

D50 and D60 Draper Headers for Self-Propelled Windrowers

Operator's Manual

169441 Revision D

Original Instruction

D50 SP Draper Header



D60 SP Draper Header



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Introduction

This instructional manual contains information on the D50 and D60 Draper Headers for self-propelled windrowers. It must be used in conjunction with your windrower operator's manual.

Your header

The D50 and D60 are designed to serve a dual function in your grain, hay, and specialty crop harvesting operation. Teamed with your self-propelled windrower and optional hay conditioner, D50 and D60 Draper Headers will cut and lay crop into uniform fluffy windrows.

Windrowing allows starting the harvest earlier, protects the crop from wind damage, and gives more flexibility in scheduling combine time.

Your warranty

Carefully read the information provided in this manual before attempting to maintain or service a D50 or D60 Draper Header

MacDon provides warranty for Customers who operate and maintain their equipment as described in this manual. A copy of the MacDon Industries Limited Warranty Policy, which explains this warranty, should have been provided to you by your Dealer. Damage resulting from any of the following conditions will void the warranty:

- Accident
- Misuse
- Abuse
- Improper maintenance or neglect
- Abnormal or extraordinary use of the machine
- Failure to use the machine, equipment, component, or part in accordance with the manufacturer's instructions

Your manual

Use this manual as your first source of information about the machine. If you follow the instructions provided, your header will work well for many years. Contact your Dealer if you need assistance, information, or additional copies of this manual.

The following conventions are used in this document:

- Right and left are determined from the operator's position. The front of the header faces the crop; the back of the header attaches to the windrower.
- Unless otherwise noted, use the standard torque values provided in Chapter *7.2 Torque Specifications, page 268*.

When setting up the machine or making adjustments, review and follow the recommended machine settings in all relevant MacDon publications. Failure to do so may compromise machine function and machine life and may result in a hazardous situation.

The Table of Contents and Index will guide you to specific areas of this manual. Study the Table of Contents to familiarize yourself with how the information is organized.

Keep this manual handy for frequent reference and to pass on to new Operators or Owners. The manual storage case is located inside the left endshield.

NOTE:

Keep your MacDon publications up-to-date. The most current English version can be downloaded from our website (www.macdon.com) or from our Dealer-only site (<https://portal.macdon.com>) (login required).

This document is currently available in English only.

Summary of Changes

The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
Throughout	Changed “Harvest Header®” to “Draper Header”. The term “Harvest Header®” is no longer in use.	Technical Publications
Throughout	Changed “sickle”, “sickle drive”, “sickle head”, and “wobble box” to “knife”, “knife drive”, “knifehead”, and “knife drive box” for consistency with current publications.	Technical Publications
Throughout	Updated formatting for consistency with current publications.	Technical Publications
1.4 Maintenance Safety, page 5	Moved into Safety chapter.	Technical Publications
1.5 Hydraulic Safety, page 7	Added topic.	Technical Publications
1.7 Safety Decal Locations, page 9	Added an illustration showing the decals installed on newer upper cross augers, and added a note explaining that Upper Cross Auger kits and their decals have changed over the years.	ECN 61273
1.7 Safety Decal Locations, page 9	Updated image of decal MD #129261. The color and orientation of the decal have changed.	ECN 43117
1.7 Safety Decal Locations, page 9	Added footnote explaining the decal MD #174432 is no longer available for sale. If a replacement is needed, order MD #131393.	ECN 55006
2.1 Definitions, page 19	Added terms to the list of definitions.	Technical Publications
3.10.1 Engaging Reel Safety Props, page 36	Revised procedure to clarify the exact position of the safety props when engaged.	Product Integrity
3.20 Upper Cross Auger (Option), page 92	Added note explaining that newer upper cross auger kits use bolt-on flighting instead of beater bars. Added illustration showing UCA with bolt-on flighting.	ECN 61273
3.20.1 Removing Beater Bars, page 92	Added note explaining that newer upper cross auger kits do not include or use beater bars.	ECN 61273
3.20.2 Installing Beater Bars, page 93	Added note explaining that newer upper cross auger kits do not include or use beater bars.	ECN 61273
Attaching Tow-Bar, page 108	Added topic.	Technical Publications
4.4.2 Service Intervals, page 129	Changed all upper cross auger grease points to a 50-hour interval.	ECN 61273
4.12.3 Maintenance Record, page 243	Changed all upper cross auger grease points to a 50-hour interval.	ECN 61273
4.12.2 Maintenance Schedule, page 241	Changed all upper cross auger grease points to a 50-hour interval.	ECN 61273

Section	Summary of Change	Internal Use Only
<i>4.12.4 Checking Hydraulic Hoses and Lines, page 244</i>	Moved to Maintenance Requirements section.	Technical Publications
<i>5 Options and Attachments, page 245</i>	Organized kits by type and added kit part numbers.	Technical Publications
<i>5.4.8 Upper Cross Auger, page 253</i>	Added note explaining that newer upper cross auger kits use bolt-on flighting instead of beater bars. Added illustration showing UCA with bolt-on flighting.	ECN 61273
<i>7 Reference, page 267</i>	Created Reference chapter and moved the existing Conversion Chart, Torque Specifications, and Unloading and Assembly information into it.	Technical Publications
<i>Recommended Fluids and Lubricants, page</i>	Moved to inside back cover.	Technical Publications

Model and Serial Number

Record the model number, serial number, and model year of the header and Slow Speed Transport/Stabilizer Wheel option (if installed) on the lines below.

Draper Header

Header Model: _____
Serial Number: _____
Year: _____

Serial number plate (A) is located on the left endsheet, near the knife drive motor.

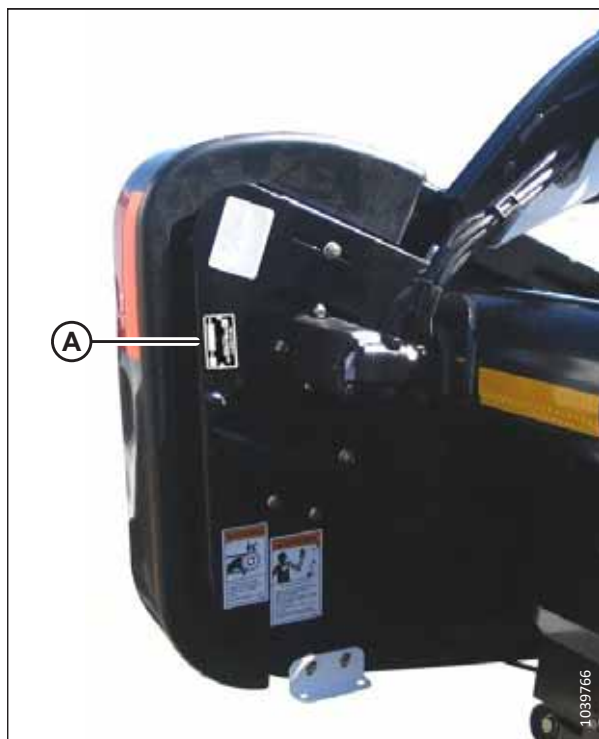


Figure 1: Header

Slow Speed Transport / Stabilizer Wheel Option

Serial Number: _____
Year: _____

Serial number plate (A) is located on the left wheel pivot tube.



Figure 2: Transport/Stabilizer Option

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Chapter 1: Safety

Understanding and consistently following these safety procedures will help to ensure the safety of those operating the machine and of bystanders.

1.1 Safety Alert Symbols

The safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

- **ATTENTION!**
- **BECOME ALERT!**
- **YOUR SAFETY IS INVOLVED!**

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

- Accidents disable and kill
- Accidents cost
- Accidents can be avoided



Figure 1.1: Safety Symbol

1.2 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. Two signal words, **IMPORTANT** and **NOTE**, identify non-safety related information.

Signal words are selected using the following guidelines:



DANGER

Indicates an imminently hazardous situation that, if it is not prevented, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation that, if it is not prevented, could result in death or serious injury. It may also be used to alert you to unsafe practices.



CAUTION

Indicates a potentially hazardous situation that, if it is not prevented, may result in minor or moderate injury. It may also be used to alert you to unsafe practices.

IMPORTANT:

Indicates a situation that, if not prevented, could result in a malfunction or damage to the machine.

NOTE:

Provides additional information or advice.

1.3 General Safety

Operating, servicing, and assembling machinery presents several safety risks. These risks can be reduced or eliminated by following the relevant safety procedures and wearing the appropriate personal protective equipment.



CAUTION

The following general farm safety precautions should be part of your operating procedure for all types of machinery.

Wear all protective clothing and personal safety devices that could be necessary for the job at hand. Do **NOT** take chances. You may need the following:

- Hard hat
- Protective footwear with slip-resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- Respirator or filter mask

In addition, take the following precautions:

- Be aware that exposure to loud noises can cause hearing impairment. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.



Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. Familiarize yourself with its use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when Operators are fatigued or in a hurry. Take time to consider the safest way to accomplish a task. **NEVER** ignore the signs of fatigue.

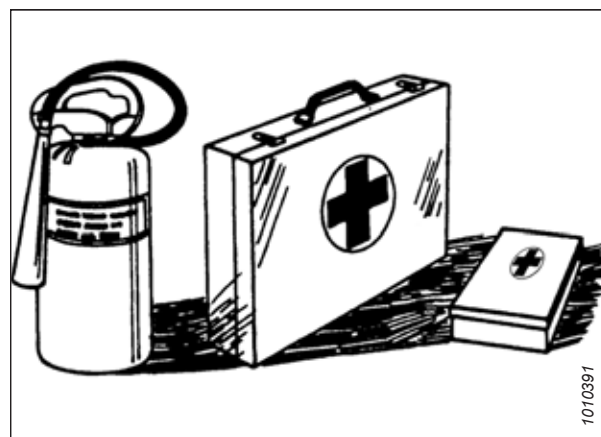


Figure 1.4: Safety Equipment

SAFETY

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as hoodies, scarves, or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Ensure that the driveline guards can rotate independently of their shaft, and that they can telescope freely.
- Use only service and repair parts made or approved by the equipment manufacturer. Parts from other manufacturers may not meet the correct strength, design, or safety requirements.



Figure 1.5: Safety around Equipment

- Keep hands, feet, clothing, and hair away from moving parts. **NEVER** attempt to clear obstructions or objects from a machine while the engine is running.
- Do **NOT** modify the machine. Unauthorized modifications may impair the functionality and/or safety of the machine. It may also shorten the machine's service life.
- To avoid injury or death from the unexpected startup of the machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

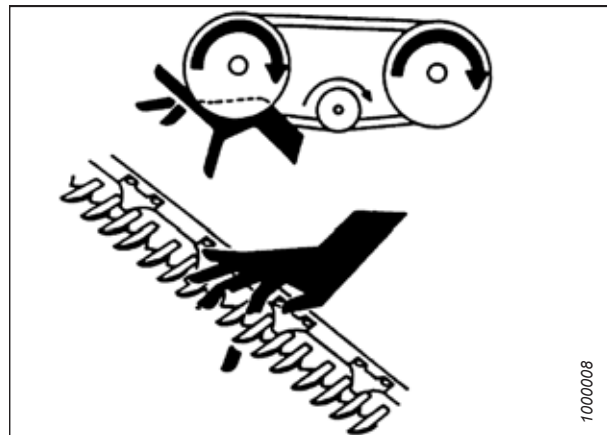


Figure 1.6: Safety around Equipment

- Keep the machine service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Ensure that all electrical outlets and tools are properly grounded.
- Keep the work area well-lit.
- Keep machinery clean. Straw and chaff on a hot engine are fire hazards. Do **NOT** allow oil or grease to accumulate on service platforms, ladders, or controls. Clean machines before they are stored.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover any sharp or extending components to prevent injury from accidental contact.



Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

Maintaining your equipment safely requires that you follow the relevant safety procedures and wear the appropriate personal protective equipment for the task.

To ensure your safety while maintaining the machine:

- Review the operator's manual and all safety items before operating or performing maintenance on the machine.
- Place all controls in Neutral, stop the engine, set the parking brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, or repairing the machine.
- Follow good shop practices:
 - Keep service areas clean and dry
 - Ensure that electrical outlets and tools are properly grounded
 - Keep the work area well lit
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Ensure that all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install the transport lock or place safety stands under the frame before working under the machine.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or another mechanically driven component by hand (for example, accessing a lubricant fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.



Figure 1.8: Wet Floors Present Safety Risks

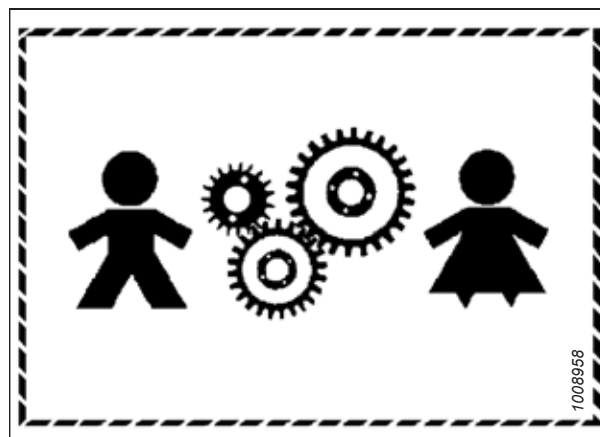


Figure 1.9: Equipment is NOT Safe for Children

SAFETY

- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.



Figure 1.10: Personal Protective Equipment

1.5 Hydraulic Safety

Because hydraulic fluid is under extreme pressure, hydraulic fluid leaks can be very dangerous. The proper safety procedures must be followed when inspecting for hydraulic fluid leaks and servicing hydraulic equipment.

- Always place all hydraulic controls in Neutral before leaving the operator's seat.
- Ensure that all the components in the hydraulic system are kept clean and in good condition.
- Replace any worn, cut, abraded, flattened, or crimped hoses and steel lines.
- Do **NOT** attempt any makeshift repairs to hydraulic lines, fittings, or hoses by using tapes, clamps, cements, or welding. The hydraulic system operates under extremely high pressure. Makeshift repairs can fail suddenly and create hazardous conditions.

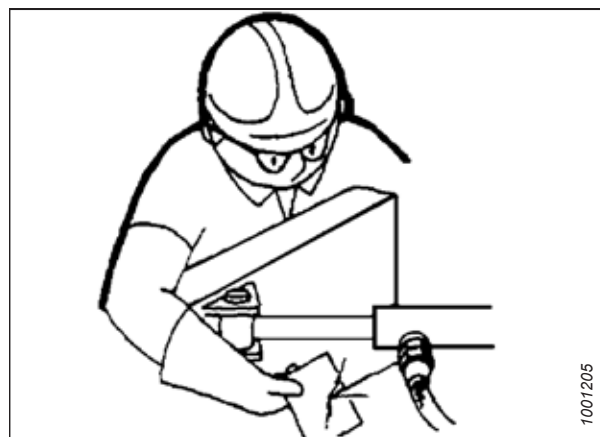


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for high-pressure hydraulic fluid leaks. Use a piece of cardboard as a backstop instead of your hands to isolate and identify a leak.
- If injured by a concentrated, high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin.



Figure 1.12: Hydraulic Pressure Hazard

- Ensure that all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system.

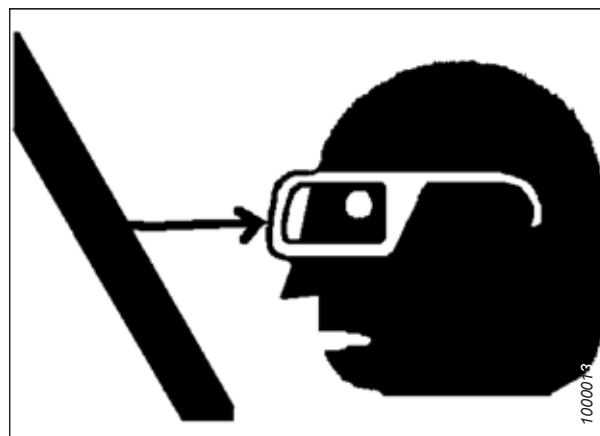


Figure 1.13: Safety around Equipment

1.6 Safety Signs

Safety signs are decals placed on the machine where there is a risk of personal injury, or where the Operator should take extra precautions before operating the controls. They are usually yellow.

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or illegible.
- If the original part on which a safety sign was installed is replaced, ensure that the repair part displays the current safety sign.
- Replacement safety signs are available from your Dealer.

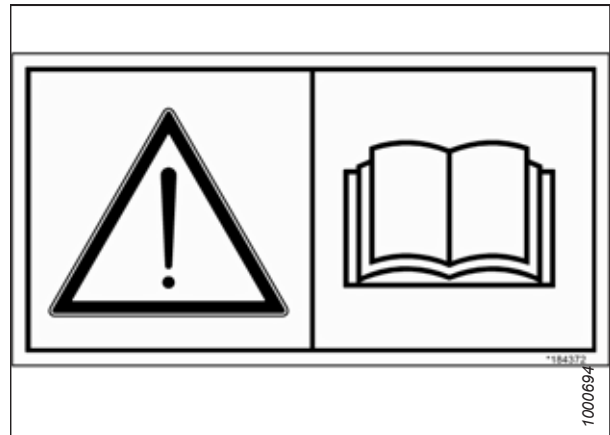


Figure 1.14: Operator's Manual Decal

1.6.1 Installing Safety Decals

Worn or damaged safety decals will need to be removed and replaced.

1. Decide exactly where you are going to place the decal.
2. Clean and dry the installation area.
3. Remove the smaller portion of the split backing paper.
4. Place the decal in position and slowly peel back the remaining paper, smoothing the decal as it is applied.
5. Prick small air pockets with a pin and smooth them out.

1.7 Safety Decal Locations

Safety signs are usually yellow decals, and are placed on the machine where there is a risk of personal injury, or where the operator has to take extra precaution before operating controls.

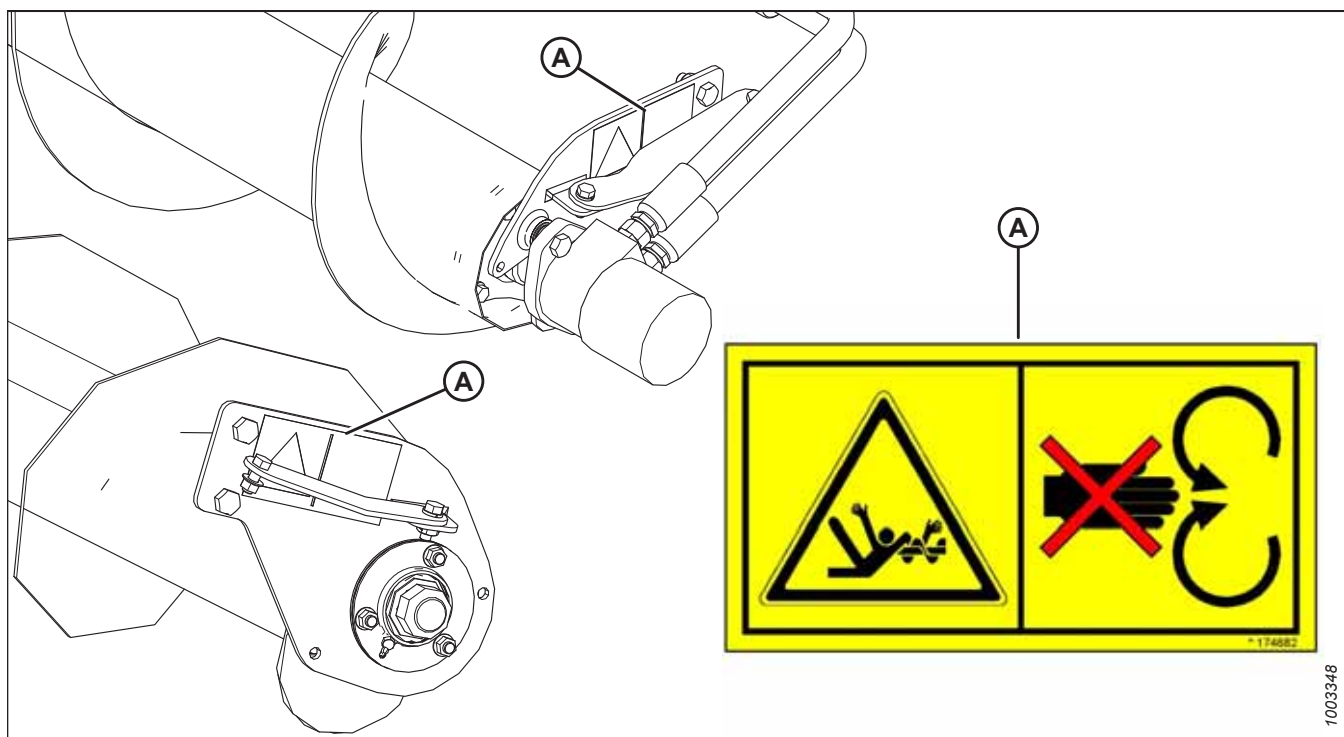


Figure 1.15: Upper Cross Auger – Older Version

A - MD #174682

NOTE:

The Upper Cross Auger (UCA) kits have changed over the years, and the safety decals installed on the augers have changed also. Refer to the appropriate illustration for the UCA installed on your header.

SAFETY

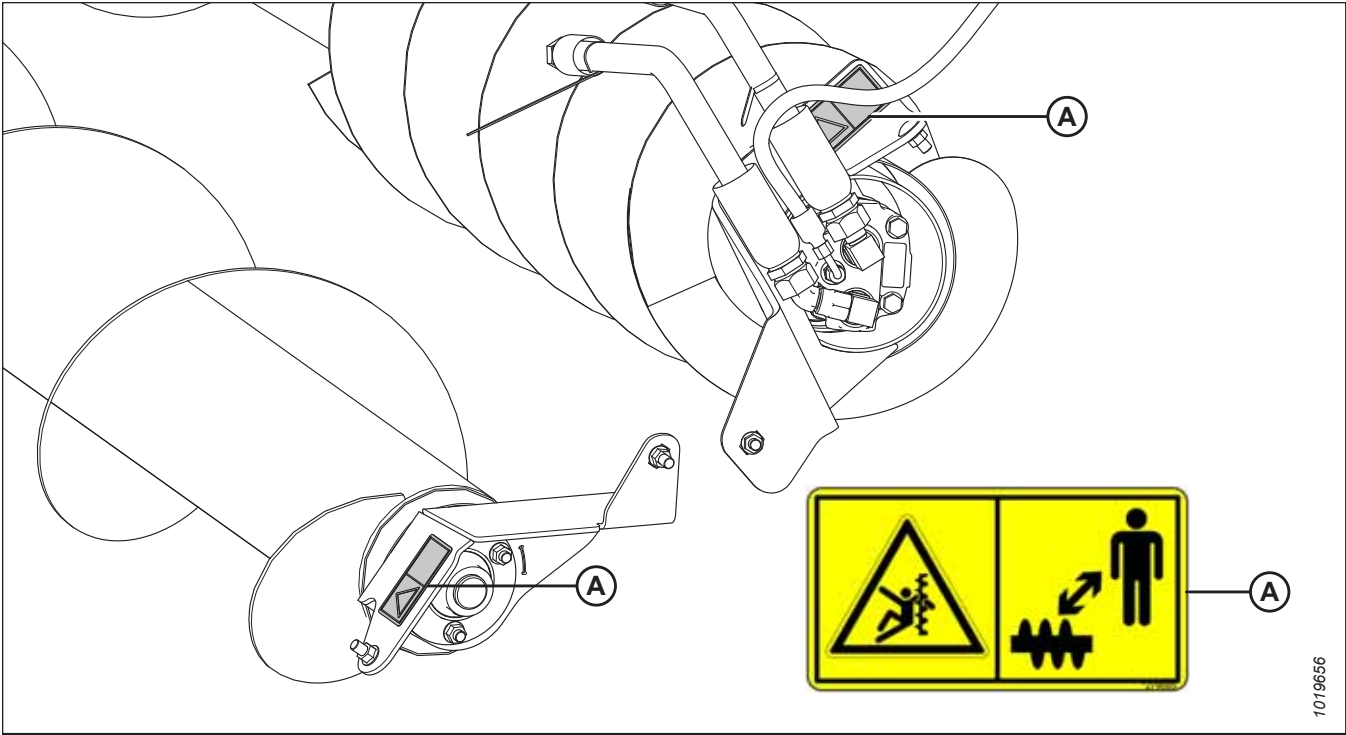


Figure 1.16: Upper Cross Auger – Newer Version

A - MD #279085

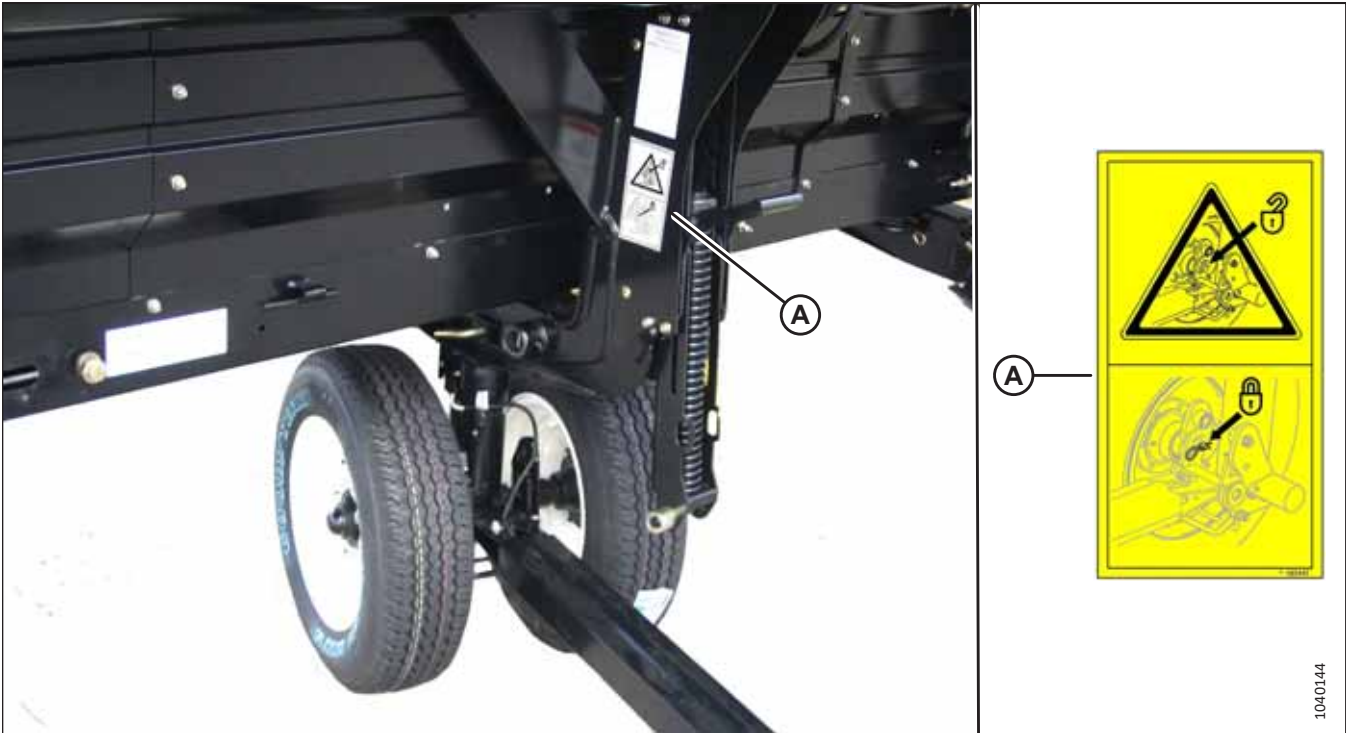
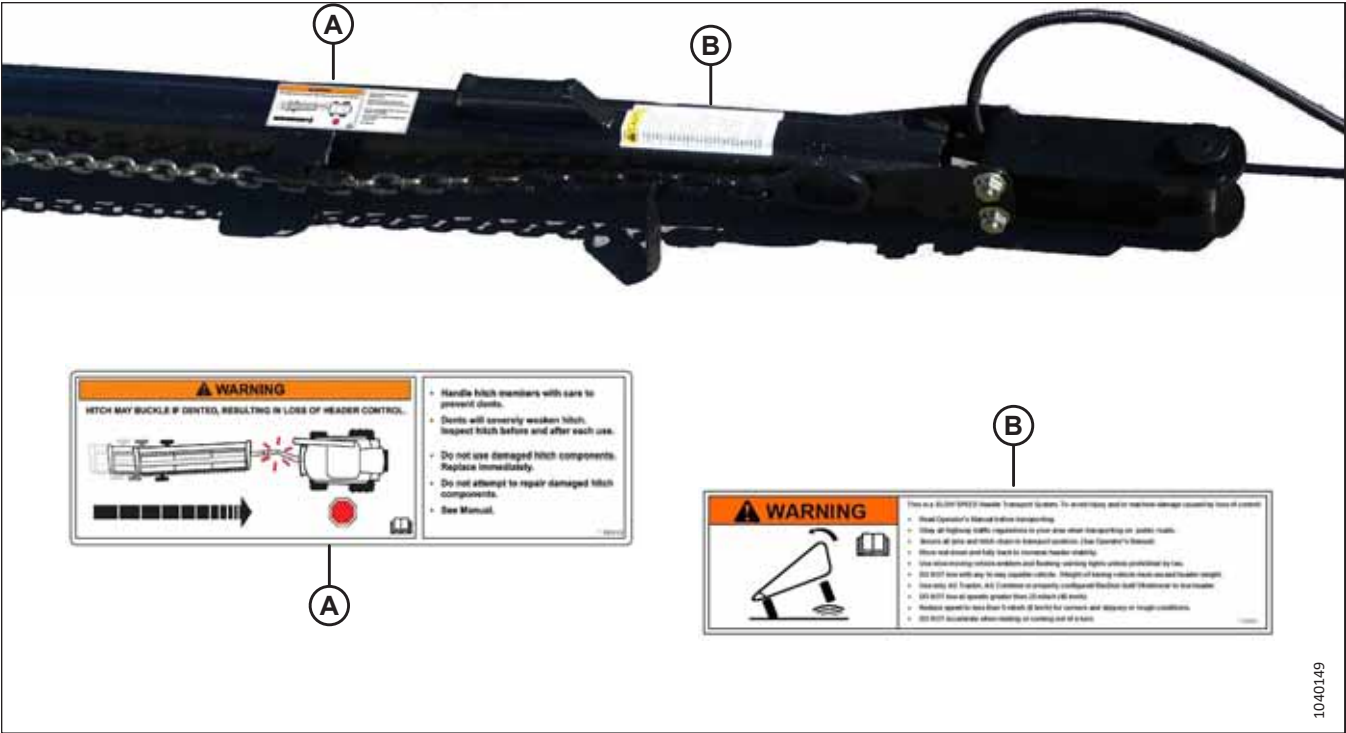


Figure 1.17: Slow Speed Transport

A - MD #193147

SAFETY



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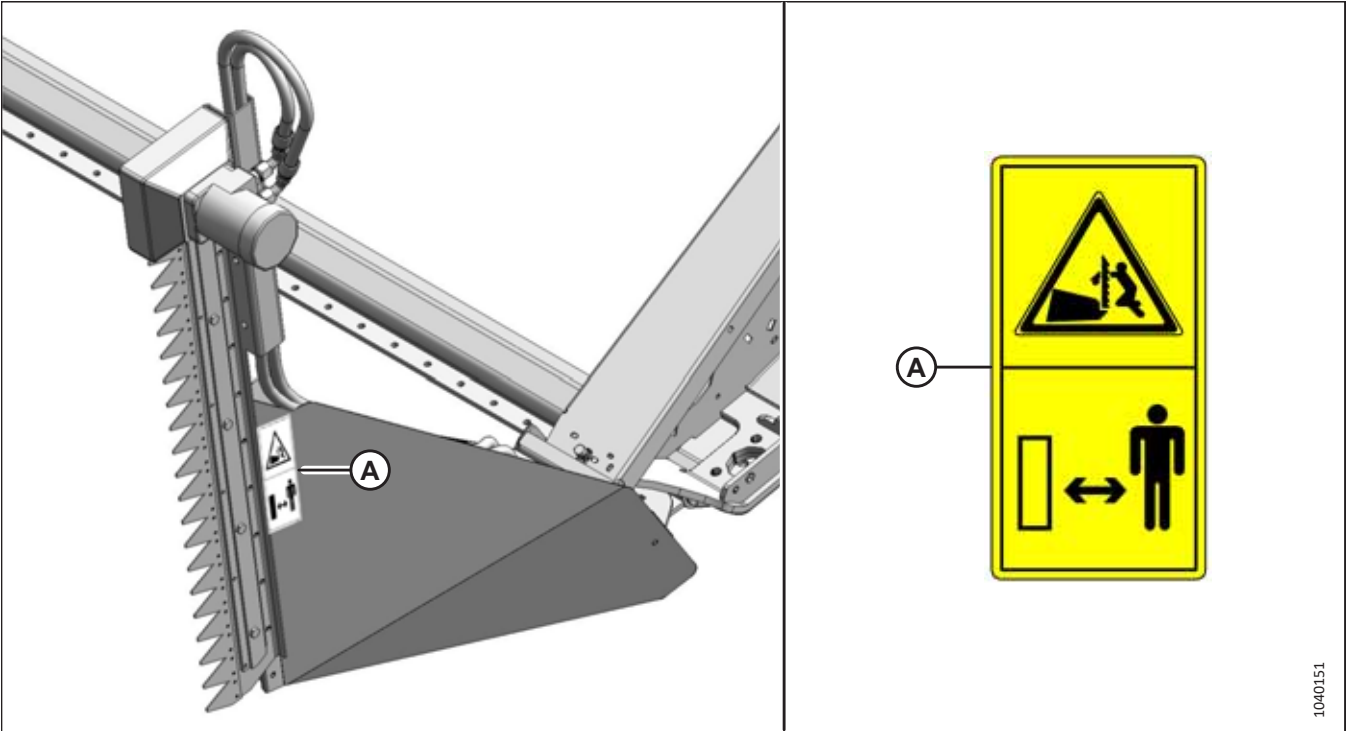
Figure 1.18: Slow Speed Transport Tow-Bar

A - MD #193113

B - MD #129261

NOTE:

Decal MD #129261 has two different appearances in this illustration as the decal has changed over the years. The version shown attached to the tow-bar is an older version; the version at the bottom of the illustration is the current version.



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Figure 1.19: Vertical Knife

A - MD #174684

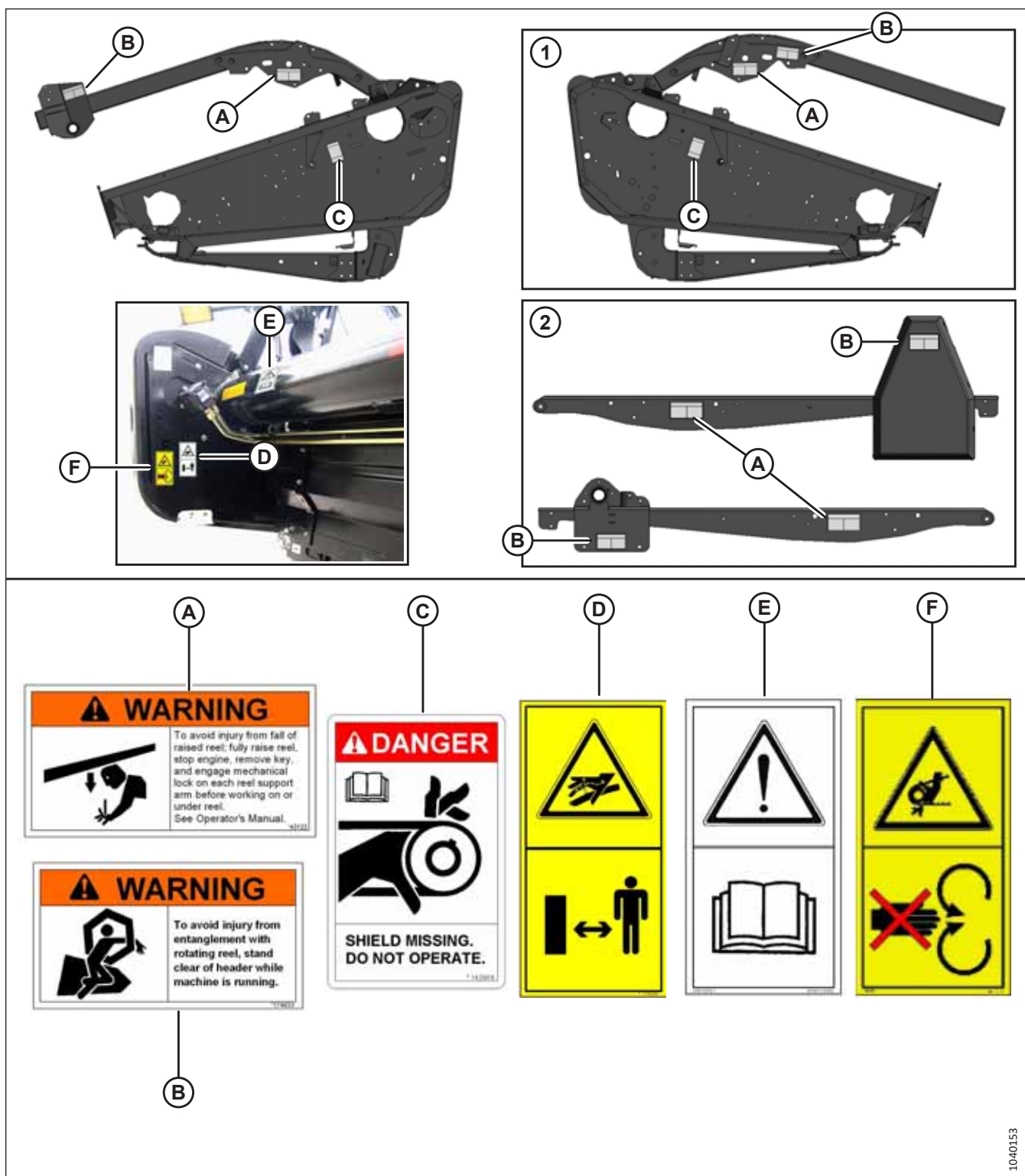


Figure 1.20: Endsheets, Reel Arms, Backsheet – North American Headers

1 - D60 Headers Only

A - MD #42122 (Both Reel Arms)

D - MD #174436 (Both Ends)

2 - D50 Headers Only

B - MD #174633 (Both Reel Arms)

E - MD #113482 (Both Ends)

C - MD #142909 (Both Reel Arms)

F - MD #184371 (Double Knife: Both Ends; Single Knife: Left End Only)

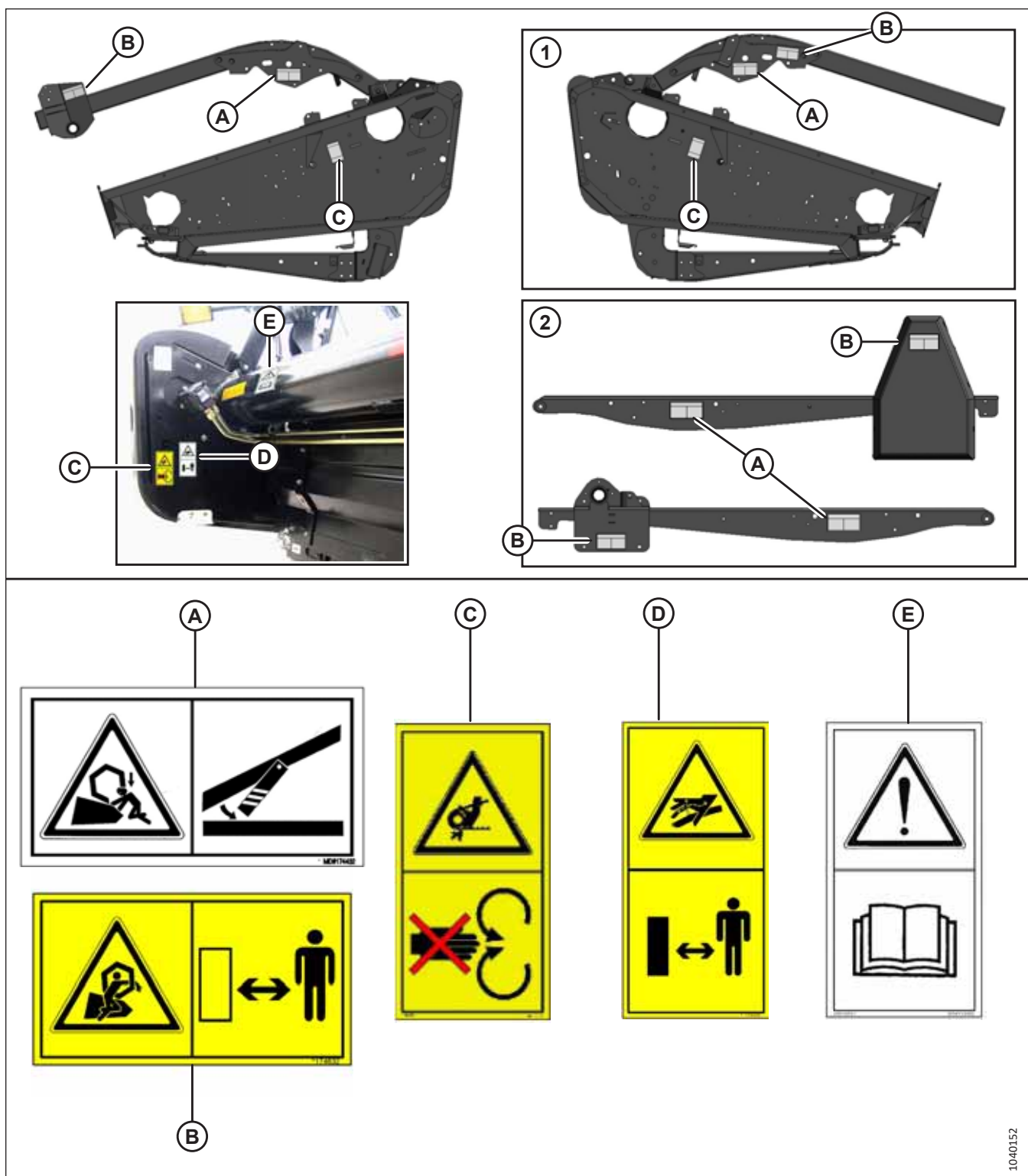


Figure 1.21: Endsheets, Reel Arms, Backsheet – Export Headers

1 - D60 Headers Only
 A - MD #174332 (Both Reel Arms)
 D - MD #174436 (Both Ends)

2 - D50 Headers Only
 B - MD #174632 (Both Reel Arms)
 E - MD #113482 (Both Ends)

C - MD #184371 (Double Knife 4 Places; Single Knife 3 Places)

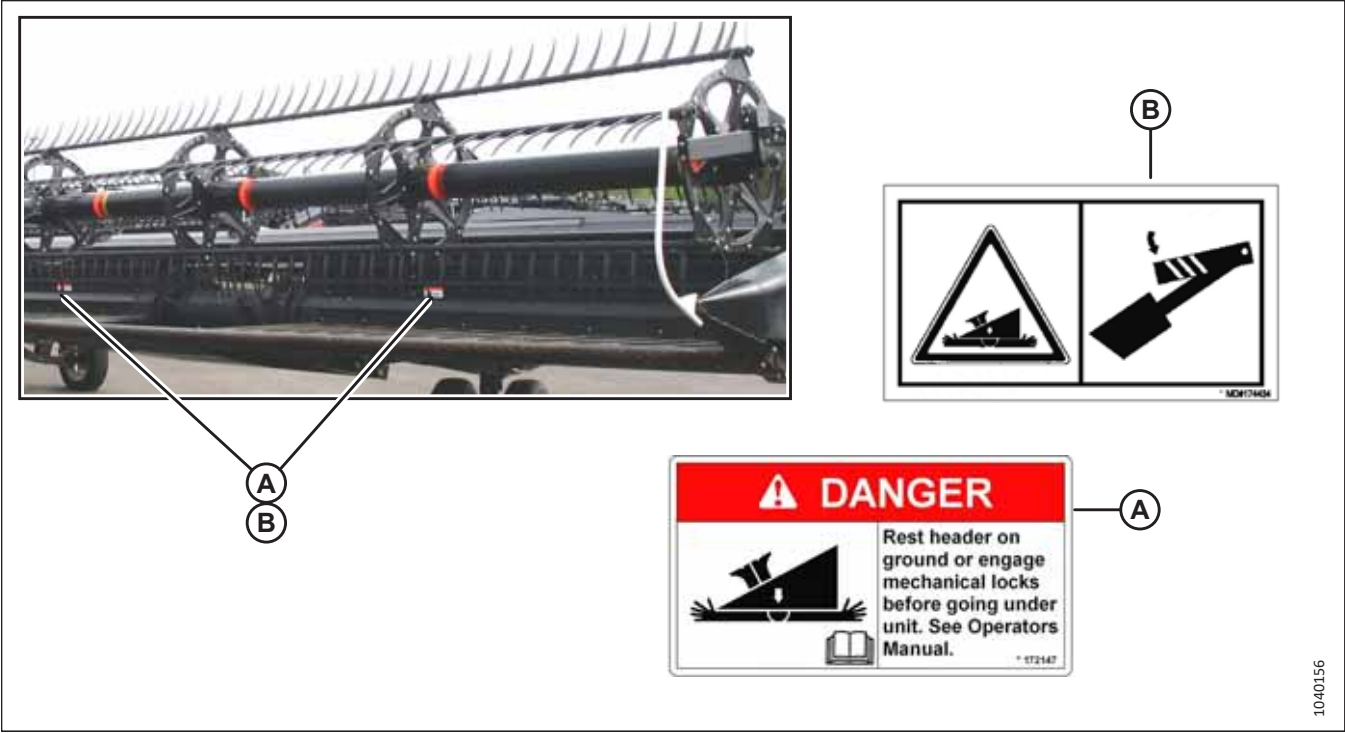


Figure 1.22: Decks

A - MD #172147 (North American Headers)

B - MD #174434 (Export Headers)

SAFETY

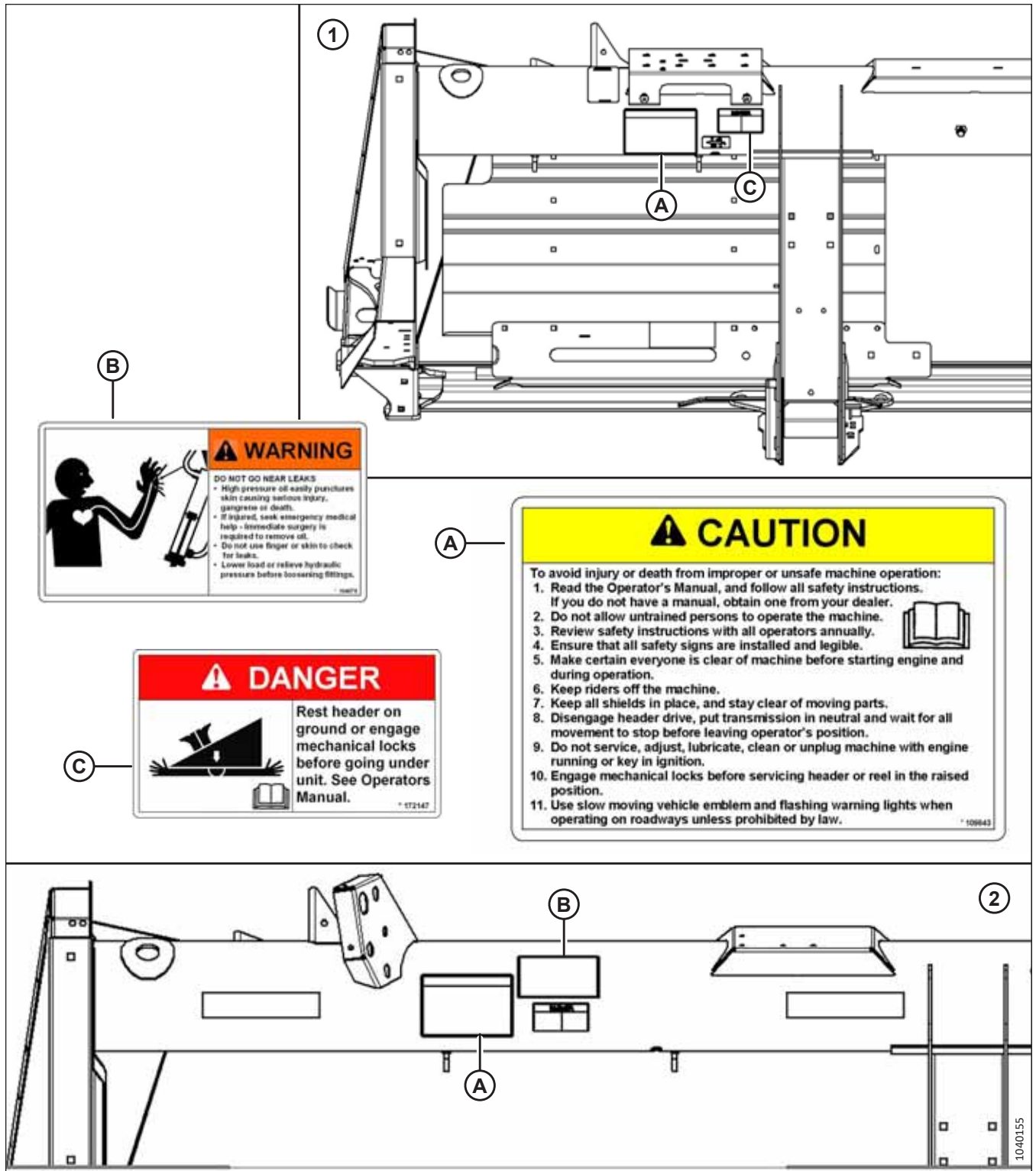


Figure 1.23: Backtube – 4.5 and 6.1 m (15 and 20 ft.) North American Headers

1 - 4.5 m (15 ft.) North American Header

2 - 6.1 m (20 ft.) North American Header

A - MD #109843

B - MD #134070

C - MD 3172147

SAFETY

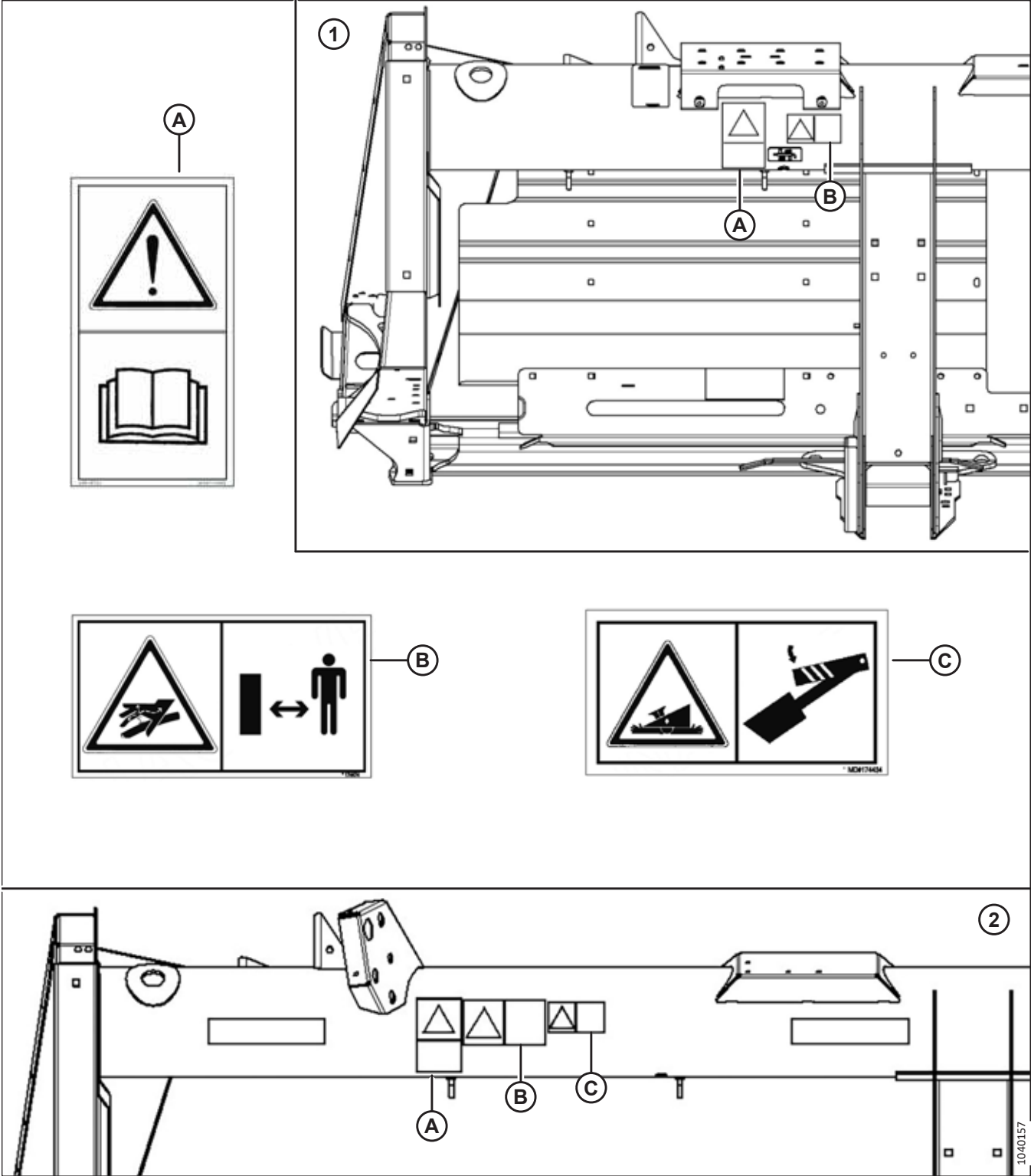


Figure 1.24: Backtube – 4.5 and 6.1 m (15 and 20 ft.) Export Headers

1 - 4.5 m (15 ft.) Export Header
A - MD #113482

2 - 6.1 m (20 ft.) Export Header
B - MD #174474

C - MD #174434

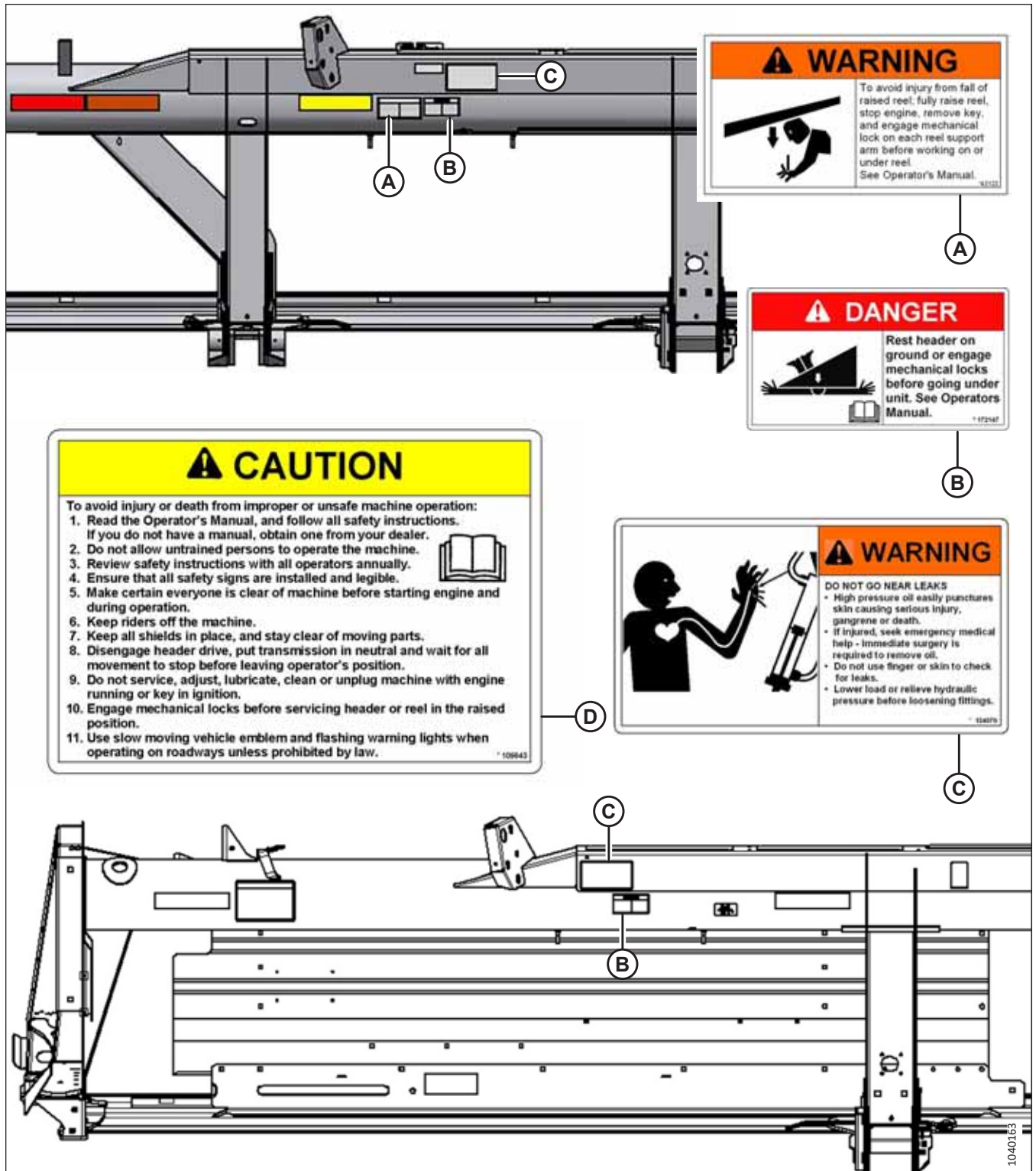


Figure 1.25: Backtube – 7.6–12.1 m (25–40 ft.) North American Headers

A - MD #42122 (Double-Reel Headers Only)
D - MD #109843 (Both Ends)

B - MD #172147 (Both Ends)

C - MD #134070

SAFETY

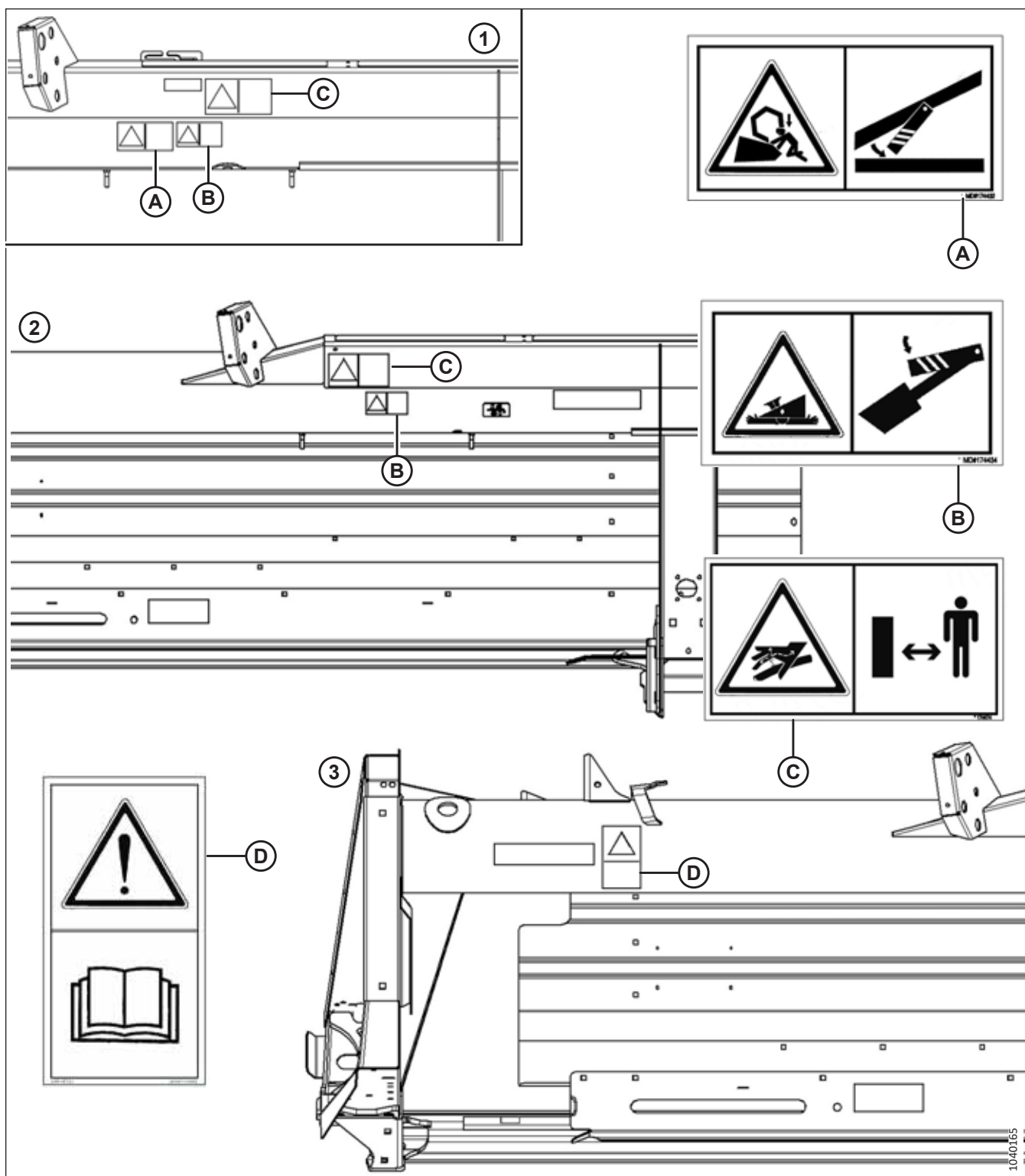


Figure 1.26: Backtube – 7.6–12.1 m (25–40 ft.) Export Headers

1 - 9.1–12.2 m (30–40 ft.) D50 and D60 Export Headers

A - MD #174432

D - MD #113482

2 - 7.6 m (25 ft.) D60 Export Header

B - MD #174434

3 - 7.6–12.2 m (25–40 ft.) D50 and D60 Export Headers

C - MD #174474

Chapter 2: Product Overview

The product overview provides the dimensions, details, and performance criteria for the various sizes and configurations.

2.1 Definitions

The following terms, abbreviations, and acronyms are used in this manual.

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode, in which the Operator's seat faces the header
CDM	Cab display module on an M Series Windrower
D Series Header	MacDon D50, D60, and D65 rigid draper headers
DK	Double knife
DWA	Double Windrow Attachment
Engine-forward	Windrower operation with Operator and engine facing in direction of travel
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position in which the given sealing surfaces or components are making contact with each other and the fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M Series Windrowers	MacDon M100, M105, M150, M155, M155E4, M200, and M205 Windrowers
n/a	Not applicable
N-DETENT	The slot opposite the NEUTRAL position on the operator's console of M Series SP Windrowers
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
Nut	An internally threaded fastener designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-Ring Seal
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when inserted into a mating part
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit and a header. It is designed to cut and lay crops into windrows for later harvest
SK	Single knife
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)

PRODUCT OVERVIEW

Term	Definition
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism
WCM	Windrower control module
Windrower	The power unit for a header

2.2 Specifications

Use the specification table to reference information about a machine's specific configuration. The table lists dimensions, weights, performance ranges, and features.

Table 2.1 Header Specifications

Header Model		D60		D50/D60			D60
Header Size		4.6 m (15 ft.)	6.1 m (20 ft.)	7.6 m (25 ft.)	9.1 m (30 ft.)	10.7 m (35 ft.)	12.2 m (40 ft.)
Conveyor (Draper) and Decks							
Draper width		1057 mm (41.6 in.)					
Draper drive		Hydraulic					
Draper speed		0–225 m/min. (0–742 fpm)					
Delivery opening	D50	Not applicable		1710–1920 mm (67.3–75.6 in.)			Not applicable
	D60	1540–1770 mm (60.61–69.7 in.)	1720–1950 mm (67.1–76.7 in.)				
	Height	945–1058 mm (37.2–1058 mm)					
Draper angle (cutterbar on the ground)	D50 & D60	13.0–18.4°					
Reel							
Reel drive		Hydraulic from windrower hydraulic oil supply					
Reel speed		0–62 rpm					
Quantity of tine tubes		6 or 9		D50: 5 or 6; D60: 9		5 or 6	5
Effective reel diameter		1650 mm (65 in.)					
Finger tip radius range		766–800 mm (30.2–31.5 in.)					
Finger type	Plastic	—		Standard			
	Heavy-duty plastic	Standard		Optional D60			—
Finger spacing		152.4 mm (6 in.)					
Upper Cross Auger (Optional)							
Outside diameter		305 mm (12 in.)					
Weight		61 kg (34 lb.)	74 kg (163 lb.)	87 kg (192 lb.)	100 kg (221 lb.)	113 kg (250 lb.)	127 kg (279 lb.)
Stabilizer Wheels (Optional)							
Size		Not applicable			ST205 / 75R-15		
Pressure		Not applicable			Load range E: 552 kPa (80 psi) Load range D: 415 kPa (60 psi)		
Weight		Not applicable			91 kg (200 lb.)		

NOTE:

Specifications and design are subject to change without notice or obligation to revise previously sold units.

NOTE:

Weights do not include options.

2.3 Component Identification

Operating and maintaining the header requires understanding the names of its main components and their locations.

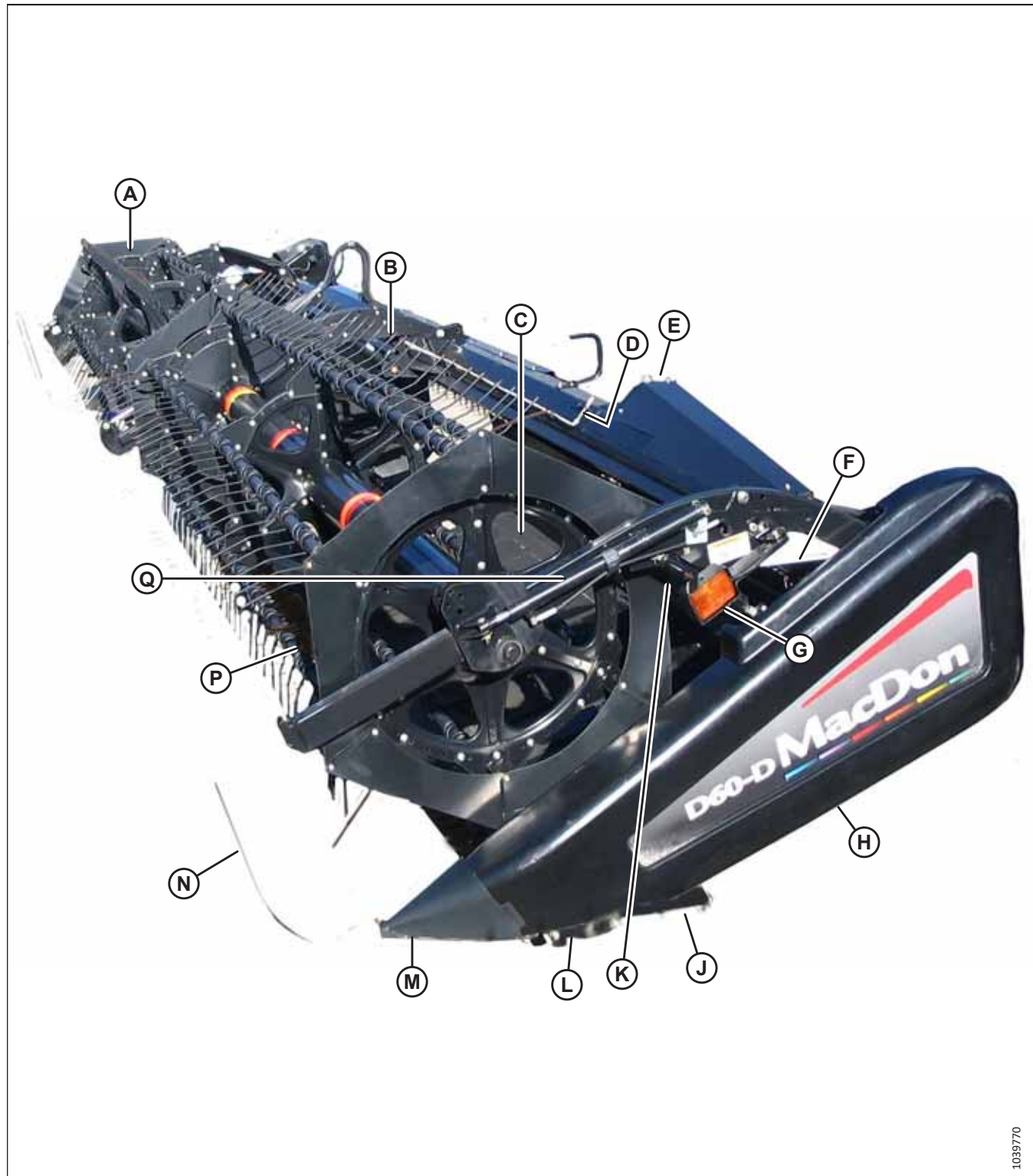


Figure 2.1: Header Components

A - Reel Cam

D - Center Reel Arm Prop Handle

G - Transport Light

K - Reel Lift Cylinder

N - Crop Divider Rod

B - Pick-Up Reel Tines

E - Hydraulic Connections

H - Removable Endshield

L - Knife Drive Box

P - Reel Endshield

C - Drapers

F - Reel Safety Prop

J - Skid Shoe

M - Crop Divider

Q - Reel Fore-Aft Cylinder

Chapter 3: Operation

Safely operating the machine requires familiarizing yourself with its capabilities.

3.1 Owner/Operator Responsibilities

Familiarize yourself with the responsibilities of operating this machine.



CAUTION

- It is your responsibility to read and understand this manual completely before operating the header. Contact your MacDon Dealer if an instruction is not clear to you.
- Follow all safety messages in the manual and on safety decals on the machine.
- Remember that YOU are the key to safety. Good safety practices protect you and the people around you.
- Before allowing anyone to operate the header, for however short a time or distance, make sure they have been instructed in its safe and proper use.
- Review the manual and all safety related items with all Operators annually.
- Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.
- Do NOT modify the machine. Unauthorized modifications may impair the function and/or safety of the machine and also may reduce the length of service you receive from your machine.
- The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.

3.2 Operational Safety

Follow all the safety and operational instructions given in this manual.

CAUTION

Adhere to the following safety precautions:

- Follow all safety and operational instructions provided in your operator's manuals. If you do not have a windrower manual, get one from your Dealer and read it thoroughly.
- Never attempt to start the engine or operate the machine except from the windrower seat.
- Check the operation of all controls in a safe, clear area before starting work.
- Do NOT allow riders on the windrower.



Figure 3.1: No Riders

CAUTION

- Never start or move the machine until you are sure all bystanders have cleared the area.
- Avoid travelling over loose fill, rocks, ditches, or holes.
- Drive slowly through gates and doorways.
- When working on inclines, travel uphill or downhill whenever possible. Be sure to keep transmission in gear when travelling downhill.
- Never attempt to get on or off a moving machine.
- Do NOT leave operator's station while the engine is running.
- To avoid bodily injury or death from unexpected startup of a machine, always stop the engine and remove the key before adjusting or removing plugged material from the machine.
- Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. For instructions, refer to [3.7 Shutting down Header, page 33](#).
- Operate only in daylight or good artificial light.

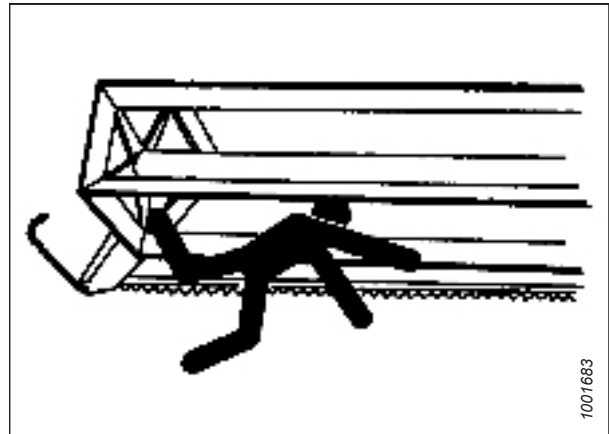


Figure 3.2: Bystander Hazard

3.3 Header Attachment/Detachment

This chapter includes instructions for attaching a header to, and detaching a header from a windrower.

3.3.1 Attaching Header to Windrower

Refer to your windrower operator's manual for instructions for mechanically attaching the header to the windrower.

Refer to the following procedures for electrical and hydraulic connections.

Header drive hydraulic hoses and electrical harness are located on the left cab-forward side of the windrower. The reel drive and control hoses are located on the right cab-forward side.

1. Before connecting header drive hydraulics (A) and electrical harness (B) to header, check fittings and connectors. Clean them if required.



Figure 3.3: Header Drive Hoses

2. Disengage and rotate lever (A) counterclockwise to fully up position.
3. Remove cap (B) securing the electrical connector to the frame.
4. Move hose bundle (C) from the windrower hose support and route it along the header hose guide.



Figure 3.4: Header Drive Hoses

OPERATION

5. Push the hose connectors onto the mating receptacle until the collar on the receptacle snaps into locked position.
6. Remove the cover from electrical receptacle (A).
7. Push the electrical connector onto the receptacle and turn the collar on the connector to lock it in.
8. Attach the cover to the mating cover on the windrower's wiring harness.

