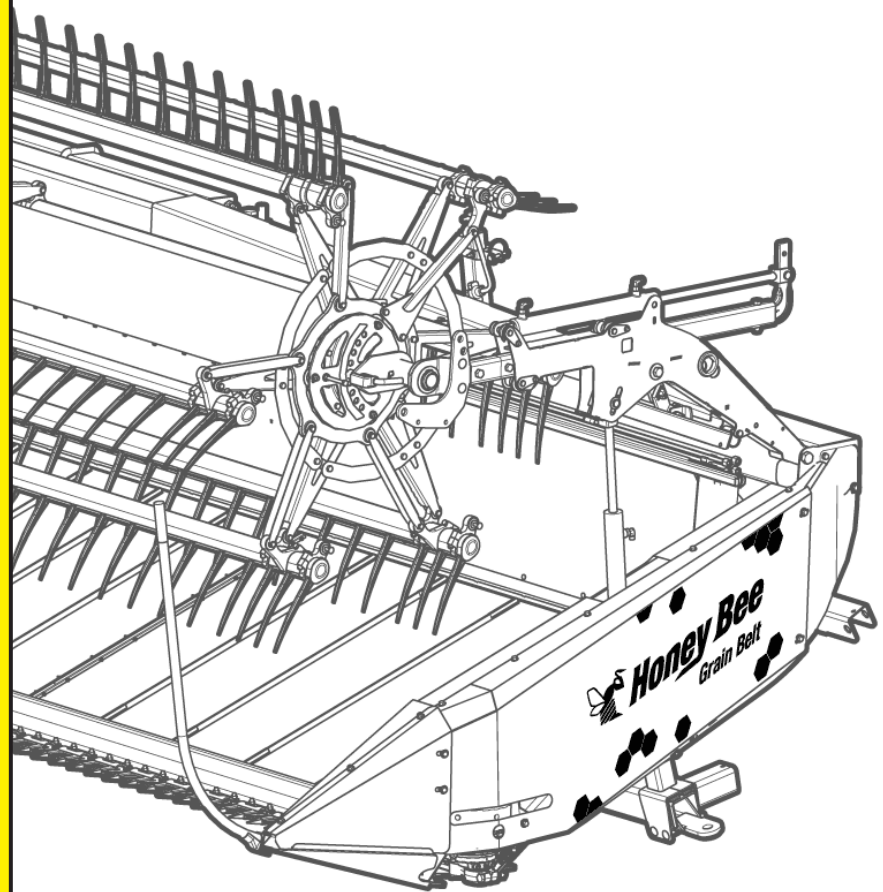


2021

Grain/Rice Belt Header Operator Manual



Document Revision History			
Revision	Author	Date	Description
1.0	AD	18/12/2018	Updated illustrations to show updated hitch jack Updated all hydraulic schematics Replaced coverimage Added draper flow control illustration for single pump config. Removed Deck Shift info (to be included in separate supplement)
1.1	AD	01/31/2020	Update hydraulic tilt cylinder Added FENDT information Updated hydraulic schematics Updated reel lubrication info
1.2	AD	02/01/2020	Added deck shift information

Grain/Rice Belt Header Delivery Inspection Report

TO THE DEALER: *This form must be completed and returned to Honey Bee Manufacturing Ltd. along with the Warranty Registration Form. (please print)*

Model: _____ Serial #: _____
Check Completed By: _____ Signature: _____
Dealer Name: _____ Date: _____

As soon as you receive this machine, inspect it thoroughly to be certain that it is in good order and complete. Finish a pre-delivery inspection, paying special attention to the steps listed below, prior to delivery to the customer. Indicate with a tick mark in the left-hand column when correct/complete.

Pre Run-In Checks:

- ☐ Crop dividers and crop divider pipe/snub nose installed (*see section 5.2 for details*)
- ☐ Quick couplers match power unit.
- ☐ Reel tie-down removed.
- ☐ Knife drive hold down bolts torqued to 120 ft-lb (163 Nm). (*see decal located next to the knife drive*)
- ☐ Knife head block cap screws torqued to 41 ft-lb (56 Nm).
- ☐ Knife head cross bolt torqued to 53 ft-lb (72 Nm) for CNH/Crary knife or 73 ft-lb (99 Nm) for SCH knife.
- ☐ Reel centered in header left to right (*see section 9.6*).
- ☐ Reel fingers clear cutterbar by approximately 2" across length of the knife (*see section 9.7*).
- ☐ On all split reel headers in order to fully extend RH reel lift cylinder the header reel must be running.
- ☐ Safety and warning decals affixed securely and clearly readable (*see section 4.15*).
- ☐ Safety guards and shields installed and secure.
- ☐ Header lubricated (*see section 7*).
- ☐ Optional equipment, as per sales order, is installed and operates correctly.

Mounting Checks:

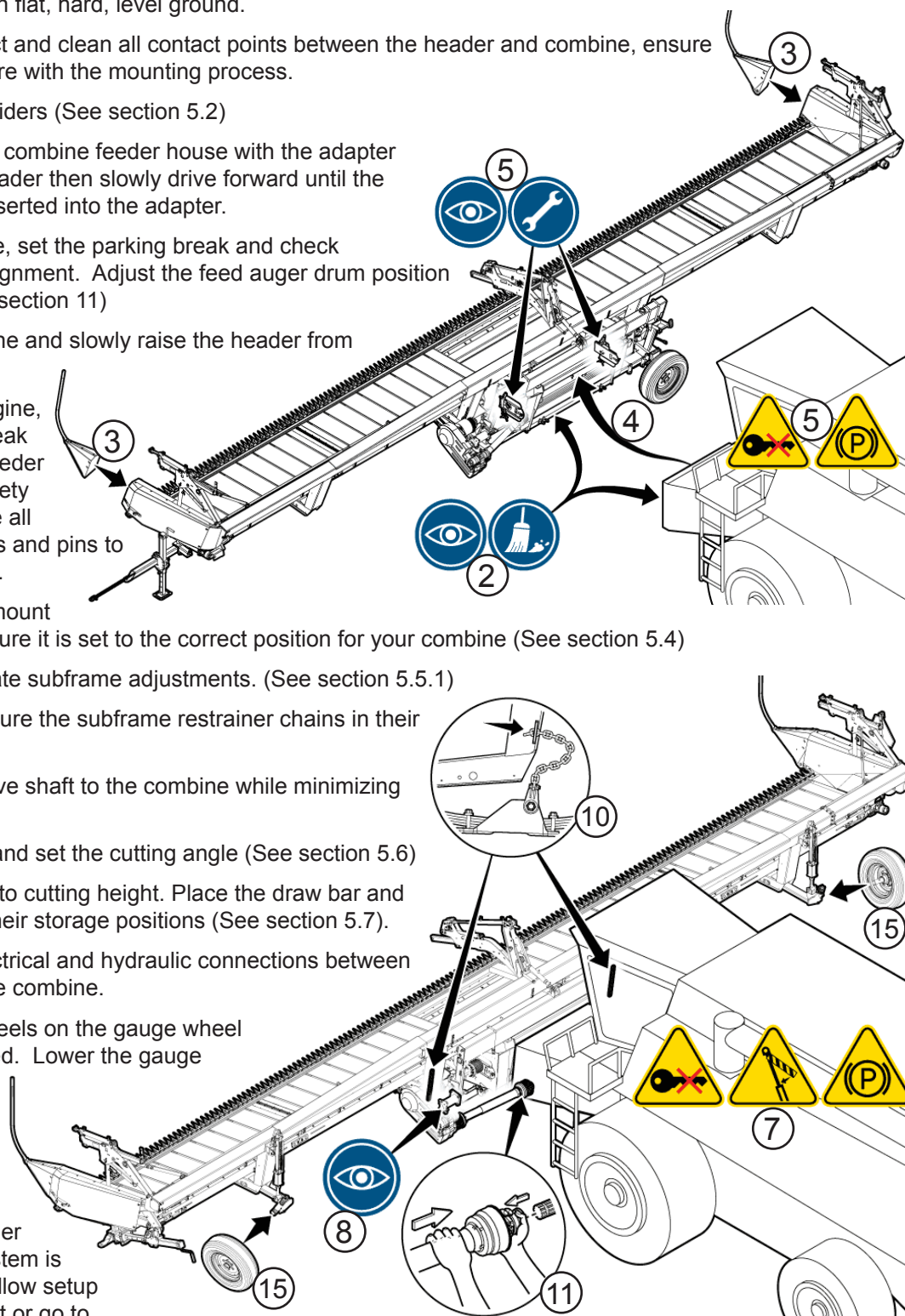
- ☐ All adapter installation instructions completed.
- ☐ Hydraulic oil pressures and flow rates are set.
- ☐ Electrical systems working properly.
- ☐ Table drop rate valve installed and set properly.
- ☐ Hydraulic plumbing is leak-free.
- ☐ Drapers on all decks track evenly with adequate clearances between draper, end strut gauge wheels, and the transport hitch jack (in its storage position).
- ☐ Drapers are tensioned. DO NOT OVERTIGHTEN.
- ☐ Header is leveled for field operation.
- ☐ Header Lift Link Bolts need to be set so there is 3" of space between the Lift Link and Lift Link Lug (not to exceed 5"). (*See section 5.6*).

Pre-Transport Checks

- ☐ Hitch and axle attached and secure.
- ☐ Reel lowered in the full-aft position, and tied down, and restrained from rotating. Caution: Do not bend center tubing.
- ☐ Wheel bolts torqued to 120 ft-lb (163 Nm).
- ☐ Tire pressures @ 80 psi (552 KPa)
- ☐ All lock pins in place and securely fastened.
- ☐ All fasteners and parts secure.
- ☐ Wiring, hydraulic hoses, and fittings/connections secure.
- ☐ Wiring and hoses tied up securely for transport.
- ☐ Reflectors and SMV sign in place and clean.
- ☐ Warning and clearance lights installed and operational.

Grain/Rice Belt Header Quick Start Guide

1. Park the header on flat, hard, level ground.
2. Thoroughly inspect and clean all contact points between the header and combine, ensure nothing will interfere with the mounting process.
3. Install the crop dividers (See section 5.2)
4. Carefully align the combine feeder house with the adapter opening on the header then slowly drive forward until the feeder house is inserted into the adapter.
5. Turn off the engine, set the parking break and check clearances and alignment. Adjust the feed auger drum position if necessary (See section 11)
6. Restart the combine and slowly raise the header from the ground.
7. Shut down the engine, set the parking break and engage the feeder house cylinder safety stops then engage all feeder house locks and pins to secure the header.
8. Check the pump mount plate position, ensure it is set to the correct position for your combine (See section 5.4)
9. Make all appropriate subframe adjustments. (See section 5.5.1)
10. Unhook and resecure the subframe restrainer chains in their longest position.
11. Secure the pto drive shaft to the combine while minimizing the shaft angle.
12. Level the header and set the cutting angle (See section 5.6)
13. Lower the header to cutting height. Place the draw bar and transport axle in their storage positions (See section 5.7).
14. Secure all the electrical and hydraulic connections between the header and the combine.
15. Install the axle wheels on the gauge wheel brackets if equipped. Lower the gauge wheel jack until the spring shaft is compressed by 1-1.5". (See section 5.8)
16. If HoneyBee Header Height Control system is installed please follow setup instructions with kit or go to honeybee.ca/manuals for more instructions.



1 - Important Notices

This manual covers Honey Bee Grain Belt Headers, compatible with only the following combines:

John Deere	9400, 9500, 9600, 9410, 9510, 9610, CTS, CTSII, 60, 60STS, 70, 70STS, S650, S660, S670, S680, S690, 9450, 9550, 9650, STS, T670
Case/IH	1660, 1680, 1688, 2166, 2188, 2366, 2377, 2388
NH CR	9040, 9060, 9065, 9070, 9080, 9090, 6.80, 6.90, 7.90, 8.90, 9.90, 10.90
NH CX	8070, 8080, 8090, 8.8, 8.9
Case/IH AFX	7010, 8010
Case/IH AF	5088, 6088, 7088, 7120, 8120, 5140, 6140, 7140, 7240, 8240, 9240
Lexion	400, 500, 600, 700 Series
Gleaner	A85, R66, R76, S67, S77, S68, S78, S96, S97, S98, S88 *2007 & newer.
Massey	9790, 9895, 9520, 9540, 9545, 9560, 9565
Challenger	540, 540C, 560, 560C *2007+
Fendt	Ideal 7, 8, 9



IMPORTANT!

Review the sections of this manual regarding adjustments, settings, leveling, and table height before attempting to operate this header.

Without proper adjustment, damage to the header may occur.



IMPORTANT!

Please wash this equipment after transporting!

Honey Bee Manufacturing will not be responsible for any paint deterioration resulting from salt or harsh chemical corrosion if this equipment is not properly washed after transport. Use a mild soap solution, then rinse thoroughly.

If this equipment is stored near salted roadways through the winter months, it should be cleaned each spring.



IMPORTANT!

If reading this as a digital document:

Please be aware that the table of contents and cross references within this document can be clicked to bring you directly to the contents they reference.

On most software, you can press CTRL+F to bring up a search box that allows you to find specific words or terms within the document.

2 - Purchase Information

Dealers Name: _____

Address: _____

Phone: () _____

Purchase Date: _____

Model: _____

Serial Number: _____

Delivery Date: _____

Modification Record	
Date	Modification

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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3 - Introduction

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

This manual should be considered a permanent part of your header and should remain with the machine when you sell it.

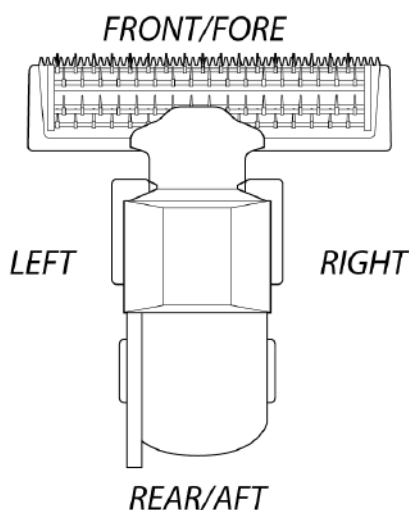
Use only correct replacement parts and fasteners. Metric and inch fasteners require a specific metric or inch wrench.

All names given in this document for equipment components are those in use at the time of design.

Please write down your equipment serial numbers in the Specification section. Accurately record all the numbers to help in tracing the header should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

3.1 - Directions

Right and left hand sides are determined by facing in the direction the implement will travel when going forward.



3.2 - Warranty

Honey Bee Manufacturing Ltd. (Honey Bee) warrants your new Grain Belt 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 first use 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.

3.2.1 - 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 on the Honey Bee Manufacturing Ltd Claim Form (CFI).

3.2.2 - 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 Header.

This warranty shall not apply to any Header table 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.

3.2.3 - Operator's Manual

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

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4 - Safety

YOU are responsible for the safe operation and maintenance of your Honey Bee Header. YOU must ensure anyone who is going to operate or work on the Header is familiar with the operating and maintenance procedures and related SAFETY information contained in this manual.

Remember YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Unauthorized modifications to the header may impair the function and/or safety and affect header life.

4.1 - Operation and Maintenance Requirements

Operating instructions for this header should be reviewed by each operator at least once a year. The meaning of each decal should be understood, and their locations should be known prior to operating the header.

4.2 - Understand Signal Words

The following are safety terms used around the equipment and throughout this manual. Please read and understand their descriptions.



This is a safety-alert symbol. When you see this symbol, be alert to the potential for personal injury. Follow recommended precautions and safe operating practices.

DANGER!

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

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 alert against unsafe practices.

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.

IMPORTANT!

Warns of potential damage to the header if proper procedures are not followed.

NOTE:

Notifies you of important information to which you should pay attention.

4.3 - Hydraulic Safety



WARNING!

This machine is powered and run by hydraulic oil under high pressure. Caution must be taken around the machine because high pressure hydraulic fluid can penetrate the skin causing serious injury and possibly death. When looking for a hydraulic leak, always hold a piece of cardboard up to the suspected area. Never use your unprotected hands to locate a leak.

Always wear eye protection, gloves and long sleeve clothing when working near hydraulics. Small leaks can be completely invisible.

You can reduce this hazard by relieving the system pressure before disconnecting hydraulic lines. Once finished, tighten all connections to specifications before re-applying pressure.



WARNING!

If a hydraulic-related accident occurs, see a doctor immediately. Any hydraulic fluid injected into the body 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.

4.4 - General Safety

Maintain moving parts, hydraulics and motors clear of chaff and straw to prevent the possibility of fire.

Carry a multipurpose fire extinguisher in the power unit and know how to use it. Check the extinguisher regularly and keep it fully charged.

Provide a first aid kit in the cab for emergencies and know how to use it.

Do not wear loose clothing or jewelry around moving parts.

Wear appropriate protective gear. This list 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

Do not allow anyone to ride on the header while it or the power unit is in motion.

Make certain that the park brake is engaged, and the power unit is in neutral before starting the engine.

Clear the area of bystanders, especially small children before starting the power unit.

Do not allow anyone to operate the header who has not been instructed in how to operate the machine.

All operators should familiarize themselves with the SAFETY section in the Power unit Operators Manual.

Some pictures or illustrations in this manual may not show protective shields in place. This is done in order to make important components visible. Make certain that all protective shields are secured in place before operating the machine.

4.5 - Operating Safety – Good Practices

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.

Either lower both the table and the reel, or raise the header to its full height and set the platform lock before servicing the header. If working under the reel, set the reel cylinder locks. A loss of hydraulic pressure could cause the header and reel to lower unexpectedly.

NEVER operate machinery while fatigued, sick or otherwise impaired.

Do not operate the header in crowded or confined areas.

Remember, some models of the header are not centered on the combine feeder house, it may be offset to the right, which may distort your judgment.

DANGER!

DO NOT stand between the combine and the header while the header is being raised or lowered.

4.6 - Maintenance Safety

Before undertaking any maintenance, engage the park brake, either lower the reel and header, or raise and lock the header using the platform lock and shut off the engine of the combine. Make sure there is no pressure being supplied to the hydraulic lines.

Hydraulic leaks can penetrate the skin causing serious injuries. Small leaks can be invisible and are the most dangerous. Use some kind of object, such as cardboard, to find the leak -- DO NOT USE YOUR HAND.

Ensure that all pressure is released from the hydraulic lines before starting a repair. Replace or repair damaged hoses immediately.

Care should be taken when maintaining the knife. Sickle sections are very sharp and can easily cause severe injury. Use heavy leather or canvas gloves when working with the knife. Always ensure everyone is well clear before moving the knife, manually or under power.

4.7 - Transport Safety

- Transport the header with the SMV (Slow Moving Vehicle) sign clearly displayed on the rear of the header and use your hazard lights if the law permits. Check local road laws before transporting.
- When transporting the header on roads, always be aware of the width of the header.
- For long - distance transporting completely install the full transport assembly. (See dismount section).
- Do not transport the machine at night, at dawn, or at dusk.
- Ensure hitch is firmly attached and secured with hitch pins before moving.
- Attach the hitch safety chain before moving.
- Do not exceed 32 kph (20 mph) during transport.
- The towing vehicle must weigh a minimum of 67% of the weight of the header being towed.
- Use caution when making turns in order to avoid loss of control.

4.8 - Before Transport Checklist

Do a complete walk-around and ensure everything is secure.

Check:

- All reel mounting, reel drive and adapter assembly bolts to be sure no bolts/nuts are loose;
- Wheel bolts to make sure they are tight;
- Transport tire pressure - recommended pressure is 80 psi (552 kPa)
- Spindle and hitch lock pins - ensure they are in place and securely fastened.
- Inspect all hoses. Ensure they are secured so they will not pinch or drag during transport.
- Ensure hitch tongue and safety chain are fastened to the header and to the transporting vehicle.

4.9 - During Transport Checks

Stop after the first 5 to 10 kilometers (2 to 6 miles) and check to make sure the wheel bolts are tight (The bolts should be torqued to 120 ft-lb (163 Nm)) and ensure the wheel hubs are not hot. Make periodic checks every 50 to 60 km (31 -37 miles) if towing the header long distances.

Check the hitch bolt and safety chain periodically to make sure they are secure.

4.10 - In-Field Checks

The First Time Setup and Operation section of your owner's manual covers the adjustments which may be required on your Grain Belt header. Read this section carefully before using your Grain Belt header. Make the necessary adjustments before operating your header, and check these adjustments periodically as required.

4.11 - Storage

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

If the storage location exposes the header to road salt during the winter months, thoroughly wash the header in spring time.

It is recommended to rotate the drapers so that the seam of the join is located underneath the table. This will improve drainage, thus reducing the possibility of ice buildup stretching, and damaging the draper material.

4.12 - High Pressure Spray



IMPORTANT!

Avoid spraying yourself, sensitive electronics or hydraulic connections with a pressure sprayer.

4.13 - Using Correct Torque Values



IMPORTANT!

It is extremely important that you use the correct torque values when servicing your header. Failure to follow the torque recommendations in section 15.6 can result in equipment damage or injury.

4.14 - Fire Prevention



WARNING!

Inspect the header for material buildup on a daily basis. Build up of chaff and crop debris near moving parts is a fire hazard. Check and clean these areas frequently. Before inspection or service, shut off engine, engage the parking break, remove the key and wait for all moving parts to come to a stop.

Keep a fire extinguisher with your equipment at all times and ensure the operator is educated in its operation.

4.15 - Safety Decal Locations

The following safety decals have been placed on your machine in the areas indicated. They are intended for your safety, and the safety of those working with you. Please take this manual, walk around your machine and familiarize yourself with the locations and content of these warning signs and labels. Review this information, and the operating instructions in this manual with your machine operators. Keep decals legible. If they are not, we suggest you obtain replacements from your Honey Bee dealer.

- Keep them clean.
- Know the location and meaning of all decals. Cross reference the numbers on the diagram below with the chart on the following pages to help identify the labels.

For continued safe operation of this machinery, it is recommended that you replace damaged safety decals immediately. You may purchase replacement decals from your dealer.

The following illustration indicates the location of all safety decals on your header. Match the number indicated in this diagram to the numbered illustrations provided.

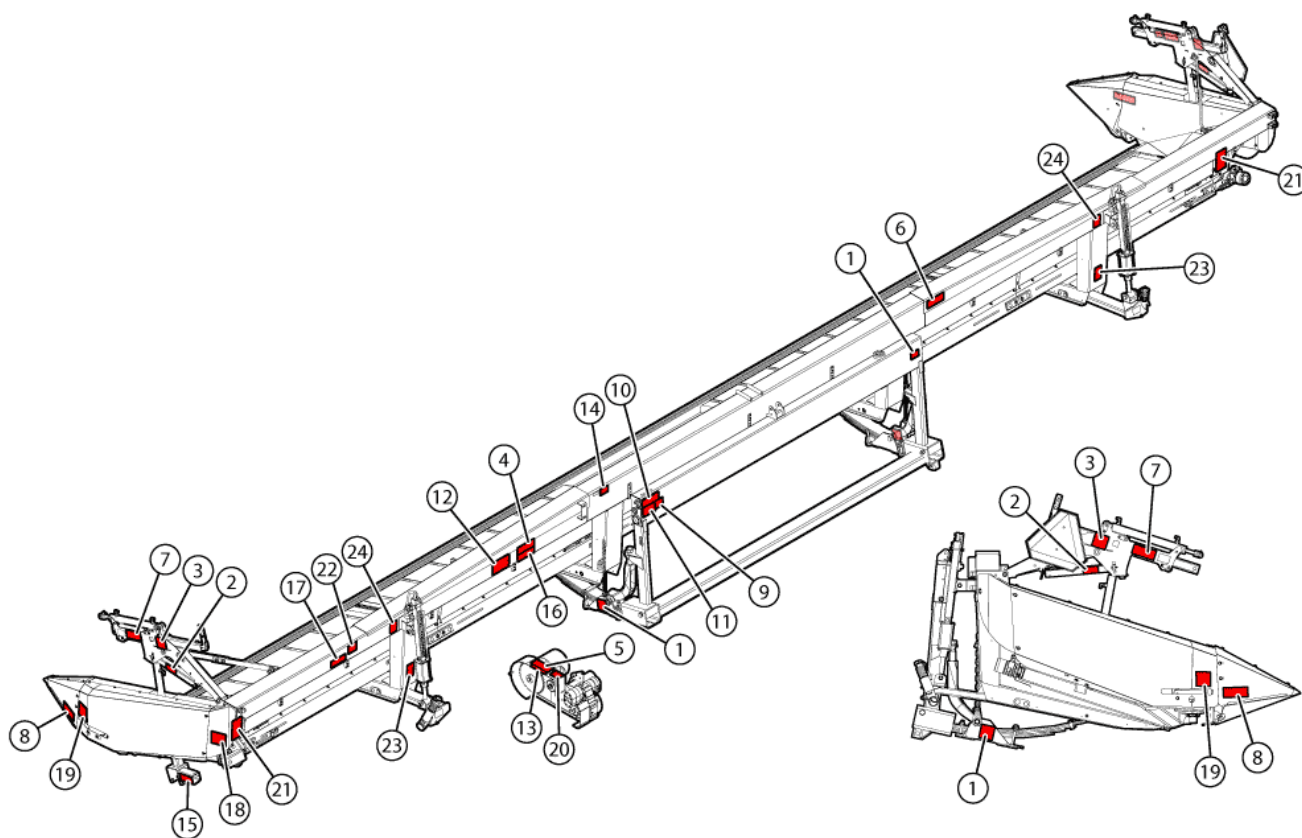


Fig. 1 - Safety Decal Locations

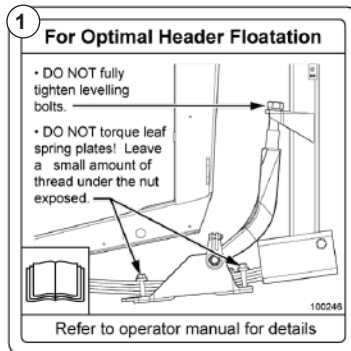


Fig. 2 - Decal - Floatation Info

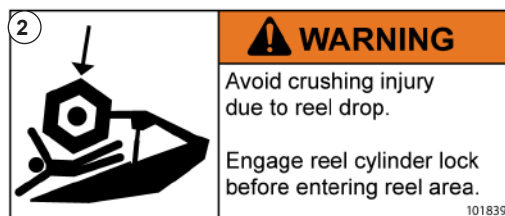


Fig. 3 - Decal - Reel Drop Warning

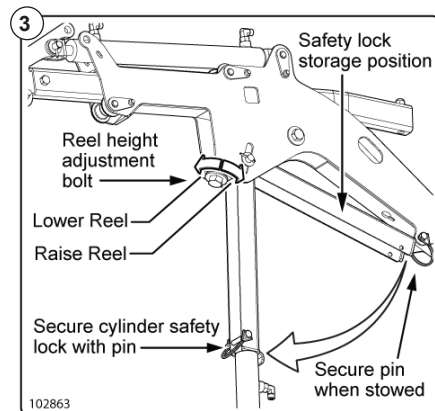


Fig. 4 - End Reel Arm Instructions

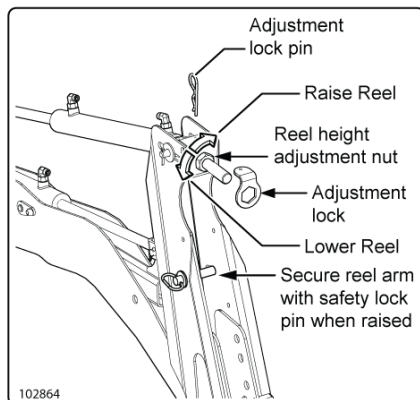


Fig. 5 - Center Reel Arm Instructions
(Not shown in decal illustration)

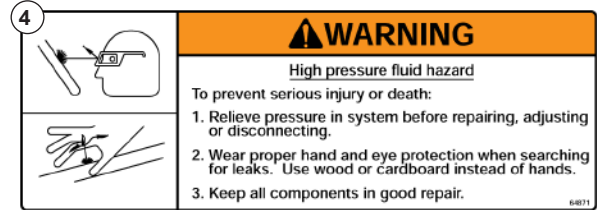


Fig. 6 - Decal - Hydraulic Warning

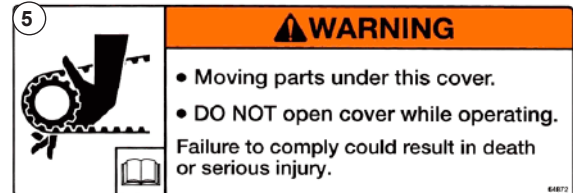


Fig. 7 - Decal - Cover Opening Warning



Fig. 8 - Decal - Pinch Warning

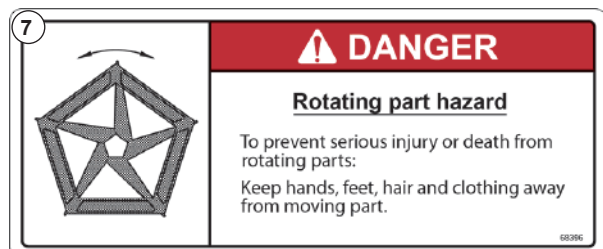


Fig. 9 - Decal - Rotating Reel Warning

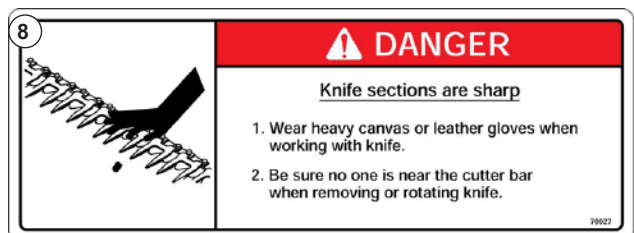


Fig. 10 - Decal - Sharp Knife Section Warning



Fig. 11 - Decal - Service Warning

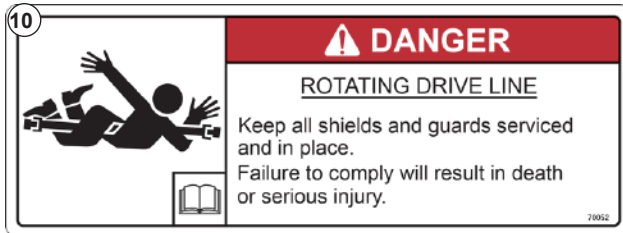


Fig. 12 - Decal - Drive Line Warning

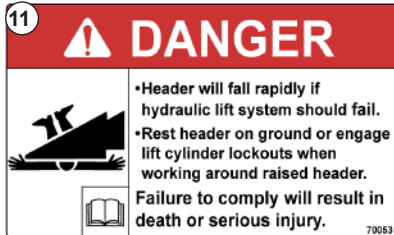


Fig. 13 - Decal - Header Drop Warning

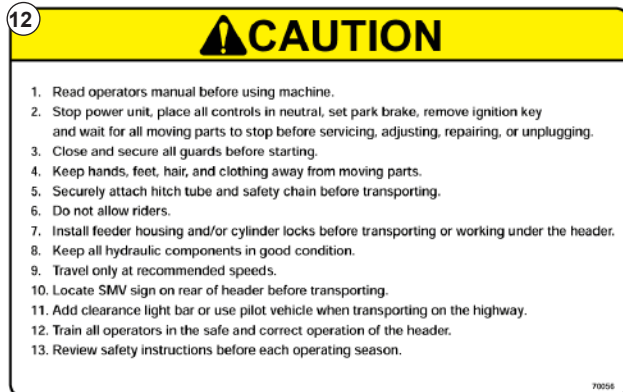


Fig. 14 - Decal - Read Operator Manual

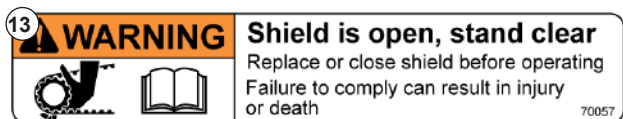


Fig. 15 - Decal - Open Shield Warning

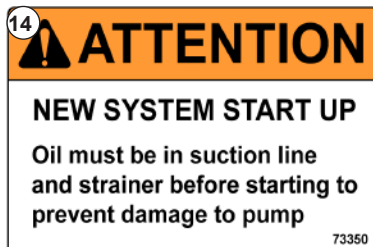


Fig. 16 - Decal - Startup Oil Attention

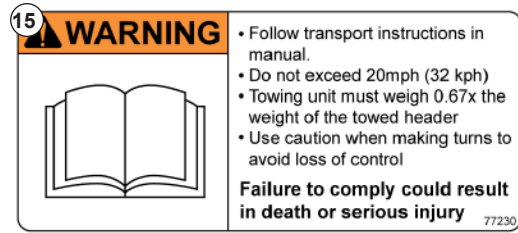


Fig. 17 - Decal - Transport Safety

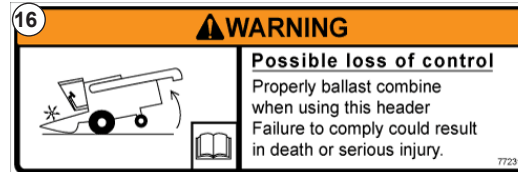


Fig. 18 - Decal - Ballast Warning



Fig. 19 - Decal - Read Operator Manual

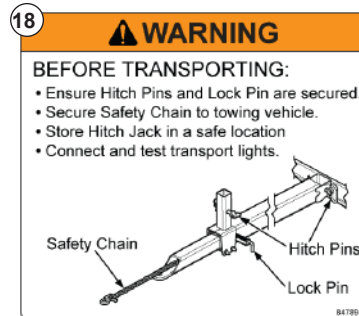


Fig. 20 - Decal - Transport Hitch Safety

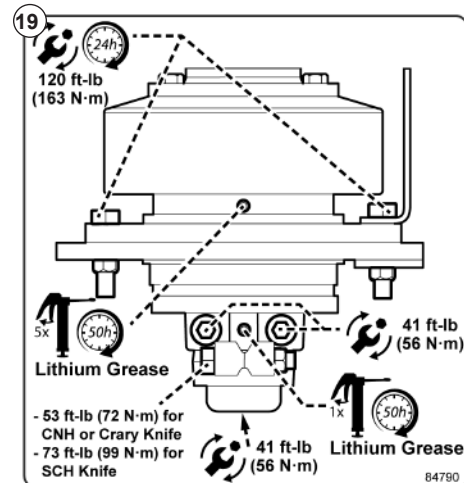


Fig. 21 - Decal - Knife Drive Maintenance

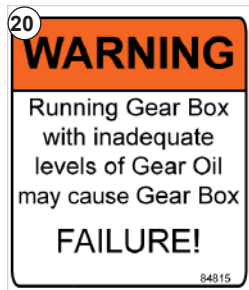


Fig. 22 - Decal - Gearbox Lubrication Warning

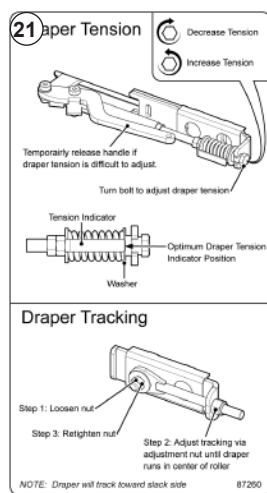


Fig. 23 - Decal - Draper Inst.

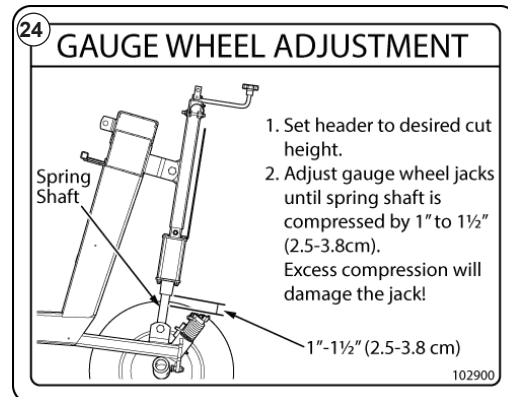


Fig. 26 - Gauge Wheel Instructions

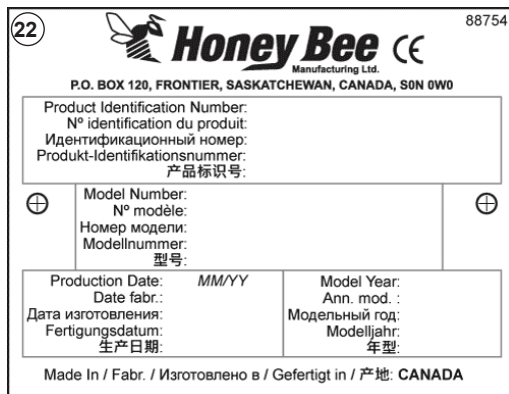


Fig. 24 - Serial Number Plate



Fig. 25 - Pinch Point

5 - Mounting Instructions

These instructions are designed to help you safely and easily mount your Grain Belt Header onto the combine.

