until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten angle fittings to torque shown while holding body of fitting with a wrench.

Thread Size (Outside Diameter)	Nut Size	Torque Value ***		Turns to Tighten (After Finger Tight)	
(in.)	(in.)	(Nm)	(lb-ft)	(Flats)	(Turns)
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

***The torque values shown are based on lubricated connections as in reassembly.

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Grain Belt Plus Header – Operator's Manual

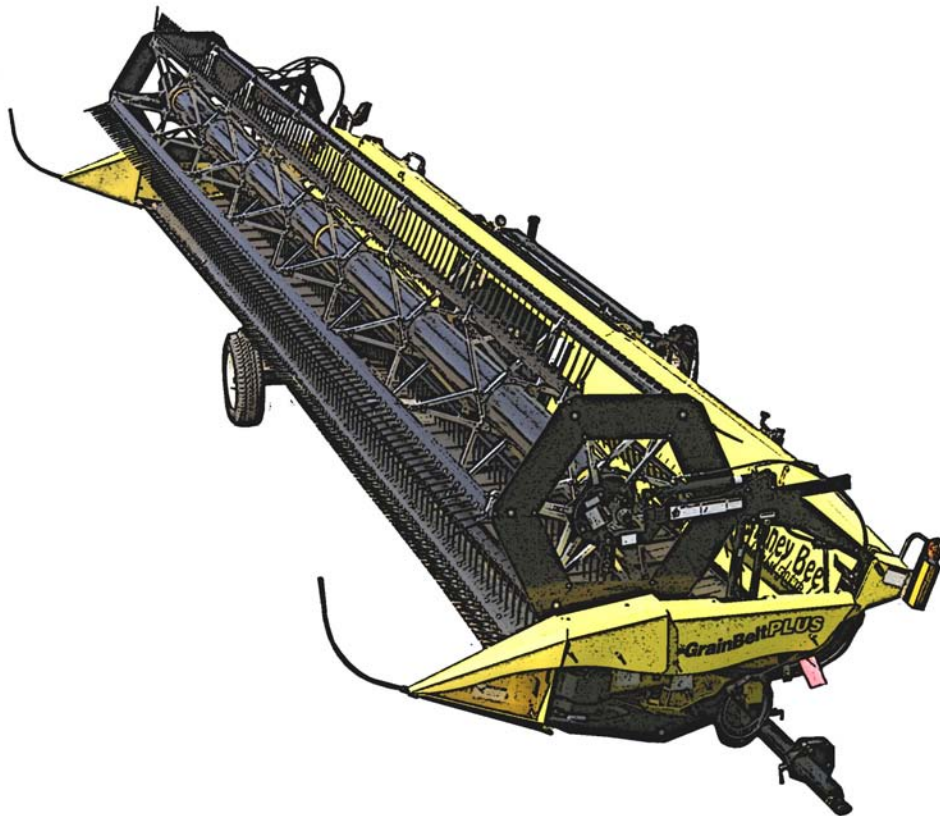
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Introduction

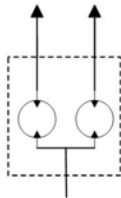
Over the last year, Honey Bee Manufacturing has made a number of improvements to our Grain Belt Plus Headers. Unfortunately your operator's manual does not reflect these changes. This supplement has been created to educate you on the major updates and changes we have instituted in your equipment. Please read your operator's manual and this supplement carefully and ensure you understand all information provided.

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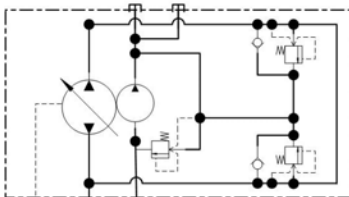
Hydraulic Schematics

Hydraulic Schematic Symbols

Hydraulic Schematic Symbols – Main Table Hydraulic Circuit



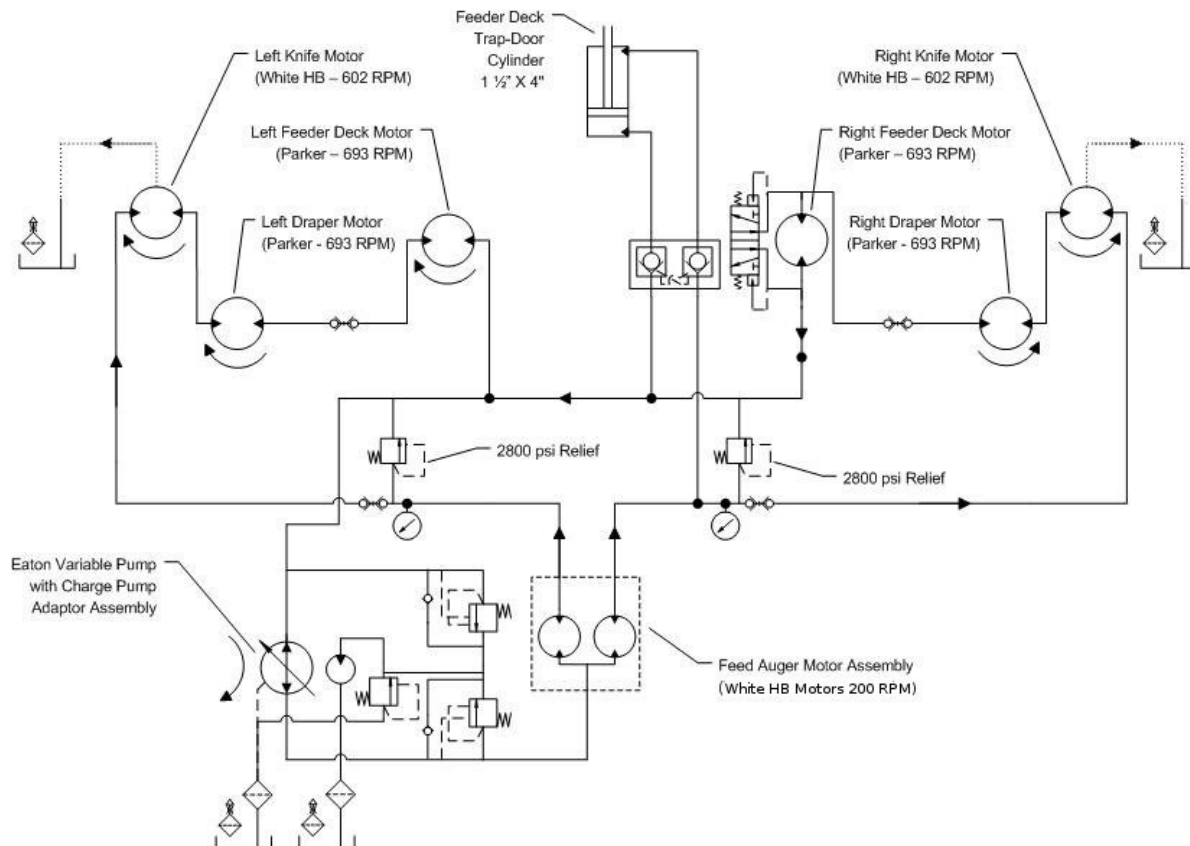
Finger auger motor assembly (White HB Motors – 200 RPM).