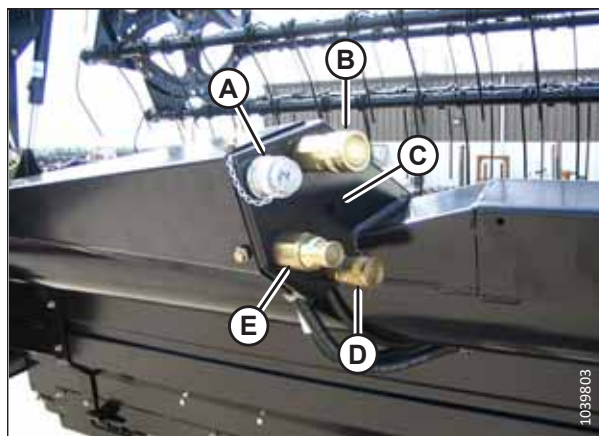


Figure 3.5: Header Receptacles

A - Electrical Receptacle B - Knife Drive
C - Case Drain (Double Knife) D - Draper Drive
E - Return

9. Lower lever (A) and engage it in down position.



Figure 3.6: Hose Storage

10. Before connecting the reel hydraulics, check the fittings. If the fittings are dirty, clean them.

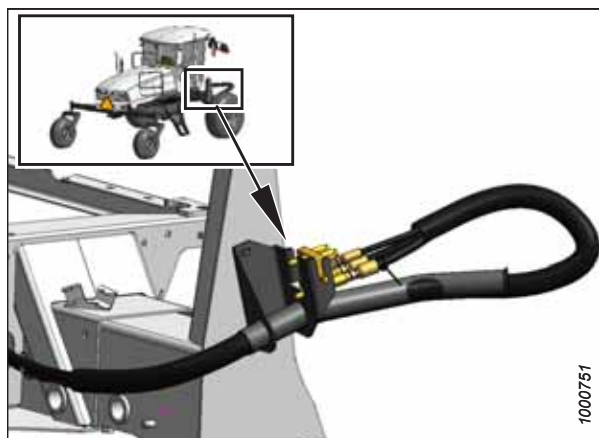


Figure 3.7: Reel Hose Storage

OPERATION

11. Open the cover on header receptacle (A).
12. Push in lock button (B) and pull handle (C) to the half-open position.

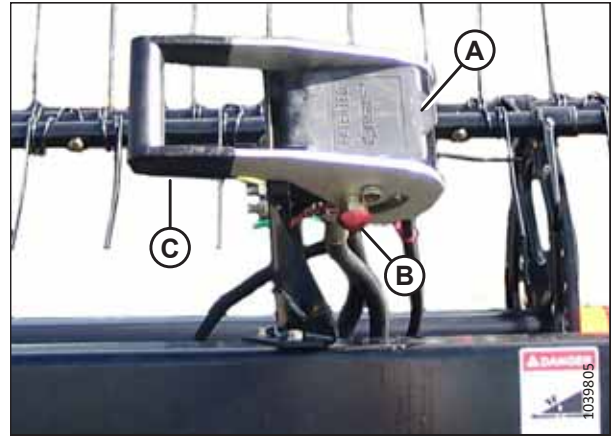


Figure 3.8: Reel Hydraulics Receptacle

13. Remove the hose bundle with multicoupler (C) from the windrower, place the multicoupler onto the header receptacle, and push handle (B) to engage the connector pins.
14. Push the handle away from the hoses until lock button (A) snaps out.
15. Raise and lower the header and the reel a few times to allow trapped air to pass back to the reservoir.

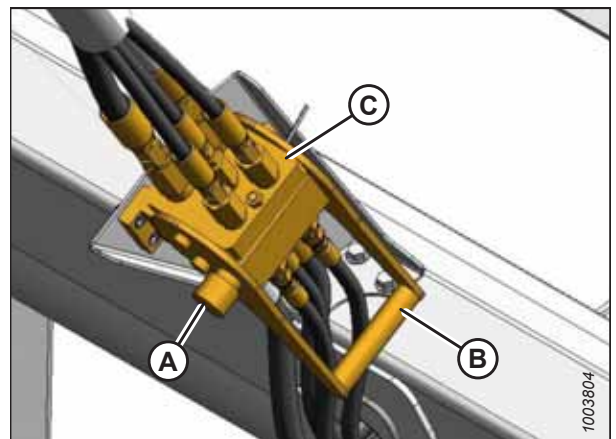


Figure 3.9: Reel Hose Connection

3.3.2 Detaching Header from Windrower

To detach the header from an M Series Windrower, follow the procedure provided here.

1. Lower the header fully.
2. Lower the reel fully.
3. Shut down the engine, and remove the key from the ignition.

OPERATION

Disconnecting reel hydraulics:

4. Push in lock button (A) and pull handle (B) to disengage multicoupler (C) from the header receptacle.
5. Route the hose bundle back onto the windrower and store multicoupler (C) on the hose support.

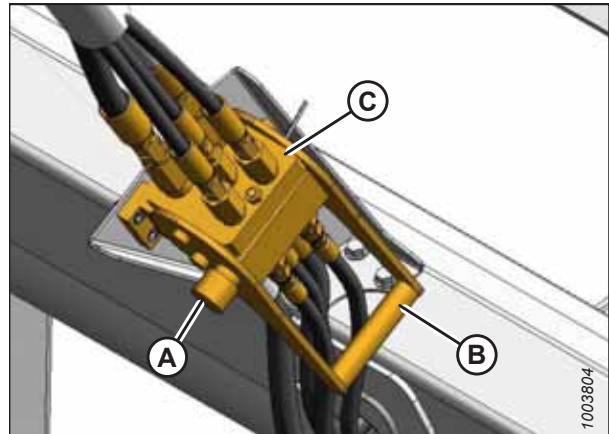


Figure 3.10: Reel Hydraulics

6. Close the cover on header receptacle (A).

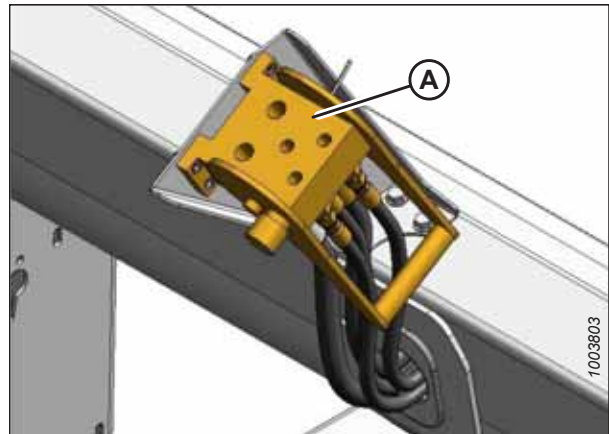


Figure 3.11: Closed Receptacle Cover

Disconnecting header drive hydraulics:

7. Disengage and rotate lever (A) counterclockwise to the fully up position.
8. Disconnect the electrical connector from the header.

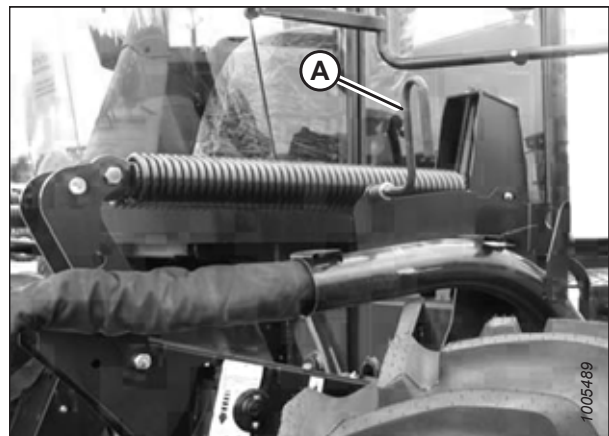


Figure 3.12: Header Drive Hydraulics

OPERATION

9. To disconnect the hoses from the header, line up slot (A) in collar with pin (B) on the connector.
10. Push the collar toward the pin and pull the connector to disengage.
11. Install caps on the connectors and the hose ends (if equipped).

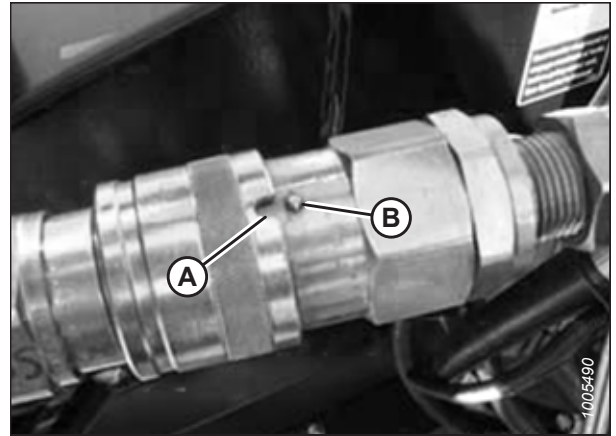


Figure 3.13: Quick Disconnect

Storing hose bundle on windrower support:

12. Route hose bundle (A) back onto the hose support on the windrower.
13. Rotate lever (B) and lock in the down position.
14. Install cap (C) on the electrical connector.
15. Detach the header from the windrower. For instructions, refer to the windrower operator's manual.

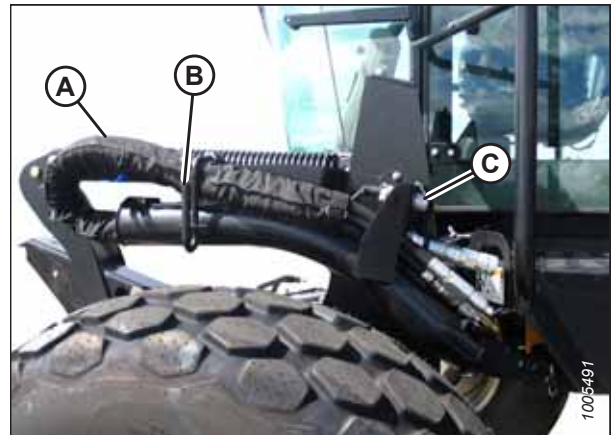


Figure 3.14: Hose Storage

3.4 Break-in Period

Until you become familiar with the sound and feel of your new header, be extra attentive.



CAUTION

Before investigating an unusual sound or attempting to correct a problem, shut off engine and remove key.

After attaching the header to the windrower for the first time, follow these steps:

1. Operate the machine with the reels, drapers, and knives running slowly for five minutes. Watch and listen **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

NOTE:

Reels and side drapers will not operate until oil flow fills the lines.

2. Refer to [4.12.1 Break-in Inspection, page 241](#) and perform all the specified tasks.

3.5 Preseason Check

Equipment should be inspected and serviced at the beginning of each operating season.

Perform the following procedures at the beginning of each operating season:



CAUTION

- Review this manual to refresh your memory on the safety and operating recommendations.
 - Review all the safety decals and other decals on the header and note the hazard areas.
 - Be sure all the shields and guards are properly installed and secured. Never alter or remove safety equipment.
 - Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.
 - Check the first aid kit and fire extinguisher. Know where they are and how to use them.
1. Adjust the tension on the drive belts depending on your equipment. For instructions, refer to [Tensioning Untimed Knife Drive Belts, page 157](#).
 2. Perform all the annual maintenance. For a list of maintenance tasks, refer to [4.12.2 Maintenance Schedule, page 241](#).

3.6 Daily Start-Up Check

Complete the following tasks each day before starting the machine.



CAUTION

- Clear the area of other persons, pets, etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.
 - Wear close-fitting clothing and protective shoes with slip-resistant soles.
 - Remove foreign objects from the machine and surrounding area.
 - Carry with you any protective clothing and personal safety devices that could be necessary through the day. Do NOT take chances. You may need a hard hat, protective glasses or goggles, heavy gloves, a respirator or filter mask, or wet weather gear.
 - Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.
1. Check the machine for leaks and any parts that are missing, broken, or not working correctly.

NOTE:

Use proper procedure when searching for pressurized fluid leaks. For instructions, refer to [4.12.4 Checking Hydraulic Hoses and Lines, page 244](#).

2. Clean all lights and reflective surfaces on the machine.
3. Perform all daily maintenance. For a list of tasks, refer to [4.12.2 Maintenance Schedule, page 241](#).



Figure 3.15: Safety Devices

3.7 Shutting down Header

To prevent injuries and equipment damage, always perform the procedures for shutting down the header.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

To shut down the header, and before leaving the windrower seat for any reason, follow these steps:

1. Disengage the header drive.
2. Park the windrower on level ground whenever possible.
3. Lower the header fully.
4. Place all controls in NEUTRAL or PARK.
5. Lower and fully retract the reel.
6. Shut down the engine, and remove the key from the ignition.
7. Wait for all windrower and header movement to stop before exiting the vehicle.

3.8 Cab Controls

The primary header functions are controlled inside the windrower cab.



CAUTION

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

Refer to your windrower operator's manual to identify the following in-cab controls:

- Header engage/disengage
- Header height
- Header angle
- Ground speed
- Reel speed
- Reel height
- Reel fore-aft position

3.9 Header Safety Props

When engaged, the header safety props located on the header lift cylinders prevent the header from falling unexpectedly. For instructions on operating the safety props, refer to your windrower operator's manual.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

3.10 Reel Safety Props

The reel safety props are located on the reel arms. When engaged, the reel safety props prevent the reel from falling unexpectedly.

IMPORTANT:

To prevent damage to the reel support arms, do **NOT** transport the header with the reel safety props engaged.

3.10.1 Engaging Reel Safety Props

Engage the reel safety props whenever you intend to work on or around a raised reel. When engaged, the reel safety props prevent the reel from falling unexpectedly.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Move reel safety props (A) to the engaged position, as shown. **The prop MUST be placed on the top surface of raised lug (B), making contact with the cylinder mount, to ensure positive engagement.**

NOTE:

Keep pivot bolt (C) sufficiently tight so that the prop remains in the stored position when not in use, but can still be engaged using hand force.

4. Repeat Step 3, [page 36](#) on the opposite side of the header.

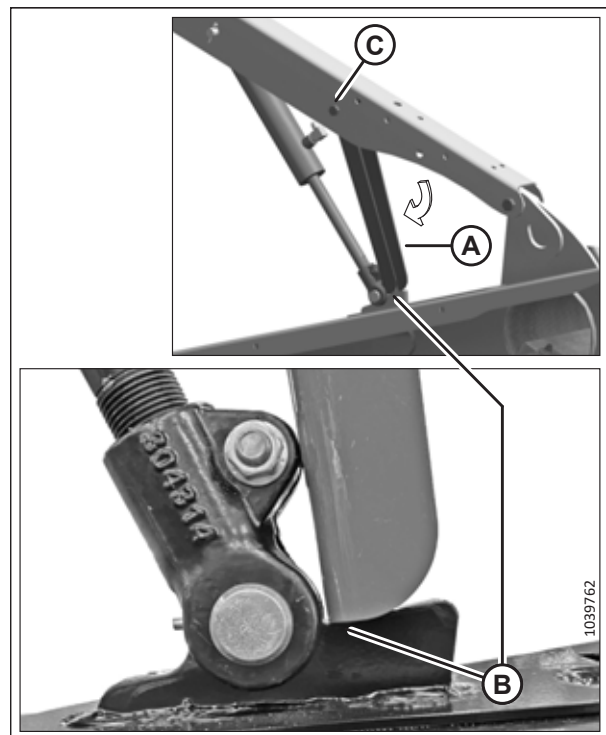


Figure 3.16: Reel Safety Prop – Left Arm Shown

OPERATION

5. **Double-reel header, center arm:** Use handle (A) to move the lock rod to inboard position (B), which engages pin (C) under the prop.
6. Lower the reel until the safety props contact the outer arm cylinder mounts and the center arm pin.

NOTE:

The center arm only applies to double-reel headers.

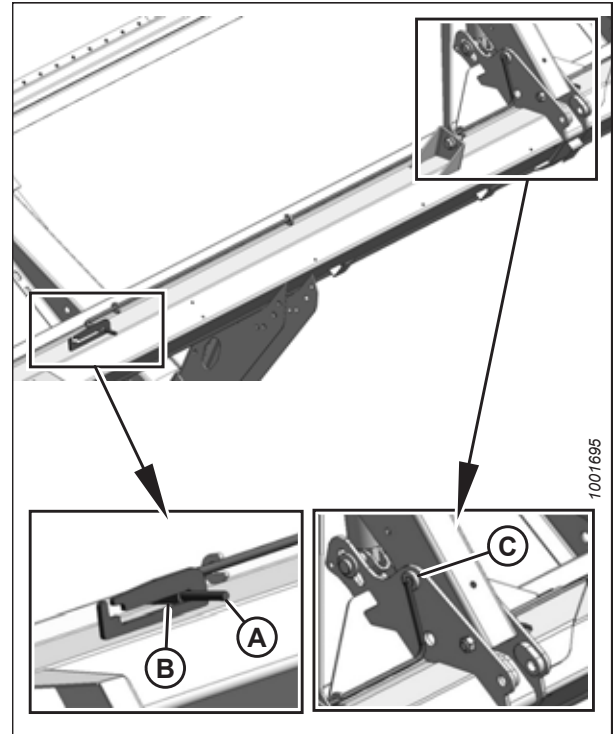


Figure 3.17: Reel Safety Prop – Center Arm

3.10.2 Disengaging Reel Safety Props

Disengage the reel safety props once you have completed working on or around a raised reel.

! DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Raise the reel to the maximum height.
2. Shut down the engine, and remove the key from the ignition.
3. Move reel safety props (A) back inside the reel arms.
4. Repeat Step 3, page 37 on the opposite end of the reel.

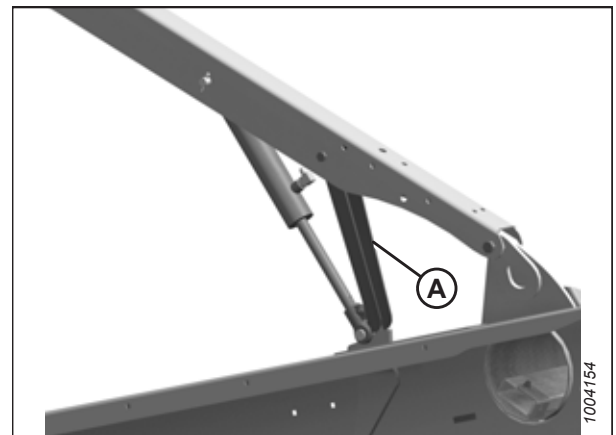


Figure 3.18: Reel Safety Prop – Left Arm Shown

OPERATION

5. **Double-reel headers, center reel arm:** Use handle (B) to move lock rod (A) to the outboard position.

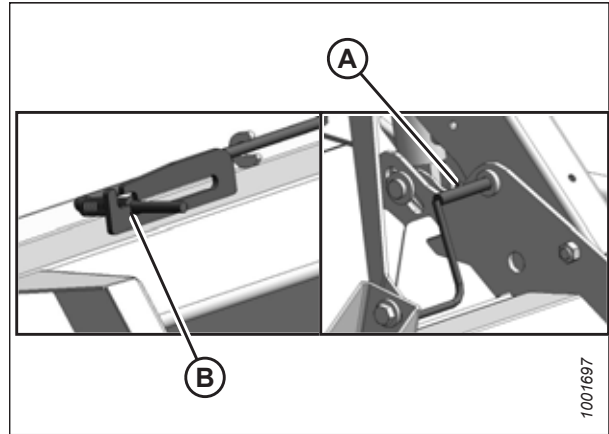


Figure 3.19: Reel Safety Prop – Center Arm

3.11 Header Setup

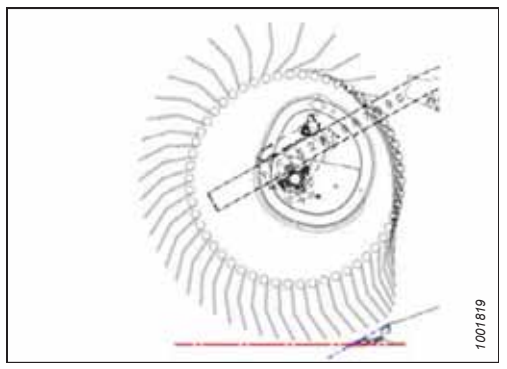
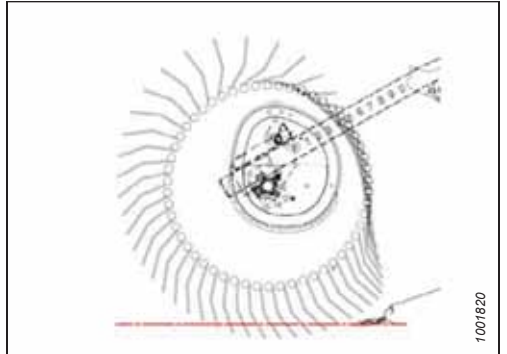
The combination of reel positions and reel cam settings allow the operator to adjust to various crops and conditions.

1. In Table 3.1, page 39, find the row for the type of crop to be cut.
2. Determine the desired stubble height for that crop.
3. In the column for the applicable crop condition, find the recommended reel setting reference for that crop.
4. Look up the recommended reel setting reference in Table 3.2, page 39. This table illustrates the reel profile at each cam setting and the reel location relative to the ground at different positions on the reel arm.

Table 3.1 Recommended Machine Setup

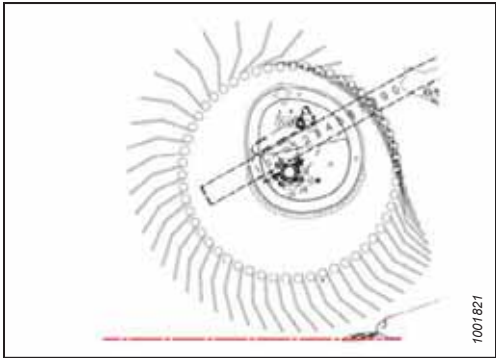
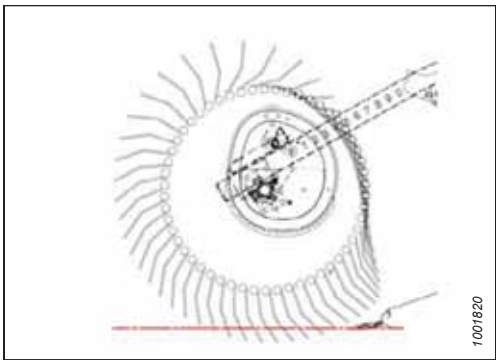
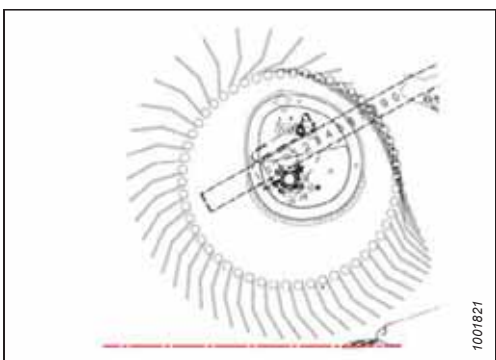
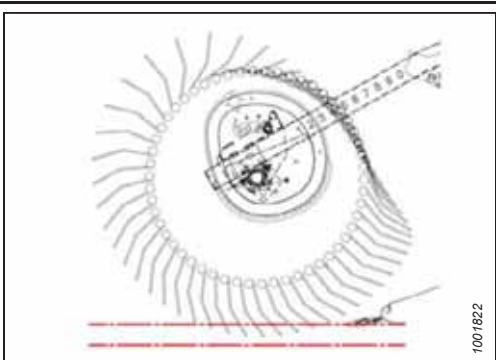
Crop Type	Stubble	Crop Condition			
		Light	Normal	Heavy	Lodged
Cereals	10–20 cm (4–8 in.)	E	A	B	D or G
	25+ cm (10+ in.)	F	A	B	D or G
	Ground	C	A	A	A
Alfalfa	10–20 cm (4–8 in.)	E	A	A or C	—
Canola	25+ cm (10+ in.)	F	A	B or H	D
Grass	Ground	A	A or J	J	—
Rice	25+ cm (10+ in.)	F	A	G	G

Table 3.2 Recommended Reel Settings

Reel Setting Reference	Cam Setting Number (Finger Speed Gain)	Reel Position Number	Header Angle	Reel Finger Pattern
A	2 (20%)	6 or 7	Middle	
B	2 (20%)	3 or 4	Variable	

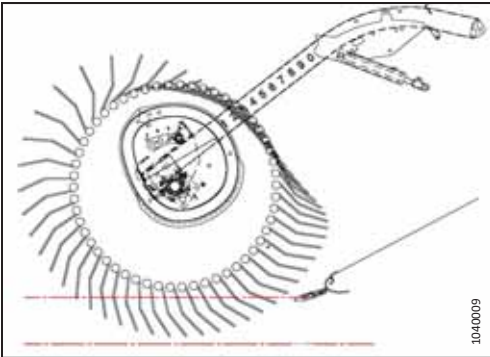
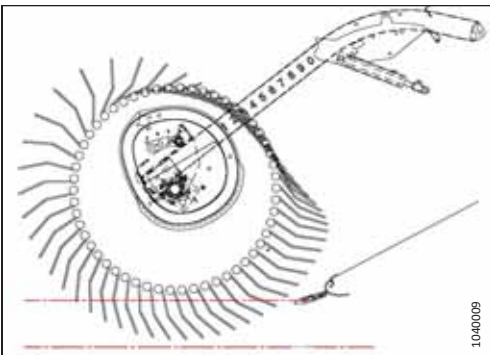
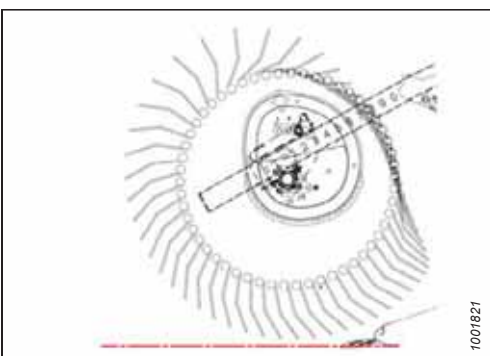
OPERATION

Table 3.2 Recommended Reel Settings (continued)

Reel Setting Reference	Cam Setting Number (Finger Speed Gain)	Reel Position Number	Header Angle	Reel Finger Pattern
C	3 (30%)	6 or 7	Middle	
D	3 (30%)	3 or 4	Variable	
E	4 (35%)	6 or 7	Middle	
F	4 (35%)	2 or 3	Variable	

OPERATION

Table 3.2 Recommended Reel Settings (continued)

Reel Setting Reference	Cam Setting Number (Finger Speed Gain)	Reel Position Number	Header Angle	Reel Finger Pattern
G	4 (35%)	1	Maximum	
H	4 (35%)	1	Variable	
J	1 (0%)	6 or 7	Middle	

OPERATION

NOTE:

- Adjust the reel forward to position the fingers closer to the ground, while tilting the header back. Fingers/tines will dig into the ground at extreme reel-forward positions, so adjust skid shoes or header angle to compensate.
- Adjust the reel aft in thinner crops to prevent plugging on the cutterbar.
- Increase the header angle to position the reel closer to the ground, or decrease the angle to position the reel farther from the ground.
- Raise header, increase header angle, and position reel fully forward in lodged crop for maximum stubble height.
- Minimum crop carrying capacity (minimum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest aft position.
- Maximum crop carrying capacity (maximum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest forward position.
- The finger tip speed at the cutterbar is higher than the reel speed at higher cam settings due to the nature of the cam action. For instructions, refer to Table [3.2, page 39](#).

3.12 Header Operating Variables

Satisfactory header function requires making adjustments to suit various crops and conditions, reduce crop loss, and increases productivity.

The variables listed in Table 3.3, page 43 allow the operator to affect the header performance.

You will quickly become adept at adjusting the machine to achieve the results you desire. Most of the adjustments have been preset at the factory, but the settings can be changed to suit crop conditions.

Table 3.3 Operating Variables

Variable	Refer to
Cutting height	3.12.1 Cutting Height, page 43
Header float	3.12.2 Header Float, page 48
Header angle	3.12.3 Header Angle, page 48
Reel speed	3.12.4 Reel Speed, page 49
Ground speed	3.12.5 Ground Speed, page 50
Reel height	3.12.8 Reel Height, page 54
Reel fore-aft position	3.12.9 Reel Fore-Aft Position, page 55
Reel tine pitch	3.12.10 Reel Tine Pitch, page 63
Crop divider rods	3.12.12 Crop Divider Rods, page 73

3.12.1 Cutting Height

The D Series Draper Headers are capable of cutting the crop to a desired stubble height or cutting as close as possible to the ground. Cutting height will vary depending on the type of crop, crop conditions, etc.

Cutting off Ground

When cutting off the ground, height is controlled using a combination of header lift cylinder adjustment and a stabilizer wheel system (or stabilizer/slow speed transport wheel system).

The stabilizer wheel system in both options is designed to minimize bouncing at the header ends and float the header to achieve an even cutting height when cutting above ground level in cereal crops. The system produces even stubble height and greatly reduces operator fatigue.

The stabilizer wheel system (or stabilizer/slow speed transport wheel system) is available only for 9.1–12.2 m (30–40 ft.) headers.

Adjusting Stabilizer/Slow Speed Transport Wheels

A properly adjusted header will achieve a balance between the amount of header weight carried by the float springs and the amount carried by the stabilizer/slow speed transport wheels.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Raise the header so the stabilizer wheels are off the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Check that the float is working properly. Refer to your windrower operator's manual for instructions.

OPERATION

4. Remove hairpin (A) from the latch on the right wheel assembly.
5. Disengage latch (B), lift the wheel out of the hook, and place the wheel on the ground as shown.

NOTE:

This reduces the weight of the assembly and makes adjusting the wheel position easier.

6. Lift the left wheel slightly to support the weight, and pull handle (C) upwards to release the lock.
7. Lift the left wheel to the desired height and engage the support channel in slot (D) in the upper support.
8. Push down on handle (C) to lock it.
9. Lift the right wheel back into field position and ensure latch (B) is engaged.
10. Secure the latch with hairpin (A).
11. Support the wheel weight by lifting it slightly with one hand, and pull up on handle (A) to release the lock.
12. Lift the wheels to the desired height, and engage the support channel into slot (B) in the upper support.
13. Push down on handle (A) to lock it.

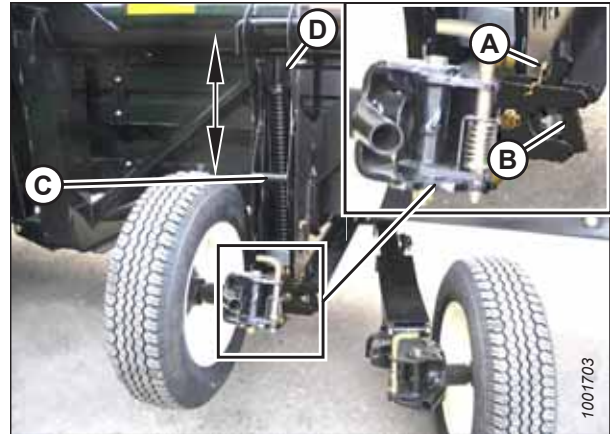


Figure 3.20: Right Wheel

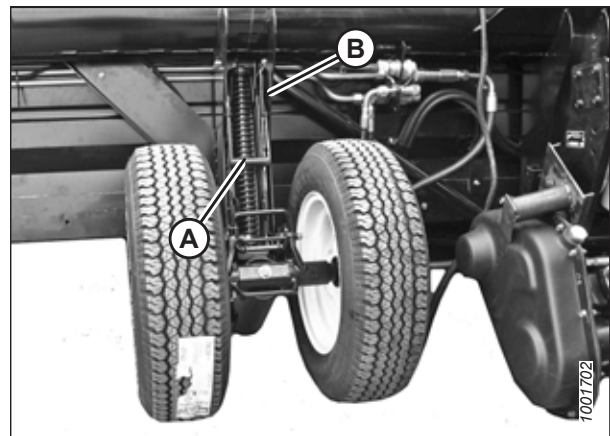


Figure 3.21: Left Wheel

14. Lower the header to the desired cutting height using the windrower controls and then check load indicator (A).

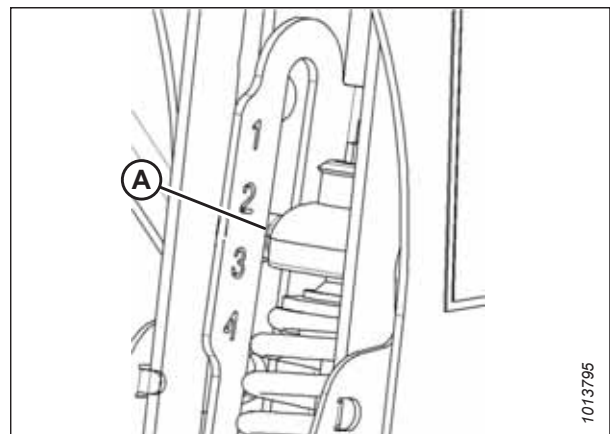


Figure 3.22: Load Indicator

OPERATION

IMPORTANT:

Continuous operation with excessive spring compression (that is, the load indicator reading greater than 4 or compressed length [A] less than 295 mm [11 5/8 in.]) can result in damage to the suspension system.

15. Adjust the header angle to the desired working angle with the machine's header angle controls. If header angle is not critical, set it to mid-position.
16. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

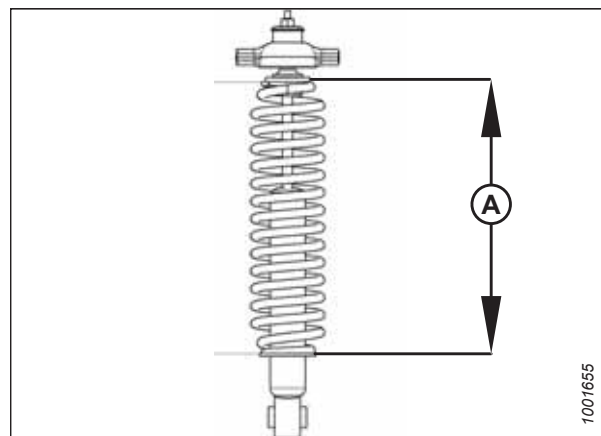


Figure 3.23: Spring Compression

Adjusting Stabilizer Wheels

A properly adjusted header will achieve a balance between the amount of header weight carried by the float and the amount carried by the stabilizer wheels.

IMPORTANT:

Do **NOT** use the stabilizer wheel system for header height control on headers from model year 2006 or earlier. Doing so would damage the wheel suspension system.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.



CAUTION

The handle may be under tension—especially when the wheels are on the ground. Raise the header until the wheels are off the ground before making adjustments.

1. Raise the header until the stabilizer wheels are off the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Check that the float is working properly. Refer to for instructions.
4. Support the wheel weight by lifting slightly with one hand on handle (B), and pull up on handle (A) to release the lock.
5. Lift the wheel using handle (B), and engage the support channel into center slot (C) in the upper support.
6. Push handle (A) down to lock.

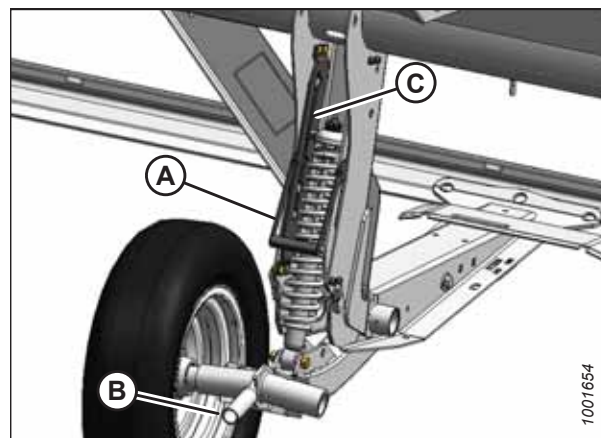


Figure 3.24: Stabilizer Wheel

OPERATION

- Lower the header to the desired cutting height and check load indicator (A).

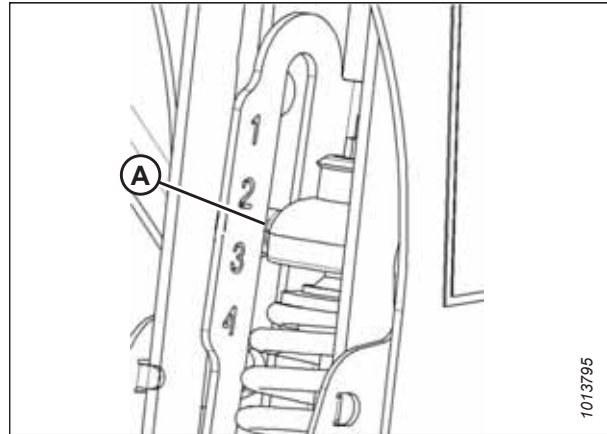


Figure 3.25: Load Indicator

IMPORTANT:

Continuous operation with excessive spring compression (that is, load indicator reading greater than 4 or a compressed length (A) less than 295 mm [11 5/8 in.]) can result in damage to the suspension system.

- Adjust the header angle to the desired working angle with the windrower's header angle controls. If header angle is not critical, set it to mid-position.
- Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

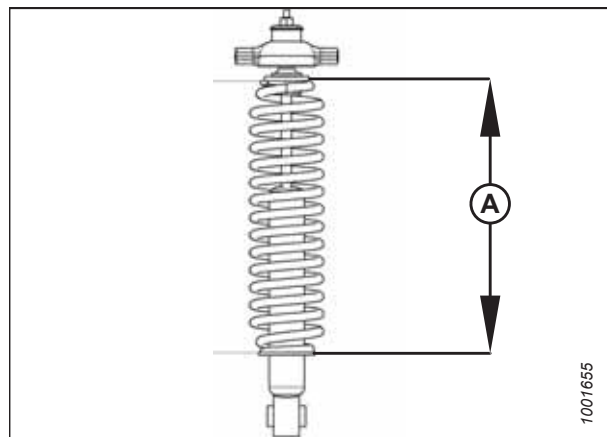


Figure 3.26: Spring Compression

Cutting on Ground

Cutting on the ground is performed with the header fully lowered and the cutterbar on the ground. The orientation of the knife and knife guards relative to the ground (header angle) is determined by the skid shoes and the center-link—it is **NOT** determined by the header lift cylinders. The skid shoes and center-link allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

Lowering the skid shoes or decreasing the header angle increases the cutting height. This may be desirable in stony conditions to reduce damage to cutting components. Also, a longer stubble length helps material dry faster. Raising the skid shoes and increasing the header angle allows the crop to be “shaved”.

Refer to the following for additional information about the adjustments used to optimize cutting on the ground:

- [Adjusting Inner Skid Shoes, page 47](#)
- [Adjusting Outer Skid Shoes, page 47](#)
- [3.12.3 Header Angle, page 48](#)
- [3.12.2 Header Float, page 48](#)

Adjusting Inner Skid Shoes

Skid shoes are used to determine stubble height when cutting on the ground.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the windrower operator's manual.
4. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). For instructions, refer to [Adjusting Stabilizer/Slow Speed Transport Wheels, page 43](#).
5. Remove lynch pin (A).
6. Hold shoe (B) and remove pin (C) by disengaging it from the frame and pulling it away from the shoe.
7. Raise or lower skid shoe (B) to achieve the desired position; use the holes in support (D) as a guide.
8. Install pin (C), engage the pin in the frame, and secure it with lynch pin (A).
9. Repeat Step 5, page 47 to Step 8, page 47 for all inner skid shoes and ensure that all skid shoes are equally adjusted.
10. Adjust the header angle to the desired working position using the machine's header angle controls. If the header angle is not critical, set it to the mid-position.
11. Check the header float as described in your windrower operator's manual.

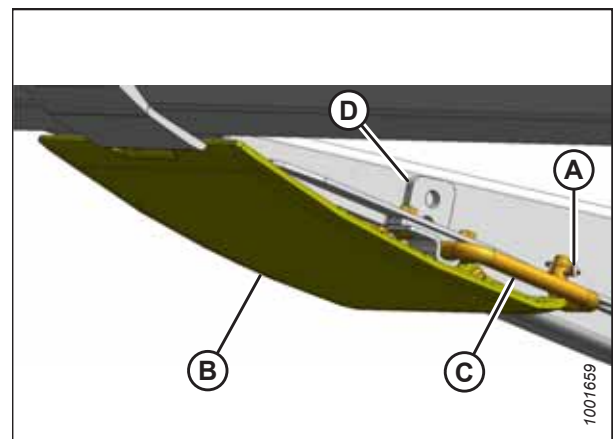


Figure 3.27: Inner Skid Shoe

Adjusting Outer Skid Shoes

Skid shoes affect stubble height when cutting on the ground.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the windrower operator's manual.
4. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). For instructions, refer to [Adjusting Stabilizer/Slow Speed Transport Wheels, page 43](#).
5. Remove lynch pin (A) from pin (C) on skid shoe (B).

Figure 3.28: Outer Skid Shoe

OPERATION

6. Hold shoe (B) and remove adjustment pin (C) by disengaging it from the frame and pulling it away from the shoe.
7. Raise or lower skid shoe (B) to achieve the desired position; use the holes in the support as a guide.
8. Reinstall pin (C), engage it in the frame, and secure it with lynch pin (A).
9. Ensure that all skid shoes are equally adjusted.
10. Check the header float as described in your windrower operator's manual.

3.12.2 Header Float

D Series Draper Headers are designed to ride on the skid shoes when cutting on the ground. The windrower float system reduces the ground pressure so that the header floats over obstacles and follows ground contours instead of being supported by the windrower lift cylinders.

Refer to your windrower operator's manual for details about header float adjustments.

3.12.3 Header Angle

Header angle can be adjusted to accommodate different crop conditions and/or soil types.

The header angle (A) controls the distance between the draper and ground (B) and is a critical component for effective cutting on the ground. The header angle is similar to guard angle (C), which is the angle between the upper surface of the guards and ground (B).

Flatter header angles are recommended for normal crop conditions and for stony ground because it minimizes knife section breakage, and reduces soil scooping or build-up at the cutterbar in wet conditions.

Steeper angles are recommended in downed crops for better lifting action, or for cutting close to the ground in hay for example. Refer to [3.12.10 Reel Tine Pitch, page 63](#) and [3.12.9 Reel Fore-Aft Position, page 55](#) for adjustment details.

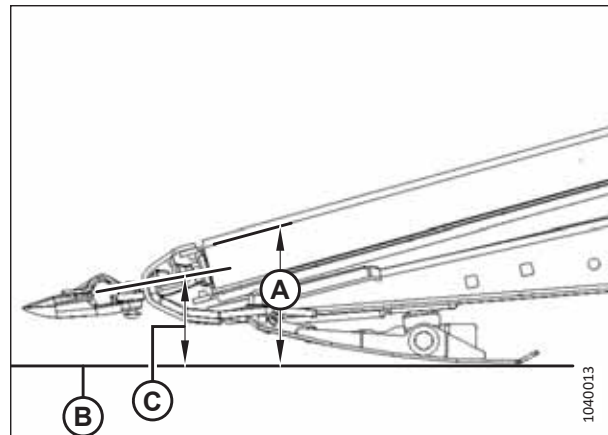


Figure 3.29: Shortest Center-Link

OPERATION

Header angle also affects the type of windrow that is laid. Refer to [3.14 Windrow Types, page 80](#). Choose an angle that maximizes performance for your crop and field conditions.

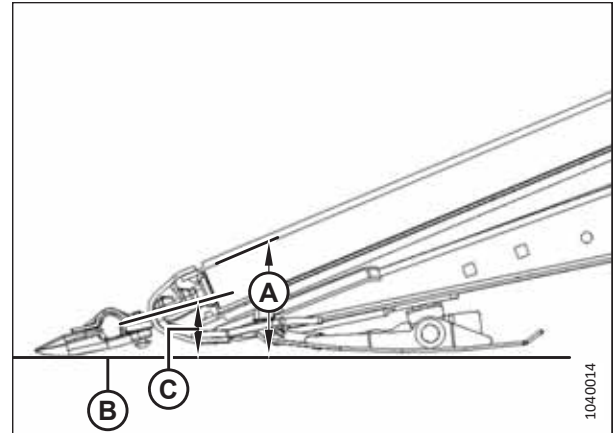


Figure 3.30: Longest Center-Link

This table summarizes the adjustment range.

Table 3.4 Header Angle Adjustment Range

Header Width	Draper Angle	Guard Angle
4.6 m (15 ft.)	N/A	N/A
6.1 m (20 ft.)	13.0–18.4°	7.0–12.4°
7.6 m (25 ft.)	13.0–18.4°	7.0–12.4°
9.1 m (30 ft.)	13.0–18.4°	2.0–7.4°
10.7 m (35 ft.)	13.0–18.4°	2.0–7.4°
13.7 m (40 ft.)	13.0–18.4°	2.0–7.4°

Controlling Header Angle

Header angle varies by adjusting the length of the top center-link (mechanical or hydraulic) between the windrower and the header.

Refer to your windrower operator's manual for adjustment details.

3.12.4 Reel Speed

Reel speed affects feeding of crop into the knife and onto the drapers, as well as the smoothness and evenness of the delivered crop.

Operating the reel too fast or too slow relative to ground speed will cause bunching. At the proper speed, the reel discs should appear to be being driven by the ground.

- If they look like they are skidding relative to ground, the reel is turning too slow.
- If they look like they are spinning excessively relative to the ground, reel speed may be too fast.

In standing crop, reel speed should be just faster than or equal to ground speed, sweeping crop across the knife.

Flattened crop or a crop that is leaning away from the cutterbar requires a higher reel speed in relation to ground speed. This can be achieved by increasing reel speed, decreasing ground speed, or both.

Excessive shattering of grain heads or crop loss over the header backtube may be indications that reel speed is too fast. Excessive reel speed causes undue wear of reel components and unnecessary load on reel drive, resulting in uneven reel motion.

Generally, a 9-bat reels can effectively operate at lower reel speed, while minimizing crop loss in shatter prone crops.

OPERATION

The reel speed is adjustable with the controls in the windrower cab. Refer to your windrower operator's manual for adjustment details.

Optional Reel Drive Sprockets – D60

Optional reel drive sprockets for use in special crop conditions are available as an alternative to the factory-installed sprocket.

For installation details, refer to [Replacing Reel Drive Sprocket, page 215](#).

3.12.5 Ground Speed

Operating at the proper ground speed will result in cleanly cut crops and evenly distributed material in uniform windrows.

Refer to [3.14 Windrow Types, page 80](#) for effects of ground speed on windrow formation.

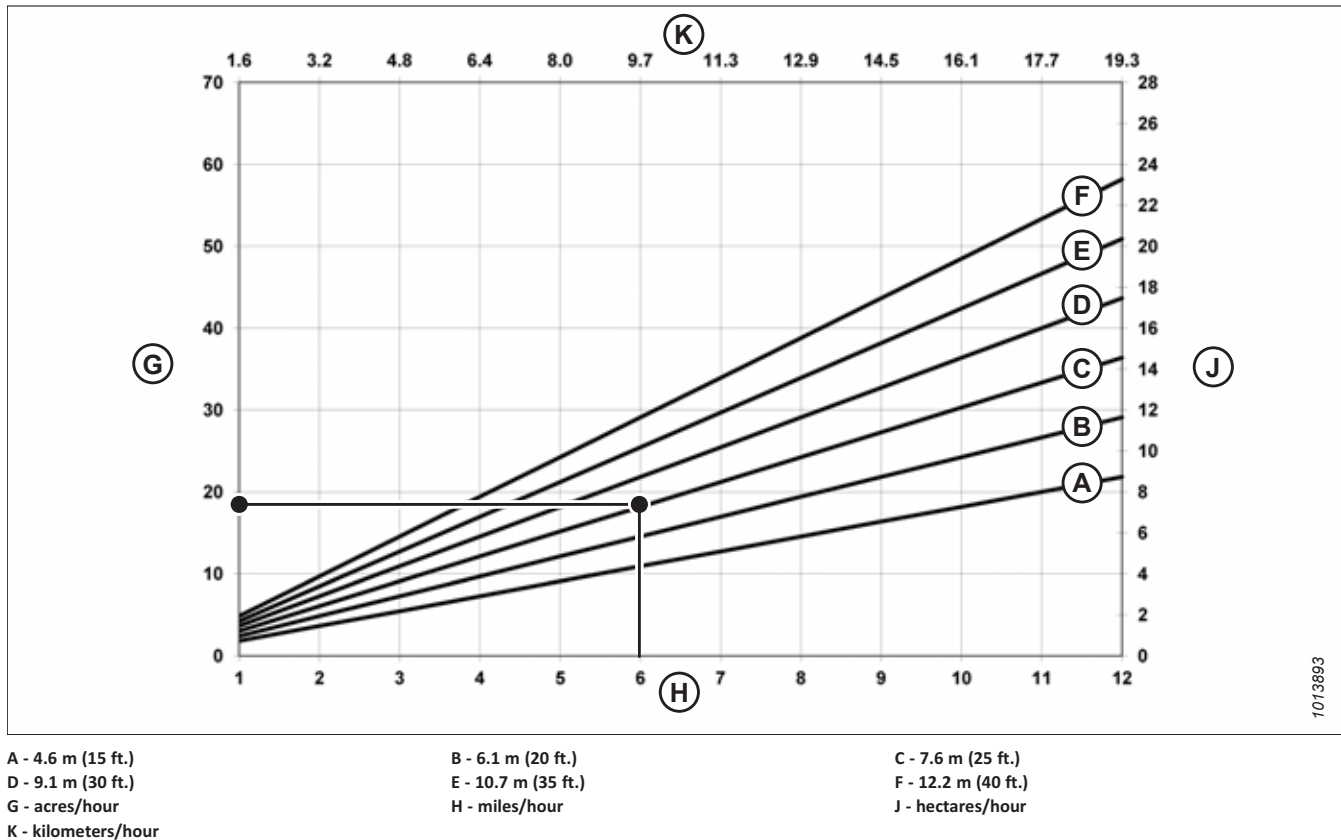
Reduce ground speed in difficult cutting conditions to reduce loads on cutting components and drives.

Use lower ground speeds in very light crops (e.g., short soybeans) to allow the reel to pull in short plants. Start at 4.8–5.8 km/h (3.0–3.5 mph) and adjust as required.

Higher ground speeds may require heavier float settings to prevent excessive bouncing which causes uneven cutting and possible damage to cutting components. If ground speed is increased, draper and reel speeds should be increased to handle the extra material.

Figure 3.31, [page 50](#) illustrates the relationship between ground speed and area cut for the various sized headers.

Figure 3.31: Ground Speed vs Acres



Example: A 7.6 m (25 ft.) header operating at a ground speed of 9.7 km/h (6 mph) would produce a cut area of approximately 7.3 hectares (18 acres) in one hour.

3.12.6 Draper Speed

Correct draper speed is important for achieving a good flow of cut crop away from the cutterbar.

The draper speed is controlled with the windrower cab display module (CDM). Refer to your windrower operator's manual for instructions.

Adjust draper speed to optimize crop feeding for a well formed windrow. Excessive draper speed will reduce draper life.

3.12.7 Knife Speed

The header knife drive is driven by the windrower hydraulic pump and is controlled with the windrower cab display module (CDM). The default speed is 1200 strokes per minute (spm).

Refer to your windrower operator's manual for more information.

Table 3.5 Knife Speed Guidelines

Header Size	Recommended Knife Speed Range (spm)	
	Single Knife	Double Knife
4.6 m (15 ft.)	—	1500–1900
6.1 and 7.6 m (20 and 25 ft.)	1200–1400	1400–1700
9.1 m (30 ft.)	1200–1400	1200–1600
10.7 m (35 ft.)	1100–1300	1200–1400
12.2 m (40 ft.)	1050–1200	1100–1400

Knife Speed Recommendations

Refer to the following charts for guidelines on the recommended knife speeds for particular crops. Separate charts are provided for single- and double-knife headers of different sizes.

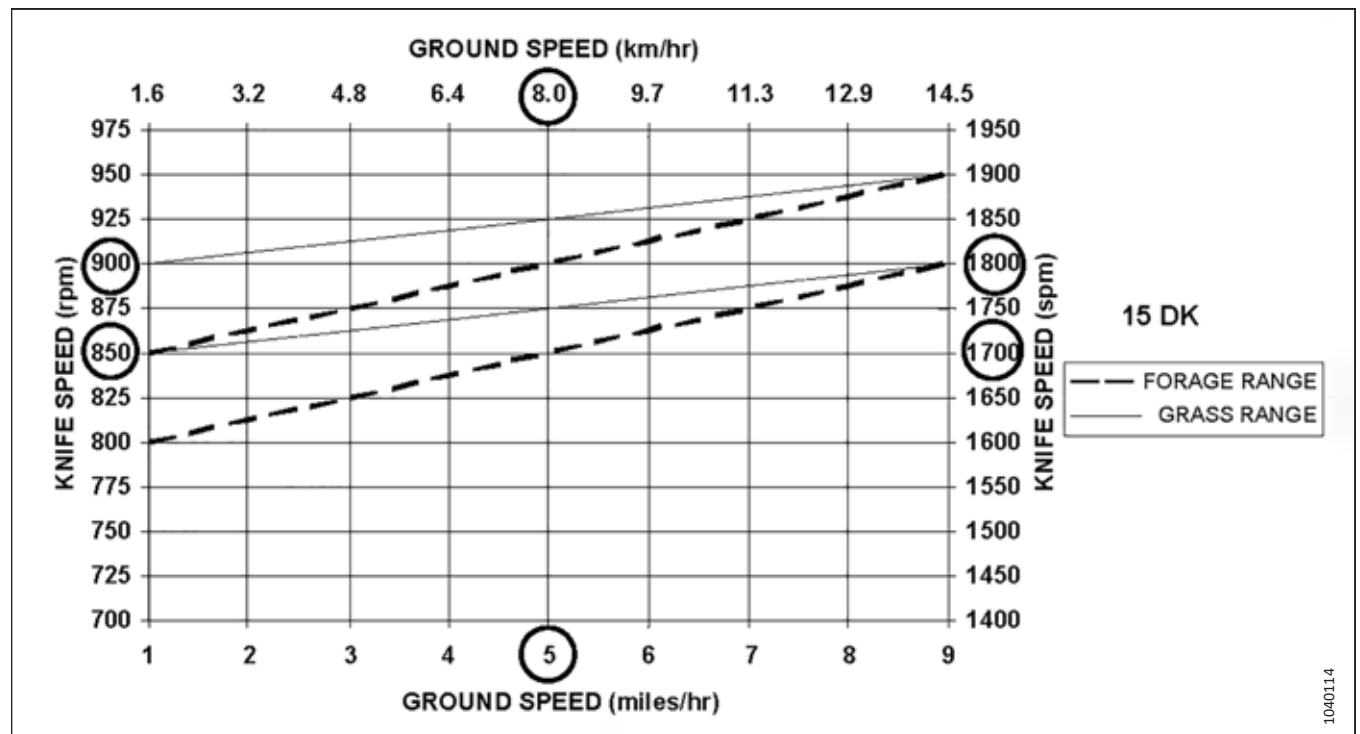


Figure 3.32: 4.6 m (15 ft.) Double-Knife Headers

Example: Cutting forage at 8.0 km/hr (5.0 mph), use a knife speed between 850 and 900 rpm (1700 and 1800 spm).

OPERATION

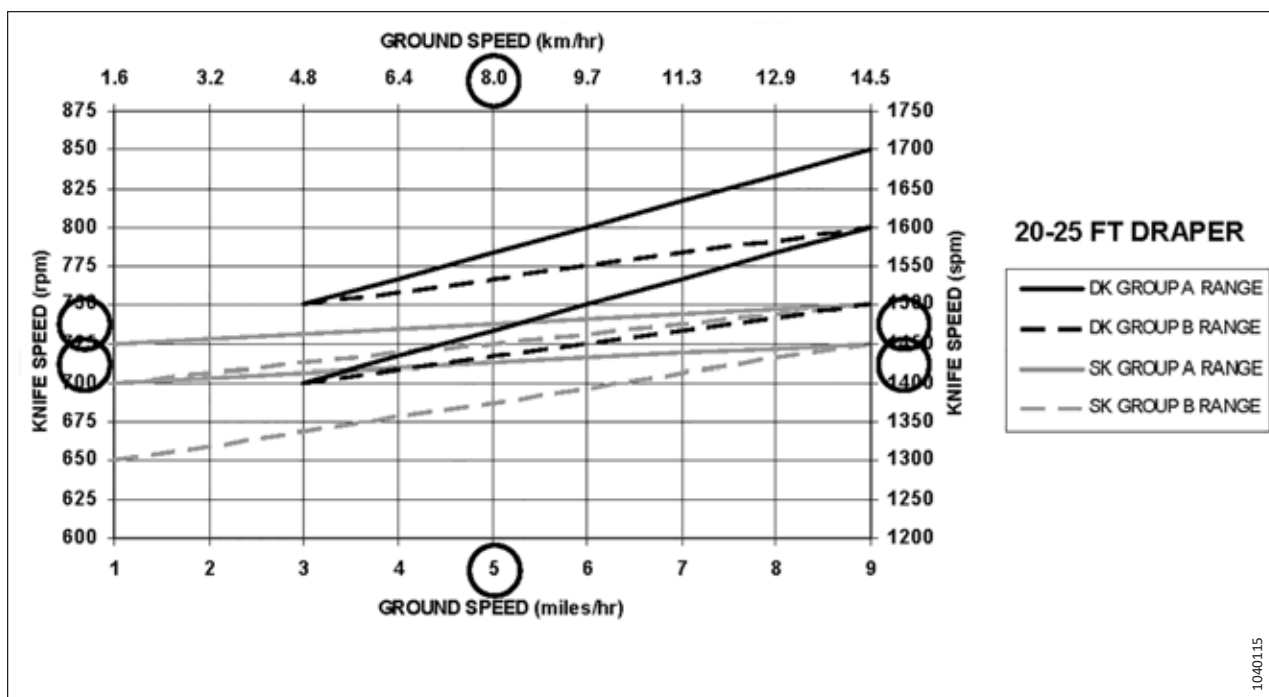


Figure 3.33: 6.1 and 7.6 m (20 and 25 ft.) Single- and Double-Knife Headers

Group A - Forage, alfalfa, and flax

Group B - Canola, cereals, and edible beans

Example: Cutting Group A crops at 8.0 km/hr (5.0 mph) with a single-knife header, use a knife speed between 710 and 735 rpm (1420 and 1470 spm).

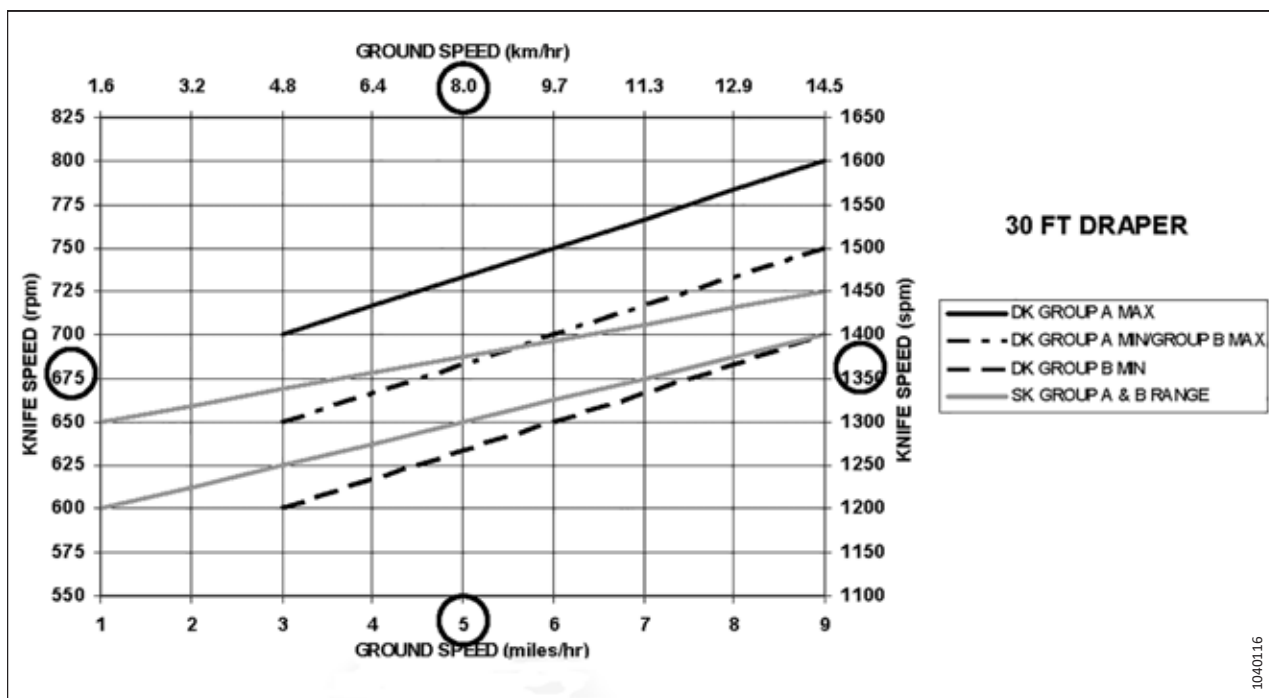


Figure 3.34: 9.1 m (30 ft.) Single- and Double-Knife Headers

Group A - Forage, alfalfa, and flax

Group B - Canola, cereals, and edible beans

Example: Cutting Group A or B crops at 8.0 km/hr (5.0 mph) with a double-knife header, use a knife speed of approximately 680 rpm (1360 spm).

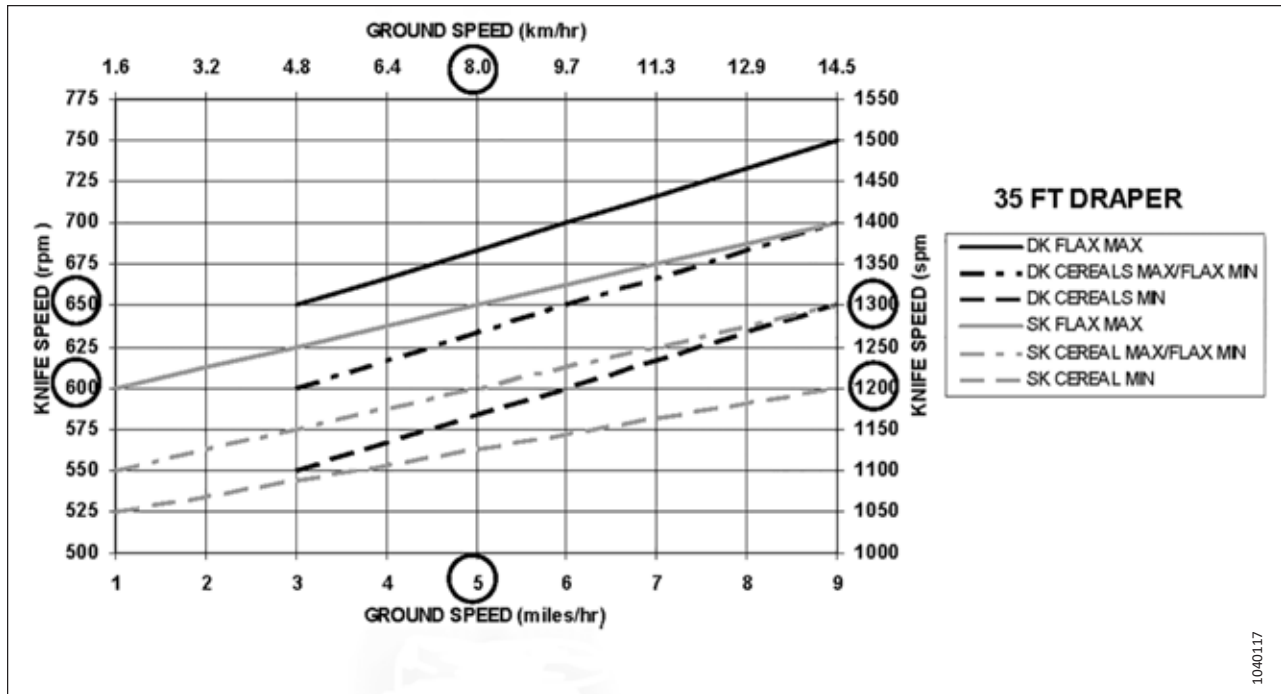


Figure 3.35: 10.7 m (35 ft.) Single- and Double-Knife Headers

Example: Cutting flax at 8.0 km/hr (5.0 mph) with a single-knife header, use a knife speed between 600 and 650 rpm (1200 and 1300 spm).

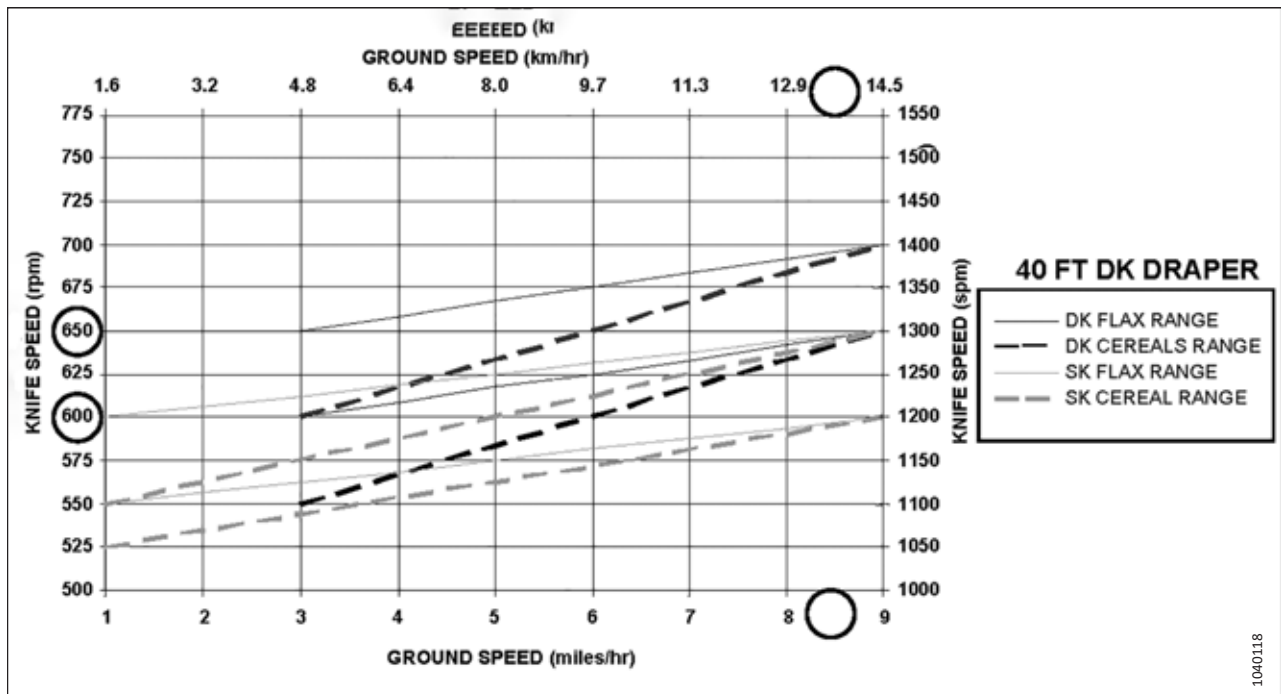


Figure 3.36: 12.2 m (40 ft.) Single- and Double-Knife Headers

Example: Cutting flax at 13.7 km/hr (8.5 mph) with a single-knife header, use a knife speed between 595 and 645 rpm (1190 and 1290 spm).

NOTE:

This is close to the maximum knife speed for a 12.2 m (40 ft.) single-knife header, which may result in ragged cutting. Double-knife headers allow higher knife speeds and clean cutting.

3.12.8 Reel Height

The crop type and condition determines the operating height of the reel.

Set the reel height to carry material past the knife and onto the drapers with minimal disturbance and damage to the cut crop. For instructions, refer to [3.12.9 Reel Fore-Aft Position, page 55](#).

The reel height is controlled using switches in the windrower cab.

Table 3.6 Reel Height

Crop Condition	Reel Position
Lodged rice	Lowered (also change reel speed and/or cam setting)
Bushy or heavy standing (all)	Raised

The following conditions might result if the reel is set too low:

- Crop loss over the header backtube
- Crop disturbance on the drapers caused by the reel fingers
- Crop being pushed down by the tine tubes

The following conditions might result if the reel is set too high:

- Cutterbar plugging
- Crop lodging and being left uncut
- Grain stalks dropping ahead of cutterbar

Refer to [3.11 Header Setup, page 39](#) for recommended reel height in specific crops and crop conditions.

IMPORTANT:

Maintain reel clearance to prevent fingers contacting the knife or the ground. For instructions, refer to [4.10.1 Reel Clearance to Cutterbar, page 197](#).

3.12.9 Reel Fore-Aft Position

Reel fore-aft position is a critical factor for achieving the best results in adverse conditions. The reel position is factory-set for an average, straight standing crop, but it can be adjusted forwards or backwards as required using the controls inside the cab.

Decal (A) is attached to the right reel support arm for identifying reel position. The aft edge of the cam disc (B) is the reel fore-aft position marker.

For straight standing crop, center the reel over the cutterbar (4–5 on the decal).

For crops that are down, tangled, or leaning, it may be necessary to move the reel ahead of the cutterbar (lower number on decal).

IMPORTANT:

Be vigilant and maintain adequate clearance to prevent the reel from contacting the roof of the windrower, which is possible under certain conditions.

IMPORTANT:

Operating with reel too far forward can cause the fingers to contact the ground before the cutterbar. Lower the skid shoes or adjust the header angle as required when operating with the reel in this position. Otherwise, damage to the fingers will occur.

IMPORTANT:

Adjust to a steeper header angle if experiencing difficulty picking up flattened crop. Refer to for adjustment instructions. Adjust reel position only if header angle adjustments are not satisfactory.

Refer to for recommended reel positions in specific crops and crop conditions.

NOTE:

In crops that are difficult to pick up such as rice, or severely lodged crops that require full forward positioning of the reel, set the reel tine pitch to provide proper placement of the crop onto the drapers. Refer to [3.12.10 Reel Tine Pitch, page 63](#) for adjustment details.

Adjusting Reel Fore-Aft Position – Mechanical Method

The factory-set reel position suits normal conditions, but the fore-aft position can be mechanically adjusted as required.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Lower or raise the reel so that the support arms are horizontal.
2. Shut down the engine, and remove the key from the ignition.

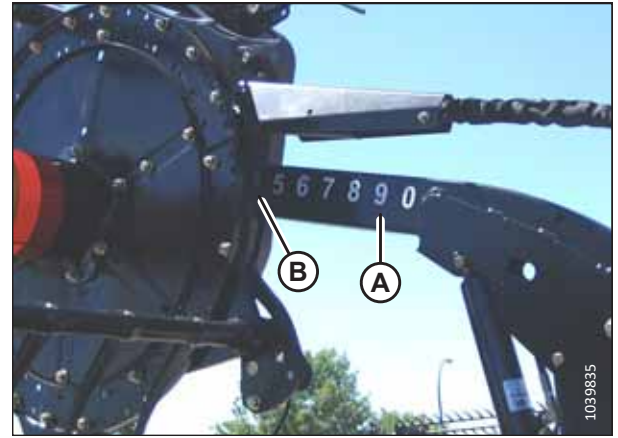


Figure 3.37: Fore-Aft Decal

OPERATION

3. Remove pin (A) from each reel support arm.
4. Using a 15/16 in. wrench on bolt (B), turn the sprocket inside the reel arm to slide the reel to the desired position. If the reel binds on the arms from misalignment, move in smaller increments (two holes at a time).
5. Re-install pin (A). Be sure the same hole is used at each arm.
6. Check that the reel is evenly adjusted.
7. Check the reel clearance to cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
 - [4.10.1 Reel Clearance to Cutterbar, page 197](#)
 - [4.10.2 Reel Frown, page 200](#)

IMPORTANT:

Operating with the reel too far forward can result in the fingers contacting the ground. When operating with the reel in this position, lower the skid shoes or adjust the header angle as required to prevent damaging the fingers.

Adjusting Reel Fore-Aft Position – Hydraulic Method

The factory-set reel position suits normal conditions, but the fore-aft position can be adjusted as required using the controls inside the cab.

1. Select FORE-AFT mode on the selector switch in the cab.
2. Operate the hydraulics to move the reel to the desired position, using decal (A) as a reference.
3. Check the reel clearance to the cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
 - [4.10.1 Reel Clearance to Cutterbar, page 197](#)
 - [4.10.2 Reel Frown, page 200](#)

IMPORTANT:

Operating with the reel too far forward can result in the fingers contacting the ground. When operating with the reel in this position, lower the skid shoes or adjust the header angle as required to prevent damaging the fingers.

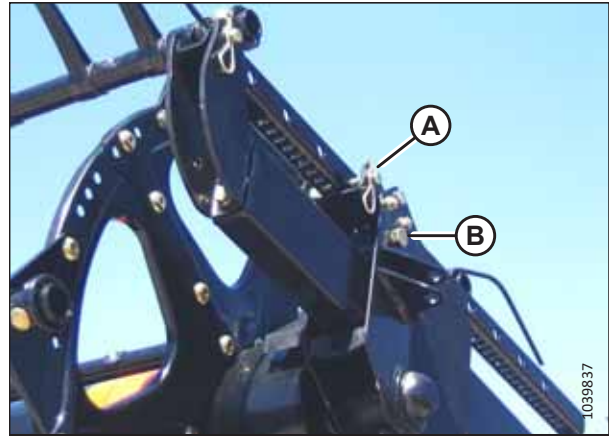


Figure 3.38: Reel Fore-Aft



Figure 3.39: Fore-Aft Decal

Repositioning Fore-Aft Cylinders on Single Reel

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms.



DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

OPERATION

NOTE:

The reel components are not shown in the illustrations in this procedure for the sake of clarity.

1. Position reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.

Repositioning the right reel arm cylinder

3. Remove bolt and nut (A) and four bolts (B) securing hose shield (C).

NOTE:

Only two of bolt (B) are visible in the illustration. The other two are on the other side of the hose shield.