Use the Mounting Checklist at the end of this section to ensure that the header is mounted properly and is ready for the field.

Follow the instructions in this chapter before attempting to operate your header.

5.1 - Combine Preparation

1. Check the combine feeder house to ensure there is nothing that will interfere with the connection to the header. Clean all contact areas thoroughly.
2. Check all locking mechanisms and/or lock pins on feeder house of combine to ensure they work properly and will not interfere with mounting the Grain Belt Header.
3. Check for leaks and loose fittings on hydraulic lines. Repair if necessary.
4. Ensure the feeder house output speed matches the recommended speed of the header. See section 15.3.2 for details.

5.2 - Header Preparation

1. Check the feeder house adapter area on the Grain Belt Header for obstructions.
2. Ensure the hydraulic pump, hoses, and drive shaft are clear of the feeder house adapter. If necessary, slide the pump back on its mount.
3. Check hydraulic hoses to be sure the couplers match those on the combine.

NOTE:

Some hydraulic connectors may not be supplied with the Grain Belt Header.

If the transport package is not installed, place the header on flat, hard and level ground as described in section 12.2.

4. Park the Grain Belt Header on flat, hard, and level ground. Level the header by adjusting the hitch jack.
5. Install the crop divider pipes on the crop dividers, then install the crop dividers on each end of the header.

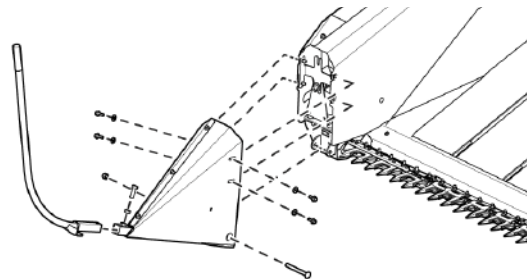


Fig. 27 - Crop Divider Installation

NOTE:

The crop dividers may have to be removed when transporting on public roadways in order to comply with width restrictions.

NOTE:

The crop divider pipe is intended to be used when cutting off the ground, and the stub nose is to be used when cutting close to the ground.

NOTE:

Ensure feederhouse angle is set so that when bottom of feederhouse is approximately 2 ft (60 cm) off the ground and the face of the feederhouse is approximately perpendicular with the ground. The guard angle should be approximately level with the ground when the header cutter bar is on or in close proximity to the ground.

5.3 - Positioning Header on Feeder house:

1. Position combine directly behind the header with the feeder house aligned as closely as possible, on center, with the adapter on the header sub frame.
2. With the feeder house on the combine lowered, slowly drive the combine forward until the feeder house front is aligned both vertically and horizontally with the adapter on the header. If the feeder house angle does not align horizontally, adjust the optional hitch jack to improve alignment.

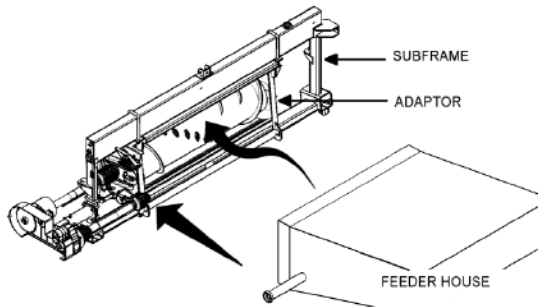


Fig. 28 - Combine-subframe alignment

3. 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. Slowly raise the feeder house on the combine until the top of the feeder house makes contact with the inside top of the feeder house adapter.



IMPORTANT!

If the bottom of the feeder house makes contact with the auger adapter too soon, it may be necessary to extend the top link on the sub frame (See section 5.6).



WARNING!

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

5. Check clearance and alignment of the feeder house to the adapter.

6. Check 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 to a more forward position in the adapter (See section 11.1.3.)
7. If the feeder house and the adapter are properly aligned, restart the engine and raise the feeder house (and header).



IMPORTANT!

If feeder house and the feeder house adapter ARE NOT properly aligned, repeat steps 2, 3, 4, and 5.



WARNING!

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

Engage the feeder house lock as described in your Combine Operators Manual.

8. With the header in the raised position insert all lock pins and/or header adapter locking bolts as described in your combine owner's manual.



CAUTION!

Be sure all lock pins are properly installed before proceeding.

5.4 - Pump Mount Plate Position

Ensure that the hydraulic pump is in the correct position by observing the pump mount plate. If adjustment is required, simply remove the two nuts and bolts, reposition the pump and re-install the nuts and bolts indicated.

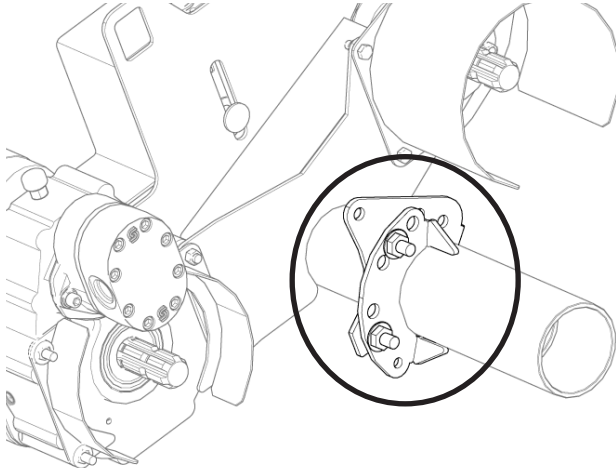


Fig. 29 - Pump Position - CAT Combines

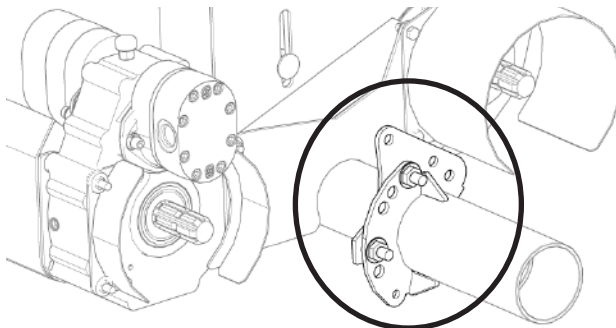


Fig. 30 - Pump Position - CaseIH, New Holland, JD Combines

5.5 - Coupling

5.5.1 - Sub Frame Adjustment

The sub frame requires some adjustment to allow full floatation of the header in the field

1. After the header is mounted to the combine, lengthen the right sub frame leveling bolt to allow approximately 3" between the lift link and the lift link lug.
2. Repeat the adjustment on the left side.

DANGER!

Do not allow more than 5" at the space below the lug shown below or the table may drop!

NOTE:

This adjustment allows the cutter bar to drop down, giving more clearance between the ground and the feeder deck. Further adjustments can be made as necessary.

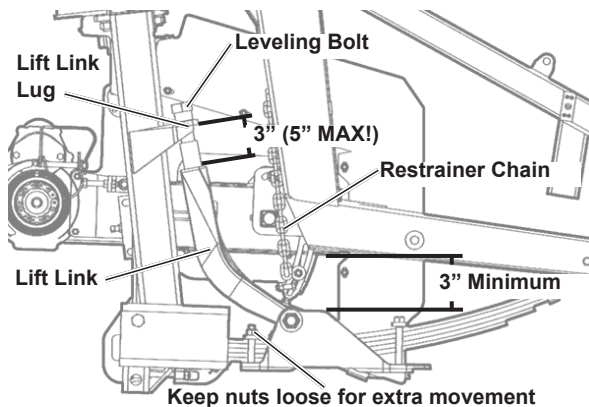


Fig. 31 - Header Subframe Side View

For further instruction on leveling the header, see section 5.6.

5.5.2 - Electrical Connections

If the header hydraulic system is used to drive the reel, the flow control will be equipped with a remote speed adjustment. Connect power wires to a power source on the combine and install a switch in a convenient location.

- Connect warning lights and flashers.
- Connect reel speed sensor wires.

5.5.3 - Restrainer Chains

The restrainer chains located on the left and right sides of the subframe restrict the amount of header floatation and suspend the adapter when the header is in the transport/dismount position.

Unhook the chains and re-attach them in the longest position. This will provide unrestricted header floatation in the field.

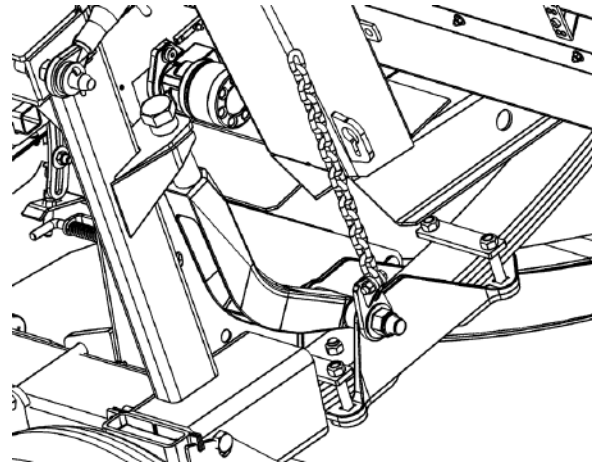


Fig. 32 - Subframe Restrainer Chain

5.5.4 - Coupling the Drive Shaft

Remove the pin and lift the telescoping drive line from the storage bracket. Replace the pin and close the clip. Couple the drive line to the combine output shaft. Align the drive line so that a minimal amount of angle is required when the drive line is coupled.

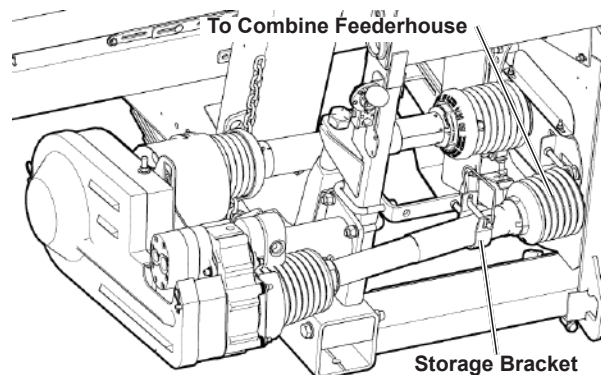


Fig. 33 - Drive Shaft Detail

5.6 - Tilt and Leveling

The header is attached to the adapter by the top link (or optional hydraulic tilt cylinder), and the two leaf springs. The top link/tilt cylinder adjusts the forward angle of the table. This directly affects the angle of the cutter bar. The adjustment bolts on the spring saddles adjust leveling and the overall height. Turning the adjustment bolts will alter the clearance between the ground, and the back of the center deck.

5.6.1 - Forward Angle – Manual Adjustment

Loosen lock tab on top link.

- Turn top link clockwise to tilt header back
- Turn counter-clockwise to tilt header forward.

Re-tighten lock tab once desired header angle has been reached.

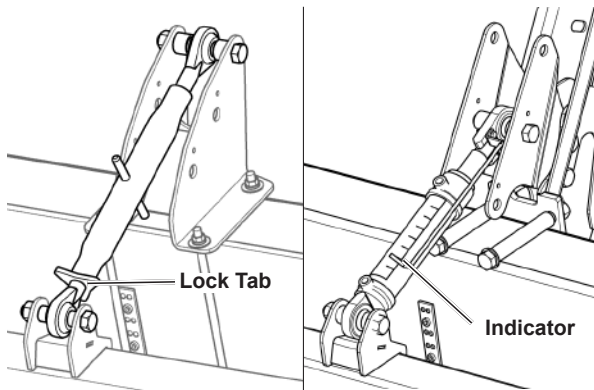


Fig. 34 - Manual & Hydraulic Top Link

NOTE:

The top link connection may look slightly different for each machine.

CAUTION!

Do not over-extend top link. OVER-EXTENSION OF LINK MAY CAUSE TABLE TO DROP SUDDENLY.

5.6.2 - Leveling, Table Height & Adjustment

See Fig. 31 for reference.

- Shortening the leveling bolts will raise the header.
- Lengthening the leveling bolts will lower the header.

To level the header:

1. Lower the header to the ground in order to take the weight off the bolts to allow them to be turned.
2. Adjust the leveling bolts on the side that requires raising or lowering.
3. Raise the table and ensure it is level.

To lower the cutter bar relative to the sub-frame, extend leveling bolts. This will provide more clearance between the sub-frame and the ground. This adjustment will also provide more clearance between the center deck and the ground allowing the cutter bar to contact the ground first.

WARNING!

Do not expose more than 5" (125mm) of thread (including spacer) on the leveling bolts. If bolts are extended too far, threads will disengage from the lift link and the table will drop suddenly.

IMPORTANT!

Care must be taken when lengthening the leveling bolts. This action will decrease the size of the opening leading to the auger adapter.

IMPORTANT!

The distance between the spring saddle and the table strut should be between 3" (75 mm) and 5" (125 mm). This distance will change as the header angle is changed, so it may be necessary to re-adjust leveling bolts.

The auger adapter is stationary in the sub-frame, so as the table lowers with the leveling bolts, the hydraulic lines under the upper tube will move closer to the fingers in the auger. To ensure that the fingers do not contact the hydraulic lines: disconnect the drive line, lift the finger auger and rotate the drum. Check the clearance.



IMPORTANT!

The following diagrams are presented to show you the maximum range of adjustments to the leveling bolts and the top link. In each of the views, the sub-frame has been kept at a constant height above the ground.



IMPORTANT!

Care should be taken not to over extend the top link. The maximum length from bolt center to pin center is 19". Extending further may cause the header to drop suddenly.

Example A:

The leveling bolts have been shortened, causing the cutter bar to be lifted, and the top link has been shortened, causing the table to be tipped back.

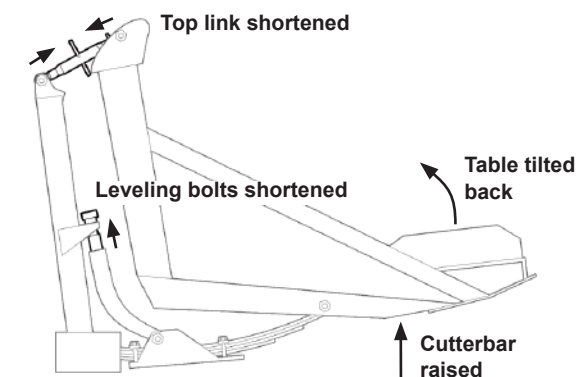


Fig. 35 - Example A: Bolts & Link Shortened

Example B:

The leveling bolts have been shortened, and the top link is fully extended. Notice how the top link tilts the table forward.

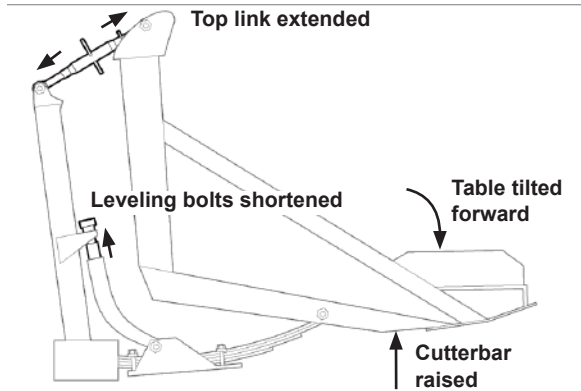


Fig. 36 - Example B: Bolts Shortened & Link Extended

NOTE:

With both of these examples (A & B), if the feeder house is lowered allowing the cutter bar to get closer to the ground, the sub-frame and center deck will contact the ground first.

Example C:

The leveling bolts are extended with the top link shortened. The extension of the leveling bolts allows the table to drop in relation to the sub-frame. Clearance between the strut and the spring saddle is at a minimum which may not provide adequate end-to-end float.

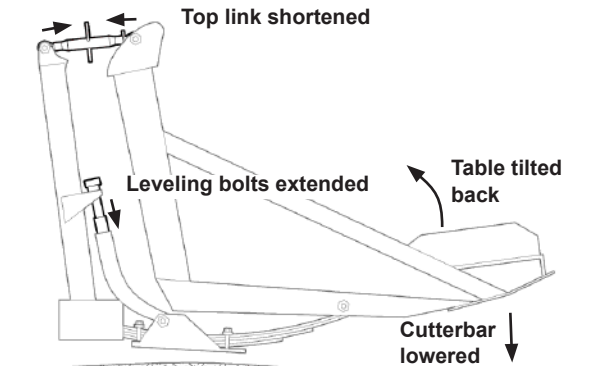


Fig. 37 - Example C: Bolts Extended & Link Shortened

CAUTION!

At this extreme of the adjustment range, you may encounter interference between the finger drum and the upper tube.

Example D:

The leveling bolts are extended with the top link also extended. The top link tilts the table forward bringing the cutter bar closer to the ground. The clearance between the strut and the spring saddle is also increased in this example, providing better floatation.

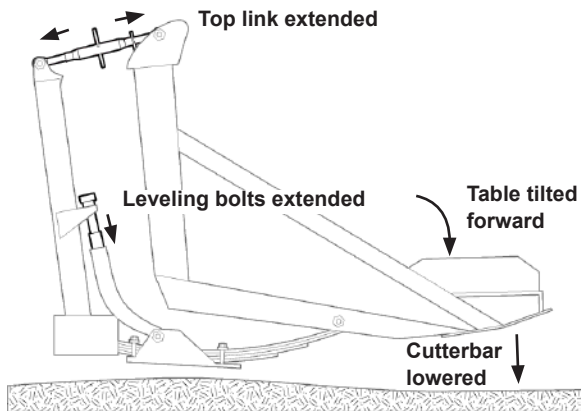


Fig. 38 - Example D: Bolts Extended & Link Extended



NOTE:

Before operation of equipment all clearances must be checked.



CAUTION!

These examples are extremes, and it is not suggested or recommended to adjust your header to the extreme. Experiment within the range of these “maximum” settings to determine which configuration will be best for your situation and crop cutting conditions.

5.6.2.1 - Example Usage

In rocky conditions with a short crop, you may want to keep the guard tips oriented flatter in relation to the ground. Try shortening the top link.

In bushy crops such as mustard you may want to tip the header forward with the top link to maximize the opening.

5.6.3 - Floatation

To vary the stiffness of the suspension, loosen or tighten the clamp plates on the spring saddles on the left and right ends of the subframe.

Whenever the header is lifted using the combine, the clamp plates will be loose. This condition is normal, and acceptable. Tighten the clamp plates only if stiffer floatation is desired.

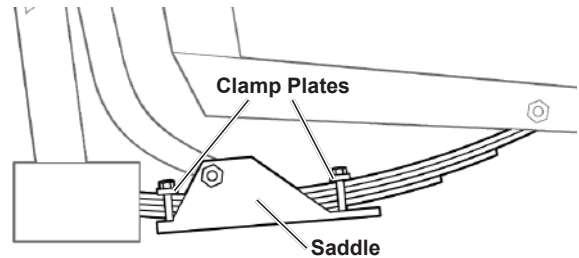


Fig. 39 - Spring Saddle Clamp Plates

When operating in the field position, the restrainer chains should be at full extension (loosened) to provide maximum end-to-end floatation for the header.

5.7 - Store Transport Equipment

5.7.1 - Standard Transport Option – Convert to Field Operation

NOTE:

The transport axle, hitch and gauge wheels are optional. If these were not purchased, disregard references to them in this manual.

WARNING!

Transport axle and transport hitch parts are heavy. Care should be taken when handling them to avoid injury.

With the header in a raised and locked position:

1. Remove the wheels from both ends of the transport axle. Re-insert the wheel lock pins into the axle for later use.
2. Remove the axle lock pin which fastens the rear of the transport axle to the header sub frame.
3. Slide the transport axle tube toward the front of the header until it falls to the ground.
4. Insert axle lock pin back into the transport axle for storage.

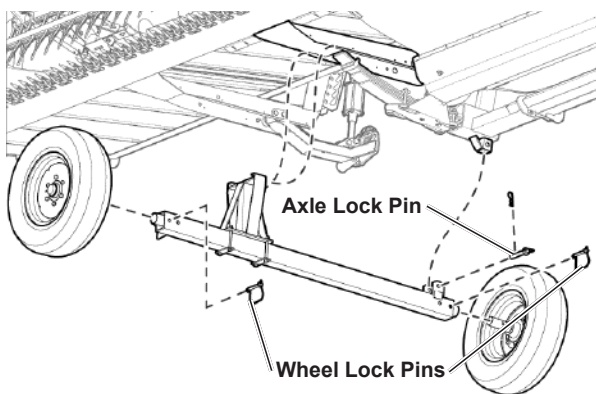


Fig. 40 - Remove Transport Axle

5. Store the wheels in an appropriate location or install them onto the optional gauge wheel brackets (if equipped).

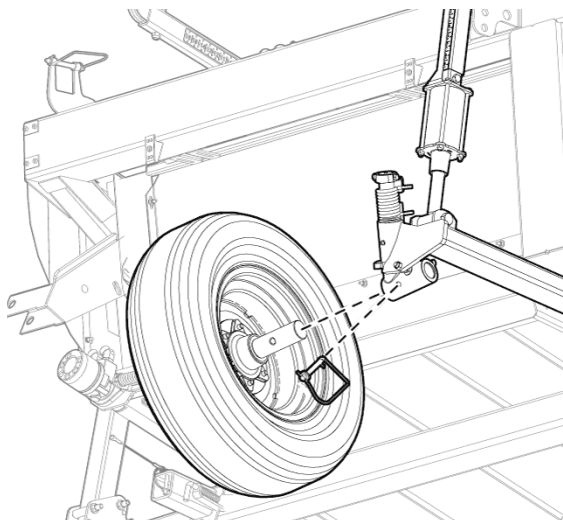


Fig. 41 - Install Wheels on Gauge Wheel Brackets

5.7.2 - Transport Hitch - Convert to Field Operation

WARNING!

Shut off the combine engine, engage the parking break and wait for everything to come to a complete stop prior to exiting the cab.

Engage the combine's feeder house lift cylinder lock prior to working on the header.

1. Loosen the jack lock pin and remove jack from the hitch tube. Place the jack in its storage position on the end of the header as shown below.

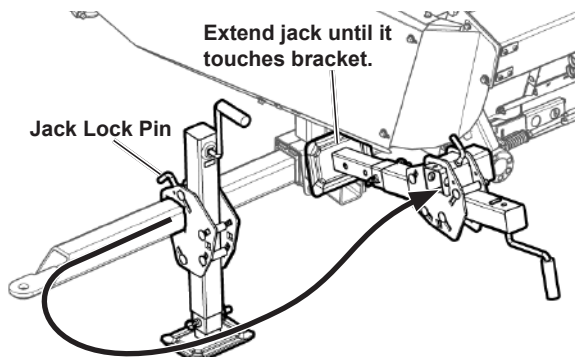


Fig. 42 - Store the Hitch Jack

2. Loosen the hitch tube lock pin and slide the hitch tube to its storage position

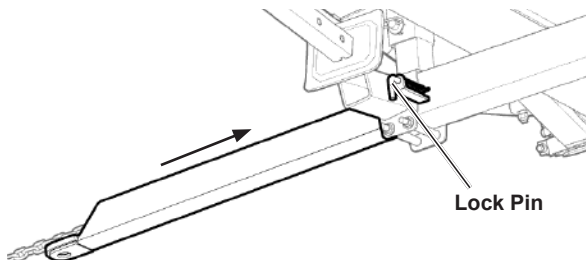


Fig. 43 - Hitch Tube - Storage Position

3. Secure the hitch tube chain to the hitch jack storage bracket as shown below.

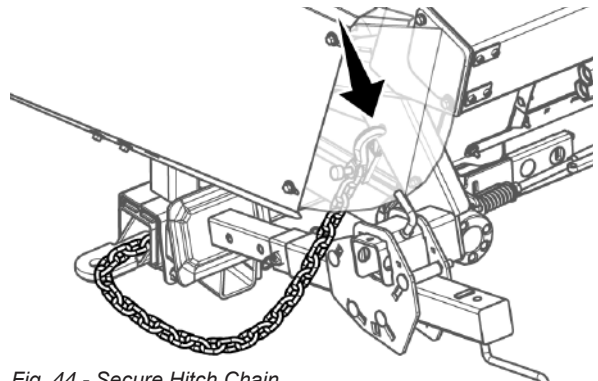


Fig. 44 - Secure Hitch Chain

5.7.3 - Transport Hitch - Optional Removal

If desired, the hitch tube may be removed, if the weight of the header needs to be reduced, or if the hitch interferes with the ground when cutting at a low angle.

1. Remove pin from the hitch bracket.
2. Lower hitch end to the ground.

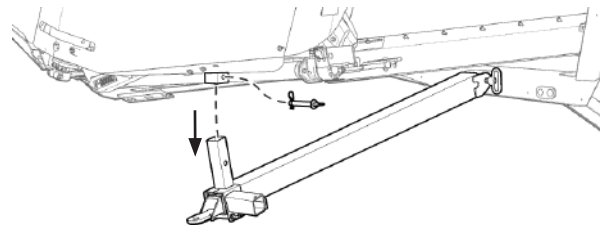


Fig. 45 - Lower End of Hitch Tube

3. Remove pin from the end of hitch tube where it is connected at the strut. Stay clear of hitch tube as it falls.

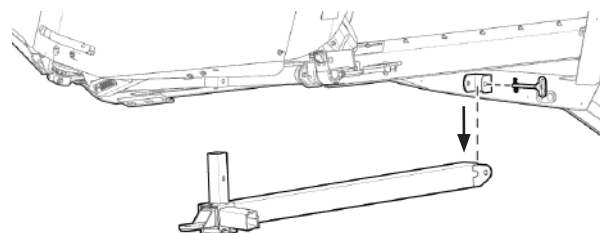


Fig. 46 - Remove Hitch Tube

WARNING!

Hitch parts are very heavy. Care must be taken when handling these parts to prevent injury.

5.7.4 - Integral Axle - Convert to Field Operation

1. Fully raise the header from the ground.

WARNING!

Shut off the combine engine and wait for everything to come to a complete stop prior to exiting the cab.

Engage the combine's main lift cylinder lock prior to working on the header.

NOTE:

Depending on your model of header, the integral axle, hitch and gauge wheels may be optional.

WARNING!

The transport axle and transport hitch parts are heavy. Care should be taken when handling them to avoid injury.

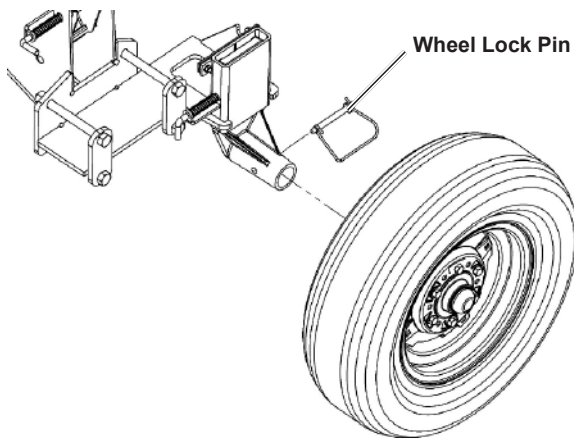


Fig. 47 - Remove Wheels from Integral Transport

3. Install the wheels on the gauge wheel brackets on the rear of the header (if equipped), otherwise place the tires in a secure storage location.

4. Pull the riser lock pin to release the axle riser from the rear of the integral transport.
5. Allow the axle riser to drop out of its bracket, flip it upside down and re-insert it from the top of the bracket as shown.

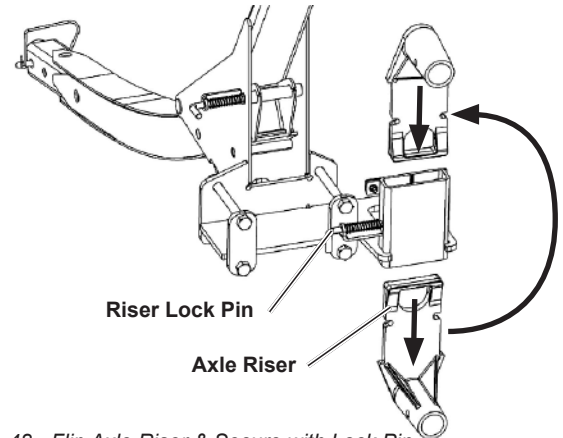


Fig. 48 - Flip Axle Riser & Secure with Lock Pin

NOTE:

If the axle riser is not put in its storage position, then it may fall out while cutting.

6. Push on the end of the transport axle with your foot to loosen the axle, then release the transport axle storage pin.
7. Retract the lock pin, grasp the axle handle and pull the axle upward, then set it into the storage pocket.
8. Reinstall the transport axle storage pin.

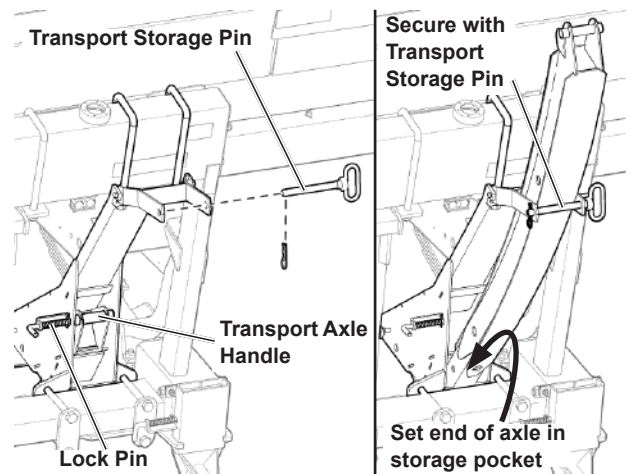


Fig. 49 - Integral Axle - Field Position

5.8 - Caster Gauge Wheels

Gauge wheels enhance the table's ability to follow the profile of uneven ground. In the cutting position, especially in short or "down" crops, this can be essential. The gauge wheels are designed to swivel, making it unnecessary to raise the header when cornering.

CAUTION!

Damage to the gauge wheels could result if header and gauge wheels are not lifted clear of the ground when backing up.

Damage to castor wheels can also result from making tight turns. The sharp turning capabilities of some combines can cause one of the wheels to be dragged backwards.

NOTE:

The header should be parked on level ground and leveled before attempting to adjust gauge wheel height.

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 by 1.5" (38mm) to 2" (50mm).

IMPORTANT!

Excessive compression of the Shock Assembly will cause stress and premature wear in the top link.

NOTE:

Adjustments to table tilt, spring flotation, and pitch will affect the amount of compression in the Shock Assembly. Check shock shaft exposure, and adjust accordingly, after any of these adjustments.

CAUTION!

Remember, the Gauge Wheels are NOT designed to support the full weight of the header! Their purpose is to help guide the table over variations in ground level.

The four mounting holes on the header frame provide additional adjustment when cutting crops high, leaving lots of stubble, or cutting low with the table tilted forward.

5.8.1 - Gauge Wheel Height Adjustment

1. Fully retract the gauge wheel jack, the pointer should be at or above the "1" mark.
2. Adjust the header table height until the cutter bar is at the desired average cutting height for the crop being cut. i.e. stubble height.
3. Lower the gauge wheel assembly to the ground using the screw jack until the Spring Shaft is compressed 1.0 to 1.5". Repeat this procedure on the other gauge wheel assembly.
4. Confirm that the spring shaft of the gauge wheel assembly is compressed to the specified 1.0–1.5" range. If incorrect, repeat steps (1-4) as described.

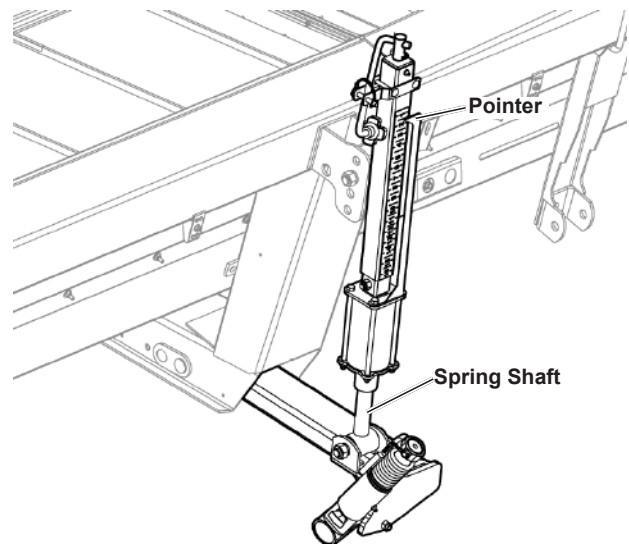


Fig. 50 - Gauge Wheel Jack

5.9 - Mounting Checklist

- ☐ Header adapter aligned and fitted to the feeder house of the combine.
- ☐ Feed auger adjusted. (Auger fingers do not contact the feeder house.)
- ☐ Feeder house lock pins/bolts in place and properly locked/tightened.
- ☐ Transport axle tube and hitch tube removed from the header.
- ☐ Gauge wheels installed as directed. (If equipped.)
- ☐ Hydraulic lines (quick couplers) fully connected.
- ☐ Gearbox aligned and connected to the bottom feeder house output shaft.
- ☐ Feed auger drive shaft aligned and connected.
- ☐ Electrical connections in place and tested.
- ☐ Restrainer chains latched in the longest position.
- ☐ Header is level.
- ☐ Feeder house drive straight as possible and correct length.



WARNING!

Before proceeding, you **MUST** follow the Mounting Checklist. This will ensure that the header is properly installed.



IMPORTANT!

If the combine will not raise the header, see the Troubleshooting section of this manual.



WARNING!

Be sure no one is standing near the machine while you are raising or lowering the header.

5.10 - Pre-Start Checklist

- ☐ Start the Combine and lower the header to level ground, if necessary.
- ☐ Inspect the header for damaged or loose parts. Repair or replace any such parts immediately.
- ☐ Check oil level in hydraulic reservoir of the header. Add to specified level with the recommended oil, if required.
- ☐ Ensure that all protective shields are in place and secured.
- ☐ Inflate tires to 50 psi (345 kPa) for both transport, and for field operation.
- ☐ Inspect all hydraulic hoses and fittings. Ensure connections are secure and hoses are in good condition.
- ☐ LUBRICATE THE HEADER as outlined in the Service section of this manual.
- ☐ Make certain Draper Support bar has been removed.

Cold Weather Start-up – Temperatures below 10C/50F



IMPORTANT!

It is a good practice, and in cold weather it is absolutely necessary, to allow the oil to warm up prior to any cutting. Turn the draper flow control to zero to prevent pressure spikes

5.11 - Normal Start

1. Start the combine. With the combine at low idle, engage header drive. Do not increase to high idle until oil has reached operating temperature.
2. Once the oil is warm, increase the draper flow control to desired speed.



NOTE:

If oil flow passes over the relief, it may be necessary to adjust the relief pressure. Refer to the Hydraulic Section of this manual.

3. Raise the reel to full height. Hold the switch on momentarily at full height, then drop the reel to its lowest position (cylinders fully retracted). Complete this cycle at least twice to ensure it is working properly.
4. ENGAGE THE PARKING BRAKE. Engage platform drive switch (see Combine Owner's Manual for instruction) with engine at idle RPM. The platform draper, knife and reel should begin to turn.



WARNING!

If any oil leaks appear, shut the combine down immediately and make the necessary repairs before restarting.

5. Increase idle speed. When combine is at high idle check and set:
 - Reel speed (controlled via combine, see section 9.3 for details).
 - Draper tracking (See section 10.4 for details).
 - Draper speed (See section 10.5 for details)

If adjustments are required see the appropriate section of this manual.