Eaton variable displacement closed circuit piston pump assembly with 4,750 psi forward relief, 3,000 psi reverse relief and charge pump adaptor (24 GPM nom. setting, maximum 25.1 GPM @ 520 RPM).

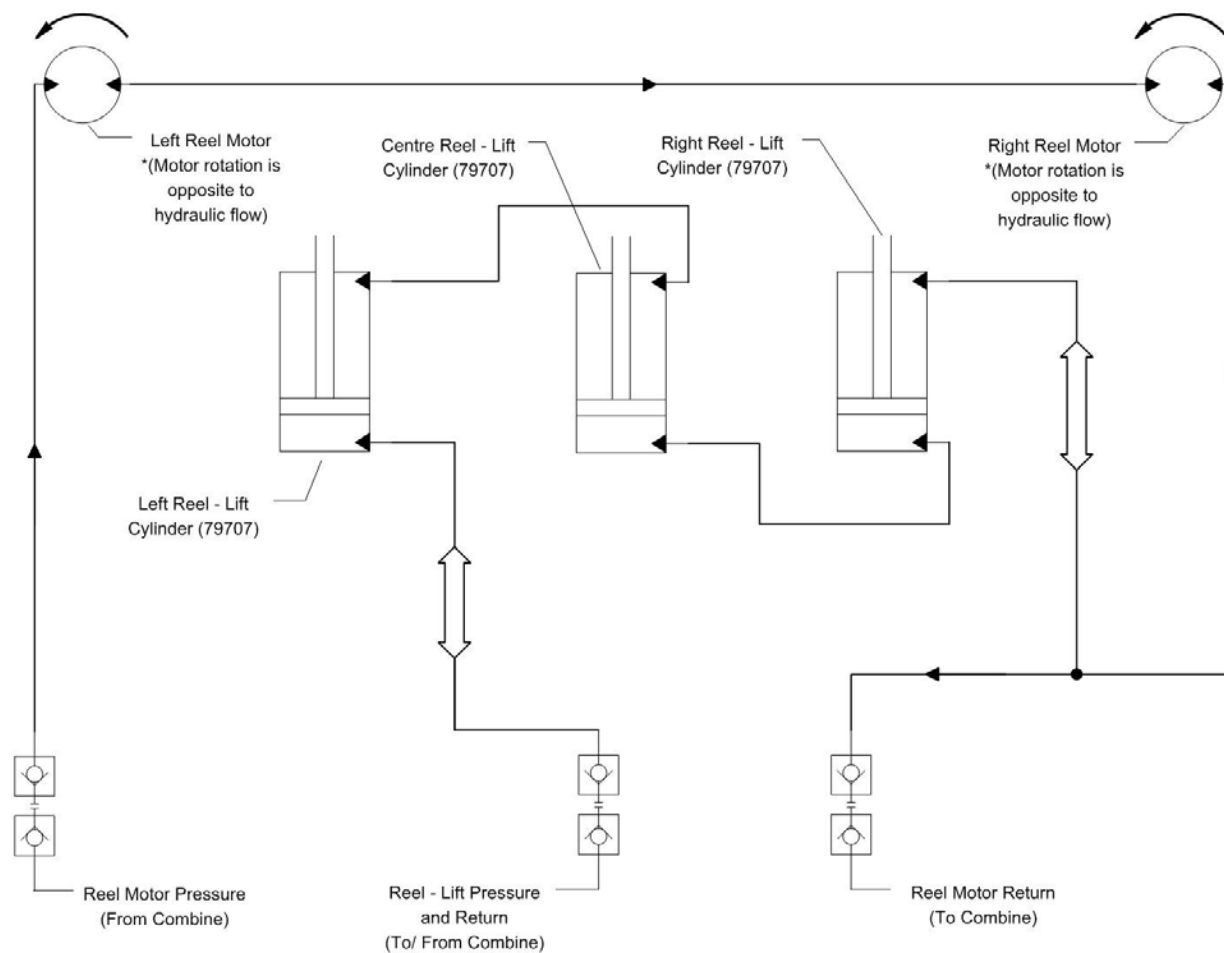
Main Table Hydraulic Circuit

Main Table Hydraulic Circuit – Grain Belt Plus Header



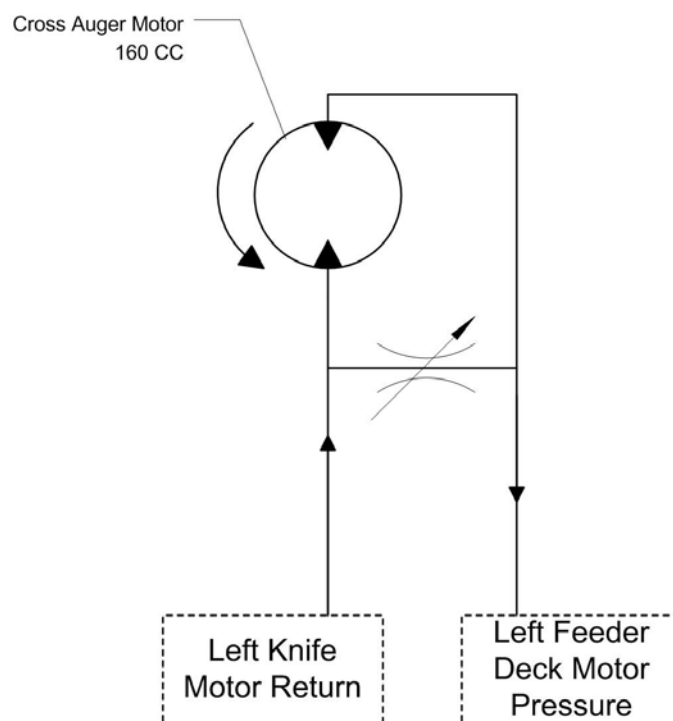
Split Reel Lift Circuit with Double Reel Drive

Split – Reel Lift Circuit with Double Reel Drive (42 and 45 ft Headers)