4. Move hose shield (C) and the hoses away from the reel arm cylinder.
5. Remove bolts (D) that secure aft plate (E), and then remove the aft plate.

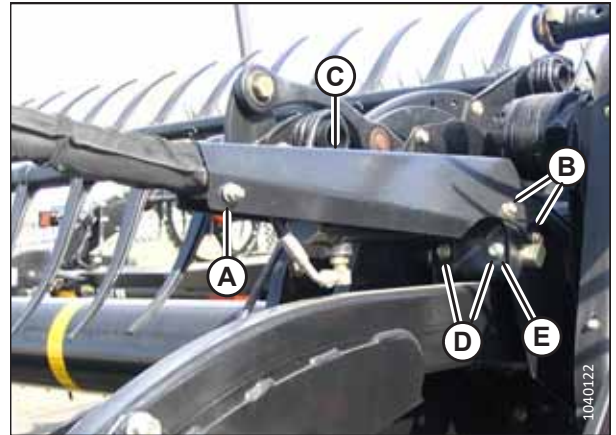


Figure 3.40: Right Reel Arm Cylinder in Forward Position

6. Remove bolts (A) so that front support (B) is free to move up.

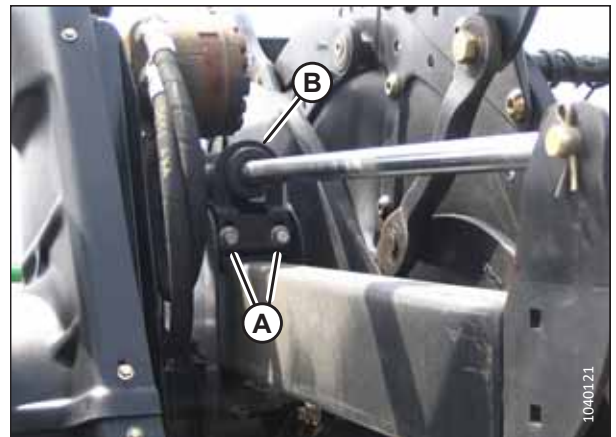


Figure 3.41: Right Reel Arm Cylinder

OPERATION

7. Lift the aft end of the cylinder out of the support assembly, and retract the cylinder so that cylinder center port fitting (A) engages the support assembly.

NOTE:

Loosen a hose fitting to allow movement of the cylinder rod. Be sure to retighten the hose fitting after cylinder installation.

8. Reinstall plates (B) and (C) with previously removed bolts.

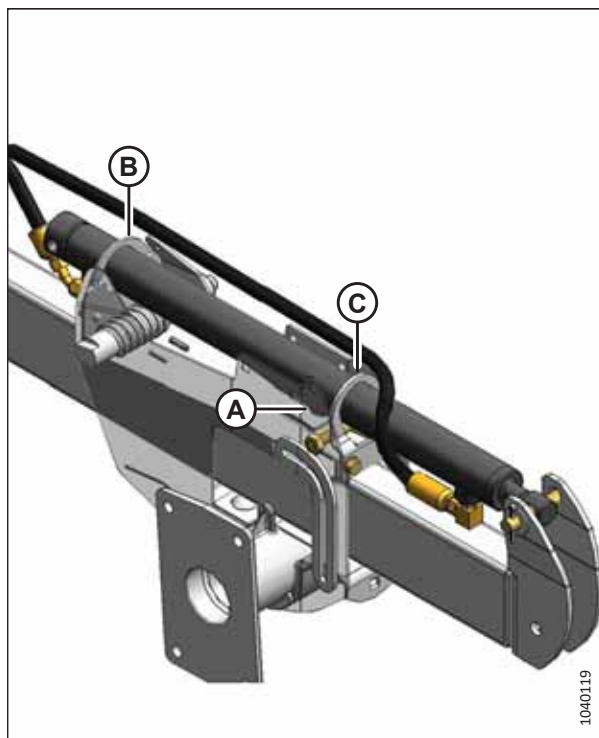


Figure 3.42: Right Reel Arm Cylinder

9. Reposition the hoses and reinstall hose shield (C) with bolts (B).
10. Position the hoses inside hose shield (C), and reinstall bolt and nut (A).

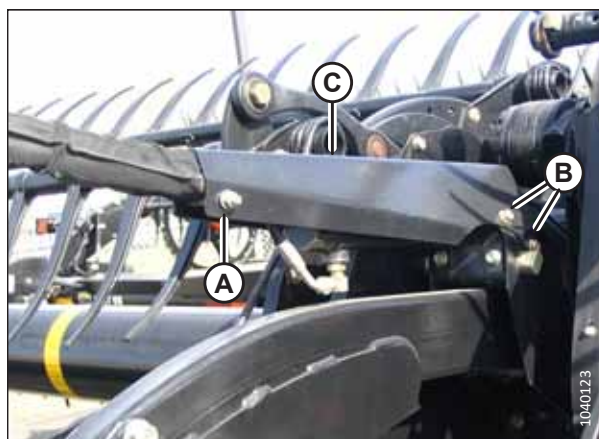


Figure 3.43: Right Reel Arm Cylinder

Repositioning the left reel arm cylinder

11. Loosen fitting (A) to allow it to rotate when the cylinder is repositioned.
12. Remove bolt (B), nut, and spacer (C) that secure the cylinder to the left reel arm.
13. Extend the cylinder so that the mounting hole lines up with new location (D) as shown.

NOTE:

Loosen a hose fitting to allow movement of the cylinder rod. Be sure to retighten the fitting after cylinder installation.

14. Reinstall bolt (B) and nut with spacer (C).
15. Tighten the fitting.
16. Check the reel clearance to the backsheet, upper cross auger (if installed), and reel braces.
17. Adjust the reel tine pitch if necessary. For instructions, refer to [3.12.10 Reel Tine Pitch](#), page 63.

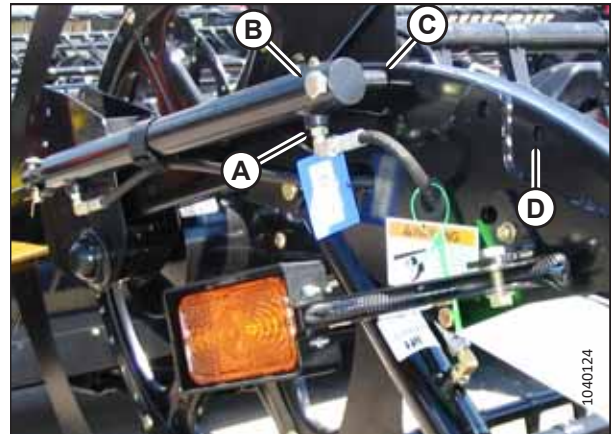


Figure 3.44: Left Reel Arm Cylinder

Repositioning Fore-Aft Cylinders on Double Reel

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms.



DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Position the reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.

Repositioning the center arm cylinder

3. Remove bolt and nut (A) and four bolts (B) securing hose shield (C) on the center reel arm.

NOTE:

Only two of bolt (B) are visible in the illustration. The other two are on the other side of the hose shield.

4. Move hose shield (C) and the hoses away from the reel arm cylinder.
5. Remove bolts (D) that secure aft plate (E), and then remove the aft plate.

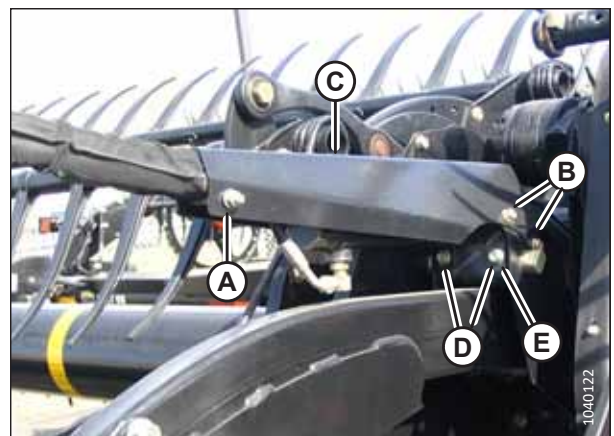


Figure 3.45: C Reel Arm Cylinder in Aft Position

OPERATION

6. Remove bolts (A) so that front support (B) is free to move up.

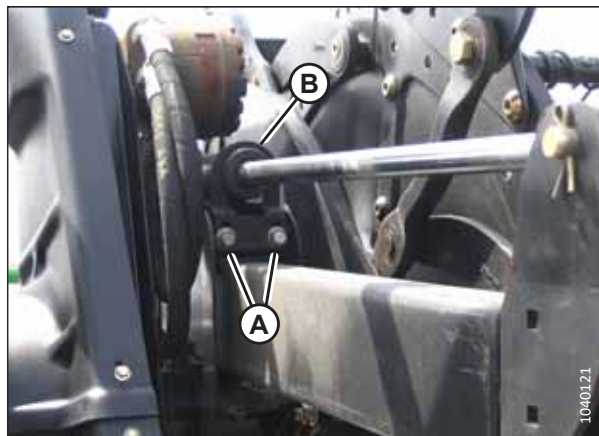


Figure 3.46: Center Reel Arm Cylinder

7. Lift the aft end of the cylinder out of the support assembly, and retract the cylinder so that cylinder center port fitting (A) engages the support assembly.

NOTE:

Loosen a hose fitting to allow movement of the cylinder rod. Be sure to retighten the hose fitting after cylinder installation.

8. Reinstall forward support plate (B) with bolts (C).

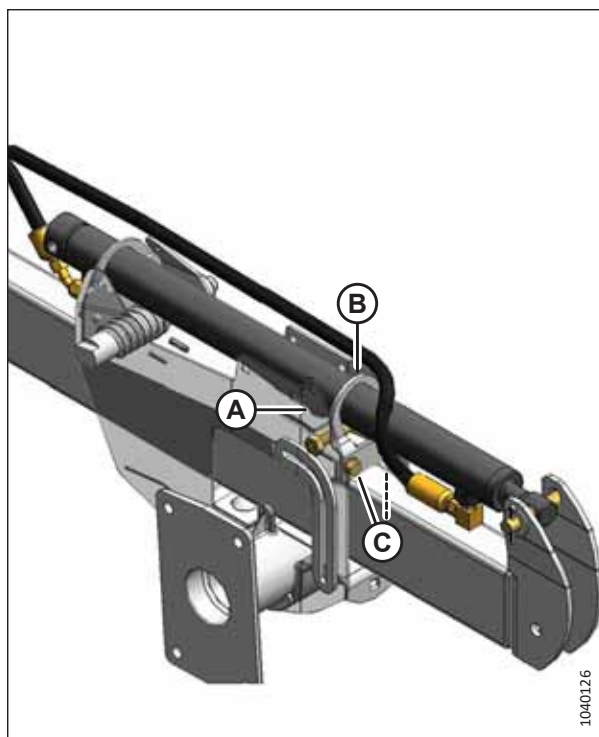


Figure 3.47: Center Reel Arm Cylinder

OPERATION

9. Reposition the hoses and reinstall hose shield (C) with bolts (B).
10. Position the hoses inside hose shield (C), and reinstall bolt and nut (A).
11. Reinstall aft support plate (D) with bolts (E).

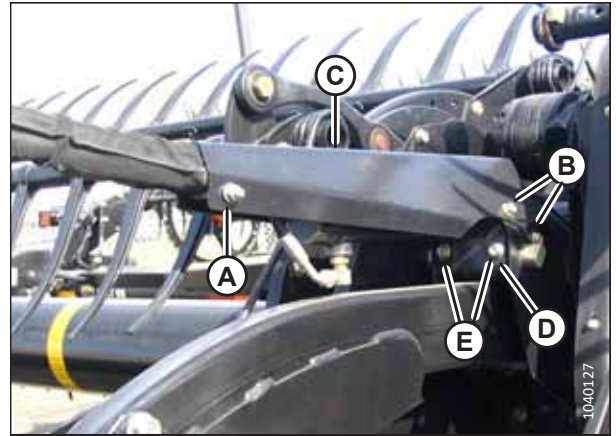


Figure 3.48: Center Reel Arm Cylinder

Repositioning the right arm cylinder

12. Remove bolts (A) that secure aft plate (B), and then remove the aft plate.

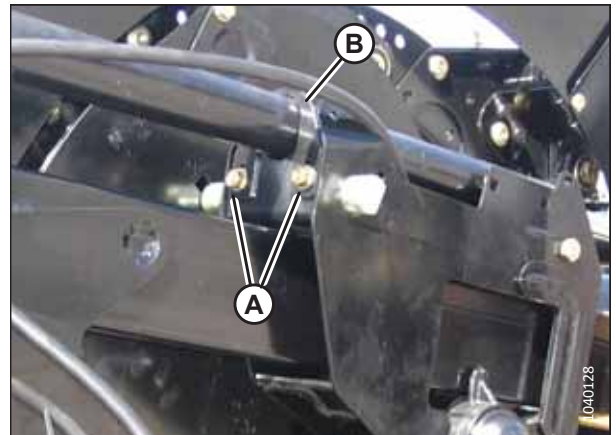


Figure 3.49: Right Reel Arm Cylinder

13. Remove bolts (A) so that front support (B) is free to move up.

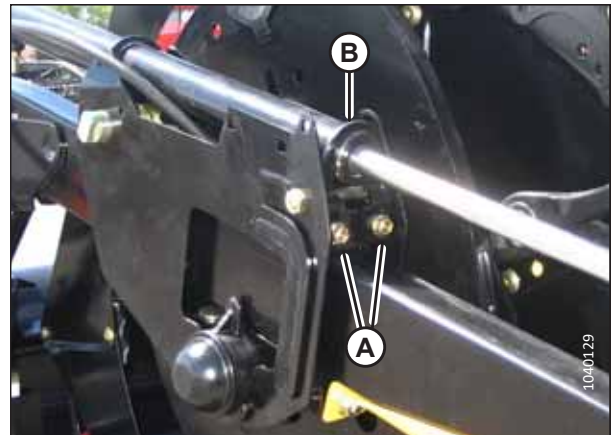


Figure 3.50: Right Reel Arm Cylinder

OPERATION

14. Lift the aft end of the cylinder out of the support assembly, and retract the cylinder so that cylinder center port fitting (A) engages the support assembly.

NOTE:

Loosen a hose fitting to allow movement of the cylinder rod. Be sure to retighten the hose fitting after cylinder installation.

15. Reinstall plates (B) and (C) with previously removed bolts.

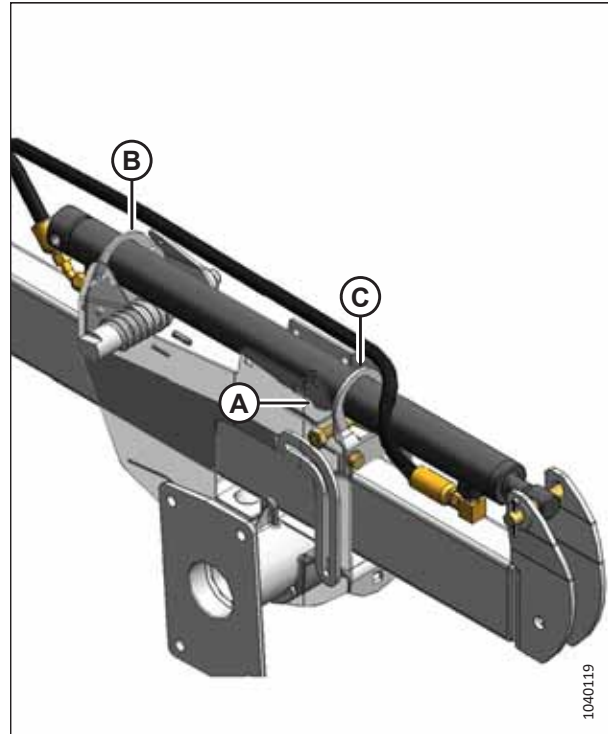


Figure 3.51: Right Reel Arm Cylinder

Repositioning the left reel arm cylinder

16. Loosen fitting (A) to allow it to rotate when the cylinder is repositioned.
17. Remove bolt (B), nut, and spacer (C) that secure the cylinder to the left reel arm.
18. Extend the cylinder so that the mounting hole lines up with new location (D) as shown.

NOTE:

Loosen a hose fitting to allow movement of the cylinder rod. Be sure to retighten the fitting after cylinder installation.

19. Reinstall bolt (B) and nut with spacer (C).
20. Tighten the fitting.
21. Check the reel clearance to the backsheet, upper cross auger (if installed), and reel braces.
22. Adjust the reel tine pitch if necessary. For instructions, refer to [3.12.10 Reel Tine Pitch](#), page 63.

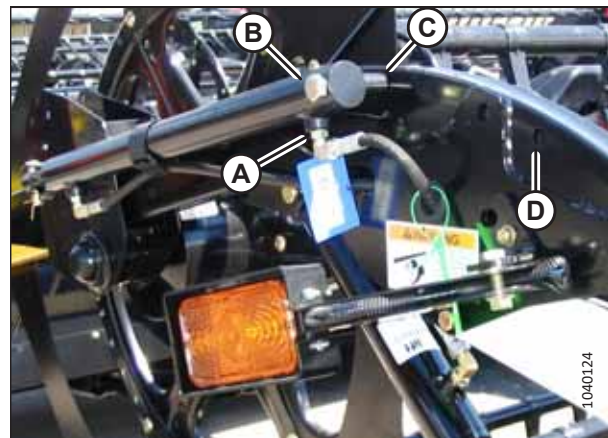


Figure 3.52: Left Reel Arm Cylinder

3.12.10 Reel Tine Pitch

The reel is designed to pick up flattened and severely lodged crops. It is not always necessary to increase the tine pitch (select a higher cam setting) to pick up lodged crops, because the cam setting is mainly used to determine how the crop is delivered onto the drapers.

Finger positioning, relative to the ground (tine pitch), is not significantly affected by the cam setting. For example, with the cam position range at 33°, the corresponding finger pitch range is only 5° at the lowest point of the reel's rotation.

For the best results, use the minimum cam setting that delivers the crop past the rear edge of the cutterbar and onto the drapers.

Reel Cam Settings

The following outlines the function of each cam setting and provides setup guidelines for various crop conditions. The setting numbers are visible above the slots on the cam disc.

If adjustments are necessary, refer to [Adjusting Reel Cam – D60, page 67](#).

Cam Position 1, Reel Position 6 or 7 delivers the most even crop flow onto the drapers without fluffing up or disturbing the material.

- This setting will release crop close to the cutterbar and works best if the cutterbar is on the ground.
- Some crops will not be delivered past the cutterbar when the cutterbar is raised off the ground and the reel is pushed forward; therefore, set the initial reel speed approximately equal to the ground speed.

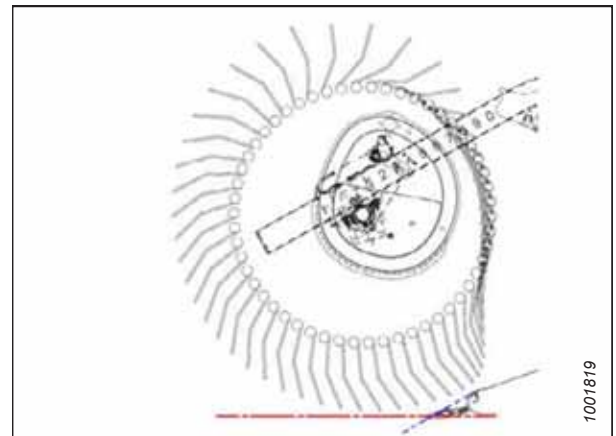


Figure 3.53: Finger Profile – Cam Position 1

Cam Position 2, Reel Position 3 or 4 is the recommended starting position for most crops and conditions.

- If the crop is stalling on the cutterbar when the reel is in the forward position, increase the cam setting to push the crop past the rear edge of the cutterbar.
- If the crop is getting fluffed or if there is a disruption to the flow across the drapers, decrease the cam setting.
- This setting generates a fingertip speed that is approximately 20% faster than the reel speed.

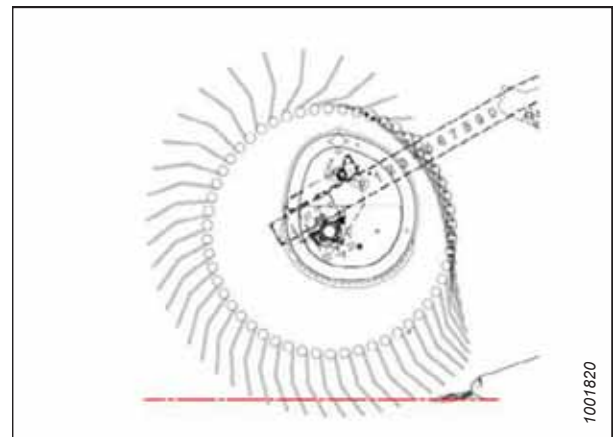


Figure 3.54: Finger Profile – Cam Position 2

OPERATION

Cam Position 3, Reel Position 6 or 7 is mainly used to leave long stubble.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting generates a fingertip speed that is approximately 30% faster than the reel speed.

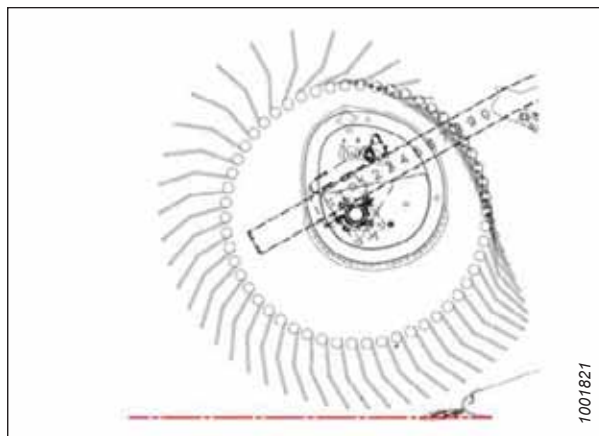


Figure 3.55: Finger Profile – Cam Position 3

Cam Position 4, Reel Position 2 or 3 is used with the reel fully forward to leave the maximum amount of stubble in lodged crops.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting generates a fingertip speed that is approximately 35% faster than the reel speed.

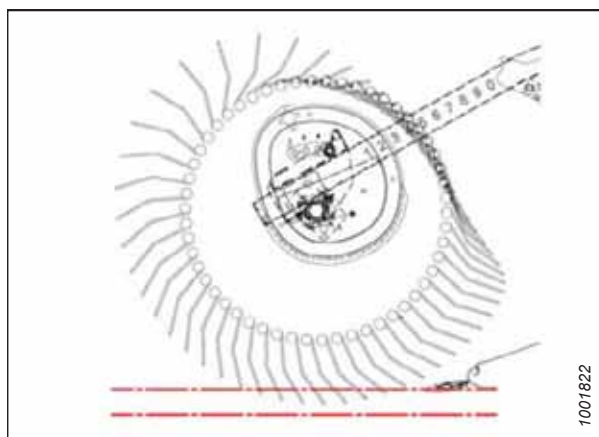


Figure 3.56: Finger Profile – Cam Position 4

Cam Position 4, Header Angle At Maximum, and Reel Fully Forward provides the maximum amount of reel reach below the cutterbar to pick up lodged crops.

- This position leaves a significant amount of stubble when cutting height is set to approximately 203 mm (8 in.). In damp materials such as rice, it's possible to double the ground speed because of the reduction of cut material.
- This setting generates a fingertip speed that is approximately 35% faster than the reel speed.

NOTE:

Higher cam settings with the reel fore-aft position set between 4–5 sharply decreases the draper capacity because the reel disrupts the crop flow across the drapers and the fingers engage the crop that is moving on the drapers. High cam settings are recommended only with the reel at, or close to, full forward settings.

IMPORTANT:

The reel to cutterbar clearance should always be checked following adjustments to reel tine pitch and reel fore-aft position. For instructions, refer to [4.10.1 Reel Clearance to Cutterbar, page 197](#).

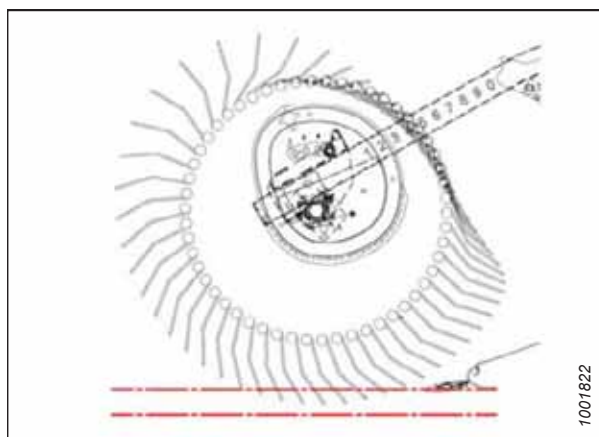


Figure 3.57: Finger Profile – Cam Position 4

Adjusting Reel Cam – D50

The reel is designed to pick up flattened and severely lodged crops. Adjustment may be required as crop conditions change.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Loosen bolt (A) on the clamp securing the cam disc to the reel arm.

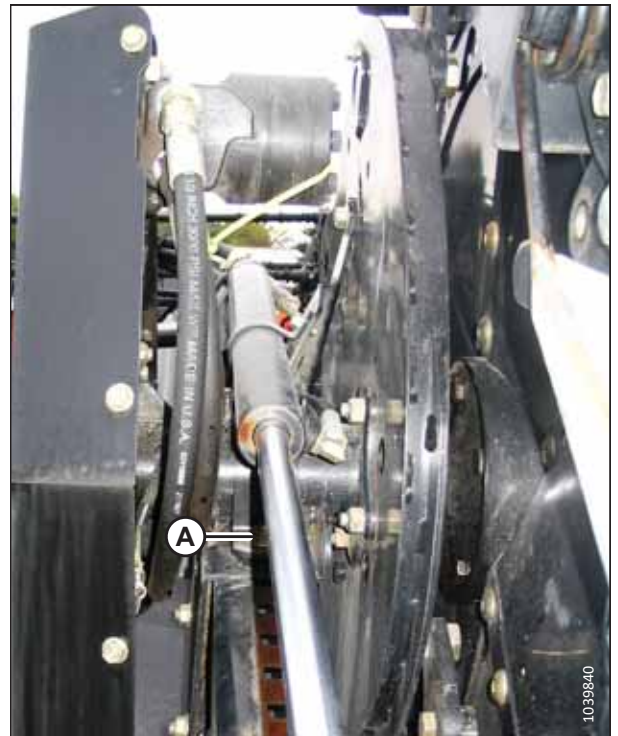


Figure 3.58: Reel Arm – D50

OPERATION

5. Loosen bolt (A) in the cam slot, and rotate the cam clockwise so that the bolt disengages from cam stop (B).
6. Remove bolt (A) from the cam disc.

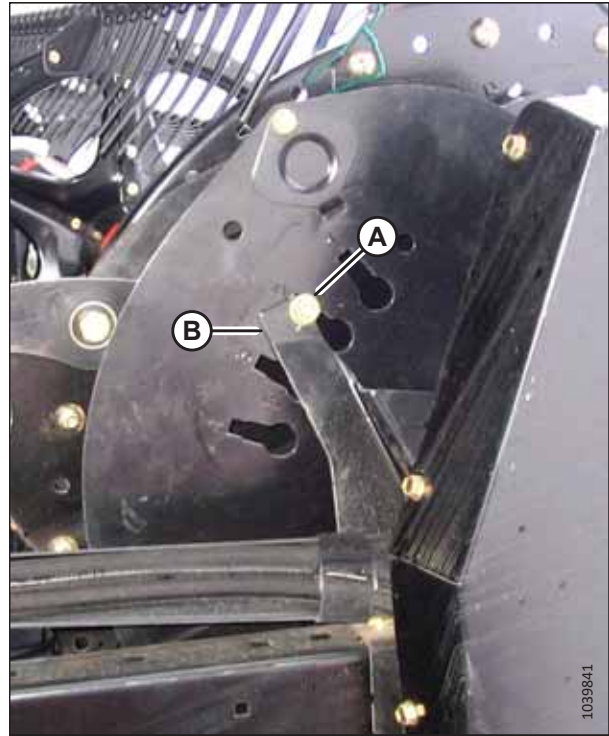


Figure 3.59: Reel Cam – D50

7. Rotate the cam disc to the desired position. Use a wrench on bolt head (A) if necessary.



Figure 3.60: Reel Arm – D50

OPERATION

8. Insert the head of bolt (A) into the numbered slot, and rotate the cam disc so that the bolt engages cam stop (B).
9. Tighten the bolts.

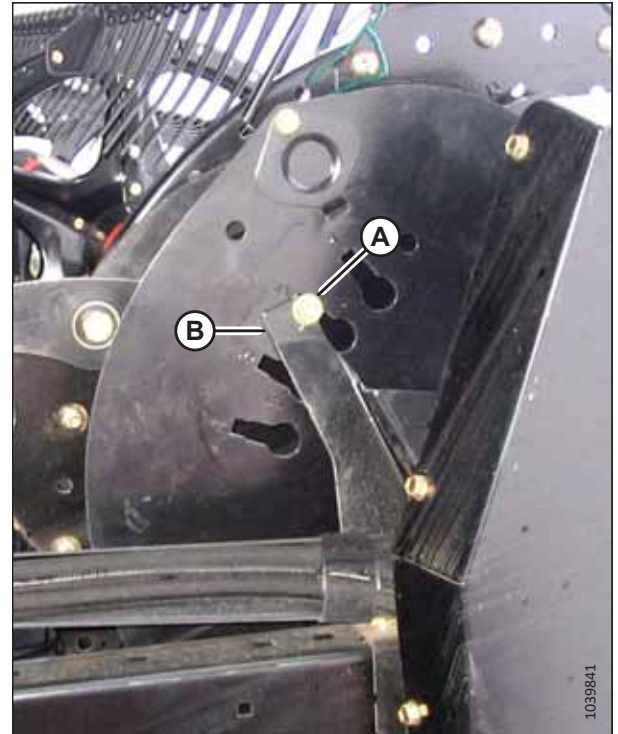


Figure 3.61: Reel Cam – D50

Adjusting Reel Cam – D60

The reel is designed to pick up flattened and severely lodged crops. Adjustment may be required as crop conditions change.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Turn latch pin (A) counterclockwise using a 3/4 in. wrench to release the cam disc.

IMPORTANT:

Turning the pin to the end of the ramp will lock the pin in the disengaged position. Turn the pin clockwise to unlock it, and secure cam position before operating the machine.

5. Use the wrench on bolt (B) to rotate the cam disc and align latch pin (A) with the desired cam disc hole position (C) (1 to 4).

NOTE:

Bolt (B) is positioned through the cam disc (transparent view shown in illustration for improved clarity).

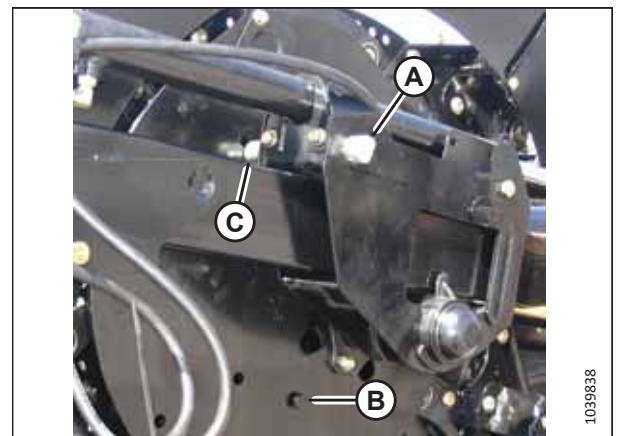


Figure 3.62: Cam Disc Positions

OPERATION

6. Turn latch pin (A) clockwise to engage and lock the cam disc.
7. Repeat Steps 4, [page 67](#) to 6, [page 68](#) for the opposite reel.

IMPORTANT:

Ensure the cam is secured into position before operating the machine.

3.12.11 Crop Dividers

Crop dividers are used to help divide the crop when harvesting. They are removable to allow installation of vertical knives and to decrease transport width.

Removing Crop Dividers with Latch Option from Header – D60

To correctly remove crop dividers with the latch option, follow the recommended removal procedure provided here.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to [4.3 Endshields, page 116](#).
6. Lift safety lever (A).
7. Hold onto crop divider (B), push lever (C) to open the latch, and lower the crop divider.

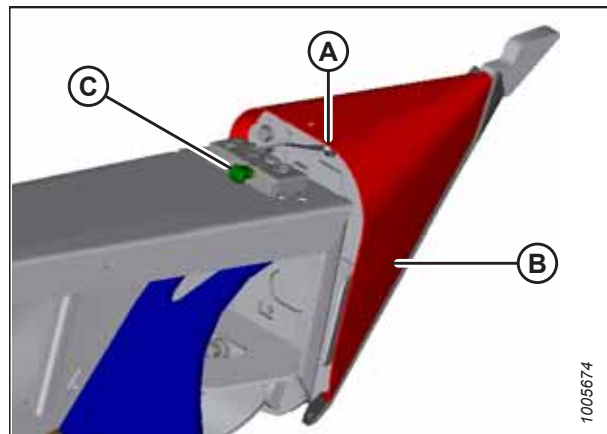


Figure 3.63: Crop Divider

OPERATION

8. Lift the crop divider off the endsheet and store as follows:
 - a. Insert the pin on the crop divider into the hole in the endsheet at location (A) as shown.
 - b. Lift the crop divider and position lugs (B) on the crop divider into the bracket on the endsheet. Ensure the lugs engage the bracket.
9. Close or install the endshields. For instructions, refer to [4.3 Endshields, page 116](#).

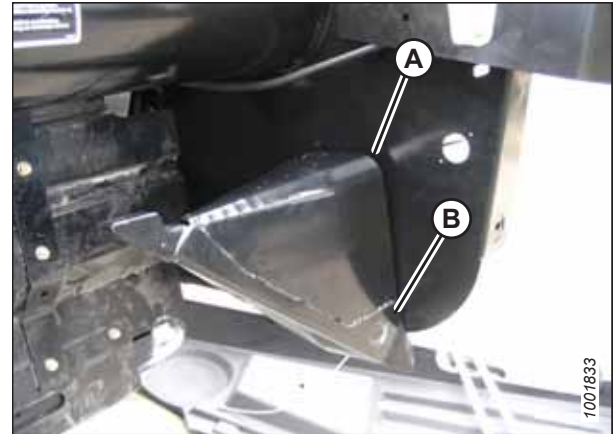


Figure 3.64: Stored Crop Divider

Removing Crop Dividers without Latch Option from Header – D50

To correctly remove crop dividers without the latch option, follow the recommended removal procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to [4.3 Endshields, page 116](#).
6. Remove bolt (A), lock washer, and flat washer.
7. Lower crop divider (B) and then lift the crop divider to remove it from the endsheet.
8. Close or install the endshields. For instructions, refer to [4.3 Endshields, page 116](#).

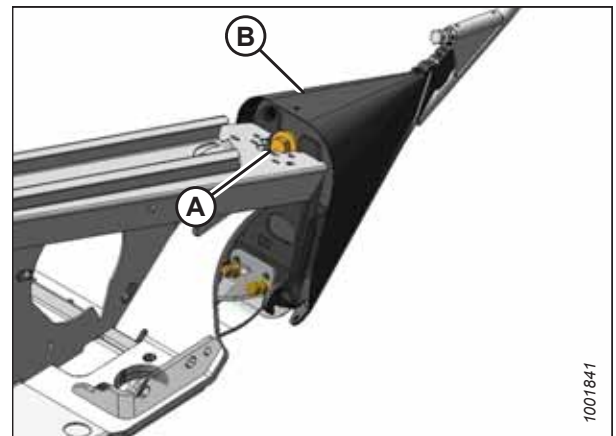


Figure 3.65: Crop Divider

Installing Crop Dividers with Latch Option onto Header – D60

To correctly install crop dividers with the latch option, follow the recommended installation procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to [4.3 Endshields, page 116](#).
6. Remove the crop divider from the storage location by lifting the crop divider to disengage lugs (A) at the lower end and then lowering it slightly to disengage pin (B) from the endsheet.

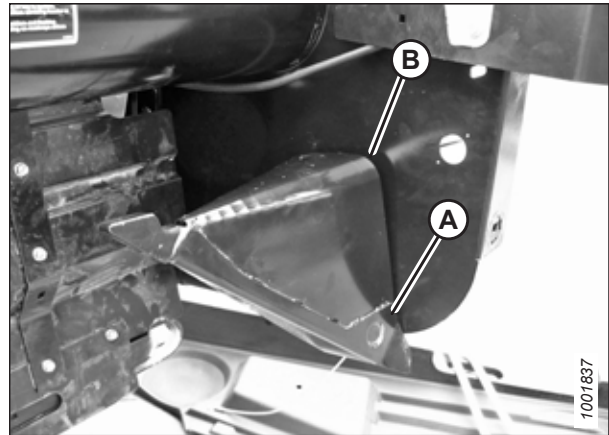


Figure 3.66: Stored Crop Divider

OPERATION

7. Position the crop divider as shown by inserting lugs (A) into the holes in the endsheet.
8. Lift the forward end of the crop divider until pin (B) at the top of the crop divider engages and closes latch (C).
9. Push safety lever (D) downward to lock the pin into latch (C).

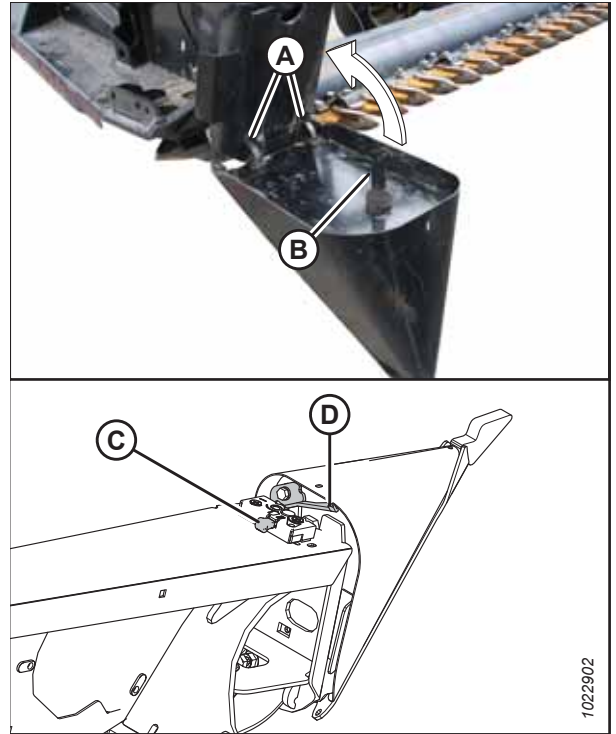


Figure 3.67: Crop Divider

10. Pull at the tip of the crop divider and ensure there is no lateral movement. If necessary, adjust bolts (A) to tighten the crop divider and eliminate lateral movement.
11. Close or install the endshields. For instructions, refer to [4.3 Endshields, page 116](#).

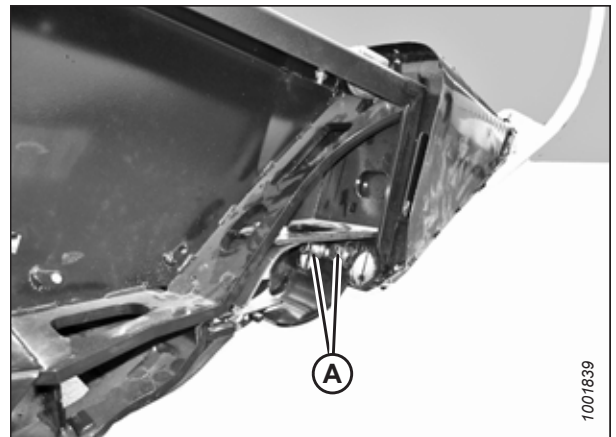


Figure 3.68: Crop Divider

Installing Crop Dividers without Latch Option onto Header – D50

To correctly install crop dividers without the latch option, follow the recommended installation procedure provided here.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower the reel.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.

OPERATION

4. Engage the header safety props. For instructions, refer to your windrower operator's manual.
5. Open or remove the endshields. For instructions, refer to [4.3 Endshields, page 116](#).
6. Remove bolt (A), lock washer, and flat washer from the inside of the endsheet.

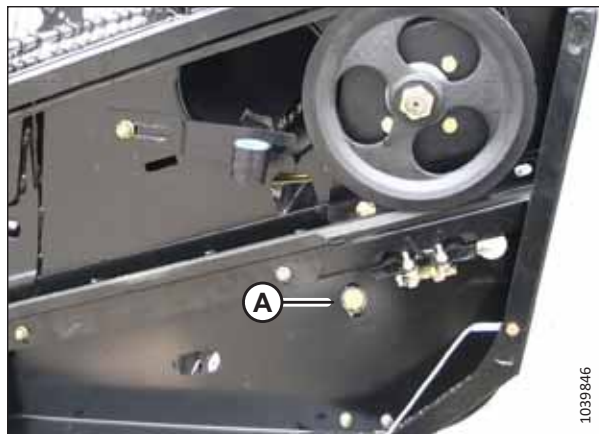


Figure 3.69: Stored Hardware

7. Remove the crop divider from the storage location by lifting the crop divider to disengage lugs (A) at the lower end and then lowering it slightly to disengage pin (B) from the endsheet.

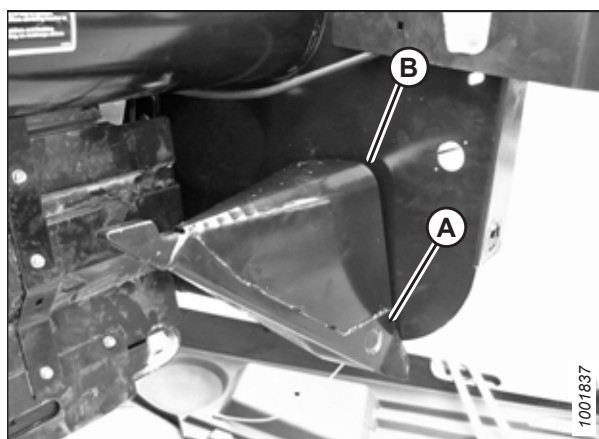


Figure 3.70: Stored Crop Divider

8. Position the crop divider as shown by inserting lugs (A) into the holes in the endsheet.

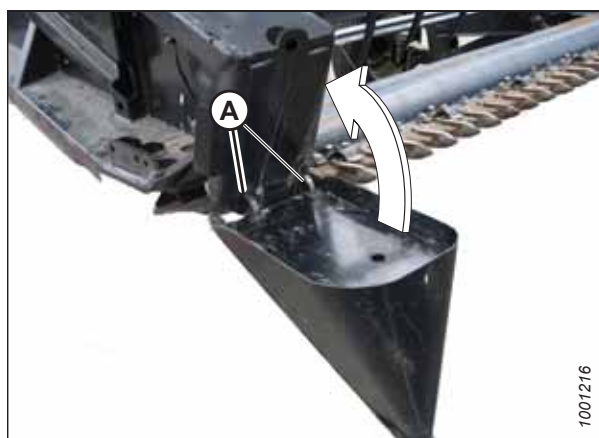


Figure 3.71: Crop Divider

OPERATION

9. Lift the forward end of the crop divider and install bolt (A) and special stepped washer (B) (step towards the divider). Tighten the bolt.
10. Pull at the tip of the crop divider and ensure there is no lateral movement. If necessary, adjust bolts (C) to tighten the crop divider and eliminate lateral movement.
11. Close or install the endshields. For instructions, refer to [4.3 Endshields, page 116](#).

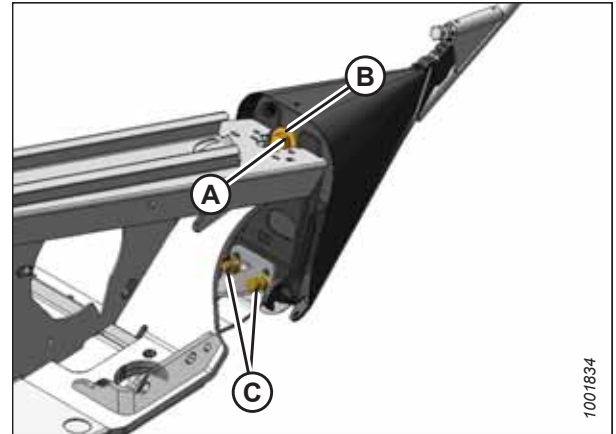


Figure 3.72: Crop Divider

3.12.12 Crop Divider Rods

Crop divider rods can be used in conjunction with crop dividers. The removable crop divider rods are most useful when crop is down. In standing crops using only crop dividers is recommended.

Table 3.7 Crop Divider Rods Recommended Use

With Divider Rods		Without Divider Rods
Alfalfa	Lodged cereal	Edible beans
Canola	Peas	Milo
Flax	Soybeans	Rice
Grass seed	Sudan grass	Soybeans
Lentils	Winter forage	Standing cereal

Removing Crop Divider Rods

To remove the crop divider rods and place them in their storage position, perform the removal procedure provided here.

1. Loosen bolt (A) and remove crop divider rod (B) from both sides of header.

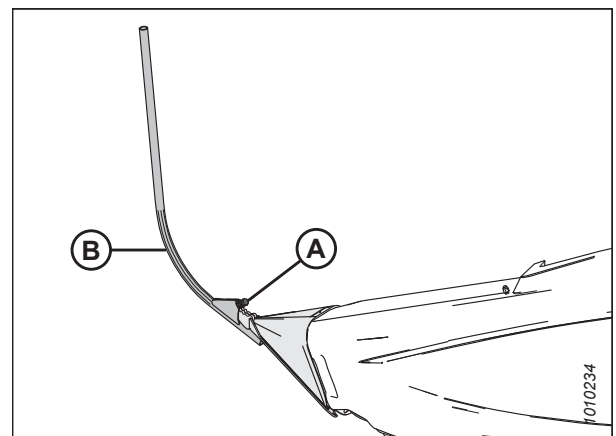


Figure 3.73: Crop Divider Rod

OPERATION

2. Store both crop divider rods (A) inboard on the right endsheet.

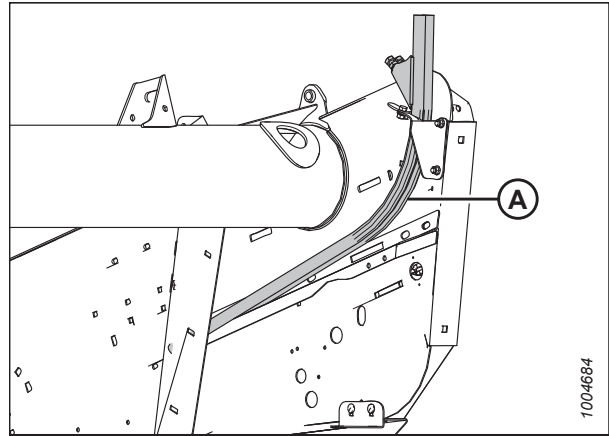


Figure 3.74: Right Endsheets

3.13 Delivery Opening

The width and location of the delivery opening can be changed. This affects the width and configuration of the windrow.

The decision to widen or narrow the center delivery opening, or to double windrow, should be based on the following factors:

- Capability to pick-up a windrow
- Type and yield of crop
- Weather conditions (rain, humidity, wind)
- Drying time available

Refer to [3.14 Windrow Types, page 80](#) for the strengths and weaknesses of the various windrow configurations with respect to these factors.

The procedure for adjusting the delivery opening varies depending on whether the optional hydraulic deck shift has been installed.

Also refer to [3.13.3 Double Windrowing, page 76](#).

3.13.1 Adjusting Size of Delivery Opening on Header with Manual Deck Shift – D60

Both draper decks can be moved manually to adjust the delivery opening.

Both decks can be positioned to vary the delivery opening as follows:

- **D60 4.6 m (15 ft.) headers:** 154 to 177 cm (60 5/8 to 69 11/16 in.)
- **D60 6.1–12.2 m (20–40 ft.) headers:** 172 to 195 cm (67 1/8 to 76 11/16 in.)

1. Loosen bolts (A) on both decks.
2. Slide the decks to the desired opening width. Retighten bolts (A).

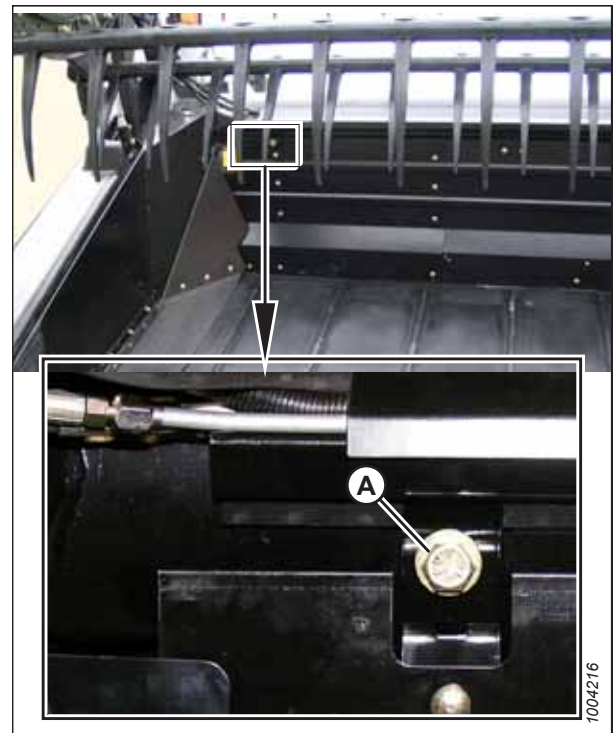


Figure 3.75: Manual Deck Shift

3.13.2 Adjusting Size of Delivery Opening on Header with Manual Deck Shift – D50

Both draper decks can be moved manually to adjust the size of the delivery opening.

Both decks can be positioned to set the delivery opening at three widths:

- **Wide:** 1925 mm (76 in.)
- **Medium:** 1875 mm (74 in.)
- **Narrow:** 1715 mm (67.5 in.)

The decks are factory-set at the Medium width position.

To change the delivery opening, follow these steps:

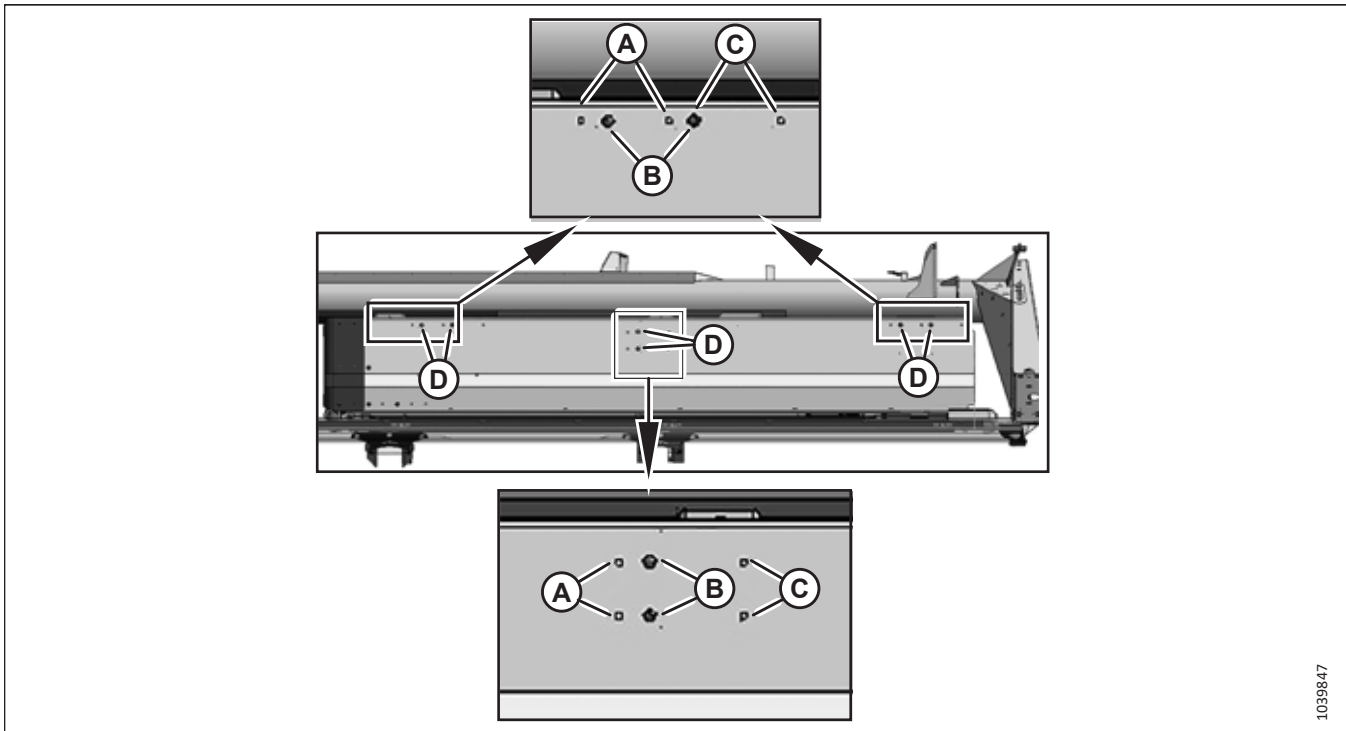


Figure 3.76: D50 Left Deck – Right Deck is Opposite

1. Remove six bolts (D) from the backsheet, and move the deck so that the holes at the desired opening width line up (for a wide opening, holes [A]; for a medium opening, holes [B]; and for a narrow opening, holes [C]).
2. Re-install and tighten bolts (D).
3. Repeat these steps on the other deck.

3.13.3 Double Windrowing

Double windrowing is laying two swaths side-by-side. Larger capacity combines or forage harvesters can then pick up twice as much material in a single pass, saving time and fuel.

Double-windrowing is available on D60 7.6–12.2 m (25–40 ft.) headers. The end delivery opening size (1710 mm [67 in.]) is designed to give minimal clearance between the first windrow laid and the standing crop. The center delivery opening size from the factory is 1870 mm (74 in.), with an adjustable range of 1540–1970 mm (61–78 in.).

NOTE:

If using end delivery with a 9.1 m (30 ft.) header equipped with the Slow Speed Transport option, the crop can interfere with the outboard wheel. To rectify the problem, remove the outboard wheel.

OPERATION

Shifting Decks Hydraulically

The hydraulic deck shift feature allows you to select center, left, or right delivery from the windrower cab. It is only available on 7.6–12.2 m (25–40 ft.) D60 Draper Headers.

Refer to your windrower operator's manual for identification and operation of the deck shift control.

To lay a double windrow, do the following:

1. Position the decks at the left end of header to deliver crop from right end (A) for the first round.
2. To deliver crop from the left end (B) of the header, use the deck shift control in the windrower to shift the decks to the right end of the header.
3. Complete the second round to lay a double windrow.
4. Repeat above steps to lay additional double windrow.

NOTE:

The end delivery opening is designed to give adequate clearance between the first windrow and the standing crop, and optimum space between the two windrows.

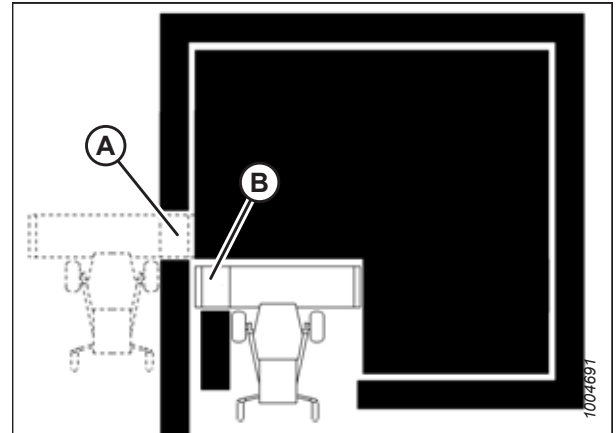


Figure 3.77: Double Windrowing

Shifting Decks Manually

Both decks can be shifted manually, and can be positioned to deliver the crop from the right or left end and from the center.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

OPERATION

To deliver crop from the right end, move the decks to the left end of the header as follows:

1. Loosen bolt (A) on the right deck.
2. Slide the deck to close off the center opening. Tighten bolt (A).

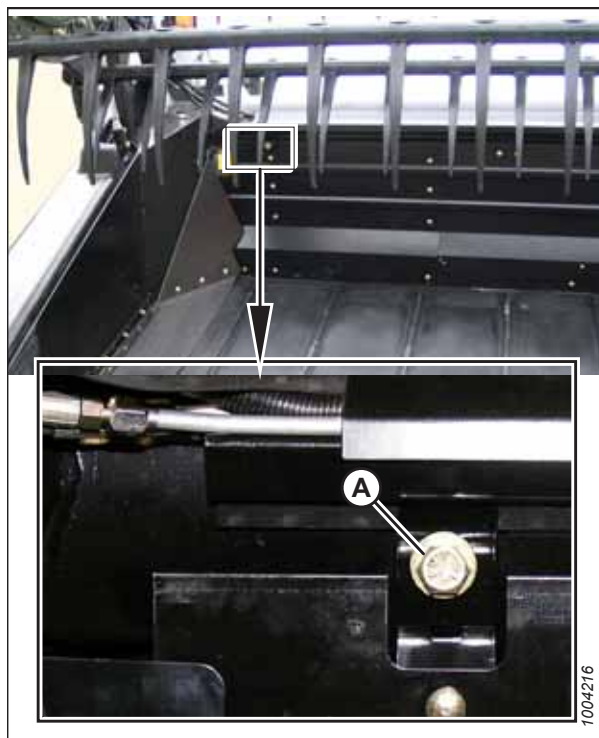


Figure 3.78: Right Deck Shown

3. Reverse draper drive motor hoses (A) on the moved deck so that the draper turns the same direction as the unmoved deck.

NOTE:

Loosen the clamp on the plastic sleeve at the drive motor so that hoses (A) can be reversed. Tighten the clamp.

NOTE:

To deliver crop from the left end, move the decks to the right end of the header following the steps above.

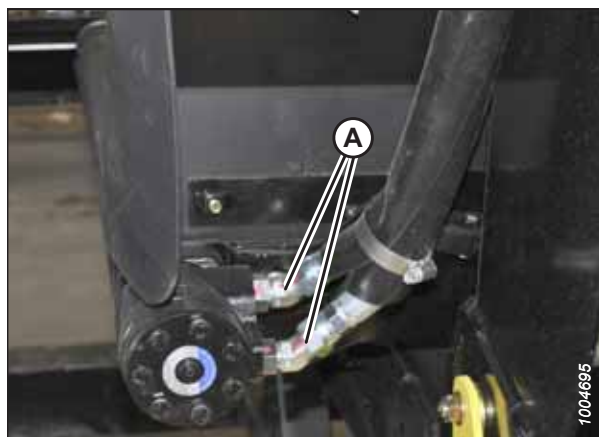


Figure 3.79: Right Deck Motor

OPERATION

To lay a double windrow, do the following:

4. Position decks at the left end of header to deliver crop from right end (A).
5. Complete one round or one length of the field.
6. Complete the second round or length in the opposite direction to lay a double windrow.
7. Repeat the above steps to lay additional double windrows.

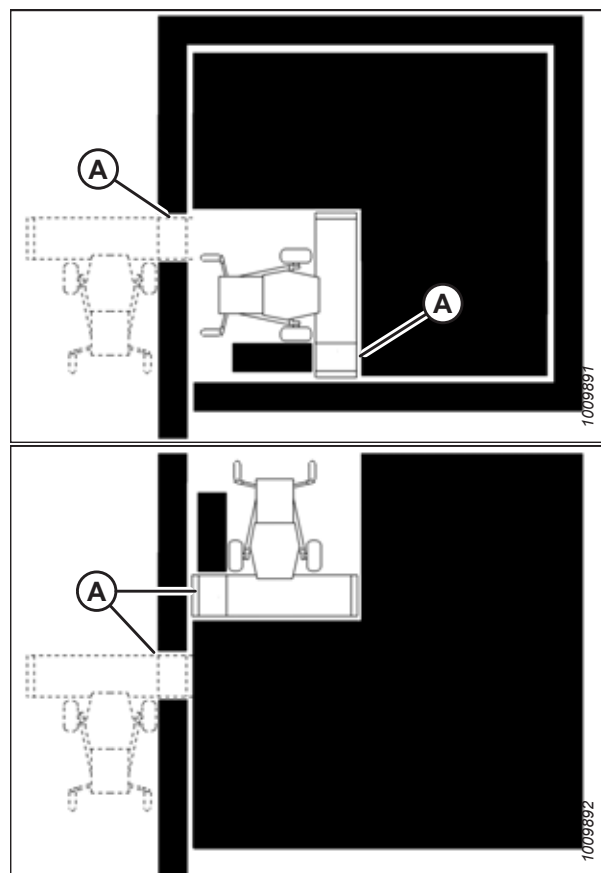


Figure 3.80: Double Windrowing

3.14 Windrow Types

Review the qualities that make up a good windrow to better understand how the crop delivery method affects your windrow.

There are three basic criteria by which the quality of a windrow is measured:

- **Weight Distribution:** Heads and stalks distributed evenly across full width of windrow
- **Good Curing:** A loose, open windrow for better drying
- **Good Weatherability:** A well-formed windrow that supports heads off the ground and holds together in extreme weather conditions

Table 3.8 Windrow Descriptions

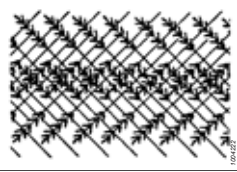
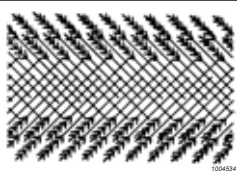
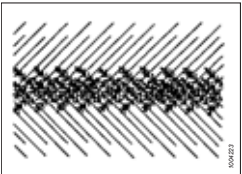
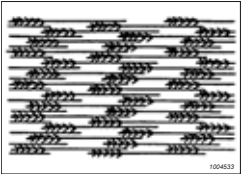
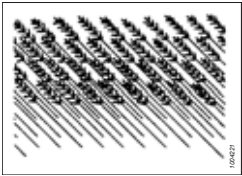
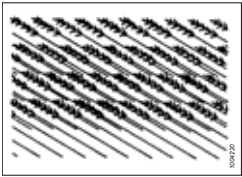
Windrow Type	Windrow Descriptions
<p>Herringbone</p> 	<p>Description: The most desirable form of windrow, stalks are crossed and interwoven. Heads are distributed across full width of windrow. This windrow can be formed by center delivery only.</p> <p>Weight Distribution: Good</p> <p>Curing: Good</p> <p>Weatherability: Excellent</p> <p>Machine Setting Guidelines:</p> <ul style="list-style-type: none"> • Reel and ground speed approximately equal • Medium draper speed • Center delivery
<p>Fantail</p> 	<p>Description: The stalks are crossed in the center and the heads are in line along outside edges. This windrow can be formed by center delivery only.</p> <p>Weight Distribution: Fair</p> <p>Curing: Fair</p> <p>Weatherability: Fair</p> <p>Machine Setting Guidelines:</p> <ul style="list-style-type: none"> • Low draper speed • Low header angle • Center delivery

Table 3.8 Windrow Descriptions (continued)

Windrow Type	Windrow Descriptions
<p>Dovetail</p> 	<p>Description: The stalks are lined along outside edges of windrow and heads are crossed in center. This windrow can be formed by center delivery only.</p> <p>Weight Distribution: Poor</p> <p>Curing: Fair</p> <p>Weatherability: Poor</p> <p>Machine Setting Guidelines:</p> <ul style="list-style-type: none"> • High draper speed • High header angle • Center delivery
<p>Parallel</p> 	<p>Description: The stalks are parallel to windrow and heads evenly distributed across width of windrow. This windrow can be formed by center delivery or end delivery.</p> <p>Weight Distribution: Good</p> <p>Curing: Good</p> <p>Weatherability: Good</p> <p>Machine Setting Guidelines:</p> <ul style="list-style-type: none"> • Medium draper speed • Medium header angle • Center or end delivery

OPERATION

Table 3.8 Windrow Descriptions (continued)

Windrow Type	Windrow Descriptions
<p>45° Diagonal</p> 	<p>Description: The stalks are lined along one edge and heads are along opposite edge, 45° to windrow perpendicular. This windrow can be formed by end delivery or by center delivery, if the crop is leaning to one side.</p> <p>Weight Distribution: Poor</p> <p>Curing: Fair</p> <p>Weatherability: Poor</p> <p>Machine Setting Guidelines:</p> <ul style="list-style-type: none"> • Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning
<p>75° Diagonal</p> 	<p>Description: The stalks are closer to parallel than the 45° windrow. Stalk tips are lined along one edge with heads opposite, 75° to windrow perpendicular. This windrow can be formed by end delivery or by center delivery, if the crop is leaning to one side.</p> <p>Weight Distribution: Fair</p> <p>Curing: Good</p> <p>Weatherability: Fair</p> <p>Machine Setting Guidelines:</p> <ul style="list-style-type: none"> • Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning

NOTE:

If combining, follow the same path as the header did for windrowing for optimal combine feeding performance.

3.15 Haying Tips

These tips may be useful when using the header in hay crops

3.15.1 Curing

Curing crops quickly helps maintain the highest quality because for each day that hay lies on the ground, 5% of the protein is lost.

A quick cure will maintain top quality because:

- 5% of the protein is lost for each day hay lies on the ground.
- The sooner the cut hay is off the ground, the earlier the start for new growth.

Leaving the windrow as wide and thin as possible makes for the quickest curing. The cured hay should be baled as soon as possible.

3.15.2 Topsoil Moisture

On wet soil, the general rule of wide and thin does **NOT** apply. A narrower windrow will dry faster than hay left flat on wet ground.

When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level using the table below.

Level	% Moisture	Condition
Wet	Over 45%	Soil is muddy
Damp	25–45%	Shows footprints
Dry	Under 25%	Surface is dusty

If the ground is wet due to irrigation, wait until soil moisture drops below 45%.

If the ground is wet due to frequent rains, cut when the weather allows and let the forage lie on the wet ground until it dries to the moisture level of the ground. The cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

3.15.3 Weather and Topography

Cut as much hay as possible by midday, when drying conditions are best.

Fields sloping south get up to 100% more exposure to the sun's heat than the north sloping fields. If hay is baled and chopped, consider baling the south-facing fields and chopping fields facing north.

When relative humidity is high, the evaporation rate is low and hay dries slower.

If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresher, less saturated air.

Cutting hay perpendicular to the direction of the prevailing wind is also recommended.

3.15.4 Windrow Characteristics

Adjust speed and header variables to achieve the ideal windrow characteristics.

Table 3.9 Windrow Characteristics

Configuration	Advantage
High and fluffy	Movement of air through the windrow is more important to the curing process than is direct sunlight.
Consistent formation, not bunched	Permits an even flow of material into the baler, chopper, etc. and allows for more even drying.
Even distribution of material across windrow	Results in even and consistent bales to minimize handling and stacking problems.
Properly conditioned	Prevents excessive leaf damage.

Refer to [3.12 Header Operating Variables, page 43](#) for instructions on adjusting the header.

3.15.5 Driving on Windrows

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked. If practical, set forming shields for a narrower windrow that can be straddled.

NOTE:

Driving on windrows in high-yielding crops may be unavoidable if a full width windrow is necessary.

3.15.6 Raking and Tedding

Raking or tedding speeds up drying; however, benefits must be evaluated against additional leaf loss.

There is little or no advantage to raking or tedding if the ground beneath the windrow is dry. Large windrows on damp or wet ground should be turned over when they reach 40–50% moisture.

To avoid excessive yield losses, hay should not be raked or tedded when moisture is less than 25%.

3.15.7 Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, so that water can escape and evaporate faster.

However, treated hay lying on wet ground will also absorb moisture faster. Costs and benefits relative to your area should be carefully considered before using a drying agent.

3.16 Draper Deflectors

D60 single-knife headers are equipped with rubber deflectors that are attached to the inboard side of the endsheets to prevent material from falling through the gap between the endsheet and the draper.

In some cases, material hesitates on the deflectors and will not flow onto the draper. If this happens, replace the existing deflector with a narrower one or rework the existing deflector.

3.16.1 Replacing Draper Deflector

To replace a draper deflector, follow these steps:

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. Remove three screws (A) securing the aft end of existing deflector (B) to the frame behind the backsheet.

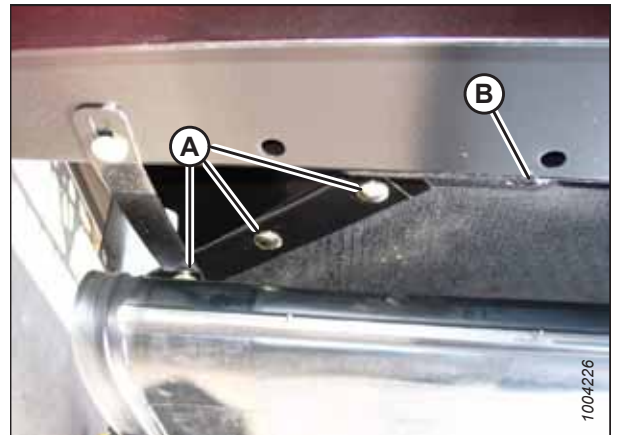


Figure 3.81: Carriage Bolts

OPERATION

6. Drill out seven pop-rivets (A) along the endsheet and remove deflector (B).
7. Locate new deflector (B) onto the endsheet bracket and attach with seven pop-rivets (MD #18768) (A).

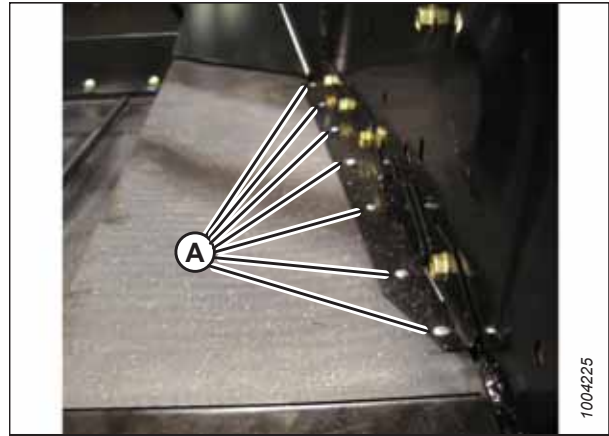


Figure 3.82: Wide Deflector

8. Position new deflector (MD #172381) (A) onto the endsheet bracket and attach with seven pop-rivets (MD #18768) (B).
9. Reinstall three screws at the aft end of the deflector.

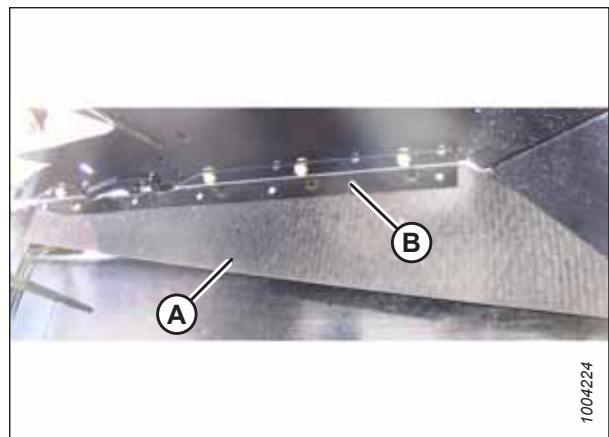


Figure 3.83: Narrow Deflector

3.16.2 Reworking Draper Deflectors

If the draper deflectors are too wide, they can be trimmed to narrow them.

To trim the deflectors, follow these steps:



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).

OPERATION

5. Mark a straight line (A) on the deflector 100 mm (4 in.) from and parallel to the back edge of the deflector.
6. Mark another line (B) on the deflector 100 mm (4 in.) from and parallel to the endsheet.
7. Using a sharp knife, cut the rubber deflector along lines (A) and (B), taking care not to cut the draper underneath the deflector.
8. Cut the rubber deflector along steel retainer (C) from the inboard edge up to line (B), and remove the excess rubber.

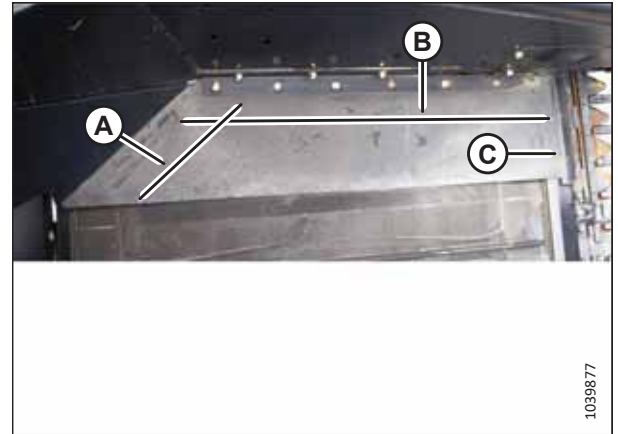


Figure 3.84: Existing Deflector

9. Use the cut-off portion of the deflector as a template to rework the deflector on the opposite end of the header.



Figure 3.85: Deflector After Trimming

3.17 Knifehead Shield

The knifehead shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cutout.

It is recommended that the shield(s) be installed when harvesting severely lodged crop or any crop condition where plugging occurs at knife head cut-out.

IMPORTANT:

Remove the shields when cutting with the cutterbar on the ground in muddy conditions. Mud may pack into the cavity behind the shield which could result in knife drive box failure.

Different shields are available for different header sizes. Be sure to use the correct shield for your header. For more information, refer to [5.2.2 Knifehead Shield, page 247](#).

The shields and mounting hardware are available from your MacDon Dealer.

3.17.1 Installing Knifehead Shield



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.



CAUTION

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. Place knifehead shield (A) against the endsheet as shown. Align the shield so the cutout matches the profile of the knifehead and/or hold-downs.
6. Bend knifehead shield (A) along the slit to conform to the endsheet.
7. Align the mounting holes and secure with two 3/8 in. x 1/2 in. Torx® head bolts (B).
8. Tighten bolts (B) just enough to hold knifehead shield (A) in place while allowing it to be adjusted as close to the knifehead as possible.
9. Manually rotate the knife drive box pulley to move the knife and check for areas of contact between the knifehead and knifehead shield (A). Adjust the shield to eliminate interference with the knife if necessary.