6. With header lowered to 2 inches (5 cm) from the ground, stop the combine, shut the engine down and wait for all moving parts to stop moving before exiting the cab. Then check:
 - Header leveling (end to end).
 - Header cutting angle.
 - Strut and spring saddle separation 3" to 5" recommended.
 - Gauge wheel height.
 - Reel mount bolts.
 - Knife head section bolts and bearing block bolt.
 - Knife head bearing bolt.
 - Knife drive support/crank bolts.
 - Connector bar bolts on knife back.
 - Knife drive mounting bolts.
7. With the header raised, engage header drive with combine at idle. The header, knife, and drapers should operate.
8. Activate the reel with combine controls. Steadily increase engine speed until full operating RPM has been reached.



CAUTION!

Practice operating and maneuvering the header and combine in an open area away from people and buildings.

6 - Cutting System

The cutter bar must be properly maintained in order to obtain good field performance. Inspect the cutter bar daily for damaged and broken parts before starting work. Repair or replace parts as required.

WARNING!

Raise the header table, raise the reel, stop the engine, set the parking brake and remove the ignition key before dismounting the combine.

Engage feeder house lift cylinder locks and reel lift cylinder locks.

Clear the area of bystanders, especially small children.

Wear heavy canvas or leather gloves when working with the cutting system.

6.1 - Knife Removal

1. Remove the two socket-head cap screws on the knife head block.
2. Slide the knife out of the cutter bar.

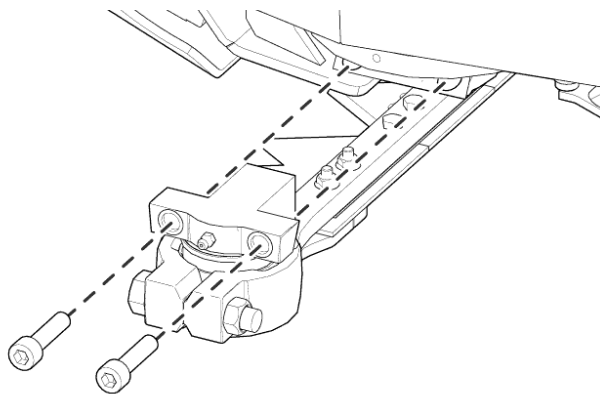


Fig. 51 - Knife Head Removal

Reverse the procedure when installing the knife. Apply a small amount of thread lock to the cap screws before installation. Torque bolts to the recommended specifications of 59 ft-lb (80 Nm).

6.2 - Cutting System Maintenance

6.2.1 - Guards

When replacing guards always mount the new guard with the SCH stamp to the top. Be sure the spacer bar is on top of the cutter bar.

The f/lock nut on the guard bolt should always be on the top.

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. Look along the length of the cutter bar to be sure the guards are aligned. Tighten guard bolts.

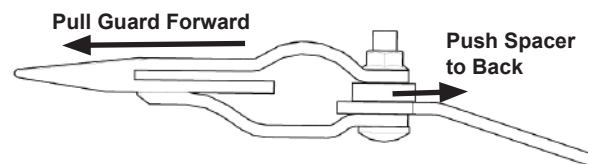


Fig. 52 - Knife Guard Installation Alignment

6.2.2 - Sickle Sections

Install the sickle sections on the knife by alternating the cutting surfaces. Place one section with the cutting surface on top and the next with the cutting surface on the bottom. They must be sharp, and in good condition to obtain optimum cutting performance.

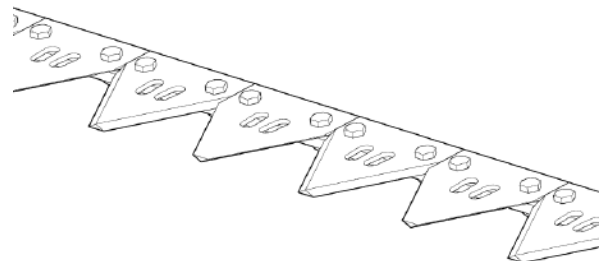


Fig. 53 - Knife Sections - Alternating Alignment

6.2.2.1 - Replace a Section – Method 1:

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. Install the guard. Ensure the spacer bar is pushed to the rear, and the guard is as far forward as possible. A small pry-bar may be helpful for this task.

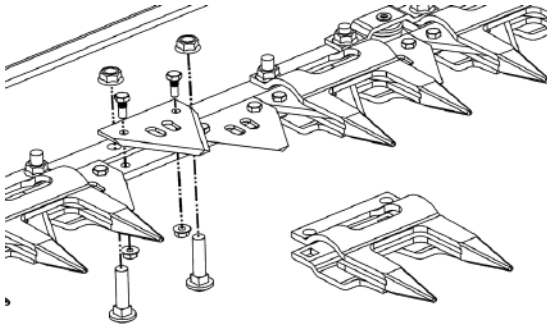


Fig. 54 - Remove Guard then Replace Broken Section

6.2.2.2 - Replace a Section – Method 2:

1. Move the knife by hand until one section bolt is exposed.
2. Remove the bolt.
3. Turn the knife until the other bolt is exposed.
4. Remove it, and install a new section.
5. Replace and tighten the bolt.
6. Turn knife back to install and tighten the other bolt.



IMPORTANT!

Remember when installing sections to alternate the serrations, one facing up and the next facing down

6.2.3 - Knife Drive/Knife Head

Proper maintenance of the knife drive is critical to the performance of your Grain Belt Header. See section 7 for details.

Check the following components daily:

- Knife drive hold down bolts
- Knife head bearing (ensure bolt is tight, then check condition of bearing and nylon sleeve).
- Knife head cross bolt. Torque to 73 ft-lb (99 Nm) for a SCH system.
- Socket head cap screws. Torque to 41 ft-lb (56 Nm)
- Knife head hold-down bolts (those that attach the knife head to the knife back) 120 in lbs. (13.5 Nm)

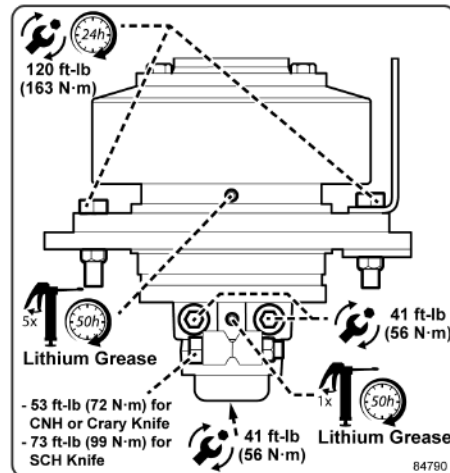


Fig. 55 - Decal - Knife Drive Maintenance

Rotate the knife drive by hand after tightening the knife head bolt to be sure the bearing, and the knife are moving freely.

Replace any defective parts immediately to prevent damage to the drive.

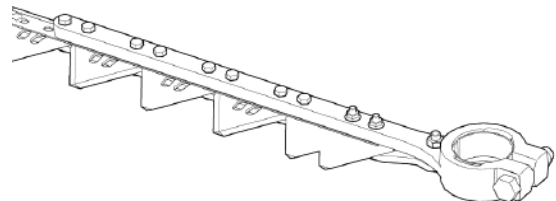


Fig. 56 - Knife Head Hold Down Bolts

6.2.4 - SCH Connector Bar

On some models of Honey Bee headers a connector bar is used to connect two sections of knife. The knife back is the part of the knife to which the sickle sections are bolted. On units that use the SCH cutting system, the connector bar is installed on the underside of the knife back. The SCH connector bar has twelve threaded bolt holes in the bar. The knife back is punched with holes to accommodate the sickle sections and the holes are slightly tapered from the bottom.

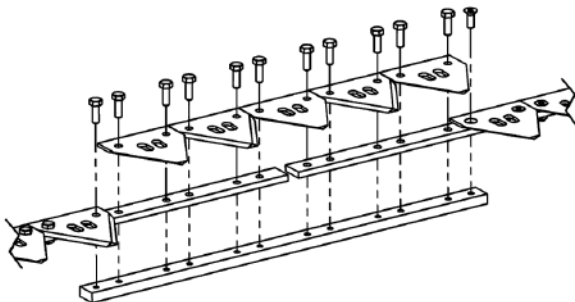


Fig. 57 - SCH Connector Bar

Knife sections must be installed on the top side of the knife back (the side with the SCH Logo). The bolts should be tightened to between 120 - 150 in-lbs, (13.5 - 17 Nm).

6.2.5 - Center Overlap (Double Knife)

If a header has a double knife drive, the two knives will overlap at the center of the header. The sickle sections where the knives overlap use countersunk fasteners to provide a smooth surface over which the other end of the knife slides.

The guards used in this overlap area are specially designed to accommodate the extra thickness in this area of the knife.

If the knife is noisy or overheats, check this area to ensure the overlap guards have been properly installed.

If these sections are loose, it is possible that the countersunk bolts are not seating properly. The backup bar may need to have a slight countersink drilled around the holes to permit the bolts to seat fully.

Always use threadlock when servicing the overlap sections.

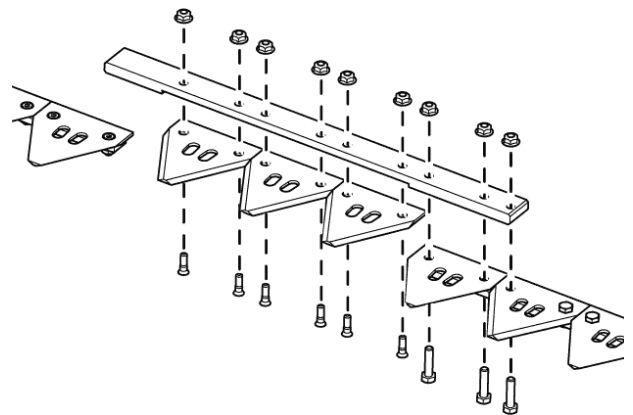


Fig. 58 - Knife Overlap

6.2.6 - Repair 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 sickle section bolt hole. To use the connector bar properly, the damaged section needs to be cut out and/or a section of knife removed.



IMPORTANT!

If the knife breaks close to the knife head, remove that section of knife, reconnect the knife head, and then add the new section to the far end of the knife where there is less mechanical stress. The join in the two knives must be located midway under a sickle section, not in the gap between two sickle sections.

When you encounter this type of break, inspect the knife for dull/damaged guards, and sections, and gummy build-ups which might cause binding. One or more of these problems may have been the cause of the failure.

7 - Maintenance & Lubrication

7.1 - Lubrication



IMPORTANT!

The knife drive and knife drive bearing require lithium grease, the remaining grease points on the header can be lubricated with high quality general purpose grease.

Item	Lubricant	Quantity	Frequency	Location/ Comments
Knife Drive	Lithium Grease	5 shot	50 hours	Bottom of crank shaft
Knife Drive bearing	Lithium Grease	1 shot	50 hours	Side of knife drive knuckle
Gauge Wheels Caster Sleeve	Grease	1 shot	10 hours	Caster sleeves
Gauge Wheel Jack Sleeve	Grease	1 shot	As needed	Top of gauge wheel jacks
Cross Auger Jack Sleeve	Grease	1 shot	As needed	Top of cross auger jacks
Driveshafts	Grease	Brush	50 hours	Telescoping members
Driveshaft Guards	Grease	1 shot	50 hours	1 location per cone
Knife	Water/Diesel	Soak	As needed	If knife is gumming
Drive Chain	Chain lube	Soak	As needed	Inside chaincase
Hub and spindle	Grease	Re-pack	Annually	Replace seals as needed
Gear Box	75W90 Full Synthetic			Check daily that no leaks occur
Hydraulic tank	Co-Op Trans-Hydraulic/Esso Hydraulic 56	Replace fluid	Every 3 years or 1000 hours	Optimum Operating range -30C to +80C (-22F to +176F)
Reel Bearing	Grease	1-2 shot	10 hours	Left and right ends of reel via grease zerk on shaft.

7.2 - Lubrication Service Locations

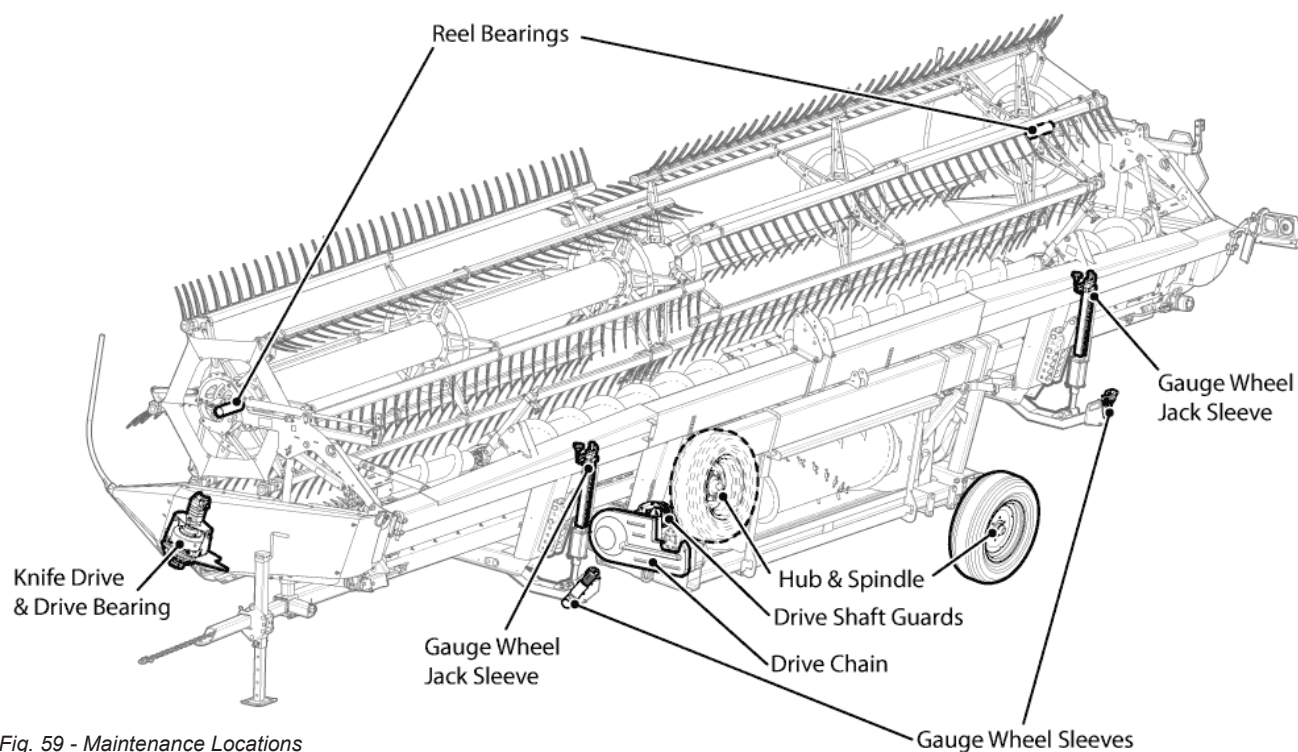


Fig. 59 - Maintenance Locations

7.2.1 - Drive Shaft (PTO) Lubrication

Lubricate with quality grease before starting work and every 50 operating hours thereafter. Clean and grease the drive line before each period of storage.

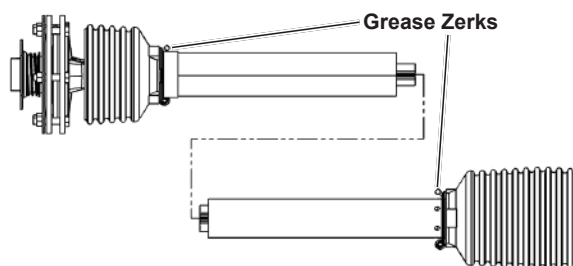


Fig. 60 - PTO Grease Zerk Locations

Apply grease to the telescoping drive shafts using a brush to ensure good coverage.

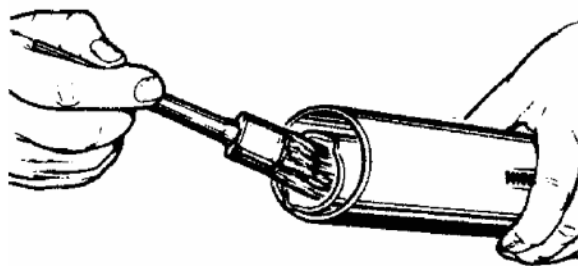


Fig. 61 - Brush grease into center sleeve

7.2.2 - Filters

The suction line strainer (100 MESH) does not require replacement. If the oil becomes contaminated, the strainer should be removed, washed and dried before re-installation.

Change the return line hydraulic filter after the first 50 hours of operation and seasonally thereafter. Compatible replacement filter is the Donaldson Duramax P164375.

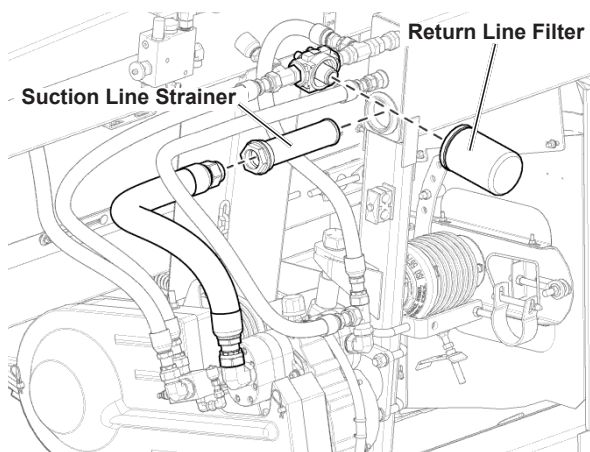


Fig. 62 - Hydraulic Oil Filter Replacement

7.3 - Maintenance Inspection

Item	Look For
Drive Lines:	<ul style="list-style-type: none"> • Wear on each yoke and cross kit • Lubrication in slide tubes and shield bearing • Worn friction disks, pressure plates. • Pressure setting of slip clutch
Reel	<ul style="list-style-type: none"> • Missing, damaged or broken fingers • Worn bearing joints • Bent broken, loose or missing parts • Wear in reel drive couplers and reel joints (split reel) • Lubrication
Crop Dividers & Deflectors	<ul style="list-style-type: none"> • Damage, wear on the shoe of the divider • Stress cracks
Chain Case	<ul style="list-style-type: none"> • Sprocket wear • Chain stretch or damage
Hydraulics	<ul style="list-style-type: none"> • Leaks at pump, hoses, steel lines, and cylinders • Damaged pressure gauges • Squealing relief valve.
Transport & Hitch	<ul style="list-style-type: none"> • All components are secured • Cuts and wear on tires
Cutting system	<ul style="list-style-type: none"> • Work, loose skid plates or poly skid under the cutter bar • Worn or loose knife head and knife drive bearings.



IMPORTANT!

Service, repair, or replace all components as required.

7.3.1 - Periodic Checks

Check all cutting parts carefully for damage and wear. Worn knives and guards can cause higher cutting pressures and increase incidences of knife stalling. Sickles 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 nearing the thickness of two sections, it is time to replace the guards.

- Check knife back and spacer bars.
- Check connector bar joints, which should always be under a sickle section.
- Oil knife and guards for storage.

7.3.2 - Auger Drum Maintenance:

High wear parts, such as the finger guides, should be checked carefully. Remove the inspection covers on the drum and examine the inside. Check the finger bearings for binding. Examine the rivet or roll pin in the finger bearing. It must be tight. If the roll pin is working its way out, install a wire in the center of the roll pin. Inspect the drive lines, and lubricate as shown in the Center-feed Auger section of this manual.

7.3.3 - Drapers – Periodic Maintenance:

These steps can significantly reduce repair costs to the drapers:

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 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 and freezing action may stretch the draper material.
11. Perform these steps on the center deck.

7.3.4 - Replacing Center Bolt in Suspension Springs.

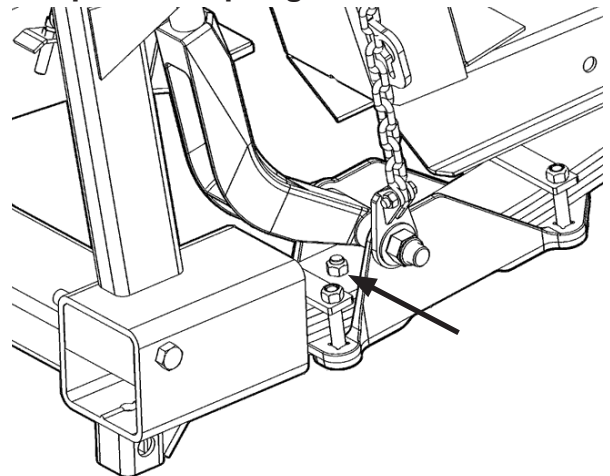


Fig. 63 - Suspension Spring Center Bolt

If the suspension spring center bolt is broken and requires replacement:

1. Remove any tension from the suspension springs. If you are required to jack up the sub frame, be sure to use blocks to support the weight.
2. Loosen the leveling bolt on the lift link and spring saddle that has the broken bolt.
3. Line up the holes in the spring and spring saddle.
4. Drive out the broken bolt with a punch.
5. Install a new bolt from the bottom and secure with a nut.

8 - Hydraulics

All of the Grain Belt Headers have a self-contained hydraulic system: The combine feeder house drive shaft is connected to a gearbox, which is connected to the hydraulic pumps (single pump units have one pump). Oil flows to the knife drive, then to the draper control circuit from the smaller displacement pump (single pump units – draper circuit feeds from knife circuit). The draper control circuit is split between the lateral drapers and the center draper. The oil then returns to the reservoir tank. Adapters with a header-driven reel have the drapers and the reel plumbed in parallel with separate flow-controls. There are two relief valves in the system, one in the knife drive circuit and the second in the flow control of the draper circuit (a third for header-driven reels in the reel circuit).

8.1 - Operating Pressure

The Knife Circuit pressure gauge, connected to the relief valve, is mounted to the side of the hydraulic reservoir. It indicates the hydraulic pressure available to the Knife circuit.

The Draper circuit pressure gauge, connected to the Draper Flow Control, is also mounted to the side of the hydraulic reservoir. It indicates the hydraulic pressure available to the Draper circuit.

Operate the header with the combine at high idle, and the ambient oil temperature about 70°F (20°C). The Knife circuit pressure gauge should be between 200psi (14 bar) and 1000 psi (69 bar), and the Draper circuit pressure gauge should be between 1000 psi (69 bar) and 2300 psi (159 bar).

NOTE:

New units tend to operate on the higher side of this range, and double drive knife systems will require approximately 300 psi to 500 psi (21 - 35bar) more pressure for normal operation. Oil pressure will increase during normal cutting operations and will vary depending on crop conditions, the condition of the cutting system, draper speed and ground speed.

8.2 - Cold Weather Operation – Temperatures below +10C/+50F

CAUTION!

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

While warming the oil, turn the draper flow-control to zero to prevent pressure spikes.

1. Engage header drive with combine at low idle to warm the oil.
2. Do not operate the header drive at a high idle until oil has reached operating temperature.
3. Once the oil is warm, adjust the draper flow-control to the desired speed. If the flow-control passes too much oil over the relief, it may be necessary to adjust the flow-control relief pressure higher. Consult your dealer or a factory representative.

CAUTION!

It is **NOT RECOMMENDED** to adjust the relief pressure higher than the factory setting without first consulting your dealer or a factory representative. The relief valve is factory set at 3000 psi (207 bar).

8.3 - High Pressure - Diagnostic Checks

If the pressure required to drive the knife is high, check the cutting system for

1. Material gumming or binding on the knife. Clean as required.
2. Broken and dull sickle sections. Replace as required.
3. Bent, broken and dull guards. Replace as required.

If the cutting system seems to be OK, check the following areas:

1. Knife head bearing. Unbolt knife head block and pull knife back at least 12" (300mm). Refer to the Cutting section for procedures if required.
2. Turn knife head block and bearing by hand, if bearing is rough or noisy, replace bearing.
3. Leave 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.
4. Start the combine and engage drive. Check knife drive pressure. Normally, it takes 100 psi to 150 psi to operate the drive motor in this manner. If pressure is now significantly lower, the problem will be found in the knife. If pressure is still high, the problem is in the knife drive motor, draper motor circuit or the hydraulic circuit.

8.3.1 - Other Problem Sources

If the output rpm of the drive shaft from the combine is too high, or the pump capacity is not matched to the combine, the pressure may be high. High pressures may indicate a problem in the draper circuit. See "Draper Operating Pressure" in this section.

8.4 - Diagnostic Checks

1. If the pressure at the main pressure gauge and draper gauge is low, or is fluctuating, shut combine down, and check the oil level in the hydraulic tank. Oil should be visible at the top of the sight glass.
2. If oil pressure drops when making a right hand turn or on a side hill, shut combine down, and check oil level.
3. If the knife stalls while cutting, check for:
 - Low oil level,
 - Leaking relief valve,
 - Worn pump.



NOTE:

If there is a sudden loss of hydraulic pressure, check for major leaks in the system. If no leaks are found, inspect the output shaft of the pump. If the shaft is sheared or stripped, install a coupler kit.

If none of the above items are the cause of low oil pressure, it will be necessary to install a flow meter to determine the cause. Contact your dealer for assistance.

8.5 - Chain Case Pumps by Combine

Adapter	Knife Drive Pump	Pump Part #	Mid Sec Measurement	Draper Drive Pump	Pump Part #	Mid Sec Measurement
NH (CR/CX & TR/TX) AFX	163D70010 / 31.8 cc / 1.94 ci	27395	1-1/4"	83013657 / 17cc / 1.04 ci	28030	11/16"
JD & CIH	83007988 / 36.1 cc / 2.20 ci	27951	1-7/16"	83017852 / 19 cc / 1.16 ci	28221	3/4"
AGCO & GLNR	163D7008 / 29 cc / 1.77 ci	27394	1-1/8"	83013657 / 17cc / 1.04 ci	28030	11/16"
CAT	163D70011 / 22.5 cc / 1.37 ci	27393	7/8"	80004978 / 12.6 cc / 0.77 ci	28220	1/2"
MISC	163D70010 / 31.8 cc / 1.94 ci	27395	1-1/4"			

8.6 - Check or Adjust Knife Relief Pressure

CAUTION!

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

1. Jam a wood block tightly in the knife, between a guard and a cutting section.
2. Restart the combine, engage the feeder house and check the pressure on the gauge. The relief pressure should be 3000 psi (may be closer to 2800 psi on single pump units). If adjustments are required, proceed as follows:

CAUTION!

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

3. Locate the relief valve on the side of the Knife Drive Pump. Loosen lock nut and turn the relief screw counter clockwise to increase pressure, clockwise to decrease. Adjust the relief screw 1/4 turn at a time in the appropriate direction.

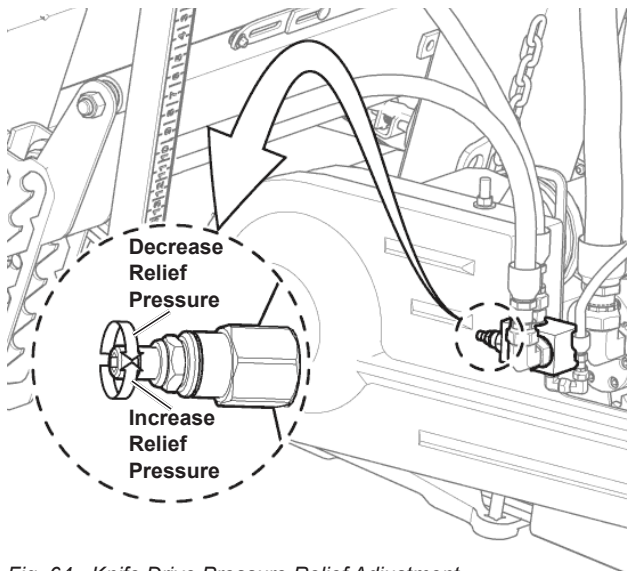


Fig. 64 - Knife Drive Pressure Relief Adjustment

4. With the knife still jammed, restart the combine, engage the feeder house drive and check the pressure on the gauge.

WARNING!

Be sure all bystanders are away from the machine prior to engaging the header.

Repeat the above steps until the desired pressure reading is attained.

IMPORTANT!

The relief pressure should not exceed 3000 psi (2800 psi in single pump units). Exceeding this pressure could cause damage to the pump and the hydraulic system.

8.7 - Draper Operating Pressure

The pressure indicated on the draper flow-control gauge is the amount of force required to pump oil through the draper circuit. When the flow-control dial is set to zero, the oil is diverted through the “T” port of the flow-control which returns it directly to the tank. When the flow-control dial is set to full, all the oil goes through the “R” port, through the draper motors and then returns to the tank. Adjust this lever to achieve the desired draper speed.

The flow-control is equipped with a relief valve, which is factory preset at 3000 psi. If the operating pressure is consistently at or near this range, oil will bypass over the relief to the “T” port. When oil is bypassed over the relief, heat is generated. If this condition is excessive, the oil may over-heat. Damage to the pump and motors may result. This setting is non adjustable, and tamper proof.

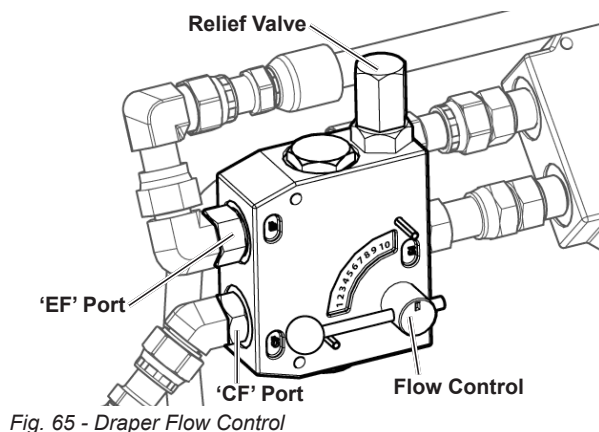


Fig. 65 - Draper Flow Control

8.7.1 - If the draper pressure is high:

1. Ensure draper tension is not too tight.
2. Check that material is not wrapping around rollers. Clean rollers as required.
3. Inspect the bearings in drive and idler rollers. Replace as required.
4. Check the oil pressure with tension on draper released (motors running free). Continued high pressure will indicate a faulty draper motor. Replace as required.

8.7.2 - If a faulty draper motor is suspected:

1. Let the system cool down.
2. Start up and run draper at full speed. Record the reading on the pressure gauge.
3. Look for motors that seem to be running more slowly.
4. Check the temperature of each motor to see if one is hotter than the others.
5. SHUT COMBINE DOWN.
6. Grab the drive roller of a deck with both hands and rotate the roller back and forth. If the motor is difficult to turn, disconnect these hoses and install a fitting to bypass the suspect motor.
7. Restart the combine and run the draper. Record the difference in draper pressure, and observe whether the draper speed of the other decks returns to normal.
8. If the differences are significant, replace the motor.

8.8 - Bleeding Air Out Of Reel Lift Circuit (Solid Reel Only):

If the reel does not go up or down evenly, it may be necessary to bleed the slave cylinder. Complete this procedure only when header drive is disengaged and header is on the ground. Lower the reel to the bottom of the cylinder stroke. The reel cylinders have a center to center collapsed length of 24". Fully extended, cylinder length is 40".

There are two methods of bleeding the system:

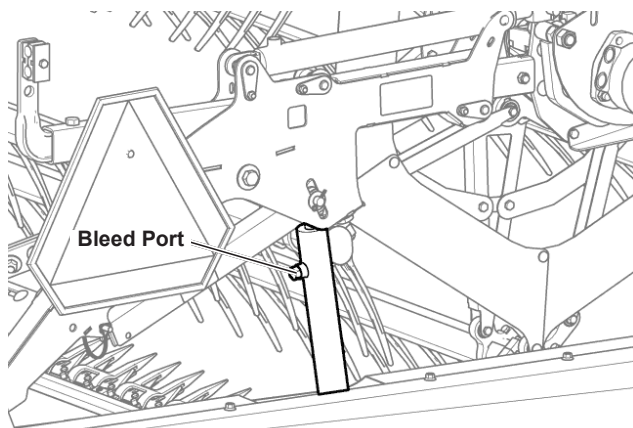


Fig. 66 - Reel Cylinder Bleed Port

8.8.1 - A: Static Method.

1. Cycle the reel up to the top of the stroke.
2. Cycle reel down but stop reel when about 2" of cylinder rod is still exposed and before cylinders reach the bottom of their strokes.
3. Shut combine down. It is best to wait for 10 to 15 minutes so air bubbles in the oil can dissipate.
4. Using a screw driver or a wrench (depending on the style of cylinder), loosen the bleed port hex cap on the slave cylinder (far right hand cylinder). Air and oil will escape, and the reel will drop.
5. Tighten bleed screw (cap) and cycle reel. Repeat this procedure again if necessary.

8.8.2 - B: Alternate method

1. Lower the reel to the bottom of its stroke.
2. Shut combine down.
3. Using a screw driver or a wrench (depending on the style of cylinder), loosen the bleed port hex cap on the slave cylinder (far right hand cylinder).
4. Start combine and lift reel until cylinders are fully extended and the air has escaped from slave cylinder.
5. Lower the reel, shut combine down and tighten cylinder head on slave cylinder.
6. Cycle the reel and repeat procedure if necessary.

Because of expansion in hydraulic lines, it is normal for the right hand slave cylinder to lag slightly when lifting reel.

9 - Reel

9.1 - Set Reel Safety Stops

End reel arms: Raise reel completely and engage safety stops on reel lift cylinders at each end of the header. The stop must be snapped over cylinder with the lock pin.

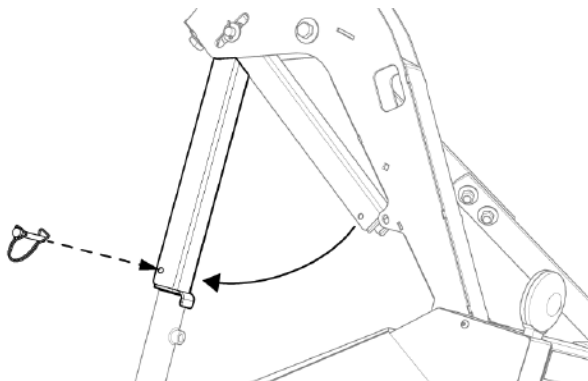


Fig. 67 - End Reel Arm Safety Stop

Center reel arm: Pin reel arm in front of arm on center reel arm tower to hold it up mechanically.

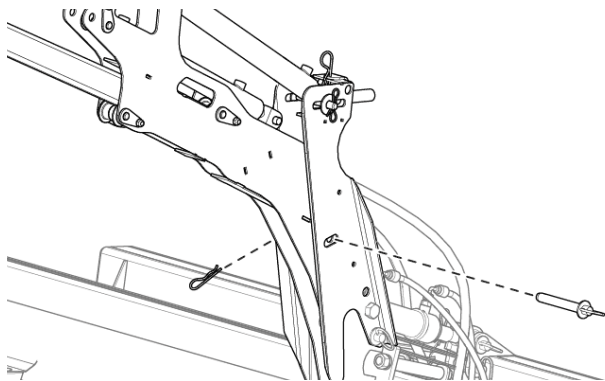


Fig. 68 - Center Reel Arm Safety Stop

9.2 - Reel Drive

Depending on the model of table, the reel is driven by either one or two 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.

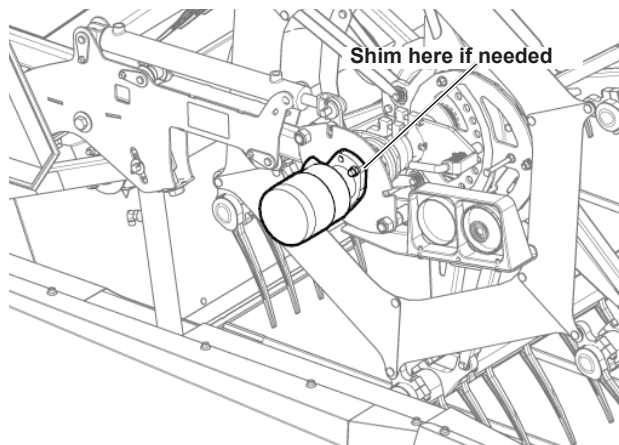


Fig. 69 - Reel Drive Alignment



IMPORTANT!

Reel motors are capable of bidirectional 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.

9.3 - Reel Speed Adjustment

There are types of reel used on the header:

- The UII Reel should rotate from 12% to 15% faster than the ground speed.
- The HCC Reel should rotate from 10% to 12% faster than the ground speed.
- The Honey Bee Reel should rotate from 10% to 20% faster than the ground speed.