Grain Belt Plus – Cross Auger Assembly

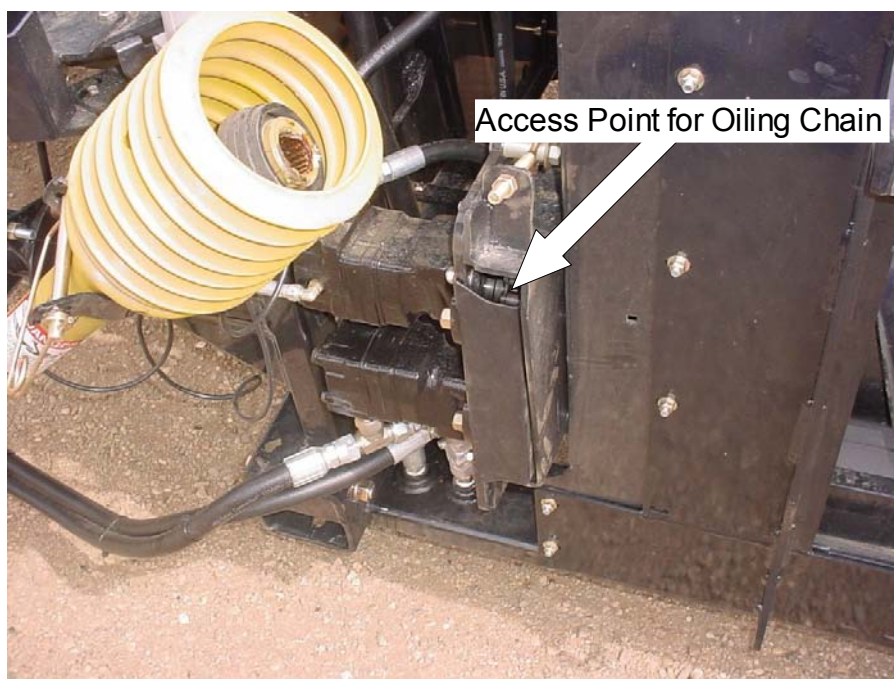
Grain Belt Plus – Cross Auger Assembly



Lubrication and Maintenance

Other Lubrication Maintenance:

- Knife: If knife is gumming, soak with water first, as alternative soak with diesel fuel.
- Gear Box - Speed Increaser: Gravity filled from hydraulic tank. Check daily that no leaks occur.
- Finger Auger Motor Assembly – Oil Chain.
- Hub and Spindle: Re-pack annually.



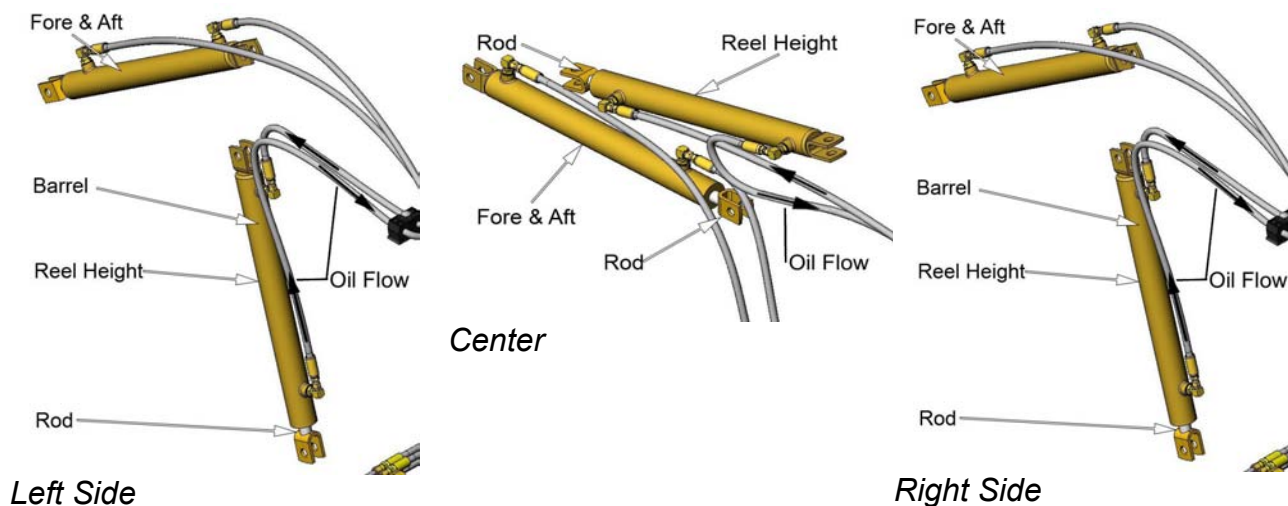
Finger Auger Motor Chain Lubrication Point

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Reel

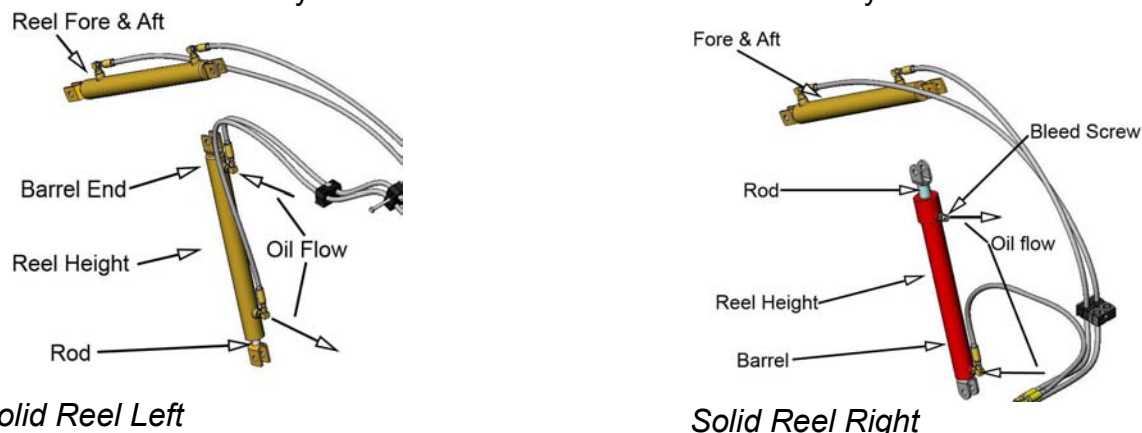
Split-Reel Lift Hydraulic Circuit

Pressure from the combine feeds the barrel end of the left cylinder. As the barrel rises, oil on the bottom side of the piston is forced out of the rod end port, into the rod end port on the center cylinder. The cylinder piston rises and oil from barrel end port of center cylinder is forced out into the barrel end of right cylinder. As the right cylinder piston rises, oil is forced out of the rod end port into the reel return line, and back to the combine hydraulic reservoir. To lower the reel, a check valve assembly located on the combine opens to allow oil to free flow in reverse due to the weight at the reel.



Solid Reel Hydraulic Circuit

Pressure from the combine feeds the barrel end of the left-hand cylinder. As the cylinder barrel rises, oil below the piston is displaced. The volume of the rod on the left cylinder matches the volume of the barrel on the right cylinder. The displaced oil causes the right cylinder to raise. This cylinder has a vent to bleed air from the system.