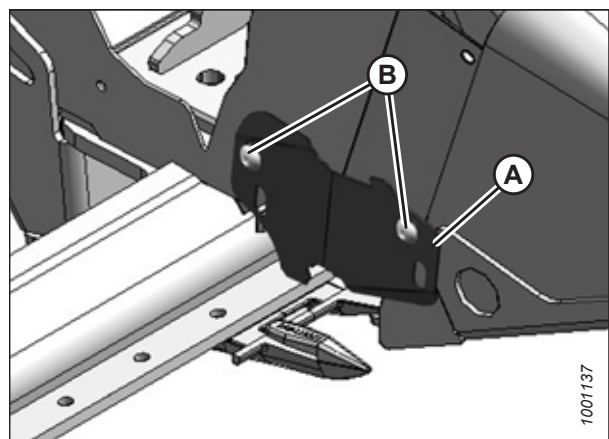


Figure 3.86: Knifehead Shield

OPERATION

10. Tighten bolts (B).

3.18 Leveling Header

The windrower linkages are factory-set to provide the proper level for the header and should not normally require adjustment.

NOTE:

The float springs are **NOT** used to level the header.

1. If the header is not level, check the pressure of the windrower's tires to ensure they are properly inflated. For instructions, refer to the windrower operator's manual.
2. If the header is still not level, adjust the windrower linkages as required. For instructions, refer to the windrower operator's manual.

3.19 Unplugging Cutterbar

Follow safety procedures when clearing a plugged cutterbar, and refer to troubleshooting recommendations of plugging persists.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the machine for any reason.



CAUTION

Wear heavy gloves when working around or handling knives.

IMPORTANT:

Lowering the rotating reel on a plugged cutterbar will damage the reel components.

To remove plugged material from the cutterbar, follow these steps:

1. Stop forward movement of the machine and disengage the header drives.
2. With the header on the ground, back up several feet, and then engage the header drive clutch.
3. If the plug does not clear, disengage the header drive clutch and raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. For instructions, refer to the windrower operator's manual.
6. Clean off the cutterbar by hand.

NOTE:

If cutterbar plugging persists, refer to [6 Troubleshooting, page 255](#).

3.20 Upper Cross Auger (Option)

The upper cross auger (UCA) (A) improves delivery of very bulky crops across the header and onto the windrow.

Beater bars assist in delivering material through the header opening, but the beater bars are removable if wrapping occurs.

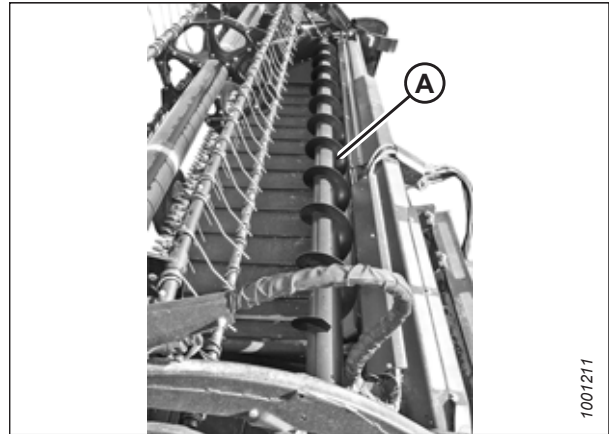


Figure 3.87: Upper Cross Auger with Beater Bars

NOTE:

Newer UCA kits do not include or use beater bars; they use bolt-on flighting instead.

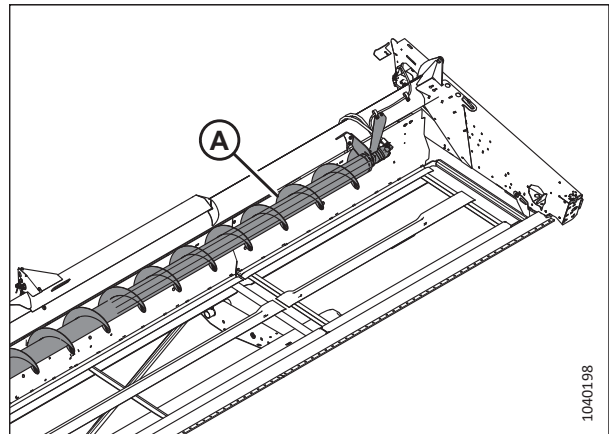


Figure 3.88: Upper Cross Auger with Bolt-On Flighting

3.20.1 Removing Beater Bars

Beater bars assist in delivering material through the header opening, but the beater bars are removable if wrapping occurs.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

NOTE:

Some newer upper cross augers do not have beater bars.

1. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.

OPERATION

3. Remove bolts (A) securing beater bars (B) and clamps (C) to the auger tubes, and remove the beater bars and clamps.

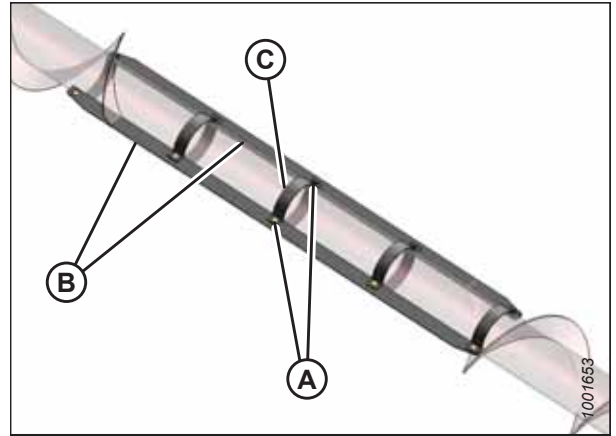


Figure 3.89: Beater Bars

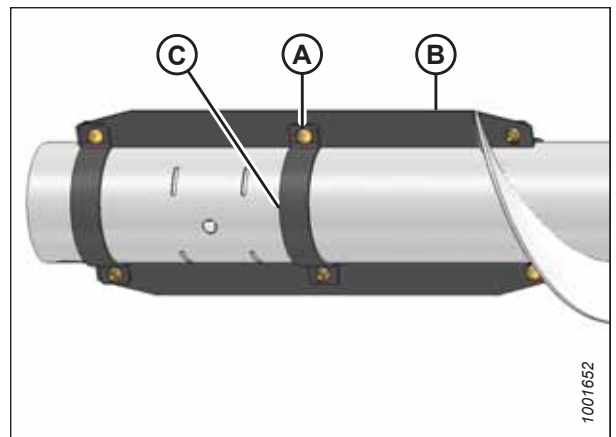


Figure 3.90: Beater Bars

3.20.2 Installing Beater Bars

Beater bars can improve the delivery of material through the header opening.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

NOTE:

Some newer upper cross augers do not have beater bars.

1. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.

OPERATION

3. Position one beater bar (B) and one clamp set (C) onto the auger tube and loosely secure with carriage bolt (A) and nut. Bolt head **MUST** face the direction of auger rotation.
4. Position the remaining clamp sets (C) onto the auger tube and loosely attach to beater bar (B) with carriage bolts (A) and nuts. Bolt heads **MUST** face the direction of auger rotation.
5. Position second beater bar (B) in clamp sets (C) and secure with carriage bolts (A) and nuts.

NOTE:

To reduce the chance of wrapping, offset the beater bars by 90°.

6. Tighten the bolts.

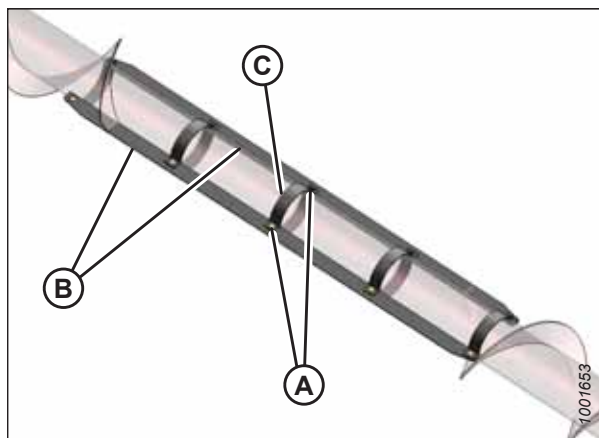


Figure 3.91: Beater Bars

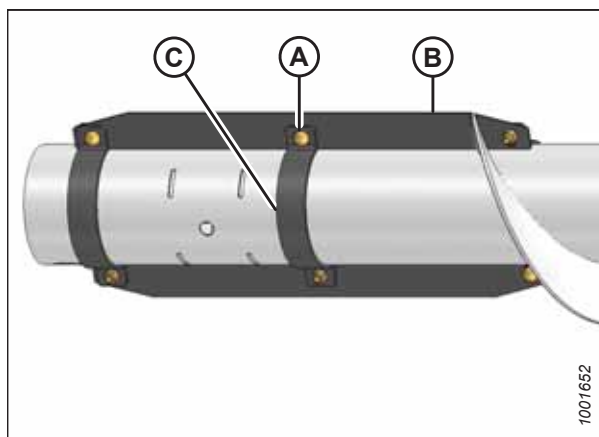


Figure 3.92: Beater Bars

3.21 Transporting Header



WARNING

Do NOT drive the windrower with header attached on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the header may not be apparent under these conditions.

3.21.1 Precautions for Transporting Header on a Windrower

Take the following precautions when transporting the header on a windrower.



WARNING

Do NOT drive the windrower with the header attached on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the header may not be apparent under these conditions.



CAUTION

- Check local laws for width regulations and lighting or marking requirements before transporting on roads.
- Follow all recommended procedures in your windrower operator's manual for transporting, towing, etc.
- Disengage the header drive clutch when travelling to and from the field.
- Before driving windrower on a roadway, be sure flashing amber lamps, red tail lamps, and head lamps are clean and working properly. Pivot amber lamps for best visibility by approaching traffic. Always use these lamps on roads to provide adequate warning to other vehicles.
- Do NOT use field lamps on roads; they may confuse other drivers.
- Before driving on a roadway, clean the slow moving vehicle emblem and reflectors. Adjust the rear view mirror and clean the windows.
- Lower the reel fully and raise the header unless transporting in hills.
- Maintain adequate visibility and be alert for roadside obstructions, oncoming traffic, and bridges.
- When travelling downhill, reduce speed and keep the header at a minimum height. This provides maximum stability if forward motion is stopped for any reason. Raise the header completely at the bottom of grade to avoid contacting the ground.
- Travel speed should be such that complete control and machine stability are maintained at all times.

3.21.2 Towing Header

Headers with the optional Slow Speed Transport can be towed behind a properly configured MacDon windrower, a properly configured combine, or an agricultural tractor.

Refer to the towing vehicle's operator's manual for instructions.

Attaching Header to Towing Vehicle

Review this list of cautions before attaching a header behind a MacDon windrower, a properly configured combine, or an agricultural tractor.



CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- The weight of the towing vehicle must exceed the header weight to ensure adequate control and braking performance.
- Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or a properly configured MacDon windrower.
- Ensure the reel is fully lowered and back on the support arms to increase header stability during transport. For headers with hydraulic reel fore-aft, never connect the fore-aft couplers to each other or the circuit will be complete and the reel could creep forward during transport.
- Check that all pins are properly secured in transport position at the wheel supports, cutterbar support, and hitch.
- Check tire condition and pressure prior to transporting.
- Connect the hitch to the towing vehicle using a proper hitch pin with a spring locking pin or other suitable fastener.
- Attach the hitch safety chain to the towing vehicle. Adjust the safety chain length to provide only enough slack to permit turning.
- Connect the header seven-pole plug wiring harness to the mating receptacle on the towing vehicle. (The seven-pole receptacle is available from your MacDon Dealer Parts Department).
- Ensure the lights are functioning properly and clean the slow moving vehicle sign and other reflectors. Use flashing warning lights unless prohibited by law.

Precautions for Towing a Header

Review this list of cautions before towing a header behind a MacDon windrower, a properly configured combine, or an agricultural tractor.



CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- The weight of the towing vehicle must exceed the header weight to ensure adequate control and braking performance.
- Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or a properly configured MacDon windrower.
- Use flashing warning lights unless prohibited by law.
- Do NOT exceed 40 km/h (25 mph) when towing a header using the Slow Speed Transport option. Reduce speed to less than 8 km/h (5 mph) for corners and slippery or rough conditions.
- Do NOT accelerate when making or coming out of a turn.
- Obey all highway traffic regulations in your area when transporting on public roads. Use flashing amber lights unless prohibited by law.

3.21.3 Converting from Transport to Field Position

The header needs to be converted back to field position if it was towed to a new location.

Removing Tow-Bar

The transport tow-bar can easily be disassembled and stored on the header.

1. Block the tires to prevent the header from rolling, and unhook the header from the towing vehicle.
2. Disconnect electrical connector (A) on the tow-bar.
3. Remove pin (B) from the tow-bar, and detach outer section (C) from inner section (D).

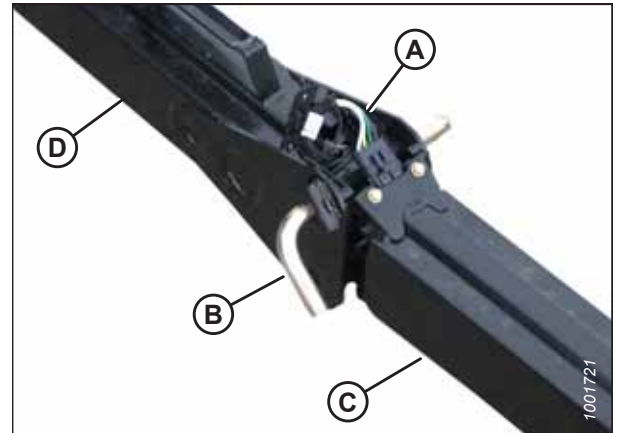


Figure 3.93: Tow-Bar Assembly

4. Disconnect electrical connector (A) at the front wheel.

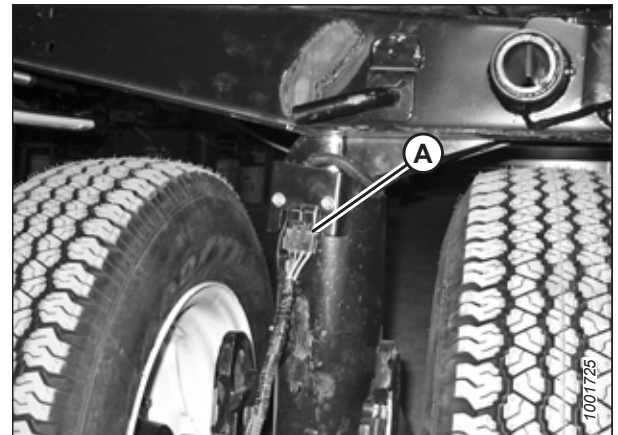


Figure 3.94: Wiring Connector

5. Remove clevis pin (A) and set aside for reinstallation.
6. Push latch (B) and lift tow-bar (C) from the hook. Release latch.
7. Install clevis pin (A).

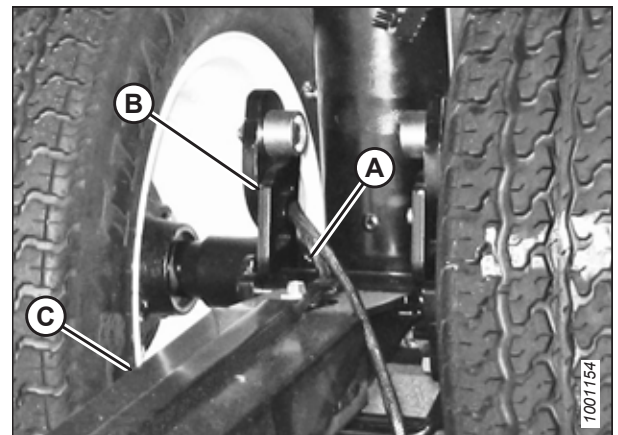


Figure 3.95: Tow-Bar Latch

OPERATION

Storing the Tow-Bar

The tow-bar consists of two sections: inner half (A) and outer half (B).

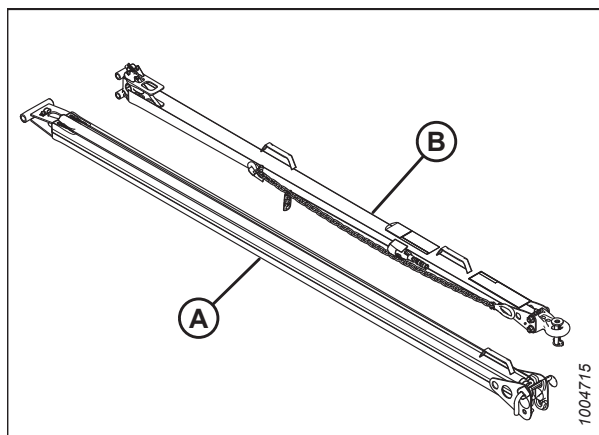


Figure 3.96: Tow-Bar Assembly

1. On the left side of the header's backtube, place the inner end of the outer half of the tow-bar into cradle (A).

NOTE:

The exact appearance of the tow-bar storage cradle varies according to the model of header.

2. Secure the clevis/pintle end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure the pin with a lynch pin.
3. Install rubber strap (D) on cradle (A).

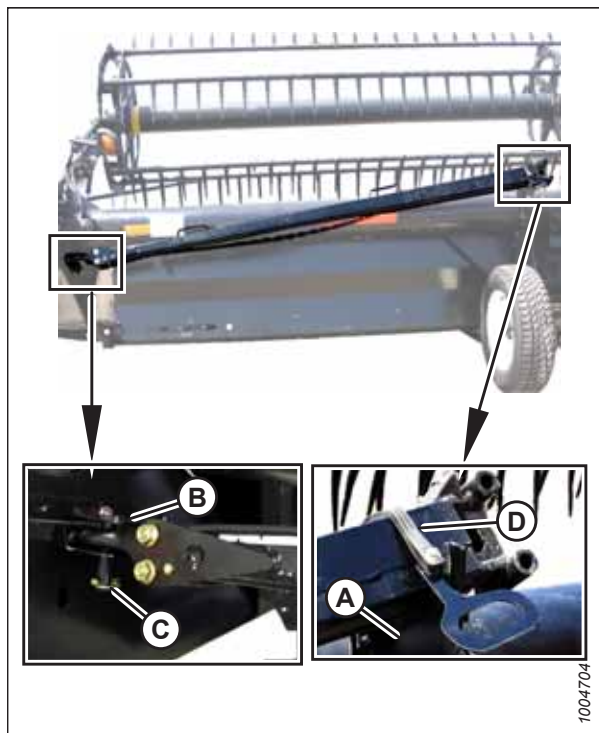


Figure 3.97: Tow-Bar Storage

OPERATION

4. On the right side of the header's backtube, place the inner end of the inner half of the tow-bar into cradle (A).

NOTE:

The exact appearance of the tow-bar storage cradle varies according to the model of header.

5. Secure the tube end of the tow-bar in support (B) on the endsheet using L-pin (C) from the tow-pole connection. Secure the L-pin with ring (E).
6. Install rubber strap (D) on cradle (A).

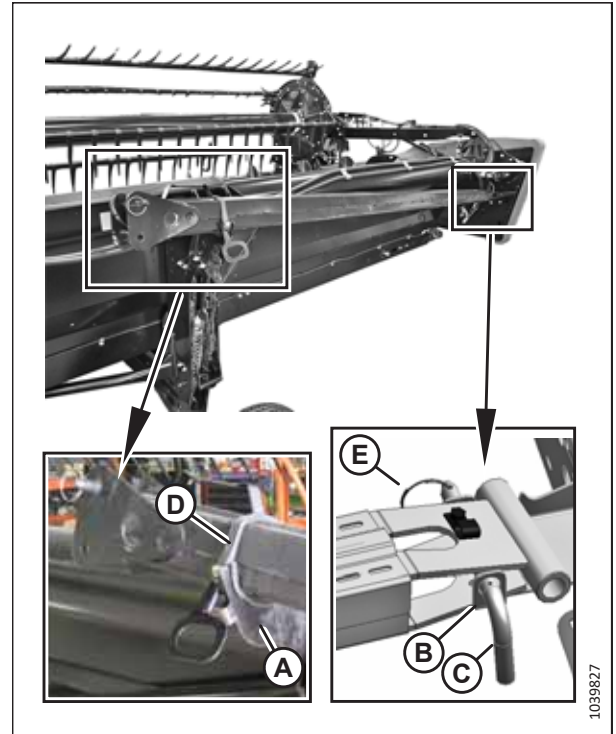


Figure 3.98: Tow-Bar Storage

7. Attach the header to the windrower. Refer to windrower operator's manual for instructions.

IMPORTANT:

Carrying the tow-bar on the header will affect the main header float. Refer to your windrower operator's manual for adjustment procedures.

8. Place the transport wheels into field position. Refer to the following:
 - [Moving Front Wheels into Field Position, page 99](#)
 - [Moving Rear Wheels into Field Position, page 101](#)

Moving Front Wheels into Field Position

The front (left) wheels are located closest to the towing vehicle. To prepare for operation in the field, the wheel assembly must be rotated to face the cutterbar and lifted to the desired height.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props.

OPERATION

4. Swivel front wheel assembly (A) so the wheels are aligned with the lower frame.
5. Remove pin (B) and pull the wheel assembly toward the rear of the header. Store the pin in hole (C) at the top of the leg.
6. Pull handle (D) upward to release and lower the linkage into the vertical support.

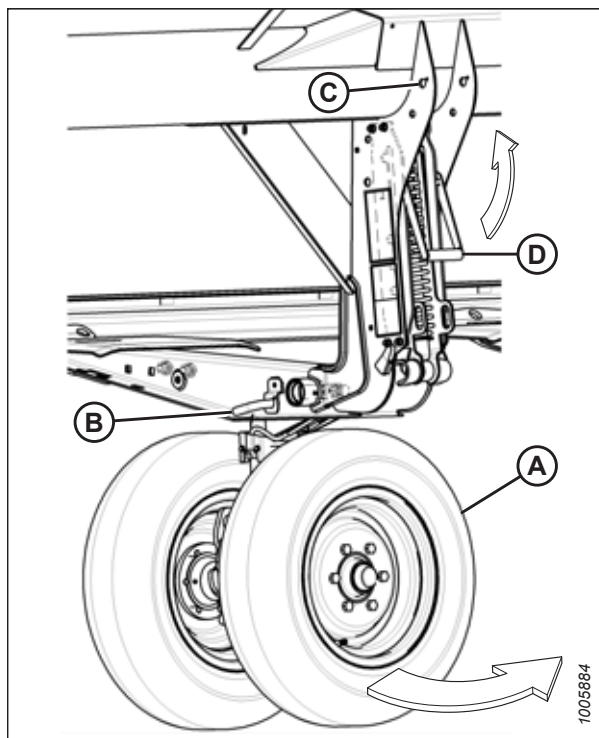


Figure 3.99: Front Wheels – Left

7. Align lift hook (A) with lug (B) and lift the wheel assembly to engage the pin in the lift hook. Ensure latch (C) is engaged.
8. Install clevis pin (D) and secure to the center of the axle with the hairpin.

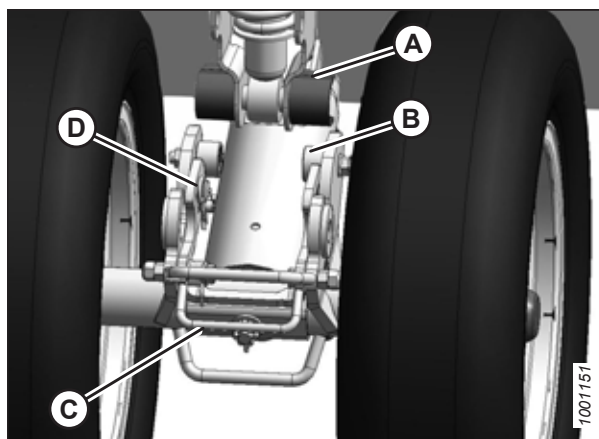


Figure 3.100: Front Wheels – Left

OPERATION

9. Lift the wheel assembly to the desired height and slide linkage (A) into the appropriate slot in the vertical support.
10. Push handle (B) down to lock it.



Figure 3.101: Front Wheels – Left

Moving Rear Wheels into Field Position

The rear (right) wheels are located farthest from the towing vehicle. To prepare for operation in the field, the rear wheel assembly must be rotated to face the cutterbar and lifted to the desired height.

1. Pull up pin (A) on the left rear wheel, swivel the wheel clockwise, and release the pin to lock the wheel.

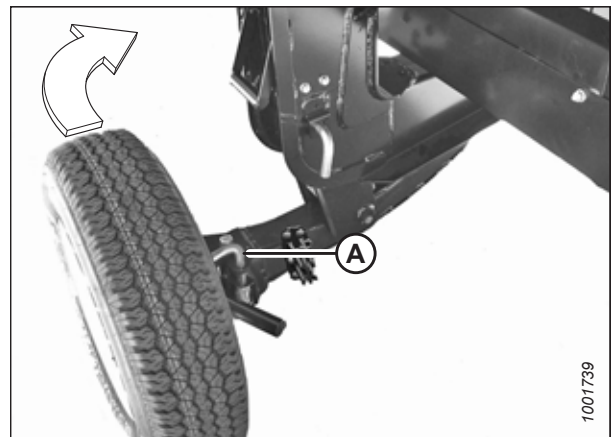


Figure 3.102: Rear Wheel – Right Side

2. Remove pin (A) and store at location (B).
3. Pull handle (C) upward to release the linkage.
4. Lift the wheel to the desired height, and engage the support channel into slot (D) in the vertical support.
5. Push handle (C) down to lock the linkage.

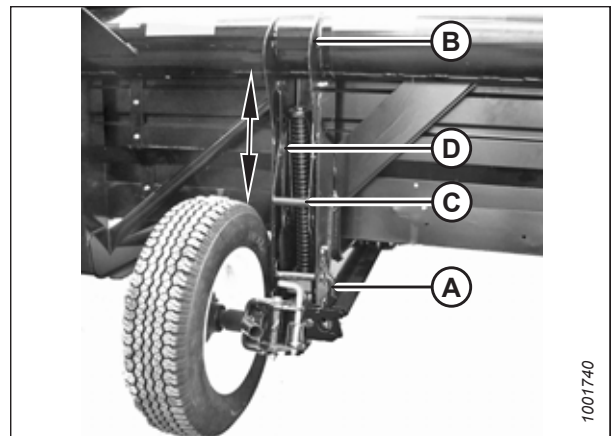


Figure 3.103: Rear Wheel – Right Side

OPERATION

6. Pull pin (A) on brace (B) on the left wheel in front of the cutterbar. Disengage the brace from the cutterbar, and lower the brace against axle (C).
7. Remove pin (D), lower support (E) onto the axle, and reinsert the pin into the support.
8. Swing axle (C) clockwise towards the rear of the header.

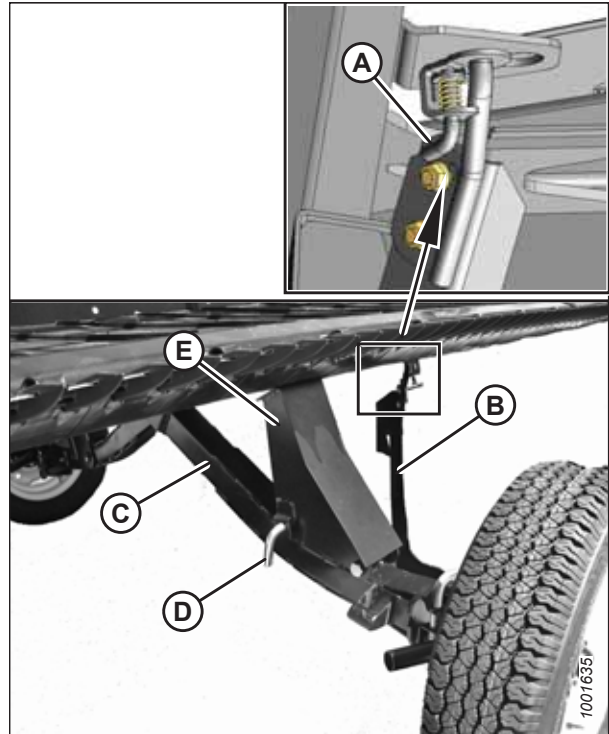


Figure 3.104: Right Rear Axle

9. Pull up pin (A) on the right wheel. Swivel the wheel counterclockwise to the position shown, and release pin (A) to lock the wheel in place.
10. Remove hairpin (B) from latch (C).
11. Lift the wheel, lift latch (C), and engage lug (D) onto the left axle. Ensure the latch closes.
12. Secure the latch with hairpin (B), ensuring the open end of the pin faces the rear of the windrower.

NOTE:

The hairpin can become dislodged by crop if it is installed with the open end facing the cutterbar.

IMPORTANT:

Check that wheels are locked and that handle is in locked position.

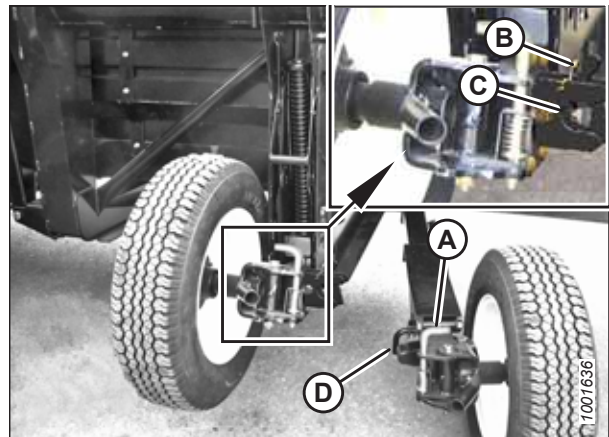


Figure 3.105: Rear Axles

13. Complete the conversion by ensuring left (A) and right (B) wheels are in the positions shown.

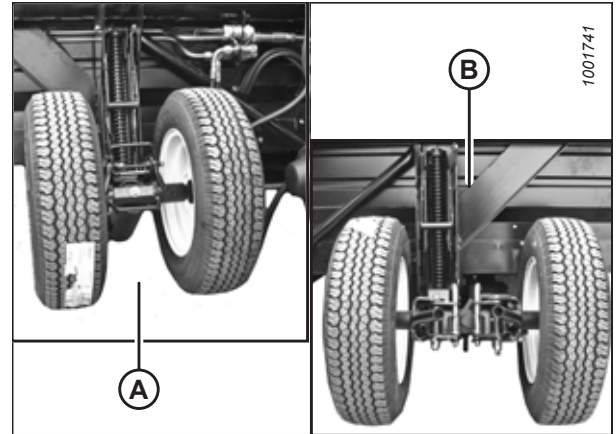


Figure 3.106: Field Position

3.21.4 Converting from Field to Transport Position

The header needs to be converted to the transport when being towed to a new location.

Moving Front Wheels into Transport Position

The front (left) wheels are located closest to the towing vehicle. To prepare for transport, the wheels must be lowered to the ground and rotated to face the direction of travel.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.



CAUTION

Stand clear of the wheels and release the linkage carefully; the wheels will drop once the mechanism is released.

1. Pull handle (B) upward to release and raise linkage (A) fully upward into the vertical support.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. For instructions, refer to the windrower operator's manual.

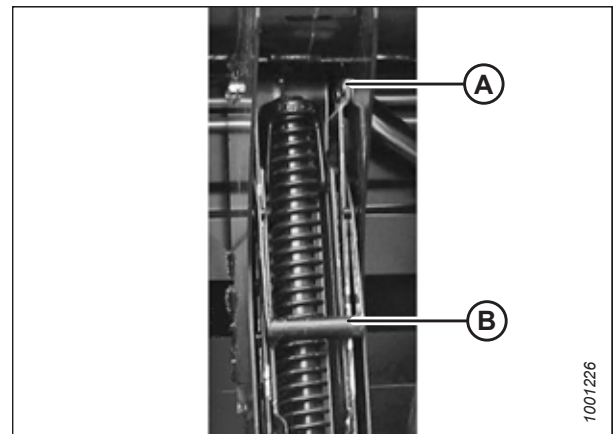


Figure 3.107: Raising Linkage

OPERATION

5. Remove the hairpin and clevis pin (A).
6. Pull latch handle (B) to release suspension linkage (C), and pull the suspension linkage away from spindle (D).
7. Lower the wheels slowly.

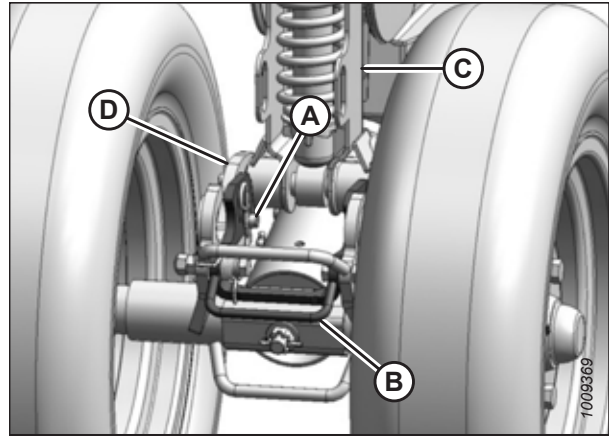


Figure 3.108: Left Front Wheels

8. Lower handle (B) to lock the linkage.

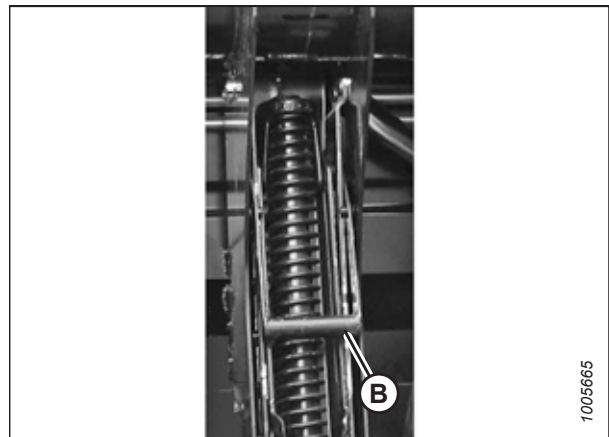


Figure 3.109: Locking Linkage

OPERATION

9. Remove pin (A) from storage at the top of leg (B).
10. Swivel the wheels clockwise until connector (C) is turned towards the left end of the header.
11. Insert pin (A) and turn to lock.
12. Lower the header until the left wheels are just touching the ground.

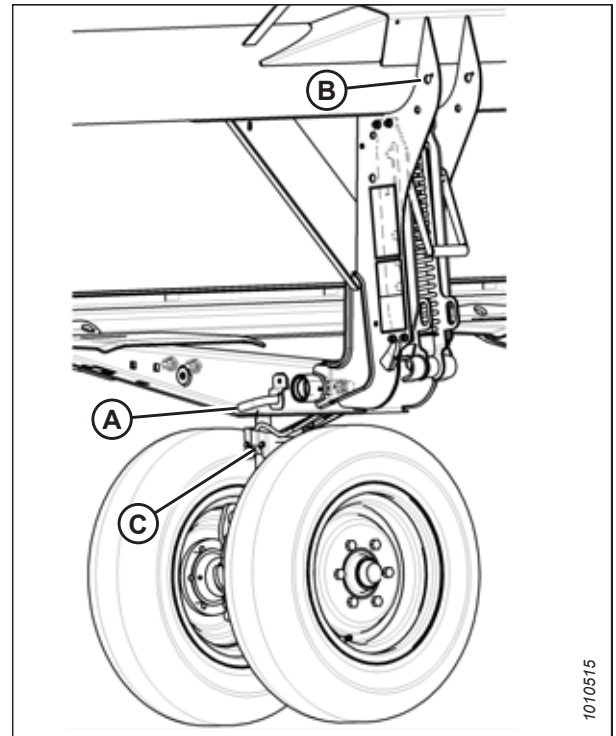


Figure 3.110: Left Front Wheels

Moving Rear (Right) Wheels into Transport Position

The rear wheels are located farthest the towing vehicle. To prepare for transport, the wheels must be lowered to the ground, expanded to transport width, and rotated to face the direction of travel.

1. Remove hairpin (A) from latch (B).
2. Lift latch (B), disengage right axle (C), and lower to the ground.



CAUTION

Stand clear of the wheels and release the linkage carefully; the wheels will drop once the mechanism is released.

3. Pull handle (D) carefully to release the spring and lower the wheel to the ground.
4. Lift the wheel and linkage with handle (E) and position the linkage in the bottom slot.
5. Lower handle (C) to lock.

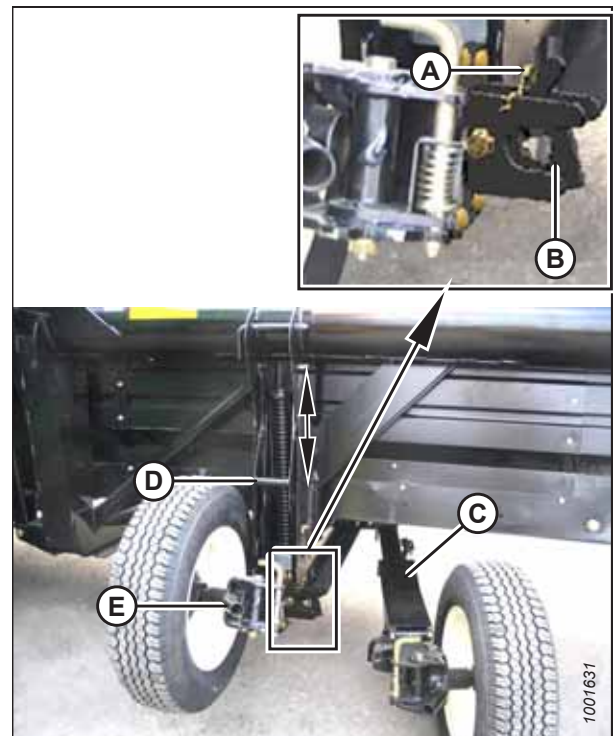


Figure 3.111: Separating Axles

OPERATION

6. Remove pin (A) and install at location (B) to secure the linkage. Turn the pin to lock.
7. Pull pin (D), swivel wheel (C) counterclockwise 90°, and release the pin to lock.

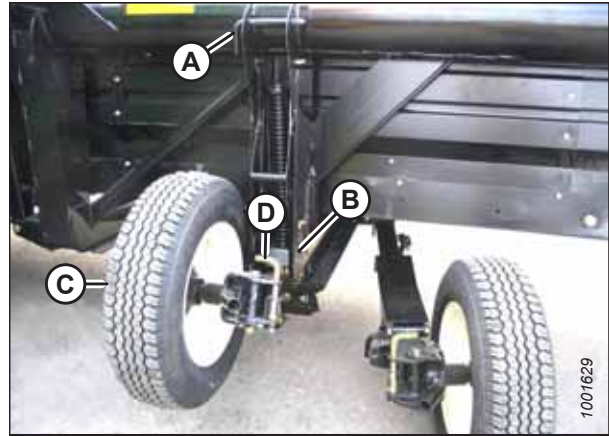


Figure 3.112: Wheel Position

8. Ensure the left wheel is in the transport position as shown.



Figure 3.113: Left Wheel in Transport Position

9. Pull pin (A) and swivel right rear wheel (B) clockwise 90°.



Figure 3.114: Right Rear Wheel

OPERATION

10. Lock wheel (A) with pin (B). Move right axle (C) to the front of the header.

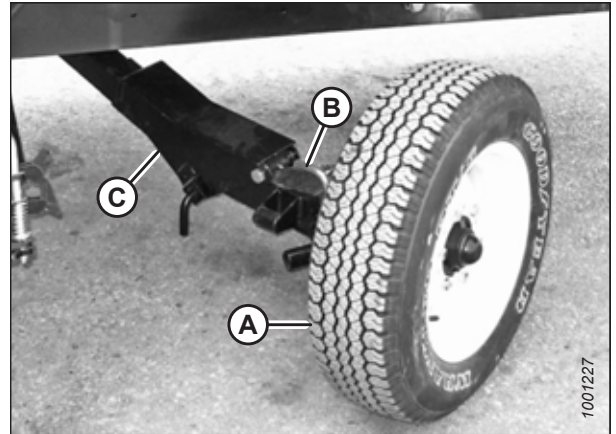


Figure 3.115: Right Rear Wheel

11. Remove pin (A), raise support (B) to the position shown, and reinsert pin.

IMPORTANT:

Ensure pin (A) engages the tube on the axle.

12. Swing brace (C) into the position shown and insert the brace into slot (D) behind the cutterbar. Position the brace so that pin (E) engages the hole in bracket (F). The right wheel is now in transport position.
13. Disengage the header safety props. For instructions, refer to the the windrower operator's manual.
14. Detach the header's hydraulic and electrical connections from the windrower. For instructions, refer to [3.3 Header Attachment/Detachment, page 25](#).
15. Start the windrower and lower the header to the ground.

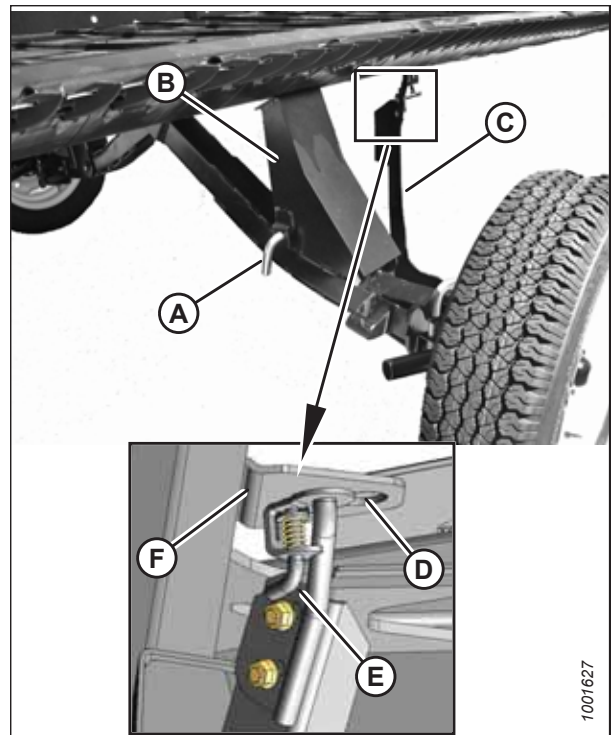


Figure 3.116: Right Rear Wheel Position

OPERATION

Attaching Tow-Bar

The tow-bar consists of two sections, which make storage and handling easier.

1. Unhook rubber strap (D) from cradle (A) on the right side of the header.
2. Remove clevis pin (C) and detach the tube end from support (B).
3. Replace clevis pin (C).
4. Lift the inner half of the tow-bar off the header and place it near the left side of the header.

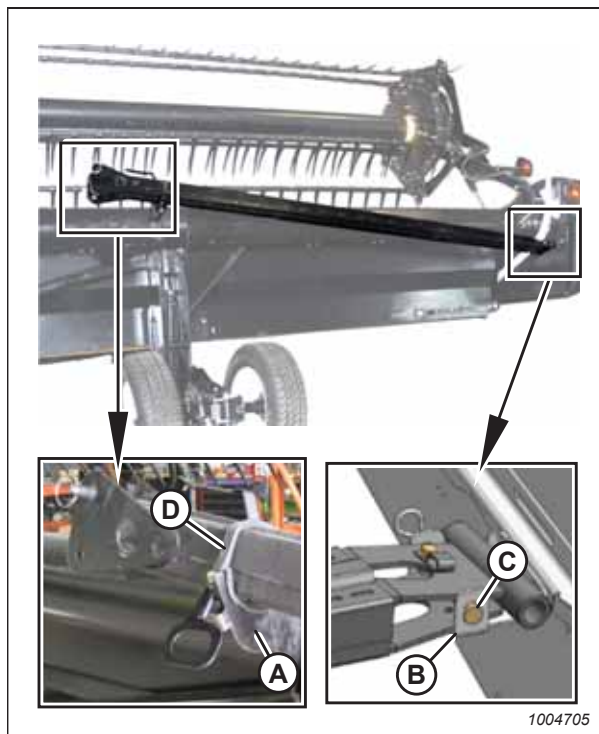


Figure 3.117: Tow-Bar Removal – Right Side

5. Unhook rubber strap (D) from cradle (A) on the left side of the header.
6. Remove hitch pin (C) from support (B), and remove the tow-bar.
7. Install rubber strap (D) on cradle (A).

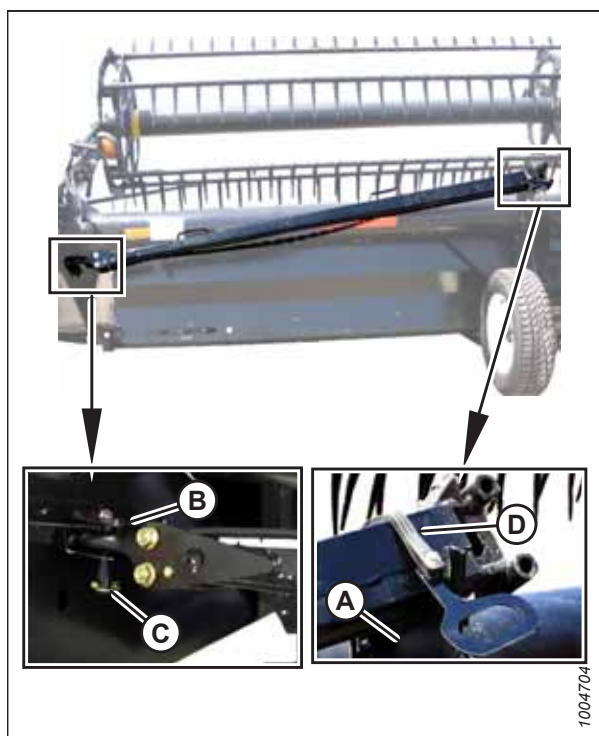


Figure 3.118: Tow-Bar Removal – Left Side

OPERATION

8. Connect outer half (B) of the tow-bar to inner half (A).

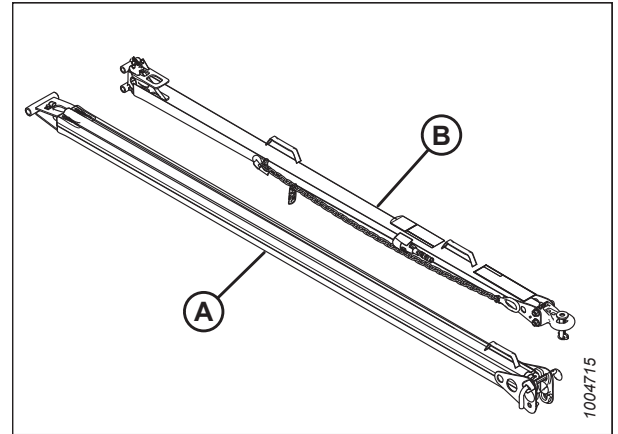


Figure 3.119: Tow-Bar Assembly

9. Lift outer half (B) and insert it into inner half (A).

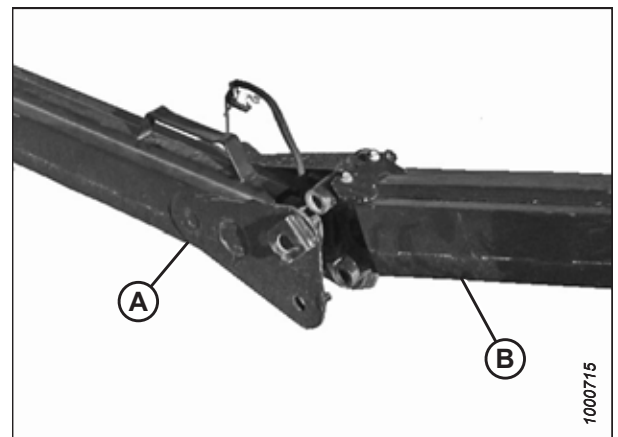


Figure 3.120: Tow-Bar Assembly

10. Secure the two halves together with L-pin (A) and then turn to lock. Secure the L-pin with ring (B).
11. Connect the electrical harness to connector (C).

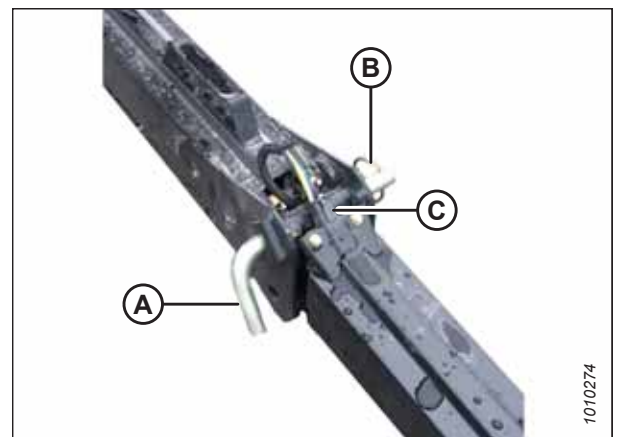


Figure 3.121: Tow-Bar Assembly

OPERATION

12. Position tow-bar (A) onto the axle, and push against latch (B) until the tow-bar pins drop into hooks (C).
13. Check that latch (B) has engaged the tow-bar.
14. Install clevis pin (D) and secure with hairpin.

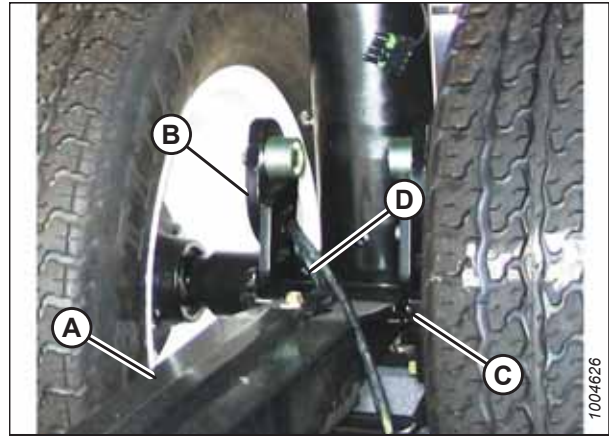


Figure 3.122: Attaching Tow-Bar

15. Connect electrical harness (A) at the front wheel.



Figure 3.123: Harness Connection

3.22 Storing the Header

Ensure the header is ready for the next harvest by taking steps to prevent corrosion, reduce unnecessary wear, and replace worn components.



CAUTION

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.



CAUTION

Cover the cutterbar and knife guards to prevent injury from accidental contact.

- Lower the reel completely. If the header is stored outside, tie the reel to the frame to prevent rotation caused by the wind.
- Lower the header onto blocks to keep the cutterbar off the ground.
- Clean the header thoroughly.
- Check for worn or broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
- Loosen the drive belts.
- Lubricate the header thoroughly leaving excess grease on the fittings to keep moisture out of the bearings.
- Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
- Store the machine in a dry, protected place if possible. If storing outside, always cover with a waterproof canvas or other protective material.
- If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.
- Replace or tighten any missing or loose hardware. For instructions, refer to [7.2 Torque Specifications, page 268](#).
- Repaint all worn or chipped painted surfaces to prevent rust.

Chapter 4: Maintenance and Servicing

This chapter contains the information necessary to perform routine maintenance and occasional servicing tasks on your machine. The word “maintenance” refers to scheduled tasks that help your machine operate safely and effectively; “service” refers to tasks that must be performed when a part needs to be repaired or replaced. For advanced service procedures, contact your Dealer.

4.1 Preparing Machine for Servicing

Observe all safety precautions before beginning service on the machine.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator’s seat, and always engage the safety props before going under the machine for any reason.



CAUTION

To avoid personal injury, follow all the safety precautions listed before servicing header or opening drive covers.

1. Lower the header fully. If it is necessary to service the header in the raised position, always engage the safety props.
2. Stop the engine and remove the key from the ignition.
3. Engage the park brake.
4. Wait for all moving parts to stop.

4.2 General Procedures

Refer to this chapter for information on procedures which are repeated throughout this manual.

4.2.1 Installing a Roller Chain

When working on chain driven systems, you may need to install a new roller chain. This topic explains how to install a chain with a clip and pin connector link.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Locate the ends of the chain on the sprocket.
2. Install pin connector (A) into chain, preferably from the sprocket backside.
3. Install connector (B) onto the pins.
4. Install spring clip (C) onto front pin (D) with the closed end of the clip in the direction of sprocket rotation.
5. Locate one leg of clip in groove of aft pin (E).
6. Press the other leg of the spring clip over the face of aft pin (E) until it slips into the groove. Do **NOT** press the clip lengthwise from the closed end.
7. Ensure the clip is seated in the grooves of the pins.

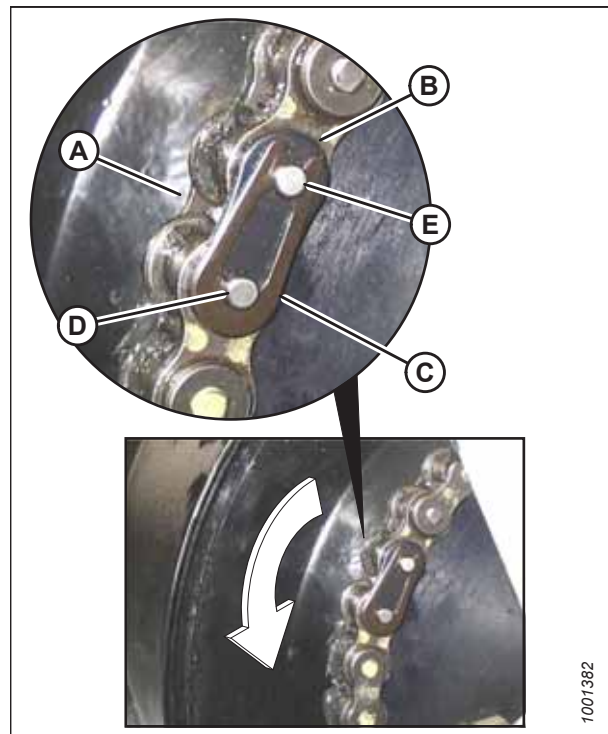


Figure 4.1: Chain Link Connector

4.2.2 Installing a Sealed Bearing

This installation procedure applies to all typical sealed bearings.

1. Clean the shaft and apply a rust preventive coating.
2. Install flange (A), bearing (B), second flange (C), and lock collar (D).

NOTE:

The locking cam is on only one side of the bearing.

3. Install and tighten flange bolts (E).
4. Position the shaft correctly, and lock the lock collar with a punch. Lock the collar in the same direction the shaft rotates, and tighten the set screw in the collar.
5. Loosen the flange bolts on the mating bearing one turn and then retighten. This will allow the bearing to properly line up.

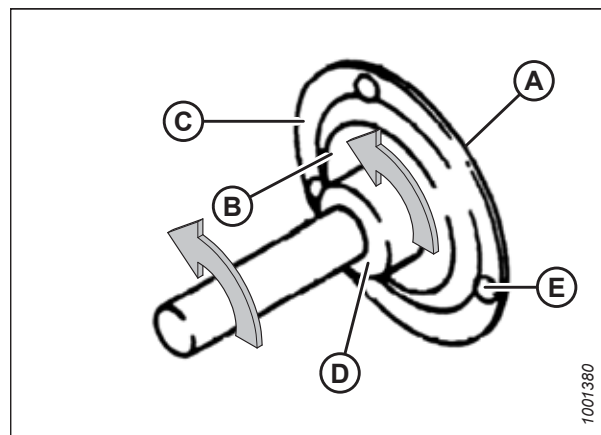


Figure 4.2: Sealed Bearing

4.3 Endshields

Single-knife headers are fitted with a hinged endshield on the left end of the header for easy access to the header drive. The right end is not hinged, but is still removable. Double-knife headers are fitted with hinged endshields on both ends of the header.

4.3.1 Opening Hinged Endshield

Hinged header endshields can be opened to provide access to the components within.

1. To open a hinged header endshield, press against the latch in the opening at location (A) on the inboard side of the endsheet.



Figure 4.3: Inboard Side of Left Endsheat

2. Pull the endshield away from the header, and swing it out and back behind the endsheet until latch (A) engages the hook on the endsheet.

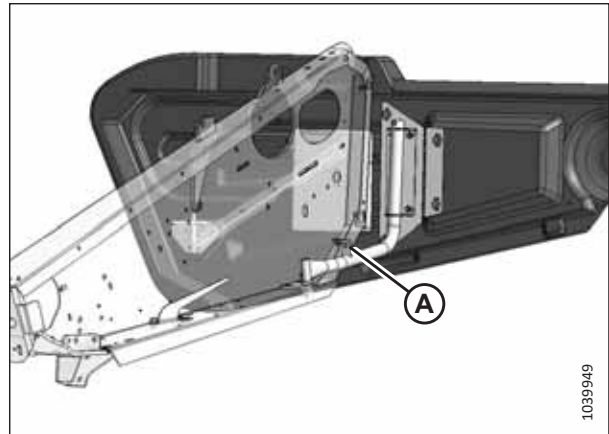


Figure 4.4: Open Endsheat

4.3.2 Closing Hinged Endshields

The header endshields cover components. After accessing the components you will need to close the endshield.

1. Lift latch (A) to allow the endshield to move.

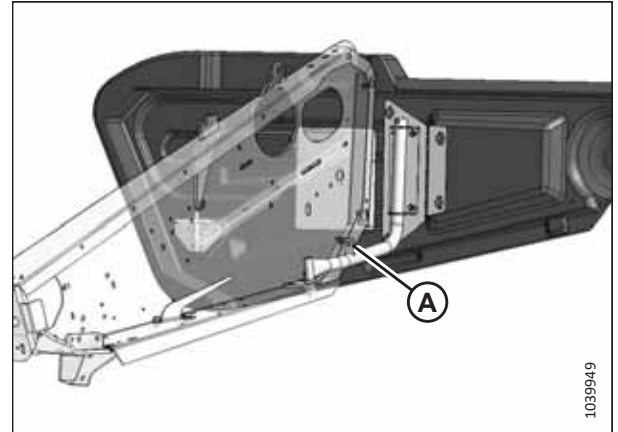


Figure 4.5: Open Endshield

2. Swing the endshield forward until the front engages crop divider (A).



Figure 4.6: Left Endshield

3. Push the endshield in at location (A), opposite the latch. The endshield will self-latch.



Figure 4.7: Left Endshield

4.3.3 Adjusting Hinged Endshield

Polyethylene endshields expand or contract when subjected to large temperature changes. The position of the latch pin can be adjusted to compensate for dimensional changes.

1. Measure gap (X) between the front end of the endshield and the header frame and compare the measurement to the values provided in this table.

Table 4.1 Gap (X) Chart

Temperature °C (°F)	Gap (X) between Endshield and Frame mm (in.)
-4 (25)	28 (1 1/8)
7 (45)	24 (1)
18 (65)	20 (13/16)
29 (85)	16 (5/8)
41 (105)	12 (1/2)
52 (125)	8 (5/16)
63 (145)	4 (3/16)
89 (165)	0

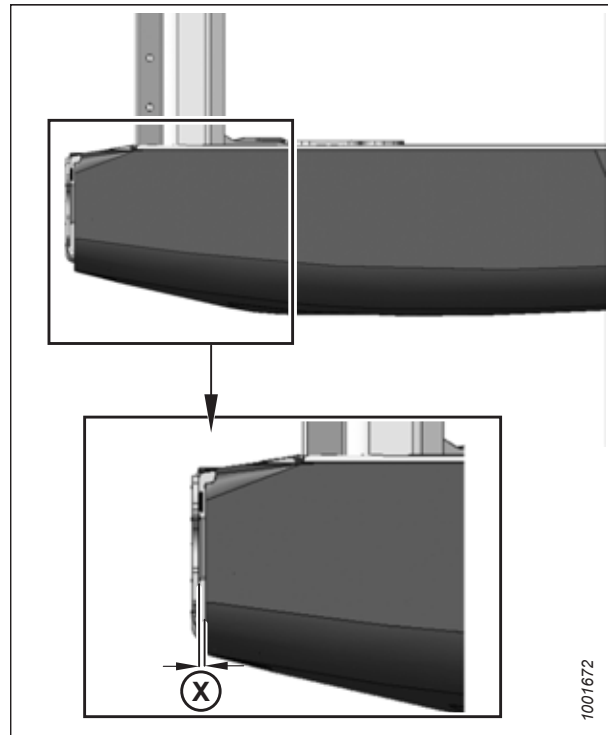


Figure 4.8: Gap Between Endshield and Frame

If adjustments are required, proceed as follows:

2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).



Figure 4.9: Left Endshield

3. Loosen bolts (A) on the support.

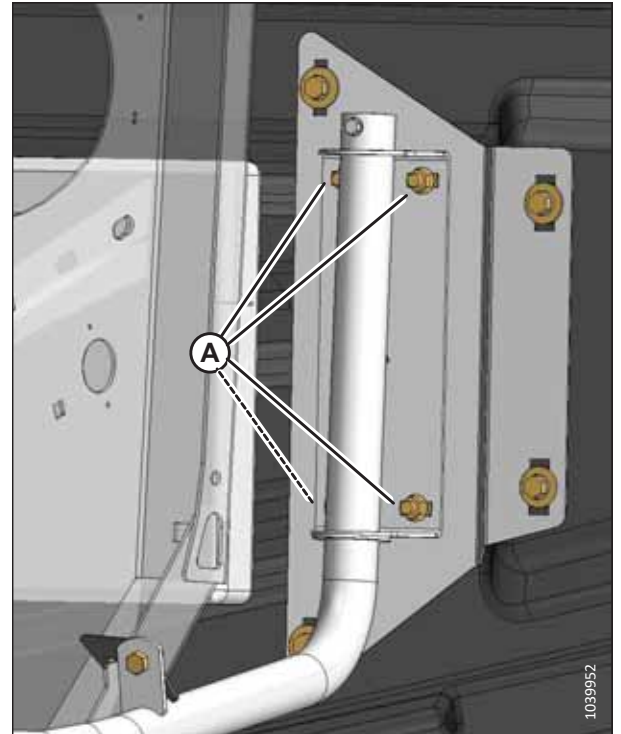


Figure 4.10: Endshield Support

4. Loosen bolts (A) on latch assembly (B).

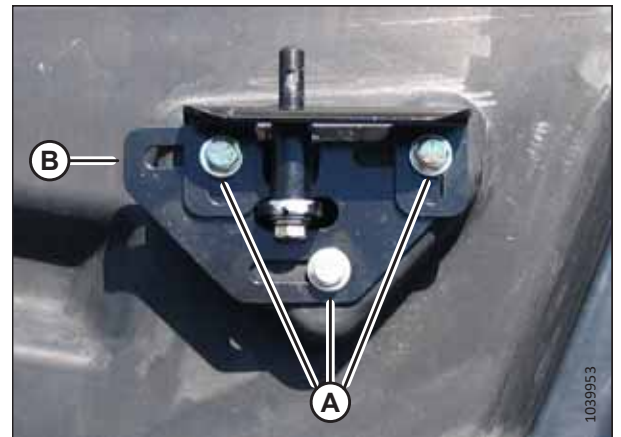


Figure 4.11: Latch Assembly

MAINTENANCE AND SERVICING

5. Close the endshield and adjust its position to achieve the desired gap between the front end of the endshield and the header frame.



Figure 4.12: Left Endshield

6. Re-open the endshield and tighten bolts (A).

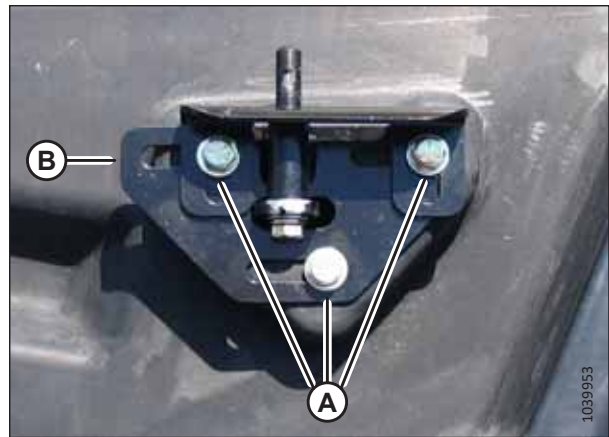


Figure 4.13: Latch Assembly

7. Tighten bolts (A).
8. Loosen bolts (B).

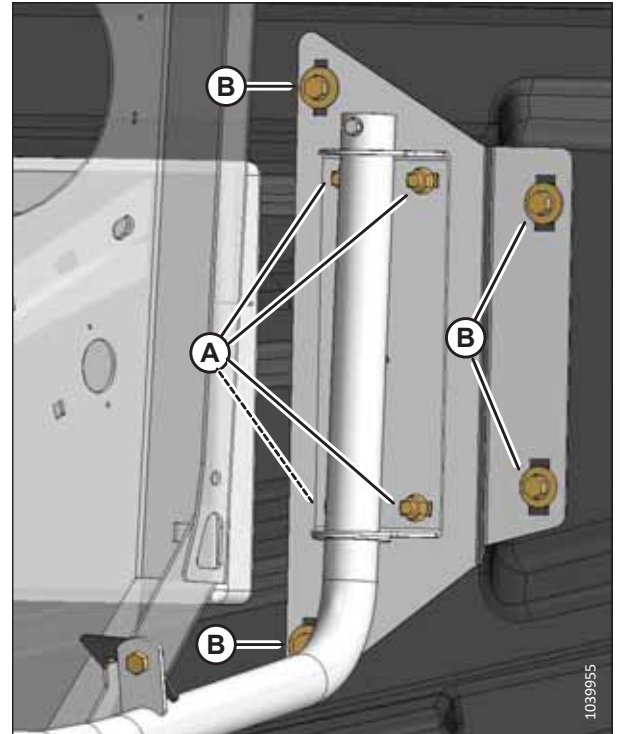


Figure 4.14: Endshield Support

9. Loosen bolts (A) on latch (B), and adjust the latch as required to achieve a snug fit between the aft end of the endshield and the header frame.
10. Tighten all bolts.
11. Close the endshield.

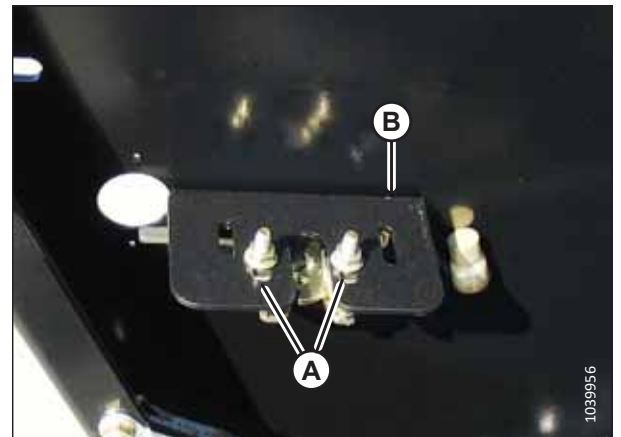


Figure 4.15: Latch

4.3.4 Removing Hinged Endshield

1. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield](#), page 116.



Figure 4.16: Left Endshield

2. Remove screw (A) from the top of the endshield support tube.
3. Lift the endshield off the support tube.

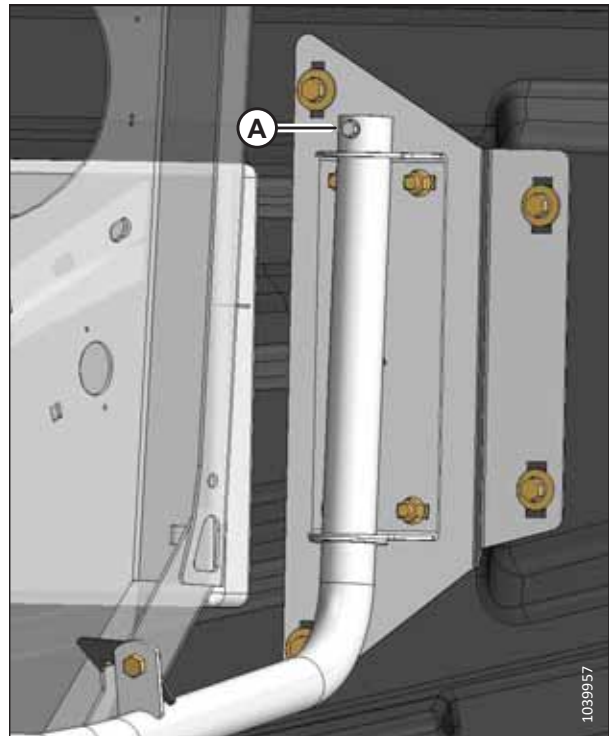


Figure 4.17: Endshield Support

4.3.5 Installing Hinged Endshield

1. Position the endshield on the support tube.
2. Secure in place with screw (A).

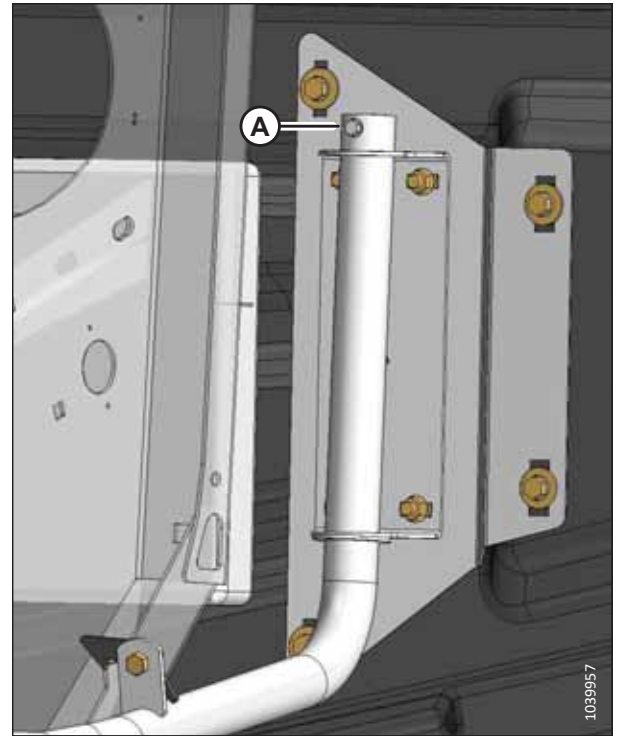


Figure 4.18: Endshield Support

3. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).



Figure 4.19: Left Endshield

4.3.6 Removing Non-Hinged Endshields

The non-hinged header endshields cover components. To access the components, you will need to remove the endshields.

1. To open the endshield, press against the latch in the opening at location (A) on the inboard side of the endsheet.



Figure 4.20: Inboard Side of Endsheets

2. Lift the endshield up, then pull it out and back.



Figure 4.21: Endshield Removed

4.3.7 Installing Non-Hinged Endshields

1. Position the forward end of the endshield in crop divider (A), and then position the endshield over the endsheet. Pin (B) at the top of the endsheet must engage the endshield.

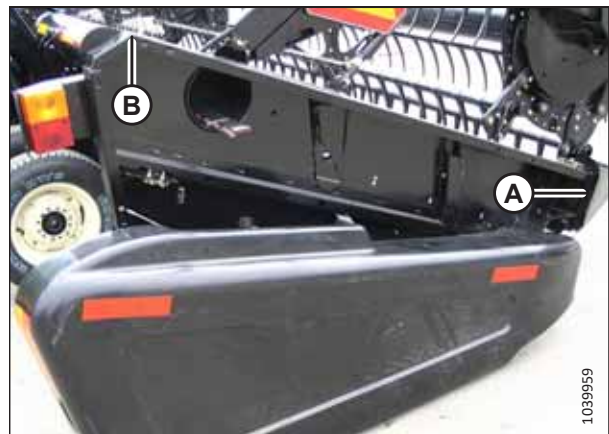


Figure 4.22: Endshield Installed

2. Push the endshield in at location (A), opposite the latch. The endshield will self-latch.



Figure 4.23: Right Endshield

4.3.8 Adjusting Non-Hinged Endshields

Polyethylene endshields expand or contract when subjected to large temperature changes. The position of the latch pin can be adjusted to compensate for dimensional changes.

1. Measure gap (X) between the front end of the endshield and the header frame and compare the measurement to the values provided in this table.