“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.

9.4 - Reel Position

9.4.1 - Hydraulic Fore & Aft

All 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.

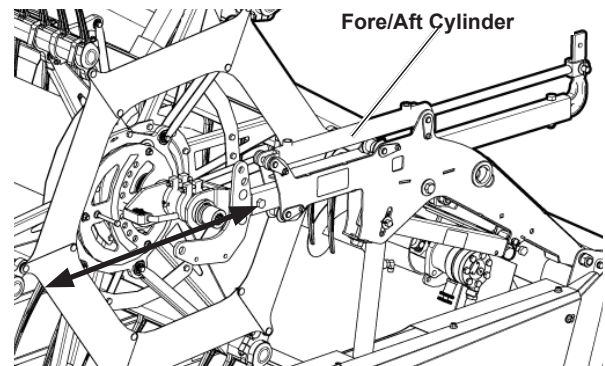


Fig. 70 - Fore/Aft Cylinder

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

9.4.2 - Split-Reel Lift Hydraulic Circuit

When raising the reel, pressure from the combine feeds the left hand lift cylinder, which feeds the center cylinder which in turn feeds the right hand cylinder and back to the hydraulic cylinder.

When lowering the reel, the weight of the reel will reverse the oil flow.

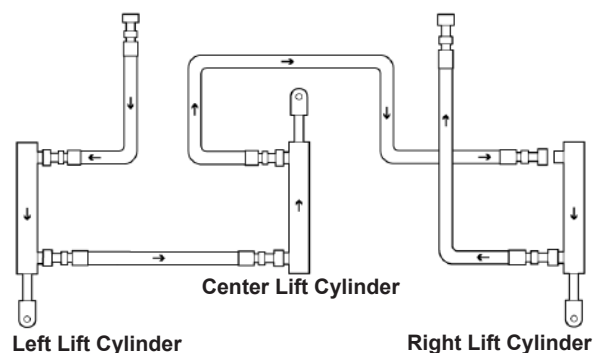


Fig. 71 - Split Reel Lift Cylinders

NOTE:

In order to fully extend RH reel lift cylinder the header reel must be running, otherwise the lift cylinder will only partially extend.

9.4.3 - Solid Reel Lift Hydraulic Circuit

When raising the reel, pressure from the combine feeds the left hand lift cylinder, which feeds the right hand lift cylinder. This cylinder has a bleed screw to bleed air from the system if required.

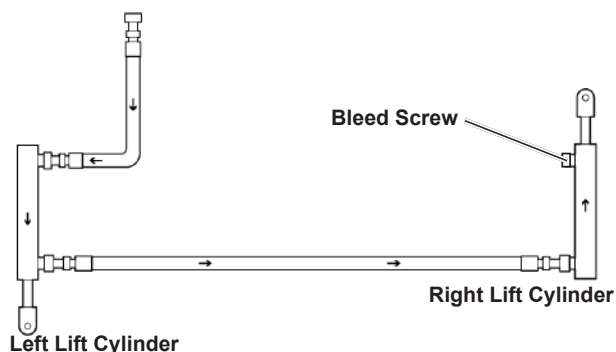


Fig. 72 - 30ft and Under - Solid Reel Lift Cylinders

9.5 - Reel Arm Leveling and Height Adjustment

Headers are equipped with adjustable reel height, which limits how much the reel can be lowered, and how close the reel can come to the header. The reel height is adjusted by tightening or loosening the bolt immediately in front of the reel lift cylinder.

To adjust the height:

1. Start the combine and fully lower the reel.



WARNING!

Engage the emergency brake, shut the combine down, and allow all moving parts to come to a complete stop before exiting the cab.

2. Using a 1-1/8" wrench or socket with ratchet wrench, tighten (turn clockwise) bolt to raise reel and loosen (turn counter clockwise) to lower the reel. Ensure you have minimum clearance of approximately 2.0" (50 mm) of the reel tines to the cutter bar.

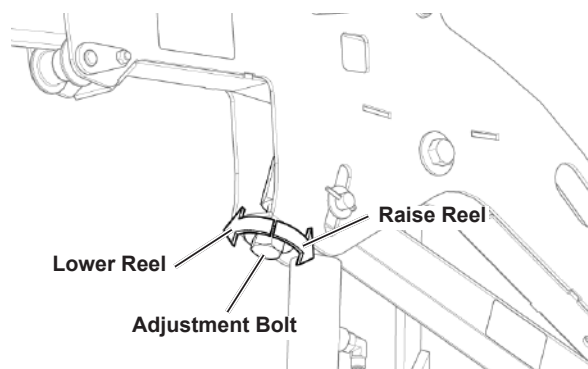


Fig. 73 - Center Reel Arm Height Adjustment

3. Repeat this procedure for right side of the header, ensuring that you have a minimum of 2.0" (50 mm) clearance of the reel tines with the cutter bar.

4. If your header has a split (double) reel, the center reel height will also need to be adjusted, release the indicated pin and adjustment lock, turn the adjustment nut clockwise to raise the reel, or counter-clockwise to lower the reel, re-secure the lock and pin.

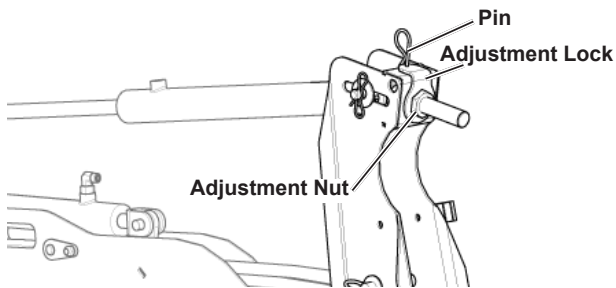


Fig. 74 - Center Reel Arm Height Adjustment

5. If possible, rotate reel by hand to ensure the reel tines will not contact any part of the deck, draper, or cutter bar.



WARNING!

When servicing the reel, it is necessary to have the reel locked into the servicing (highest) position, with the lock pins securely in place.

9.6 - Reel Centering

Measure the clearance from the end shield on the reel to the crop divider on each end of the header. See the illustration below.

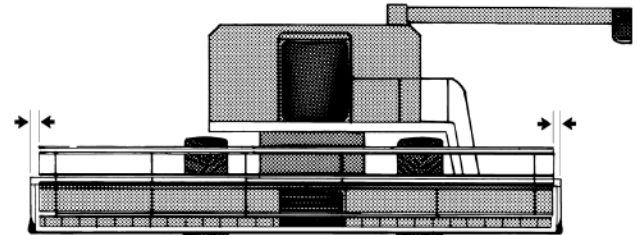


Fig. 75 - Reel Centering

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



WARNING!

Fully lower the table and reel, and engage parking brake. Turn combine off and allow all moving parts to come to a complete stop before exiting the cab.

1. Loosen the carriage bolts that secure the reel arm braces on both ends of the reel.
2. Push the reel arms until reel is centered.
3. Tighten bolts when centered.

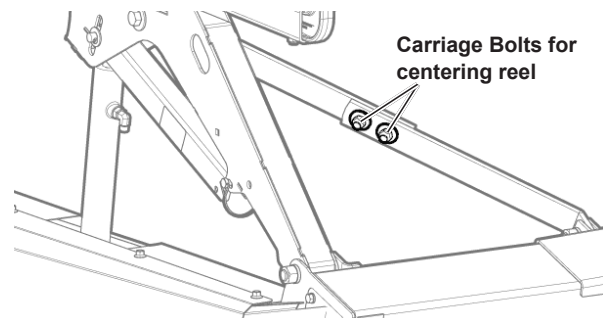


Fig. 76 - Loosen bolts to adjust reel position.

9.7 - Placement of the Reel on the Header

The fore/aft distance from the tip of the guard to the tip of the reel tines can be adjusted from 1" to 12" (300 mm) depending on the crop. The vertical distance between the reel tines and the cutter bar should be a minimum of 2".

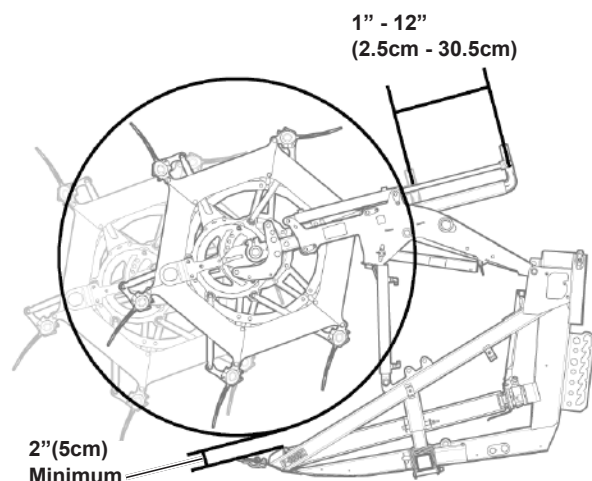


Fig. 77 - Reel Position

Normally the more "down" the crop, the further ahead the reel should be set.

Setting the reel too far ahead will not push the crop into the knife will be cut, nor will it efficiently deliver it onto the draper.

Set the reel tines the same distance from the guards on both ends.

Adjust the reel height stops so that the tine tips will miss the guards and sickle by at least 2" with the cutter bar fully raised, to avoid cutting tines, and breaking knife sections.

Normally the more "down" the crop; the closer the tines will need to be placed to the cutter bar, down to this 2" minimum.

Set the reel tines the same distance from the guards on both ends.

Adjust the reel height stops so that the tine tips will miss the guards and sickle by at least 2" with the cutter bar fully raised, to avoid cutting tines, and breaking knife sections.

Normally the more "down" the crop; the closer the tines will need to be placed to the cutter bar, down to this 2" minimum.

9.8 - 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!

Care must be taken to ensure that the reel tines do not come in contact with the cutter bar. Tine contact will cause damage to the tines, knife sections, and guards. At no time should the reel tines contact the ground. Contact with the ground or with rocks will cause damage to the reel.

9.9 - 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.

9.10 - Universal – U-II Pick-Up Reel: Tine Pitch Adjustment

Plastic 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:

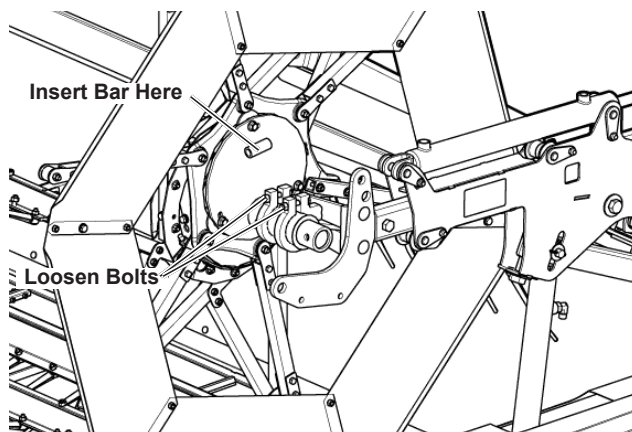


Fig. 78 - Adjusting Tine Pitch

1. Loosen the bolts (shown right) 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 tine pitch on 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.

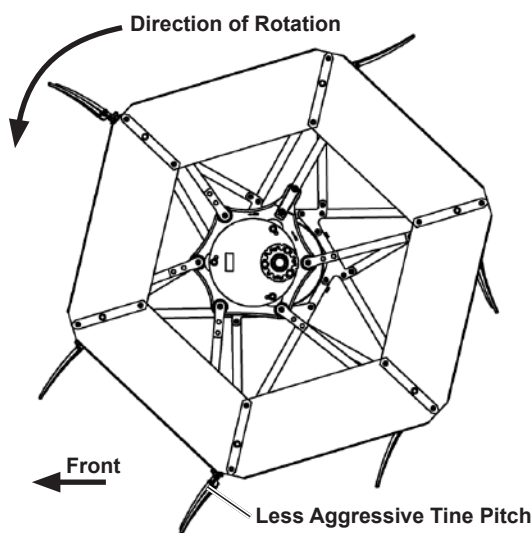


Fig. 79 - U-II Reel Tine Pitch

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.

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!

Tine pitch must be the same at both ends of the reel.



NOTE:

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.

9.11 - Control Rings (U-II Reels only)

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

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.

9.12 - Honey Bee Reel Tine Pitch Adjustment

1. Pull and rotate lock pin to one side so it is disengaged from reel.
2. Lift the handle up for less aggressive tine pitch.

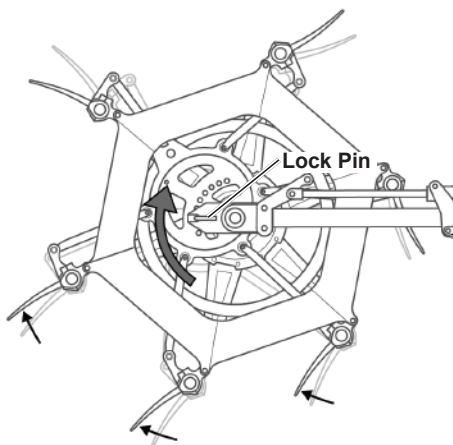


Fig. 80 - HB Reel - Decrease Tine Pitch

3. Lower the handle for more aggressive tine pitch.

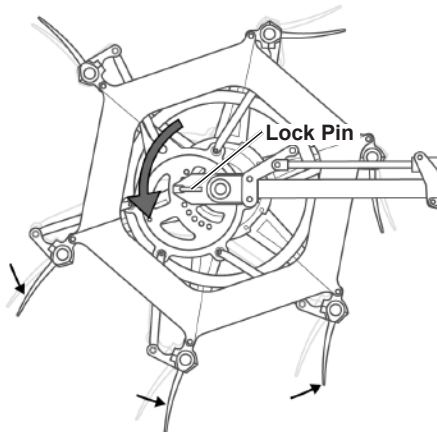


Fig. 81 - HB Reel - Increase Tine Pitch

4. Once desired setup is obtained, re-engage the lock pin.
5. Repeat this process for the other end of the reel to ensure each side has identical tine pitch.
6. Readjust reel height and reel fore/aft in order to maintain a minimum safe knife clearance (2" (5 cm)).

9.13 - Hart-Carter (HCC) Reel

The HCC reels supplied with the header are 6-bat reels, with plastic tines.

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.

9.13.1 - HCC Reel – Tine Pitch Adjustment

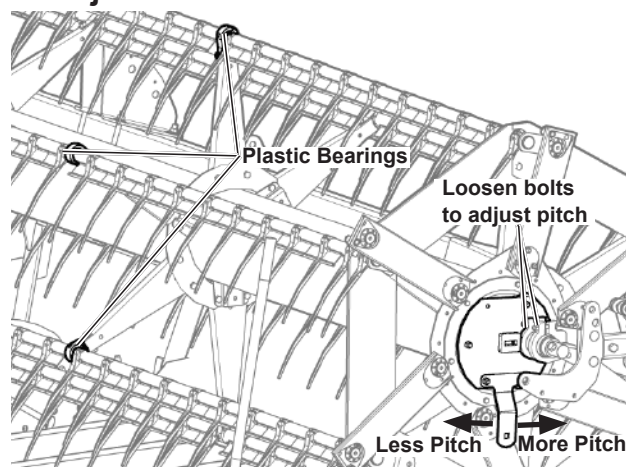


Fig. 82 - HCC Reel

1. Locate the tine pitch adjustment levers, and tine-pitch adjustment bolts, located at both ends of the reel.
2. 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°)
3. Re tighten the adjustment bolt, securing the pitch setting.

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.

9.14 - 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.

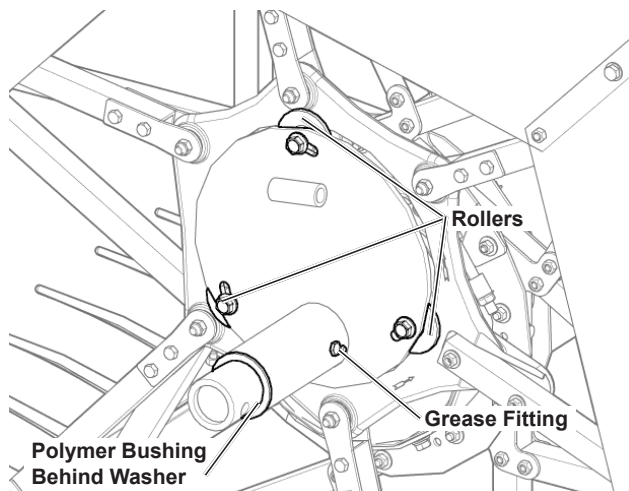


Fig. 83 - Reel Lubrication - HCC Reel



NOTE:

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.

9.15 - Check Points Before Operation:



WARNING!

Always engage reel lift cylinder locks and table lift cylinder locks before working under or around raised reel. Do not rely on the power unit hydraulic system for support. A rupture or a leak in any part of the system will cause the table and reel to drop if the proper stops are not in place.

- 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.
- 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.

10 - Draper and Decks

Depending on the options purchased, there are two lateral drapers on the table which move the crop to the opening. All drapers must be set, and maintained properly to perform well. Quick release adjusters with spring tensioning allow easy access for cleaning, and maintain proper draper tension. Unpack the draper. Check the size to ensure it is correct for the size of the deck.

CAUTION!

Lower the header to the ground or onto stable blocks, whichever provides the most comfortable working height.

Raise the reel to its maximum height and place the locks on the reel lift cylinders to prevent the reel from falling.

10.1 - Lining Up the Idler Roller

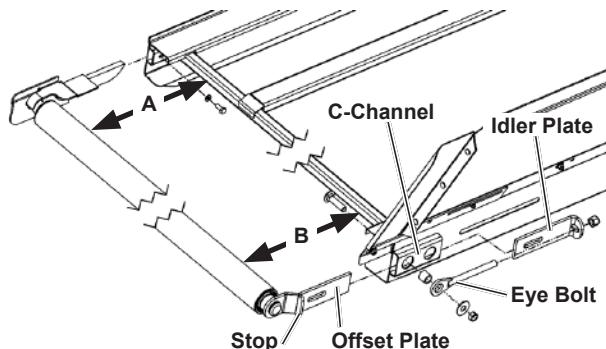


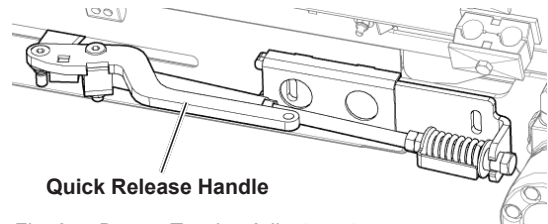
Fig. 84 - Idler Draper Alignment

Prior to installing the draper, ensure that the idler roller (the draper roller without the motor) is properly aligned. This is done by setting the end of the offset plate flush with the c-channel of the deck. Adjust the eye bolt until the end of the idler plate contacts the stop on the offset plate if not so already.

Once extended, you should make sure that everything is parallel. The easiest way to do this, is to measure the distance between the roller and the closest cross brace on the draper deck. Make sure measurement "A" is the same distance as measurement "B". If it still does not line up, you may adjust the eye bolt again.

10.2 - Draper Installation

1. Make sure that the quick release lever is in the open position prior to installing the draper on the deck.



Quick Release Handle

Fig. 85 - Draper Tension Adjustment

2. Place draper bundle on the top of deck runners, and unroll with the slats facing up. Be sure to align the v-guide with the notched side of the roller toward the rear end of the header.

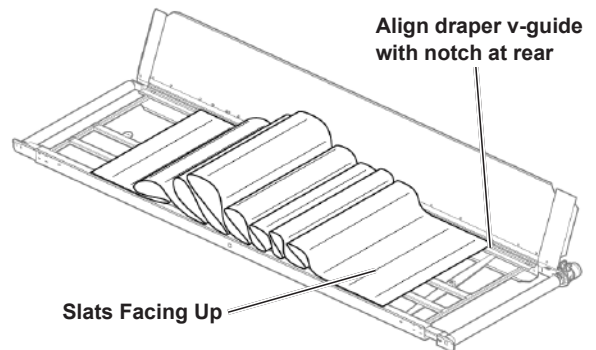


Fig. 86 - Unroll Draper

3. Wrap draper around one of the rollers and feed draper into the bottom runner of the deck. The bottom runners will support the draper, and prevent it from hanging down.

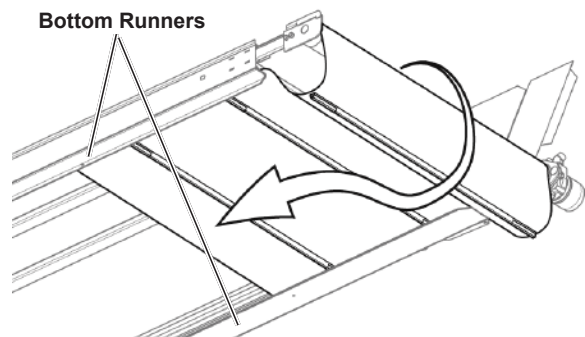


Fig. 87 - Feed Canvas Along Bottom Runners

4. Pull draper through bottom runner, and wrap around the other roller. Pull the ends of the draper together. Install a connector bar to close the joint. Take note of the position of the rounded corners on the connector bar.

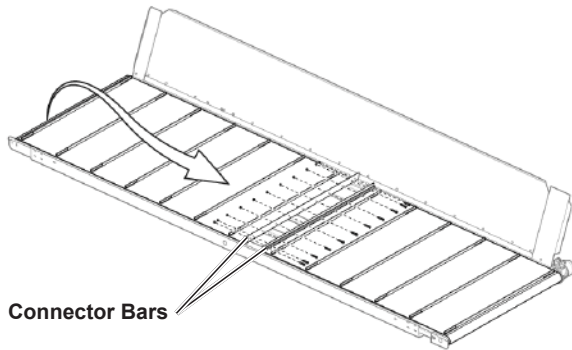


Fig. 88 - Secure Canvas with Connector Bars

5. The heads of the screws for the connector bar should be installed from the centre opening side. This helps prevent the crop being caught on the screws. Complete the installation by adjusting tension and tracking as described on the following pages.
6. Once the draper is installed on the draper deck, close the quick release lever (shown on following page) to apply tension to the draper.

10.3 - Tensioning

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

10.3.1 - Spring Tension Indicator

The spring tensioners are equipped with a spring length indicator to show the proper amount of tension that should be applied when the decks are tensioned, prior to field operation.

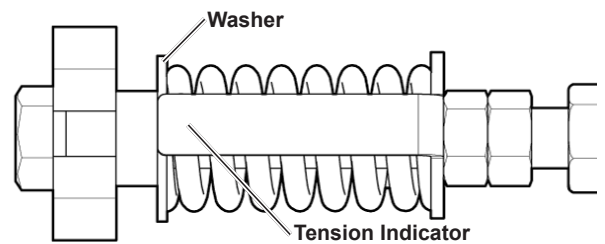


Fig. 89 - Draper Tension Indicator

NOTE:

For proper tension, the tip of the indicator should be even with the end of the spring. This allows for good draper tension, while still having spring compression left over for crop loads on the draper.

To check if tensioning is required:

1. Engage the power unit drive with the engine at low idle.
2. Observe from the cab how the drapers are tracking.

WARNING!

If adjustment is required, lower the header to the ground, raise the reel and lock in place. Shut down the header, and turn off the engine before exiting the cab.

If tensioning is required:

1. Adjust the tension by turning the adjuster bolt (Quick Release doesn't need to be released when adjusting).

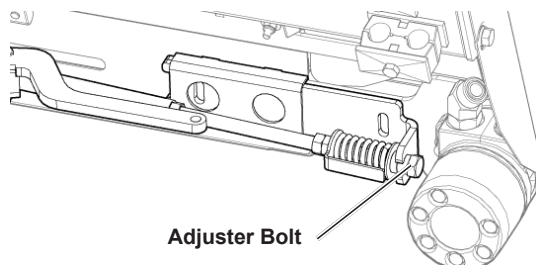


Fig. 90 - Draper Tension Adjustment

- Turn the adjuster bolt clockwise (shorten the bolt) to decrease tension
- Turn the adjuster counter-clockwise (lengthen the bolt) to increase tension.



NOTE:

When increasing tension, do not compress the spring past the indicator tip.

2. Restart the combine and repeat the running test. Re-adjust as necessary.



NOTE:

When adjusting the draper tension and tracking, check the clearance between the draper deck slats and the end strut.



CAUTION!

Draper tension should be just enough to prevent slipping. Do not overtighten as it may cause failure to the bearings, draper rollers and/or draper belts.

The draper may be damaged if it, or deck parts contact the end strut.



IMPORTANT!

A minimum of 2" (50 mm) clearance is recommended. If necessary, loosen the deck restrainer and slide deck over.

10.4 - Tracking

The draper must track properly on the rollers to avoid damage to the drapers. The draper decks allow for approximately $\frac{1}{4}$ " clearance on each side.

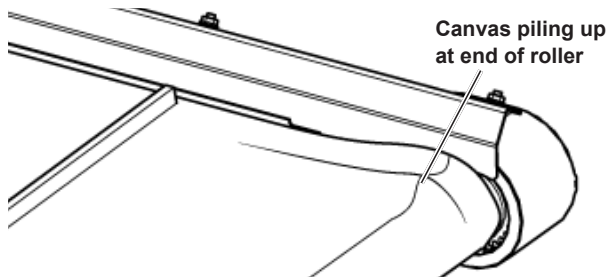


Fig. 91 - Improper Draper Tracking

10.4.1 - Idler Roller Tracking Adjustment

This roller is fixed at the cutter bar, so is adjustable only at the back panel. If the draper is tracking toward the back panel, tighten the nut on the eye bolt (shorten the eye bolt). This will push the idler mount plate and idler roller at the back panel end out, creating more slack in the draper at the cutter bar.

If the draper tracks toward the cutter bar, lengthen the eye bolt. This will pull the idler mount plate and idler roller in, creating slack in the draper at the back panel end.

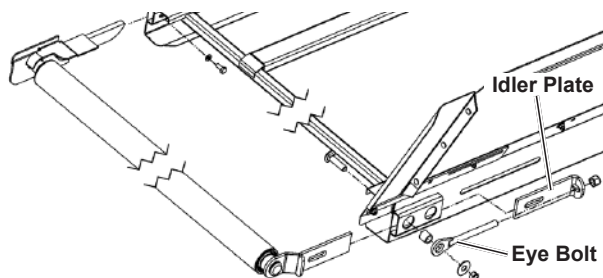


Fig. 92 - Idler Draper Alignment



NOTE:

The draper will track to the slack side.

10.4.2 - Drive Roller Tracking Adjustment

There is no direct adjustment for tracking on the drive roller end. It is self tracking by way of the v-guide in the drive roller and tensioning system

10.5 - Draper Speed

Proper draper speed is critical to the performance of your Grain Belt Header. The draper speed should be balanced with the field speed of the combine to deliver the material smoothly to the center draper.

The speed of the lateral deck drapers and the center deck draper is controlled by an adjustable flow control. Adjusting this control will affect all decks. When using the header as a swather the draper speed should be set to form a good windrow, to remove the cut crop from the cutter bar and to deliver it smoothly to the opening.

Things to Observe while cutting:

- Excessive draper speeds may form a poor swath. The heads tend to be thrown to the center and can fall through the stubble.
- Draper speeds that are too slow for the field speed tend to overload the decks with cut crop and can result in plugging the cutter bar. In lighter crops, the swath is often too open and may fall through the stubble, making it difficult to pick up.
- Experiment with different draper and field speeds to obtain the best swath formation for the cutting conditions. It may also be necessary to make adjustments as conditions change.



IMPORTANT!

Avoid over-speeding the draper. Excessive draper speed will cause premature wear and shorten draper life significantly.

10.6 - Draper Speed - Feeder Deck

On all headers with combine driven reels the feeder deck draper drive motor is plumbed in series with the lateral draper deck drive motors. Both draper circuits are controlled with one flow control. Adjusting the flow control will change the speed of the feeder draper as well as the lateral draper.



NOTE:

Any adjustment to the flow control will affect the lateral and center draper

10.7 - Center Draper - (Rearward Feeding)

Proper tension must be maintained on the draper to prevent slipping on the drive roller. The draper tension is changed by adjusting the idler roller at the front of the deck.

10.7.1 - Adjusting Center Draper Tension:

When the draper is correctly tensioned, you should be able to lift the side of the draper approximately 2" (5cm) without effort.

Draper tension can be easily modified by releasing the quick release lever, located on the side of the draper deck, and adjusting the spring loaded rod assembly accordingly.

Lock the quick lever to re-apply the tension onto the draper.

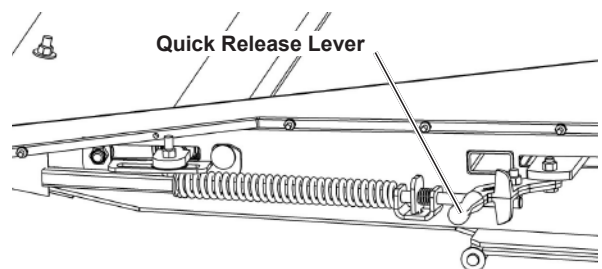


Fig. 93 - Center Draper Tension



IMPORTANT!

Do not over-tighten the center draper; it should only be tensioned enough to prevent it from slipping on the drive roller. Over-tightening will decrease draper life and may cause premature failure of the rollers.

10.8 - Draper Splicing

Regular maintenance will extend the life of your draper. Proper tension and tracking are very important. If material builds up inside the deck, it will wrap around the idler and drive rollers causing the draper to tighten. As the draper tightens, additional stress is put on the motor and the draper. If this condition is not corrected, it will result in failure of the drive roller motor or the draper. Tears in the draper can be caused by poor tracking, foreign materials, or from careless use. If only a portion of draper is damaged, a splice may be installed.

Before beginning this repair, you will need an additional connector bar set and a section of draper that is at least 2 1/2" longer than the piece to be removed.



NOTE:

If the damaged section is not near an existing connector bar, you will need 2 connector bar sets and a piece of draper 5" longer than the damaged piece.

1. Raise the header and install lift cylinder locks. (If this is too high for comfortable access, the table can be set on blocks or lowered to the ground.)
2. Raise the reel and place the locks on the lift cylinders to prevent the reel from falling.



WARNING!

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

3. Release the draper tension.
4. Remove draper connecting bar.
5. Correct the cause of the draper failure.
6. The draper should be cut midway between two slats to provide ample material for the new join. With a measuring tape, measure, and mark a line six inches from a slat on a good portion of the draper. Place a board directly under the line you have marked, to support the section you will be cutting. With a utility knife and a straight edge cut the draper along

the marks. This cut must be accurate, and square, to assure that the draper will track properly. Repeat this step on the other side of the damaged area.

7. Lay the piece you have removed flat, and measure the width, then add 3 1/2 inches. The total will be the length of material you require for the splice. (If you need two new connector bar sets, add 5".)
8. To mark the location for holes, measure 1" in from each edge to be joined, and mark a line parallel to the cut edges.
9. On each of these lines, measure 1-1/8" from the front edge of the draper, and make a mark for the first hole.

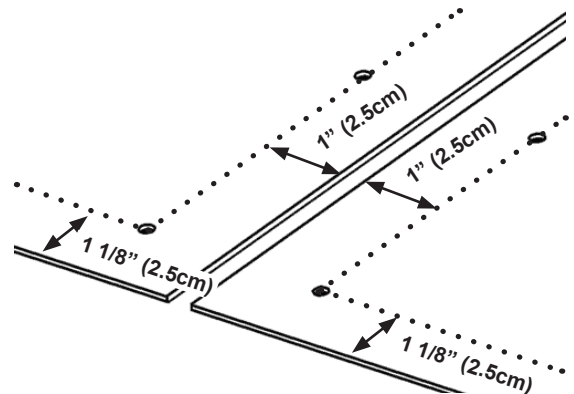


Fig. 94 - Draper Splice Hole Measurements

10. Drill 3/16" holes through each mark.
11. Place the backs of the draper together, lining up these drilled holes.
12. Place a connector bar on each side, line up the holes, and secure with a machine screw and nut.

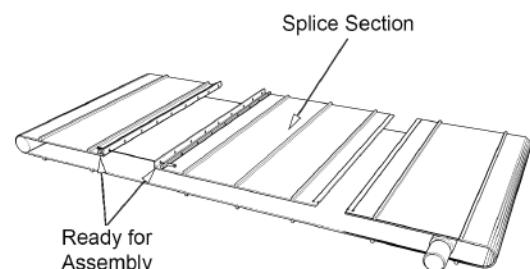


Fig. 95 - Draper Splice

13. Match up the edges of the draper and drill a hole at the opposite end on the 1" line, using the connector bar as a template. Insert a screw and secure in place. Drill the remaining holes through the holes in the connector bar, insert screws and secure.
14. Adjust draper tension. Trim all joins to 1/2" above connector bar.
15. Adjust tracking.

10.9 - Idler Roller Removal

1. Relieve draper tension using the quick release lever.
2. Remove the nut, washer, spacer and bolt that holds the eye bolt and idler plates in place.
3. Slide the idler plate with the eye bolt out of the c-channel as far as possible.
4. Pull the offset plate away from the roller end, letting the roller drop down.
5. Pull the idler roller out of the deck.
6. Check bearings on each end and remove any material build-up on the roller.
7. Re-assemble in reverse order. See section 10.1 for details. Adjust tension and tracking as necessary.

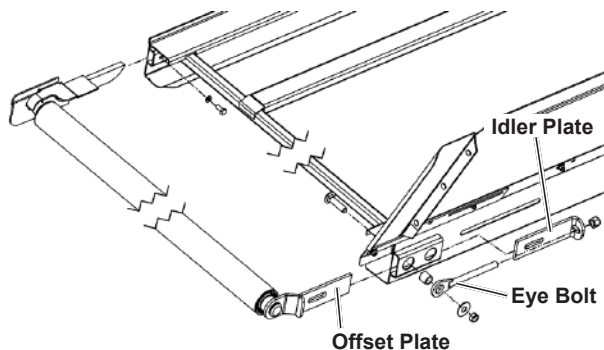


Fig. 96 - Idler Draper Alignment

10.10 - Drive Roller Removal

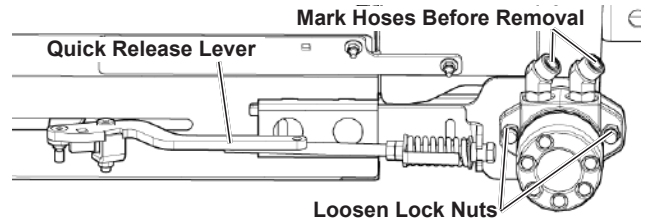


Fig. 97 - Drive Roller Removal

1. Relieve the draper tension using the quick release lever.
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. Remove the lock nuts that secure the motor onto the motor plate. It is not necessary to remove the adjuster bolt from the motor plate.
4. Pull the motor with drive roller through the hole in the motor plate.
5. Check bearing in end of roller, and remove any build up of material on roller.

NOTE:

Check and remove any built up material from the draper deck runners. If necessary, split draper at connector bar to gain access to inside of the deck.

To re-install drive roller, reverse above procedure. Adjust tension and tracking as necessary.

10.11 - Removing Draper Motor

1. Remove Hex Bolt set screws.
2. Insert two pry bars one on each side of motor, and pry motor out of drive roller. Do not hammer on the housing flanges of the motor. Damage to motor will void warranty.
3. If motor does not move, insert a 7/8" or 3/4" rod through the center of drive roller and apply force directly to the shaft of the motor.

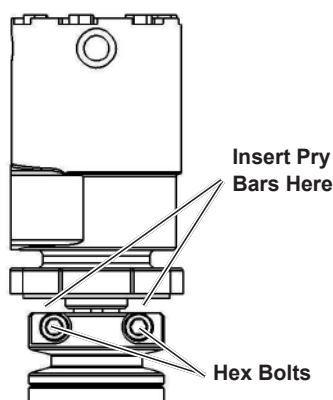


Fig. 98 - Remove Draper Motor

10.12 - Replace Bearings on Drive Roller

The roller bearings are pressed into the rollers with a friction fit and held in place with a retaining ring.