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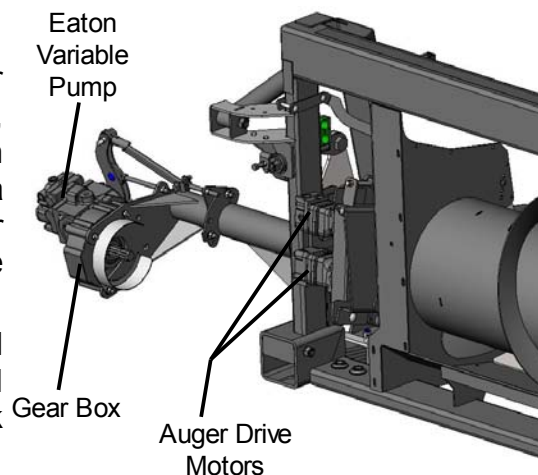
Center Feed Auger

Auger Drive Assembly

Power is transferred from the combine to the header via the header drive shaft. As the drive shaft turns, power is transferred through the gear box, to the Eaton variable pump assembly. This pump assembly has a charge pump adapter, which uses the combine's power to pressurize or "charge" the hydraulic circuit for the header.

Hydraulic oil is drawn out of the header's reservoir, and then sent through the hydraulic circuit, where it is used to power the auger, knife, draper, and feeder deck motors.

The linear actuator enables the operator to reverse the flow in the hydraulic circuit for clean-out purpose



Sub Frame Assembly - Auger Motor

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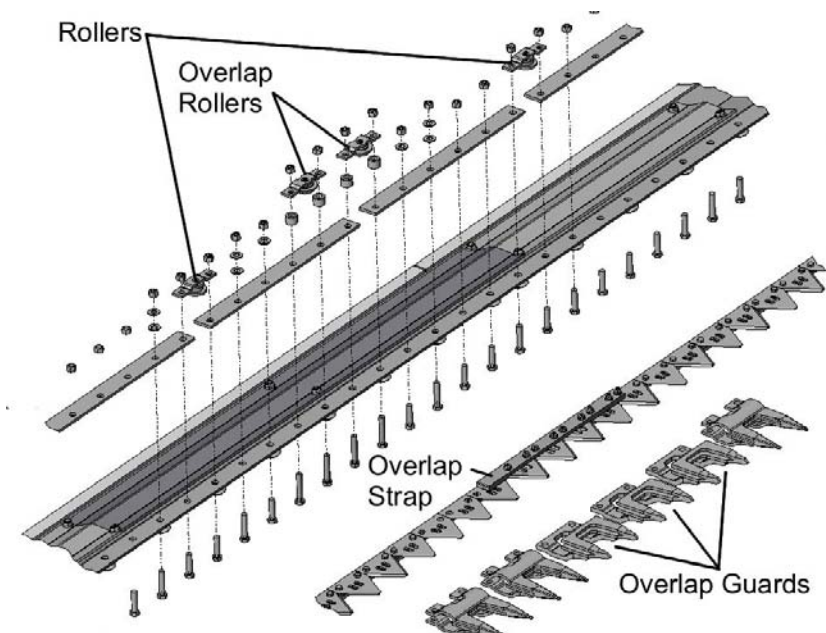
Cutting System

Overlap Kit

The overlap kit is used on all Grain Belt Plus headers, and is a necessary item with double knife drives. The knives overlap at the center of the table.

In this portion of the knife, the sickle sections have countersunk bolt holes to provide a smooth cutting surface. The overlap guards are open on top, and are designed to provide for the extra thickness in the knife. The overlap strap bolted to the left-hand knife will offset the countersunk sections to allow the knives to overlap.

NOTE:	<i>If knives are noisy or are over heating, check to see if the overlap guards have been properly installed.</i>
--------------	---



Knife Overlap Section - Exploded View

The overlap sections (on the overlap strap), and the right hand knife back should be tight to each other when the counter sunk bolts are tight.

Pneumatic Cutter Bar Floatation

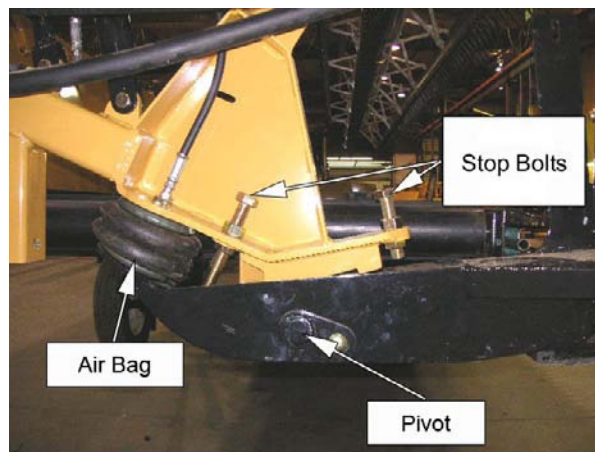
Grain Belt Plus headers are equipped with a pneumatic cutter bar suspension.

This system is designed to assist the cutter bar with flotation in low crop cutting situations. In total, there are 6 locations equipped with suspension paddles and air-bags – one on each side of the header, and one on each of the frame struts under the header.

Each end knife drive paddle will have a two position air bag or an adjustable spring to assist in end floatation.



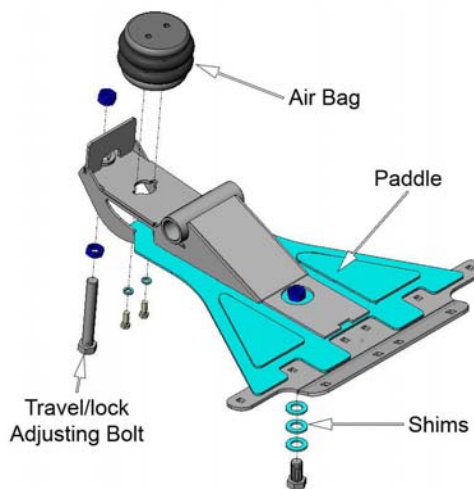
Air Bag Should be in rear holes if available.



Pneumatic Suspension - Outer Arms

Paddle Travel

The travel of the suspension paddle is limited by two adjustment bolts: one in front of the pivot point, and one behind. These bolts act as “stoppers” when they make contact with the arm. One bolt is located on each side of the pivot point. To adjust the amount of travel, loosen the lock nuts, and then turn the bolt either clockwise (to reduce travel), or counter clockwise (to increase travel). Tighten the lock nuts when desired travel is attained. The forward bolt on the mid-frame paddles is adjusted by removing/inserting shims.