Table 4.2 Gap (X) Chart

Temperature °C (°F)	Gap (X) between Endshield and Frame mm (in.)
-4 (25)	28 (1 1/8)
7 (45)	24 (1)
18 (65)	20 (13/16)
29 (85)	16 (5/8)
41 (105)	12 (1/2)
52 (125)	8 (5/16)
63 (145)	4 (3/16)
89 (165)	0

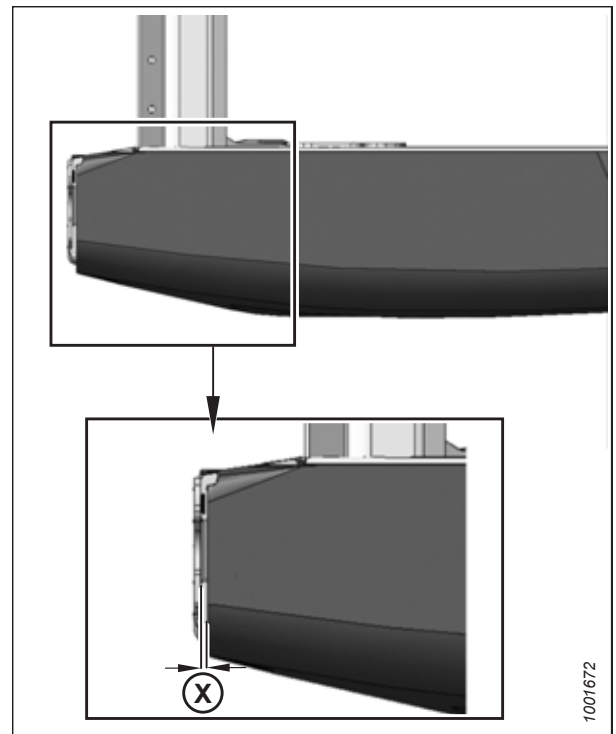


Figure 4.24: Gap Between Endshield and Frame

MAINTENANCE AND SERVICING

If adjustments are required, proceed as follows:

2. Remove the endshield. For instructions, refer to [4.3.6 Removing Non-Hinged Endshields](#), page 124.



Figure 4.25: Right Endshield

3. Loosen bolts (A) on latch assembly (B).

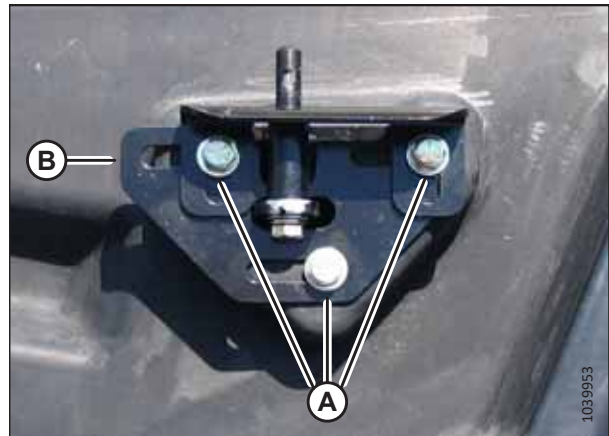


Figure 4.26: Latch Assembly

4. Close the endshield and adjust its position to achieve the desired gap between the front end of the endshield and the header frame.



Figure 4.27: Right Endshield

MAINTENANCE AND SERVICING

5. Re-open the endshield and tighten bolts (A).

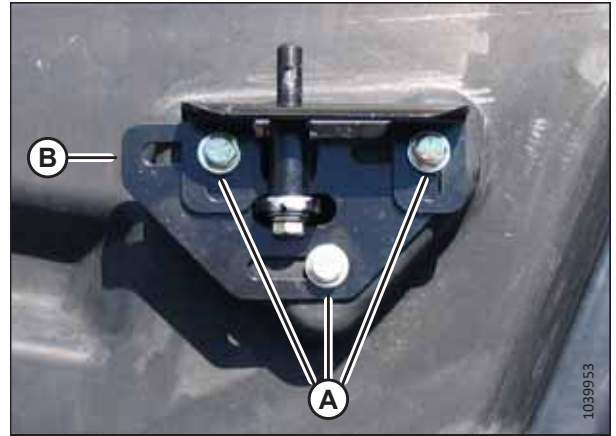


Figure 4.28: Latch Assembly

6. Loosen bolts (A) on latch (B), and adjust the latch as required to achieve a snug fit between the aft end of the endshield and the header frame.
7. Tighten bolts (A).
8. Close the endshield.

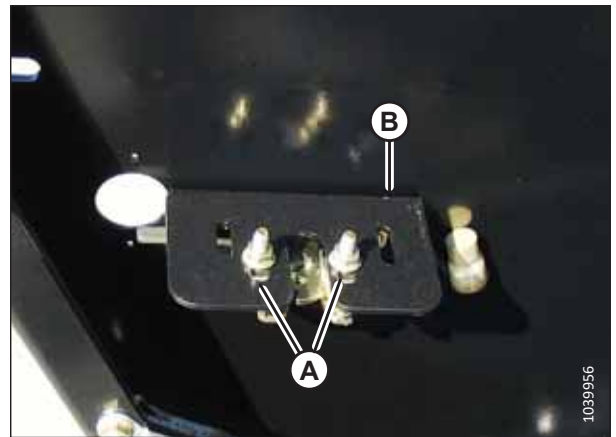


Figure 4.29: Latch

4.4 Lubrication

Some header components need to be lubricated periodically.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow the procedures in [4.1 Preparing Machine for Servicing, page 113](#).

Refer to the inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. For the maintenance schedule, refer to [4.12.3 Maintenance Record, page 243](#).

4.4.1 Lubricating Header

Greasing points are marked on machine by decals showing a grease gun and grease interval in hours of operation. Master grease point location decals are provided on header.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Refer to the inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. Refer to [4.12.3 Maintenance Record, page 243](#).

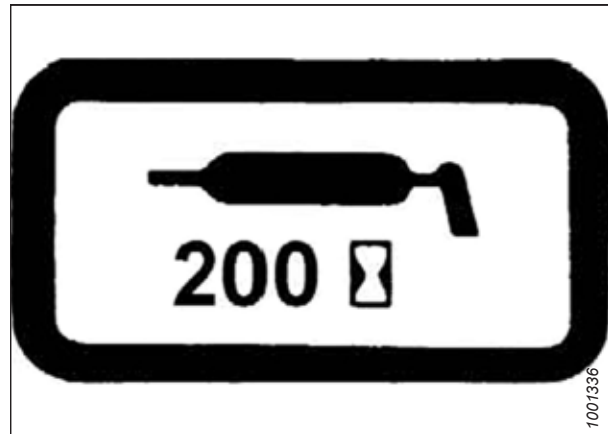


Figure 4.30: Greasing Interval Decal

1. Wipe the grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
2. Inject grease through the fitting with grease gun until grease overflows the fitting (except where noted).
3. Leave excess grease on the fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. Remove and thoroughly clean any fitting that will not take grease. Also clean the lubricant passageway. Replace fitting if necessary.
6. Use high temperature, extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

4.4.2 Service Intervals

Refer to the illustrations on the following pages to identify the various locations that require lubrication and servicing. Illustrations are organized by the frequency of service.

IMPORTANT:

Unless otherwise specified, use high temperature extreme pressure (EP2) performance with 1% maximum molybdenum disulphide (NLGI grade 2) lithium base.

Knife (except in sandy conditions):

Lubricate every 10 hours or daily.

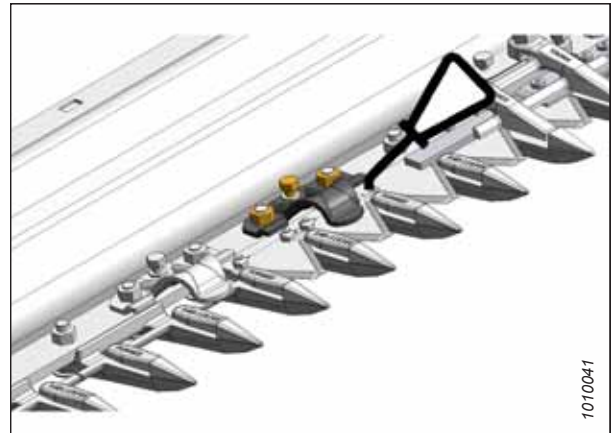


Figure 4.31: Every 10 Hours or Daily

Knifehead:

Lubricate every 25 hours.

IMPORTANT:

To prevent binding and/or excessive wear caused by knife pressure on the guards, do **NOT** overgrease knifehead (A). Apply only one to two pumps using a mechanical grease gun. Do **NOT** use an electric grease gun. If more than six to eight pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead. For instructions, refer to [4.7.3 Removing Knifehead Bearing, page 142](#).

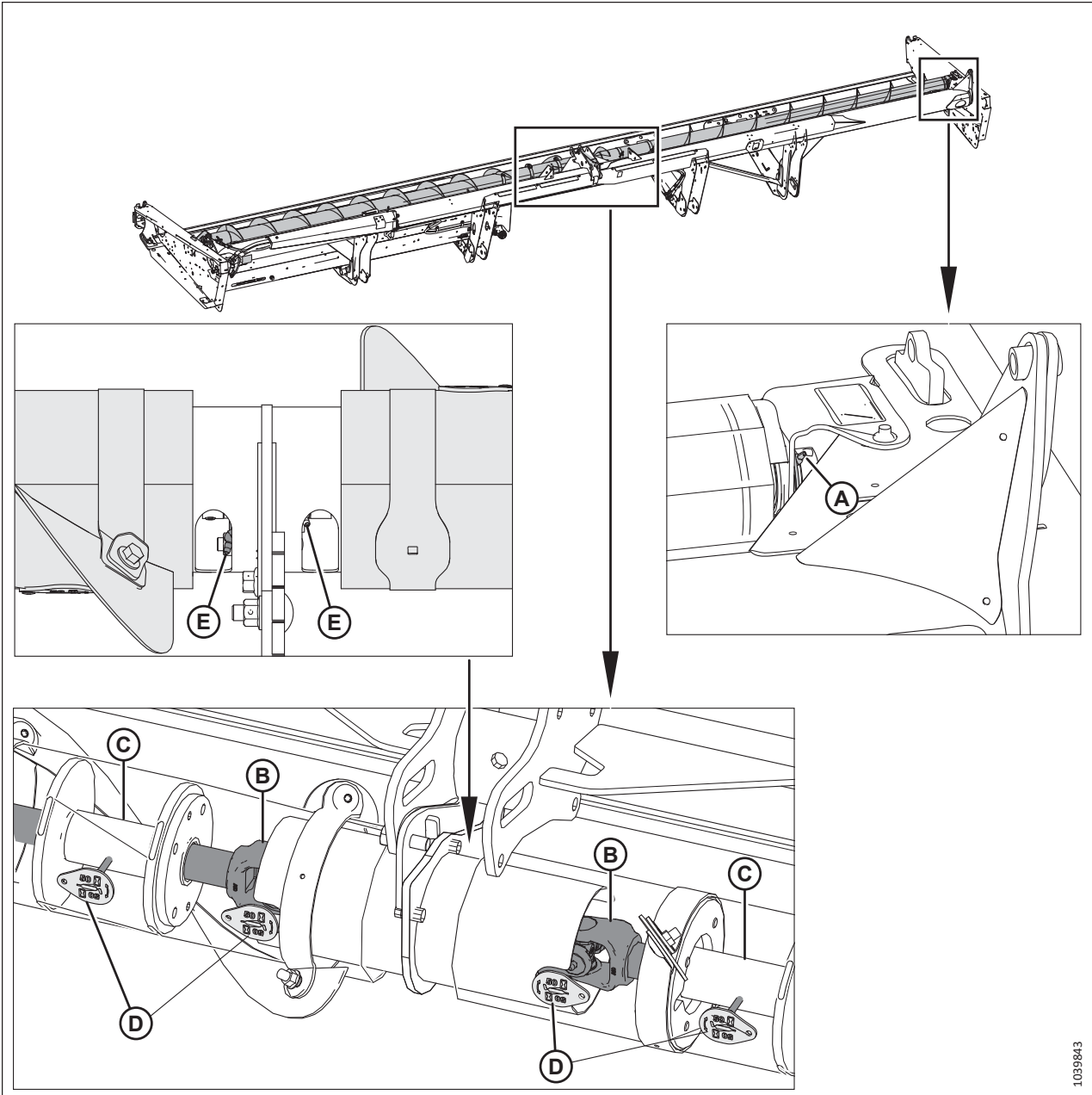
NOTE:

After greasing, run the header and check if the first few knife guards feel excessively hot. If the knife guards are too hot, relieve knife pressure on the guards by pressing the check-ball in the grease fitting.



Figure 4.32: Every 25 Hours

A - Knifehead (Single Knife [1 Place]; Double Knife [2 Places])



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Figure 4.33: Every 50 Hours – Upper Cross Auger, New Assembly

- A- Right End Bearing
- B - Two-Piece Auger Only: Upper Cross Auger U-joints [Two places, accessible by opening cover (D)]
- C - Two-Piece Auger Only: Upper Cross Auger Sliding Hubs [Two places, accessible by opening cover (D)]
- E - Two-Piece Auger Only: Upper Cross Auger Center Bearings (Two Places)

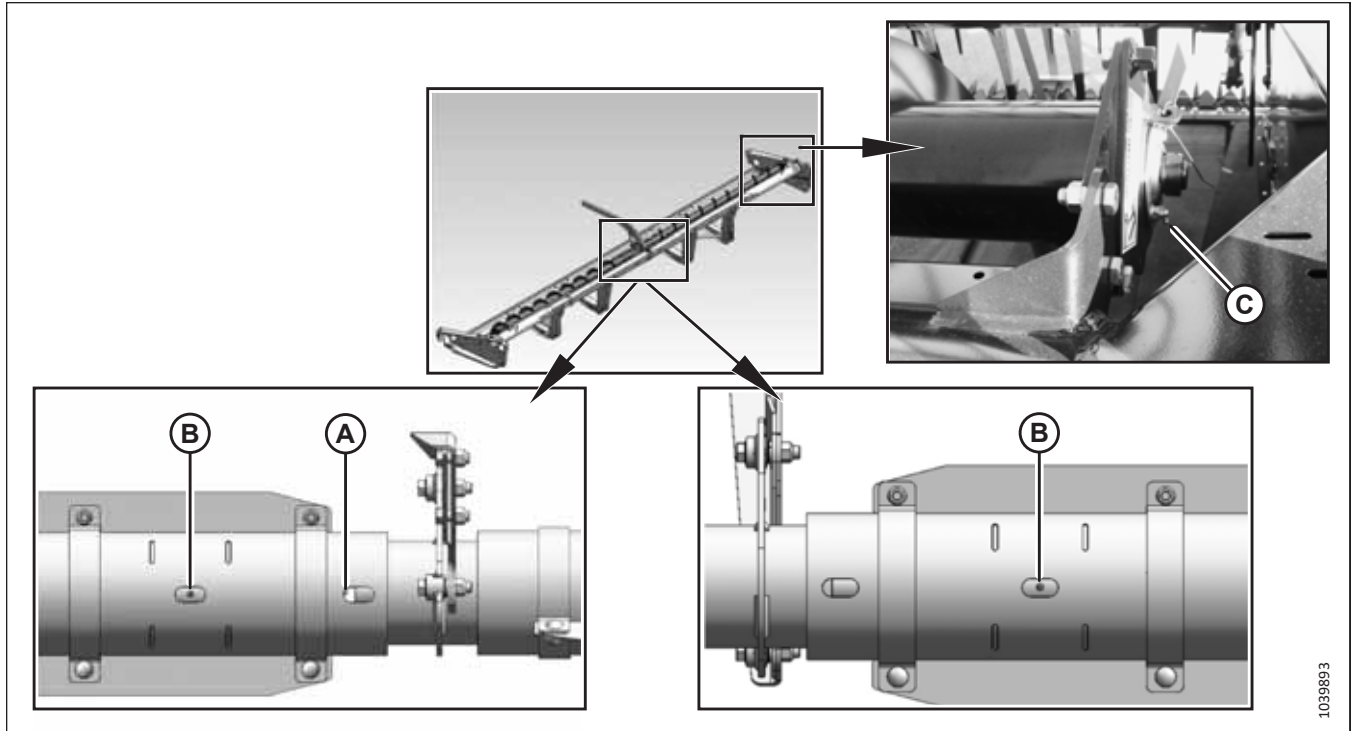
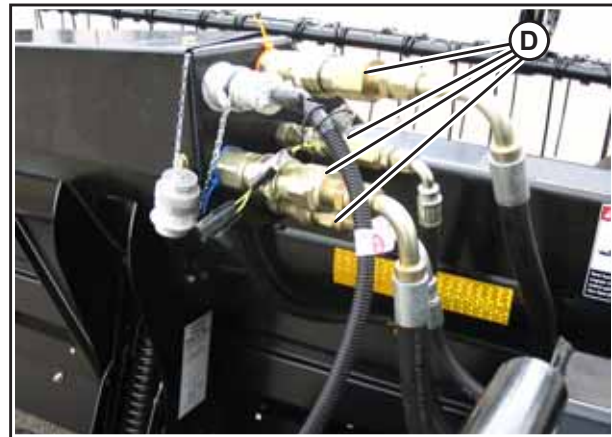
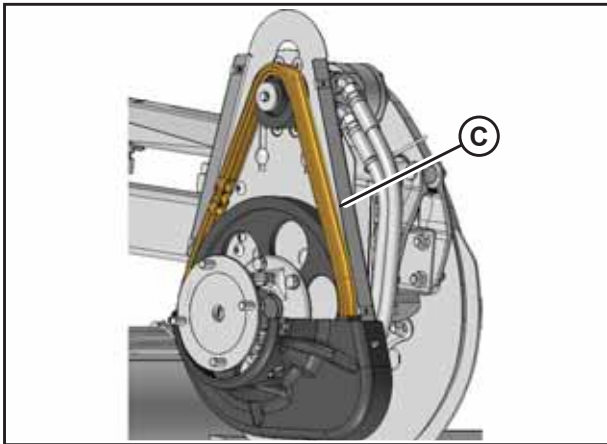


Figure 4.34: Every 50 Hours – Upper Cross Auger, Old Assembly

A - Upper Cross Auger U-joint¹
C - Right End Bearing

B - Upper Cross Auger Bearing (2 Places)

1. The U-joint has a cross and bearing kit with an extended lubrication interval. Stop greasing when greasing becomes difficult or if the U-joint stops taking grease. Overgreasing will damage the U-joint. Six to eight pumps are sufficient at first grease (factory). Decrease the grease interval (i.e., grease more often) as the U-joint wears and requires more than six pumps.



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Figure 4.35: Every 100 Hours

A - Knife Drive Box (Check Oil Level Between Lower Hole and End of Dipstick [B])
D - Hydraulic Couplers (Use WD40® or Equivalent)

C - Reel Drive Chain (1 Place) (Double Reel Shown – Single Reel Similar)

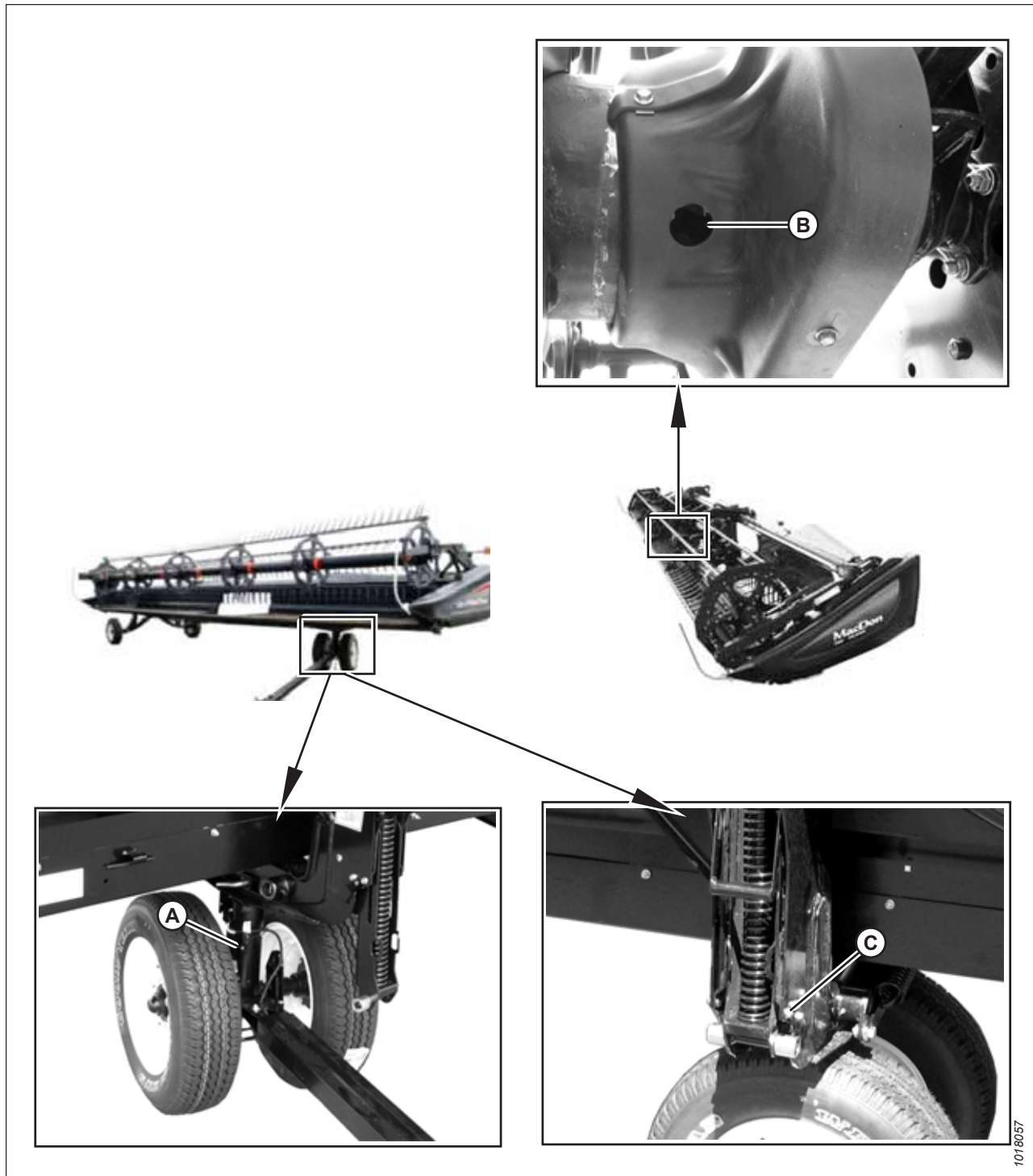


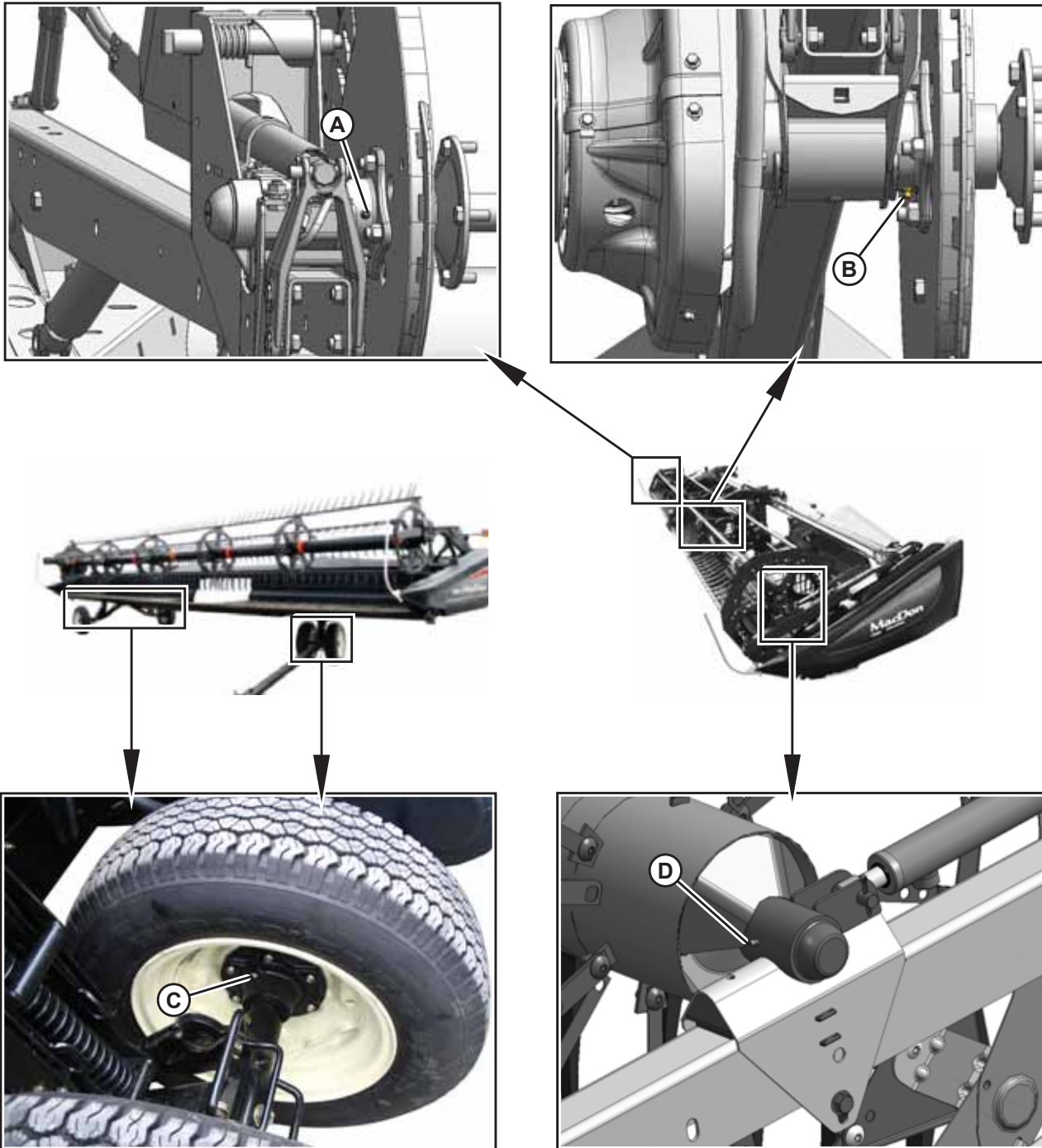
Figure 4.36: Every 250 Hours (Continued)

A - Front Wheel Pivot (1 Place)

B - Double Reel U-Joint (1 Place)²

C - Frame/Wheel Pivot (1 Place) - Both Sides

2. The U-joint has a cross and bearing kit with an extended lubrication interval. Stop greasing when greasing becomes difficult or if the U-joint stops taking grease. Overgreasing will damage the U-joint. Six to eight pumps are sufficient at first grease (factory). Decrease the grease interval (i.e., grease more often) as the U-joint wears and requires more than six pumps.



1010062

Figure 4.37: Every 500 Hours

A - Reel Right Bearing (1 Place)
C - Wheel Bearings (4 Places)

B - Reel Center Bearing (1 Place)
D - Reel Left Bearing (1 Place)

4.5 Hydraulic Schematics

Refer to the schematics that applies to your machine.

4.5.1 D50 or D60 Single-Reel Header

This schematic can be used to troubleshoot hydraulic problems on your D50 or D60 single-reel header.

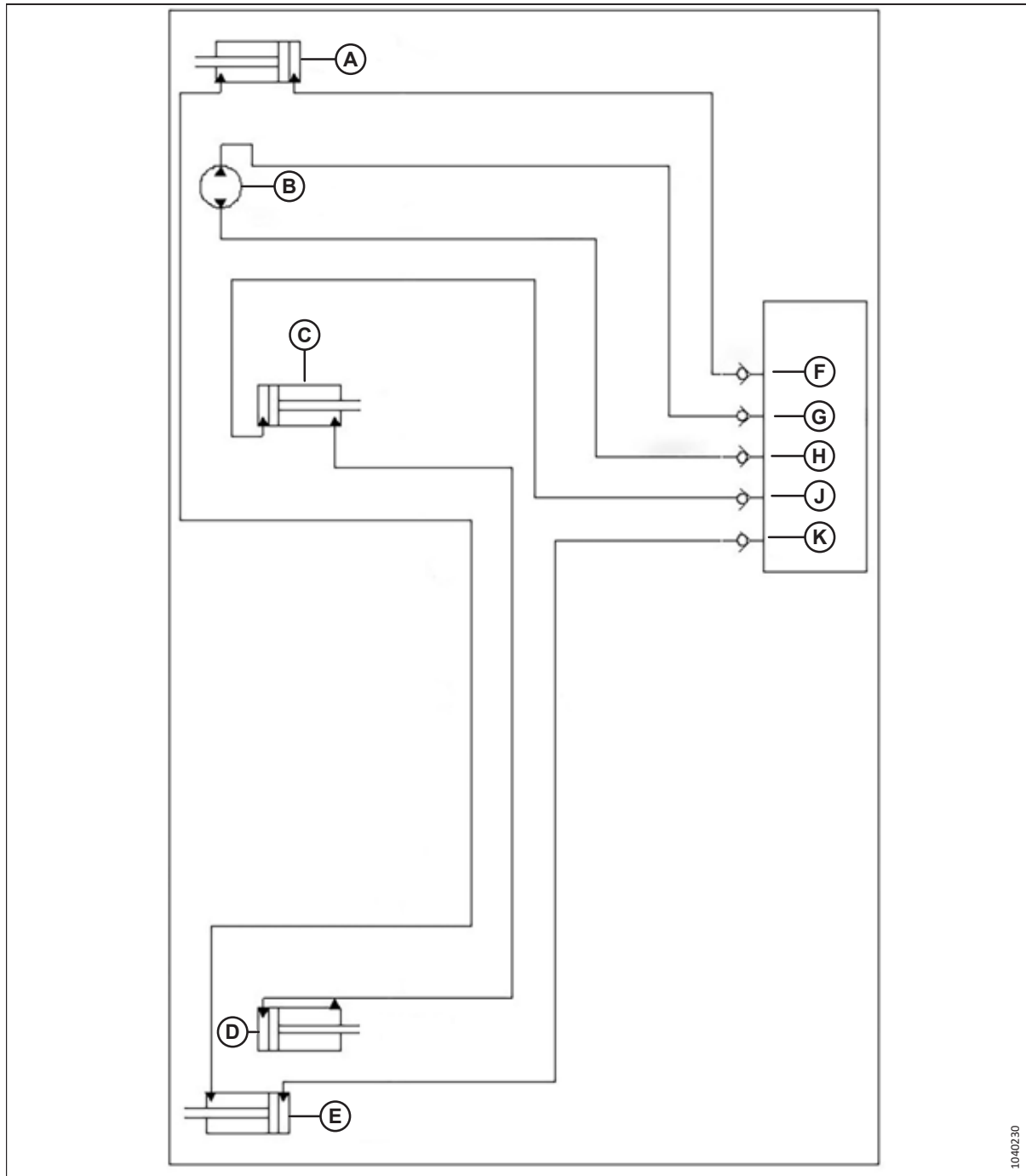


Figure 4.38: Hydraulic Schematic for a D50 or D60 Single-Reel Header

A - Right Fore-Aft Cylinder

D - Left Lift Cylinder

G - Pressure

K - Fore

B - Reel Motor

E - Left Fore-Aft Cylinder

H - Return

C - Right Lift Cylinder

F - Aft

J - Lift

4.5.2 D50 Single-Knife Header with Manual Deck Shift

This schematic can be used to troubleshoot hydraulic problems on your D50 single-reel header with manual deck shift, with or without an upper cross auger.

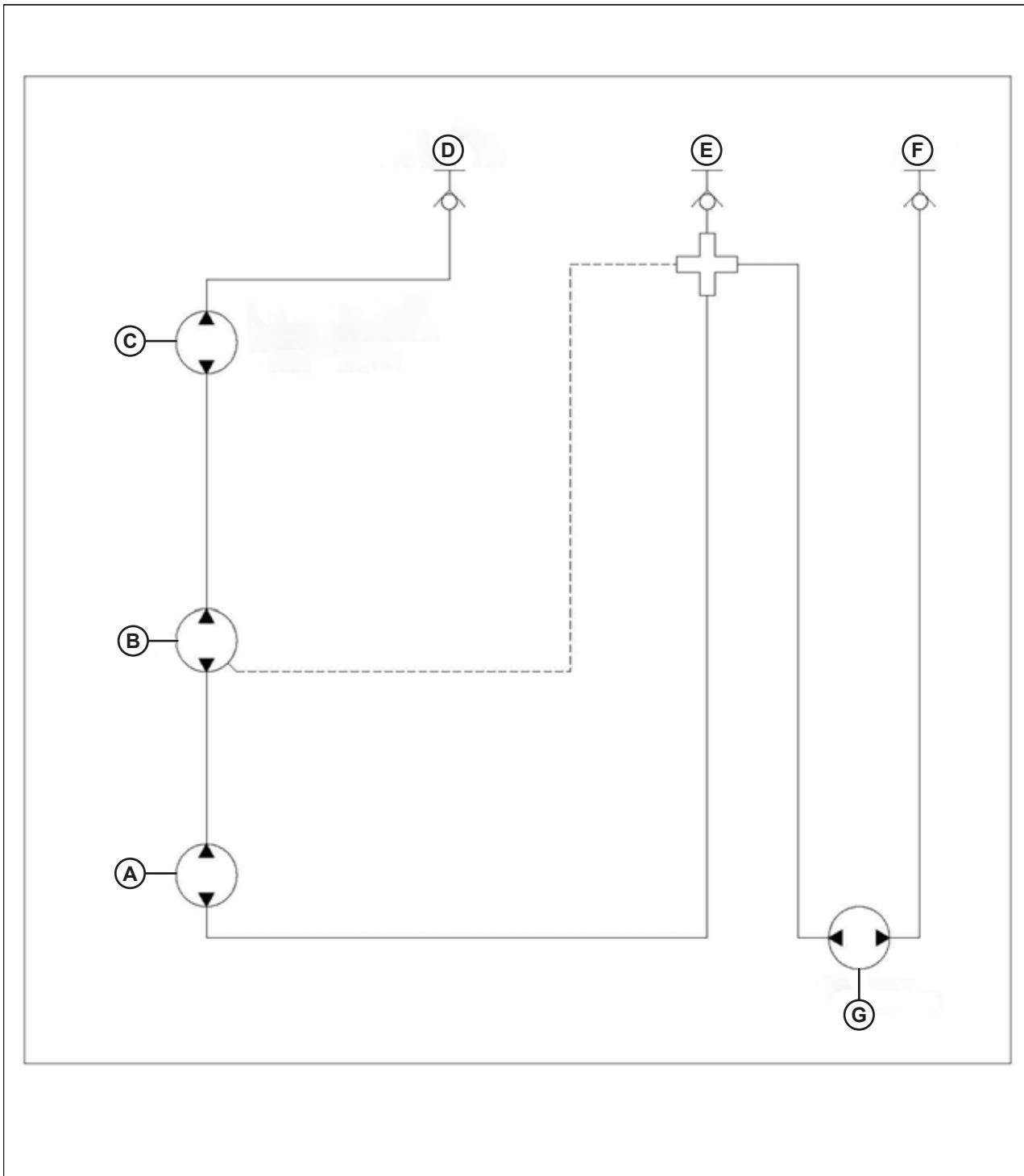


Figure 4.39: Hydraulic Schematic for a D50 Single-Knife Header with Manual Deck Shift

A - Right Draper Motor

B - Left Draper Motor

C - Upper Cross Auger (if Installed)

D - Draper Pressure

E - Return

F - Knife Pressure

G - Left Knife Drive Motor

4.5.3 D60 Double-Reel Header

This schematic can be used to troubleshoot hydraulic problems on your D60 double-reel header.

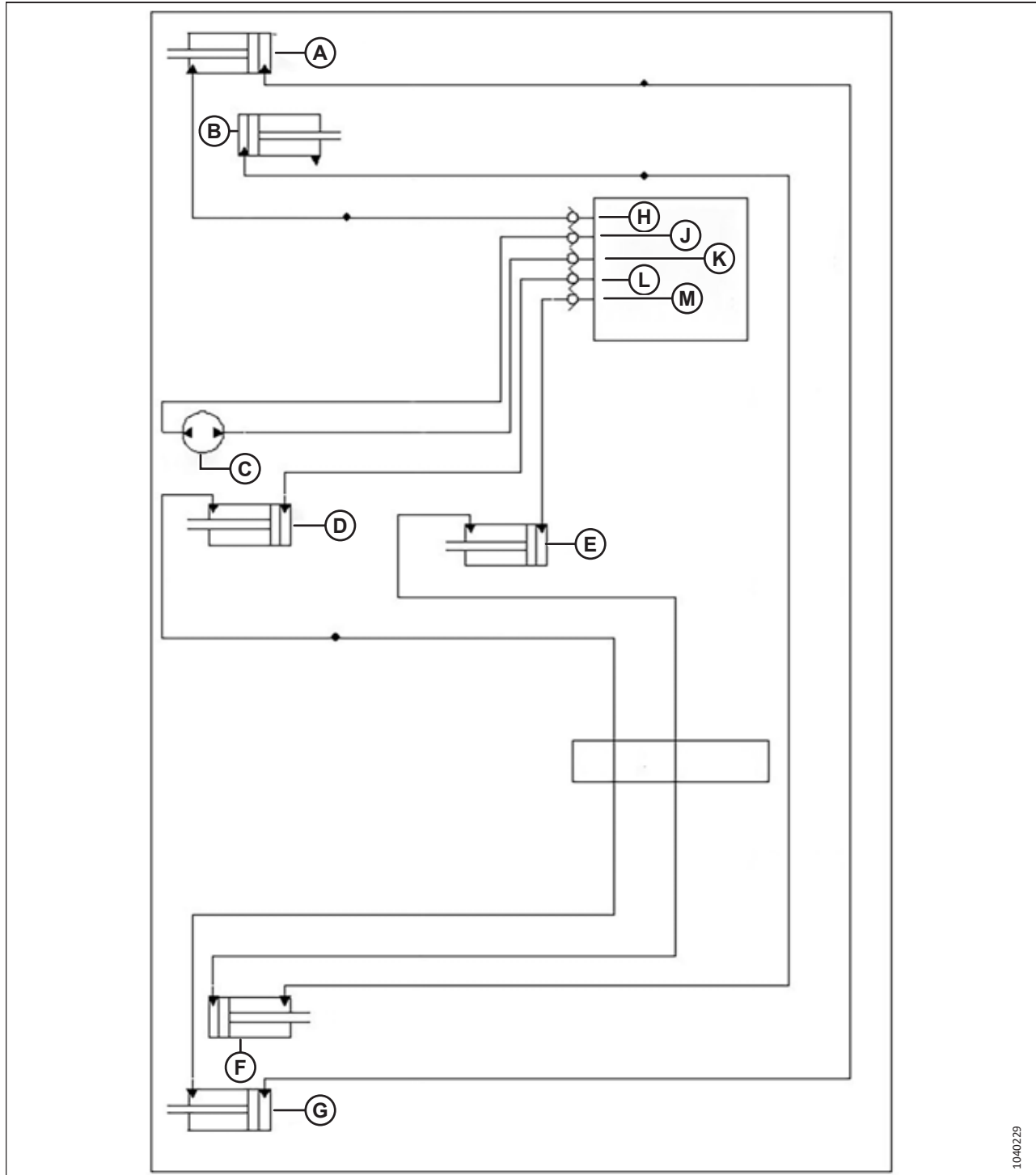


Figure 4.40: Hydraulic Schematic for a D60 Double-Reel Header

A - Right Fore-Aft Cylinder
D - Center Fore-Aft Cylinder
G - Left Fore-Aft Cylinder

B - Right Lift Cylinder
E - Center Lift Cylinder
L - Aft Coupler

C - Reel Motor
F - Left Lift Cylinder
M - Lift Coupler

4.5.4 D60 Double-Knife Header with Hydraulic Deck Shift

This schematic can be used to troubleshoot hydraulic problems on your D60 double-knife header with hydraulic deck shift, and with or without an upper cross auger.

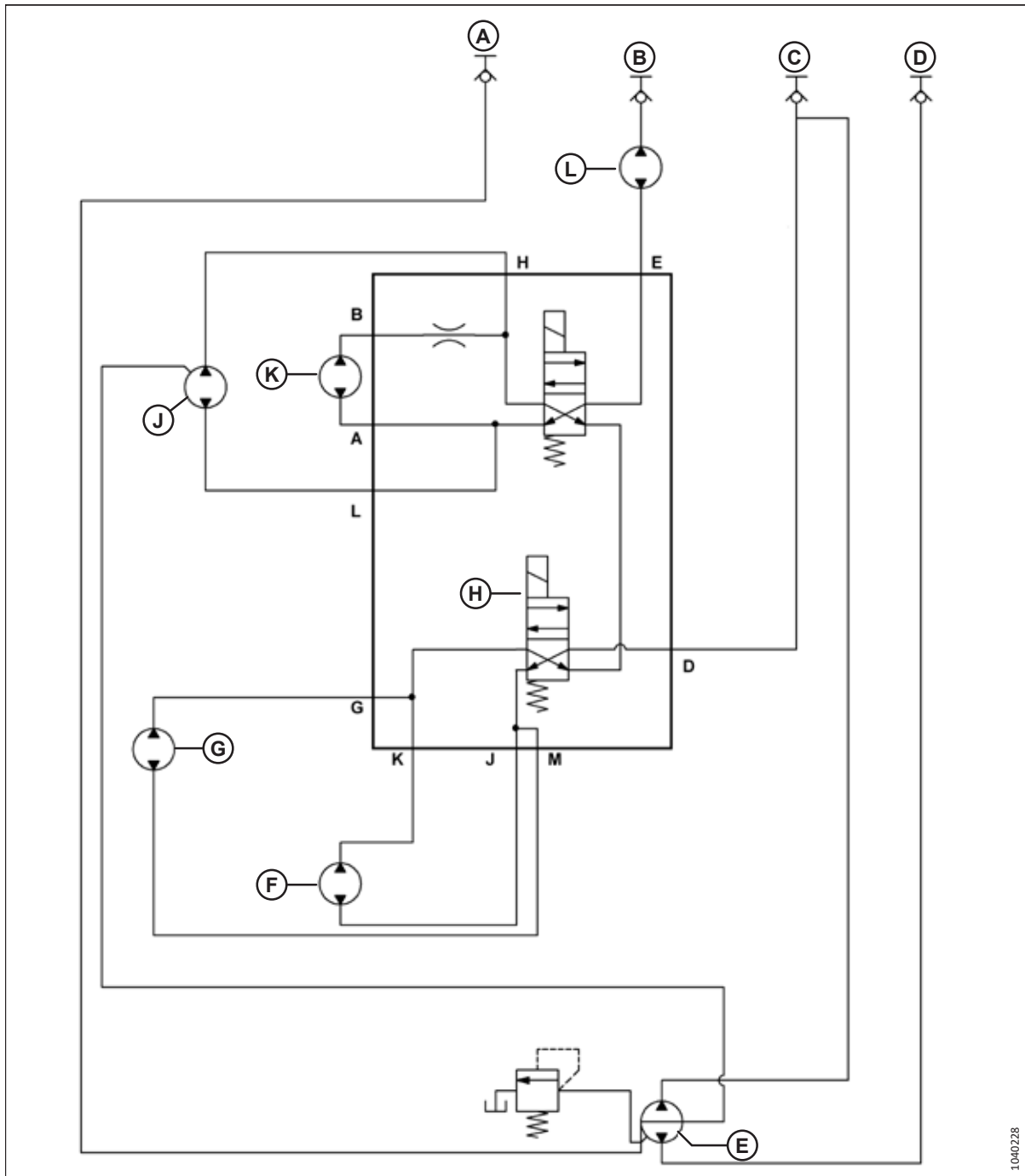


Figure 4.41: Hydraulic Schematic for a D60 Double-Knife Header with Hydraulic Deck Shift

- | | | |
|-------------------------------------|--|--------------------------------------|
| A - Case Drain | B - Draper Pressure | C - Return |
| D - Knife Pressure | E - Knife Drive Motor | F - Right Hydraulic Deck Shift Motor |
| G - Right Draper Motor | H - Four-Way Valve | J - Left Draper Motor |
| K - Left Hydraulic Deck Shift Motor | L - Upper Cross Auger Motor (if Installed) | |

4.6 Electrical System

The electrical wires and connectors that connect the header lights should be secured to avoid damage.

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing. Keep lights clean and replace defective bulbs.

4.6.1 Replacing Light Bulbs

If a light bulb on the header is burnt out or damaged, it will need to be replaced.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Use a Phillips screwdriver to remove screws (A) from the fixture and remove the plastic lens.
3. Push and twist light bulb to remove from socket.
4. Install new bulb in socket ensuring that bulb base is properly engaged in socket.
 - Use Bulb Trade #1156 for amber lights
5. Reinstall lens with screws (A).

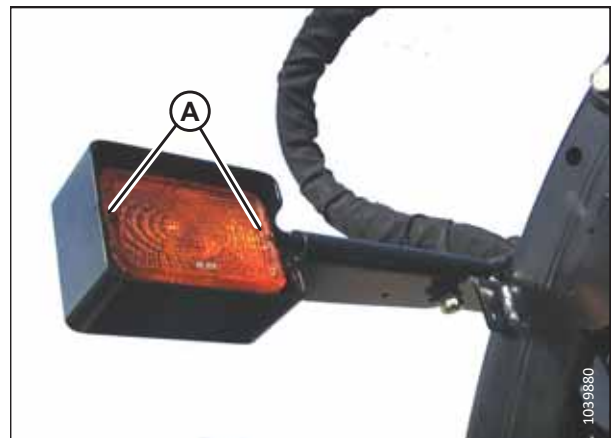


Figure 4.42: Amber Light

4.7 Cutterbar

The cutterbar is located on the front of the header. It supports the knife and guards which are used to cut the crop.

WARNING

Keep hands clear of the area between guards and knife at all times.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [4.1 Preparing Machine for Servicing, page 113](#).

CAUTION

Wear heavy gloves when working around or handling knives.



Figure 4.43: Cutterbar Hazard

4.7.1 Replacing Knife Section

Inspect the knife sections daily and ensure they are firmly bolted to the knife back and are not worn or damaged (worn or damaged sections leave behind uncut plants). Worn or damaged sections can be replaced without removing the knife from the cutterbar.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

Wear heavy gloves when working around or handling knives.

NOTE:

Coarse serrated knife sections last longer than fine serrated sections in dirty or sandy conditions. Fine serrated knife sections perform better in fine-stemmed grasses and plants that contain more fibrous stems.

1. Shut down the engine, and remove the key from the ignition.
2. Stroke the knife as required to center knife section (A) between the guards.
3. Remove nuts (B).
4. Remove the bars and lift the knife section off the knife bar.
5. Remove splice bar (C) if the knife section is under the bar.
6. Clean any dirt off the knife back and position the new knife section onto the knife bar.

IMPORTANT:

Do **NOT** mix fine and coarse sections on the same knife.

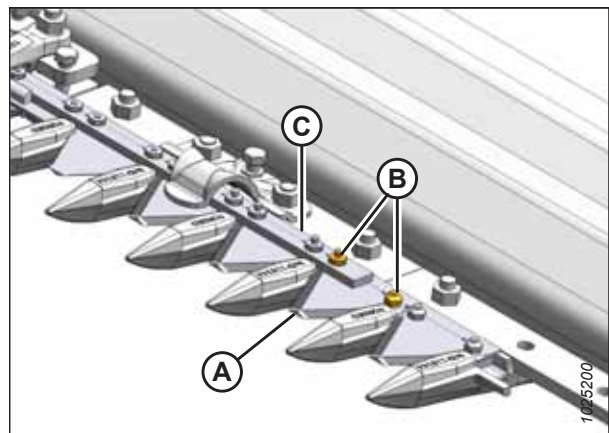


Figure 4.44: Knife Bar

7. Reposition bars (C) and/or (D) on knife (A) and install lock nuts (B).

NOTE:

If replacing screws, ensure they are fully inserted. Do **NOT** use nuts to draw screws into the knife bar.

8. Torque the nuts to 9.5 Nm (84 lbf-in).

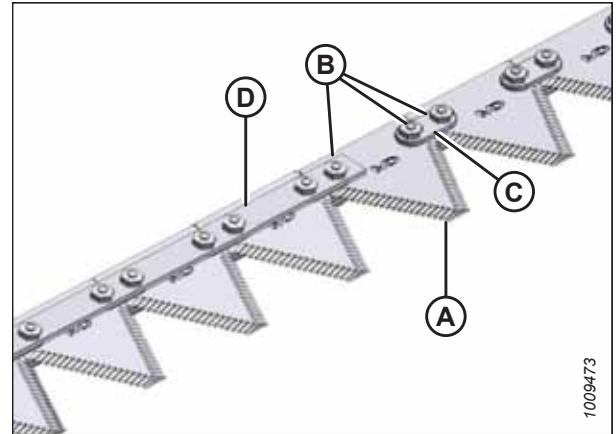


Figure 4.45: Knife Bar

4.7.2 Removing Knife

The cutterbar knife is designed to easily be replaced if worn or damaged. A spare knife can be stored in the header frame tube.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.



WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from the cutting edges. Wear heavy gloves when handling a knife.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the windrower operator's manual.
4. Stroke the knife manually to its outer limit.
5. Clean the area around the knifehead.
6. Remove bolt (A).
7. Remove grease fitting (B) from the pin.
8. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
9. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
10. Push the knife assembly inboard until it is clear of the output arm.
11. Seal the knifehead bearing with plastic or tape unless it is being replaced.

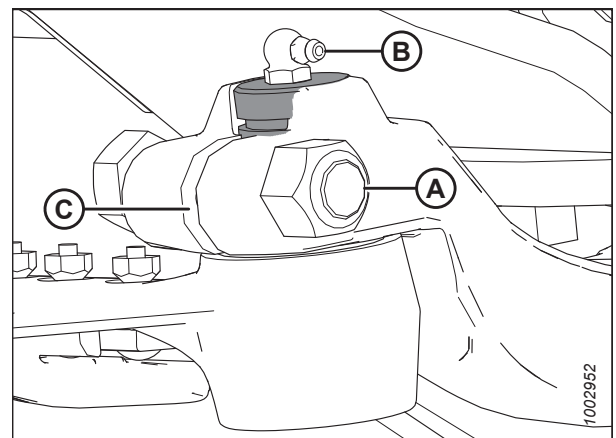


Figure 4.46: Knifehead

12. Wrap a chain around the knifehead and pull out the knife.

4.7.3 Removing Knifehead Bearing

The knifehead bearing, seals, and greasing interval protect the knifehead from the forces of the knife drive output arm. The seals and bearing require inspection and, when worn—replacement to prevent damage.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from the cutting edges. Wear heavy gloves when handling a knife.

IMPORTANT:

Repeat this procedure for each knife.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the knife. For instructions, refer to [4.7.2 Removing Knife, page 141](#).

NOTE:

Because the bearing is being replaced, it is not necessary to wrap the knifehead to protect the bearing.

3. Use a flat-ended tool with the same approximate diameter as pin (A), and tap seal (B), bearing (C), plug (D), and O-ring (E) from the underside of the knifehead.

NOTE:

Seal (B) can be replaced without removing the bearing. When changing the seal, check the pin and needle bearing for wear and replace if necessary.

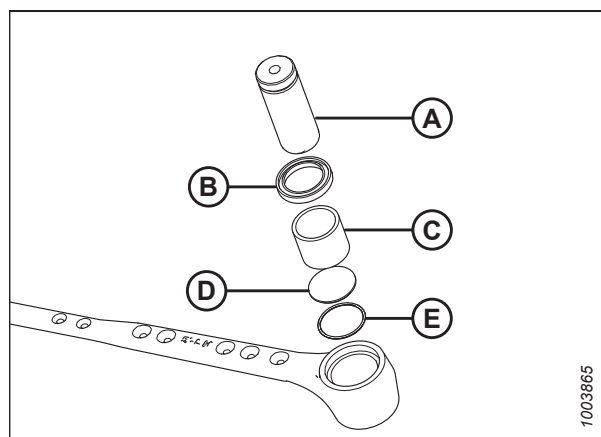


Figure 4.47: Knifehead Bearing Assembly

4.7.4 Installing Knifehead Bearing

The knifehead bearing, seals, and greasing interval protect the knifehead from the forces of the knife drive output arm. The seals and bearing require inspection and, when worn—replacement to prevent damage.

1. Place O-ring (E) and plug (D) into the knifehead.

IMPORTANT:

Install the bearing with the stamped end (the end with the identification markings) facing up.

NOTE:

It may be necessary to temporarily remove the grease fitting from the knifehead during installation of the knifehead pin. This will allow any trapped air to escape and the knifehead pin will seat correctly.

2. Use a flat-ended tool with the same approximate diameter as bearing (C), and push the bearing into the knifehead until the top of the bearing is flush with the step in the knifehead.
3. Install seal (B) into the knifehead with the lip facing outwards.

IMPORTANT:

To prevent premature knifehead or knife drive box failure, ensure there's a tight fit between knifehead pin (A) and the needle bearing, and also between the knifehead pin and the output arm.

4. Install the knife. For instructions, refer to [4.7.5 Installing Knife, page 143](#).

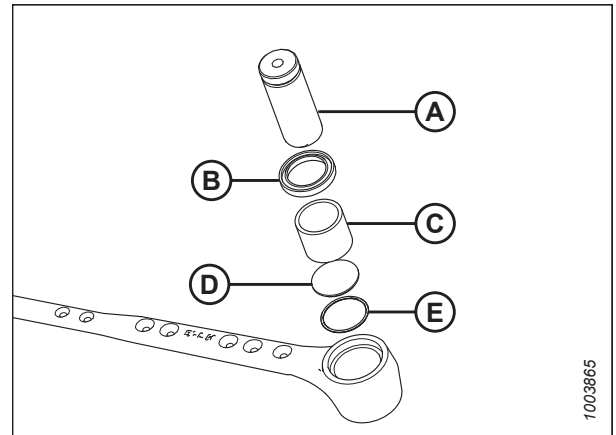


Figure 4.48: Knifehead Bearing Assembly

4.7.5 Installing Knife

The cutterbar knife is designed to easily be replaced if worn or damaged. A spare knife can be stored in the header frame tube.

! DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

! WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

1. Shut down the engine, and remove the key from the ignition.
2. Engage the header safety props. For instructions, refer to the windrower operator's manual.
3. Slide the knife into place and align the knifehead with the output arm.
4. For ease of removing or installing the knifehead pin, remove the grease fitting from the pin.

MAINTENANCE AND SERVICING

5. Install knifehead pin (A) through the output arm and into the knifehead. Tap knifehead pin (A) down, and make sure the pin is seated at the bottom of the knifehead.
6. Set groove (B) in the knifehead pin 1.5 mm (1/16 in.) above output arm (C). Secure it with 5/8 in. x 3 in. hex head bolt and nut (D), and torque the hardware to 217 Nm (160 lbf ft).
7. Using a feeler gauge, check that the gap at location (E) is 0.25 mm (0.01 in.).

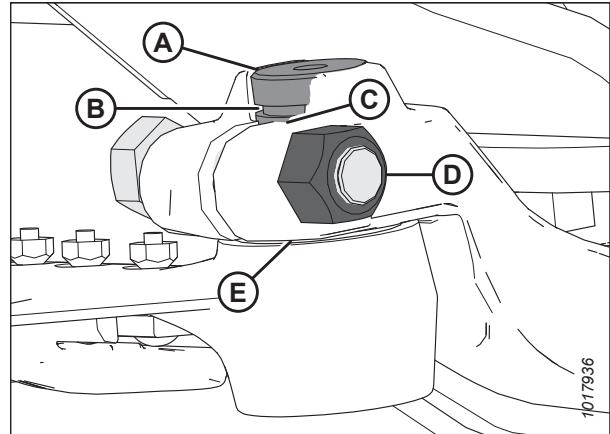


Figure 4.49: Knifehead

8. Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.

IMPORTANT:

Grease the knifehead just enough to start a slight downward movement. Overgreasing will lead to knife misalignment which causes the guards to overheat and the drive systems to overload.

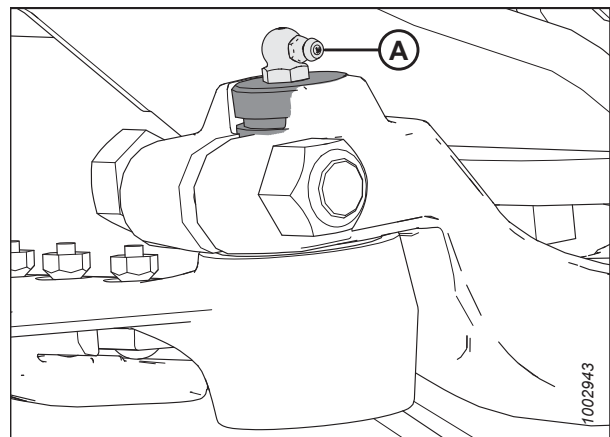


Figure 4.50: Knifehead

4.7.6 Spare Knife

A spare knife can be stored in the header frame tube at the left end of the header.

Ensure spare knife (A) is secured in place.



Figure 4.51: Spare Knife

4.7.7 Knife Guards

Perform **DAILY** inspections to ensure the knife guards are aligned and the knife sections are contacting the shear surfaces of the knife guards.

Adjusting Knife Guards

Bent knife guards may be able to be straightened with the optional guard straightening tool.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

Use guard straightening tool (MD #140135) available from your MacDon Dealer.

1. Shut down the engine, and remove the key from the ignition.
2. Position the tool as shown, and pull up to adjust the guard tips upwards.



Figure 4.52: Upward Adjustment

3. Position the tool as shown, and push down to adjust the guard tips downwards.

NOTE:

If you have trouble cutting tangled or fine-stemmed material, replace the lower guards with stub guards and install a knife hold-down on every guard. If the crop is difficult to cut, install stub guards with top guards and adjuster plates. A kit is available from your MacDon Dealer. For information, refer to [5.2.3 Stub Guard Conversion Kit](#), [page 248](#).

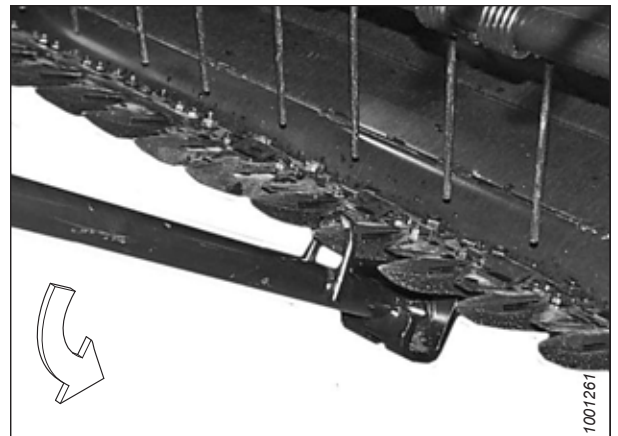


Figure 4.53: Downward Adjustment

Replacing Pointed Guards

To replaced pointed guards, perform the recommended replacement procedure provided here.

Replacing normal, drive side, and end guards

⚠ DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Stroke the knife manually until the knife sections are spaced midway between the guards.
3. Remove two nuts (B) and bolts attaching guard (A) and hold-down (C) (if applicable) to the cutterbar.
4. Remove guard (A), hold-down (C) (if applicable), and plastic wearplate (if installed).

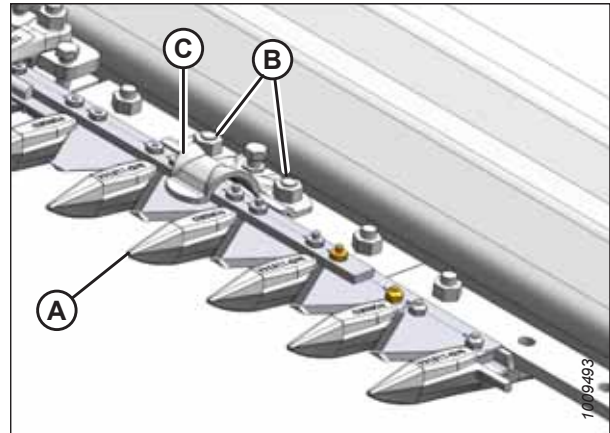


Figure 4.54: Pointed Guards

IMPORTANT:

At each end of the cutterbar, the first four guards (end guards [A] and drive side guards [B]) do **NOT** have ledger plates like standard guards (C). Ensure proper replacement guards are installed at these locations.

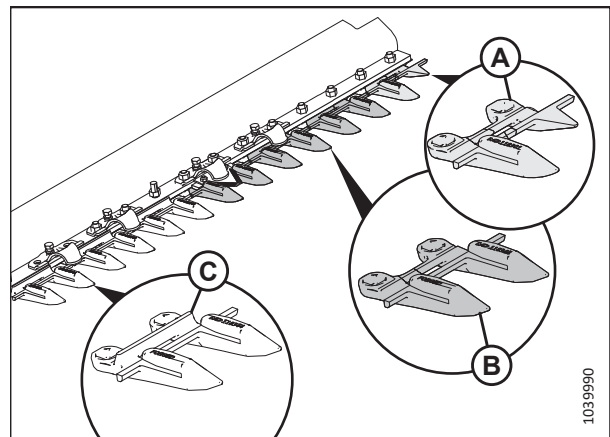


Figure 4.55: Pointed Guards – Left End of Cutterbar

A - Half Guard (End) B - Drive Side C - Normal

5. Position new guard (A), hold-down (C) (if applicable), and plastic wearplate (if applicable) onto the cutterbar. Secure with two nuts (B) and bolts, but do **NOT** tighten.
6. Check and adjust the clearance between the hold-downs and the knife. For instructions, refer to [Checking and Adjusting Knife Hold-Downs](#), page 151.

NOTE:

The guard at the center of a double-knife header (where the two knives overlap) requires a different replacement procedure. For instructions, refer to Steps 8, page 147 through 12, page 148.

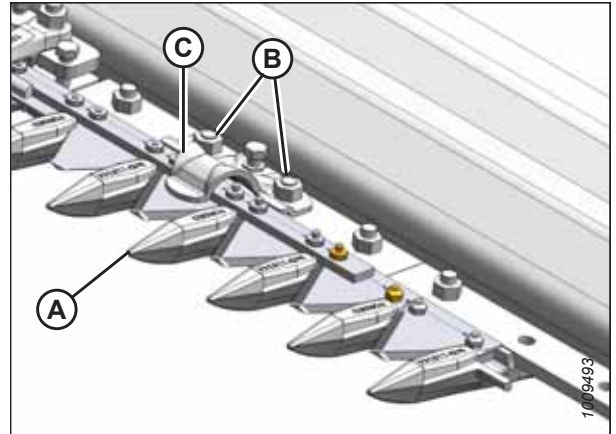


Figure 4.56: Pointed Guards

Replacing center guards

7. Shut down the engine, and remove the key from the ignition.
8. Remove two nuts (B) and bolts attaching guard (A) and hold-down (C) to the cutterbar.
9. Remove guard (A), plastic wearplate (if installed), hold-down (C), and adjuster bar (D).

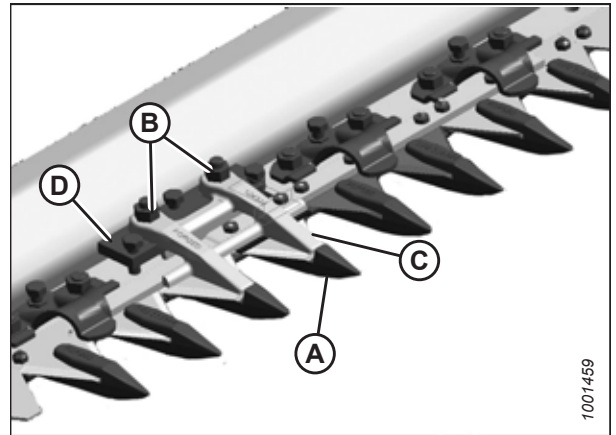


Figure 4.57: Center Guards

10. Position the plastic wearplate (if applicable), replacement center guard (A), adjuster bar, and hold-down (B) onto the cutterbar. Install bolts, but do **NOT** tighten.

IMPORTANT:

Ensure center guard (A) (right of the cutterbar split) has offset cutting surfaces.

IMPORTANT:

Hold-down (B) must accommodate the two overlapping knives at the center guard location. Ensure the proper replacement guard is installed at this location.

11. Check and adjust the clearance between the hold-down and knife. For instructions, refer to [Checking and Adjusting Knife Hold-Downs](#), page 151.

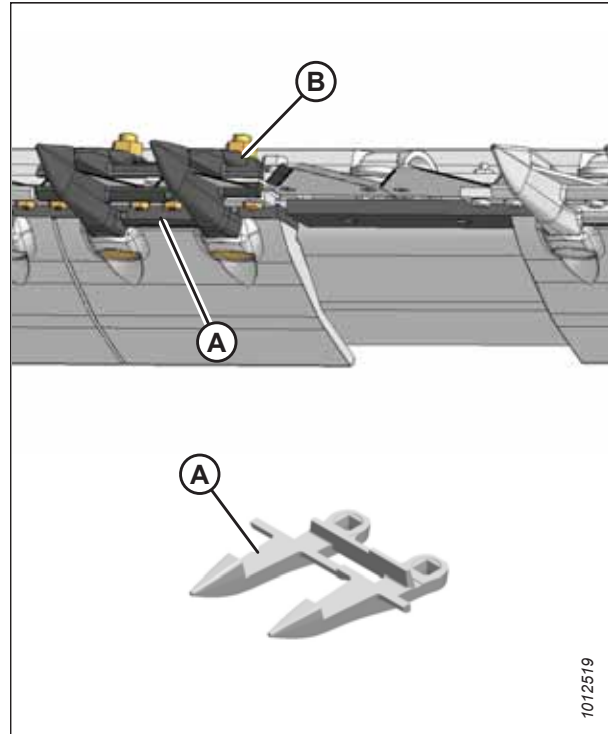


Figure 4.58: Center Guards

Replacing Stub Guards

Stub guards, complete with hold-downs and adjuster plates, are designed to cut tough crops Stub guards are available for 4.6– 7.6 m (15–25 ft.) D60 headers only.

Replacing normal, drive side, and end guards



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.

MAINTENANCE AND SERVICING

2. Stroke the knife manually until the knife sections are spaced midway between the guards.
3. Remove two nuts (A) and bolts attaching guard (B) and hold-down (C) to the cutterbar.
4. Remove guard (B), plastic wearplate (if installed), hold-down (C), and adjuster bar (D).

IMPORTANT:

Note the position of the miter on adjuster bar (D), and reinstall the adjuster bar in the same position. Mitters should **NOT** be adjacent to each other.

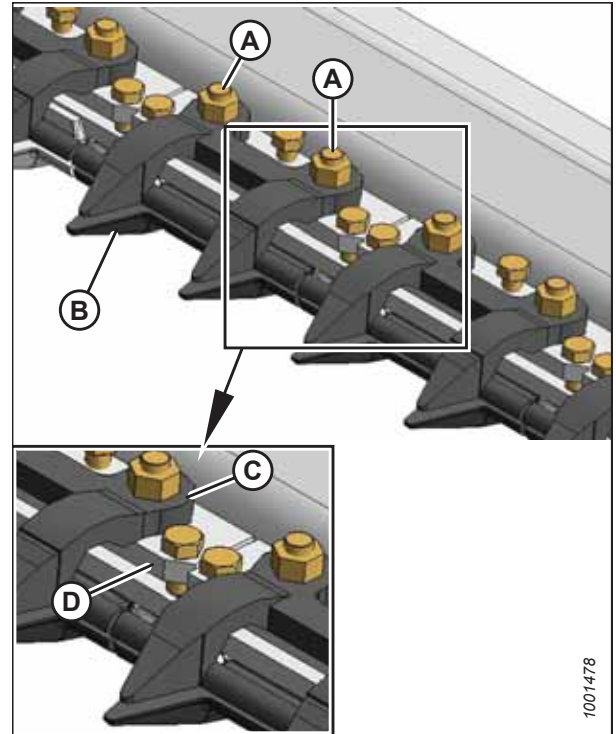


Figure 4.59: Stub Guards

IMPORTANT:

The first four outboard guards (B) on the drive sides of the header do **NOT** have ledger plates. Ensure the proper replacement guards are installed at these locations.

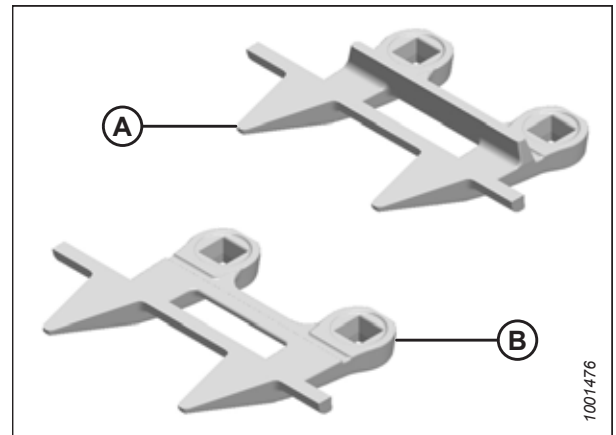


Figure 4.60: Stub Guards

A - Normal Guard

B - Drive Side Guard

MAINTENANCE AND SERVICING

5. Position the plastic wearplate (if applicable), replacement guard (B), adjuster bar (D), hold-down (C), and install bolts and nuts (A). Do **NOT** tighten.
6. Check and adjust the clearance between the hold-downs and the knife. For instructions, refer to [Checking and Adjusting Knife Hold-Downs](#), page 151.

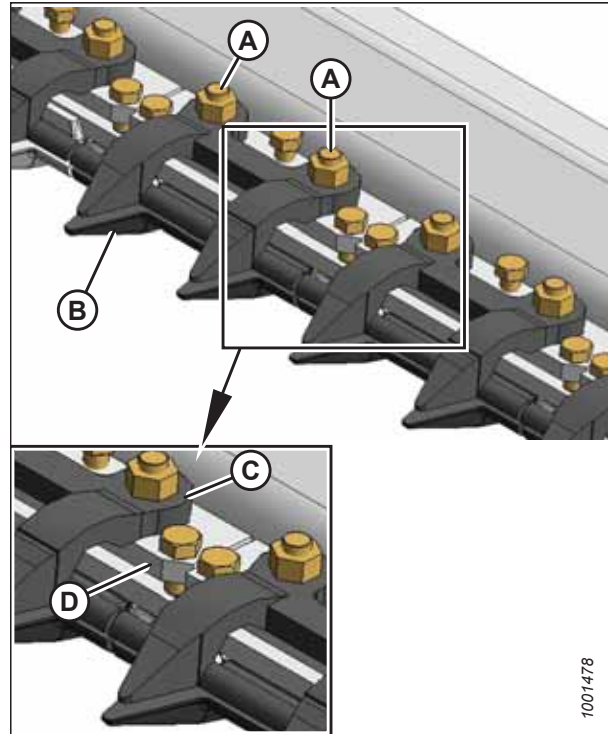


Figure 4.61: Stub Guards

Replacing center guards

NOTE:

The guard at the center of a double-knife header (where the two knives overlap) requires a slightly different replacement procedure.

7. Shut down the engine, and remove the key from the ignition.

8. Remove two nuts (A) and bolts attaching guard (B), hold-down (C), and adjuster bar (D) to the cutterbar.
9. Remove guard (B), plastic wearplate (if installed), hold-down (C), and adjuster bar (D).
10. Position the plastic wearplate (if applicable), replacement guard (B), adjuster bar (D), and hold-down (C) onto the cutterbar. Install bolts, but do **NOT** tighten.

IMPORTANT:

Ensure center guard (B) (right of the cutterbar split) has offset cutting surfaces.

IMPORTANT:

Hold-down (C) must accommodate the two overlapping knives at the center guard location. Ensure the proper replacement guard is installed at this location.

11. Check and adjust the clearance between the hold-down and the knife. For instructions, refer to [Checking and Adjusting Knife Hold-Downs](#), page 151.

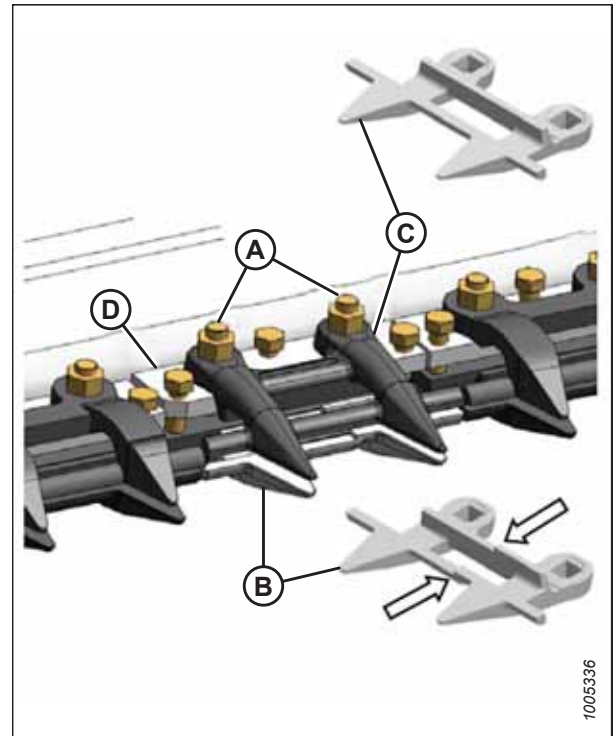


Figure 4.62: Center Guards

Checking and Adjusting Knife Hold-Downs

Follow the provided procedures to properly check and adjust the knife hold-downs.

NOTE:

Align guards prior to checking and adjusting hold-downs. For instructions, refer to [Adjusting Knife Guards](#), page 145.

Perform daily inspections to ensure knife hold-downs are preventing knife sections from lifting off guards while permitting knife to slide without binding.

Proceed to the applicable topic:

- [Checking Pointed Guard Hold-Downs](#), page 151
- [Checking Stub Guard Hold-Downs](#), page 152

Checking Pointed Guard Hold-Downs

This procedure is applicable to headers with pointed guards.



DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

Measure the clearance between the hold-downs and knife sections as follows:

1. Shut down the engine, and remove the key from the ignition.
2. Check the guard alignment and adjust it as required. Refer to [Adjusting Knife Guards](#), page 145.

3. Manually stroke the knife to align section (A) under hold-down (B).
4. At standard guard locations, push knife section (A) down against guard (C) and measure the clearance between hold-down (B) and knife section (A) with a feeler gauge. The clearance should be 0.1–0.6 mm (0.004–0.024 in.).
5. If necessary, refer to [Adjusting Pointed Guard Hold-Downs](#), page 153.