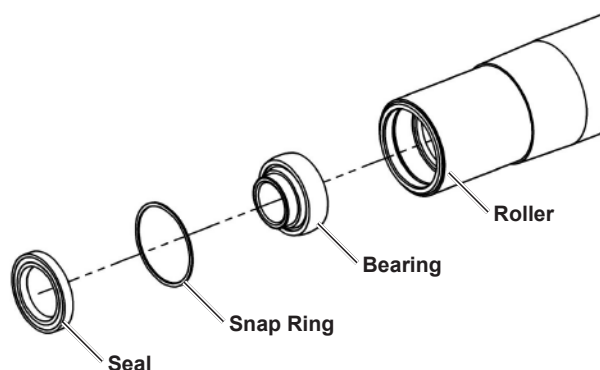


Fig. 99 - Drive Roller Assembly

1. Remove seal that holds the bearing assembly in place. Be prepared to replace the seal with a new one upon replacement.
2. Remove the snap ring that secures the bearing in place.
3. On the opposite end of the roller from the bearing to be removed, insert a small rod through the inside of the roller and push the bearing out.
4. Drive bearing out with the rod.
5. Install new bearing, and replace the retaining ring and seal.

10.13 - Replace Bearings on Idler Rollers

The roller bearings are pressed into the rollers with a friction fit and held in place with a retaining ring.

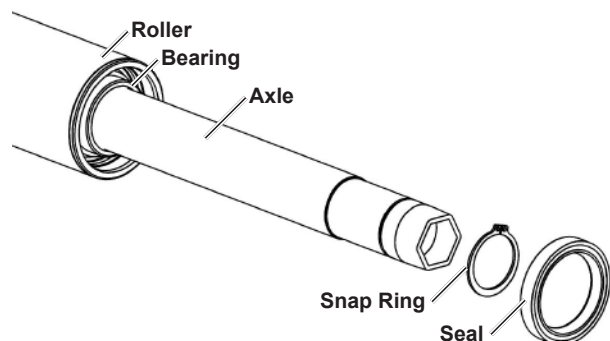


Fig. 100 - Idler Roller Bearing

1. Remove seal that holds the axle and bearing assembly in place. Be prepared to replace the seal with a new one upon replacement.
2. Remove the snap ring that secures the bearing and axle in place.
3. Grab the axle and pull it out of the roller, ensure that you pull the side with the hexagon end out first.
4. On the opposite end of the roller from the bearing to be removed, insert a small rod through the inside of the roller and push the bearing out.

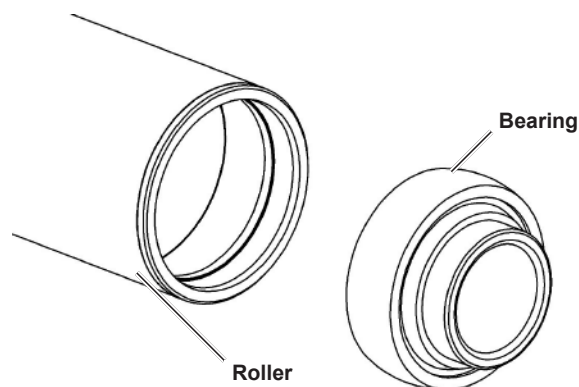


Fig. 101 - Idler Roller Bearing

5. Install new bearing, and replace the axle, snap ring and seal.

10.14 - Installing Draper Motor

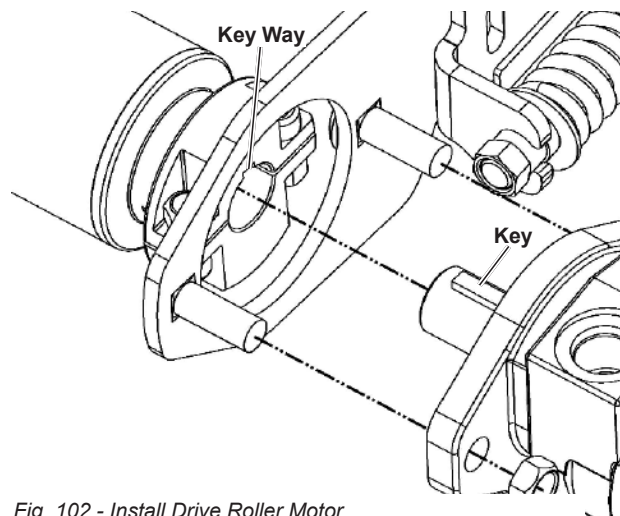


Fig. 102 - Install Drive Roller Motor

1. Clean motor shaft and hub of drive roller. Apply anti-seize to shaft.
2. Insert key in motor shaft.
3. Insert motor into hub, lining key on shaft with the key-way in the hub. Do not use a hammer on housing flange; damage of this nature to the motor will void warranty. Use a soft blow or rubber hammer to apply force to end of motor.
4. Tighten set screws.

10.15 - Hydraulic Draper Deck Shift

The hydraulic deck shift system allows the right hand draper deck to be hydraulically shifted to the left or right, allowing for center or right hand end crop delivery.

The hydraulic deck shift system is controlled via the hydraulic deck shift handle located on the right side of the subframe (please note the subframe and feed auger drum are not shown in the illustration for clarity).

DANGER!

As the header must be running for the hydraulic deck shift handle to function, you must take **EXTREME** care to avoid any moving parts when operating the deck shift handle. Failure to avoid moving parts can result in injury or death.

10.15.1 - Before using hydraulic deck shift

The feed auger drum can interfere with the lateral draper decks when operating the hydraulic deck shift.

WARNING!

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

1. Move the feed auger drum as far back as possible as outlined in section 11.1.3 on page 80.
2. Remove the drive shaft located on the left end of the feed auger drum and secure it away from moving parts.

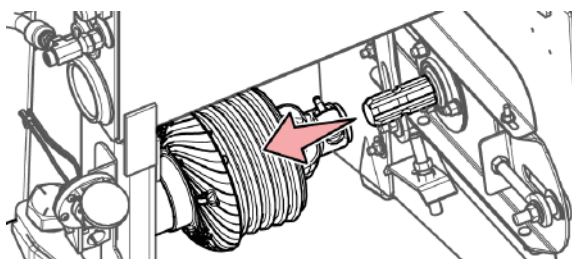


Fig. 103 - Remove feed auger drum drive shaft

10.15.2 - Operating Hydraulic Deck Shift

The hydraulic deck shift handle (located to the right of the subframe) has 3 positions.

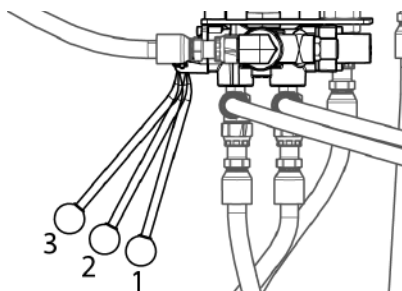


Fig. 104 - Draper deck shift handle

Position 1:

- The handle is pushed in.
- The deck shift motor moves the right hand draper deck to the left.
- The right hand draper deck motor turns to deliver crop to the right hand opening.

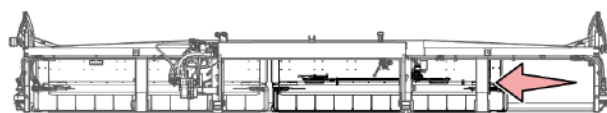


Fig. 105 - Handle in position 1 - Right hand crop delivery

Position 2:

- The handle is in the middle position
- Neutral position, preventing hydraulic flow.
- The deck shift motor, center draper motor and right hand draper motors do not receive hydraulic flow and will not move.

Position 3:

- The handle is pulled out.
- The deck shift motor moves the right hand draper deck to the right.
- The right hand draper motor turns to deliver crops to the center opening.

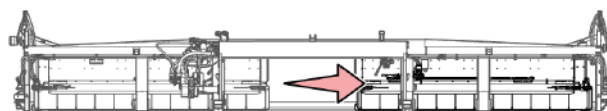


Fig. 106 - Handle in position 3 - Center crop delivery

10.15.3 - Hydraulic Draper Deck Shift Stops

The deck shift stop brackets must be configured before operation. These brackets limit the range of movement of the draper decks to prevent them from impacting anything during the deck shift process.

WARNING!

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

1. Loosen the nuts on the right deck shift motor and disengage the deck shift chain

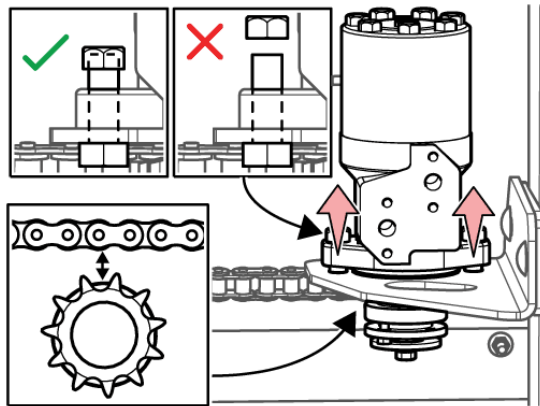


Fig. 107 - Disengage deck shift chain

2. Manually push the right deck to the right until it is about 1" (2.5 cm) away from the left end strut or end strut gauge wheel.

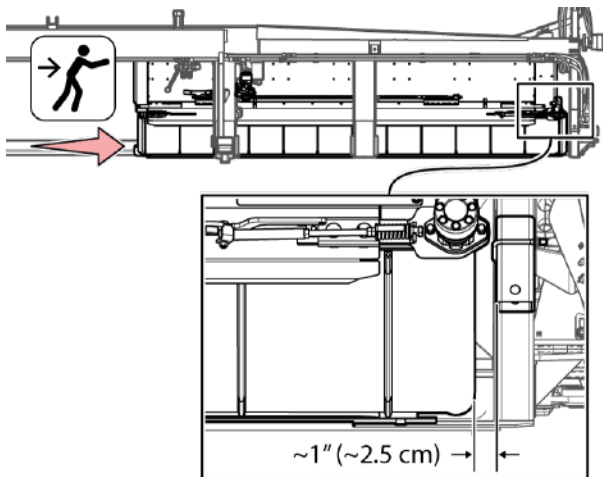


Fig. 108 - Push right deck to the right

3. Install the inner deck shift stop against the cog as shown.

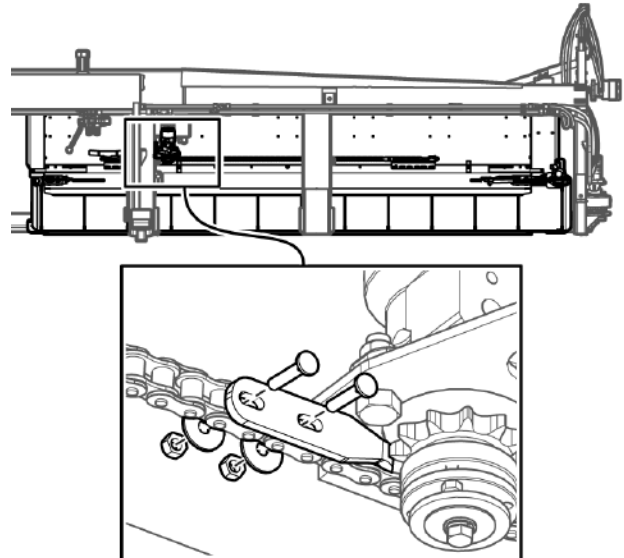


Fig. 109 - Install inner deck shift stop

4. Manually push the right deck to the left until there is approximately 1.5" (3.8 cm) space between the draper deck back panels.

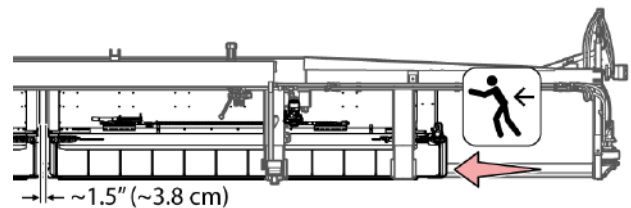


Fig. 110 - Push right deck to the left

5. Install the outer deck shift stop against the cog as shown.

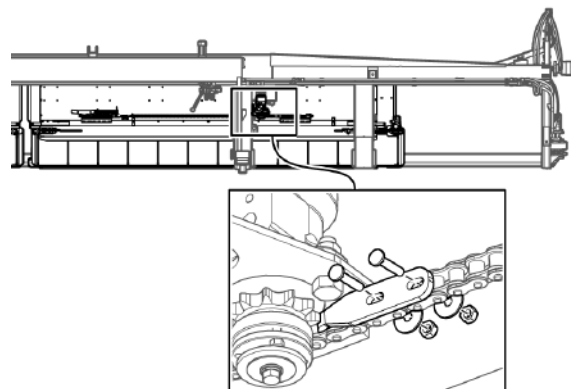


Fig. 111 - Install inner deck shift stop

6. Re-engage the deck shift chain with the cog on the left and right deck shift motors and re-tighten the motor mounting bolts.

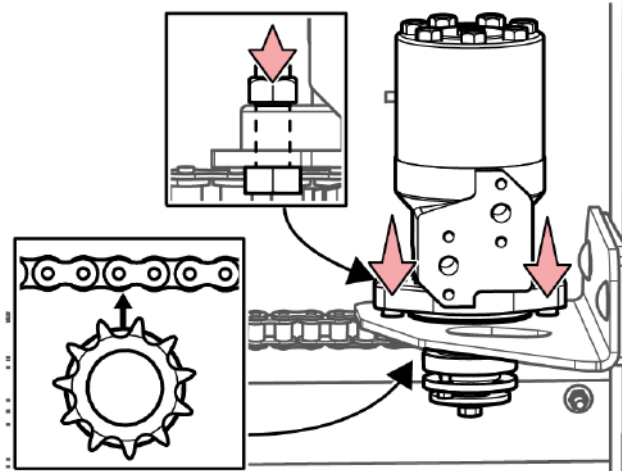


Fig. 112 - Reengage deck shift chain

7. Start the power unit and test the deck shift system to ensure the deck shift stops prevent the draper decks from impacting anything during the shifting process.

10.16 - Manual Draper Deck Shift

The manual deck shift option allows for four possible configurations of the draper decks:

- Center crop delivery (default)
- Left end crop delivery
- Right end crop delivery
- Dual crop delivery (left AND right end)

The following instructions assume you are starting from the center delivery configuration. To return to center delivery, simply reverse the steps.

10.16.1 - Before Operating Manual Deck Shift

The feed auger drum can interfere with the lateral draper decks when operating manual deck shift.



WARNING!

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

1. Move the feed auger drum as far back as possible as outlined in section 11.1.3 on page 80.
2. Remove the drive shaft located on the left end of the feed auger drum and secure it away from moving parts.

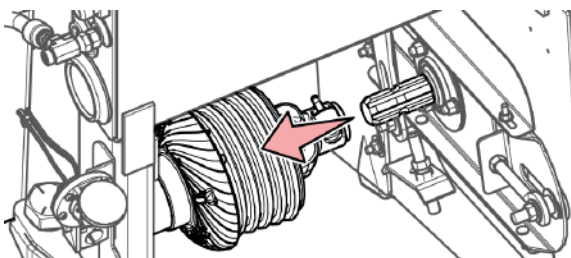


Fig. 113 - Remove feed auger drum drive shaft

10.16.2 - Left End Crop Delivery



WARNING!

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

1. Disconnect the restrainer bar from the rear of the left hand draper deck.

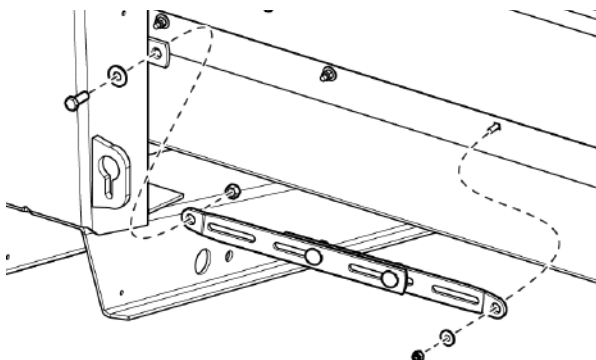


Fig. 114 - Disconnect restrainer bar

2. Manually push the left hand draper deck to the right until the draper back panel is approximately 1.5" (3.8 cm) away from the right hand deck back panel.

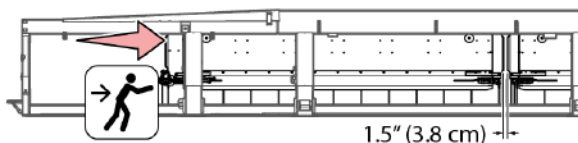


Fig. 115 - Push left draper deck to the right

3. Disconnect the center draper deck motor hydraulic quick couplers (A), then reconnect the couplers so the motor is bypassed (B). See below image for details. Take care to secure the hoses away from moving parts so they do not get damaged during operation.

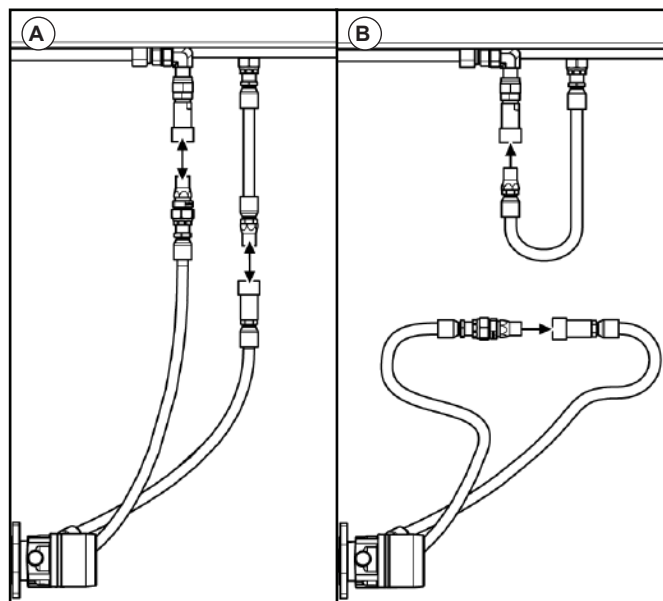


Fig. 116 - Bypass center draper motor

4. Reverse the left hand draper motor by reversing the quick couplers as shown below.

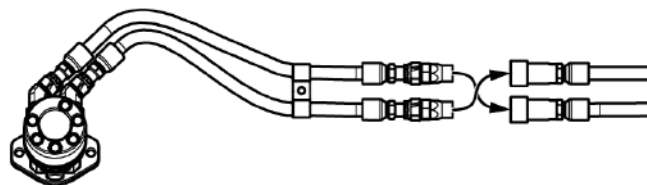


Fig. 117 - Reverse left draper motor direction

5. Resecure the draper deck to the frame with the restrainer bar which was removed in the first step.

10.16.3 - Right End Crop Delivery

WARNING!

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

1. Disconnect the restrainer bar from the rear of the right hand draper deck.

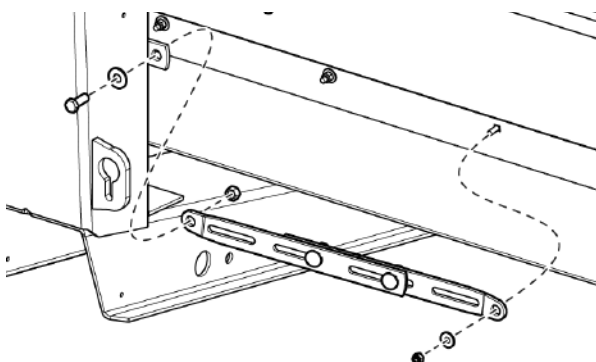


Fig. 118 - Disconnect restrainer bar

2. Manually push the right hand draper deck to the left until the draper back panel is approximately 1.5" (3.8 cm) away from the left hand deck back panel.

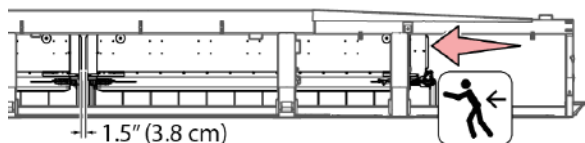


Fig. 119 - Push right draper deck to the left

3. Disconnect the center draper deck motor hydraulic quick couplers (A), then reconnect the couplers so the motor is bypassed (B). See below image for details. Take care to secure the hoses away from moving parts so they do not get damaged during operation.

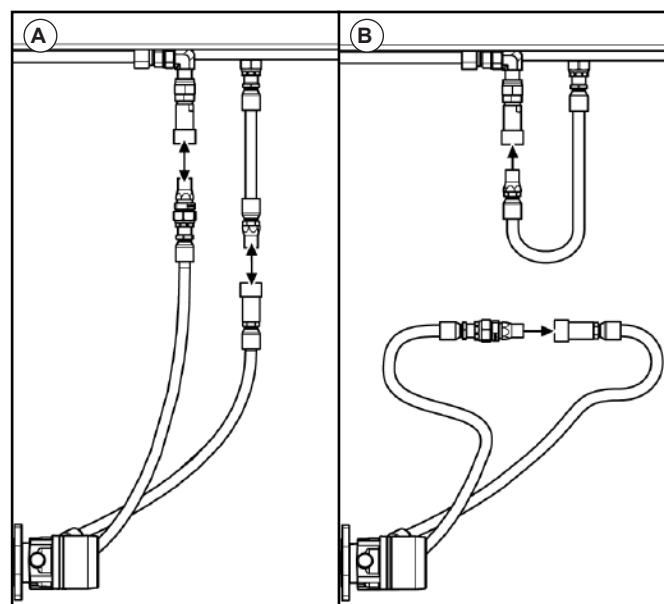


Fig. 120 - Bypass center draper motor

4. Reverse the right hand draper motor by reversing the quick couplers as shown below.

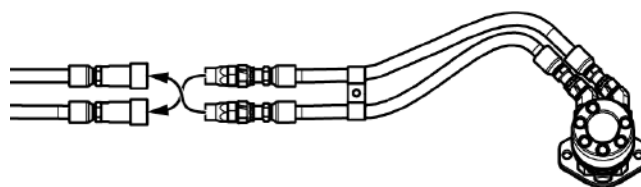


Fig. 121 - Reverse right draper motor direction

5. Resecure the draper deck to the frame with the restrainer bar which was removed in the first step.

10.16.4 - Left and Right Dual Crop Delivery

WARNING!

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

1. Disconnect the restrainer bar from the rear of the left and right hand draper decks.

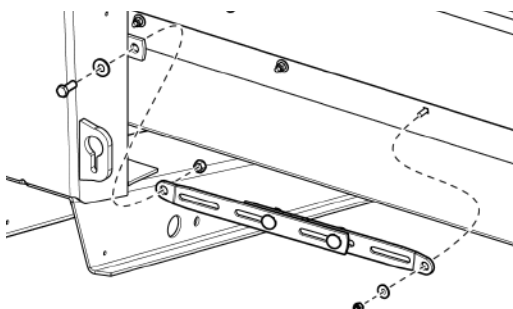


Fig. 122 - Disconnect restrainer bar

2. Manually push the left and right hand draper decks to the center of the header until the draper back panels are approximately 1.5" (3.8 cm) away from each other.

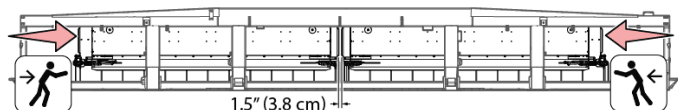


Fig. 123 - Push left and right draper deck to the center

3. Disconnect the center draper deck motor hydraulic quick couplers (A), then reconnect the couplers so the motor is bypassed (B). See below image for details. Take care to secure the hoses away from moving parts so they do not get damaged during operation.

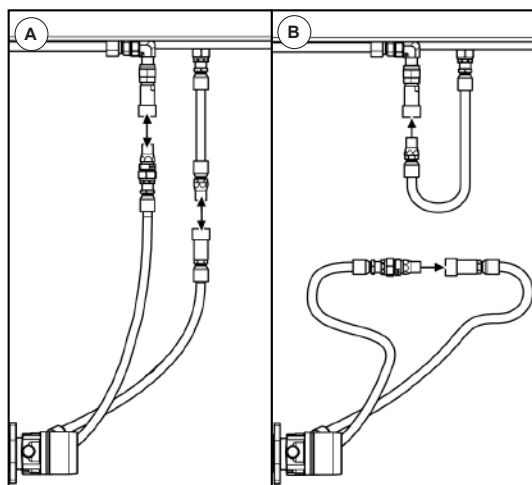


Fig. 124 - Bypass center draper motor

4. Reverse the left and right hand draper motors by reversing the quick couplers as shown below.

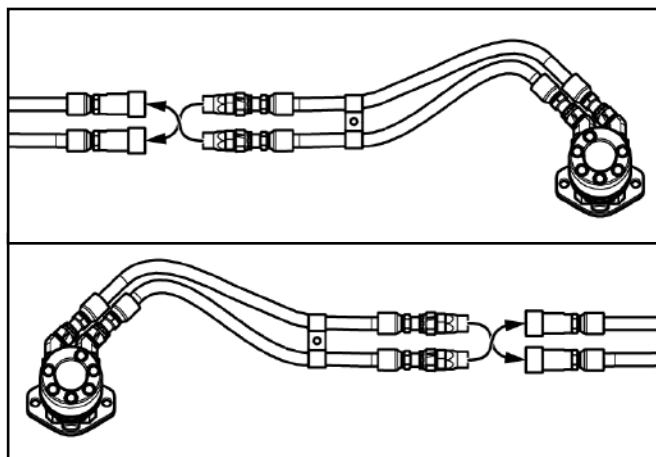


Fig. 125 - Reverse left draper motor direction

5. Resecure the draper decks to the frame with the restrainer bars which were removed in the first step.

10.17 - Draper Deck Maintenance:

- Remove draper connector bar.
- Remove draper - clean draper of debris, both sides.
- Store draper indoors.
- Clean debris from rollers, deck channels, and runners.
- Check and bend down corners of deck runners so draper does not get caught.
- Clean adjusters; lubricate guide tubes and adjuster tubes. Adjusters should move freely inside the guide tube.
- Check idler roller bearings; they should spin freely.
- Check drive roller bearings.
- Check bearing stubs.



NOTE:

If you elect to store the header outside with draper installed, position the connector bar on the underside to aid water drainage. Ice build-up underneath could cause draper to sag and drop out of the lower runner. If this is not noticed and corrected, damage may occur to draper on start-up.

11 - Center Feed Auger

The center feed auger receives the material from the center draper and propels it into the feeder house of the combine. The adjustment of the fingers, as well as the height of the auger, is critical for the optimum transfer of material into the combine feeder house. This adjustment may need to be changed for different crop types and conditions to maintain an optimum flow of material from the drapers into the feeder house.

11.1 - Standard Adjustments

Adjust the auger fingers to clear the pan or pan inserts by approximately $\frac{1}{4}$ " (6mm) to $\frac{1}{2}$ " (13mm). This is the recommended minimum clearance. Some crops may require greater clearance, and you may find other settings that suit your operating conditions better.



WARNING!

Before proceeding with the following adjustments, lower the combine header completely to the ground or raise header to its full height and put feeder house cylinder locks in the place, whichever position will give you the most comfortable access to the center auger.

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

11.1.1 - Finger Extension Adjustment

The extension - retraction action of the fingers is adjustable to suit the type of crop being harvested.

To adjust the extension/retraction of the fingers:

1. Locate timing plate arm on the right-hand end of the auger adapter
2. Loosen lock bolt.

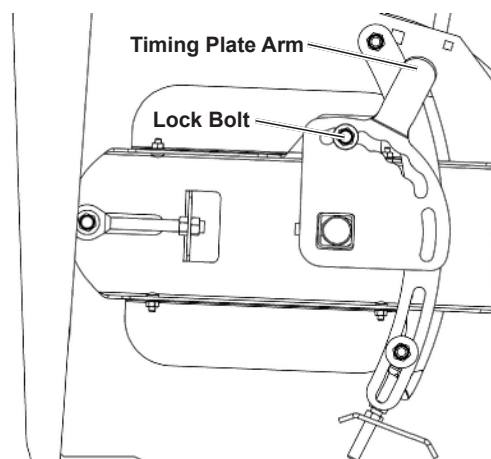


Fig. 126 - Finger Extension Adjustment

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



NOTE:

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)

6. Adjust the auger fingers so that they clear the pan or pan inserts by $\frac{1}{4}$ " (6mm) to $\frac{1}{2}$ " (13mm).

11.1.2 - Auger Drum Height Adjustment

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

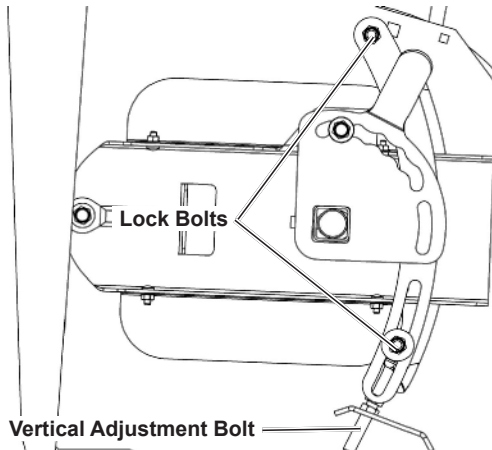


Fig. 127 - Feed Auger Drum Height Adjustment

1. Loosen the lock nuts on the auger height adjustment bracket, at both ends of the adapter.
2. Locate vertical adjustment bolt, on each end of the adapter, and loosen the lock nut on the bottom of the bolt.
3. Hold the carriage bolt still while turning the top nut. Increasing the length of the bolt will lift the auger, shortening it will lower the auger.
4. Adjust both ends the same so full length of auger will run parallel to the adapter pan.

When the desired clearance is attained, tighten the lock nut on the vertical adjustment bolt, and tighten the lock bolts on the height adjustment bracket.

11.1.3 - Fore – Aft Adjustment of the Center-Feed 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" (50mm) of travel. Care should be taken to ensure that both sides are adjusted by the same amount. When moving the auger drum ensure that the auger flighting and the auger fingers do not contact the feeder chain on the combine or the draper on the feeder deck.

Adjust the clearance as follows:

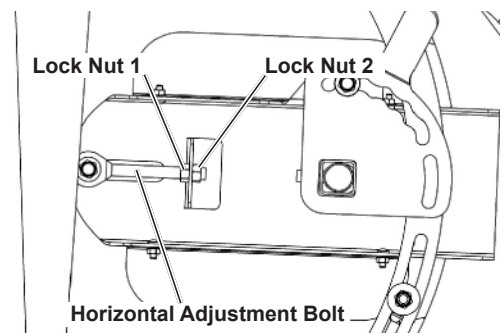


Fig. 128 - Feed Auger Drum Fore/Aft Adjustment

1. Locate the adjustment bolt on each end of the auger adapter. To decrease the clearance between the adapter and the auger; loosen lock nut 2 and turn lock nut 1 clockwise.
2. To increase the clearance, reverse this procedure.
3. When the desired clearance has been attained, re-tighten lock nuts 1 and 2.

For proper performance of the finger auger, each end of the auger should be adjusted with the same amount of clearance along the full length of the auger.



IMPORTANT!

Slowly rotate finger auger 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 arising from improper adjustment WILL NOT BE COVERED BY WARRANTY.

11.2 - Auger Drive Adjustment

The auger drive and the chain case mount are located on the left-hand side of the sub-frame. The chain case mount is secured to the sub-frame by two 5/8" u-bolts, which provide height adjustment.

11.2.1 - Drive Line Adjustment

NOTE:

Check drive shaft alignment prior to operating the header. As the angle of the drive shaft increases, the lifespan will decrease.

It is important to minimize the angle that the drive lines are operating at. The shallower the angle, the longer the lifespan of the drive shaft. Ensure you have enough overlap in the drive line sleeves.

If necessary, loosen the two U-bolts, and move the entire unit up or down.

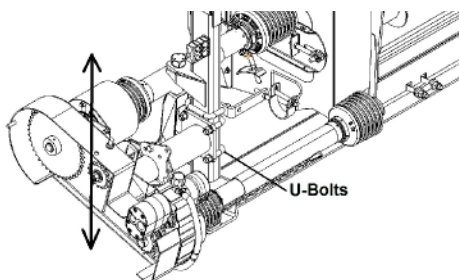


Fig. 129 - Drive Line Adjustment

NOTE:

When changing to another combine, it may be necessary to loosen the U-Bolts on the chain-case and lift the chaincase to achieve proper alignment.

11.2.2 - Chain Tension Adjustment

1. Remove the chain case shield from the auger drive assembly.
2. Loosen the idler sprocket, insert a pry bar into the bolt slot.
3. Apply downward pressure to the idler sprocket with a pry bar until approximately 1/2" (13mm) to 3/4" (19mm) of slack remains along the bottom run of chain.

4. Tighten the idler sprocket, and recheck the tension. Do not over-tighten the chain!
5. Reinstall, and secure the chain case shield.

11.2.3 - Drive Shaft

For information on the installation, service, and safety instructions for input drive lines and clutches refer to the owner's manual shipped with each drive line.

Read the manufacturer's manual before attempting to operate or service the drive shafts. If there are no manuals with the machine, request them from the manufacturer.

11.2.4 - Auger Drive Slip Clutch Adjustment

The auger drive slip clutch must be properly set in order to operate as designed. It is preset from the factory but the clutch may need to be adjusted occasionally.

To set the slip clutch you will need a metric measuring device and will have to tighten each bolt until a gap of 4.0-4.5 mm (about 3/16") between the Belleville spring washer and the plate is achieved. Measure the gap at each of the 6 bolts to ensure the measurement is the same all away around the circumference.

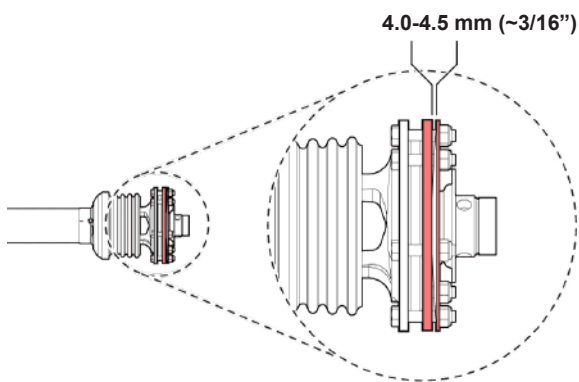


Fig. 130 - Slip Clutch Adjustment

11.3 - Operating the PTO

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

Do not wear loose fitting clothing or long, free hanging hair when operating the PTO, or when near any rotating equipment.

WARNING!

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

Never exceed the recommended operating speed of the equipment.

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. Always ensure that the implement input drive line is securely connected at both ends. Only operate a drive system when all safety guards are in place. PTO safety systems include: the combine master shield, the implement input drive line guard and the implement shielding.

If any component of the guarding system has been removed for any reason, it must be replaced or repaired prior to operating the machine.

Note the maximum drive line operating length. The implement input drive line should not be extended by more than half the available telescoping overlap.

Drive line universals should not be operated with greater than 25 degree angles.

11.3.1 - Drive Line Lubrication

From the factory, the PTO drive shafts are greased and ready for operation. For subsequent lubrication of the PTO drive shafts, use lithium, saponified high quality grease with E.P. additives.



IMPORTANT!

Do not use grease agents containing MoS₂!

Regardless of the operating hour total, the system should be lubricated at the end of every season. Especially when a high-pressure cleaner is used as lubrication is needed to force out any water that may have penetrated into the joints.

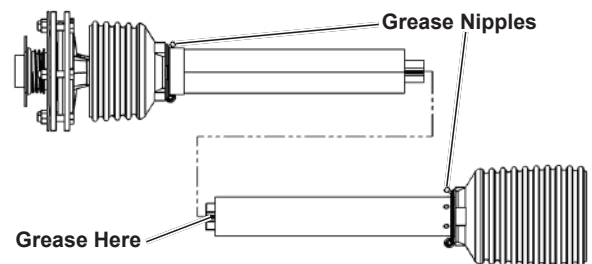


Fig. 131 - Drive Shaft Grease Points

Lubricate with quality grease before starting work and every 50 operating hours thereafter. Clean and grease the implement input drive line before each prolonged period of storage.

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

Telescoping members must have lubrication regardless of whether or not a grease fitting is present.

Telescoping members without grease fittings should be pulled apart periodically, and grease should be added manually.