Mid-Frame Paddles

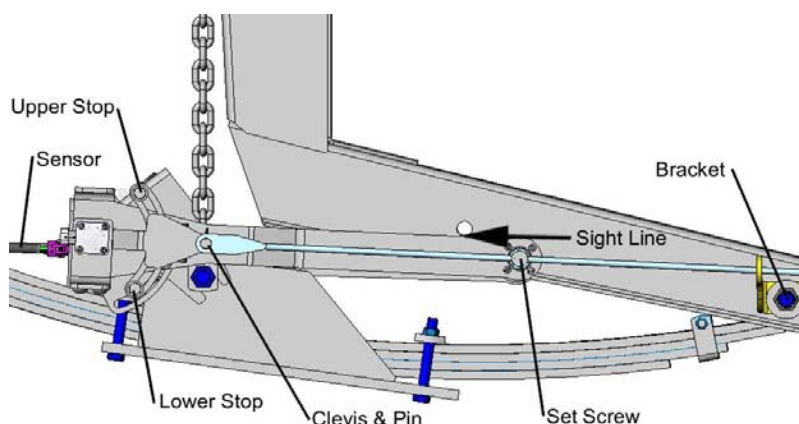
Grain Belt Plus Header Height Control

Installation and Adjustment

The header height control option uses a sensor assembly to measure changes in the vertical displacement of the leaf springs (caused by varying terrain). These changes are electronically relayed to the combines header height control, which compensates accordingly.

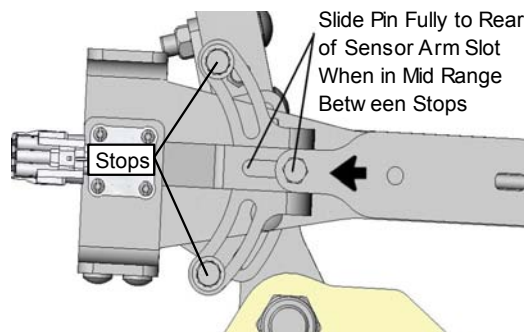
Initial Physical Adjustment and Set-up

1. Remove the feeder house cylinder safety lock, lower the header to its normal operating height, and set the header tilt to the desired angle.
2. Raise the header, shut down the engine and wait for all moving parts to stop before leaving the cab.
3. Set the feeder house lift cylinder safety locks in place.



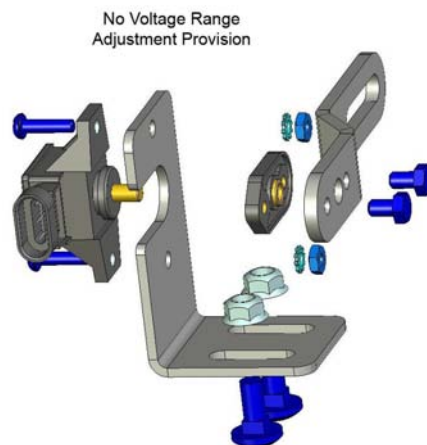
Header Height Sensor - Components

4. With light pressure, manually move the sensor arm down to the center of its range of motion. Check that the clevis arm pin is set close to the rear of the sensor arm while it is in this alignment.
5. With the upper and lower stops at their outer limits, move the sensor arm to its upper and lower limits of travel.
6. If the type of sensor installed is adjustable, see items 8 and 9 for sensor adjustment.



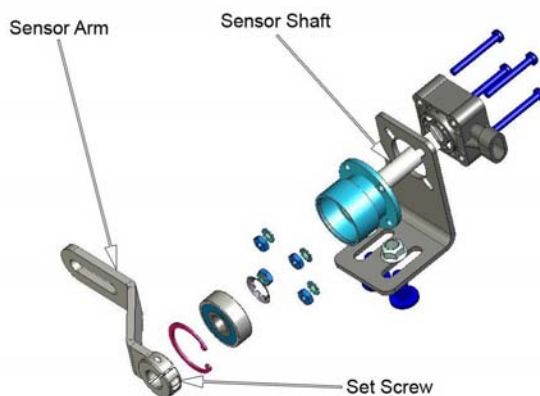
Clevis Pin Adj.

7. This type of sensor is not adjustable.



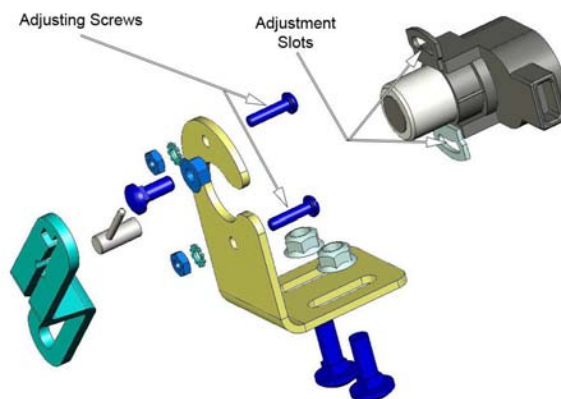
Non-Adjustable Sensor

8. This type of sensor is adjusted by loosening the set screw on the sensor arm locking collar, and moving it until equal travel up and downward is available within specified voltage range.



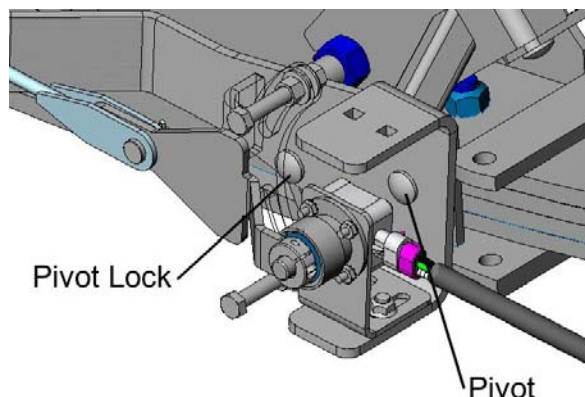
Adjustable Sensor - Type 1

9. This type of sensor is adjusted by loosening the two screws shown here, and turning the body of the sensor until equal travel up and downward is available within specified voltage range.



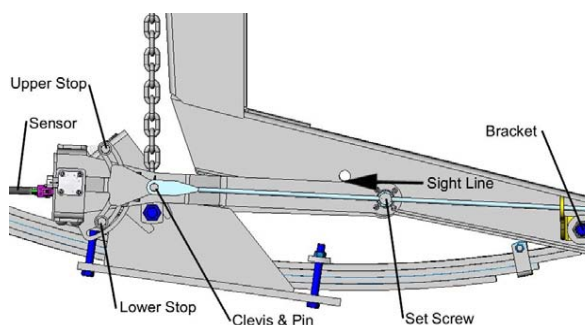
Adjustable Sensor - Type 2

10. With the header fully raised, the sensor arms on both sides of the subframe should be resting lightly against the upper stop. If this is not the case, loosen the lock and pivot bolts and adjust. When the sensor is set correctly, re-tighten the bolts.



Header Height Sensor - Left Side

11. Move the sensor arm down with your finger. If it does not reach the lower stop, loosen the link arm set screw, hold the sensor arm at its center of travel, and set a straight line of sight through these parts.