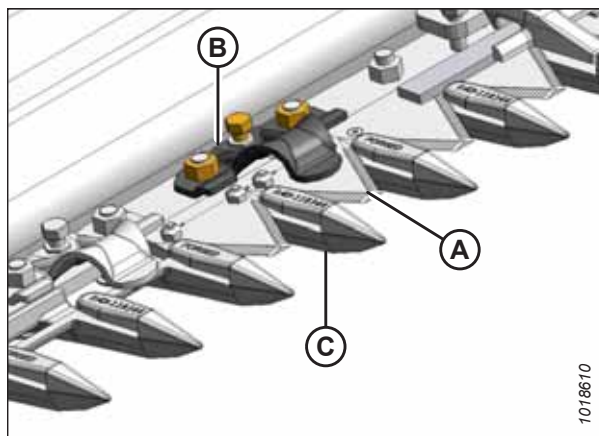


Figure 4.63: Normal Guard Hold-Down

Double knife

6. Manually stroke the knife to align sections (A) and (C) under center hold-down (B).
7. Measure between knife sections (A) and (C) with a feeler gauge. The clearances should be as follows:
 - At tip of hold-down: 0.1–0.4 mm (0.004–0.016 in.)
 - At rear of hold-down: 0.1–1.0 mm (0.004–0.040 in.)
8. If necessary, refer to [Adjusting Hold-Down Clips at Double-Knife Center Pointed Guard](#), page 154.

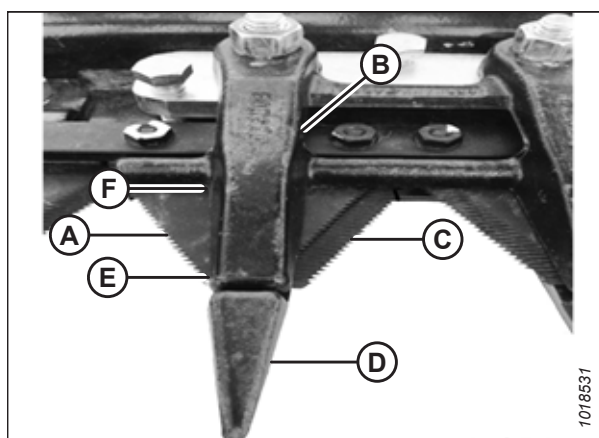


Figure 4.64: Double-Knife Center Guard Hold-Down

Checking Stub Guard Hold-Downs

This procedure is to measure clearance between hold-downs and knife sections on single- and double-knife headers with stub guards.



DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.

2. Manually stroke knife to locate section under hold-down (A).
3. **Standard guard:** At standard guard locations, push knife section (B) down against guard (C) and measure clearance between hold-down clip (A) and knife section (B) with a feeler gauge. The clearance should be as follows:
 - **At hold-down tip (D):** 0.1–0.4 mm (0.004–0.016 in.)
 - **At rear of hold-down (E):** 0.1–1.0 mm (0.004–0.040 in.)
 - **At sheet metal hold-down (F):** 0.1–0.6 mm (0.004–0.024 in.)
4. If necessary, refer to [Adjusting Stub Guard Hold-Downs](#), page 155.

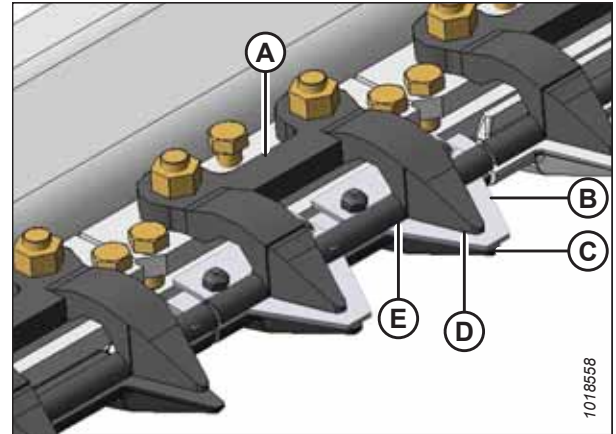


Figure 4.65: Short Knife Forged Hold-Down

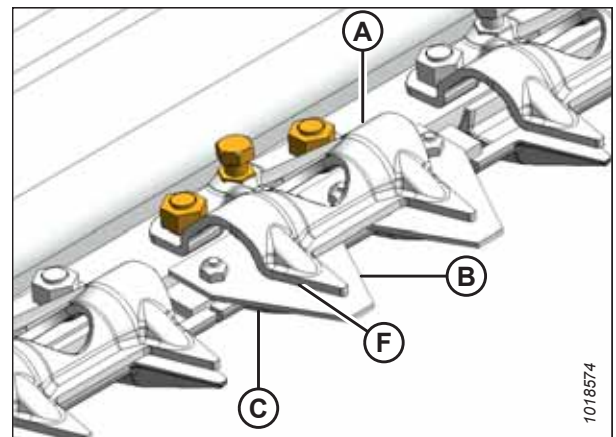


Figure 4.66: Short Knife Sheet Metal Hold-Down

5. **Double-knife center stub guard:** Manually stroke the knife to locate sections under hold-down (B). Measure clearance between knife sections (A) and (C) with a feeler gauge. The clearance should be as follows:
 - **At hold-down tip (D):** 0.1–0.4 mm (0.004–0.016 in.)
 - **At rear of hold-down (E):** 0.1–1.0 mm (0.004–0.040 in.)
6. If necessary, refer to [Adjusting Stub Guard Hold-Downs](#), page 155.

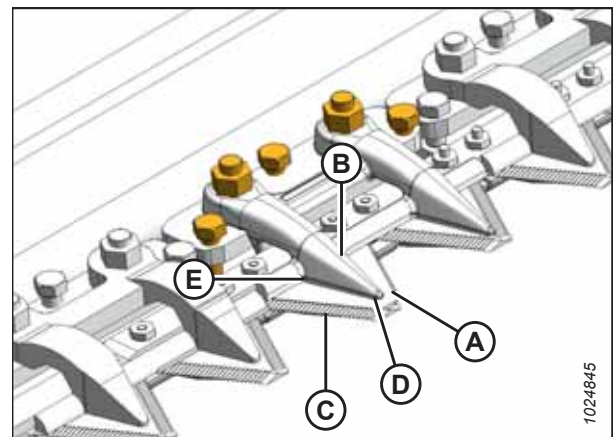


Figure 4.67: Double-Knife Center Short Knife Guard Hold-Down

Adjusting Pointed Guard Hold-Downs

This procedure is applicable to formed sheet metal hold-downs. Do **NOT** use this procedure for the hold-down at the center guard position where knives overlap on double-knife headers.

For the center guard, refer to [Adjusting Hold-Down Clips at Double-Knife Center Pointed Guard](#), page 154.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Decrease the clearance by turning bolt (B) clockwise to lower the front of hold-down (A).
3. Increase the clearance by turning bolt (B) counterclockwise to raise the front of the hold-down.

NOTE:

For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), and then retighten the nuts.

4. Check the clearance again and adjust it as required.

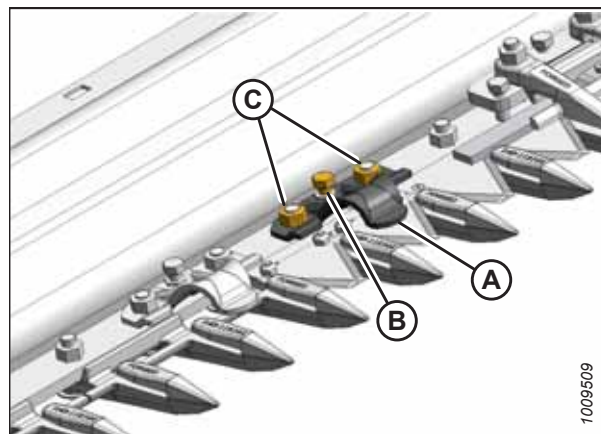


Figure 4.68: Cutterbar

5. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

NOTE:

Insufficient hold-down clearance will result in overheating of the knife and the guards—adjust clearance as necessary.

Adjusting Hold-Down Clips at Double-Knife Center Pointed Guard

Follow the provided procedure to properly adjust the hold-down clips at the double-knife center pointed guard.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Stroke the knives so that sections (A) are under hold-down (B) as shown in the Figure at right.
3. Loosen nuts (C) and back off bolts (D) until they don't contact the cutterbar.
4. Lightly clamp hold-down (B) to guard (E) with a C-clamp or equivalent. Position the clamp on the trash bar at location (F).
5. Turn bolts (D) until they contact the cutterbar, then tighten them **ONE** turn.
6. Remove the clamp.
7. Tighten nuts (C) and torque the nuts to 88 Nm (65 lbf-ft).
8. Check clearances. For instructions, refer to [Checking Pointed Guard Hold-Downs, page 151](#).

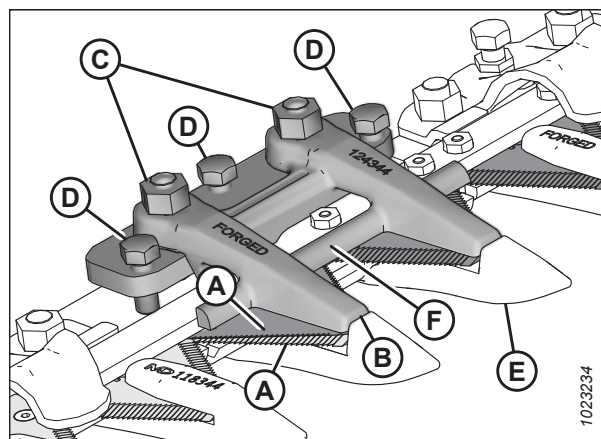


Figure 4.69: Center Guard

Adjusting Stub Guard Hold-Downs

Follow the instructions outlined in this section to properly adjust the hold-downs.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.

Forged hold-down

2. Manually stroke knife to center section(s) (A) under hold-down (B) as shown in the Figure at right.
3. Loosen nuts (C) and back off bolts (D) clear of cutterbar.
4. Position a C-clamp or equivalent on trash bar at location (F), and lightly clamp hold-down (B) to guard (E).
5. Turn bolts (D) until they contact cutterbar, then tighten **ONE** turn.
6. Remove clamp.
7. Tighten nuts (C) and torque to 45 Nm (35 lbf·ft).
8. Check that specified clearances are achieved. For instructions, refer to [Checking Stub Guard Hold-Downs](#), page 152.

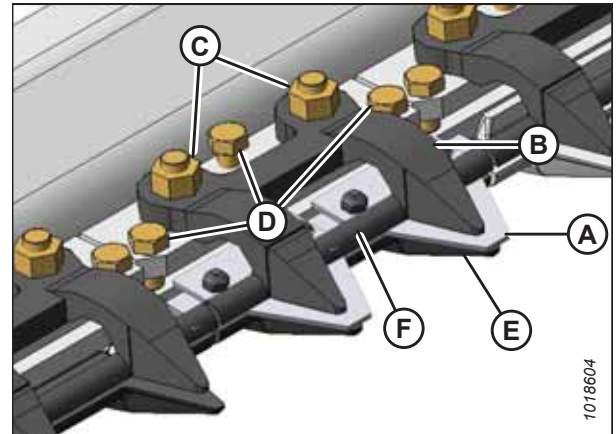


Figure 4.70: Normal Stub Guard Forged Hold-Down

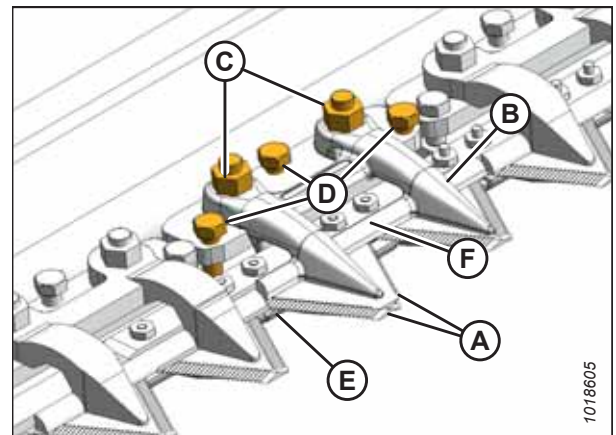


Figure 4.71: Double-Knife Center Stub Guard

Sheet metal hold-down

9. Stroke knife to center section (A) under hold-down (B).
10. Decrease clearance by turning bolt (C) clockwise to lower front of hold-down. Clearance should be 0.1–0.6 mm (0.004–0.024 in.).
11. Increase clearance by turning bolt (C) counterclockwise to raise front of hold-down.

NOTE:

For larger adjustments, it may be necessary to loosen nuts (D), turn adjuster bolt (C), and then retighten nuts.

12. Torque nuts (D) to 88 Nm (65 lbf·ft) after all adjustments are complete and specified clearances are achieved. For instructions, refer to [Checking Stub Guard Hold-Downs](#), [page 152](#).

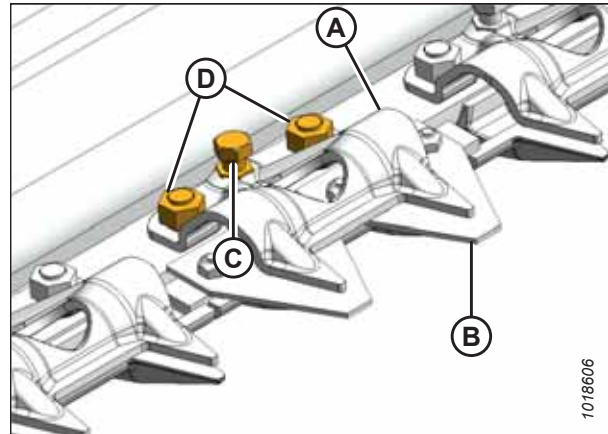


Figure 4.72: Stub Guard Sheet Metal Hold-Down

! DANGER

Check to be sure all bystanders have cleared the area.

13. Complete hold-down adjustments, run header at low engine speed, and listen for noise caused by insufficient clearance.

IMPORTANT:

Insufficient hold-down clearance will result in overheating of knife and guards—readjust as necessary.

4.8 Knife Drive

The knife drive system transforms pumped hydraulic pressure into a mechanical motion that strokes a series of serrated knife blades at the front of the header back and forth to cut a variety of crops.

4.8.1 Knife Drive Belts

Untimed Knife Drive Belts

This section applies to single-knife headers and to 12.2 m (40 ft.) double-knife headers with untimed knife drives.

Tensioning Untimed Knife Drive Belts

The procedure for tensioning untimed knife drive belts is the same for single- and double-knife headers.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

IMPORTANT:

To prolong belt and drive life, do **NOT** overtighten the belt.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Loosen two bolts (A) securing the motor assembly to the header endsheet.
4. Turn adjuster bolt (B) clockwise to move the drive motor until a force of 89 N (20 lbf) deflects belt (C) 20–25 mm (3/4–1 in.) at the midspan.
5. Tighten bolts (A) and the jam nut on bolt (B).

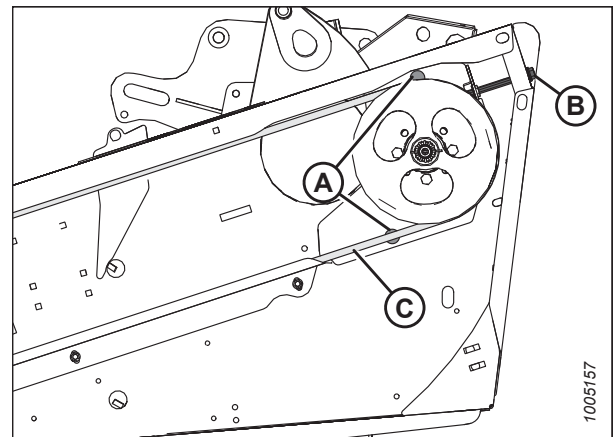


Figure 4.73: Untimed Knife Drive

6. Ensure the clearance between belt (A) and belt guide (B) is 1 mm (1/32 in.).
7. Loosen three bolts (C), and adjust the position of guide (B) as required.
8. Tighten three bolts (C).
9. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

NOTE:

Readjust the tension of a new belt after a short run-in period (about 5 hours).

10. Repeat the above steps for the opposite end on double-knife headers.

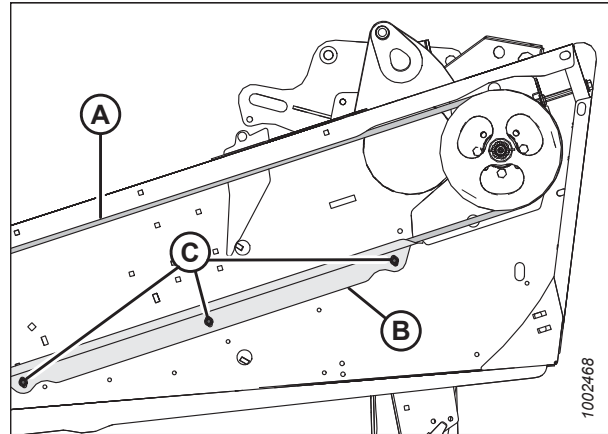


Figure 4.74: Untimed Knife Drive

Removing Untimed Knife Drive Belts

The untimed knife drive belt removal procedure is the same for both sides of a double-knife header.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Loosen two bolts (A) securing the motor assembly to the header endsheet.
4. Loosen the belt tension by turning tensioning bolt (B) counterclockwise.

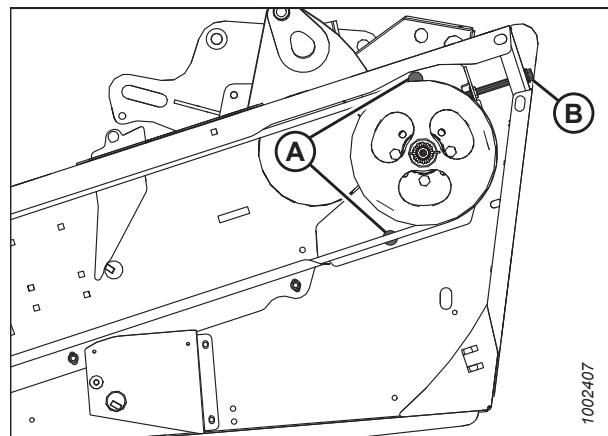


Figure 4.75: Single and Untimed Double-Knife Drive

5. Open access cover (A) on the endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.

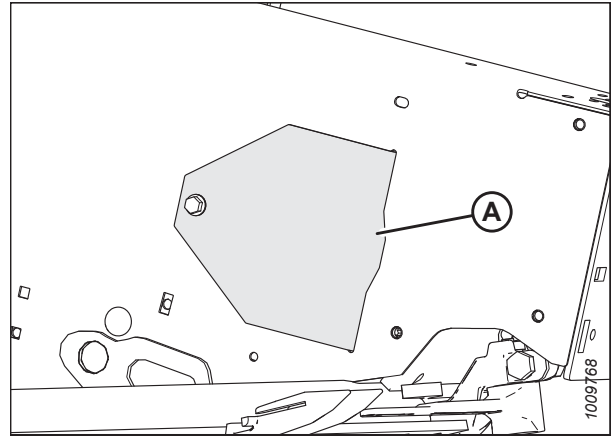


Figure 4.76: Access Cover

6. Remove belt (A) from drive pulley (B).
7. Slip belt (A) over and behind knife drive box pulley (C). Use the notch in the pulley to assist with the belt removal.

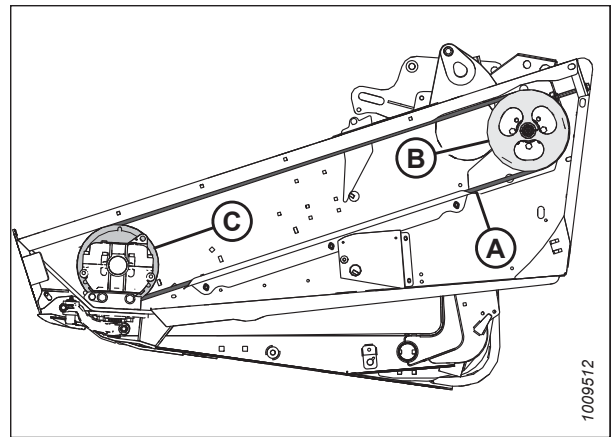


Figure 4.77: Knife Drive

Installing Untimed Knife Drive Belts

The procedure for installing untimed knife drive belts is the same for both sides of the header.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).

- Route knife drive belt (A) around knife drive box pulley (C) and knife drive pulley (B). Use the notch in the pulley to assist with the belt installation.

NOTE:

Ensure the drive motor is fully forward, do **NOT** pry the belt over the pulley.

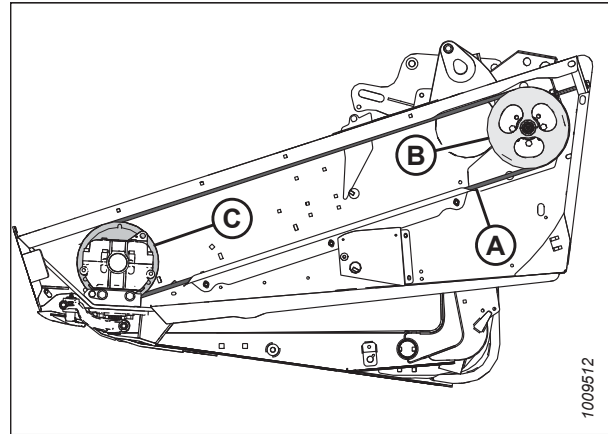


Figure 4.78: Knife Drive

- Tension the knife drive belt. For instructions, refer to [Tensioning Untimed Knife Drive Belts, page 157](#).
- Install access cover (A) and secure it with a bolt.
- Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

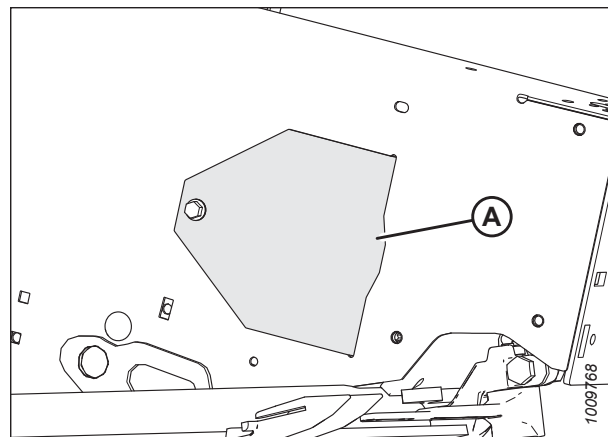


Figure 4.79: Access Cover

Timed Double-Knife Drive Belts

This section applies to 10.7 meter (35 ft.) and smaller model D60 Draper Headers.

Tensioning Timed Knife Drive Belts

The procedure for tensioning timed knife drive belts is the same for both sides of the header. The illustrations shown are for the left side—the right side is opposite.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

IMPORTANT:

To prolong belt and drive life, do **NOT** overtighten the belt.

IMPORTANT:

Do **NOT** use the adjuster bolt at the drive pulley to adjust timing belt tension.

- Shut down the engine, and remove the key from the ignition.
- Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).

3. Loosen two nuts (A) on the knife drive belt idler bracket.

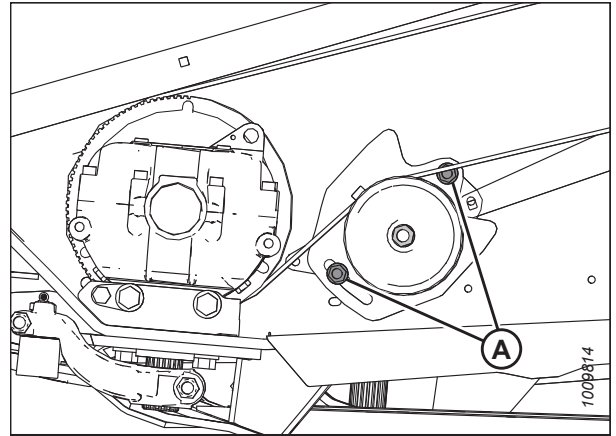


Figure 4.80: Left Knife Drive

4. Insert a long punch (or equivalent) into hole (B) in the idler bracket, and pry downward until a force of 27 N (6 lbf) deflects the timing belt 12 mm (1/2 in.) at mid-span.
5. Tighten the nuts on the knife drive belt idler bracket.

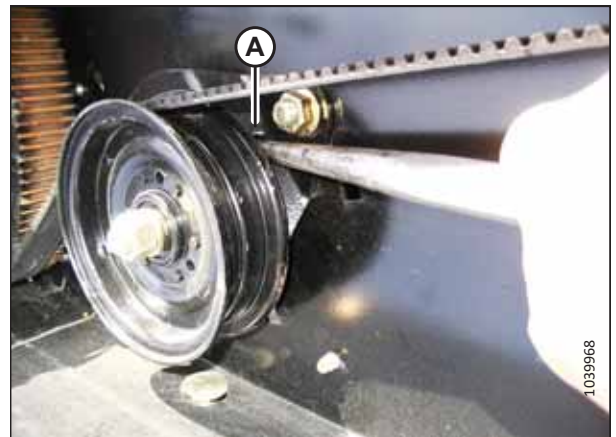


Figure 4.81: Left Knife Drive

6. Ensure clearance (A) between belt (B) and guide (C) is 0.5–1.5 mm (1/32–1/16 in.).
7. If necessary, loosen bolts (D) and adjust the guide, then tighten the bolts.
8. Repeat this procedure for the opposite side of the header.
9. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

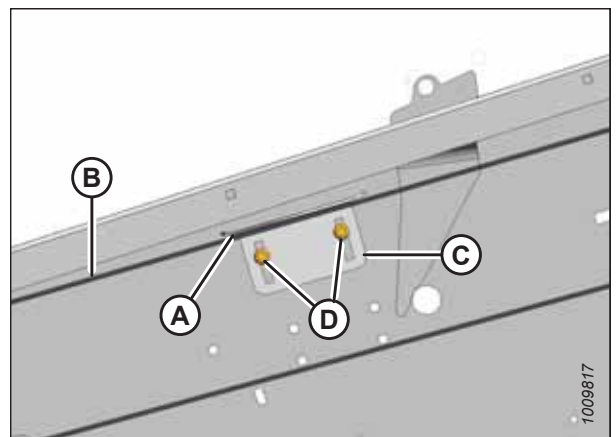


Figure 4.82: Left Belt Guide

Removing Timed Knife Drive Belt – Left Side



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

MAINTENANCE AND SERVICING

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Loosen two nuts (A) on the belt idler bracket to relieve the belt tension.
4. Loosen nut (B) on the idler pulley and slide the idler downward to loosen the belt.

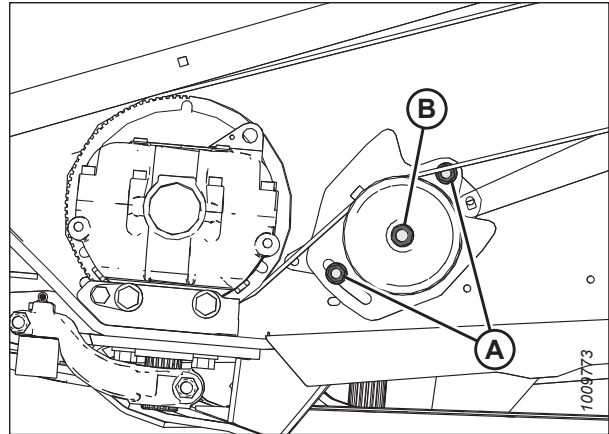


Figure 4.83: Knife Drive

5. Loosen two bolts (A) on the endsheet.



Figure 4.84: Inboard Side of Endsheets

6. Loosen two bolts (A) on the knife drive mounting bracket.
7. Turn adjuster bolt (B) to loosen the two V-belts (C), then remove the V-belts.

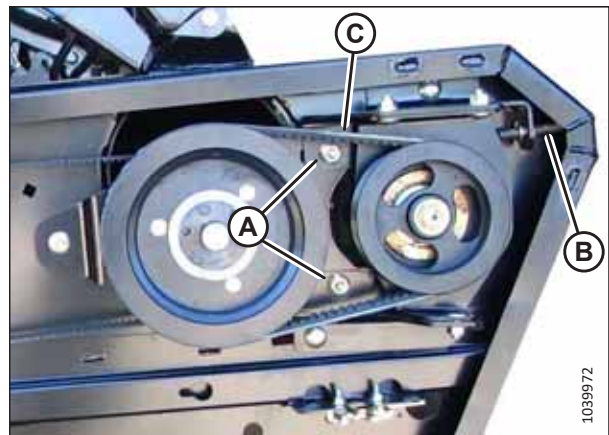


Figure 4.85: Knife Drive V-Belts

8. Open access cover (A) on the endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.
9. Remove the knife drive belt.

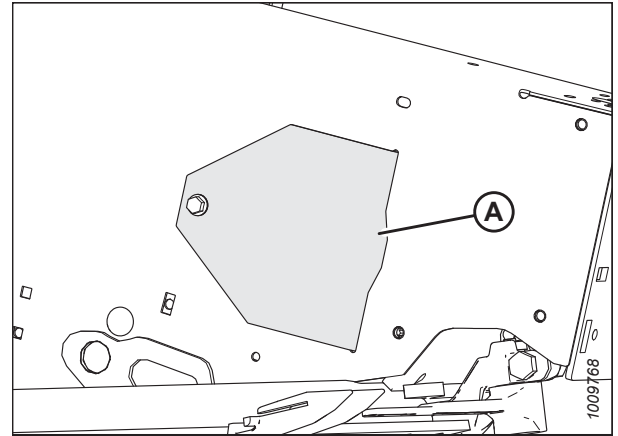


Figure 4.86: Access Cover

Installing Timed Knife Drive Belts

The procedure for installing timed knife drive belts is the same for both sides of the header.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Route knife drive belt (A) around pulley (B) and knife drive box pulley (C).

NOTE:

Ensure the drive motor is fully forward, do **NOT** pry the belt over the pulley.

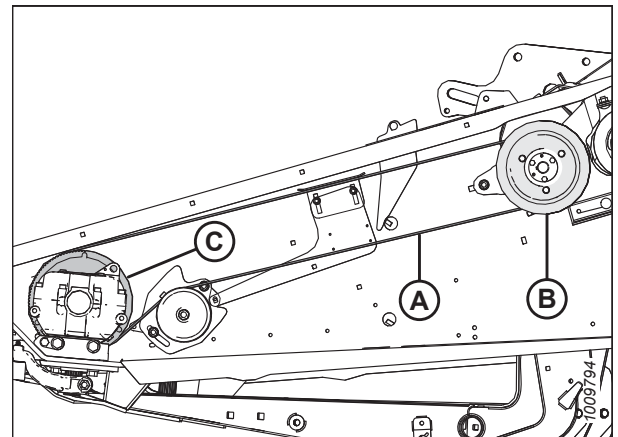


Figure 4.87: Left Side Shown – Right Side Similar

MAINTENANCE AND SERVICING

4. Position V-belts (C) on the pulleys.
5. Turn adjuster bolt (B) to move the drive motor until a force of 53 N (12 lbf) applied at mid-span deflects V-belts (C) 3 mm (1/8 in.).
6. Tighten bolts (A) on the drive mounting brackets.

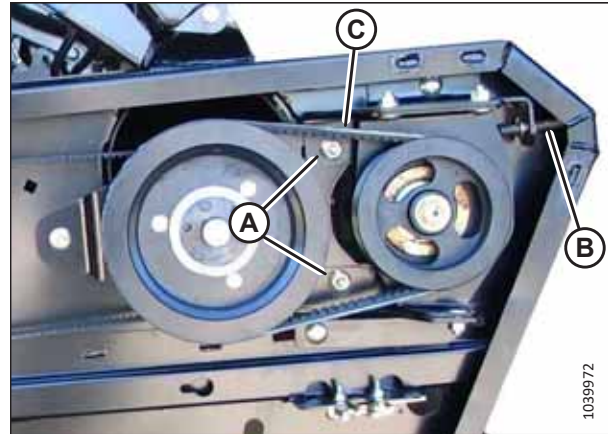


Figure 4.88: Knife Drive V-Belts

7. Tighten two bolts (A) on the endsheet.



Figure 4.89: Inboard Side of Endsheets

8. Ensure the knives are timed before tightening the belt. For instructions, refer to [Adjusting Double-Knife Timing, page 170](#).
9. Slide idler pulley (A) into the slot on support bracket (B) to take-up the slack in the timing belt.

NOTE:

Ensure lower nut (C) is as high as possible in the support bracket (B) slot.

10. Tighten nut (D) to 212–234 Nm (157–173 lbf·ft).

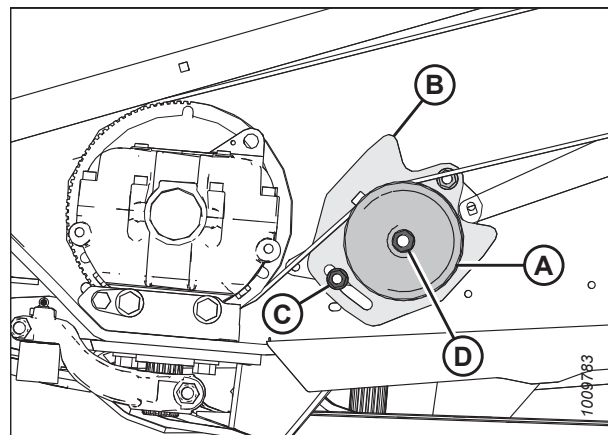


Figure 4.90: Knife Drive

11. Tension the knife drive belt. For instructions, refer to [Tensioning Timed Knife Drive Belts, page 160](#).
12. Install access cover (A) and secure it with a bolt.
13. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

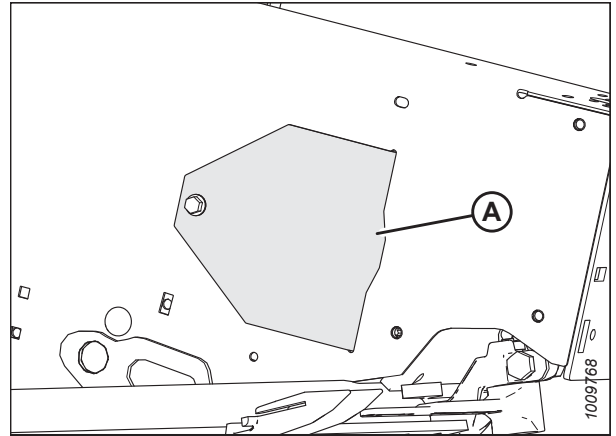


Figure 4.91: Access Cover

Tensioning Timed Drive V-Belts



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Loosen two bolts (A) on the endsheet.



Figure 4.92: Inboard Side of Endsheat

MAINTENANCE AND SERVICING

4. Loosen two bolts (A) on the knife drive mounting bracket.
5. Turn adjuster bolt (B) to move the drive motor until a force of 53 N (12 lbf) applied at mid-span deflects V-belts (C) 3 mm (1/8 in.).
6. Tighten bolts (A) and (B).
7. Check the tension of the new V-belts after a short run-in period (about five hours).

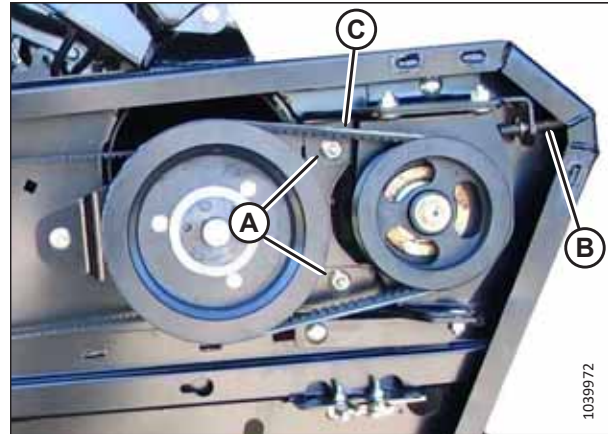


Figure 4.93: Knife Drive V-Belts

Removing Timed Drive V-Belts



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Loosen two bolts (A) on the endsheet.



Figure 4.94: Inboard Side of Endsheets

4. Loosen two bolts (A) on the knife drive mounting bracket.
5. Turn adjuster bolt (B) to loosen the two V-belts (C), then remove the V-belts.

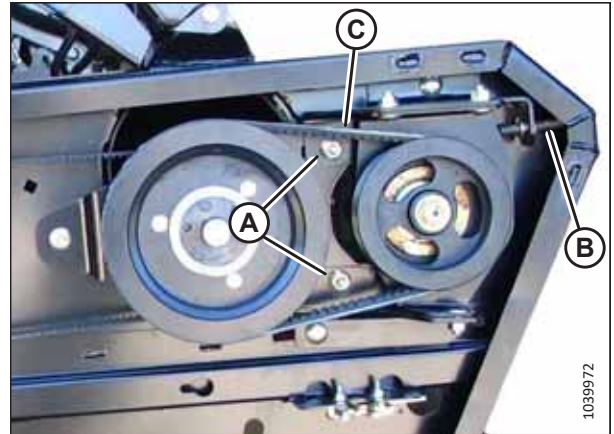


Figure 4.95: Knife Drive V-Belts

Installing Timed Drive V-Belts



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

NOTE:

Install new V-belts in matching pairs.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Position V-belts (C) on the pulleys.
4. Turn adjuster bolt (B) to move the drive motor until a force of 53 N (12 lbf) applied at mid-span deflects V-belts (C) 3 mm (1/8 in.).
5. Tighten bolts (A) on the drive mounting brackets.

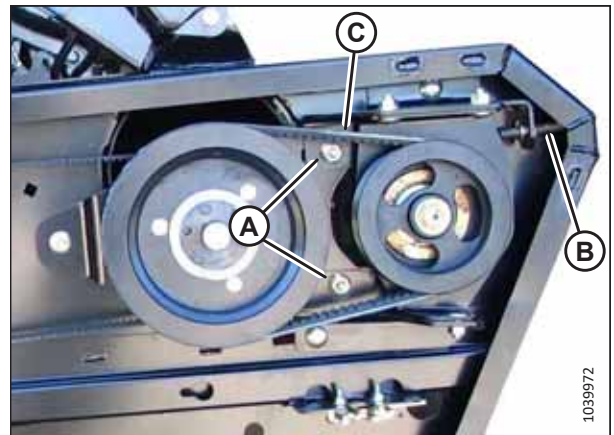


Figure 4.96: Knife Drive V-Belts

6. Tighten two bolts (A) on the endsheet.
7. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).
8. Check the tension of the new V-belts after a short run-in period (about five hours).



Figure 4.97: Inboard Side of Endsheets

Removing Timed Knife Drive Belt – Right Side

The timed knife drive belt removal procedure is the same for both sides of the header.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Loosen two nuts (A) on the belt idler bracket to relieve the belt tension.
4. Loosen nut (B) on the idler pulley and slide the idler downward to loosen the belt.

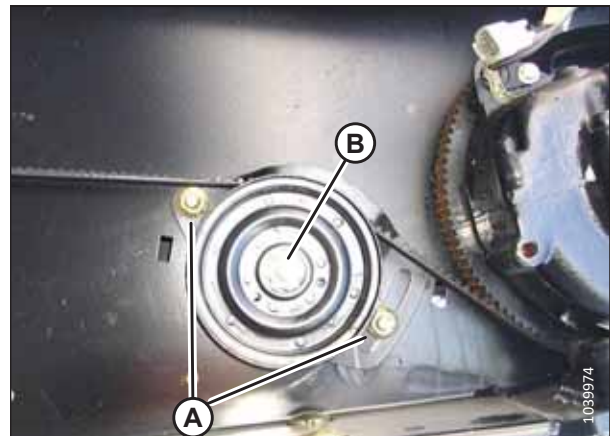


Figure 4.98: Right Knife Drive

5. Open access cover (A) on the right endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.
6. Remove the knife drive belt.

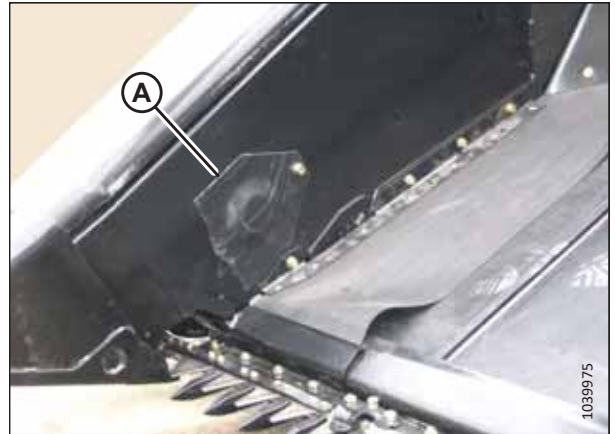


Figure 4.99: Access Cover on Right Endsheets

Installing Timed Knife Drive Belts – Right Side



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Route knife drive belt (A) around knife drive box pulley (B) and over idler pulley (C).

NOTE:

Do **NOT** pry the belt over the pulleys.

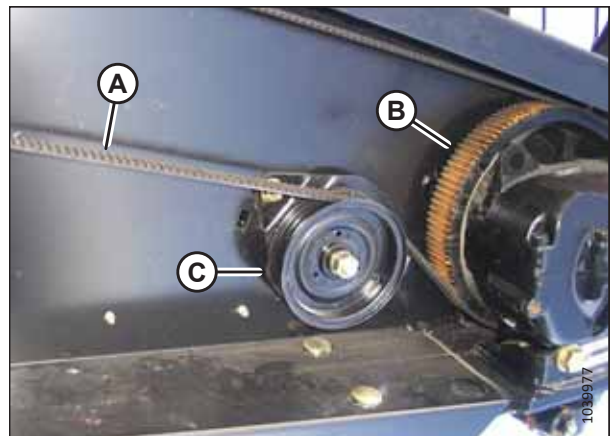


Figure 4.100: Right Knife Drive Box and Idler Pulley

MAINTENANCE AND SERVICING

4. Route knife drive belt (A) around drive pulley (B).
5. Tension the knife drive belt. For instructions, refer to [Tensioning Timed Knife Drive Belts, page 160](#).

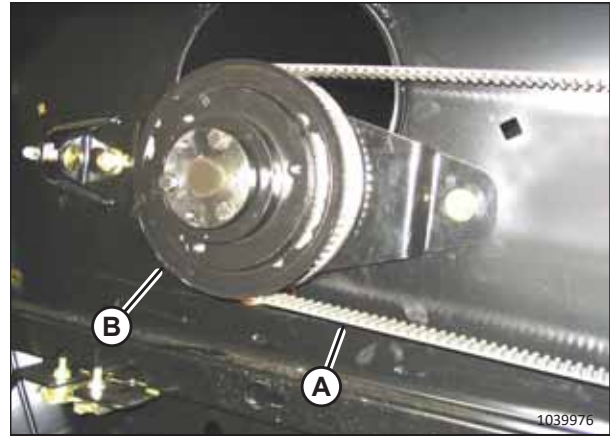


Figure 4.101: Right Knife Drive Pulley

6. Reinstall access cover (A) and secure it with a bolt.
7. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

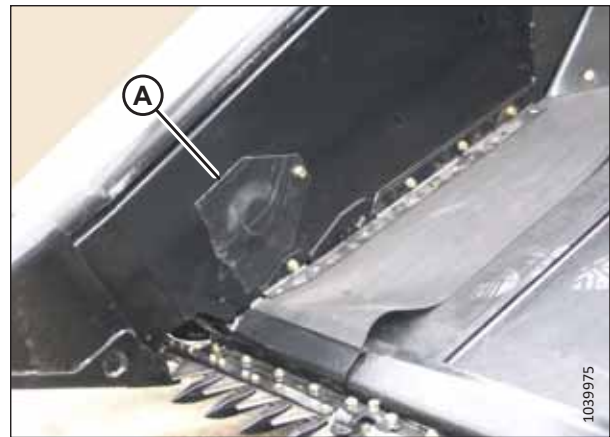


Figure 4.102: Access Cover on Right Endsheets

Adjusting Double-Knife Timing

D60 Draper Headers, 10.7 m (35 ft.) and smaller, with timed double knives, require that knives are properly timed to move in opposite directions.

1. Shut down the engine, and remove the key from the ignition.
2. Open both endshields. Refer to [4.3.1 Opening Hinged Endshield, page 116](#).
3. Remove the knife drive belt on the right side of the header. For instructions, refer to [Removing Timed Knife Drive Belt – Right Side, page 168](#).

MAINTENANCE AND SERVICING

4. Rotate the left knife drive box driven pulley clockwise until the left knife (A) is at the center of the inboard stroke (B) (moving towards center of header).

NOTE:

Center stroke is when the knife sections (C) are centered between guard points.

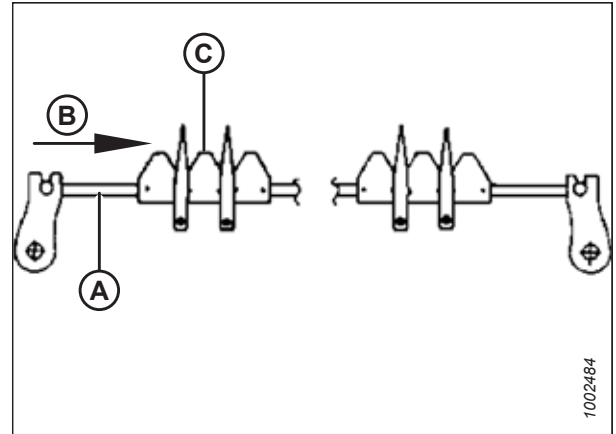


Figure 4.103: Timing – Left Side

5. Rotate the right knife drive box pulley counterclockwise until the right knife (A) is at the center of the inboard stroke (B) (moving towards center of header).

NOTE:

Center stroke is when the knife sections (C) are centered between guard points.

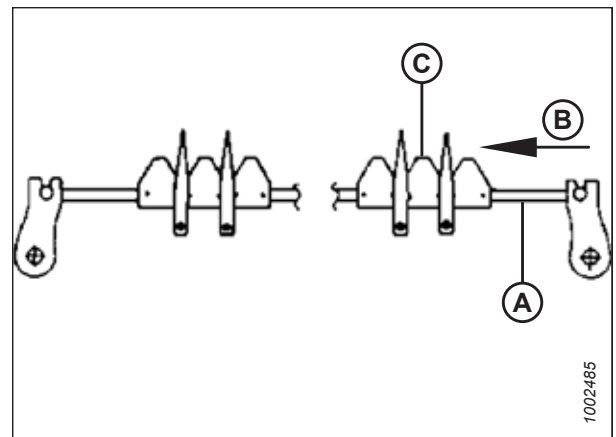


Figure 4.104: Timing – Right Side

6. Reinstall right knife drive belt (A).

NOTE:

To maintain timing, the knife drive box driver and driven pulleys must not rotate as the belt is tightened.

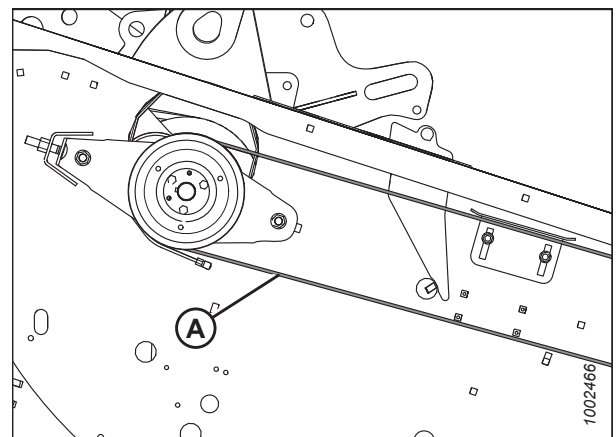


Figure 4.105: Knife Drive Belt and Drive Pulley – Right Side

7. Rotate the idler pulley bracket (A) down and slide the idler pulley up by hand to remove most of the belt slack. Tighten nut (B).
8. Check that the timing belts are properly seated in the grooves on both the driver and driven pulleys.
9. Check for correct knife timing by rotating the drive slowly by hand and observing the knives where they overlap at the centre of the header.

IMPORTANT:

The knives must move in opposite directions and begin moving at exactly the same time.

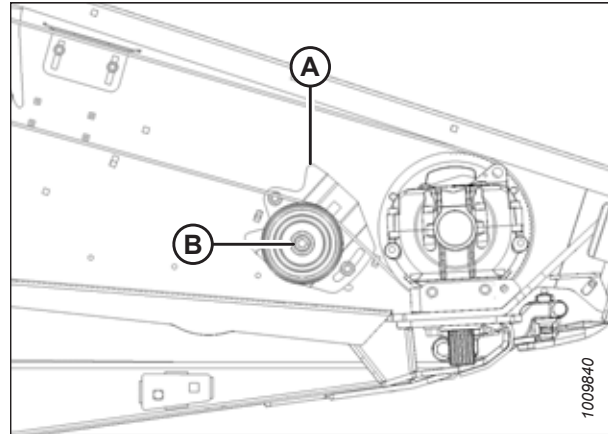


Figure 4.106: Right Knife Drive Box and Idler Pulley

10. If the knives do not begin moving at the same time, loosen the right side drive belt (A) just enough to allow the belt to be repositioned to the next cog(s) and proceed as follows:
 - a. If the right knife leads the left knife, rotate the RIGHT SIDE driven pulley (B) clockwise.
 - b. If the right knife lags the left knife, rotate the RIGHT SIDE driven pulley (B) counterclockwise.

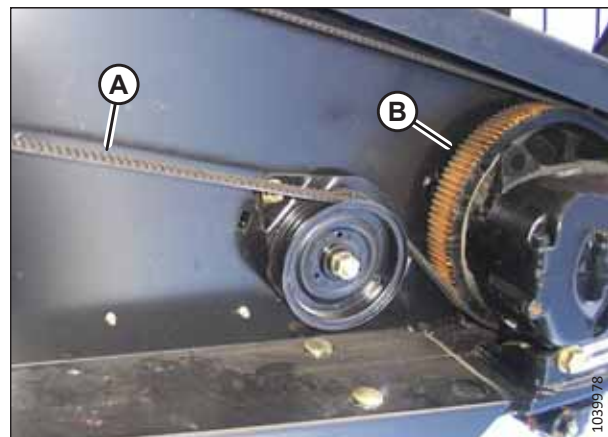


Figure 4.107: Right Knife Drive Box and Idler Pulley

11. Re-tension the right side drive belt as per above, ensuring that the drive pulleys do not rotate.

IMPORTANT:

Do **NOT** use the adjuster bolt at the drive pulley to adjust timing belt tension.

12. Recheck the timing.
13. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

4.8.2 Knife Drive Box

Knife drive boxes convert rotational motion into the reciprocating motion of the knife, and are belt driven by a hydraulic motor. There is one knife drive box on single-knife headers and two knife drive boxes on double-knife headers.



CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [4.1 Preparing Machine for Servicing, page 113](#).

Checking Mounting Bolts

Check the torque on the four knife drive box mounting bolts after the first 10 hours of operation and every 100 hours thereafter.

! DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Torque side bolts (A) first, then torque bottom bolts (B).
Torque all bolts to 271 Nm (200 lbf·ft).

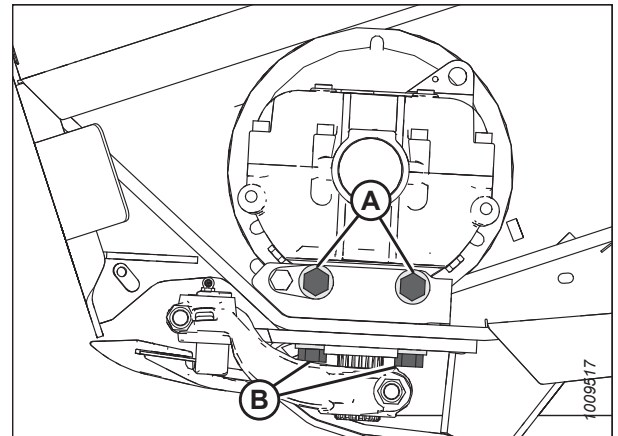


Figure 4.108: Knife Drive Box

Removing Knife Drive Box

The knife drive box(es) may need to be removed for repair at the Dealership. Follow the recommended removal procedure provided here.

! DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).

Timed double-knife headers:

NOTE:

The procedure is the same for both ends of a timed double-knife header. Images shown are for the left end—the right end is opposite.

3. Loosen two nuts (A) on the belt idler bracket to relieve the belt tension.
4. Loosen nut (B) on the idler pulley and slide the idler down to loosen the belt.
5. Proceed to Step 8, page 174.

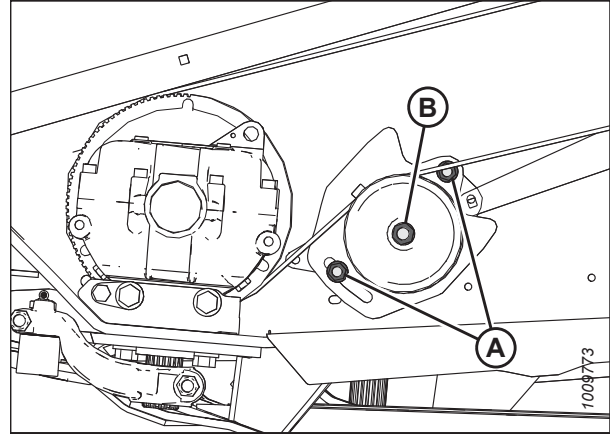


Figure 4.109: Timed Double-Knife Drive

Single and untimed double-knife headers:

6. Loosen two bolts (A) securing the motor assembly to the header endsheet.
7. Loosen the belt tension by turning tensioning bolt (B) counterclockwise.

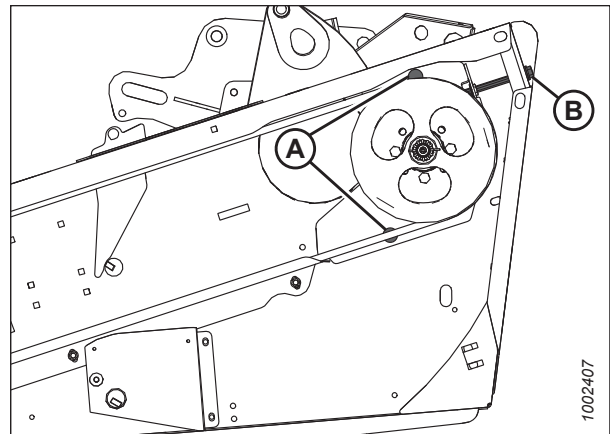


Figure 4.110: Single and Untimed Double-Knife Drive

8. Open access cover (A) on the endsheet behind the cutterbar to provide clearance between the knife drive box pulley and the endsheet.

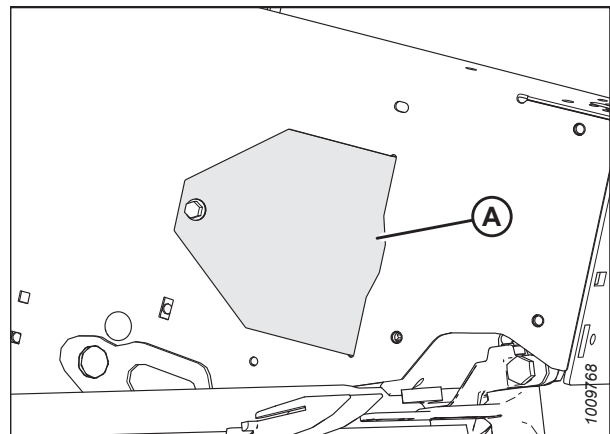


Figure 4.111: Access Cover

MAINTENANCE AND SERVICING

9. Remove belt (A) from drive pulley (B).
10. Slip belt (A) over and behind knife drive box pulley (C). Use the notch in the pulley to assist with the belt removal.
11. Stroke the knife manually to its outer limit.

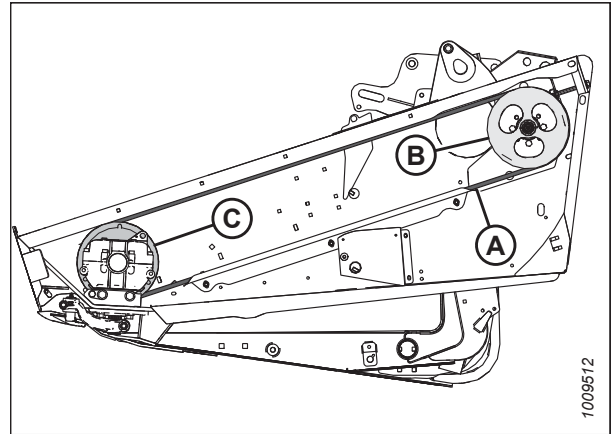


Figure 4.112: Knife Drive

12. Remove bolt (A).
13. Remove grease fitting (B) from the pin.
14. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
15. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
16. Push the knife assembly inboard until it is clear of the output arm.
17. Seal the knifehead bearing with plastic or tape unless it is being replaced.

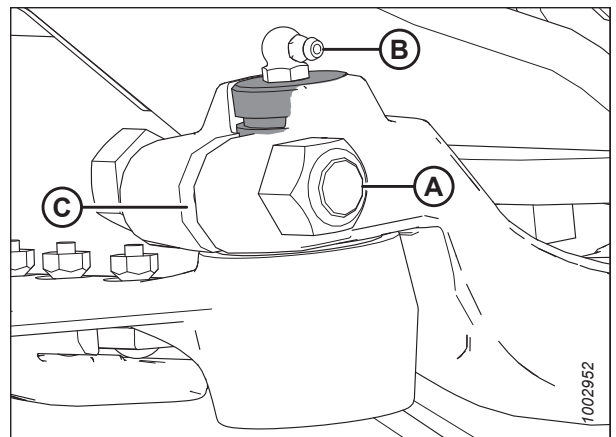


Figure 4.113: Knifehead

18. Remove bolt (A) that clamps knife drive arm (B) to the knife drive box output shaft.
19. Remove knife drive arm (B) from the knife drive box output shaft.
20. Remove four knife drive box mounting bolts (C) and (D).

NOTE:

Bolt (E) is factory set; do **NOT** remove it. It is used to secure the knife drive box in the proper fore-aft position.

CAUTION

The knife drive box and pulley weigh over 35 kg (65 lb.) Use care when removing or installing it. Lug (L) can be used for lifting.

21. Remove the knife drive box and place it on a bench for disassembly.

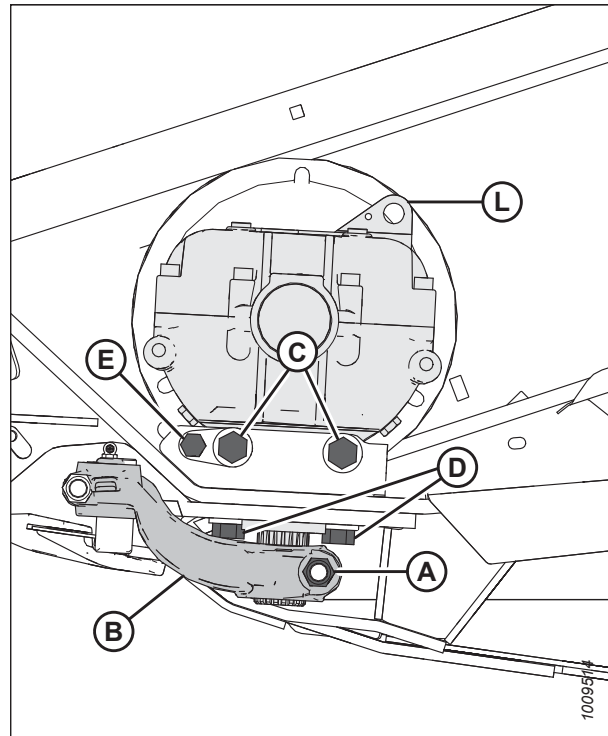


Figure 4.114: Knife Drive Box

Removing Knife Drive Box Pulley

To remove the knife drive box pulley, follow the recommended removal procedure provided here.

1. Loosen and remove knife drive box pulley clamping bolt (A) and nut (B).
2. Remove knife drive box pulley (C) using a three-jaw puller.

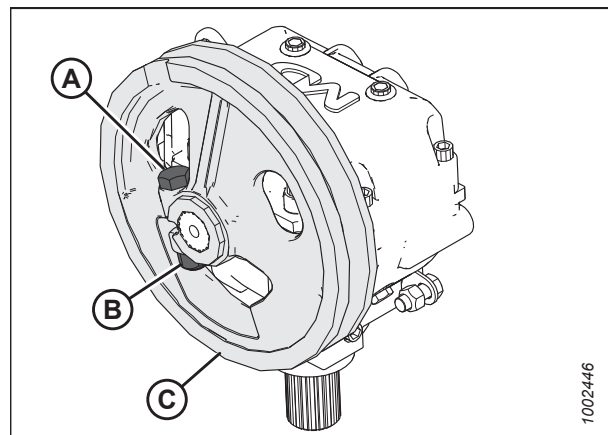


Figure 4.115: Knife Drive Box and Pulley

Installing Knife Drive Box Pulley

The knife drive box pulley is driven by the knife drive motor and the knife drive belt. To install the knife drive box pulley, follow the recommended installation procedure provided here.

1. Ensure the splines and bores in the pulley and drive arm are free of paint, oil, and solvents.
2. Apply two bands (A) of medium-strength threadlocker (Loctite® 243 or equivalent) around the shaft as shown. Apply one band at the end of the spline and the second band at the approximate midpoint location.
3. Install pulley (B) so that it is flush with the end of the shaft.
4. Secure the pulley with 5/8 in. x 3 in. hex head bolt with distorted thread NC lock nut.
5. Torque the lock nut to 217 Nm (160 lbf·ft).

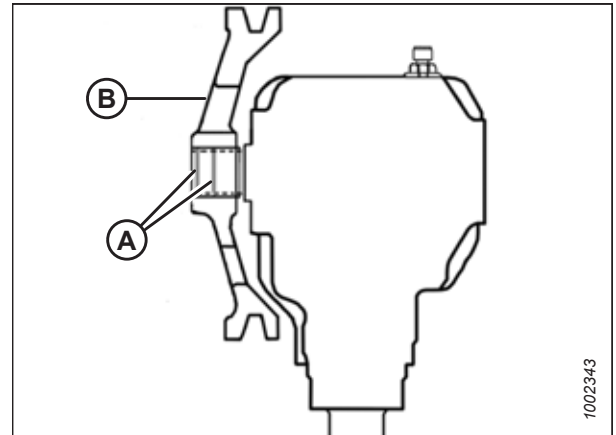


Figure 4.116: Knife Drive Box

Installing Knife Drive Box

The procedure for installing knife drive boxes is the same for single- and double-knife headers.

NOTE:

If the pulley was removed from the knife drive box, refer to [Installing Knife Drive Box Pulley, page 177](#). If the pulley was not removed, proceed to Step 1, [page 177](#).



CAUTION

The knife drive box and pulley weigh over 35 kg (65 lb.) Use care when removing or installing it. Lug (L) can be used for lifting.

1. Position the knife drive box onto the header mount and install the belt onto the pulley.
2. Secure the knife drive box to the frame using two 5/8 in. x 1 3/4 in. grade 8 hex head bolts (A) on the side and two 5/8 in. x 2 1/4 in. grade 8 hex head bolts (B) on the bottom.
3. Tighten knife drive box side bolts (A) slightly, then tighten bottom bolts (B) to ensure proper contact with the vertical and horizontal mounting surfaces.

NOTE:

Do **NOT** torque the bolts at this time.

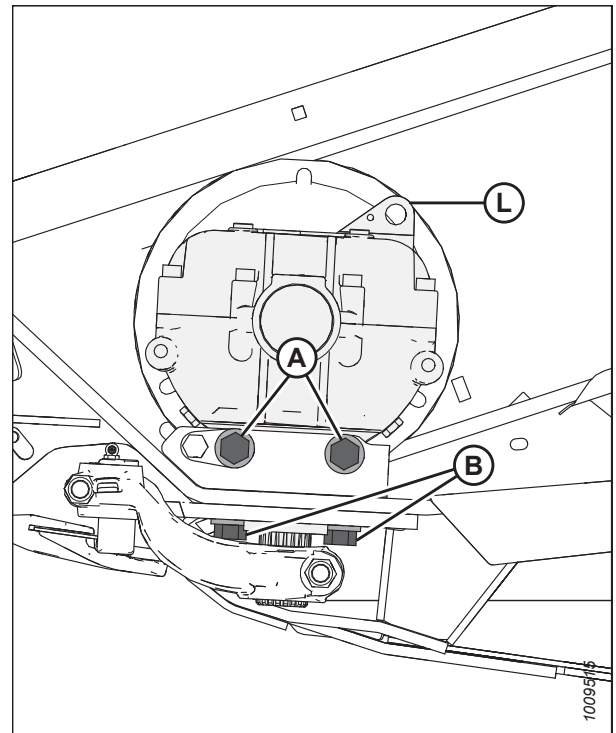


Figure 4.117: Knife Drive Box

MAINTENANCE AND SERVICING

4. Apply two bands (A) of medium-strength threadlocker (Loctite® 243 or equivalent) to the output shaft as shown. Apply one band at the end of the output shaft and the second band at the approximate midpoint location.
5. Slide output arm (B) onto the output shaft. Rotate the pulley to ensure the splines are properly aligned and the drive arm clears the frame on the inboard stroke.

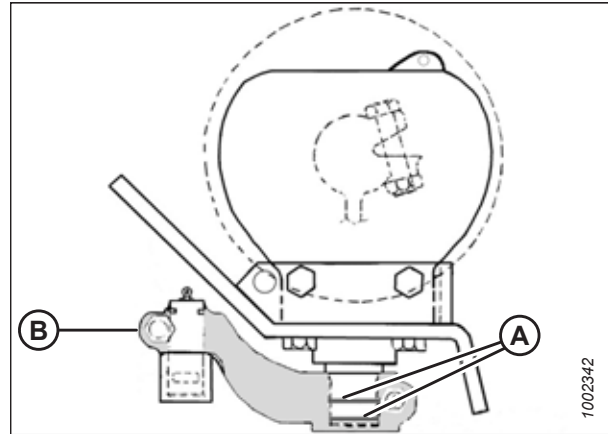


Figure 4.118: Knife Drive Box

6. Position output arm (A) to the farthest outboard position. Move output arm (A) up or down on the splined shaft until it is almost contacting knifehead (B) (exact clearance [C] is set during the knifehead pin installation).

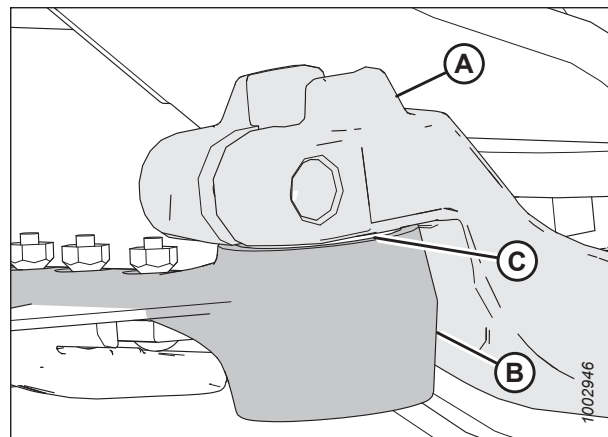


Figure 4.119: Knifehead

7. Torque output arm bolt (A) to 217 Nm (160 lbf-ft).
8. Slide the knife into place and align the knifehead with the output arm.
9. For ease of removing or installing the knifehead pin, remove the grease fitting from the pin.

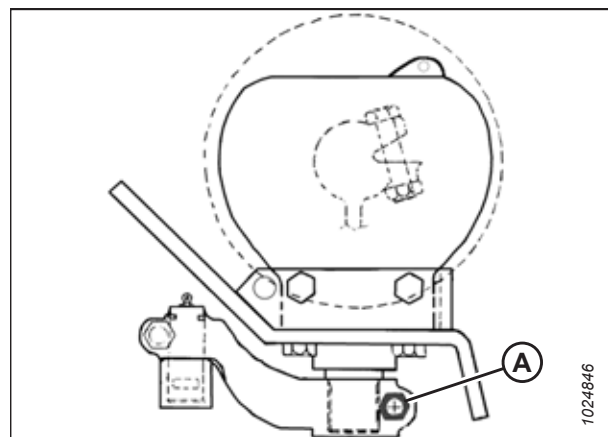


Figure 4.120: Knife Drive Box

10. Install knifehead pin (A) through the output arm and into the knifehead. Tap knifehead pin (A) down, and make sure the pin is seated at the bottom of the knifehead.
11. Using a feeler gauge, check that the gap at location (E) is 0.25 mm (0.01 in.).
12. Set groove (B) in the knifehead pin 1.5 mm (1/16 in.) above output arm (C). Secure it with 5/8 in. x 3 in. hex head bolt and nut (D), and torque the hardware to 217 Nm (160 lbf ft).

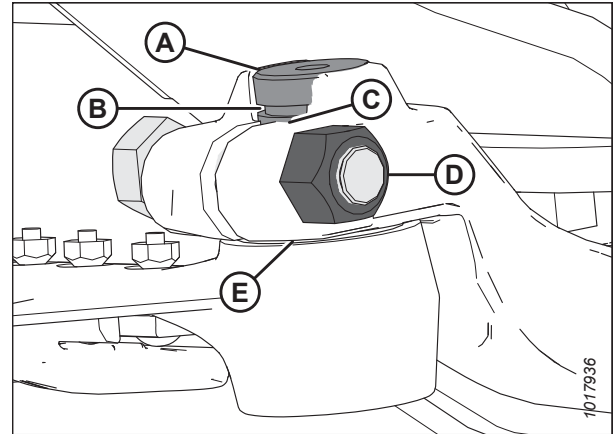


Figure 4.121: Knifehead

13. Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.

IMPORTANT:

Grease the knifehead just enough to start a slight downward movement. Overgreasing will lead to knife misalignment which causes the guards to overheat and the drive systems to overload.

14. Torque the bolts to 271 Nm (200 lbf·ft).
15. Move the output arm to the midstroke position, and ensure the knife bar doesn't contact the front of the first guard. If the knife drive box requires adjustment, contact your MacDon Dealer.

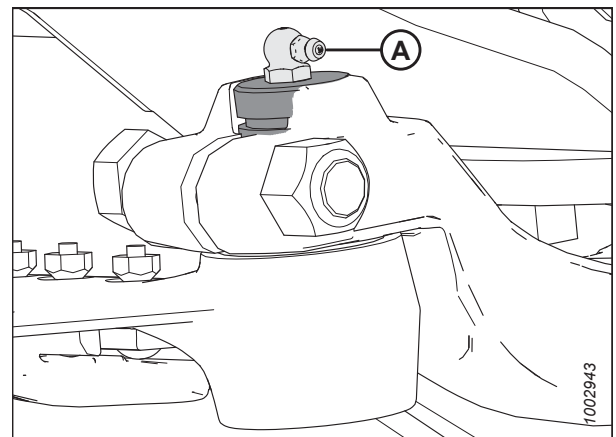


Figure 4.122: Knifehead

16. Install and tension the knife drive belts. Refer to the following topics depending on your header:
 - For untimed belts, refer to [Tensioning Untimed Knife Drive Belts, page 157](#)
 - For timed belts, refer to [Tensioning Timed Knife Drive Belts, page 160](#)
 - For timed double-knife headers, also check the knife timing. For instructions, refer to [Adjusting Double-Knife Timing, page 170](#)
17. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields, page 117](#).

Changing Oil in Knife Drive Box

Change the knife drive box lubricant after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. NEVER climb onto or go underneath an unsupported header.

1. Raise the header to allow a suitably sized container to fit under the knife box drain and collect the oil.
2. Shut down the engine, and remove the key from the ignition.
3. Open the endshield. For instructions, refer to [4.3.1 Opening Hinged Endshield, page 116](#).

MAINTENANCE AND SERVICING

4. Remove breather/dipstick (A) and drain plug (B).
5. Allow the oil to drain.
6. Reinstall drain plug (B).
7. Add oil to the knife drive box. Refer to the inside back cover for specifications.
8. Reinstall breather/dipstick (A).
9. Close the endshield. For instructions, refer to [4.3.2 Closing Hinged Endshields](#), page 117.

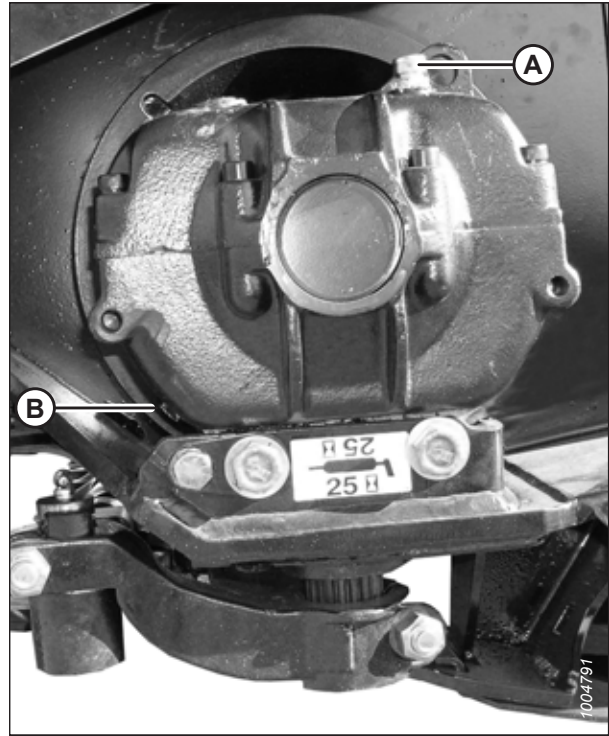


Figure 4.123: Knife Drive Box

4.9 Drapers

Two side drapers (A) convey cut crop to the center opening. Replace the side drapers if they are torn, cracked, or missing slats.

4.9.1 Adjusting Draper Tension

The drapers are tensioned at the factory and should not require adjustment. If adjustment is required, draper tension should be just enough to prevent slipping and to keep the draper from sagging below the cutterbar.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the machine for any reason.

1. Ensure white indicator bar (A) is at the halfway point in the window.

DANGER

Check to be sure all bystanders have cleared the area.

2. Start the engine.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props.
6. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) on the drive roller.