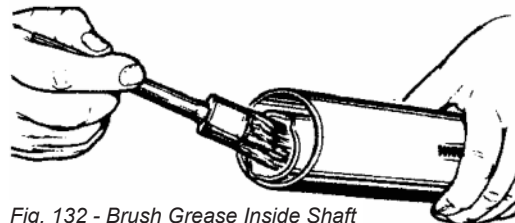


Fig. 132 - Brush Grease Inside Shaft

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

11.4 - Coupling the input drive line

Clean and grease the PTO and implement input connection.

11.4.1 - Drive Line Lock

1. Pull locking collar back towards the drive shaft.
2. Push the implement input drive line onto PTO shaft of the power unit until the locking device engages.

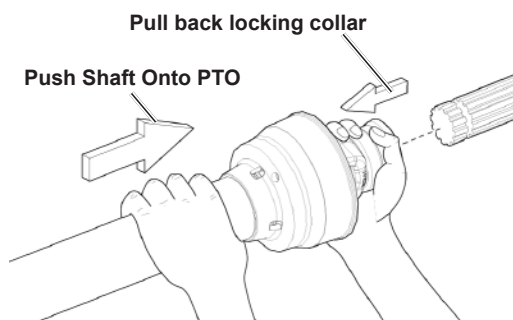


Fig. 133 - Coupling the Driveshaft



WARNING!

Check to ensure all the locks are securely engaged before starting work with the implement input drive line.



IMPORTANT!

The chain is intended to prevent the guard from rubbing against non-moving parts, thereby reducing premature wear and damage. With proper maintenance, a properly installed chain will increase the service life of the guard.

Chains must be attached to allow sufficient articulation of the shaft in all working positions. Care must be taken to ensure the chain does not become entangled with nearby components during operation or transport of machine.

The chain is not designed to carry the weight of the implement input drive line. Damage will occur if it is suspended by the chain.

11.4.2 - Drive Line Guard Disassembly

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

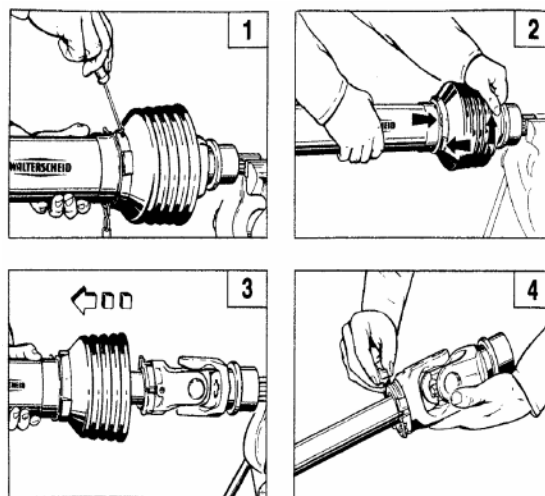


Fig. 134 - Drive Line Guard Disassembly

11.4.3 - Drive Line 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.

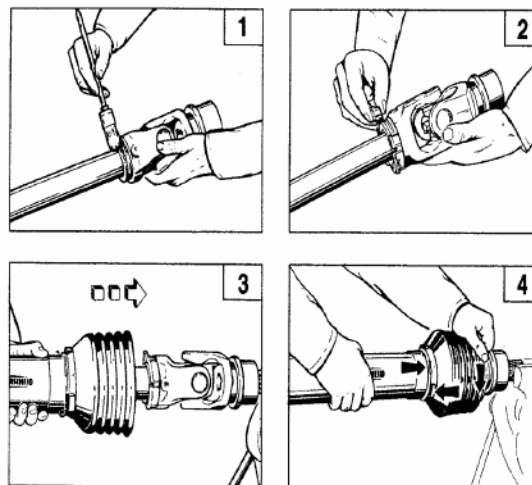


Fig. 135 - Drive Line Guard Assembly

11.4.4 - Replace Cone:

1. Disassemble guard as shown previously.
2. Remove old cone (e.g. cut open with knife).
3. Remove chain.
4. Place neck of new cone in hot water (approximately 80 C/180 F) and when heated, pull onto bearing housing.
5. Follow the assembly instructions listed above.
6. Reconnect chain.



WARNING!

Guards are designed to protect the user.

Defective and damaged guards must be repaired or replaced immediately.

12 - Dismounting the Header

There are three methods of removing the draper table, which differ only in the equipment used to support the header after it is removed from the combine:

- **Quick Dismount**, without using either transport axle package.
- **Integral Axle Dismount**, which utilizes the Integral Axle Transport package. Refer to Dismount Header onto Integral Axle.
- **Standard Axle Dismount**, using the Standard Transport Axle package. Refer to Dismount Header onto Standard Axle.

It is important to dismount the draper table properly from the combine to allow for: safe storage, ease of remounting, readiness for transport and to avoid possible damage to the draper table and combine.

WARNING!

Keep bystanders away from the machine, especially children as you complete these operations. Select a storage site away from human activity.

12.1 - Preparing For Dismount

IMPORTANT!

Park the combine on hard, level ground. Engage the park brake.

1. Start the Combine:
 - Lower the reel to its lowest possible position.
 - Raise the header to its fully raised position.

WARNING!

Engage the parking brake on the combine, shut the engine down and wait for all moving parts to stop before exiting the cab. Lock the feeder house lift cylinders in raised position as described in your Combine Owner's Manual.

2. Disconnect telescoping drive line from bottom left feeder house shaft and secure in the storage bracket.

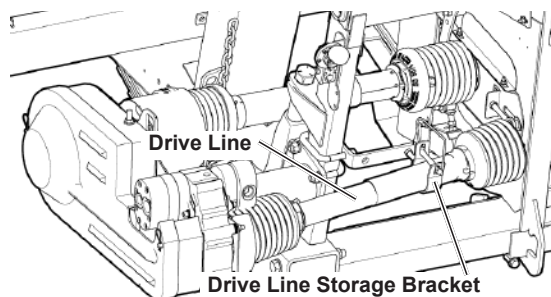


Fig. 136 - Drive Line Storage

3. Uncouple Multi Link (or individual hydraulic lines) connecting the draper table to the combine. Secure the hydraulic lines so they are clear of any moving parts or the ground.
4. Disconnect all wires from the combine to the draper table. Ensure they will not catch on the combine or the header when the combine is backing away from the draper table.
5. Lock the sub frame and the header together by shortening both the left and right restrainer chains as much as possible, which will support the sub frame in the quick dismount position.

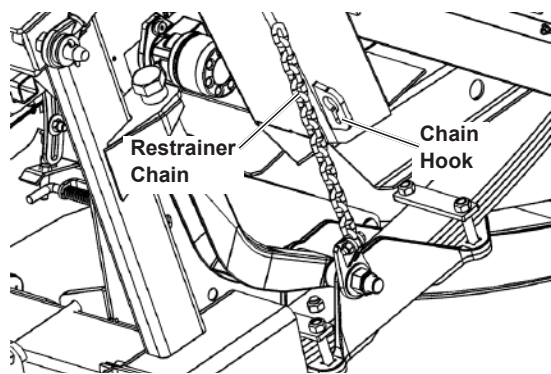


Fig. 137 - Restrainer Chain

6. Remove all locks, pins/bolts which hold auger adapter to the feeder house of combine.

12.2 - Quick Dismount



IMPORTANT!

Before starting these steps, ensure that you have fully completed the "Preparing For Dismount" section of this chapter.

1. Lay two (2) blocks (4" x 4" x 16") or (6" x 6" x 16") directly under the cutter bar, aligned with the two table struts located closest to the end of the header.

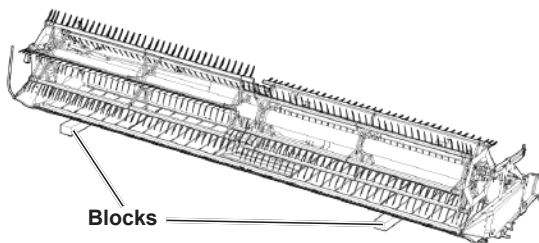


Fig. 138 - Support Front of Header With Blocks

2. Remove the feeder house cylinder locks.
3. Start the combine. Lower the header to about 12" above ground.
4. Dismount from the combine and check position of blocks to be sure they will contact the cutter bar.
5. Lower the table onto the blocks.
6. If header table is equipped with gauge wheels, the gauge wheels will support the back end of the table.



NOTE:

If gauge wheel spring tube is not shortened, the sub frame may tilt forward too far when released from combine, making it difficult to pick up.

7. If not equipped with gauge wheels, place blocks under the sub frame. Ensure they will fully contact the sub-frame and support it stably at a suitable height.

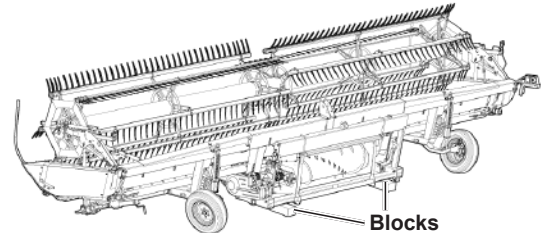


Fig. 139 - Support Rear With Blocks **OR** Gauge Wheels

8. Restart combine and slowly lower header onto blocks. When cutter bar contacts blocks, check position of blocks to be sure that cutter bar is making solid contact, and the blocks are laying absolutely flat so header will not slide off once the combine has been removed from header.
9. Restart combine continue to lower the feeder house until it is totally retracted from the auger adapter.
10. Slowly back combine 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 pins have been removed.

In the Quick Dismount position, the sub frame should be vertical or tilted slightly back toward the combine. This will make re-mounting easier.

12.3 - Integral Axle Header Dismount



IMPORTANT!

Before starting these steps, ensure that you have fully completed the "Preparing For Dismount" section of this chapter.

1. Lift transport axle out of the storage pocket, and slide it into the transport bracket. Secure it with the locking pin.

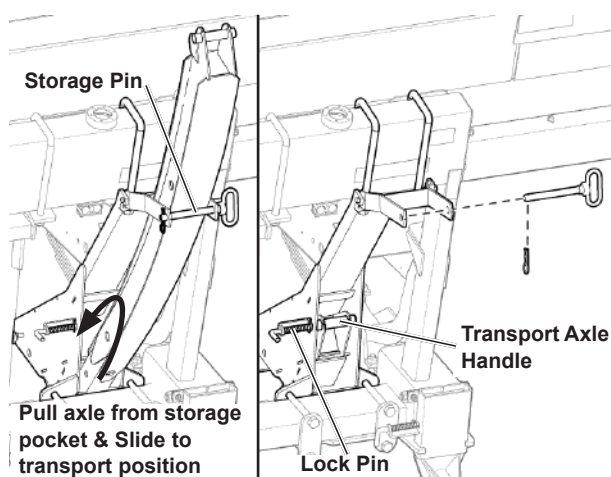


Fig. 140 - Integral Axle - Transport/Storage Position

2. Remove the transport axle riser from the bracket by pulling the lock pin and lifting upward. Turn it over, and reinsert it into the bracket from the bottom. Secure it with the locking pin.

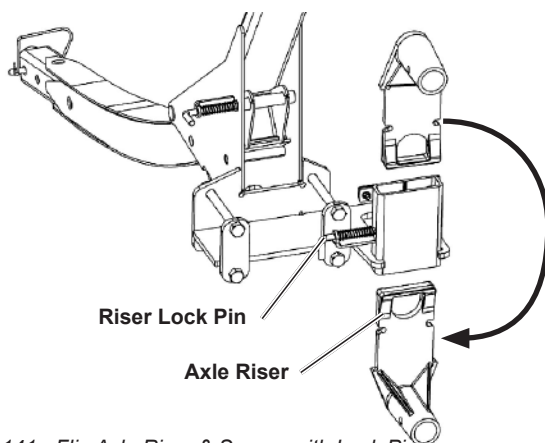


Fig. 141 - Flip Axle Riser & Secure with Lock Pin

3. Install the rear wheel assembly, and secure with the wheel lock pin. Install the front wheel assembly, and secure with the wheel lock pin.

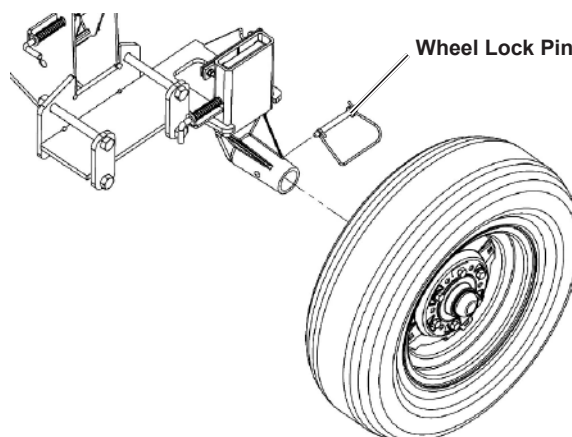


Fig. 142 - Install Wheels on Integral Transport



NOTE:

If your header has gauge wheels installed, remove the wheel assemblies and install them on the transport axle.

4. Slide the transport hitch tube out of the storage sleeve. Remove the hitch jack from its storage bracket and secure on the hitch tube. Ensure both lock pins are secured.

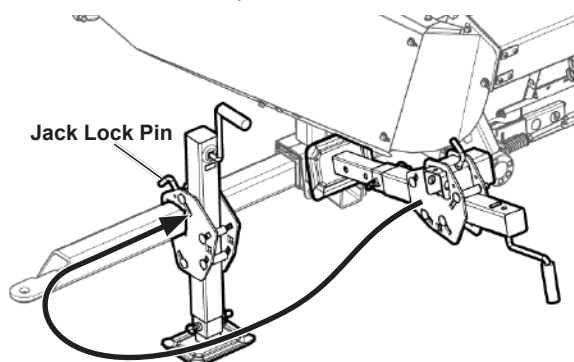


Fig. 143 - Hitch Jack - Transport Position

5. Ensure that it is safe to do so, and remove the cylinder locks from the combine.
6. Restart combine and slowly lower header to the ground. Ensure that the wheels and transport hitch jack come into full contact with the ground.

7. Restart combine continue to lower the feeder house until it is totally retracted from the auger adapter.
8. Slowly back combine away from the header. Be sure that header does not move backwards with the combine. If it does, shut combine down completely and ensure all pins have been removed, and that everything is properly disengaged.
9. Raise or lower the hitch jack to level the table.

Ensure that the safety lock pin and safety clip are properly installed so the hitch jack is securely fastened to the hitch tube.

12.4 - Standard Axle Header Dismount

Before starting these steps, ensure that you have fully completed the "Preparing For Dismount" section of this chapter.

1. Place the transport axle under the header, with the strut oriented to the cutter-bar side (front) of the header.
2. Lift the front of the axle and hook the tabs on the top of the strut tower onto the lip at each side of the header strut.
3. Remove the pin from the top U-bracket. Lift the rear of the axle into position and reinsert the pin.

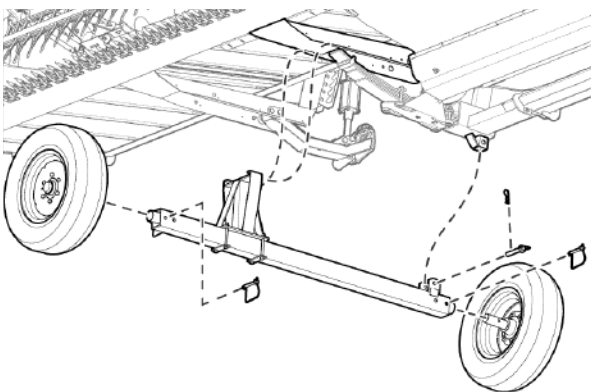


Fig. 144 - Install Transport Axle

4. For headers without gauge wheels, remove the safety pins, install the tire and wheel assembly into the axle, and reinsert the safety pin.

5. For headers with gauge wheels, remove the right hand gauge wheel assembly from its mount and install it in the rear spindle mount of the transport axle. Secure it with the safety pin. Remove the left hand gauge wheel assembly from its mount and install it in the front spindle mount of the transport axle. Secure it with the safety pin.
6. Slide the transport hitch tube out of the storage sleeve. Remove the hitch jack from its storage bracket and secure on the hitch tube. Ensure both lock pins are secured.

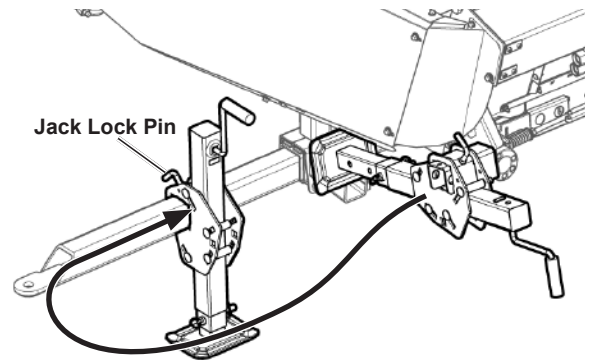


Fig. 145 - Hitch Jack - Transport Position

7. Ensure that it is safe to do so, and remove the cylinder locks from the combine.
8. Restart combine and slowly lower header to the ground. Ensure that the wheels and transport hitch jack come into full contact with the ground. Continue to lower the combine until the feeder house is completely retracted from the auger adapter.
9. Slowly back combine away from the header. Be sure that header does not move backwards with the combine. If it does, shut combine down completely and recheck to be sure all pins have been removed, and that everything is properly disengaged.
10. Raise or lower the hitch jack to level the table.

CAUTION!

Ensure that the safety lock pin and safety clip are properly installed so the hitch jack is securely fastened to the hitch tube.

13 - Optional Equipment

13.1 - Cross Auger

The cross auger can be beneficial for handling specialty crops such as peas, canola, mustard, safflower, and legumes. Many of these crops are not heavy enough to keep them firmly on the draper. Crops that are bushy or have vines tend to ride above the draper as the canvas moves under them. This often causes them to enter the feeder house in bunches or wads.

The cross auger features left and right hand flighting which gently pushes the crop down onto the draper while moving it toward the feeder deck and feed auger.

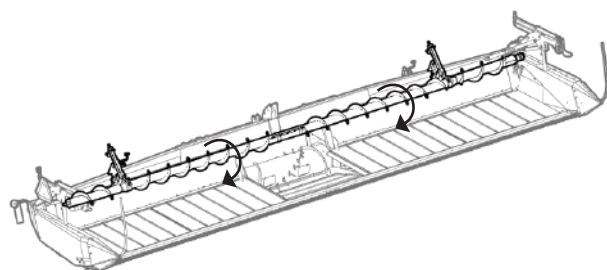


Fig. 146 - Cross Auger Direction of Rotation

The cross auger is suspended above the decks of the header on mounting brackets.

The cross auger is plumbed into the reel circuit with a manual flow control. The speed of the cross auger should be adjusted only enough to keep the crop moving. If the cross auger rotates too quickly, wrapping may occur.

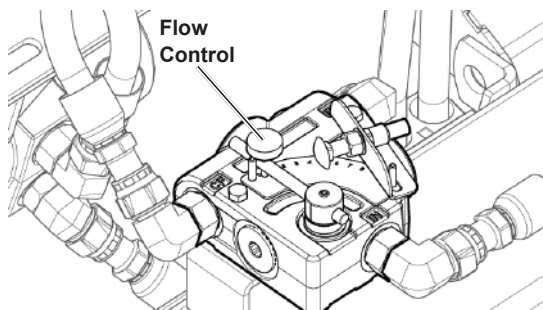


Fig. 147 - Cross auger flow control

The cross auger can be left in position even if it is not being used, such as when harvesting cereal grains. The cross auger can be turned off by fully closing the flow control. This should not affect the reel speed.

13.2 - Hydraulic Tilt Kit

The Grain Belt Header has an optional hydraulic control system for the header tilt function. Be sure you provide detailed information about your header when ordering since there are numerous mounting systems that are specific to the exact model, and year of header.

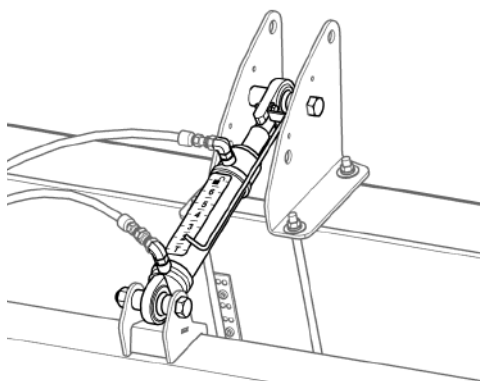


Fig. 148 - Hydraulic Tilt Cylinder

Main variations involve:

- The type of reel, single or split,
- The width of the header,
- The make and model of combine, and
- The model of combine adapter.

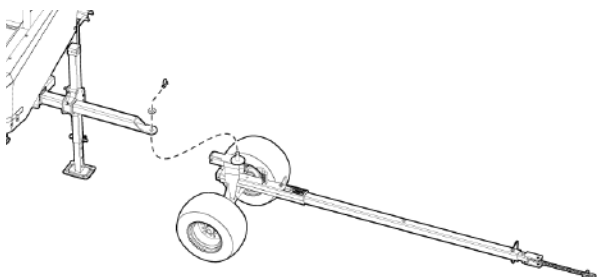
The basic kit includes all components required, including appropriate wiring adapters if required, and installation instructions.

NOTE:

It is recommended that this option be installed by a qualified Honey Bee dealer.

13.3 - Dual Wheel Hitch Carrier

The optional dual wheel hitch carrier carries the weight of the header that would normally be supported by the rear axle of the towing vehicle.

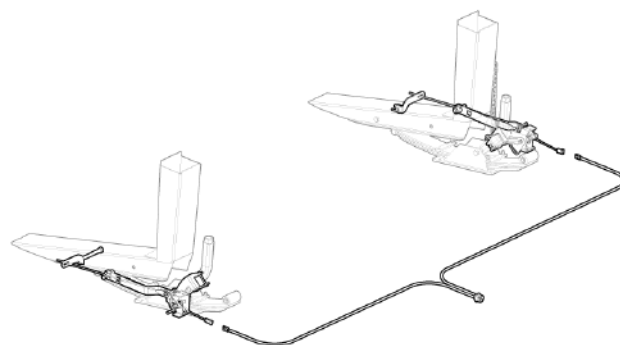


To install the hitch carrier:

- Ensure the header is in transport mode.
- Raise the header using the hitch jack until the hitch carrier can be rolled under the drawbar hitch.
- Remove the washer and pin from the hitch carrier mounting pin.
- Slowly lower the drawbar hitch onto the hitch carrier mounting pin, then secure in place using the washer and pin.
- Connect the electrical harness to the towing vehicle using the provided extension cable. Ensure the transport lights are functional.

Do not exceed 32 km/h (20 mph) when using the hitch carrier. Exceeding this speed may result in equipment damage, injury or loss of life.

13.4 - Header Height Control



The header height control option adds automatic header height sensors to the header that detect the change in position between the subframe/feederhouse and the header table. If this angle changes during operation when the header is pushed up, then the combine is signalled to raise the header.

Please follow the instructions included with the header height kit when installing.

Ensure your header is in its operational configuration prior to calibrating the header height control system. Changing the setup of your header will require re-calibration.

Please follow the configuration instructions provided with your header height control kit.

13.5 - AGCO Bezel Configuration

Some styles of header adapter can be configured to a series of bezel layouts. These adapters are needed to match your new header to the opening of the feeder house on your combine.

Combine	Model	Lateral Tilt	Non Lateral Tilt	Note
Gleaner	S67, S68, S77, S78, S88, S96, S97, S98, R76, R75, R66, R65, R72, R62	Layout 2	Layout 1	62/72 if equipped with removable indexing blocks.
	C62	N/A	Layout 5	Use 3/16 tab as spacer at top of web.
	A65, A66	Layout 3	Layout 3	
	A75, A76, A85, A86	Layout 4	Layout 4	Use 3/16 tab as spacer at top of web
Massey Ferguson	9790, 9895, 9795, 9540, 9560, 9545, 9565	Layout 4	Layout 4	Use 3/16 tab as spacer at top of web.
	9690, 9520, 9685	Layout 3	Layout 3	
	8780 V	Layout 3	Layout 3	
	8780 XP/W	Layout 3	Layout 3	
	8570	N/A	Layout 6	Cut end off guides and drill new inner hole to place as shown.
	8680	N/A	Layout 5	Use 3/16 tab as spacer at top of web
Challenger	670, 680B, 540C, 560C, 540E, 560E	Layout 4	Layout 4	
	660	Layout 3	Layout 3	
Fendt	Ideal 7,8,9	Layout 7	Layout 7	

13.5.1 - Configuring the Bezels

Refer to the following diagram to familiarize yourself with the appearance of the key components:

- Guide Plate (includes a portion bent back at 90 degrees.)
- The First Bezel.
- The Second Bezel.
- Web (extends backward from the bezels at 90 degrees.)

In addition, there are long and short sections of flat-bar used to reinforce connections.

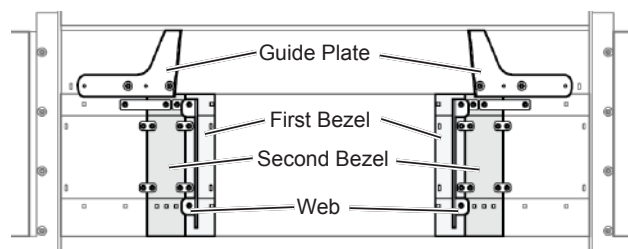


Fig. 149 - AGCO Bezels

Configuration	Components Used	Notes
Layout #1	1,2,3,4	The guide plates, (#1) are positioned using the innermost holes, as seen in the main diagram.
Layout #2	1,2,3,4	The guide plates, (#1) are moved outward exposing one hole on the inner side.
Layout #3	3,4	The guide plates, (#1) and the first bezel (#2) are removed. Reposition the web so that the vertical portion is midway on the remaining bezel.
Layout #4	4	The web is positioned in the innermost top and bottom holes, with one short support bar, used as a spacer, at the top of each web.
Layout #5	4	The web is positioned in the outermost top and bottom holes, with one short support bar, used as a spacer, at the top of each web.
Layout #6	1,2,3,4	The guide plate is positioned using the extreme outer holes, and the portion extending beyond the adapter's outer edge is trimmed off. All other components are as shown in the main diagram.

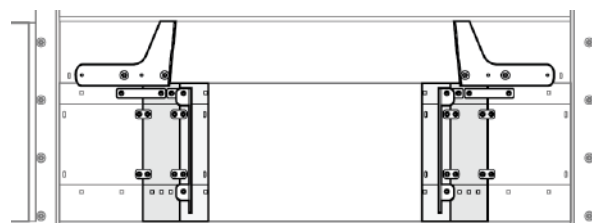


Fig. 150 - AGCO Bezel - Layout 1

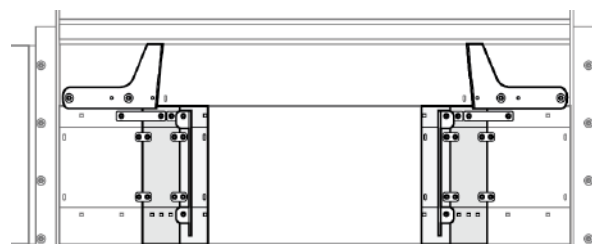


Fig. 151 - AGCO Bezel - Layout 2

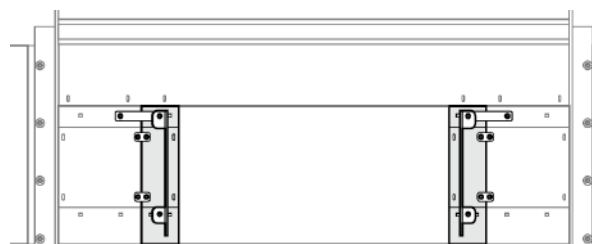


Fig. 152 - AGCO Bezel - Layout 3

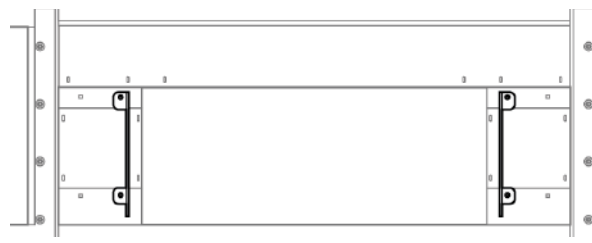


Fig. 153 - AGCO Bezel - Layout 4



Fig. 154 - AGCO Bezel - Layout 5

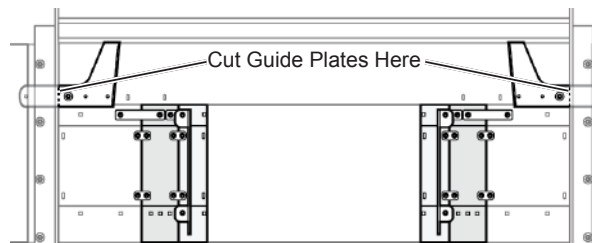


Fig. 155 - AGCO Bezel - Layout 6

Configuration	Components Used	Notes
Layout #7	Top Latch Hook Wedge Plate Lock Bracket Web	The web is positioned in the innermost top and bottom holes, with one short support bar, used as a spacer, at the top of each web. The Top Latch Hook, Wedge Plate and Lock Bracket are installed as well.

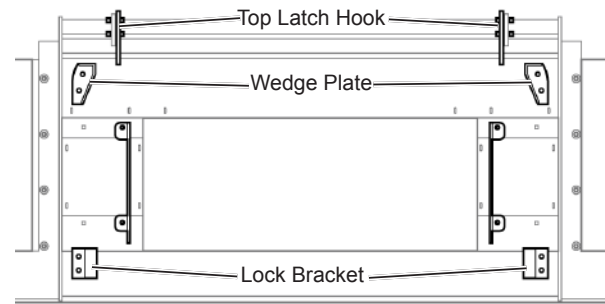


Fig. 156 - Bezel - Layout 7

14 - Troubleshooting

14.1 - Common Problems You May Encounter

Symptom	Common Cause
High Hydraulic Pressures	Cold oil Sticky Draper Sticky or tight knife Draper too tight

14.2 - Reel

Problem	Possible Cause	Solution
Reel will not hold height	Leaking hose or fitting Valve in combine leaking Line lock kit is missing (JD combines only)	Repair or replace See combine manual Contact your dealer for the appropriate kit for your combine.
Reel will not hold level	Leaking hose or fitting Air in system Faulty master cylinder Leaking cylinder seal	Repair or replace Bleed slave cylinder Repair or replace Replace seal
Reel raises/lowers erratically	Reel cylinders binding Arms bent or binding Low hydraulic oil	Replace cylinder Repair or replace See combine manual
Reel will not raise	Hydraulic couplers do not match Hydraulic couplers not engaged Faulty combine hydraulics Low oil volume from combine Defective cylinders Line Restriction	Install correct couplers Re-couple properly See combine manual
Reel raises slowly	Elbow in master cylinder too tight Hydraulic couplers not engaged	Loosen fitting Re-couple properly
Damage to center of reel	Reel set too low	Advanced setting
Reel hitting at end	Reel not centered	Advanced centering
Reel speed cannot be adjusted - Header driven reel	Poor connection in electrical wires or cable Defective reel motor	Check connections and condition of cable Replace motor (reel speed can be adjusted manually if needed)

Problem	Possible Cause	Solution
Reel will not turn/turns erratically	Flow control set too low Draper flow set too high Drive coupler not engage Faulty relief valve. Seized bearing(s) Faulty drive motor Reel Tied Down Hydraulic couplers not engaged	Advance setting Reduce draper speed. (Only when using header hydraulic system) Ensure coupler is fully seated Clean or replace Replace bearing(s) Replace motor Release reel Re-couple properly.
Reel speed cannot be adjusted - Combine driven reel	Faulty flow control	See combine manual
Single Reel		
Reel does not raise level	Air in hydraulic system	Bleed slave cylinder
Right side goes up slowly	Air in system Restricted hydraulic hose or fitting	Bleed slave cylinder Replace hose or fitting
Right side will not raise	Leaking hose, fitting or cylinder seal	Repair or replace
Left side goes up slowly	Faulty master piston seal	Replace seals
Left side will not raise or fully extend	Faulty master cylinder Faulty bypass port Faulty master cylinder piston seal	Replace cylinder Replace cylinder Replace seals
Single Reel – 36'		
Reel will not raise.	Quick couplers to combine reel drive not connected.	Couple reel drive hoses.
Double Reel		
Reel does not raise level.	Air in system.	Bleed slave cylinder.
Right side goes up slowly.	Air in system.	Bleed slave cylinder.
Right side cylinder does not fully extend	Air in system.	Bleed slave cylinder.
Lift cylinders out of phase.	Unbalanced hydraulic displacement.	Install spacer inside master cylinder. Check with the cylinder manufacturer.
Ends lift before center.	Center master cylinder “O” ring damaged.	Replace seal.
RH reel out of phase.	Air in system. Header Reel not run while phasing reel lift cylinders	Bleed slave cylinder. Header reel must be running in order to fully extend RH reel lift cylinder
Sickle Sections Breaking.	Tines of reel catching knife.	Adjust reel height.

14.3 - Knife

Problem	Possible Cause	Solution
Knife will not run.	Low hydraulic oil. Faulty drive motor Faulty knife drive. Faulty hydraulic pump. Cutter bar jammed.	Add oil, Check for leaks Repair or replace motor. Repair or replace. Repair or replace. Clean, lubricate cutter bar. Check for damaged guards or sections
Knife stalls easily.	Type of material being cut Low oil volume, less than 14gpm Low pressure at knife motor. Bent guards or cutter bar. Dull or incorrect type of sections. Faulty knife drive. Seized knife head bearing. Knife head out of alignment. Unloaded system pressure too high. Relief valve stuck open	Reduce ground speed. Check flow, should be 18.5 gpm. Check system pressure. Repair or replace. Replace Check for loose crankshaft. Replace. Adjust alignment on knife Check for faulty draper motor. Remove and clean cartridge.
Knife running too slow or too fast. (Correct Range: 600-700 rpm)	Low oil level Relief valve stuck open. Worn pump or knife motor Wrong pump for combine.	Add oil. Determine cause. Clean or replace cartridge. Repair or replace. Check with manufacturer.
Excessive vibration	Knife running too fast. Loose bearings in drive. Loose knife head bolts.	Check speed (600-700 rpm) Replace bearings. Tighten.
Excessive noise	Loose or damaged sections and/or guards. First guard bent or out of alignment. Knife drive bearing faulty Knife drive loose. Knife drive running too fast. Knife head adjusted too high or too low. Guards don't match.	Replace or tighten. Straighten or replace. Replace. Tighten bolts and check for damage to housing. Slow down to 600-700 rpm. Loosen clamp bolt on knife head bearing and adjust. Check that all guards are the same. 12mm required.