Header Height Control - Line of Sight Adj.

12. If the sensor arm reaches the end of its travel before contacting either the top, or the bottom stops, loosen the stop, and move it into light contact with the arm, then re-tighten.

Setting Header Height Control in the Field

If significant adjustments are made to the cutting angle and float of the header, it will be necessary to re-calibrate the header height control. Sensor arm assemblies are located on either side at the base of the sub-frame.

Depending on the particular make of combine, the following chart gives a list of appropriate voltage ranges for the header height control.



Variation refers to the total voltage used, and is determined by subtracting the voltage reading at the lowest position, from the voltage reading at the highest position. For example, if the voltage at the highest position is 7.0, and the voltage at the lowest position is 4.0, then the Variation (or total voltage used) is 3.0 volts.

	New Holland	AFX/John Deere	CAT Lexion	Challenger MF 9790 Gleaner R Series	AGCO with Multi-Coupler
High (Raised)	7.5 Volts Max	4.5 Volts Max	4.5 Volts Max	4.5 Volts Max	3.8 Volts Max
Low (Lowered)	2.5 Volts Min	0.5 Volts Min	0.5 Volts Min	0.5 Volts Min	1.5 Volts Min
Min. Variation	2.5 Volts	2.5 Volts	2.5 Volts	2.5 Volts	1.5 Volts

Once you have established the correct header float and angle of cut for a particular harvesting application, proceed as follows:

Calibration of Sensors

1. Turn the key on in the cab of the combine, and wait for the display screen to activate.
2. Proceed to the header diagnostics section of the digital menu.\



Not available on all combines. Must use error codes given during calibration on some combines. Refer to combine Operator's Manual.

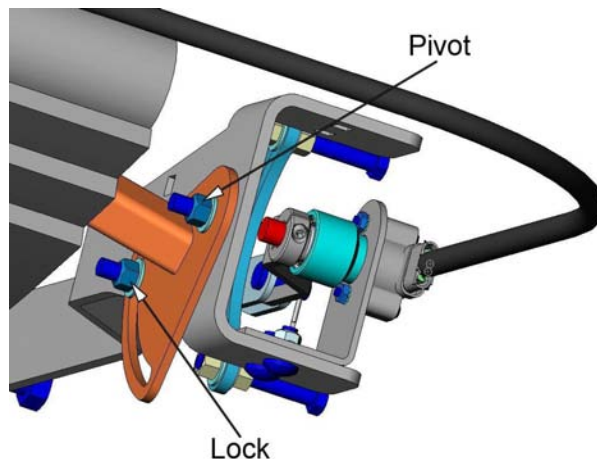
3. Begin recording the voltage readings for the maximum upward (raised) and maximum downward (lowered) ranges of the left sensor arm assembly.
4. Continue recording the voltage readings for the maximum upward (raised) and maximum downward (lowered) ranges of the right sensor arm assembly.
5. If the ranges recorded are within the chart ranges specified above, then proceed with header height control calibration in your combine operator's manual.
6. If the ranges are not within the ranges specified in the chart (either too high or too low), then proceed to Manually Adjusting the Sensors.

Manually Adjusting the Sensors



The following steps are best performed with two people – one in the cab of the combine, and one on the ground with the header height control sensors.

1. Determine the sensor, or sensors not properly calibrated.
2. On the sensor arm assemblies, locate the pivot lock and pivot bolts.
3. Loosen the set screw on the pivot arm, so that the sensor arm assembly can pivot independently of the sensor.
4. Adjust the sensor arms up or down in small increments, re-testing the voltage from the cab of the combine each time.
5. Once the sensor arm provides the required voltage ranges, tighten the set screw. If the sensor arm travel no longer reaches the upper or lower stop, move the stop into light contact with the arm.
6. Complete the header height control calibration, as detailed in your combine operator's manual.



Header Height Sensor - Rear Inside View

Adjusting the Overall Setup

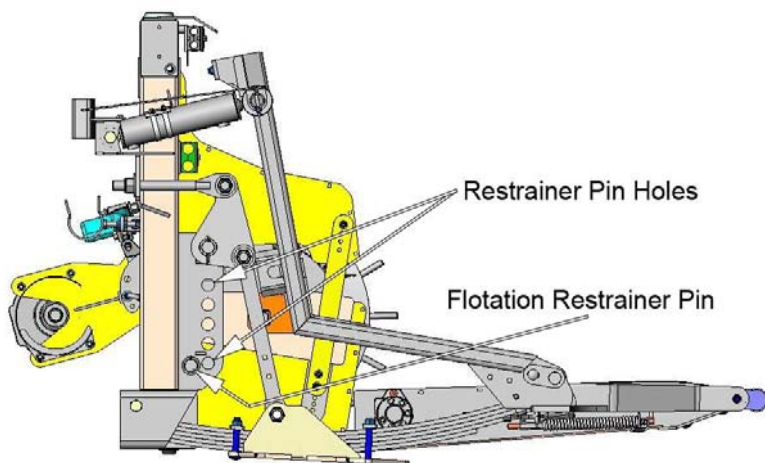
If the initial physical setup procedure did not bring the voltage readings within range, and if the total voltage available is too low (less than the Min. Variation listed for your combine), then there may be a problem with the physical setup of the header. One of two situations are commonly responsible for this problem. Please refer to Scenario 1, and Scenario 2 for possible problems, and corrective actions.

Once the appropriate corrective action has been taken, repeat Calibration of Sensors.

Scenario 1:

The flotation restrainer pins are set too high and need to be either lowered, or removed altogether and placed into the storage hole, to allow a full range of flotation.

To change the position of the flotation restrainer pins, refer to the “Header Flotation Restrainer Plate” subsection in the LEVELING chapter of the operator's manual.



Header Subframe - Right Hand Side

Scenario 2:

The link arm is set up too short (not pushed far enough in to the clevis pin slot). The clevis end of the sensor rod must be pushed to the rear, into the slot of the sensor arm. If it is not, you will get a very short or small voltage range.

To change this distance, see page 17, and proceed as follows:

1. Loosen the link arm set screw, located at the pivot.
2. Slide the clevis end of the link arm as far back as possible into the slot of the sensor arm while in its mid (horizontal) position.