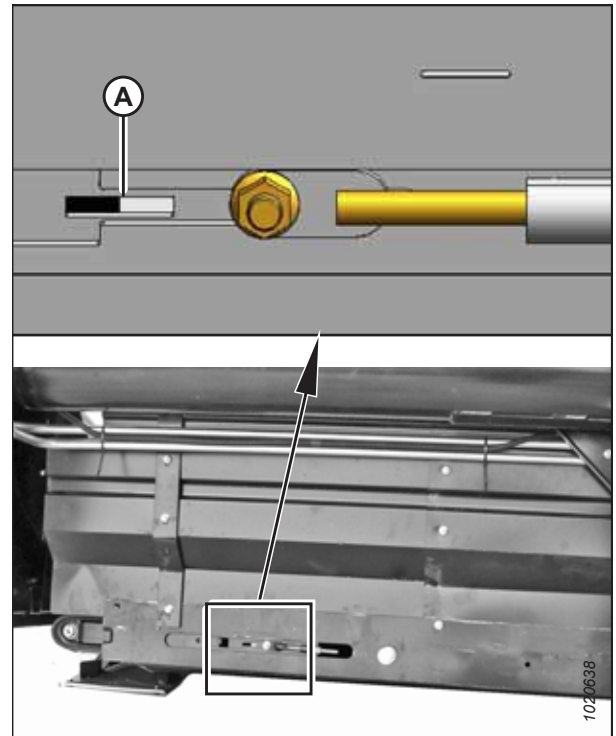


Figure 4.124: Left Adjuster Shown – Right Opposite

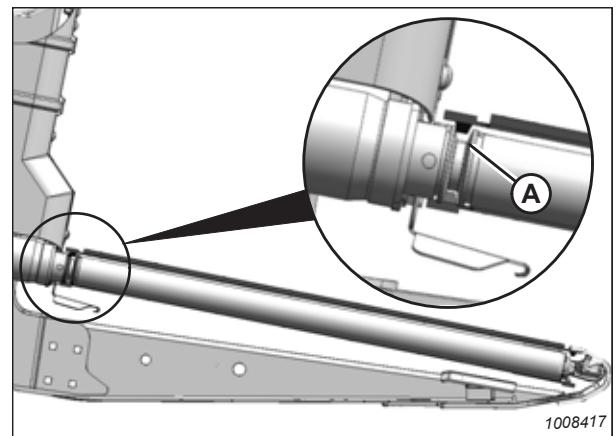


Figure 4.125: Drive Roller

7. Ensure idler roller (A) is between draper guides (B).

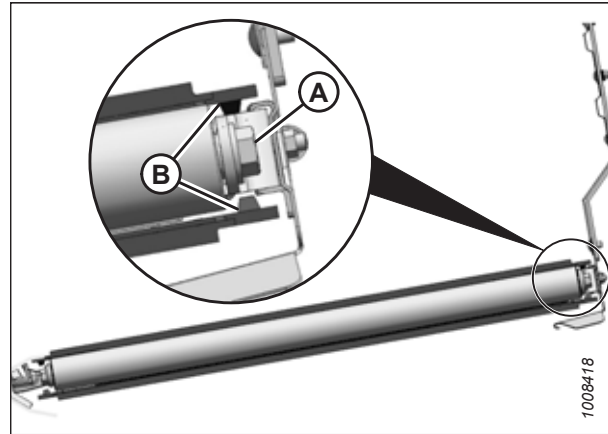


Figure 4.126: Idler Roller

IMPORTANT:

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

8. Turn adjuster bolt (A) counterclockwise to loosen the draper. White indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen the draper until the white indicator bar is at the halfway point in the window.
9. Turn adjuster bolt (A) clockwise to tighten the draper. White indicator bar (B) will move inboard in the direction of arrow (E) to indicate that the draper is tightening. Tighten the draper until the white indicator bar is at the halfway point, on the right side of the window.

IMPORTANT:

- To avoid premature failure of the draper, draper rollers, and/or tightener components, do **NOT** operate with the tension set so the white bar is not visible.
- To prevent scooping dirt, ensure the draper is tight enough that it does not sag below the point where the cutterbar contacts the ground.

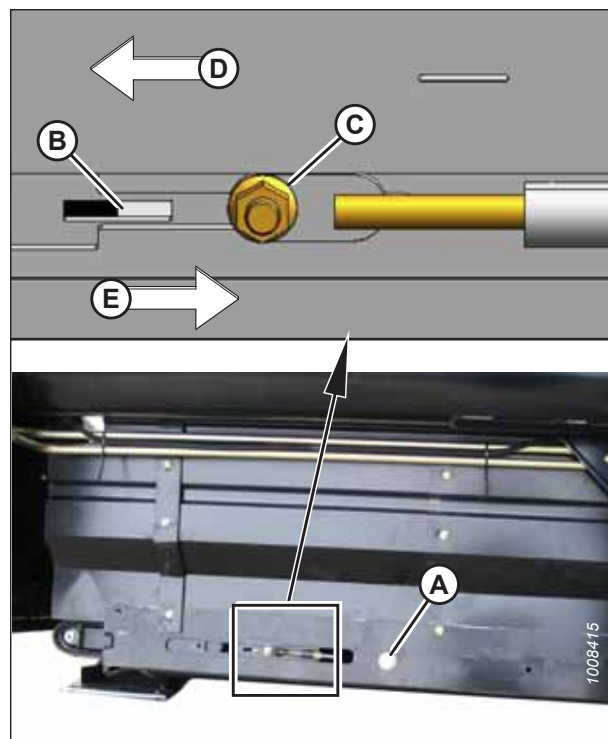


Figure 4.127: Draper Tensioner

4.9.2 Removing Split Drapers

Replace the drapers if they are torn, cracked, or missing slats.

⚠ DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

⚠ DANGER

Ensure that all bystanders have cleared the area.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Start the engine.
2. Raise the reel fully.
3. Raise the header fully.
4. Turn the draper roller until the draper joint is in the work area.

NOTE:

The decks on the header can also be shifted towards the center to provide an opening at the endsheets.

5. Shut down the engine, and remove the key from the ignition.
6. Engage the header safety props.
7. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
8. Release the tension on the draper. For instructions, refer to [4.9.1 Adjusting Draper Tension, page 181](#).
9. Remove screws (A) and tube connectors (B) at the draper joint.
10. Pull the draper from the deck.

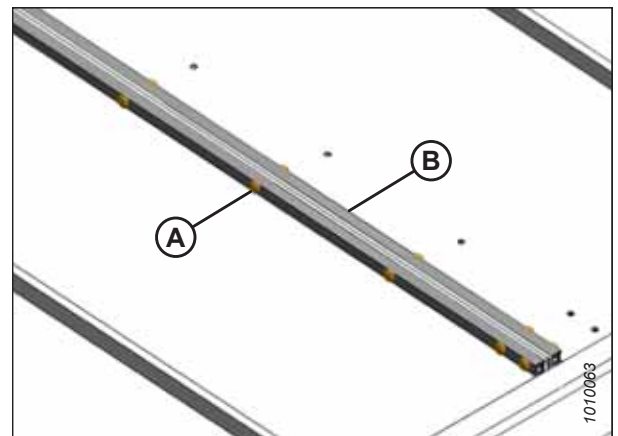


Figure 4.128: Draper Joint

4.9.3 Installing Split Drapers

Drapers are used to bring cut crop to the center of the header. To ensure they are installed correctly, follow the recommended installation procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

MAINTENANCE AND SERVICING


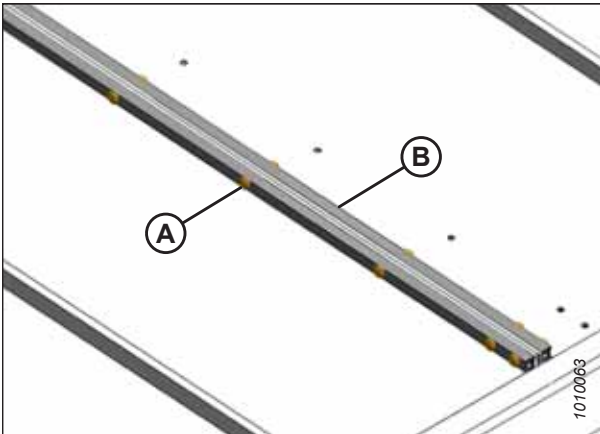
1. Raise the reel fully.
 2. Raise the header fully.
 3. Shut down the engine, and remove the key from the ignition.
 4. Engage the header safety props.
 5. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
 6. Check the deck height before installing the drapers. For instructions, refer to [4.9.8 Adjusting Deck Height, page 195](#).
 7. Apply talc, baby powder, or talc/graphite lubricant mix to the draper surface that forms the seal with the cutterbar and to the underside of the draper guides.
 8. Insert the draper into the deck at the outboard end under the rollers. Pull the draper into the deck while feeding it at the end.
 9. Feed in the draper until it can be wrapped around the drive roller.
 10. Insert the opposite end of the draper into the deck over the rollers. Pull the draper fully into the deck.
- 
- Figure 4.129: Installing Draper
11. Attach the ends of the draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.
 12. Adjust the draper tension. For instructions, refer to [4.9.1 Adjusting Draper Tension, page 181](#).
- 

Figure 4.129: Installing Draper

Figure 4.130: Draper Joint

4.9.4 Removing Endless Draper



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

MAINTENANCE AND SERVICING

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.
5. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
6. Turn bolt (A) counterclockwise to fully loosen the draper. White indicator bar (B) will move outboard in the direction of the arrow to indicate that the draper is loosening.

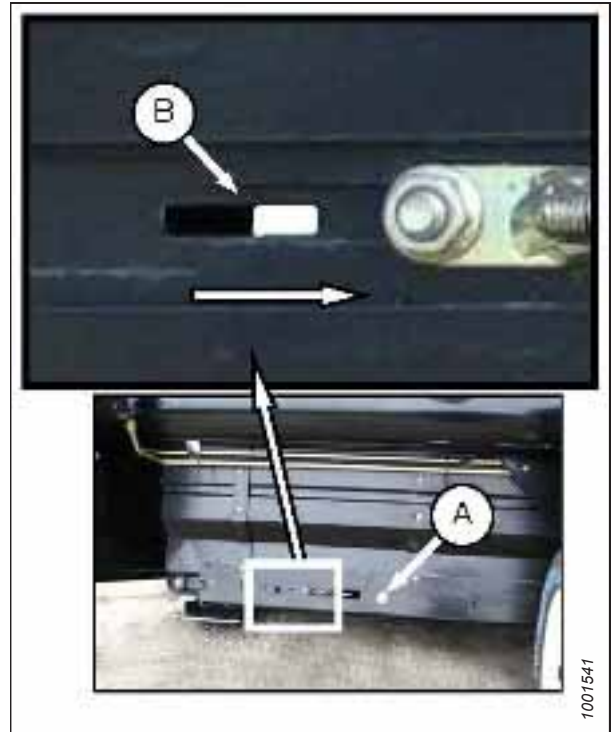


Figure 4.131: Draper Tensioner

7. Push the draper away from the cutterbar (as shown) to expose deck support (A).

NOTE:

There are two or three supports depending on header size.

8. Remove two center nuts (B) at each support.
9. Move the deck away from the cutterbar to disengage the deck supports.

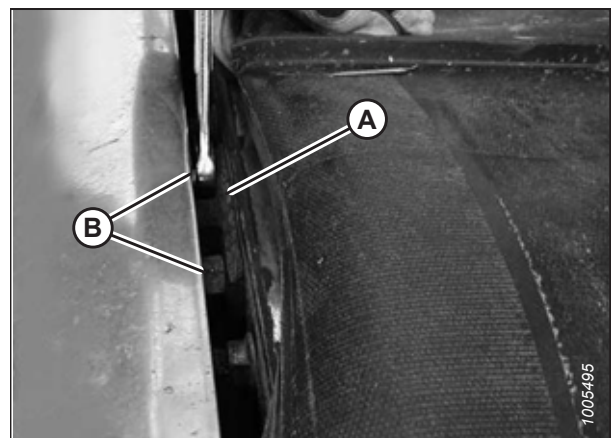


Figure 4.132: Deck Support

10. Insert a pry bar (A) into the hole located in the deck at the approximate deck mid-point location, and lift the deck clear of the cutterbar.

NOTE:

Ensure the pry bar is long enough to accommodate the width of the draper.

11. Support pry bar (A) on a suitably sized stand (B).

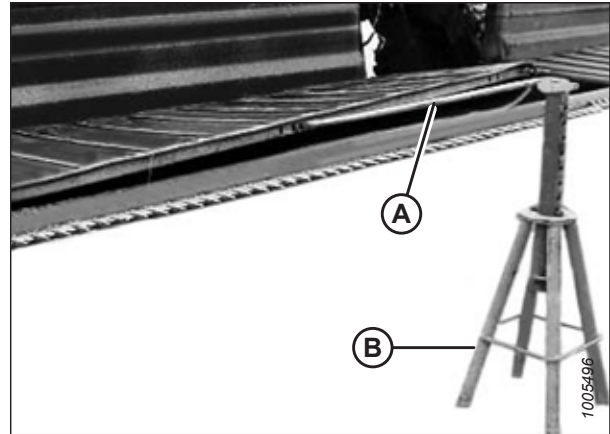


Figure 4.133: Lifting the Deck

12. Pull the draper off the deck and onto the pry bar.
13. Remove stand (B), the draper, and pry bar (A).

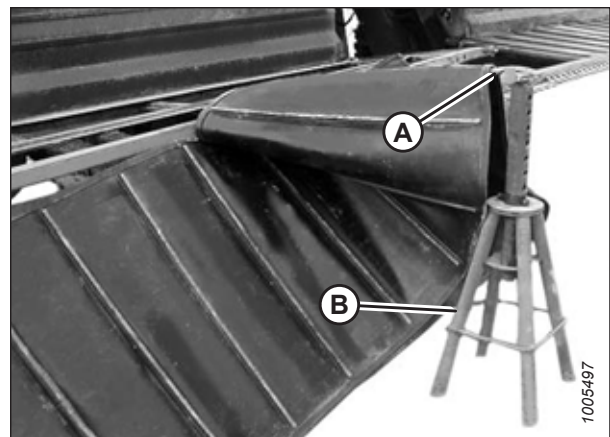


Figure 4.134: Removing Draper

4.9.5 Installing Endless Draper

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.
5. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).

6. Insert pry bar (A) through draper, and place the bar into the hole located in the deck at the approximate deck mid-point location.

NOTE:

Ensure the pry bar is long enough to accommodate the width of the draper.

7. Lift the deck clear of the cutterbar, and support the bar on a suitably sized stand (B).
8. Slide the draper onto the deck.

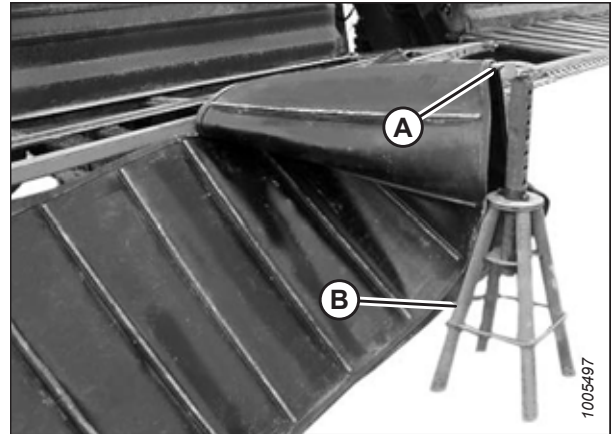


Figure 4.135: Supporting the Draper

9. Lift the deck, remove stand (B), and then lower the deck into position. Remove pry bar (A).

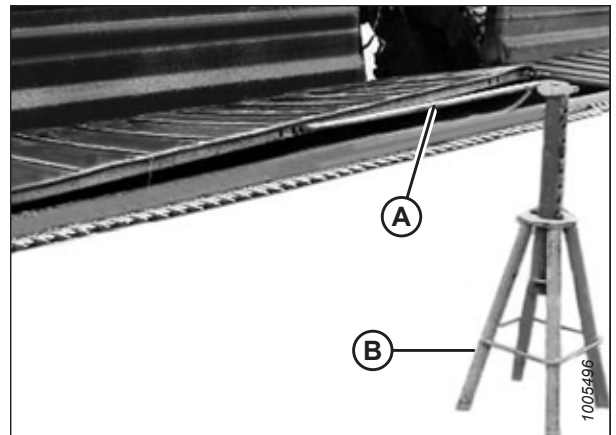


Figure 4.136: Lifting the Deck

10. Line-up deck supports (A) with the bolts in the deck.
11. Move the deck towards the cutterbar to engage the deck supports.
12. Install nuts (B) and tighten.
13. Adjust draper tension. Refer to [4.9.1 Adjusting Draper Tension, page 181](#).

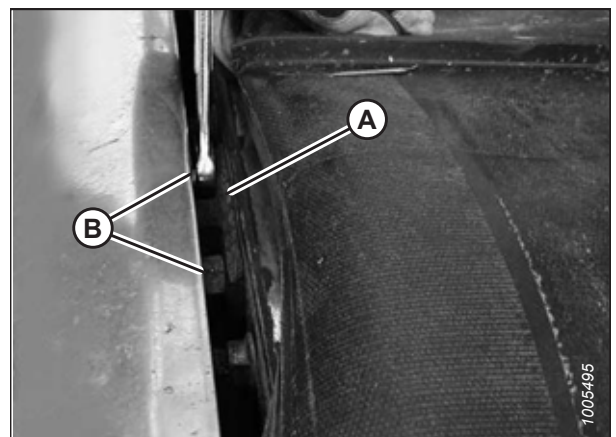


Figure 4.137: Deck Support

4.9.6 Adjusting Draper Tracking

Draper tracking is adjusted by aligning the drive and idler draper rollers.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [4.1 Preparing Machine for Servicing, page 113](#).

Each draper deck has fixed drive roller (A) and spring-loaded idler roller (B) that can be aligned using the adjuster rods so the draper tracks properly on the rollers.

Table 4.3 Draper Tracking

Tracking	Location	Adjustment	Method
Backward	Drive roller	Increase (X)	Tighten nut
Forward	Drive roller	Decrease (X)	Loosen nut
Backward	Idler roller	Increase (Y)	Tighten nut
Forward	Idler roller	Decrease (Y)	Loosen nut

1. Refer to Table [4.3, page 188](#) to determine which roller requires adjustment and which adjustments are necessary.

NOTE:

To change the distance (X), adjust the back end of the roller using the adjuster mechanism at the inboard end of the deck.

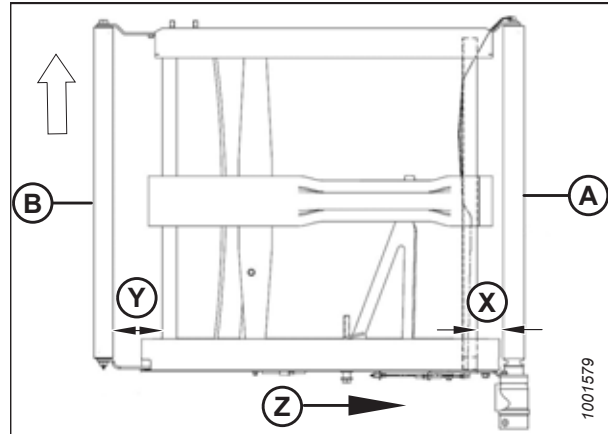


Figure 4.138: Draper Tracking Adjustments

A - Drive Roller
B - Idler Roller
X - Drive Roller Adjust
Y - Idler Roller Adjust
Z - Draper Rotation Direction

2. Adjust the drive roller distance (X) as follows:
 - a. Loosen nuts (A) and jam nut (B).
 - b. Turn adjuster nut (C).

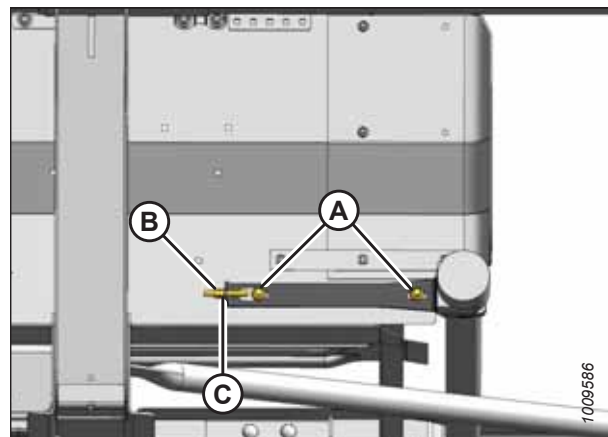


Figure 4.139: Left Drive Roller

3. Adjust the idler roller distance (**Y**) as follows:

- a. Loosen nut (A) and jam nut (B).
- b. Turn adjuster nut (C).

NOTE:

If the draper does not track at the idler roller end after the idler roller adjustment, the drive roller is likely not square to the deck. Adjust the drive roller, and then readjust the idler roller.

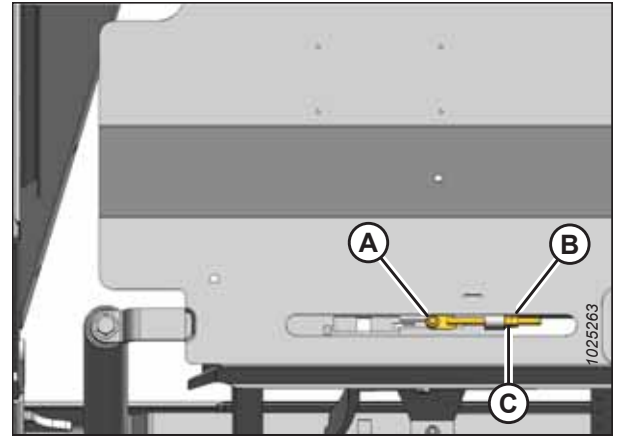


Figure 4.140: Left Idler Roller

4.9.7 Draper Roller Maintenance

The draper rollers have non-greaseable bearings; however, the external seal should be checked every 200 hours (more frequently in sandy conditions) to achieve maximum bearing life.

Removing Draper Drive Roller

To remove the drive roller, follow these steps.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Raise the header fully.
3. On deck shift headers, position the deck so the drive roller is easily accessible.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props.
6. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
7. Loosen and uncouple the draper. For instructions, refer to [4.9.2 Removing Split Drapers, page 182](#).

MAINTENANCE AND SERVICING

- Loosen the two set screws in access hole (A) in the drive roller hub at the motor end.
- Remove two bolts (B) that secure the hydraulic motor to the arm, and then pull the motor off the roller.

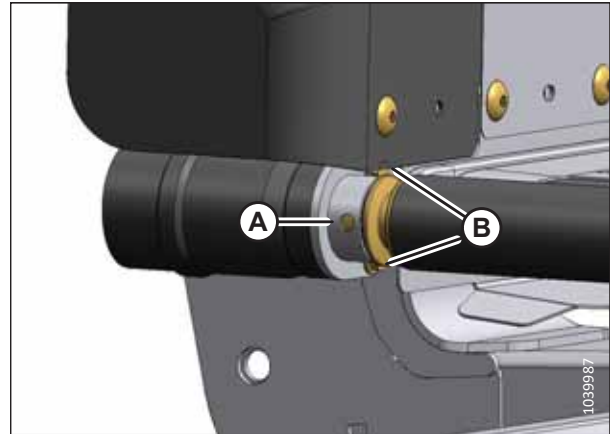


Figure 4.141: Motor End of Drive Roller

- Remove bolt (A) at the forward end of the roller, and then remove the roller from the deck.

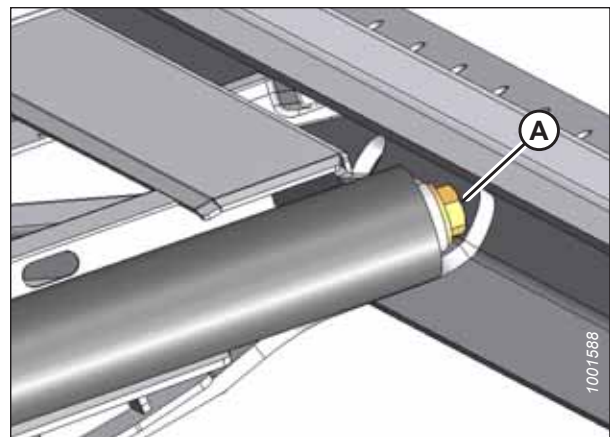


Figure 4.142: Forward End of Drive Roller

Installing Draper Drive Roller

DANGER

Engage the header safety and reel props before working under the header or the reel.

- Position the roller in the deck arms, and secure the forward end with bolt (A) and a washer. Do **NOT** tighten at this time.
- Apply SAE multi-purpose grease to the motor shaft, position the motor on the roller arm, and engage the motor shaft into the roller.

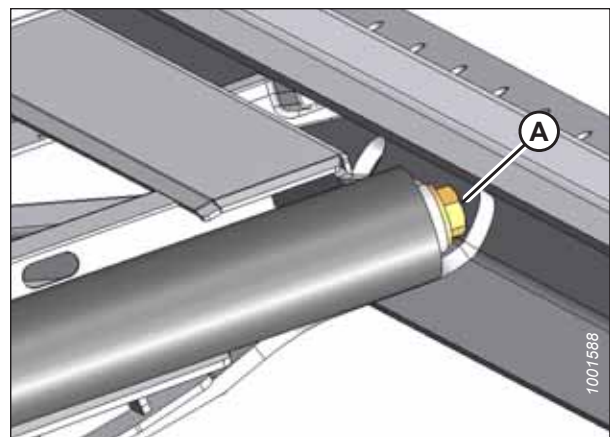


Figure 4.143: Forward End of Drive Roller

3. Secure the motor with shoulder bolts (B), and tighten. The shoulder bolts allow clearance between the motor and arm. The motor is not secured tightly to the arm.
4. Push the roller against the shoulder on the motor shaft, and hand-tighten the two set screws (A). Torque the set screws to 27 Nm (20 lbf·ft).

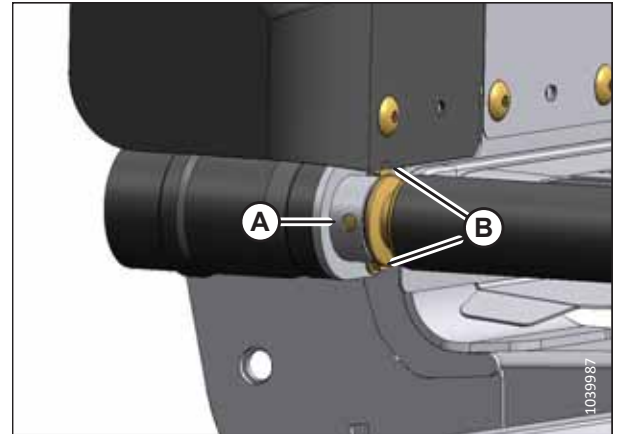
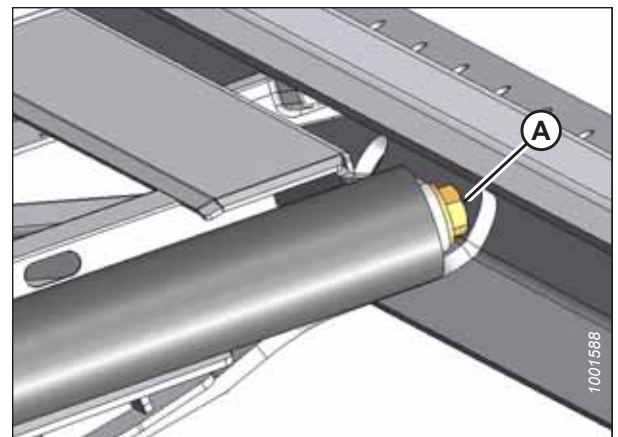


Figure 4.144: Motor End of Drive Roller

5. Torque bolt (A) to 95 Nm (70 lbf·ft).
6. Reattach draper. For instructions, refer to [4.9.3 Installing Split Drapers, page 183](#).
7. Adjust draper tension. For instructions, refer to [4.9.1 Adjusting Draper Tension, page 181](#).
8. Readjust the hydraulic motor hoses (if required), and tighten the hose clamps.
9. Run the machine, and adjust tracking if required. For instructions, refer to [4.9.6 Adjusting Draper Tracking, page 188](#).



Removing Draper Idler Roller

The feed draper idler roller needs to be removed when repairing or replacing it.

! DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

! WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

NOTE:

If the draper joint is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).

1. Start the engine.
2. Raise the header fully.
3. Raise the reel fully.

MAINTENANCE AND SERVICING

4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props.
6. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
7. Loosen the draper by turning adjuster bolt (A) counterclockwise.

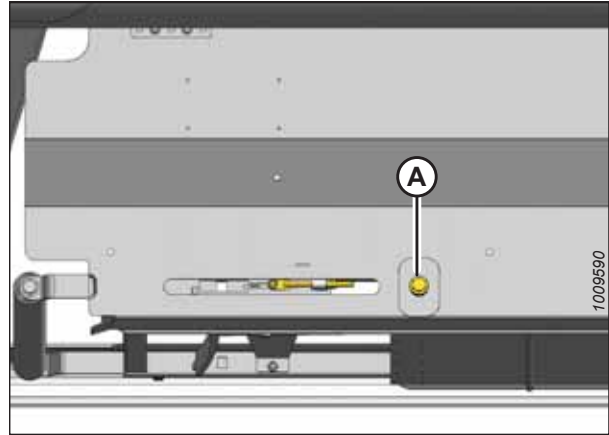


Figure 4.145: Tensioner

8. Remove screws (A), tube connectors (B), and nuts from the draper joint to uncouple the draper.
9. Pull the draper off the idler roller.

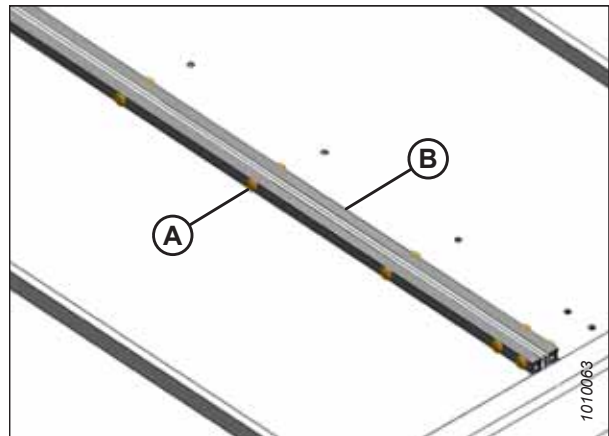


Figure 4.146: Draper Joint

10. Remove bolts (A) and washers at the ends of the idler roller.
11. Spread roller arms (B) and (C) and remove the idler roller.

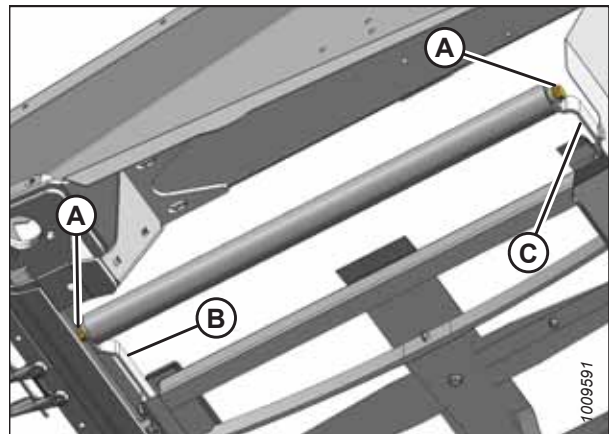


Figure 4.147: Idler Roller

Installing Draper Idler Roller

The roller needs to be installed after it has been repaired or replaced

1. Position the stub shaft into the idler roller in forward arm (B) on the deck.
2. Push on the roller to slightly deflect the forward arm so the stub shaft at the rear of the roller can be slipped into rear arm (C).
3. Install bolts (A) with washers, and torque them to 93 Nm (70 lbf-ft).
4. Wrap the draper over the idler roller, close the draper, and set the tension. For instructions, refer to [4.9.3 Installing Split Drapers, page 183](#).
5. Run the machine and verify the draper tracks correctly. Adjust the draper tracking if required. For instructions, refer to [4.9.6 Adjusting Draper Tracking, page 188](#).

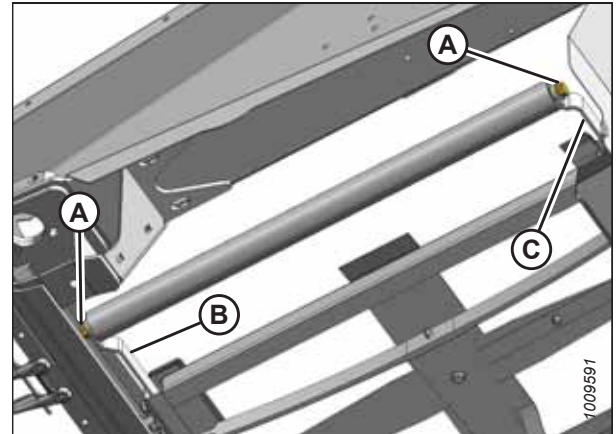


Figure 4.148: Idler Roller

Replacing Draper Roller Bearing and Seal

You will need a slide hammer to remove and replace the bearing on a drive roller.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.
5. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
6. Remove the appropriate roller assembly. For instructions, refer to
 - [Removing Draper Drive Roller, page 189](#)
 - [Removing Draper Idler Roller, page 191](#)

MAINTENANCE AND SERVICING

7. Remove bearing assembly (A) and seal (B) from roller tube (C) as follows:

NOTE:

Seal (B) is not used on the D50 Draper Header.

- a. Attach slide hammer (D) to threaded shaft (E) in the bearing assembly.
 - b. Tap out bearing assembly (A) and seal (B).
8. Clean the inside of roller tube (C), check the tube for signs of wear or damage, and replace it if necessary.

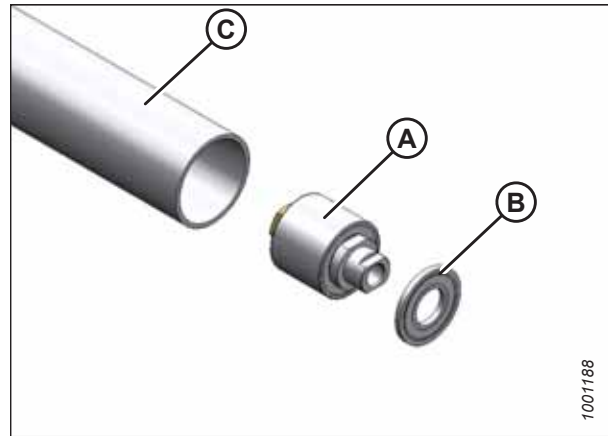


Figure 4.149: Drive Roller Bearing

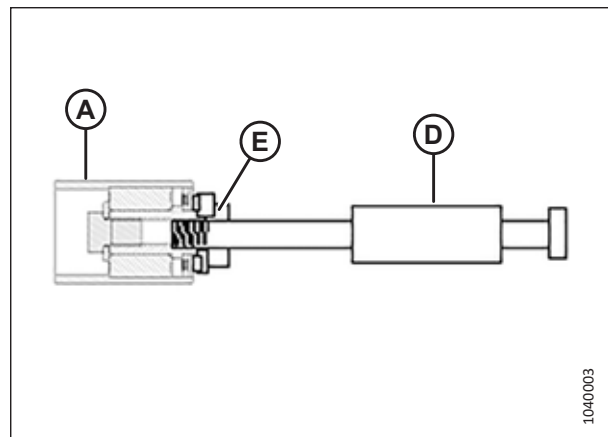


Figure 4.150: Slide Hammer Attached to Roller Assembly

9. Install new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 14–15 mm (0.55–0.2 in.) (B) from the outside edge of the tube.
10. Apply grease in front of bearing assembly (A). Refer to the inside back cover for specifications.
11. Position new seal (C) at the roller opening and position a flat washer (1 in. ID x 2 in. OD) on the seal.
12. Tap seal (C) into the roller opening with a suitably sized socket until gap (D) between the seal and the outside edge of the tube is 3–4 mm (0.12–0.16 in.).

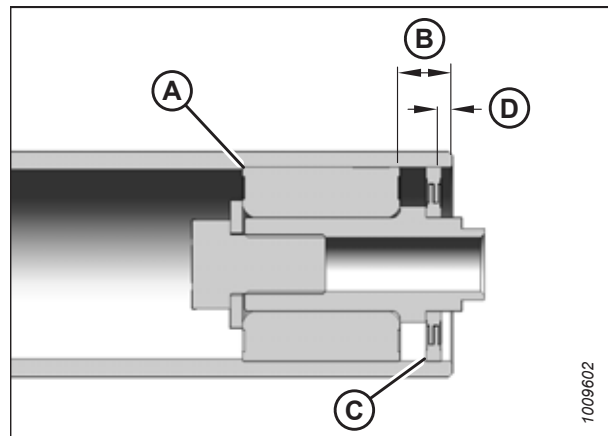


Figure 4.151: Drive Roller Bearing

4.9.8 Adjusting Deck Height

The draper seal is the gap between the draper and the cutterbar. It should be inspected before the draper is operated to prevent potential damage to the draper system.

To prevent material from entering the drapers and cutterbar, maintain the deck height such that the draper runs just below the cutterbar with a maximum 1 mm (1/32 in.) gap, or with the draper deflected down slightly (up to 1.5 mm [1/16 in.]) to create a seal.

The illustration at right shows the adjustment without the draper.

NOTE:

The measurement is taken at the supports, with the header in field position and the decks slid fully ahead.

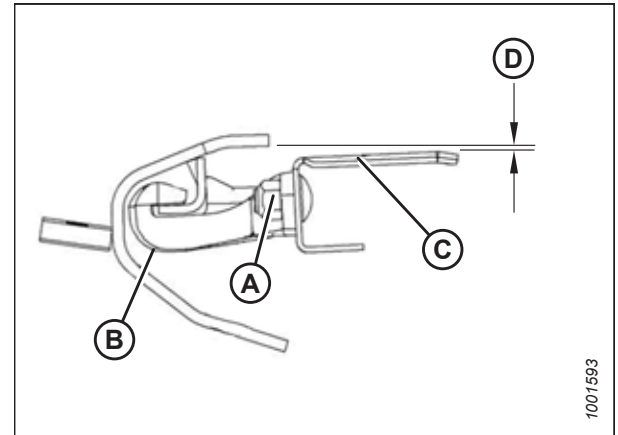


Figure 4.152: Deck Height Measurements

A - Lock Nut

B - Deck Support

C - Draper Deck

D - D50 Gap: 3–4 mm (0.12–0.16 in.);
D60 Gap: 7–8 mm (0.27–0.31 in.)

To adjust the deck height, follow these steps:



DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Lower the header onto blocks.
2. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
3. Shut down the engine, and remove the key from the ignition.
4. Reduce the tension on the draper. For instructions, refer to [4.9.1 Adjusting Draper Tension, page 181](#).

MAINTENANCE AND SERVICING

5. Lift the front edge of draper (A) past cutterbar (B) to expose the deck support.

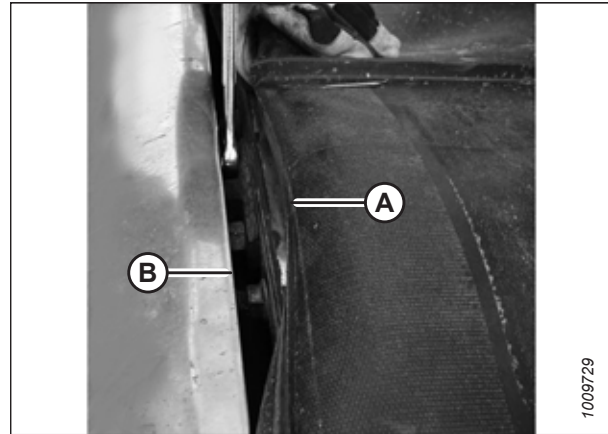


Figure 4.153: Deck Adjustment

6. Loosen two lock nuts (A) on deck support (B) by one half-turn **ONLY**.

NOTE:

The deck is shown with the draper removed in the illustration at right. There are two to four supports per deck, depending on the width of the header.

7. To lower the deck relative to the deck supports, tap deck (C) with a hammer. To raise the deck relative to the deck supports, tap deck support (B) using a hammer and punch.
8. Tighten deck support hardware (D).
9. Tension the draper. For instructions, refer to [4.9.1 Adjusting Draper Tension, page 181](#).

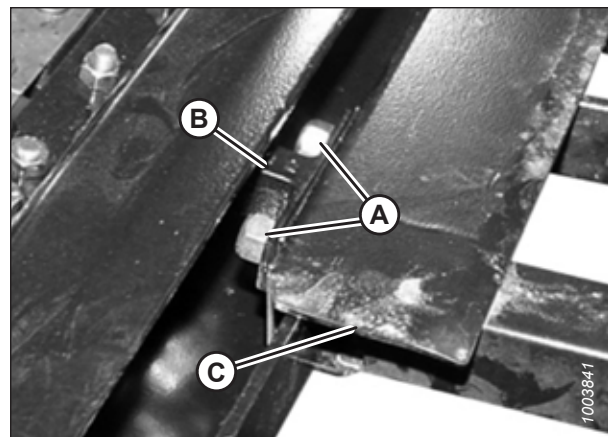


Figure 4.154: Deck Support

4.10 Reel

The reel features a uniquely shaped cam, which allows the fingers to get underneath lodged crop and pick it up before it is cut.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [4.1 Preparing Machine for Servicing, page 113](#).

4.10.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that reel fingers do not contact cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation or if there is evidence of contact during operation.

The finger to guard/cutterbar clearances with the reel fully lowered are shown in [Table 4.4, page 197](#).

Table 4.4 Finger to Guard/Cutterbar Clearance

	(X) +/- 3 mm (1/8 in.) at Reel Ends	
Header Width	Single Reel	Double Reel
4.6 m (15 ft.)	20 mm (3/4 in.)	—
6.1 m (20 ft.)	20 mm (3/4 in.)	—
7.6 m (25 ft.)	25 mm (1 in.)	—
9.1 m (30 ft.)	45 mm (1 3/4 in.)	20 mm (3/4 in.)
10.7 m (35 ft.)	60 mm (2 3/8 in.)	20 mm (3/4 in.)
12.2 m (40 ft.)	—	20 mm (3/4 in.)

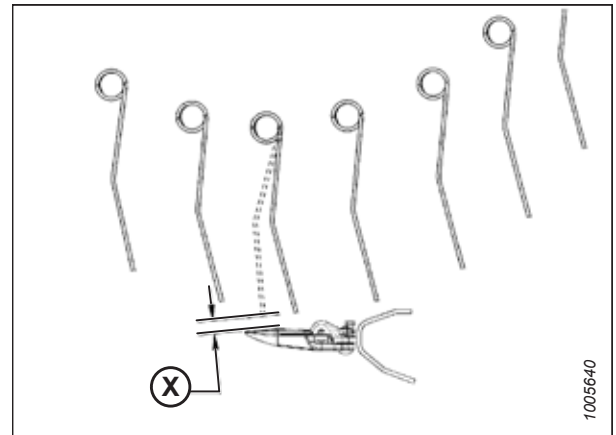


Figure 4.155: Finger Clearance

Measuring Reel Clearance

Make sure there is sufficient clearance between the reel and the cutterbar to prevent the knife from cutting the reel finger tips off during operation.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. NEVER climb onto or go underneath an unsupported header.

1. Park the machine on level ground.
2. Adjust header to working height.
3. Turn off the engine and remove the key.

MAINTENANCE AND SERVICING

4. Adjust the fore-aft reel position so that the back end of the cam disc is between the 4 and 5 on fore-aft position indication decal (A).
5. Lower the reel fully.
6. Shut down the engine, and remove the key from the ignition.



Figure 4.156: Fore-Aft Position

7. Measure the clearance at the ends of each reel at locations (A).

NOTE:

The reel is factory-set to provide more clearance at the center of the reel than at the ends to compensate for reel flexing.

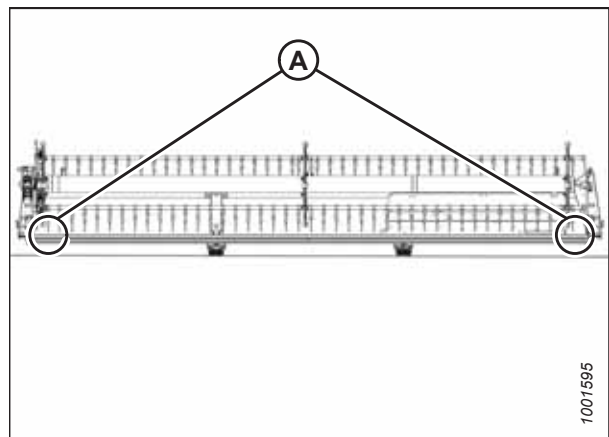


Figure 4.157: Single-Reel Header

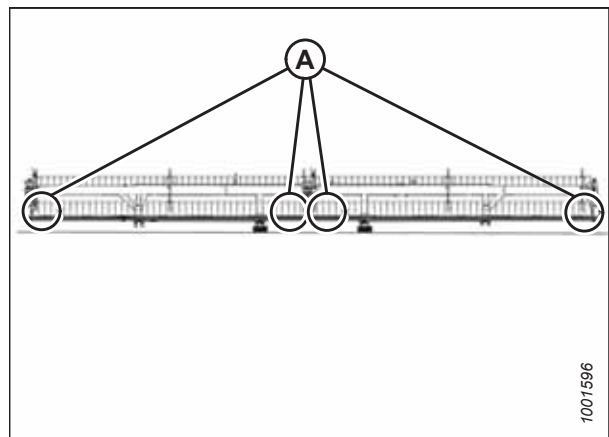


Figure 4.158: Double-Reel Header

8. Check finger clearance (X) when positioned between locations (A) and (B). Depending on the reel fore-aft position, the minimum clearance can result at the guard tine, hold-down, or cutterbar. For finger clearance measurements, refer to Table 4.4, page 197.
9. Adjust the reel if necessary. For instructions, refer to *Adjusting Reel Clearance*, page 199.

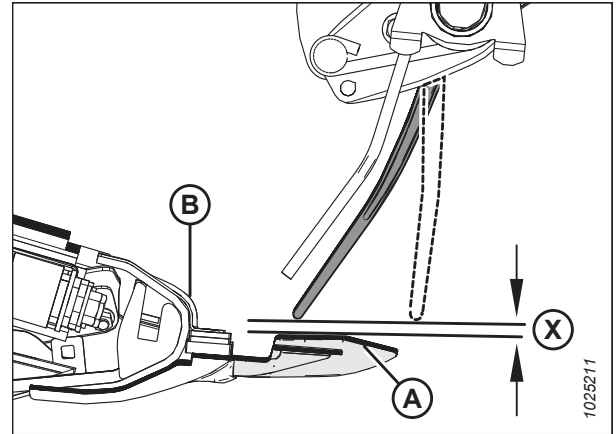


Figure 4.159: Reel Clearance

Adjusting Reel Clearance



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Engage the header safety props.
3. Lower the reel fully.
4. Shut down the engine, and remove the key from the ignition.
5. Adjust the outboard reel arm lift cylinders to set the clearance as follows:
 - a. Loosen bolt (A).
 - b. Turn cylinder rod (B) out of the clevis to raise the reel and increase the clearance to the cutterbar, or turn the cylinder rod into the clevis to lower the reel and decrease the clearance.
 - c. Tighten bolt (A).
 - d. Repeat these steps at the opposite side.

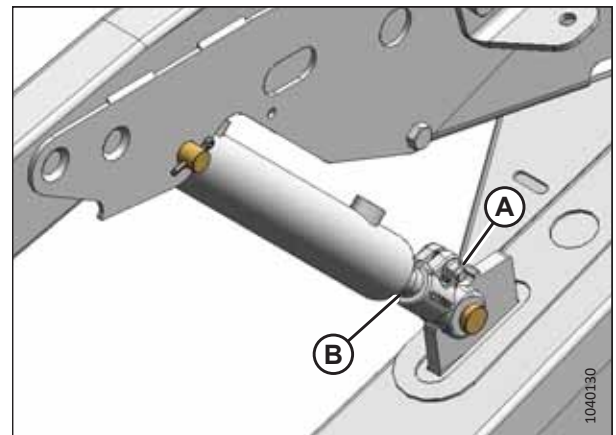


Figure 4.160: Reel Outboard Arm

6. **Double reel:** Adjust center arm lift cylinder link (A) to set the clearance at the center of the reel as follows:

NOTE:

This adjustment is most easily performed from the underside of the arm.

- a. Loosen nut (B).
- b. Turn nut (C) counterclockwise to raise the reel and increase the clearance to the cutterbar, or clockwise to lower the reel and decrease the clearance.
- c. Tighten nut (B).

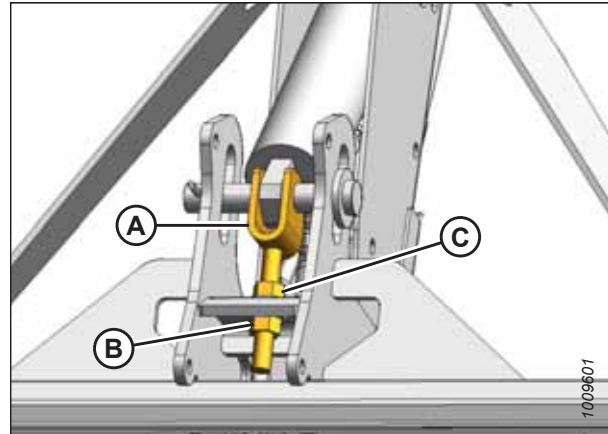


Figure 4.161: Double Reel Center Arm

7. Move the reel back to ensure the steel end fingers do not contact the deflector shields.
8. If contact is evident, adjust the reel upward to maintain the clearance at all reel fore/aft positions. Alternatively, trim the steel end fingers to obtain the proper clearance.
9. Periodically check for evidence of contact, and adjust the clearance as required.

4.10.2 Reel Frown

The reel is factory-set in a frown shape (more clearance at the center of the reel than at the ends) to compensate for reel flexing.

Adjusting Reel Frown

Adjust the reel frown by repositioning the reel tine tubes attached to the reel discs.

NOTE:

Measure the frown profile before disassembling the reel for servicing so the profile can be maintained during reassembly.

1. Position the reel all the way down and over the cutterbar (between position 4 and 5 on fore-aft decal [A]).
2. Record the measurement at each reel disc location for each reel tine tube.



Figure 4.162: Fore-Aft Position Decal

3. Start with the reel disc closest to the center of the header and proceed outward toward the ends, adjusting the header profile as follows:

- a. Remove bolts (A).
- b. Loosen bolt (B) and adjust arm (C) until the desired measurement is obtained between the reel tine tube and the cutterbar.

NOTE:

Allow the reel tine tubes to curve naturally and position the hardware accordingly.

- c. Reinstall bolts (A) in the aligned holes and tighten them.

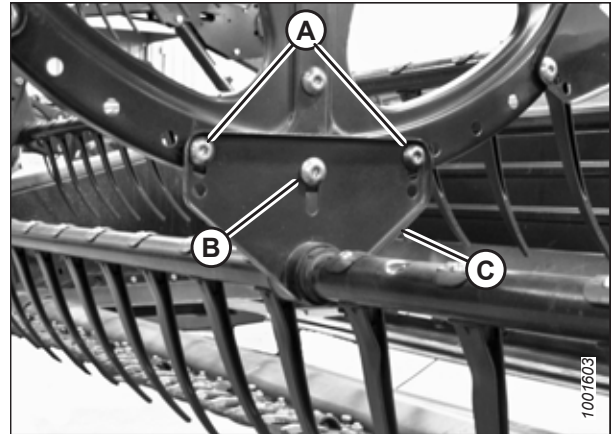


Figure 4.163: Center Reel Arm

4.10.3 Centering Reel



DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Start the engine and set the cutterbar height at approximately 150 mm (6 in.) above ground.
2. Lower the reel and adjust the fore-aft position to 5 on the reel arm indicator decal.
3. Stop the engine, and remove the key from the ignition.
4. Manually rotate the reel to position a tine tube above the cutterbar.
5. Measure clearance (A) between the reel tine tube and endsheet at both ends (B) of the header. If the reel is centered, the clearances will be the same. Refer to the following steps to center the reel.

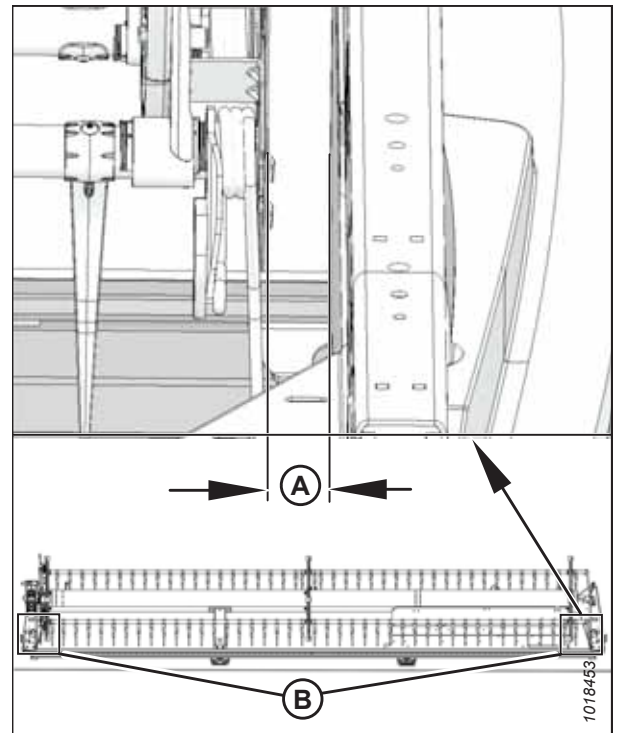


Figure 4.164: Centering Reel – Single Reel (Double Reel Similar)

Single-reel headers

6. Loosen bolt (A) on brace (B) at both ends of the reel.
7. Move the forward end of reel support arm (C) side to side as required to center the reel.
8. Tighten bolts (A) and torque to 359 Nm (265 lbf·ft).

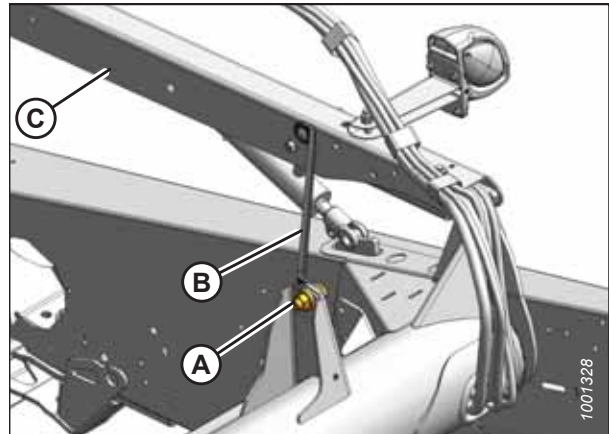


Figure 4.165: Reel Outboard Support Arm

Double-reel headers

9. Loosen bolts (A) on braces (B) at the center support arm.
10. Move the forward end of reel support arm (C) side to side as required to center the reel.
11. Tighten bolts (A) and torque to 359 Nm (265 lbf·ft).

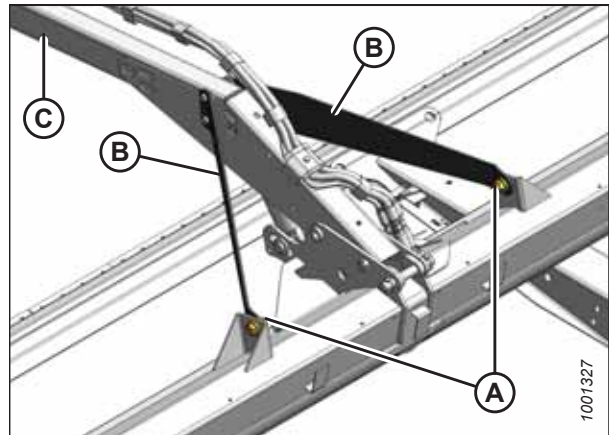


Figure 4.166: Double Reel Center Support Arm

4.10.4 Reel Drive

All 7.6 m (25 ft.) and smaller headers have single reels; 9.1–10.7 m (30–35 ft.) headers are available in single-reel and double-reel versions; all headers larger than 10.7 m (35 ft.) are only available in double-reel configurations. Single reels are driven from the right arm and double reels are driven from the center arm.

Replacing Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris.

Removing Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

Single-reel drive

2. **D60:** Remove four bolts (A) securing cover (B) to the reel drive.

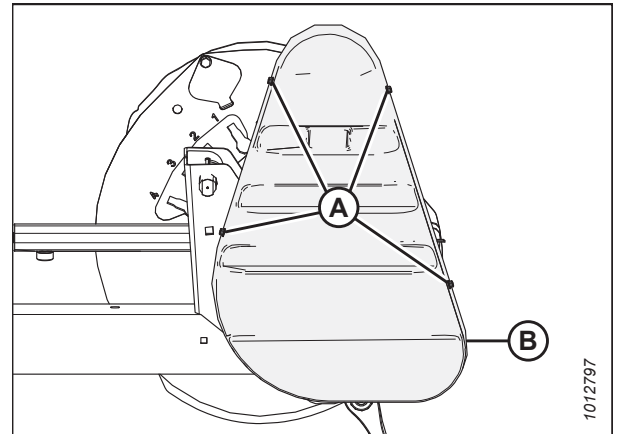


Figure 4.167: Drive Cover – D60 Single Reel

3. **D50:** Remove six screws (A) securing cover (B) to the reel drive.

NOTE:

Only three screws (A) are visible in the illustration. The other three are on the other side of the cover.



Figure 4.168: Drive Cover – D50 Single Reel

Double-Reel Drive

4. Remove six bolts (A) securing upper cover (B) to the reel drive and lower cover (C).

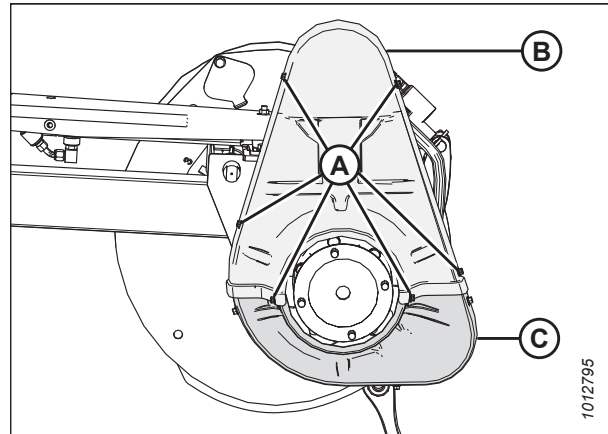


Figure 4.169: Drive Cover – Double Reel

5. If necessary, remove three bolts (A) and remove lower cover (B).

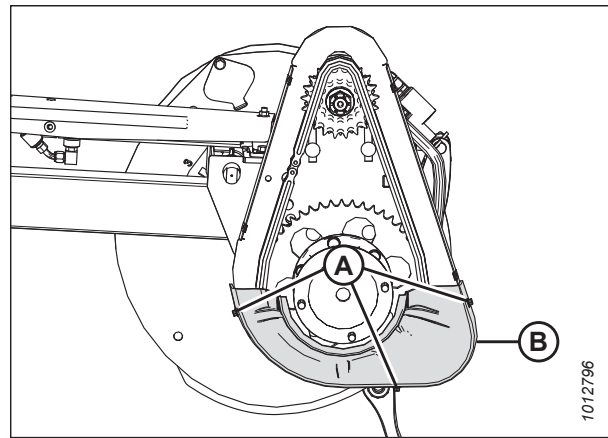


Figure 4.170: Drive Cover – Double Reel

Installing Reel Drive Cover

The reel drive cover protects the drive components from weather and debris.

Single-reel drive

1. **D60:** Position drive cover (B) onto the reel drive and secure it with four bolts (A).

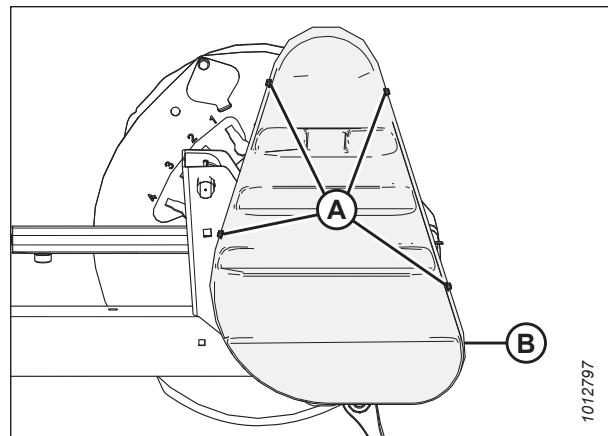


Figure 4.171: Drive Cover – D60 Single Reel

2. **D50:** Position drive cover (B) onto the reel drive and secure it with six screws (A).

NOTE:

Only three screws (A) are visible in the illustration. The other three are on the other side of the cover.

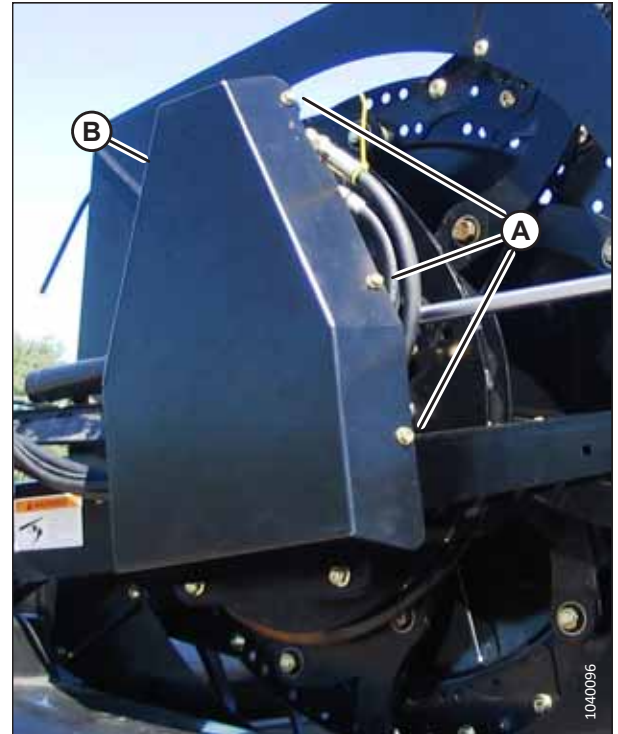


Figure 4.172: Drive Cover – D50 Single Reel

Double-reel drive

3. Position lower drive cover (B) onto the reel drive (if previously removed) and secure it with three bolts (A).

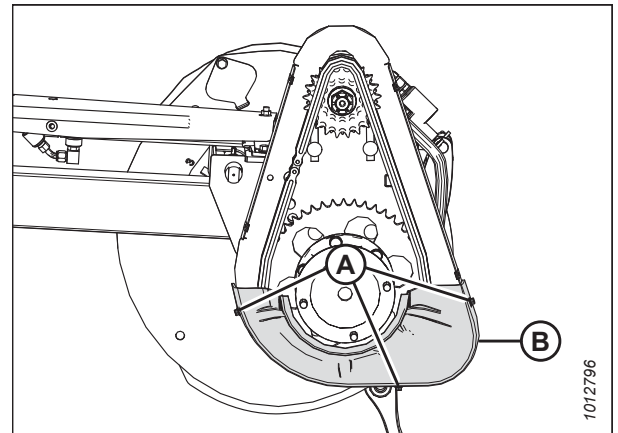


Figure 4.173: Drive Cover – Double Reel

4. Position upper drive cover (B) onto the reel drive and lower cover (C), and secure it with six bolts (A).

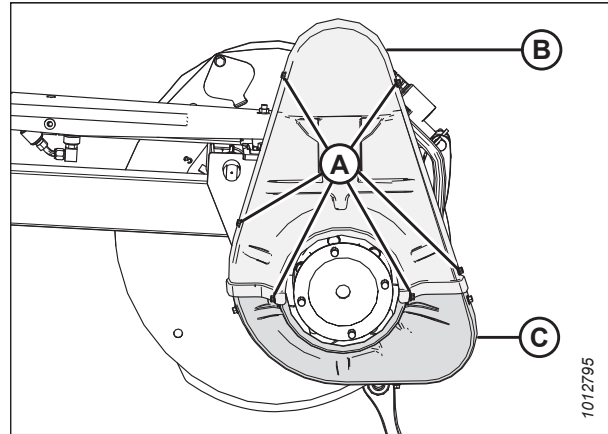


Figure 4.174: Drive Cover – Double Reel

Adjusting Reel Drive Chain Tension

The reel drive chain transfers power from the hydraulically driven reel motor to the sprockets that rotate the reels.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#).
3. **D60:** Tension on chain (A) should be such that hand force deflects chain 3 mm (1/8 in.) at mid-span. Adjust as follows:
 - a. Loosen six bolts (B) on motor mount (D).
 - b. Slide motor (C) and motor mount (D) until the required tension is achieved.
 - c. Tighten bolts (B) to 102 Nm (75 lbf·ft).

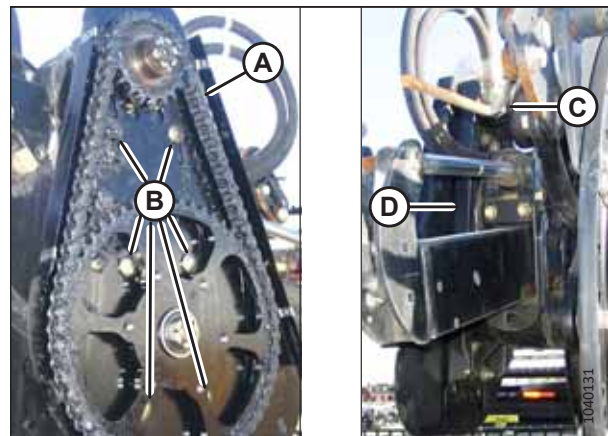


Figure 4.175: D60 Reel Drive – Single Reel Shown, Double Reel Similar

4. **D50:** Tension on chain (A) should be such that hand force deflects chain 3 mm (1/8 in.) at mid-span. Adjust as follows:
 - a. Loosen four bolts (B) on motor mount (C).
 - b. Slide the motor and motor mount (C) until the required tension is achieved.
 - c. Tighten bolts (B) to 102 Nm (75 lbf·ft).
5. Reinstall the reel drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).



Figure 4.176: D50 Reel Drive – Single Reel

Replacing Drive Chain on Single Reel

The drive chain allows the hydraulic reel drive motor to turn the reel. It can be replaced if damaged or worn.

1. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#).

MAINTENANCE AND SERVICING

- Loosen bolts (A) and slide the motor and motor mount (B) down towards the reel shaft.

NOTE:

There are four of bolt (A) on the D50 and six on the D60.

- Lift chain (C) off drive sprocket (D).
- Lower the chain until free of lower sprocket (E) and remove the chain from the drive.
- Position new chain (C) around the bottom teeth on lower sprocket (E).
- Lift the chain onto drive sprocket (D) ensuring all the links are properly engaged in the teeth.
- Slide the motor and motor mount (B) until the tension on the chain is such that hand force deflects the chain 3 mm (1/8 in.) at mid-span.
- Tighten bolts (A), and recheck the chain tension.
- Reinstall the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

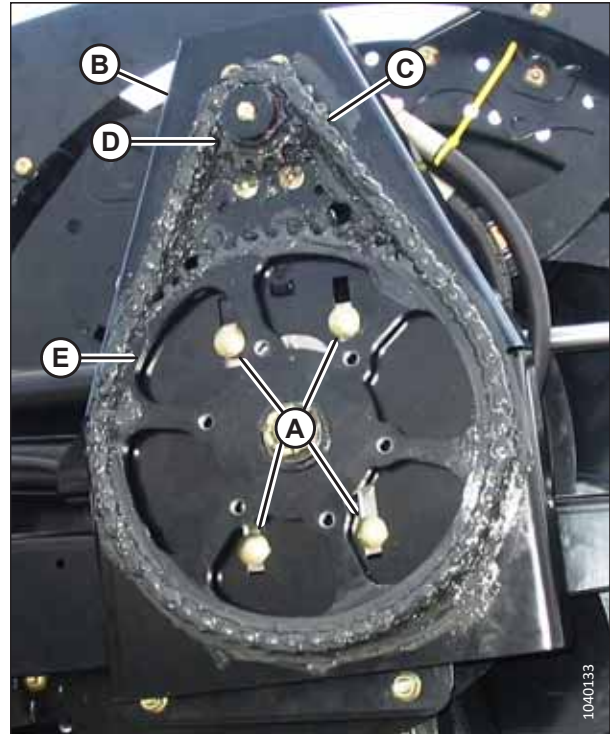


Figure 4.177: Reel Drive – D50

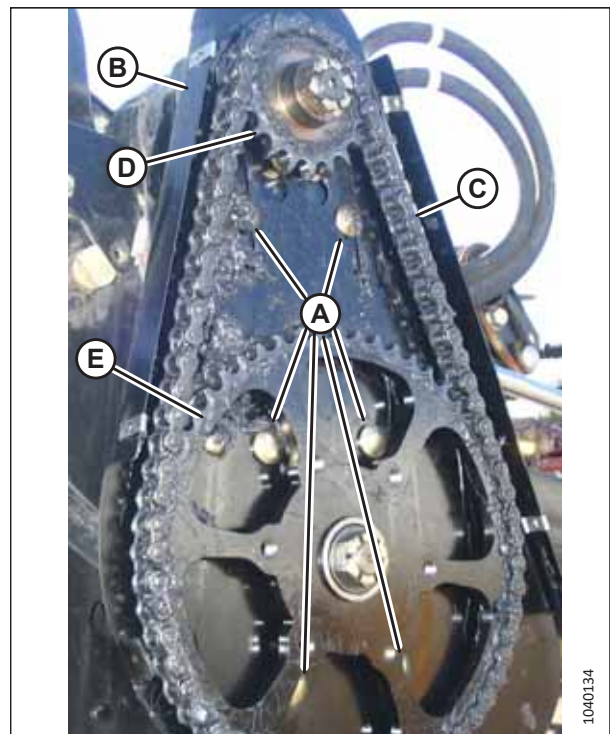


Figure 4.178: Reel Drive – D60

Replacing Drive Chain on Double Reel

The drive chain allows the hydraulic reel drive motor to turn the reel. It can be replaced if damaged or worn.

There are two methods for replacing the reel drive chain. Proceed to the procedure that is most appropriate for your circumstances:

- **Method 1:** [Replacing Drive Chain – Disconnecting Reel Drive Method, page 209](#)
- **Method 2:** [Replacing Drive Chain – Breaking Chain Method, page 213](#)

NOTE:

Method 1 is preferred because chain integrity is not affected.

Replacing Drive Chain – Disconnecting Reel Drive Method



DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#).
3. Loosen six bolts (A) and slide the motor and motor mount (B) down towards the reel shaft to loosen the chain.

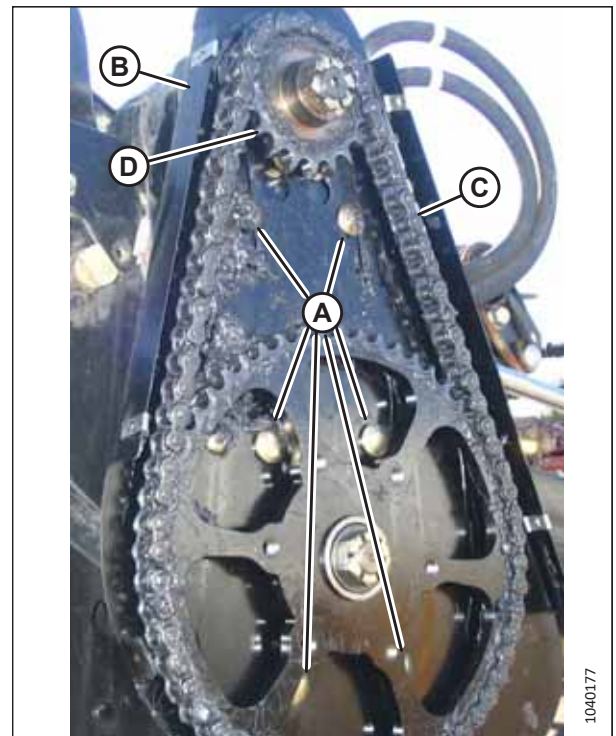


Figure 4.179: Reel Drive

MAINTENANCE AND SERVICING

4. Support the inboard end of the right reel with a front end loader and nylon slings (or equivalent setup).

NOTE:

To avoid damaging or denting center tube, support reel as close as possible to the cam end disc.



Figure 4.180: Supporting Reel

5. Remove four bolts (A) attaching the reel tube to U-joint (B).

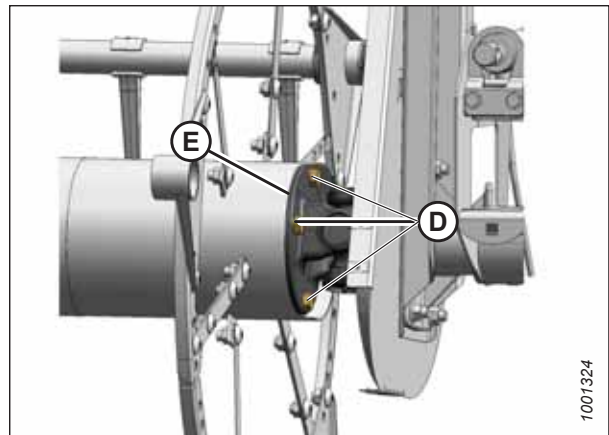


Figure 4.181: U-Joint

MAINTENANCE AND SERVICING

6. Loosen the right reel arm brace by loosening bolt (A) on the backtube.

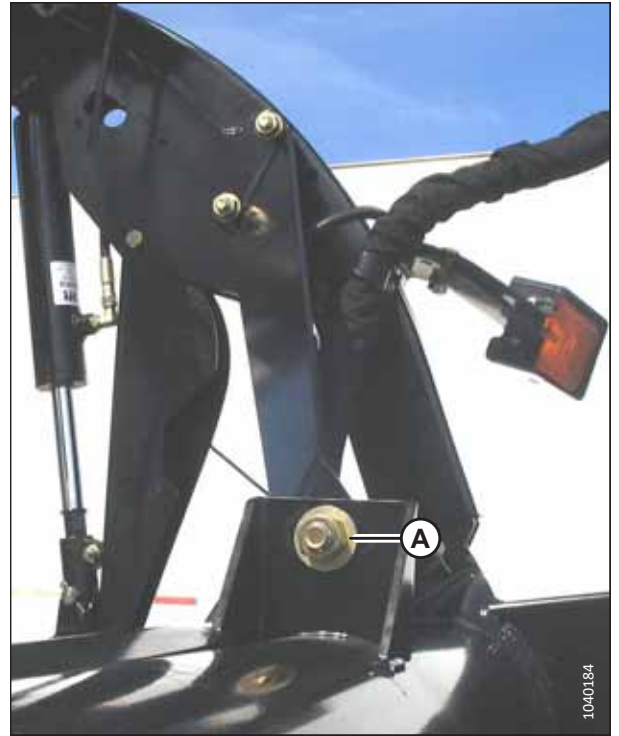


Figure 4.182: Right Reel Arm Brace

7. Move the right reel sideways to separate the reel tube (A) and U-joint (B).
8. Remove chain (C).
9. Route new chain (C) over U-joint (B) and position it on the sprockets.