Knife leaves strip of crop standing.	Bent or broken guard. Dull/Broken knife section Plugged guard	Straighten or replace. Replace. Clean.
Connector Bar Breaks	Damaged sections or guards Knife gummed up. Section bolts not tight. Sections on knife back installed on wrong side. Knife Guards are bent. Debris in joint between connector bar and knife back.	Repair or replace. Soak with diesel fuel. Tighten or replace. Remove sections, turn knife over and replace sections. Replace bent guards. Clean the contact point between connector bar and knife back.
Knife Head Breaks	Section bolts not tight Knife gummed up Damaged sections or guards Sickle sections dull Tough crop Knife drive running too fast Steel tines on reel hitting knife Guards don't match	Tighten and/or replace bolts Soak with diesel fuel Repair and/or replace Replace sections Reduce ground-speed. Check speed with photo tach Raise Reel Check that all guards are the same. 12mm required

14.4 - Draper

Problem	Possible Cause	Solution
Draper not tracking straight	Draper splice not cut straight Material building up on rollers Idler Roller is out of alignment. Drive Roller is restricted.	Re-punch connector bar holes in draper Clean rollers Adjust Idler Roller Ensure Drive Roller is free.
Draper slipping	Draper too loose Insufficient traction Draper is snagging	Adjust draper tension Roughen drive roller Check alignment
Draper not turning	Draper is snagged or caught Flow control is shut off Oil flow going over the relief	Check for interference Adjust flow control Check relief setting Remove and clean relief cartridge, check spring
Draper oil pressure in excess of 2800 psi	Material build up on rollers Faulty bearing in roller Faulty draper motor Bad Pump	Clean rollers. Replace bearing Check motor temperature, check for oil leaking from seals Replace motor or pump

14.5 - Decks

Problem	Possible Cause	Solution
Decks creep sideways in the header	Restrainer bars not installed or have fallen off	Install or replace bars.
Decks lift out of position	Deck is not locked under rear edge of cutter bar Hold down clips on back panels are loose or not installed	Place deck in proper position Tighten or replace
Decks will not shift	Decks or back panels jammed or binding	Check decks and clean out debris On hydraulic swath, to get more power to shift deck, remove one hose from draper deck motor, screw a plug onto the hose, cap the port on motor. Shift deck. Re-connect hoses to draper deck motor to run header.
Grain Heads shattering or breaking off	Reel speed too fast Ground speed too fast Crop too ripe	Reduce reel speed Reduce ground speed Cut early in morning or late at night when humidity is higher
Cut grain falling off cutter bar	Reel too high Table set too high	Lower reel Lower table
Does not pick up lodged crop	Table too high Reel too high Reel too far back Ground speed too fast for reel speed Crop lying too flat for guards to pick up	Lower table Lower reel Move reel forward Reduce ground speed or increase reel speed Install optional SCH Crop Lifters
Material builds up at ends of cutter bar	Pick up reel tines not sweeping crop off cutter bar	Bend the tines on end of reel to reach into the corners

14.6 - Adapter

Problem	Possible Cause	Solution
Combine will not hook into top of adapter	Header tilted back/forward too far Cutter bar side tire too low Feeder house adjustment on combine set wrong Sub frame not level with combine	Extend/Retract top link Run tire onto a block See Combine Manual Adjust hitch jack

14.7 - Hydraulics

Problem	Possible Cause	Solution
Oil running hot	Excessive oil going over relief Faulty pump or motors Draper too tight or not tracking	Clean or replace relief cartridge Repair or replace Adjust draper alignment
Pump vibrating	Faulty Universal Joint bearings Angle too great in drive line	Repair or replace Align auger & pump drive
Header will not lift	Combine lift capacity Add a hydraulic cylinder to feeder house	Check system pressure See Combine Manual
Oil leaking between pump	Faulty Silicone seal	Re-seal pump

14.8 - Leveling

Problem	Possible Cause	Solution
Header not level See section 5.6	Leveling bolts out of adjustment	Adjust bolts

14.9 - Table Angle

Problem	Possible Cause	Solution
Draper too flat or steep	Turnbuckle mis-adjusted	Adjust turnbuckle

14.10 - Table Bounce

Problem	Possible Cause	Solution
Suspension feels soft	Clamp plates on spring saddles are loose	Tighten clamp plates for stiffer suspension

14.11 - Sub Frame

Problem	Possible Cause	Solution
Too close to the ground with cutter bar down.	Leveling adjustment bolts too tight Turnbuckle/ hydraulic tilt adjusted too short	Loosen bolts Lengthen as needed

14.12 - Center Deck

Problem	Possible Cause	Solution
Center draper not turning	Center draper too loose Faulty drive motor Failed bearing(s) in idler or drive rollers Material buildup on rollers Foreign material under draper	Adjust draper tension Repair or replace Repair or replace Clean rollers Clean under draper
Center draper slipping	Center draper too loose Insufficient traction	Adjust draper tension Roughen drive roller
Center draper not tracking straight	Drive or idler rollers out of alignment Draper splice not cut straight Material buildup on rollers	Adjust draper tracking Re-punch connector bar holes in draper Clean rollers

14.13 - Feed Auger

Problem	Possible Cause	Solution
Auger stops when full of material	Auger drive clutch is slipping Improper pan inserts are used. Clamp Plates too loose/tight	Check and set preload on drive assembly clutch by following the directions in section 11.2.4. Check and clean clutch disks and pressure plates. Ensure that your feed auger has the proper pan inserts if they are required for your make and model. Adjust the clamp plates on the springs on the sub frame as described in section 5.6.
Material (straw) wrapping on auger	Reduce size of feeder house opening Indexing of fingers is incorrect Drum is too far forward	Remove outer fingers Install stripper bars in adapter Adjust finger indexing (timing).
Material will not feed under auger	Indexing of fingers is incorrect Auger drive is slipping Auger is not floating Fingers on drum not extending low enough	Adjust finger indexing (timing). Check drive assembly clutch Auger float seized or binding on side plates Adjust finger indexing (timing).

15 - Appendix

15.1 - Appendix A - Hydraulic Fitting Naming Standards

There will be a number of different hydraulic fittings used in this manual. The naming standards can be a little confusing, however this section should clear up any questions you may have.

A standard 2 sided hydraulic fitting is named in the following format:

- ##XX-##XX

The information on each side of the hyphen represents its respective end of the fitting. The '#' is the size designation. The 'X' denotes the type of end on that side of the fitting, this information is divided into a prefix and a suffix. The prefix indicates either male or female, and the suffix indicates the type of connection.

A 'T' fitting will be named in the following format:

- ##XX-##XX-##XX

The center set of characters describes the middle port on the 'T' fitting.

The size designations denotes which fittings go together. For example, a 10FJ fitting will fit with a 10MJ fitting, but not a 12MJ.

Hydraulic Fitting Types		
Prefix	Suffix	Description
M or F	J	JIC 37 ° flared connectors
M or F	F	Face Seal
M or F	P	Pipe Fitting
M or F	B	O-Ring Boss
F only	X	Swivel (no image shown)
M or F	STC	Snap to connect

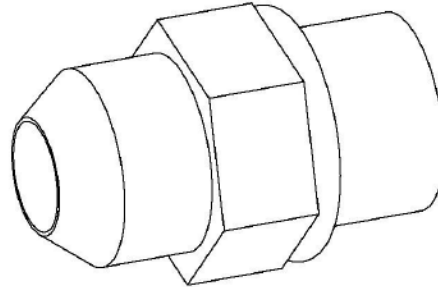


Fig. 157 - 10MJ - 10MB Fitting

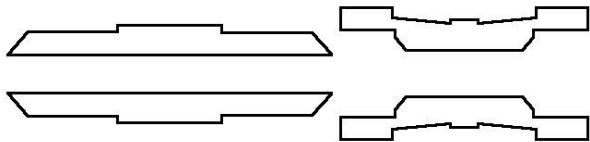


Fig. 158 - JIC 37° Fitting

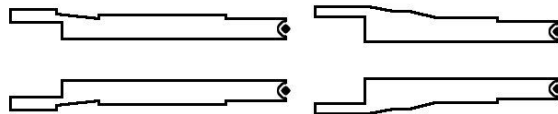


Fig. 159 - Face Seal Fitting

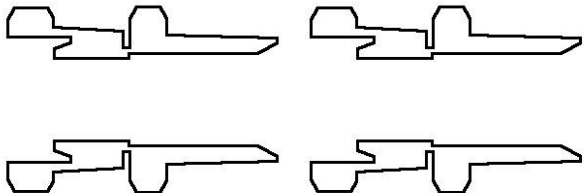


Fig. 160 - Pipe Fitting

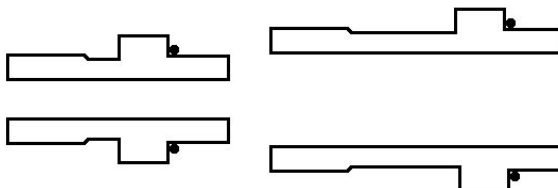


Fig. 161 - O-Ring Boss

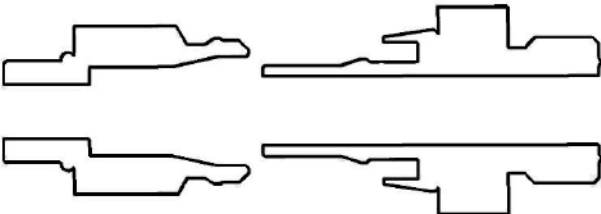
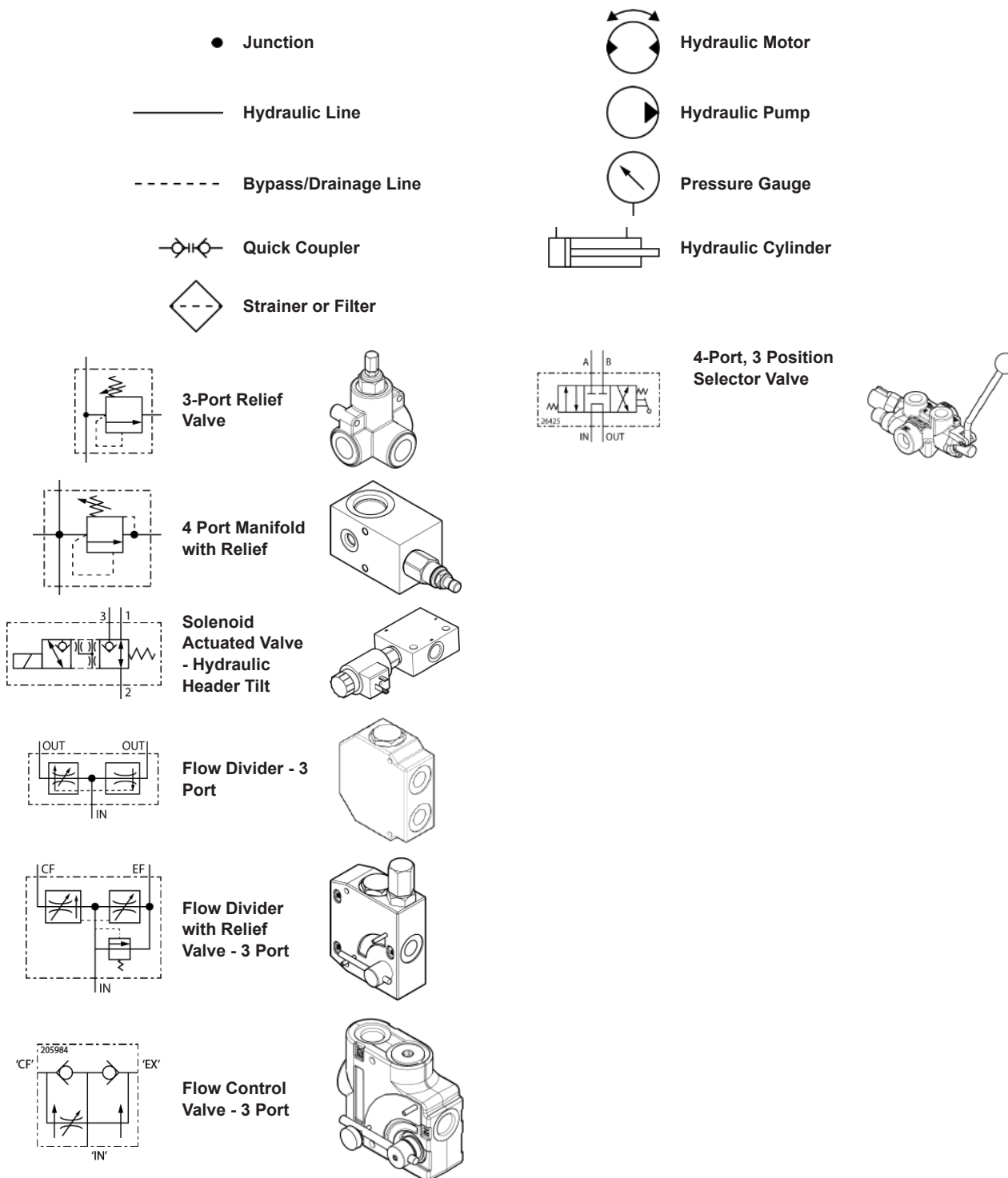


Fig. 162 - STC Fitting

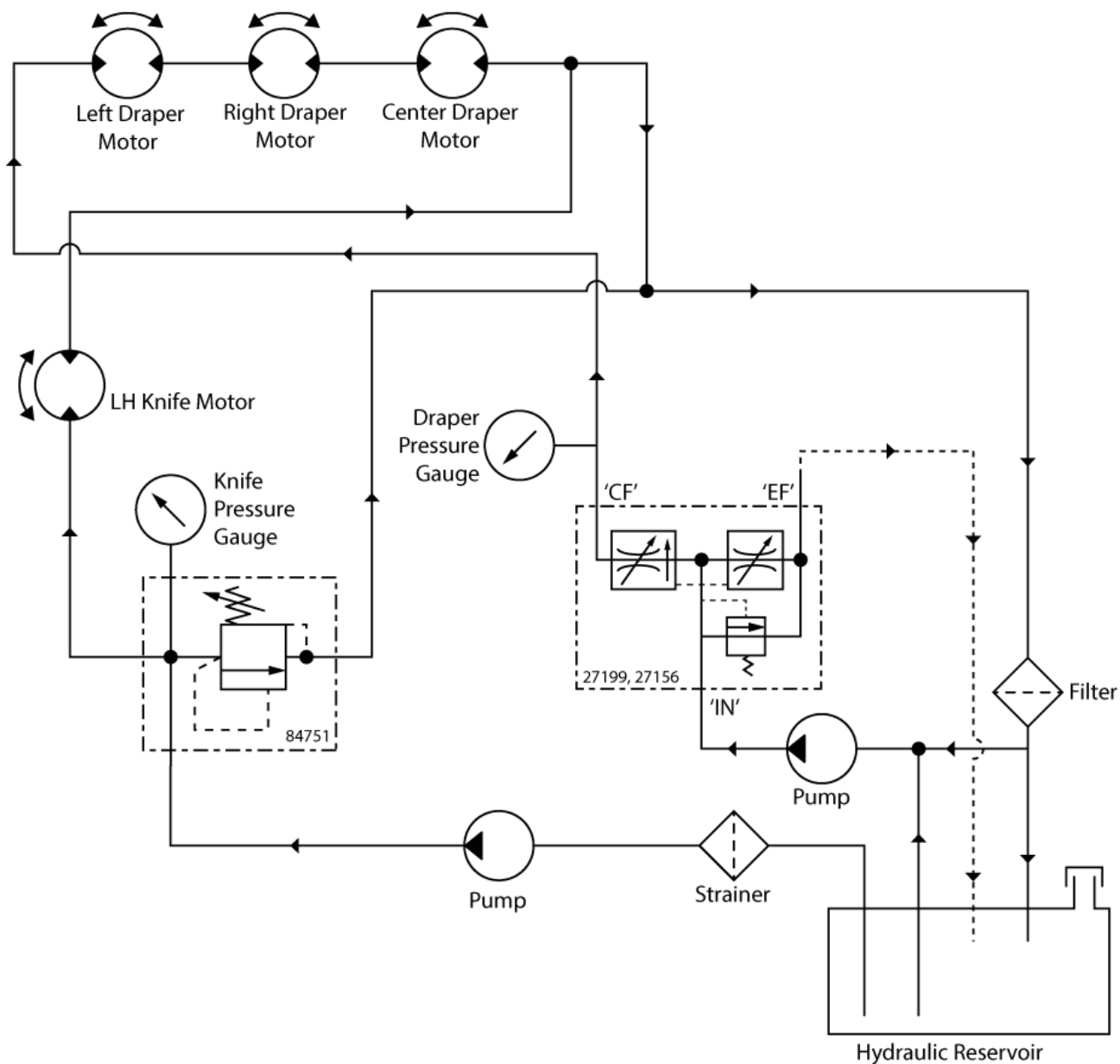
15.2 - Appendix B: Hydraulic System Schematics

15.2.1 - Hydraulic Symbols



15.2.2 - 25ft to 30ft - Main Hydraulics - Combine Driven Reel - Standard Deck - Single Knife

25ft to 30ft- Main Hydraulics - Standard Decks - Single Knife - Combine Driven Reel

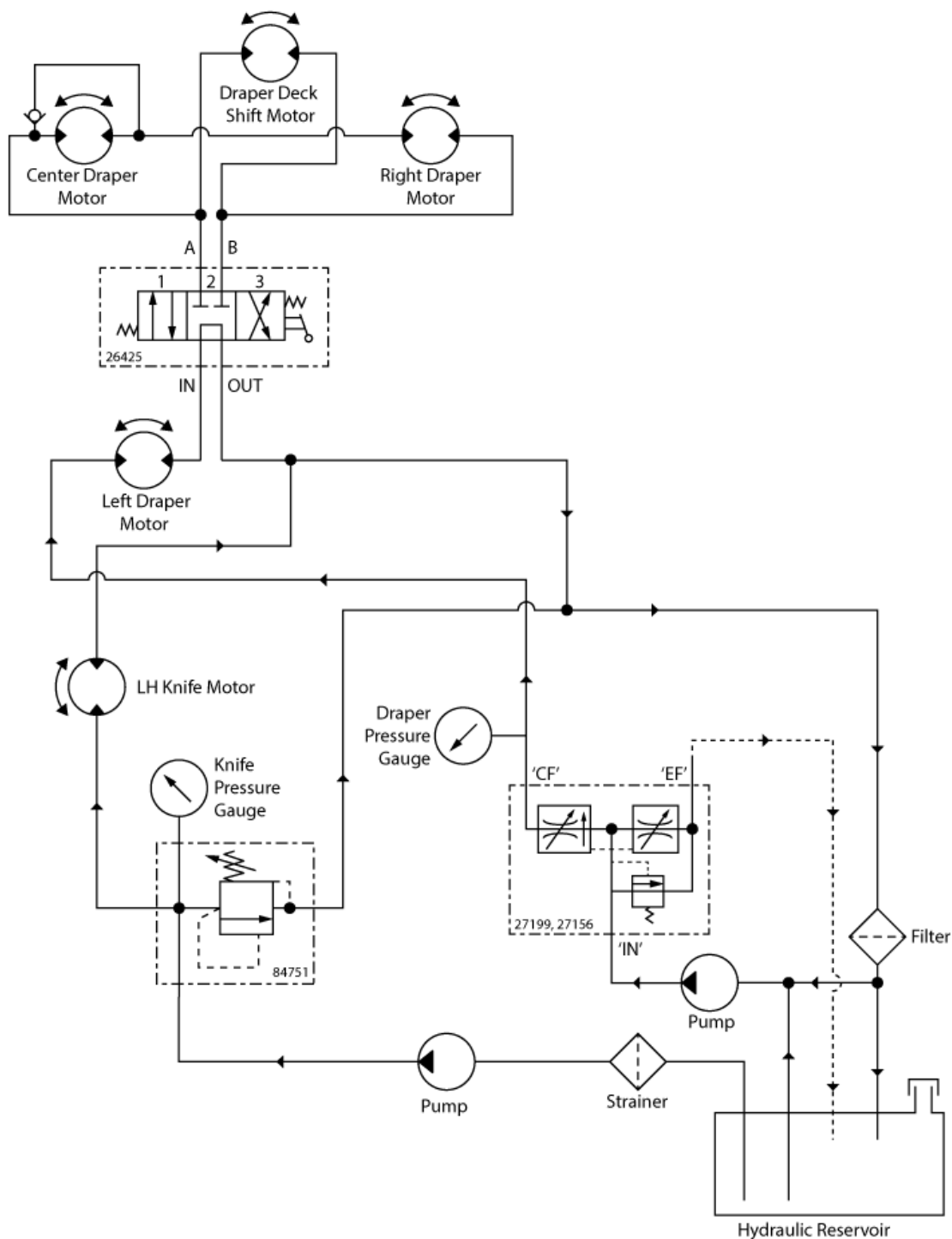


25ft to 42ft- Main Hydraulics - Standard Deck - Double Knife - Combine Driven Reel



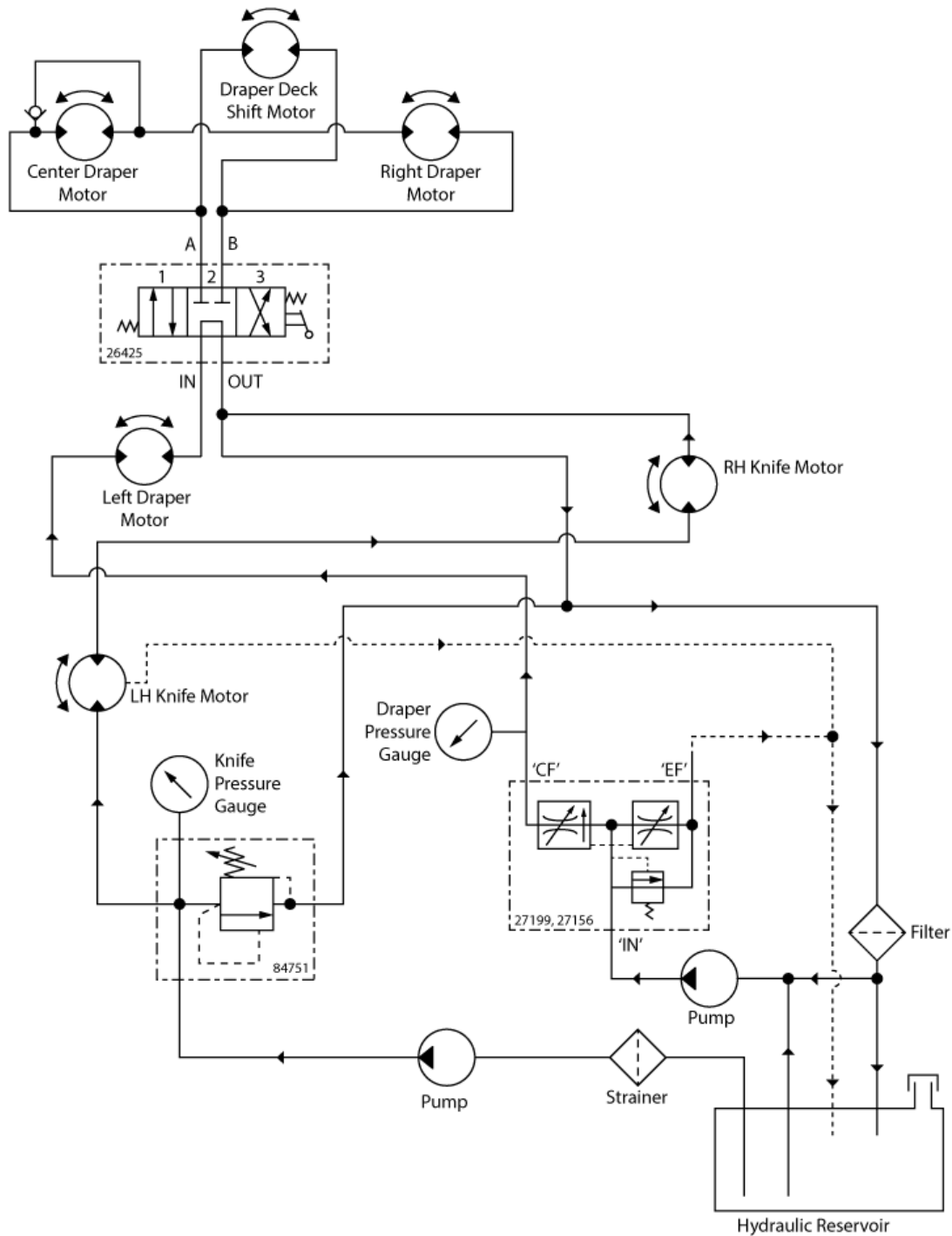
15.2.4 - 25ft to 30ft - Main Hydraulics - Combine Driven Reel - Hydraulic Deck Shift - Single Knife

25ft to 30ft- Main Hydraulics - Hydraulic Deck Shift - Single Knife - Combine Driven Reel



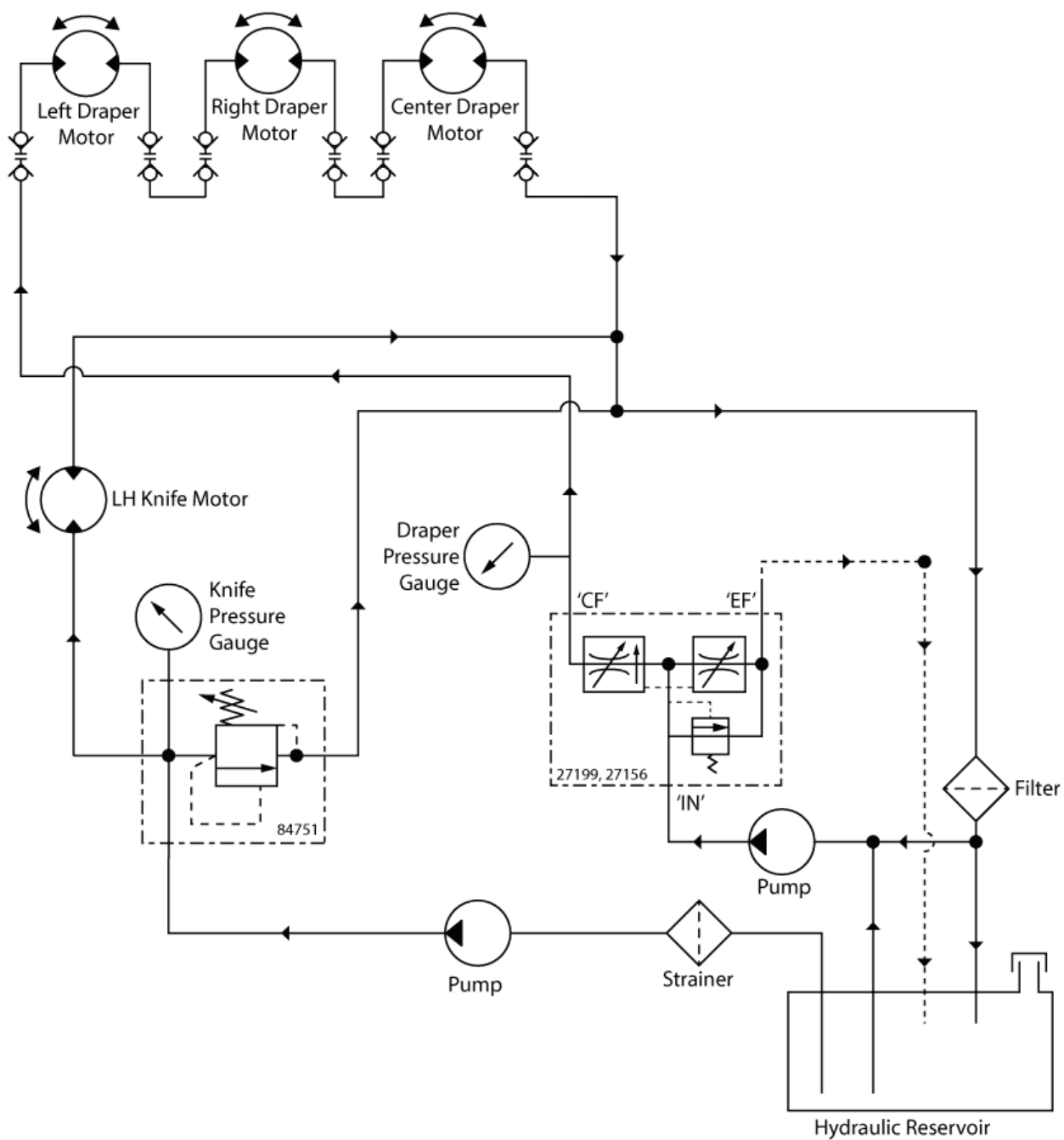
15.2.5 - 25ft to 42ft - Main Hydraulics - Combine Driven Reel - Hydraulic Deck Shift - Double Knife

25ft to 42ft- Main Hydraulics - Hydraulic Deck Shift - Double Knife - Combine Driven Reel



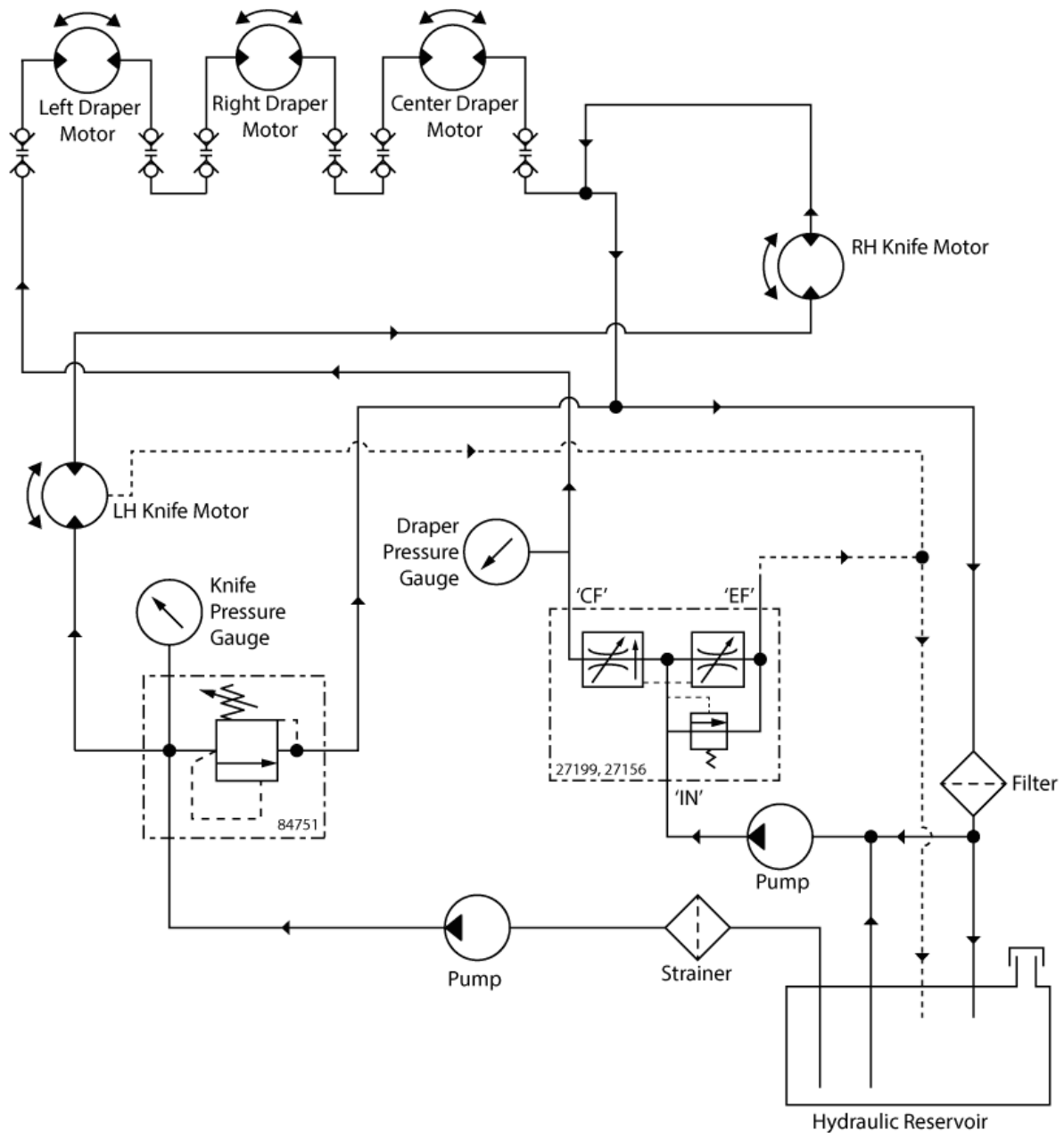
15.2.6 - 25ft to 30ft - Main Hydraulics - Combine Driven Reel - Manual Deck Shift - Single Knife

25ft to 30ft- Main Hydraulics - Manual Deck Shift - Single Knife - Combine Driven Reel



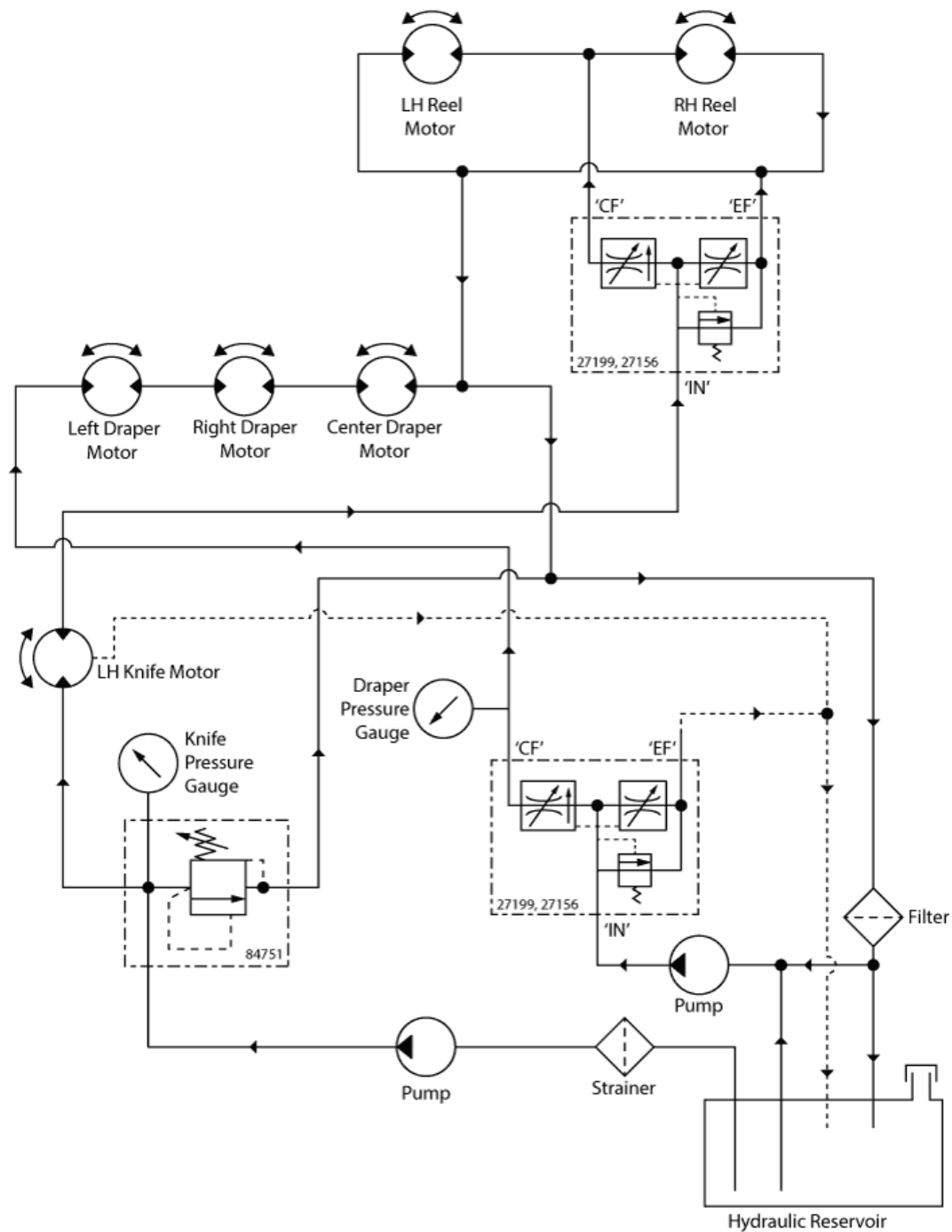
15.2.7 - 25ft to 42ft - Main Hydraulics - Combine Driven Reel - Manual Deck Shift - Double Knife

25ft to 42ft- Main Hydraulics - Manual Deck Shift - Double Knife - Combine Driven Reel