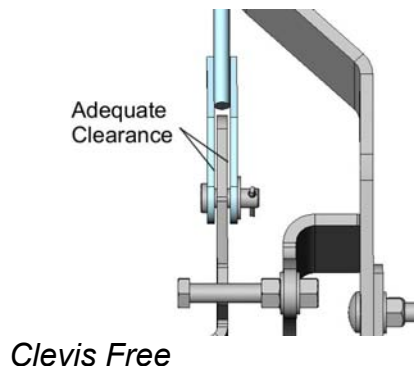
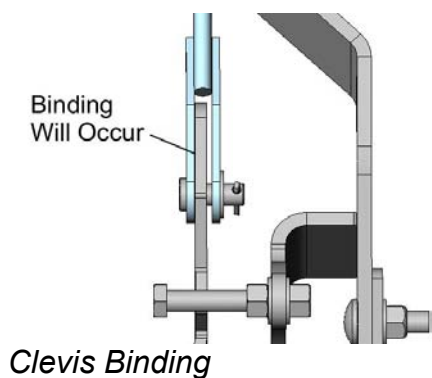


It is important to keep the rod and sensor arm in line with each other when performing this procedure. If they are not in line when securing the clevis pin into the sensor arm slot, the assembly will bind as it approaches horizontal.

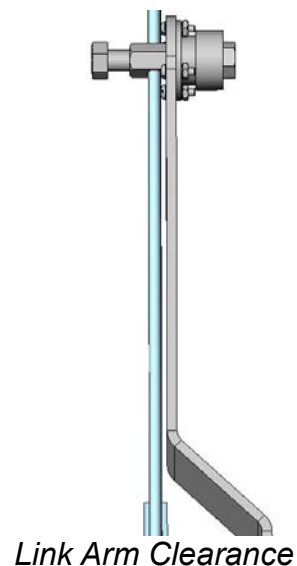
3. Re tighten the rod locking coupler nut.

Tips for smooth operation of the Header Height Control Sensors.

As discussed in Note of Scenario 2, ensure that the sensor arm is in it's mid (horizontal) position, and that the sensor rod and sensor arm are parallel with each other when tightening the rod locking coupler nut. (See the following photographs.)



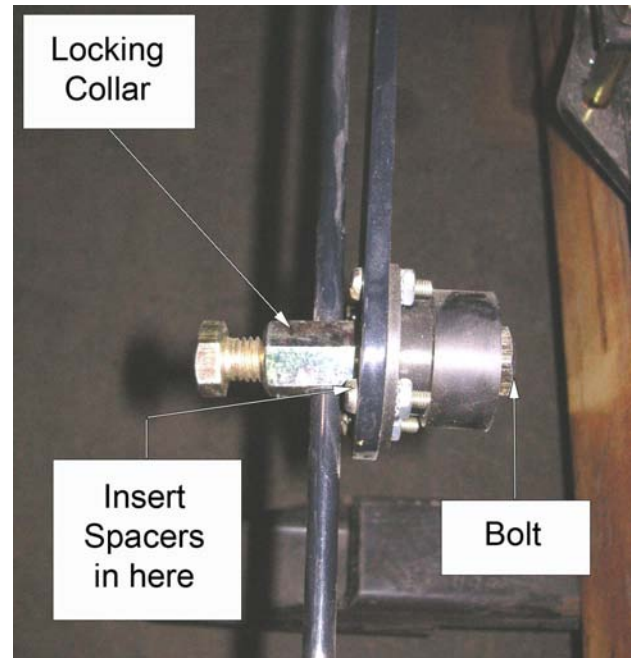
Ensure that the link arm is adequately spaced from the bearing assembly on the sensor mount, so that it moves freely and does not rub against the sensor mount.



If the sensor arm is too close or rubs on the sensor mount, it may be necessary to install one or more spacers (washers) behind the rod locking collar. Do this by first loosening the bolt on the inside of the sensor mount, then removing the rod locking collar. Next add spacer(s) into the pocket behind the locking collar, and re-assemble. Re-check the alignment and spacing between the sensor rod and sensor arm.

Ensure the sensor rod is free to move through the slot in the front sensor mount. If it is not moving freely, the sensor rod, sensor mount or sensor arm may be bent; or too many or too few spacers may have been installed in the previous adjustment.

Ensure you have a good line of sight down the link arm to the sensor arm. Some adjustment of the sensor arm may be required, and is acceptable, so long as it does not cause the voltage range to exceed the established limits.



Adding or Removing Spacers

Automatic Reel Height Control



The automatic reel height control may cause the reel to move unexpectedly on start-up. Ensure everyone is, and will remain well clear before turning the ignition key.

The reel height control operates in response to cutter bar movement as it follows ground contours. The minimum distance (“Safety Set Point”) between the cutter bar and the reel is selected from the combine. The sensors then monitor the cutter bar’s height; and activate the reel hydraulics to compensate for any changes that would compromise this minimum distance. Compensation is made directly by the reel height control as it electronically controls the valve responsible for the hydraulic flow to and from the reel lift cylinders.

Operation: Reel Height Control System

Power-On Test:

When the system is first powered up, it will perform a self-test and initialization procedure for approximately 10 seconds, prior to commencing normal operation. During this time, the cab Reel Height Control console will cycle through each indicator to test its operation.

Automatic and Manual Modes:

The operator can switch the system between Automatic Mode and Manual Mode using the Control Mode button on the cab console. The current mode will be shown in the lower left of the display.

Manual Mode Operation

In this mode, the combine reel height switch is active. The operator must monitor the reel height, and adjust the distance between the reel, and the knife manually.

Automatic Mode Operation



The cutter bar must be unlocked (floating) for this operation.

In Automatic Mode, the controller will automatically lift the reel if the safety set point is exceeded.

Up and Down input signals are transferred to the Up and Down outputs according to the controller logic, but a Down request will be blocked if it would cause the reel to go lower than the Safety Set Point. This is called the Block function, and the Block indicator is lit on the console when it is active.

If the reel and cutter bar get closer than the safety set point, the Up output is activated to lift the reel out of the way. This is called the Clear function, and the Clear indicator is lit on the console when it is active.

After a period of time, the controller will activate the Down output signal to return the reel to its set height. This is called the Return to Set function. The Return to Set indicator will be lit on the console when it is active.

Sensitivity:

The sensitivity of the control system can be adjusted using the multi-position rotary switch on the console. This may be used by the operator to adjust for different machine response, or crop conditions. The current sensitivity is shown in the upper right of the display.

High sensitivity will cause the reel to react more quickly and also cause the reel to move a greater distance. If the sensitivity is too high it will cause the reel to move too much or start hunting.

Low sensitivity will take greater cutter bar movement to move the reel and will move the reel less distance. If the sensitivity is too low, the reel fingers may be cut off by the knife.

When operating the reel close to the knife, a higher sensitivity will cause the reel to respond more quickly to small movements in the knife. Similarly, when the distance between the reel and knife can be set at a higher value, the sensitivity may be reduced, allowing the sensors to tolerate greater movement in the knife before responding.

Setting the Automatic Reel Height (Safety Set Point)

The Safety Set Point can be programmed when the control system is in Manual Mode.



To program the Safety Set Point, select Manual Mode using the Control Mode button.