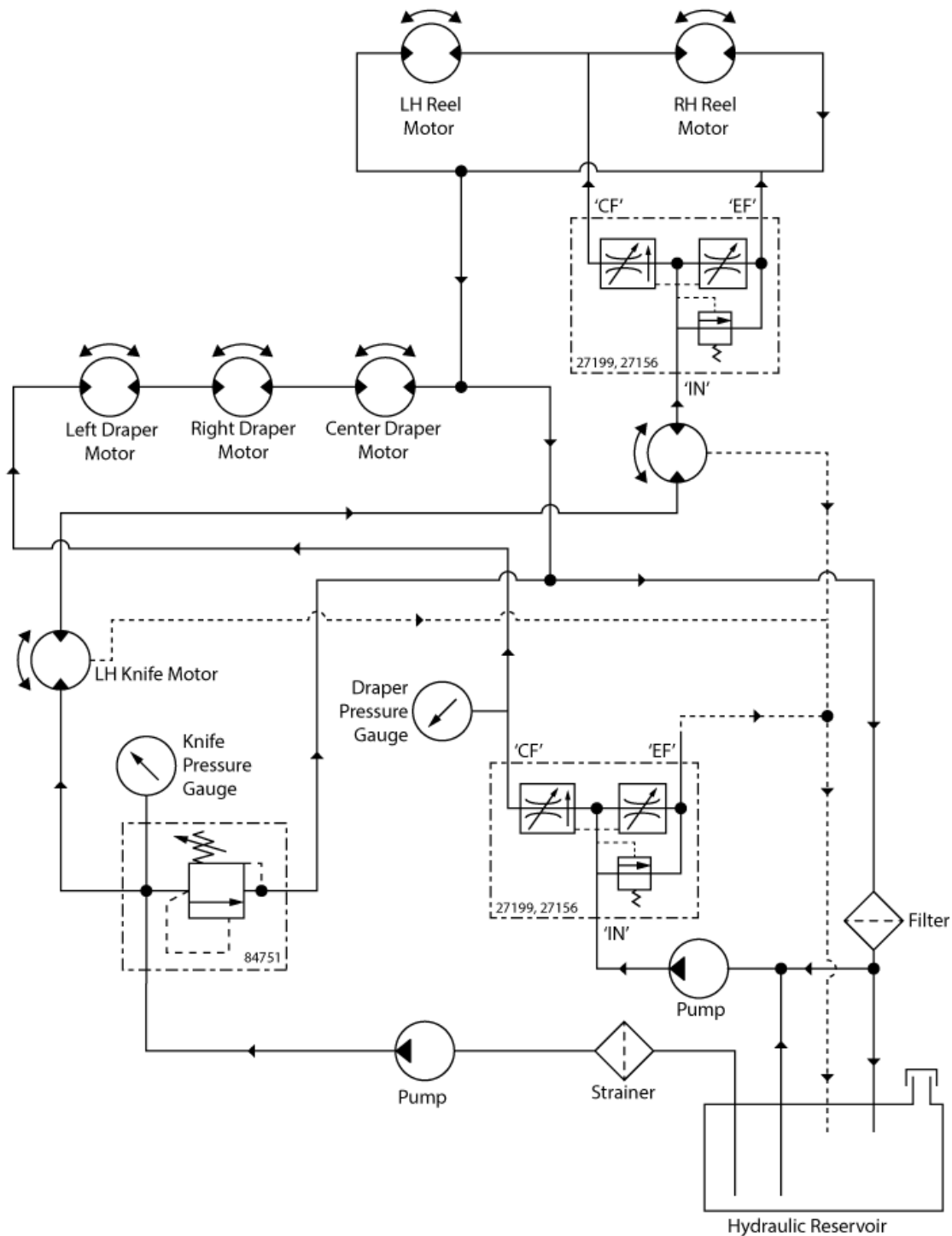
15.2.8 - 25ft to 30ft - Main Hydraulics - Header Driven Reel - Standard Deck - Single Knife

25ft to 30ft- Main Hydraulics - Single Knife - Standard Deck - Header Driven Reel



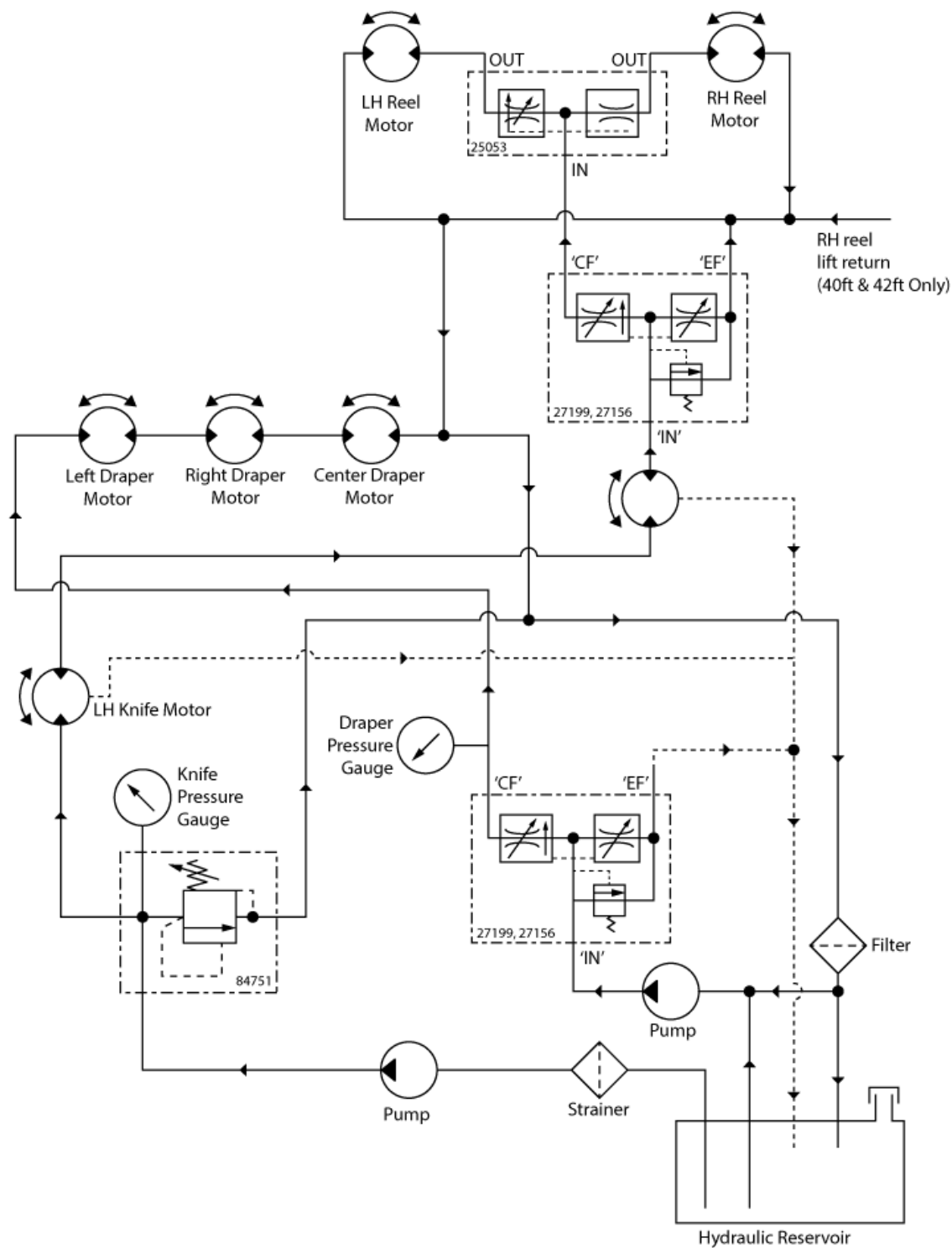
15.2.9 - 25ft to 36ft - Main Hydraulics - Header Driven Reel - Standard Deck - Double Knife

25ft to 36ft- Main Hydraulics - Double Knife - Standard Deck - Header Driven Reel



15.2.10 - 40ft to 42ft - Main Hydraulics - Header Driven Reel - Standard Deck - Double Knife

40ft to 42ft- Main Hydraulics - Double Knife - Standard Deck - Header Driven Reel

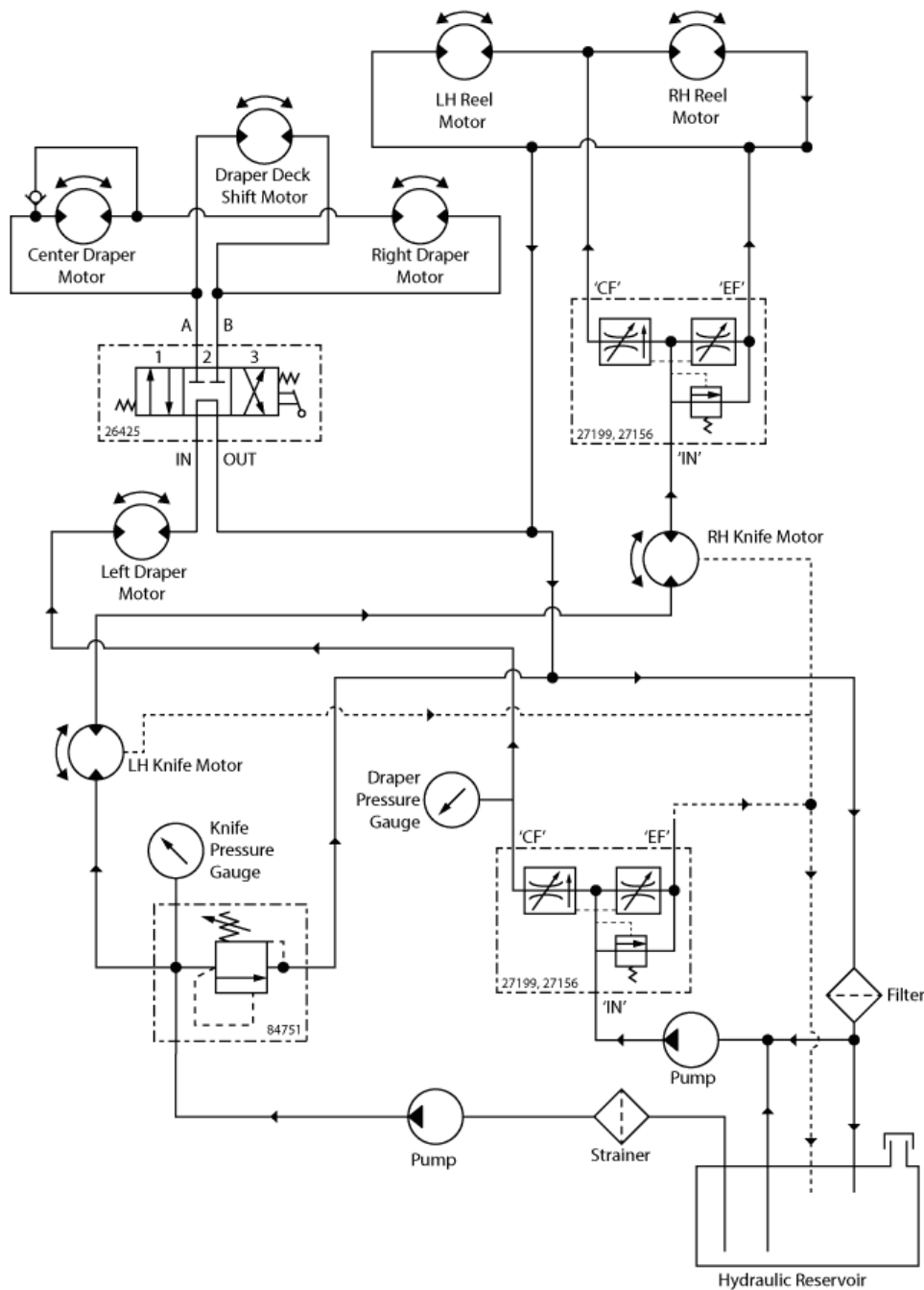


25ft to 30ft - Main Hydraulics - Hydraulic Deck Shift - Single Knife - Header Driven Reel



15.2.12 - 25ft to 36ft - Main Hydraulics - Header Driven Reel - Hydraulic Deck Shift - Double Knife

25ft to 36ft- Main Hydraulics - Hydraulic Deck Shift - Double Knife - Header Driven Reel

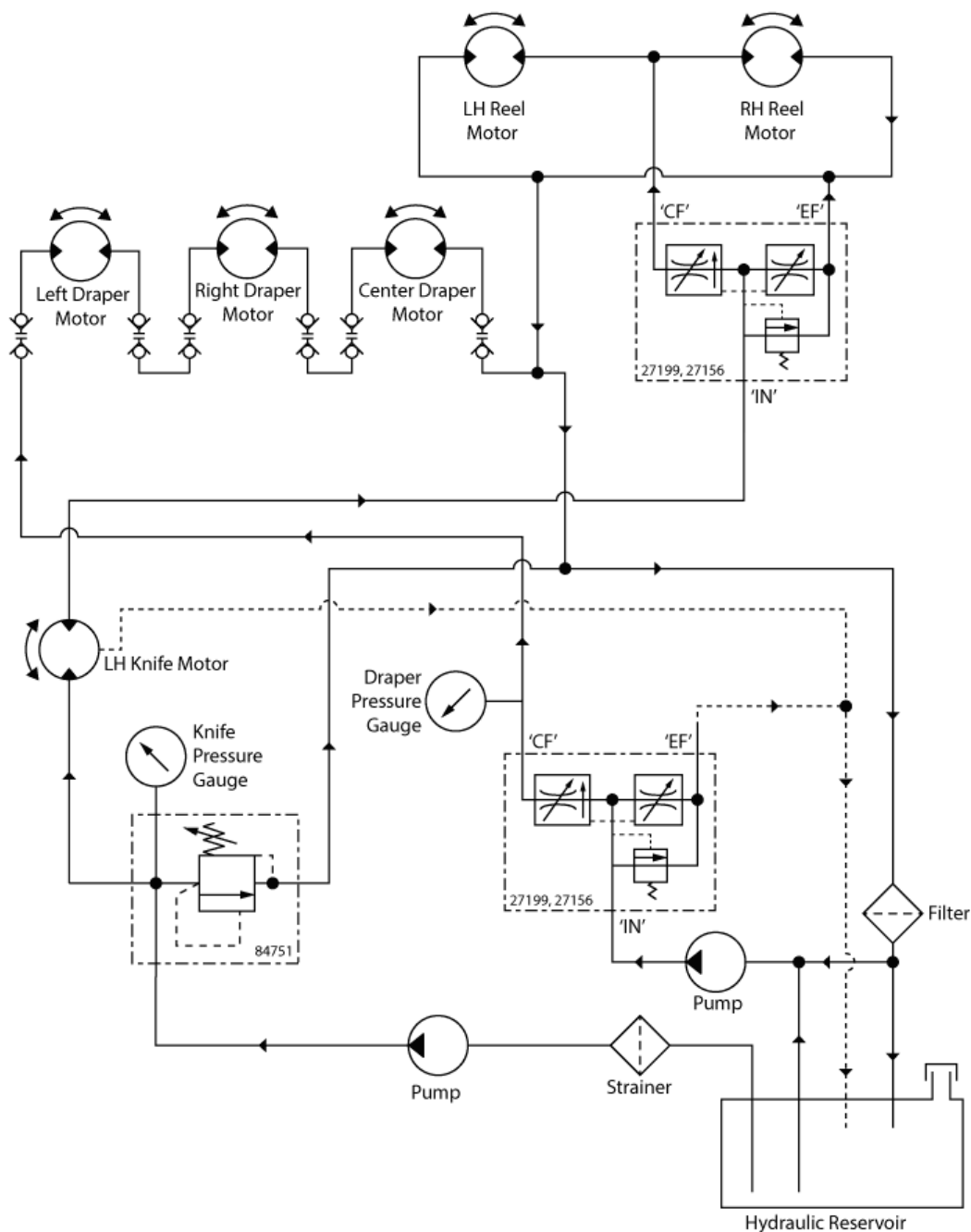


40ft to 42ft- Main Hydraulics - Hydraulic Deck Shift - Double Knife - Header Driven Reel

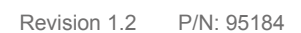


15.2.14 - 25ft to 30ft - Main Hydraulics - Header Driven Reel - Manual Deck Shift - Single Knife

25ft to 30ft- Main Hydraulics - Manual Deck Shift - Single Knife - Header Driven Reel

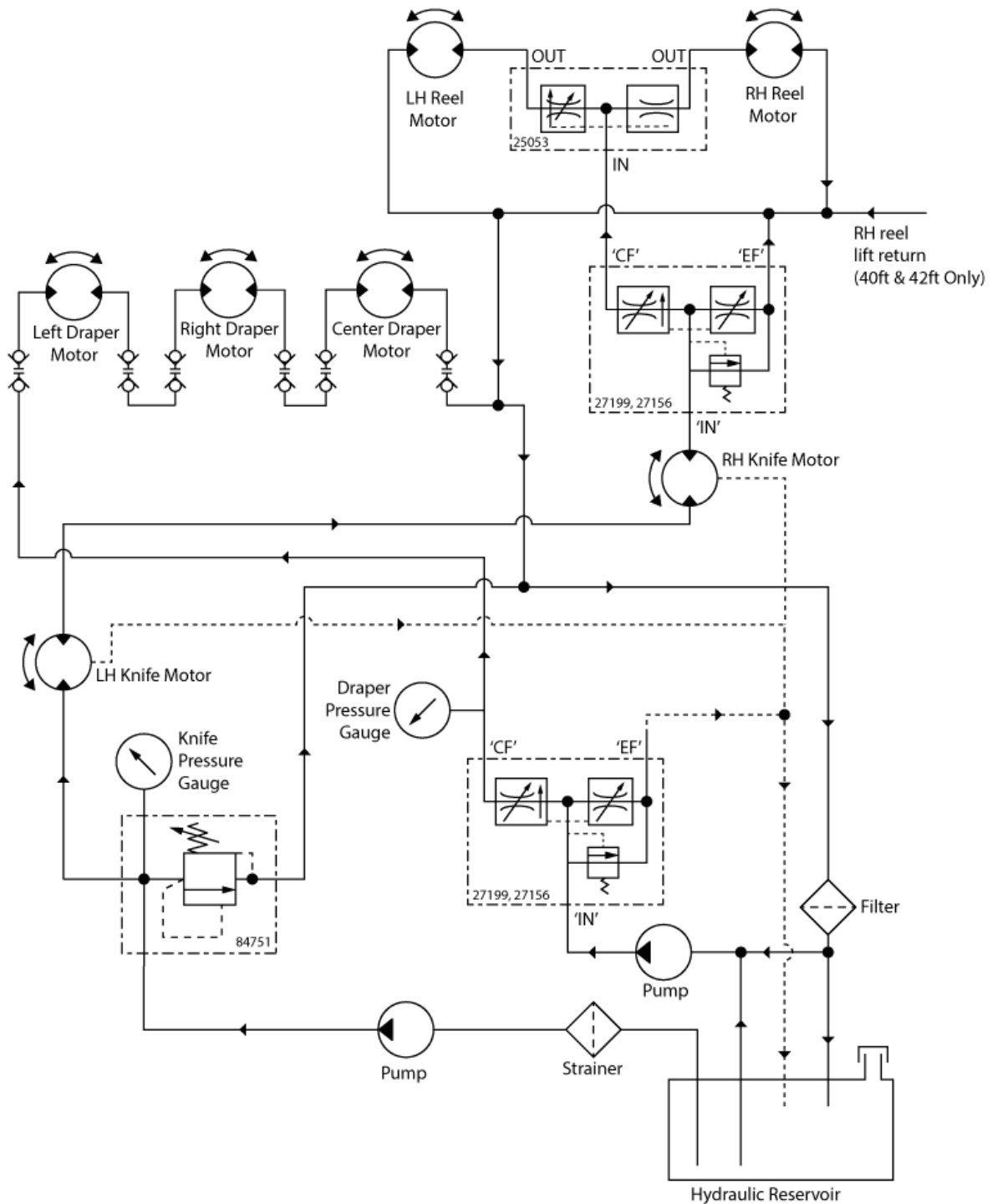


25ft to 36ft- Main Hydraulics - Manual Deck Shift - Double Knife - Header Driven Reel

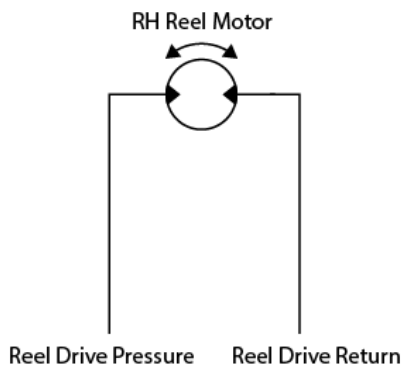


15.2.16 - 40ft to 42ft - Main Hydraulics - Header Driven Reel - Manual Deck Shift - Double Knife

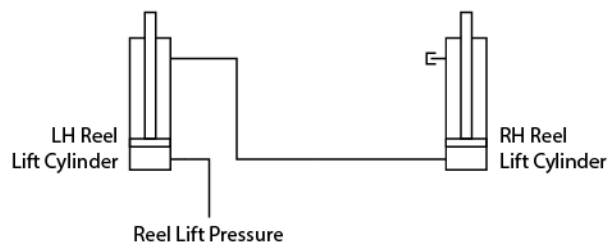
40ft to 42ft- Main Hydraulics - Manual Deck Shift - Double Knife - Header Driven Reel



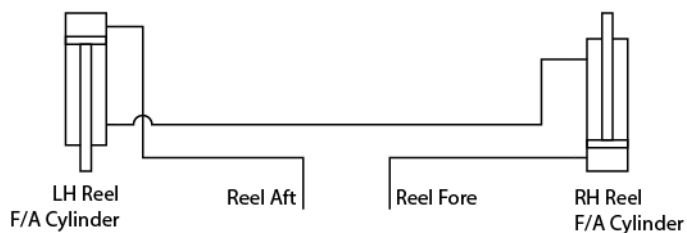
15.2.17 - 25ft to 36ft - Combine Driven Solid Reel Drive



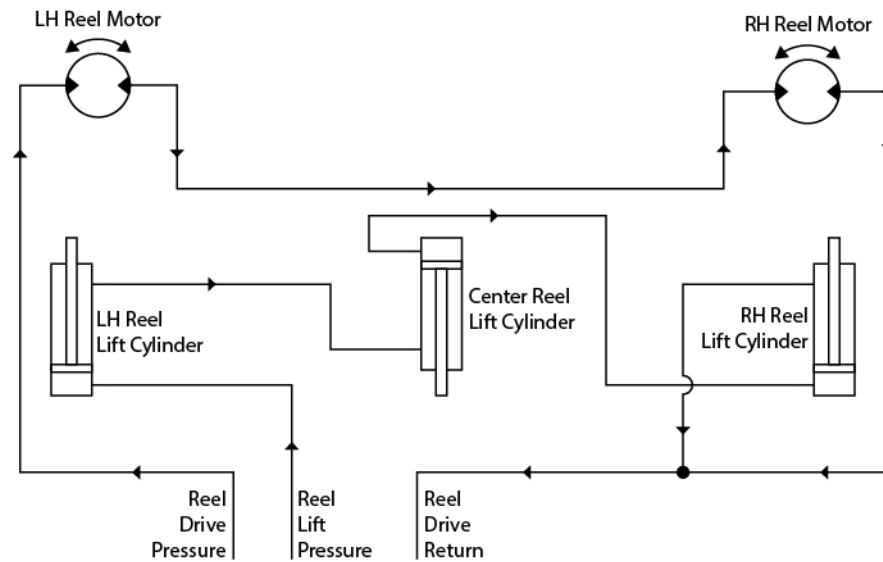
15.2.18 - 25ft to 36ft - Combine Driven Solid Reel Lift



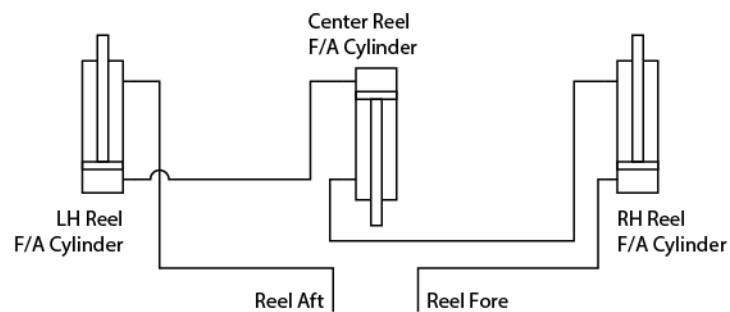
15.2.19 - 25ft to 36ft - Combine Driven Solid Reel Fore/Aft



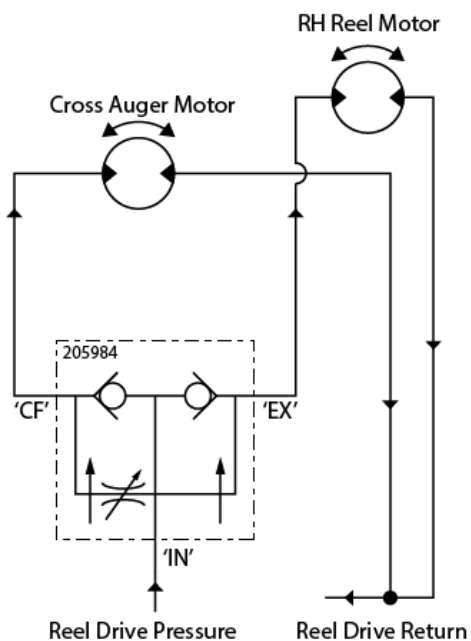
15.2.20 - 40ft to 42ft - Combine Driven Split Reel Drive & Reel Lift



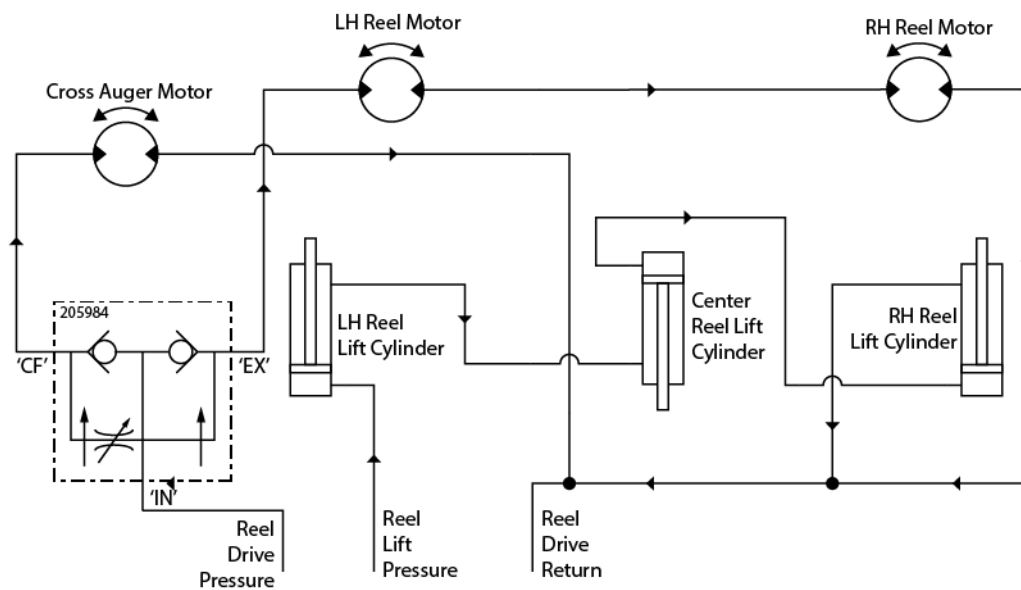
15.2.21 - 40ft to 42ft - Combine Driven Split Reel Fore/Aft



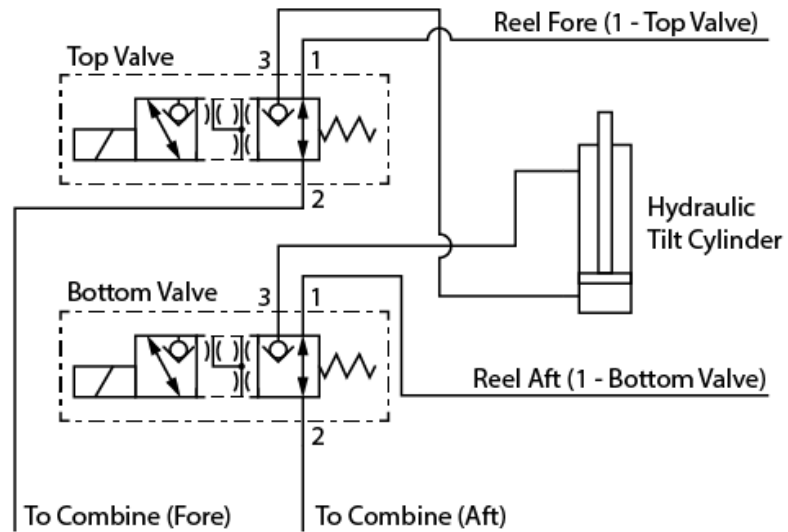
15.2.22 - 25ft to 36ft - Solid Reel Drive with Cross Auger



15.2.23 - 40ft to 42ft - Split Reel Drive & Lift with Cross Auger



15.2.24 - Hydraulic Tilt



15.3 - Appendix C - Specifications

15.3.1 - Weights

	21'		25'		30'		36'		40'		42'	
	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg	lbs	kg
Total Weight	2940	1336	3417	1551	3952	1796	4205	1911	4669	2122	4812	2187
Pickup Reel UII - 6 Bat	560	255	645	293	803	364	857	389	1020	464	1072	478
Pickup Reel HCC - 6 Bat	588	267	700	318	840	381	1008	457	1120	508	1176	533
Pickup Reel HB - 6 Bat 5" Spacing	n/a	n/a	714	324	972	441	1114	505	1140	517	1179	535
Pickup Reel HB - 6 Bat 2.5" Spacing	n/a	n/a	726	329	986	447	1132	513	1160	526	1201	545
Transport Axle/ Hitch Tube	210	96	210	96	210	96	210	96	210	96	210	96
Gauge Wheels	N/A		N/A		125	57	125	57	125	57	125	57
Knife Drive - Single	Standard		Standard		Standard		Standard		N/A		N/A	
Knife Drive - Double	Optional		Optional		Optional		Optional		Standard		Standard	



NOTE:

Weight includes: header assembly c/w decks, sub frame, center deck, auger drive, pump mounting, hydraulic pump, hydraulic tank, and attached hydraulic components.

Above weights do not include swath options or double knife drives.

All reel weights are approximate.

15.3.2 - Combine Adapters

Includes: Complete feed auger adapter, latching hardware, drive lines, and hydraulic hose kit to the combine.

NOTE:

The output speed of the feeder house shaft must be set to the recommended header input speed.

Brand/Model	Weight		Header Input Shaft Speed
	lbs	kg	RPM
Massey Ferguson 9790, 9895, 9795, 9540, 9560, 9545, 9565, 9690, 9520, 9685, 540D, 540E, 560D and 560E	804	366	625
Gleaner S (S67, S77, S68, S78, S88, S96, S97, S98) & R Series (R76,R75,R66,R65,R72,R62),			
A Series (A65, A66, A86, A85, A76, A75)			
Gleaner C Series	770	350	625
Massey Ferguson 8680, 8780W, 8780XP	770	350	625
John Deere: 9000 Series	785	351	500
CTS, CTSII, Contour Master			
50 Series, 60 Series, 70 Series, T-Series, S-Series			
Case IH: 1660, 1680, 1688, AFS Combines	770	350	500
Case IH: AFX	680	309	575
New Holland: TR/TX, CR/CX	680	309	575
Lexion: 400, 500, 600, 700 Series	782	355	770
Fendt Ideal	804	366	610-620

15.3.3 - Cross Augers

Header Length	Center Auger Drum (lbs/kg)	Auger Extension x 2 (lbs/kg)	Total (lbs/kg)
25'	98 / 44	n/a	98 / 44
30'	98 / 44	56 / 25	154 / 69
36'	98 / 44	88 / 40	186 / 84
40'	98 / 44	110 / 50	208 / 94
42'	98 / 44	120 / 55	218 / 99
45'	98 / 44	136 / 62	234 / 106

These weights only reflect the main components of the cross auger, small parts are not included.

15.3.4 - System Components

Knife Drive: SCH epicyclic 3 5/16" stroke, hydraulically driven, 1200 - 1400 strokes per minute (2 strokes = 1 RPM)

Cutting System: SCH Easy Cut, spring steel guards and bolted sections.

Draper: 42" rubberized polyester, fiberglass reinforced slats, tie bar connectors.

Draper Speed: Adjustable flow control located on the header.

	AGCO	CAT	CNH	JOHN DEERE
Knife Pump (ci)	1.77	1.37	1.94	2.2
Draper Pump (ci)	1.04	0.77	1.04	1.16
Knife Speed (rpm)	671	642	676	699
Draper Speed (rpm)	755	691	694	706

Center Deck/Draper: 68" wide, single 68" draper. Speed adjustable independently from side draper (adjustable center draper speed is not available with header driven reel package).

Reel: Hydraulically driven using combine hydraulics (or optional header hydraulics).

Reel Speed: Adjustable in cab.

Header Flotation: Lateral and vertical leaf spring float system.

Cutting Angle: Manually adjustable on all models.

Warning light kit: SP21, SP25, SP30, SP36, SP40, and SP42 - center mounted on feeder house.

These specifications are subject to change without notice or obligation.

15.3.5 - Available Options:

- Detachable Storage Axle (21'-36' headers only)
- Integral Storage Axle
- Dual Wheel Hitch Carrier
- Cross auger.
- Crop lifters for cereals and/or specialty crops.
- Combine adapter: Available for most models for self propelled combines
 - John Deere, Case / IH, New Holland, AGCO, Gleaner, Lexion, Versatile, Laverda, ESSIL,

15.4 - Rice Belt Header

The "Rice Belt" header has been modified specifically for harvesting rice. Standard features and specifications include:

- Center mounting.
- High torque, dual hydraulic direct reel drive motors.
- Vulcanized rubber drive rollers of the lateral draper decks.
- Stainless steel lining in the auger adapter.
- Poly skid plate on the cutter bar.
- Levee shields.

Size	21'	25'	30'	36'
Weight lbs/kg	3159/1436	3357/1525	TBA	TBA
Note: Weights are given less reel & combine adapter package.				

15.5 - Pickup Reel Assemblies:

15.5.1 - UII Universal

6 Bat, 32.7" (831 mm) radius, wire or plastic fingers, includes mounting hardware.

15.5.2 - HCC

6 Bat, 31" (788 mm) radius, plastic fingers, includes mounting hardware.

15.5.3 - Honey Bee Reel

6 Bat, 33.9" (860 mm) radius, Plastic Fingers, includes mounting hardware.



NOTE:

The reel radius is measured from the center of the reel tube to the tip of the fully extended reel tines.

15.6 - Torque Recommendations

15.6.1 - Bolt Torques (ft-lb)

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.

Torque Values when using UNC nuts (ft-lb).					
Bolt Size	Grade 5		Grade 8		Wrench Size
	Loctite	No Loctite	Loctite	No Loctite	
1/4	6	8	9	12	7/16
5/16	13	17	18	25	1/2
3/8	23	31	35	44	9/16
7/16	35	49	55	70	5/8
1/2	55	75	80	107	3/4
9/16	80	109	110	154	13/16
5/8	110	150	170	212	15/16
3/4	200	266	280	376	1-1/8
7/8	320	429	460	606	1-3/8
1	480	644	680	909	1-1/2
1-1/8	600	794	960	1287	1-11/16
1-1/4	840	1120	1360	1875	1-7/8
1-3/8	1100	1469	1780	2382	2-1/16
1-1/2	1460	1950	2360	3161	2-1/4

Torque Values when using C Lock Nuts (ft-lb)					
Bolt Size	Grade 5		Grade 8		Wrench Size
	Loctite	No Loctite	Loctite	No Loctite	
1/4	7.6	11.1	10	14.7	7/16
5/16	14.1	21.1	15.2	22.3	1/2
3/8	23	37	28	39	9/16
7/16	39	59	44	60	11/16
1/2	53	80	63	88	3/4
9/16	77	120	98	134	7/8
5/8	106	158	127	172	15/16
3/4	190	274	218	295	1 1/8
7/8	n/a	n/a	317	440	1 5/16
1	n/a	n/a	506	651	1 1/2

Do not grease or oil bolts or cap screws unless otherwise specified in this manual.

15.6.2 - Tightening - Flare-type Tube Fittings

Check flare and flare seat for defects that might cause leakage.

Align tube with fitting before tightening.

Lubricate connection and hand tighten swivel nut until snug.

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.

Hydraulic Fitting Torque					
Tube Size OD	Nut Size	Torque Value		Turns to Tighten (After Finger-Tightening)	
(in.)	(in.)	(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



NOTE:

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

15.6.3 - Tightening O-ring Fittings

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



NOTE:

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

Thread Size OD (in.)	Nut Size (in.)	Torque Value		Turns to Tighten (After Finger Tightening)	
		(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

16 - Support

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Equipment manuals and service information can be found on our website:

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Honey Bee

Harvest Faster

2021 Grain/Rice Belt Header Operator Manual

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