1. Use the combine controls to place the reel at a safe distance from the cutter bar, place the header at cutting height, then press and hold the Set button until the display shows the message, "Set Point Stored."
2. Select Automatic Mode, using the Control Mode button to return to normal operation.
3. Use the combine controls to raise the reel slightly until the "Block" light goes out.
4. If the Automatic Reel Height control operation is not satisfactory, refer to Adjusting Cutter Bar Sensors for Reel Height Control.



Cab Console - Reel Height

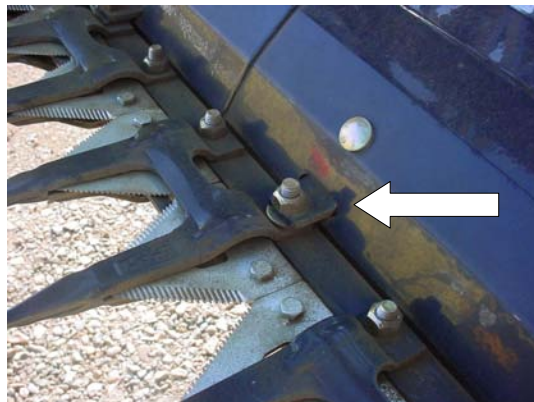
CAN Communication:

The cab console and the controller use an advanced system called CAN to communicate. When CAN communication is operating properly, the "Comm Active" indicator will be lit on the cab console. If the communication link fails, this LED will be extinguished. Depending on the type of failure, a diagnostic message may also be shown on the display.

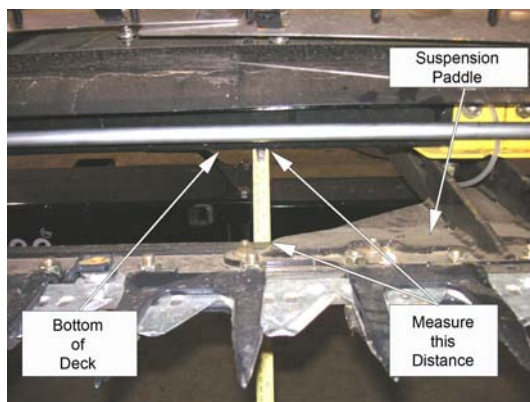
Adjusting Cutter Bar Sensors for Reel Height Control

In certain situations, it may be necessary to adjust or re-align the cutter bar sensors for the reel height control. Should these sensors become misaligned or require adjusting, proceed as follows:

1. With the header and reel fully raised, set the parking brake, reel lift locks and feeder house cylinder locks. Shut combine engine off and wait for all moving parts to come to a complete stop.
2. Remove the feather plates from the header by first removing the guard nuts that secure the feather plate tabs; then lift the whole feather plate out.
3. Next, verify that the cutter bar is set level. From the side of each suspension paddle, measure the distance between the back of the cutter bar and bottom of the deck. This measurement should be consistent.



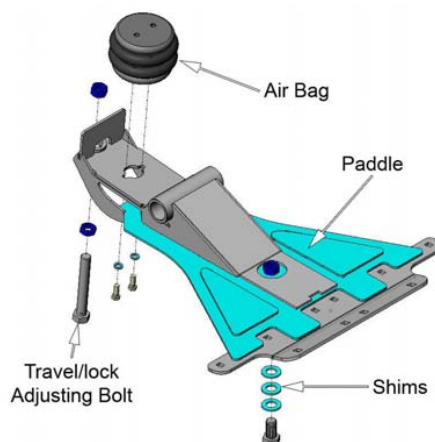
Feather Plate Tab



Leveling Cutter Bar

4. If the distance needs to be adjusted, do so by loosening the lock nut on the front or rear bolt on the suspension paddle, as required, and turn the adjustment bolt to attain the required distance. Re tighten the lock nut once the required spacing is achieved.

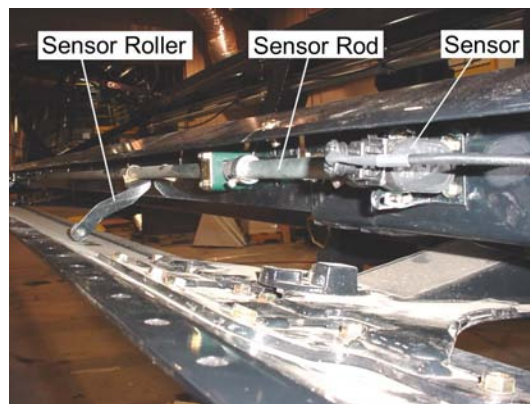
5. Loosen the clamp bolts that secure the sensor paddles to the torsion bar. The sensor paddles should now be free to move up and down without moving the sensor rod. Do one sensor paddle at a time.



Knife Suspension Paddle

6. Set the height sensor paddles at the front of the deck. This is done by rotating the sensor paddle until it is resting on the cover plate. As the clamp bolts were loosened earlier, it will be necessary to tighten them once the sensor is properly set. This will hold the sensor paddle in place.

7. Check to be sure there is some resistance through the whole range of motion of the sensor paddles. If there is not, locate the resistance spring on each sensor rod. Loosen the bolt securing the spring, and rotate the spring so that the tine pushes against the deck, causing a "downward pressure" on the sensor paddles. Re-tighten the lock bolt. This should hold all the sensor paddles, with moderate pressure, to the paddle stops.



Reel Height Sensor

8. If all sensor paddles are flush and snug against their corresponding paddle stops, and all bolts have been re-tightened, the feather-plates can be reinstalled. Start with the center feather plate (if removed), and build out from either side of it with the remaining feather plates.

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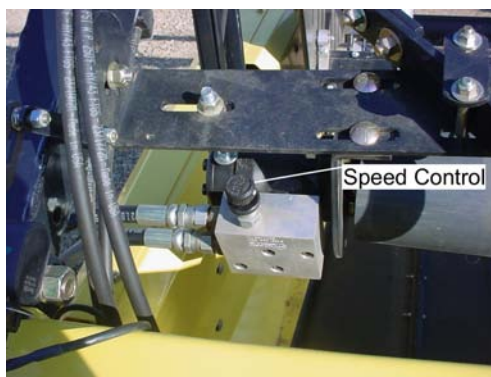
Cross Auger Assembly

The Grain Belt Plus Header is available with a cross-auger. This option is beneficial when harvesting light, or bulky crops that tend to bunch up on the table due to their bushy texture. The cross auger improves the flow of cut product toward the feeder decks.

The cross auger is powered by a hydraulic motor that is fed from the left draper motor return port. The oil from the cross auger motor then feeds back into the main return line, to the left feeder deck motor. You can adjust the speed of the cross auger by turning the needle valve, located on the manifold mounted to the cross auger motor.



Cross Auger



Speed Control

Honey Bee Manufacturing Ltd.
Box 120
Frontier, Saskatchewan
S0N 0W0

Tel (306) 296 - 2297
Fax (306) 296 - 2165

www.honeybee.ca
e-mail info@honeybee.ca

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