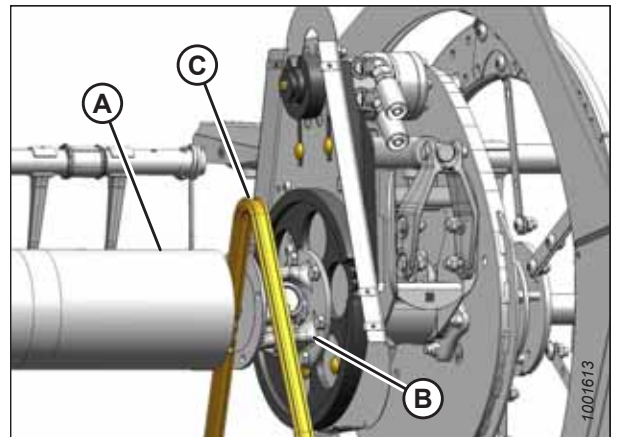


Figure 4.183: Replacing Chain

MAINTENANCE AND SERVICING

10. Slide the motor and motor mount (B) up until the tension on chain (C) is such that hand force deflects the chain 3 mm (1/8 in.) at mid-span.
11. Tighten nuts (A), and then recheck the chain tension.

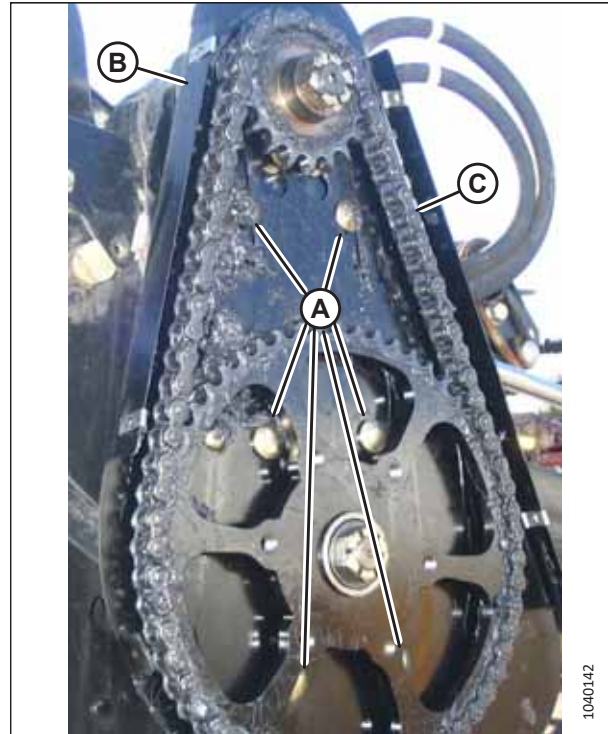


Figure 4.184: Reel Drive

12. Position right reel tube (A) against the reel drive and engage the stub shaft into U-joint (B) pilot hole.
13. Rotate the reel until the holes in the end of the reel tube and the U-joint line up.
14. Apply medium-strength threadlocker (Loctite® #243 or equivalent) to four 1/2 in. bolts (A) and install with lock washers.
15. Torque the hardware to 104 Nm (77 lbf·ft).

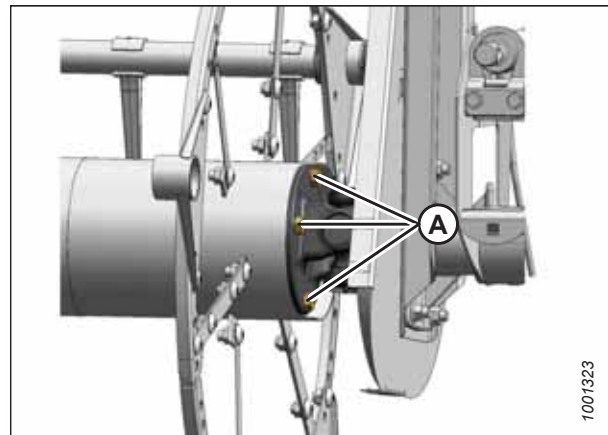


Figure 4.185: U-Joint

16. Remove the temporary reel support.



Figure 4.186: Supporting Reel

17. Retighten reel arm brace bolt (A), and torque to 366 Nm (270 lbf·ft).
18. Reinstall the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

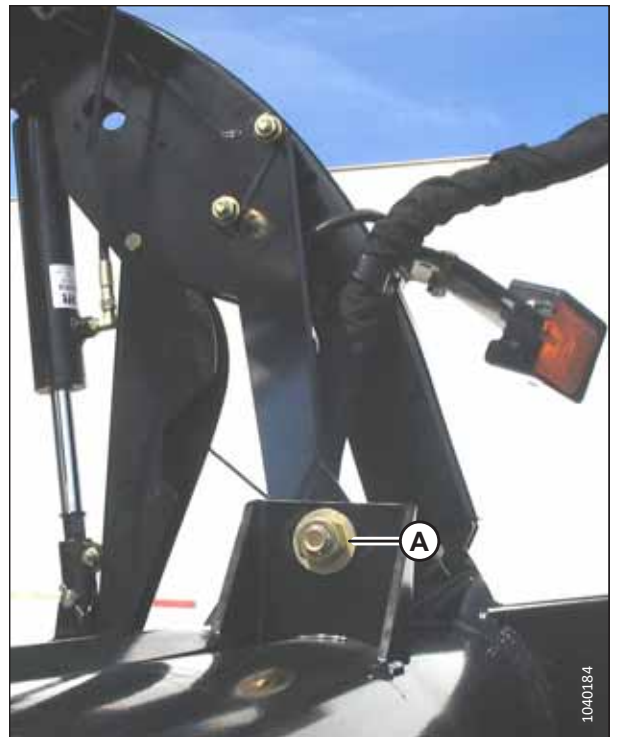


Figure 4.187: Right Reel Arm Brace

Replacing Drive Chain – Breaking Chain Method



DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#).

MAINTENANCE AND SERVICING

3. Grind off the head of a link rivet on chain (A), punch out the rivet, and remove the chain.
4. Grind off the head of a link rivet on the new chain, punch out the rivet, and separate the chain.
5. Position the ends of the new chain onto sprocket (B).

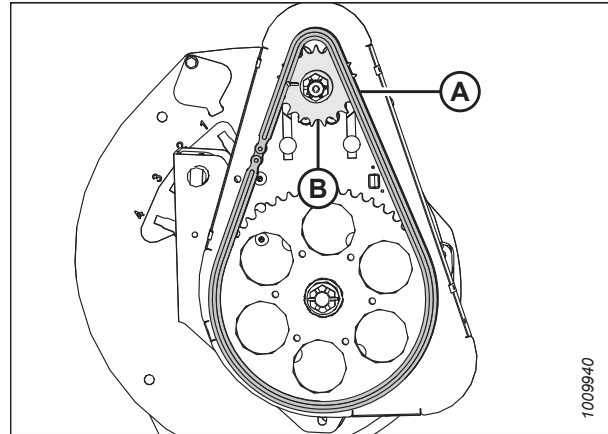


Figure 4.188: Reel Drive

6. Install pin connector (A) (not available as a MacDon part) into the chain, preferably from the backside of the sprocket.
7. Install connector (B) onto the pins.
8. Install spring clip (C) onto front pin (D) with the closed end of the spring clip facing the direction of the sprocket rotation.
9. Position one leg of spring clip (C) into the groove of aft pin (E).
10. Press the other leg of spring clip (C) over the face of aft pin (E) until it slips into the groove. Do **NOT** press the spring clip lengthwise from the closed end.
11. Ensure spring clip (C) is seated into the grooves of front pin (D) and aft pin (E).

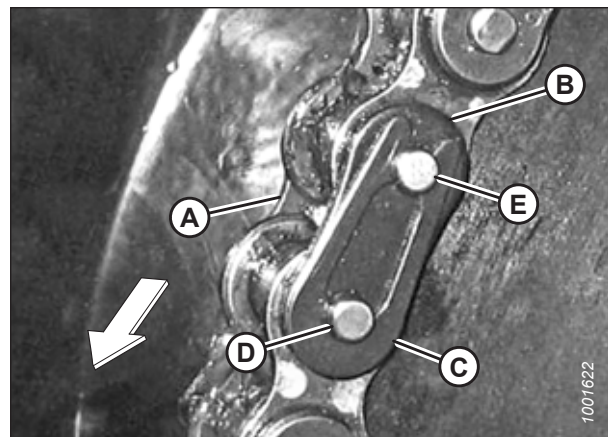


Figure 4.189: Chain

12. Slide the motor and motor mount (B) up until the tension on chain (C) is such that hand force deflects the chain 3 mm (1/8 in.) at mid-span.
13. Tighten nuts (A), and then recheck the tension.
14. Reinstall the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

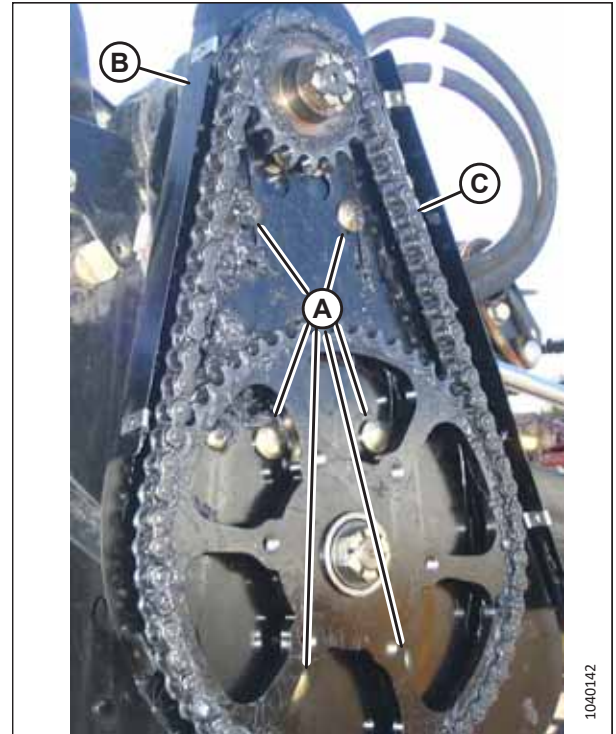


Figure 4.190: Reel Drive

Replacing Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

Removing Reel Drive Sprocket – D50

The reel drive sprocket is attached to the reel drive motor.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. NEVER climb onto or go underneath an unsupported header.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#).

3. Loosen four bolts (A) and slide the motor and motor mount (B) down towards the reel shaft.
4. Lift chain (C) off drive sprocket (D).

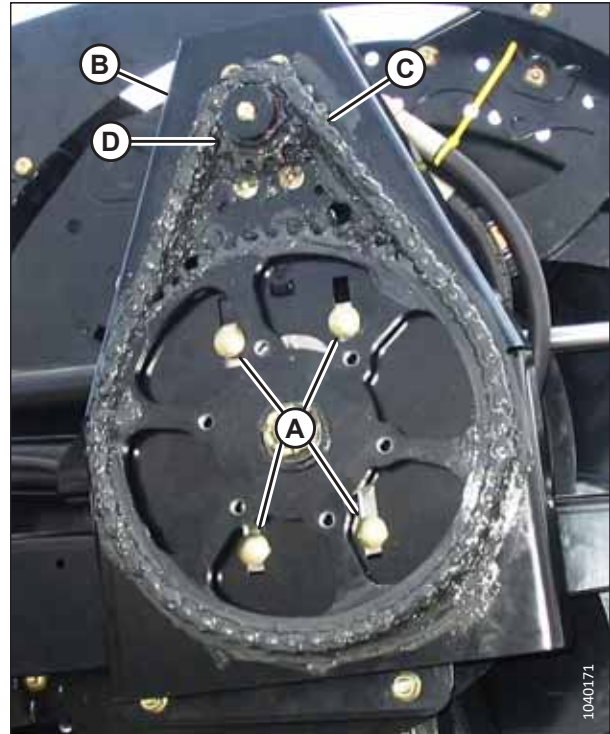


Figure 4.191: D50 Reel Drive

5. Remove bolt (A), lock washer (B), and flat washer (C) from the motor shaft.
6. Remove drive sprocket (D). Ensure the key remains in the shaft.

IMPORTANT:

To avoid damaging the motor, use a puller if the drive sprocket does not come off by hand. Do **NOT** use a pry bar and/or hammer to remove drive sprocket (C).

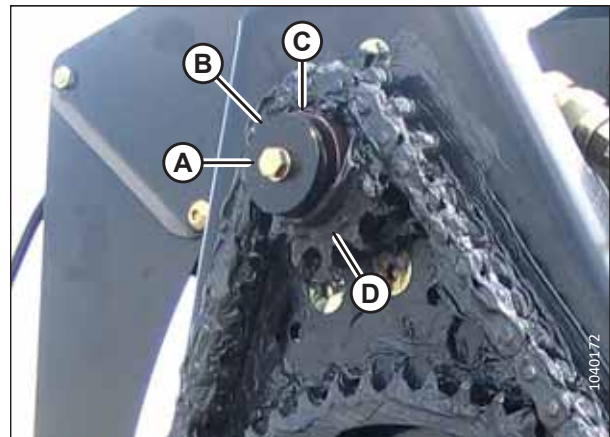


Figure 4.192: D50 Reel Drive

Removing Reel Drive Sprocket – D60

The reel drive sprocket is attached to the reel drive motor.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. NEVER climb onto or go underneath an unsupported header.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#).

MAINTENANCE AND SERVICING

3. Loosen six bolts (A) and slide the motor and motor mount (B) down towards the reel shaft.
4. Lift chain (C) off drive sprocket (D).

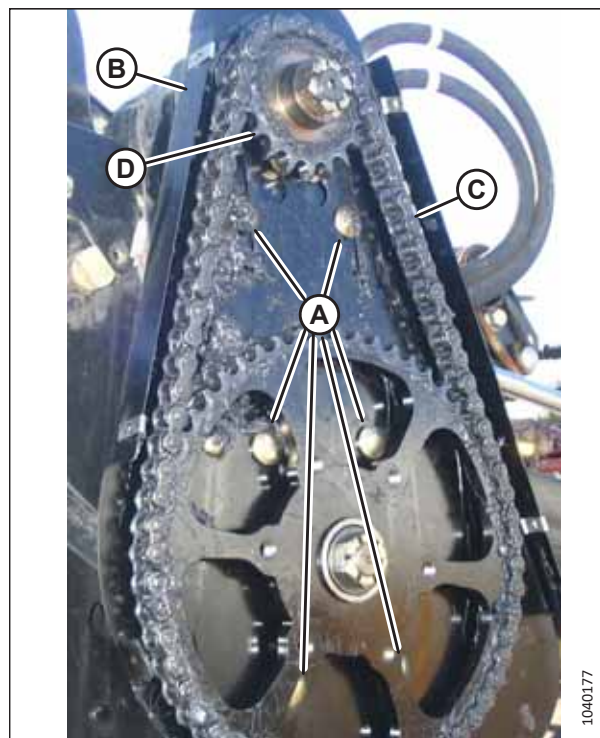


Figure 4.193: D60 Reel Drive

5. Remove cotter pin (A) and slotted nut (B) from the motor shaft.
6. Remove drive sprocket (C). Ensure the key remains in the shaft.

IMPORTANT:

To avoid damaging the motor, use a puller if the drive sprocket does not come off by hand. Do **NOT** use a pry bar and/or hammer to remove drive sprocket (C).

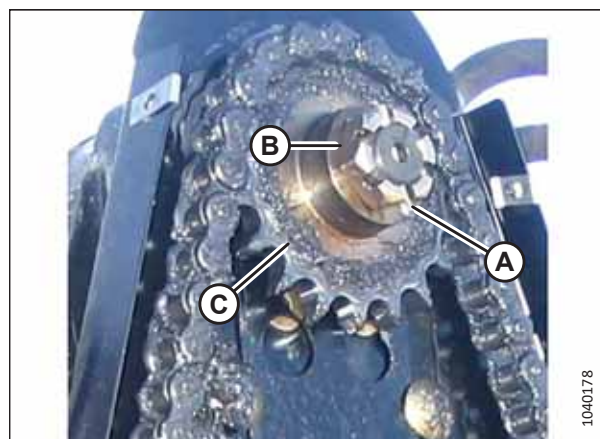


Figure 4.194: D60 Reel Drive

Installing Reel Drive Sprocket – D50

The reel drive sprocket is attached to the reel drive motor.

1. Align the keyway in sprocket (D) with the key on the motor shaft, and slide the sprocket onto the shaft.
2. Secure sprocket (D) with flat washer (C), lock washer (B), and bolt (A).
3. Torque the hardware to 24 Nm (18 lbf-ft).

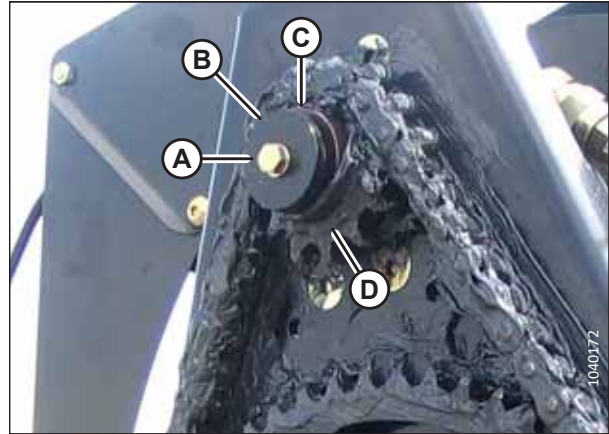


Figure 4.195: D50 Reel Drive

4. Install drive chain (C) onto drive sprocket (D).
5. Slide the motor and motor mount (B) up until required tension is achieved. The tension on chain (C) should be such that hand force deflects the chain 3 mm (1/8 in.) at mid-span.
6. Tighten bolts (A) to 102 Nm (75 lbf-ft).
7. Reinstall the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

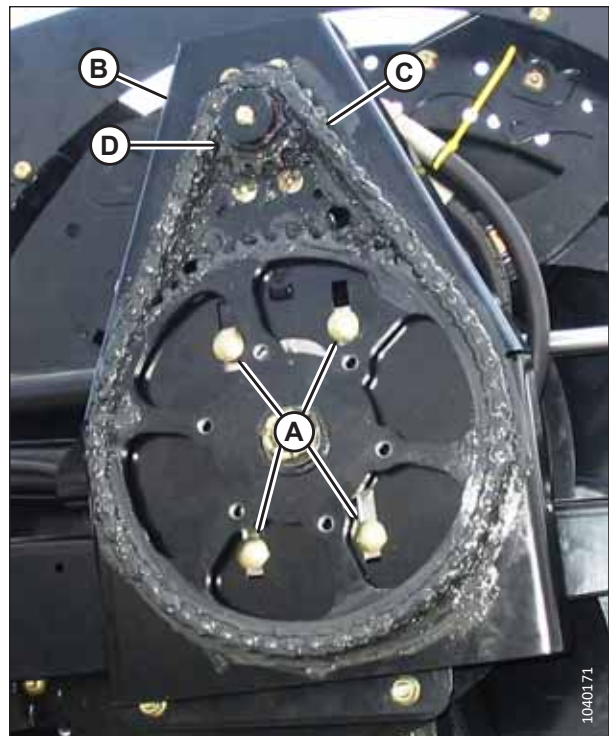


Figure 4.196: D50 Reel Drive

Installing Reel Drive Sprocket – D60

The reel drive sprocket is attached to the reel drive motor.

1. Align the keyway in sprocket (C) with the key on the motor shaft, and slide the sprocket onto the shaft.
2. Install slotted nut (B), and torque to 1.7 Nm (15 lbf-in).
3. Install cotter pin (A). If necessary, tighten slotted nut (B) to the next slot to install the cotter pin.

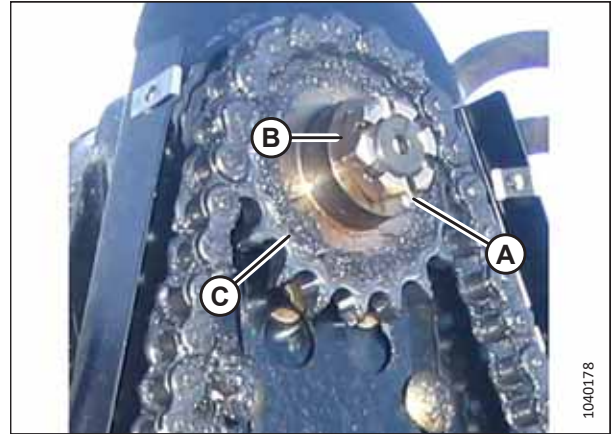


Figure 4.197: D60 Reel Drive

4. Install drive chain (C) onto drive sprocket (D).
5. Slide the motor and motor mount (B) up until the tension on the chain is such that hand force deflects the chain 3 mm (1/8 in.) at mid-span.
6. Tighten six bolts (A), and recheck the chain tension.
7. Reinstall the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

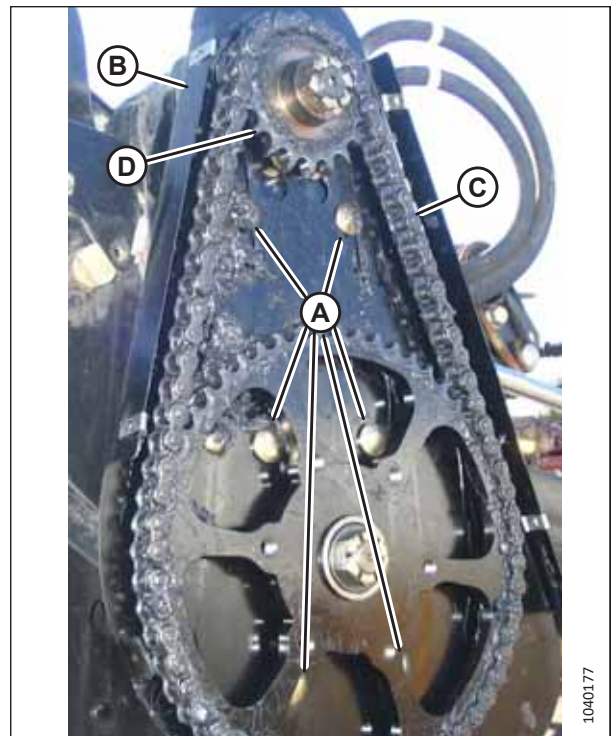


Figure 4.198: D60 Reel Drive

Replacing Double-Reel U-Joint

The double-reel drive U-joint allows each reel to move independently from the other.

Lubricate the U-joint according to specifications. For instructions, refer to [4.4 Lubrication, page 128](#).

Replace the U-joint if it is severely worn or damaged. For instructions, refer to [Removing Double-Reel U-Joint, page 220](#).

Removing Double-Reel U-Joint

If the double-reel U-joint is worn or damaged, it will need to be replaced.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props](#), page 36.
5. Remove the drive cover. For instructions, refer to [Removing Reel Drive Cover](#), page 202.
6. Support the inboard end of the right reel with a front end loader and nylon slings (A) (or equivalent lifting device).

IMPORTANT:

Avoid damaging or denting the center tube by supporting the reel as close to the cam end disc as possible.

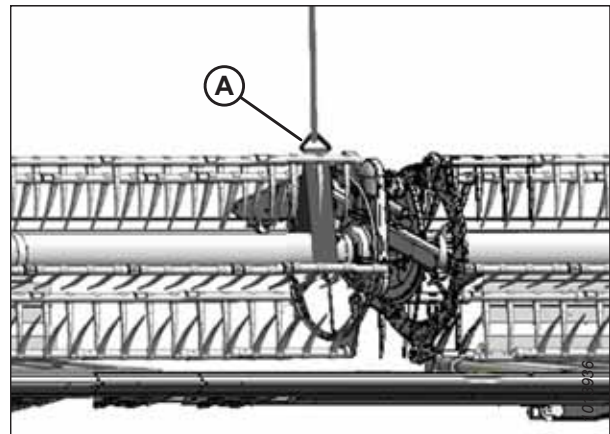


Figure 4.199: Supporting Reel

7. Remove the four bolts (A) securing the reel tube to the U-joint flange (B), and move the reel sideways.

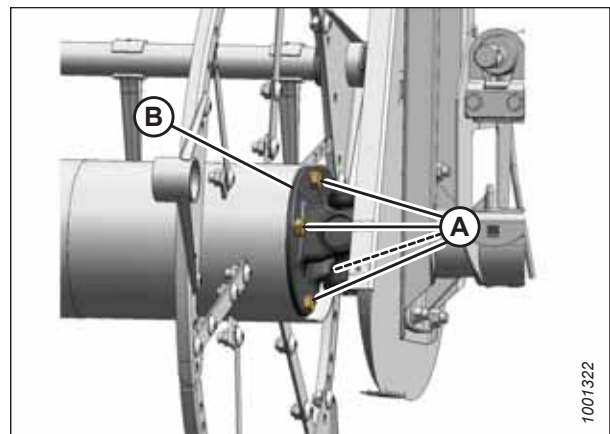


Figure 4.200: U-Joint

8. Remove six bolts (A) attaching U-joint flange (B) to driven sprocket (C).
9. Remove the U-joint.

NOTE:

It may be necessary to move the right reel sideways for the U-joint to clear the tube.

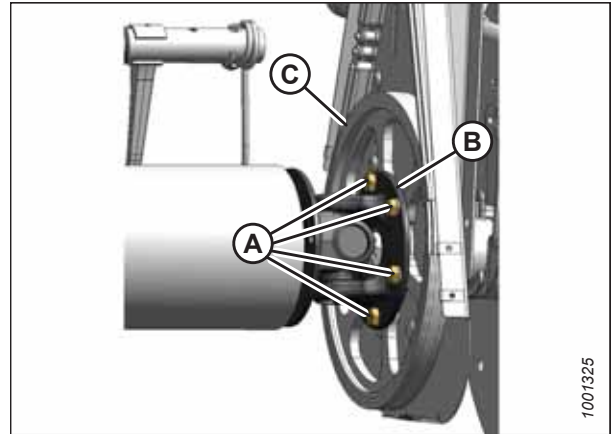


Figure 4.201: U-Joint

Installing Double-Reel U-Joint

Once the old U-joint has been removed, a new one can be installed.

NOTE:

It may be necessary to move the right reel sideways for the U-joint to clear the reel tube.

1. Position U-joint flange (B) onto driven sprocket (C) as shown. Install six bolts (A) and hand-tighten them.

NOTE:

Do **NOT** torque the bolts.

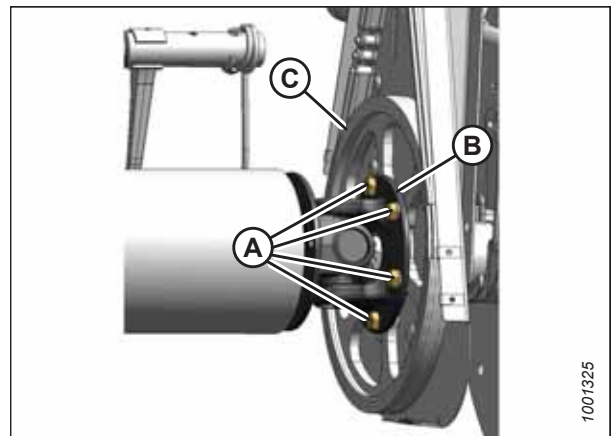


Figure 4.202: U-Joint

2. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
3. Rotate the reel until the holes in the end of the reel tube and U-joint flange (B) line up.
4. Install four bolts (A).
5. Torque the bolts to 95–108 Nm (70–80 lbf-ft).

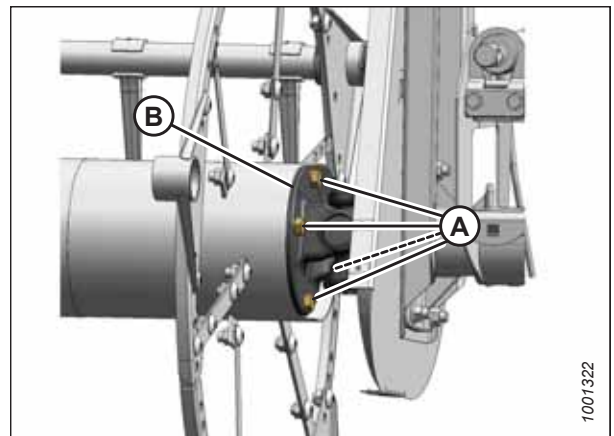


Figure 4.203: U-Joint

6. Remove temporary reel support (A).
7. Install the drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

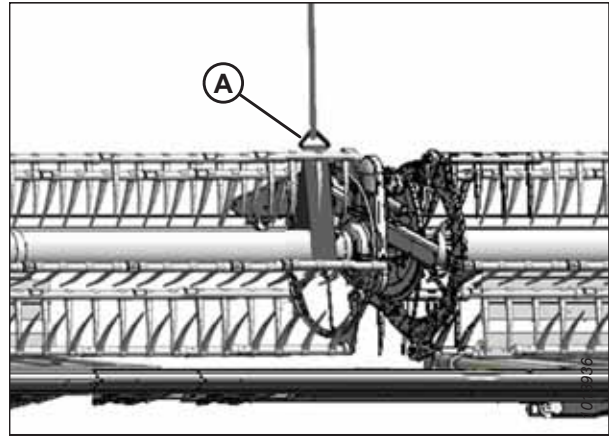


Figure 4.204: Supporting Reel

Replacing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.

Removing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. Remove the reel drive cover. For instructions, refer to [Removing Reel Drive Cover, page 202](#)
6. Remove the drive sprocket. For instructions, refer to [Replacing Reel Drive Sprocket, page 215](#).

7. Disconnect hydraulic lines (A) at motor (B). Cap or plug open ports and lines.

NOTE:

Mark hydraulic lines (A) and their locations in motor (B) to ensure correct reinstallation.

8. Remove four nuts and bolts (C) and remove motor (B). Retrieve the spacer (not shown) from between motor (B) and the motor mount (if installed).

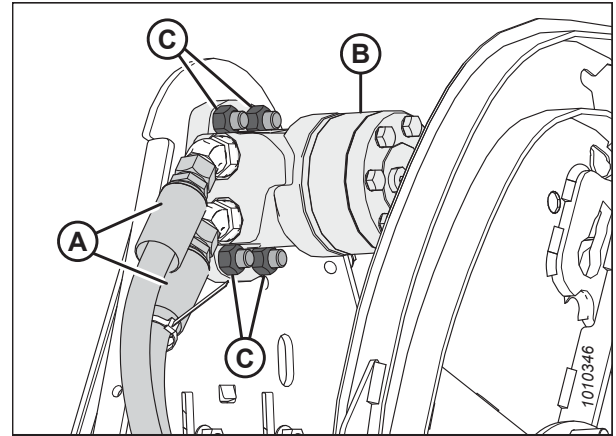


Figure 4.205: Reel Motor and Hoses

Installing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.

1. Attach motor (A) to motor mount (B) with four countersunk bolts and nuts (C).

NOTE:

The bolts should be inserted through holes and slots in the chain case into the motor mount.

2. Torque nuts (C) to 102 Nm (75 lbf-ft).

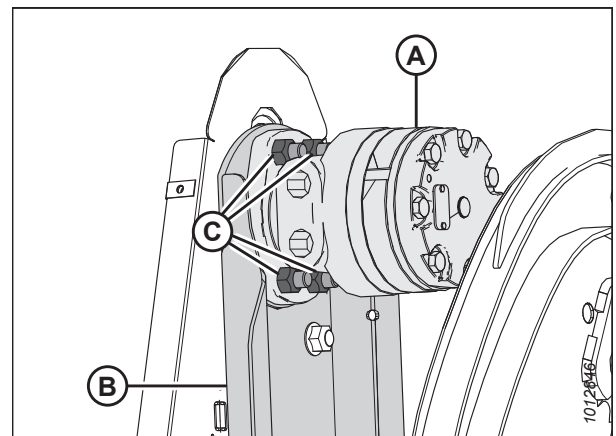


Figure 4.206: Reel Drive Motor

3. Remove the caps or plugs from the ports and lines, and connect hydraulic lines (A) to hydraulic fittings (B) on motor (C).

NOTE:

Ensure hydraulic lines (A) are installed at their original locations.

4. Install the drive sprocket. For instructions, refer to [Replacing Reel Drive Sprocket, page 215](#).
5. Reinstall the reel drive cover. For instructions, refer to [Installing Reel Drive Cover, page 204](#).

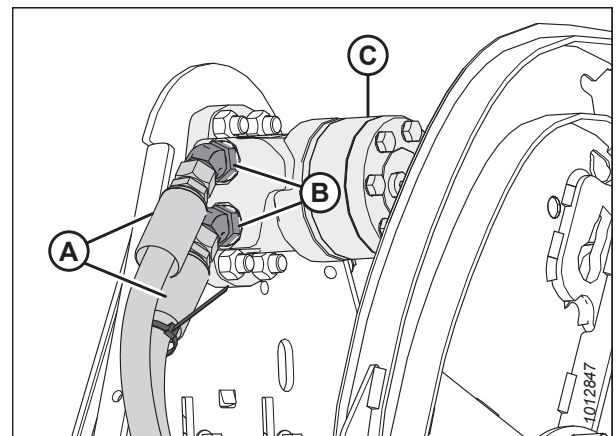


Figure 4.207: Reel Motor and Hoses

Reel Speed Sensor

The reel speed sensor system is located inside the reel drive cover.

Removing Reel Speed Sensor



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Disconnect sender wire (A).
3. Remove nut and bolt (B) attaching the sender to the support.
4. Remove sender (C).

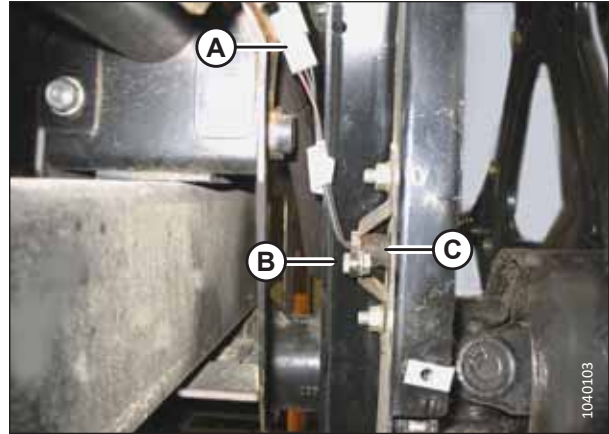


Figure 4.208: Reel Speed Sensor

Installing Reel Speed Sensor



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Position sender (C) on the support, and secure in place with nut and bolt (B).
3. Connect sender wire (A).

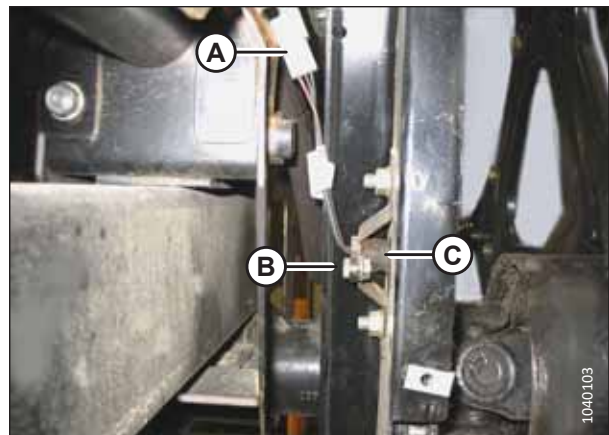


Figure 4.209: Reel Speed Sensor

4. Adjust the clearance between sensor (A) and driven sprocket (B) to 2–4 mm (0.08–0.16 in.) by bending the support.

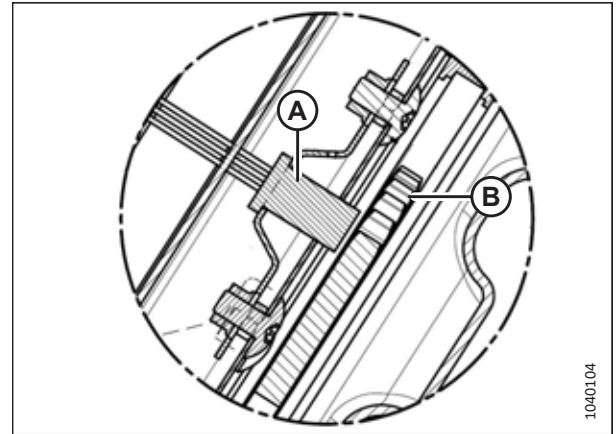


Figure 4.210: Reel Speed Sensor

4.10.5 Reel Tines and Fingers

If a steel tine or plastic finger is damaged or worn, it will need to be removed so it can be replaced.

IMPORTANT:

Keep the reel tines and fingers in good condition. Straighten or replace them as required.

Removing Steel Tines

Damaged steel fingers will need to be cut off of the reel tine tube.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. Remove the tine tube bushings from the applicable tine tube at the center and left reel discs. For instructions, refer to [4.10.6 Tine Tube Bushings, page 229](#).

6. Attach reel arms (B) (temporarily) to the reel disc at the original attachment locations (A).
7. Cut the damaged tine so it can be removed from the tine tube.
8. Remove the bolts from the existing tines and slide the tines over to replace the tine that was cut off in Step 7, [page 226](#) (remove reel arms [B] from the tine tubes as necessary).

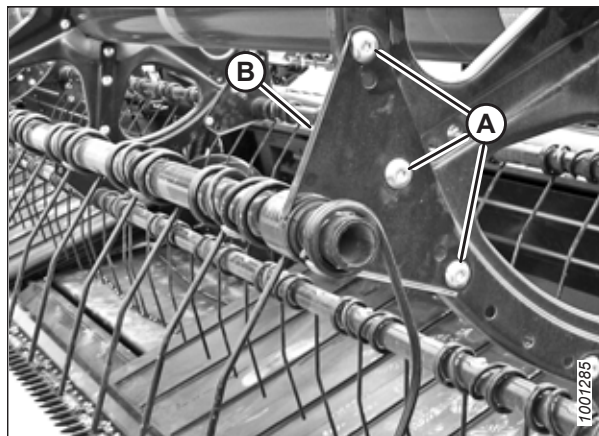


Figure 4.211: Reel Arm

Installing Steel Tines

Once the old steel tine has been removed, a new tine can be pushed onto the tine tube.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

5. Slide the new tines and reel arm (A) onto the end of the tube.
6. Install the tine tube bushings. For instructions, refer to [4.10.6 Tine Tube Bushings, page 229](#).
7. Attach the tines to the reel tine tube with bolts and nuts (B).

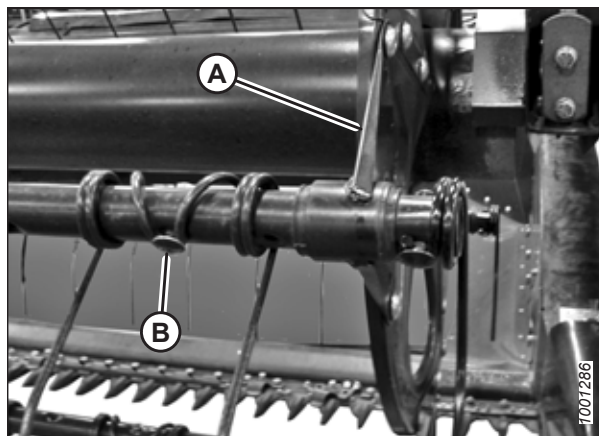


Figure 4.212: Reel Tine Tube

Removing Plastic Fingers

Plastic reel fingers are secured to the tine tube with a single Torx® screw.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. Remove screw (A) using a Torx® Plus 27 IP socket wrench.

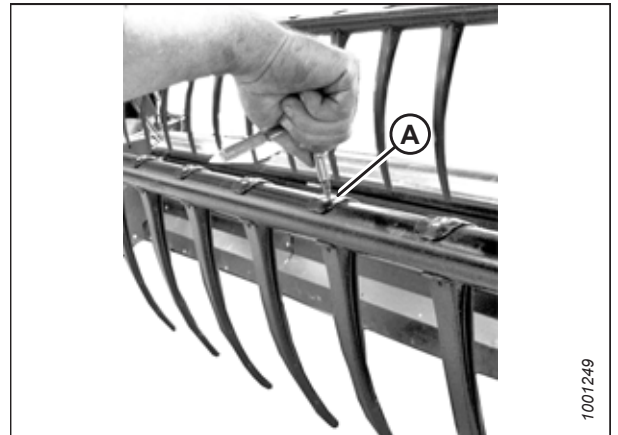


Figure 4.213: Removing Plastic Fingers

6. Push the top of the finger off the reel tine tube while slightly pulling on the tine under the tube. The finger can then be removed.



Figure 4.214: Removing Plastic Fingers

Installing Plastic Fingers

Once the old plastic reel finger has been removed, a new one can be installed.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Position the finger on the rear of the tine tube and engage the lug at the bottom of the finger in the lower hole in the tine tube.
2. Lift the top flange gently and rotate the finger until the lug in the top of the finger engages the upper hole in the tine tube.

IMPORTANT:

Do **NOT** apply force to the finger prior to tightening the mounting screw. Applying force without tightening the mounting screw will break the finger or shear the locating pins.



Figure 4.215: Installing Finger

3. Install screw (A) using a Torx® Plus 27 IP socket wrench and torque it to 8.5–9.0 Nm (75–80 lbf·in).

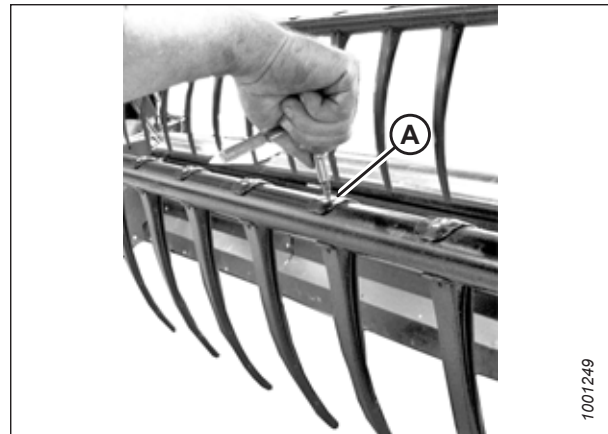


Figure 4.216: Installing Finger

4.10.6 Tine Tube Bushings

The reel tine tube rests in a tine tube bushing, which is secured to the reel disc. If a tine tube bushing is damaged or worn, it will need to be replaced.

Removing Bushings from Five-Bat Reels

The bushing clamps securing the tine tube to the bushing will need to be released so that the bushing halves can be removed.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. If replacing only the cam end bushing, proceed to Step [10, page 230](#).

Removing center disc and tail-end bushings

6. Remove bolts (A) securing arm (B) to the disc.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

IMPORTANT:

Note the hole locations in the arm and disc, and ensure bolts (A) are reinstalled at the original locations.

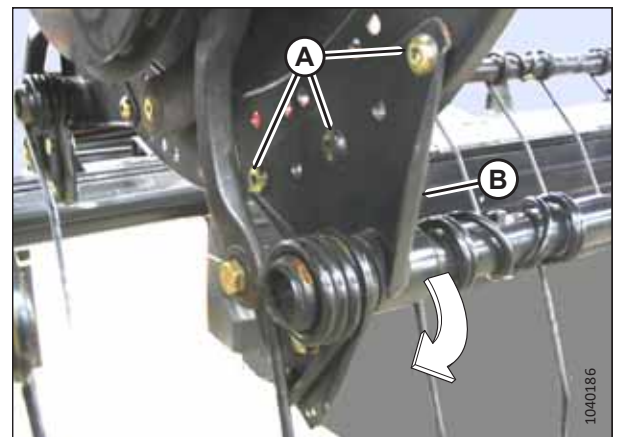


Figure 4.217: Tail End

7. Remove bolt (A) on the cam linkage so that tine tube (B) is free to rotate.

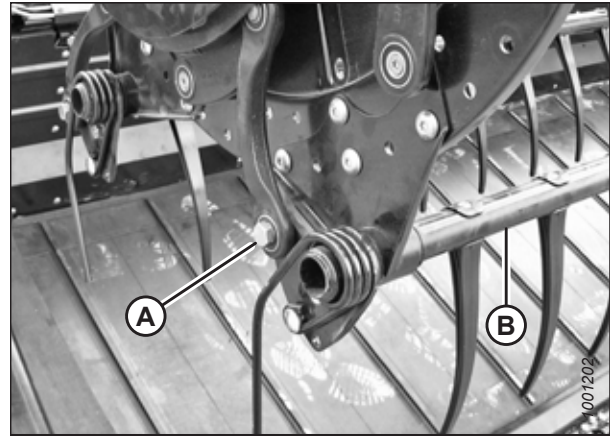


Figure 4.218: Tail End

8. Slide the tine tube outboard to expose the bushings. Remove bolt (A) from the tine next to the arm (or remove the plastic finger) if required so that the tube can slide through the arm. Refer to the following procedures as necessary:

- [Removing Plastic Fingers, page 227](#)
- [Removing Steel Tines, page 225](#)

9. Remove bushing halves (B).

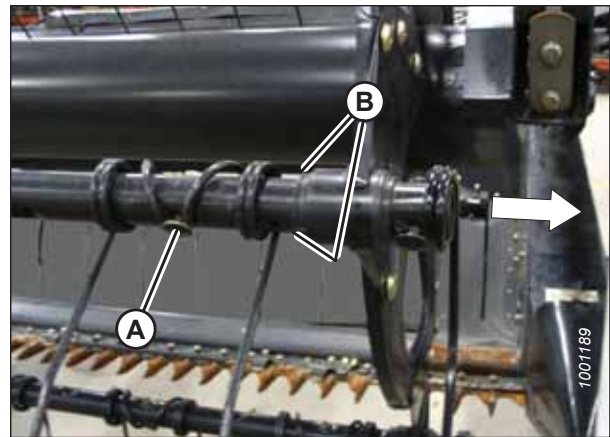


Figure 4.219: Tine Tube

Removing cam end bushings

10. Remove bolt (A) securing arm (B) to the disc.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

IMPORTANT:

Note the hole locations in the arm and disc, and ensure bolts (A) are reinstalled at the original locations.

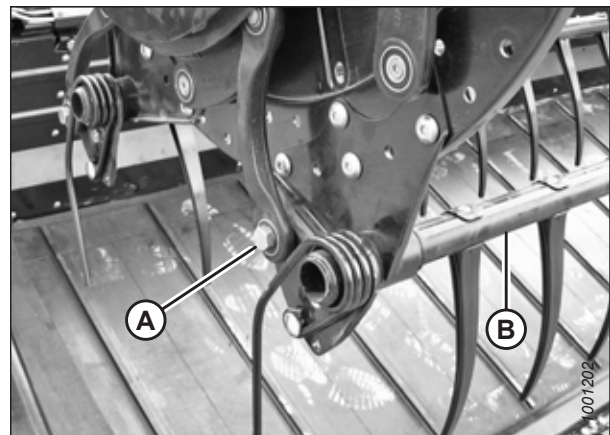


Figure 4.220: Cam End

11. Release bushing clamp (A) at the cam disc using a small screwdriver to separate the serrations. Move the clamp off the bushings.

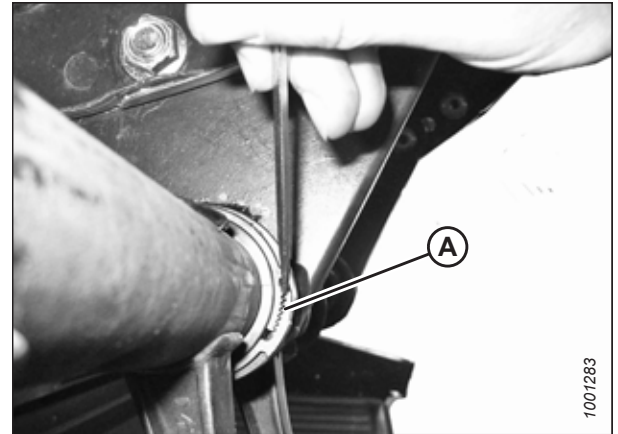


Figure 4.221: Bushing Clamp

12. Rotate arm (A) clear of the disc, and then slide the arm off the bushing. If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures if necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)
13. Remove bushing halves (B).

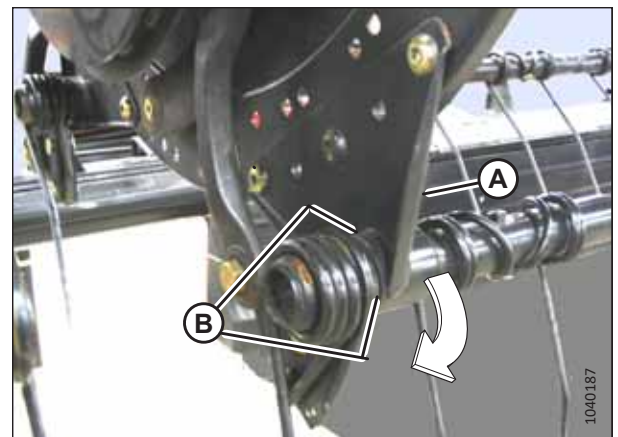


Figure 4.222: Cam End

Installing Bushings on Five-Bat Reels

Once the old tine tube bushing halves have been removed, the new ones can be installed.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

NOTE:

Use a pair of modified channel lock pliers (A) to install bushing clamps (C). Secure the pliers in a vise and grind a notch (B) into the end of each arm to fit the clamp as shown.

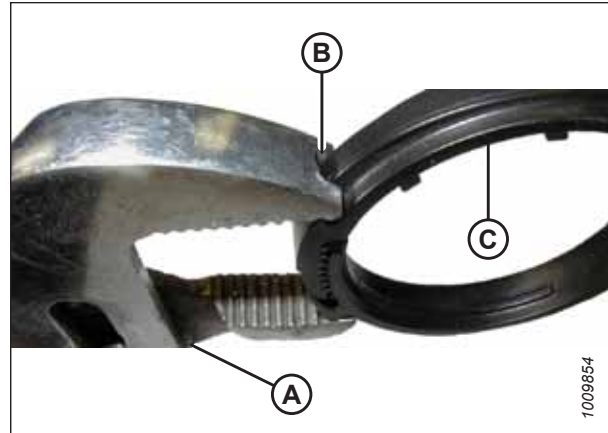


Figure 4.223: Modified Pliers

Installing cam end bushings:

1. At the cam end disc, position bushing halves (C) on the tine tube, and position the lug in each bushing half into the hole in the tine tube.
2. Slide reel arm (B) into the busing, and position it against the disc in its original location.
3. Install bolts (A) in their original holes, and tighten.
4. Reinstall any previously removed fingers or tines. Refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)
5. Reinstall bolt (D) on the cam linkage.
6. Spread bushing clamp (A) and slip it over the tine tube adjacent to the flangeless end of bushing (B). Position the clamp such that the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

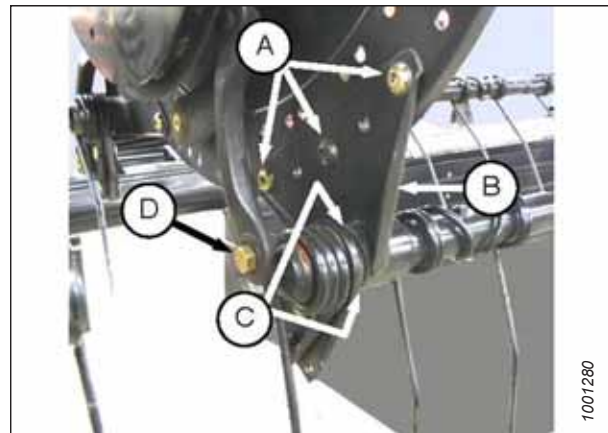


Figure 4.224: Cam End

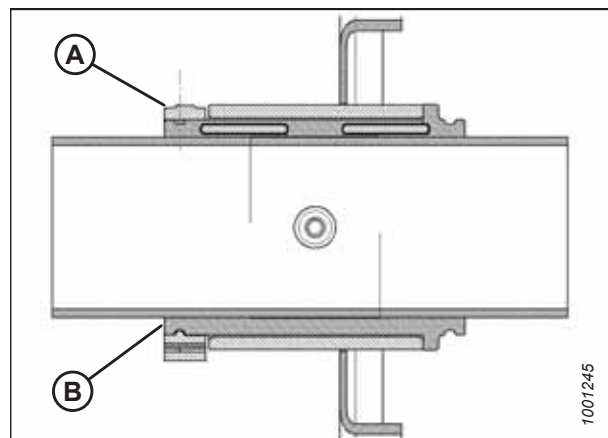


Figure 4.225: Bushing

7. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

IMPORTANT:

Overtightening the clamp might break the clamp.

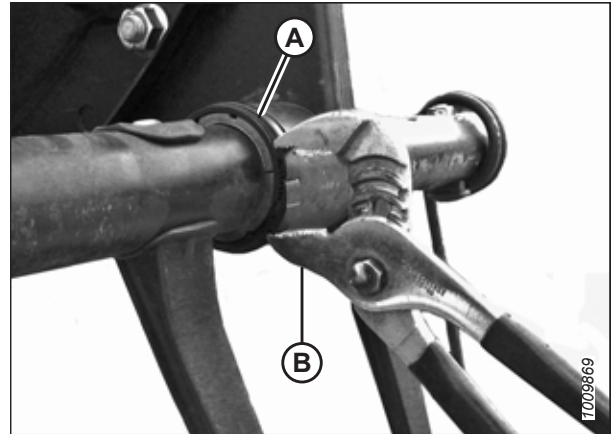


Figure 4.226: Clamp on Bushing

Installing center disc and tail-end bushings:

8. At the center and tail-end discs, position bushing halves (A) on the tine tube, and position the lug in each bushing half into the hole in the tine tube.
9. Slide the tine tube inboard (towards the cam end) to position the bushing in the reel arm.
10. Reinstall any previously removed fingers or tines. For instructions, refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)
11. Reinstall the reel endshields. For instructions, refer to .

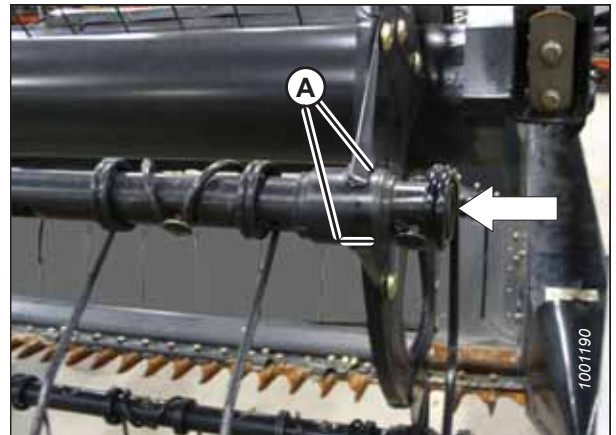


Figure 4.227: Bushing Halves on Tine Tube

Removing Bushings from Six- or Nine-Bat Reels

The bushing clamps securing the tine tube to the bushing will need to be released so that the bushing halves can be removed.



DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

1. Lower the header fully.
2. Raise the reel fully.

3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to [3.10.1 Engaging Reel Safety Props, page 36](#).
5. If replacing only the cam end bushing, proceed to Step [10, page 235](#).

Removing center disc and tail-end bushings

6. Remove bolts (A) securing arm (B) to the disc at both locations.

IMPORTANT:

Note the hole locations in the arm and disc, and ensure bolts (A) are reinstalled at the original locations.

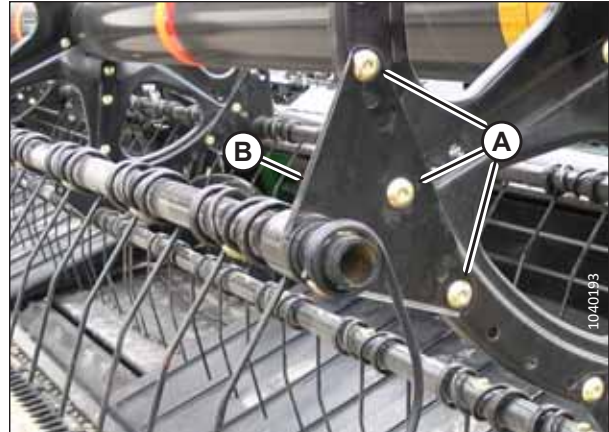


Figure 4.228: Reel Arm

7. Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull the clamp off the tine tube.

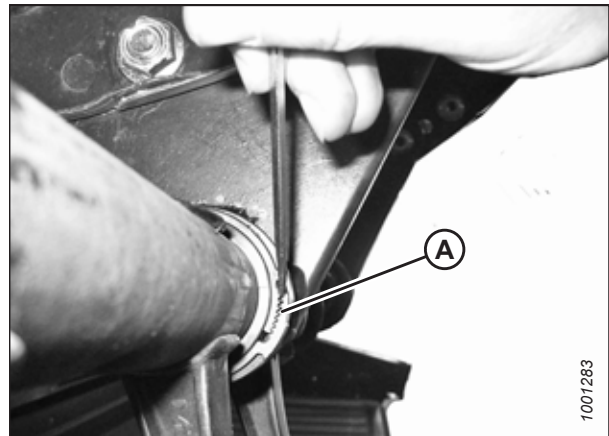


Figure 4.229: Bushing Clamp

8. Rotate arm (A) until it is clear of the disc and slide the arm inboard off of bushing (B).
9. Remove bushing halves (B). If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)

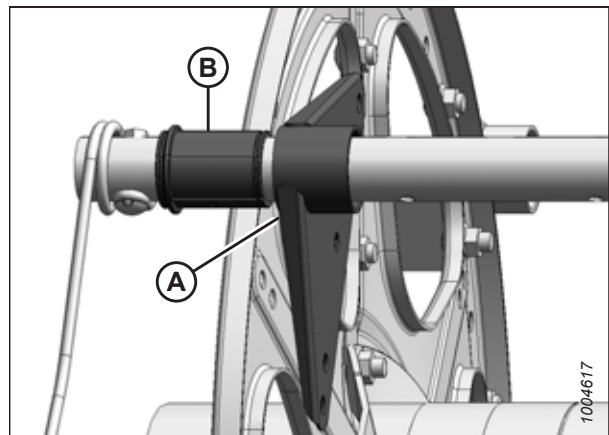


Figure 4.230: Bushing

Removing cam end bushings

10. Remove bolt (A) from the cam linkage so that tine tube (B) is free to rotate.

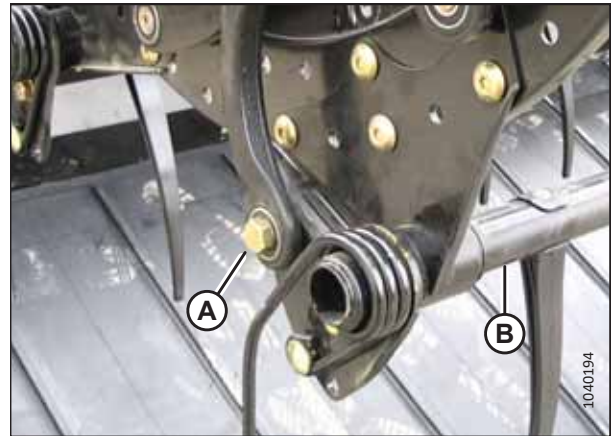


Figure 4.231: Cam Linkage

11. Slide the tine tube outboard to expose bushing (A).
12. Remove bushing halves (A). If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures if necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)

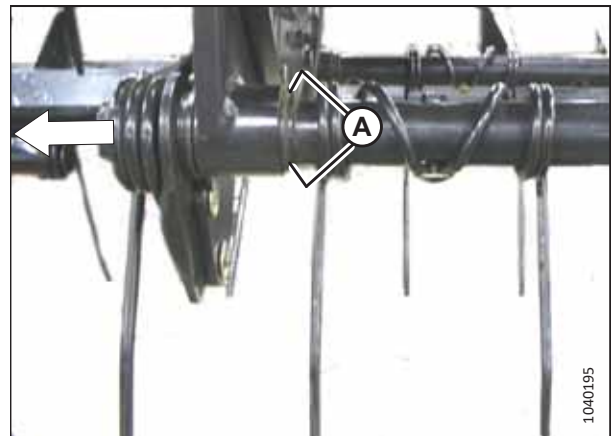


Figure 4.232: Cam End

Installing Bushings on Six- or Nine-Bat Reels

Once the old tine tube bushing halves have been removed, the new ones can be installed.



DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.



WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

NOTE:

Use a pair of modified channel lock pliers (A) to install bushing clamps (C). Secure the pliers in a vise and grind a notch (B) into the end of each arm to fit the clamp as shown.

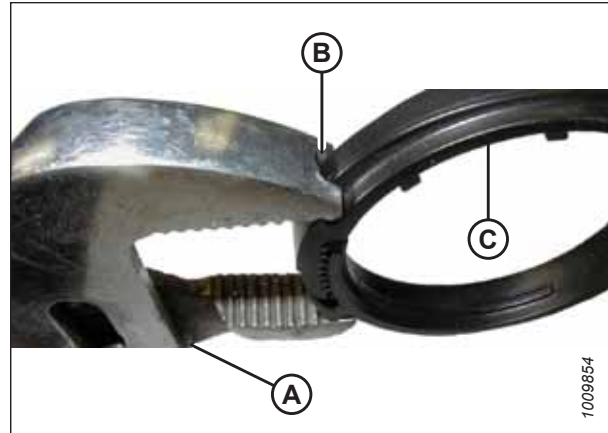


Figure 4.233: Modified Pliers

Installing cam end bushings

1. Position bushing halves (B) on the tine tube so that the lug in each bushing half fits into the hole in the tine tube.
2. Slide the tine tube toward the tail end of the reel to insert bushing (B) into the reel arm.
3. Reinstall any previously removed fingers or tines. Refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)

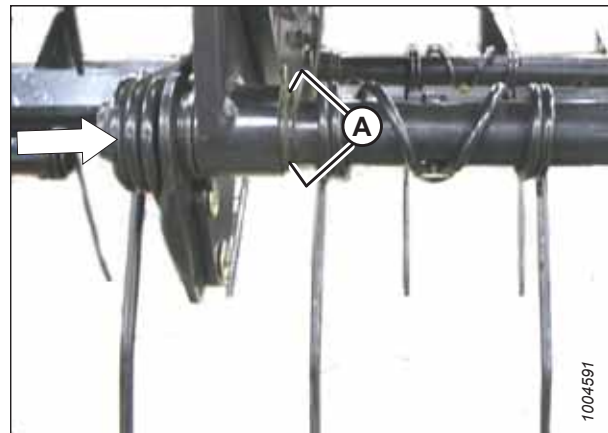


Figure 4.234: Cam End

Installing center disc and tail-end bushings

4. At the center and tail end discs, position bushing halves (C) on the tine tube so that the lug in each bushing half fits into the hole in the tine tube.
5. Slide reel arm (B) onto bushing (C) and position them against the disc at the original location.
6. Reinstall bolts (A) in their original holes, and tighten.
7. Reinstall any previously removed fingers or tines. For instructions, refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 227](#)
 - [Removing Steel Tines, page 225](#)

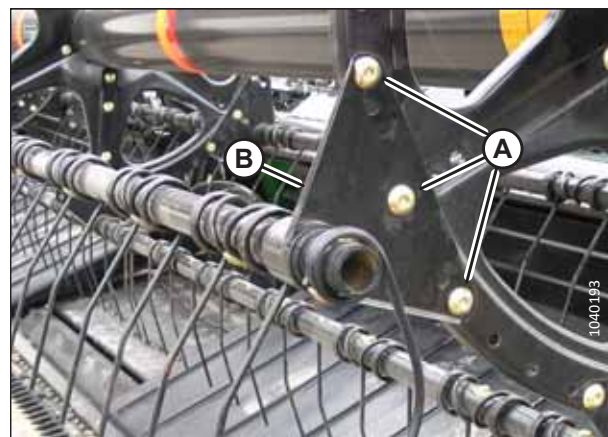


Figure 4.235: Reel Arm

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- Spread bushing clamp (A) and slip it over the tine tube adjacent to the flangeless end of bushing (B). Position the clamp such that the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

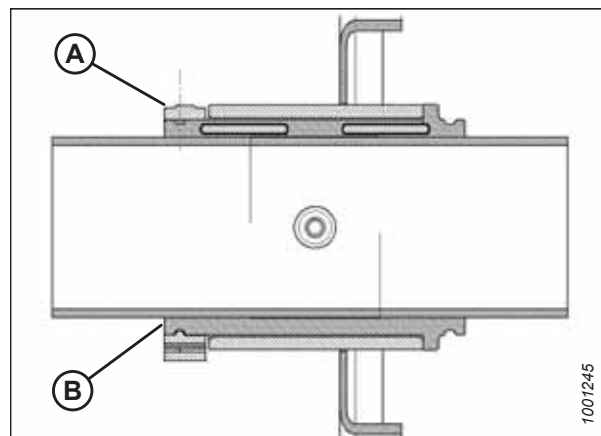


Figure 4.236: Bushing

- Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

IMPORTANT:

Overtightening the clamp might break the clamp.

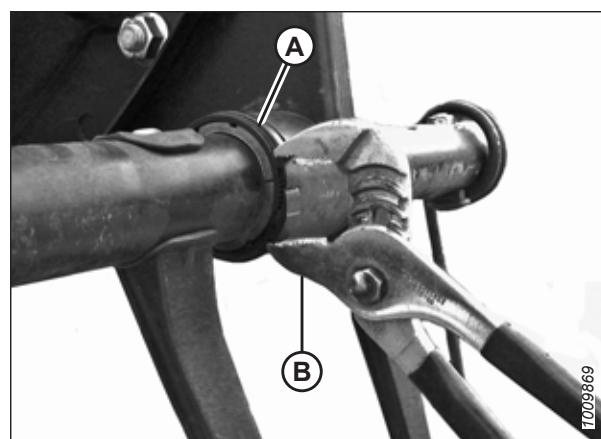


Figure 4.237: Clamp on Bushing

4.11 Transport System (Optional)

The header can be equipped with a set of transport wheels so that the header can be towed by a windrower, combine, or tractor. This option is available for use with 9.1, 10.7, and 12.2 m (30, 35, and 40 ft.) headers.

Refer to [5.3.2 Stabilizer / Slow Speed Transport Wheels, page 250](#) for more information.

4.11.1 Checking Wheel Bolt Torque

The transport wheel bolt torque should be checked after one operating hour following the installation of the wheels, and every 100 operating hours thereafter.

1. Torque wheel bolts to 110–120 Nm (80–90 lbf-ft) using the sequence shown at right.

IMPORTANT:

Whenever a wheel is removed and reinstalled, check the wheel bolt torque after one hour of operation and every 100 hours thereafter.

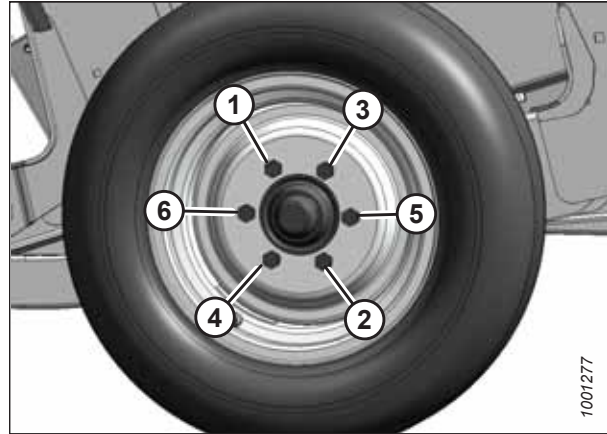


Figure 4.238: Bolt Tightening Sequence

4.11.2 Checking Axle Bolt Torque

The hardware that secures the optional transport system components to the header must be checked daily to ensure safe operation.

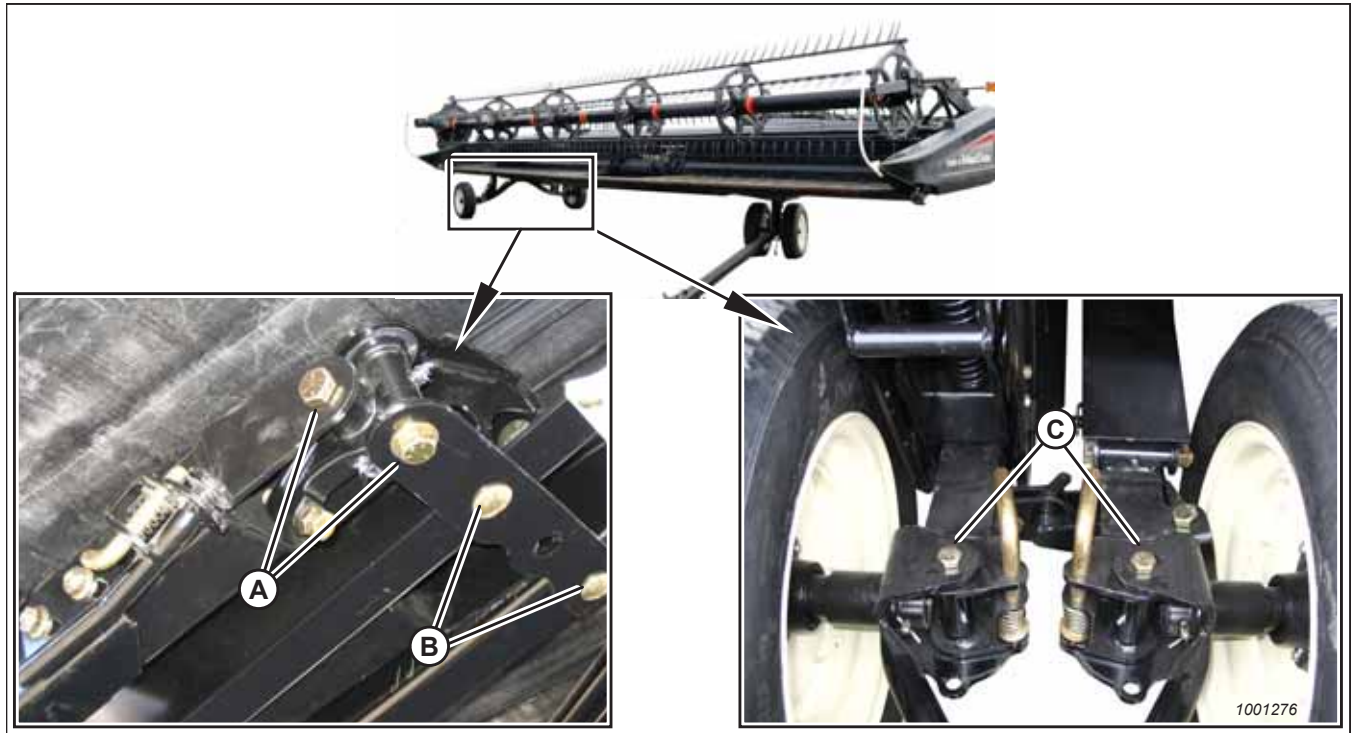


Figure 4.239: Axle Bolts

1. Check and tighten axle bolts **DAILY** until the torque is maintained as follows:

- (A): 244 Nm (180 lbf-ft)
- (B): 203 Nm (150 lbf-ft)
- (C): 244 Nm (180 lbf-ft)

4.11.3 Checking Tire Pressure

Proper tire pressure ensures tires perform properly and wear evenly.

WARNING

- Service tires safely.
 - A tire can explode during inflation which could cause serious injury or death.
 - Do NOT stand over the tire. Use a clip-on chuck and extension hose.
 - Do NOT exceed the maximum inflation pressure indicated on the tire label or sidewall.
 - Replace tires that have defects.
 - Replace wheel rims that are cracked, worn, or severely rusted.
 - Never weld a wheel rim.
 - Never use force on an inflated or partially inflated tire.
 - Make sure the tire is correctly seated before inflating it to operating pressure.
 - If the tire is not correctly positioned on the rim or is overinflated, the tire bead can loosen on one side causing air to escape at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in the area.
 - Make sure all the air is removed from the tire before removing the tire from the rim.
 - Do NOT remove, install, or repair a tire on a rim unless you have the proper equipment and experience to perform the job.
 - Take the tire and rim to a qualified tire repair shop.
1. Check the tire inflation pressure and inflate it according to the information provided in Table 4.5, page 240
 2. Make sure the tire is correctly seated on the rim before inflating. If the tire is not correctly positioned on the rim, take the tire to a qualified tire repair shop.
 3. If inflation is required, use a clip-on chuck and an extension hose to inflate the tire to the desired pressure.

IMPORTANT:

Do **NOT** exceed the maximum inflation pressure indicated on the tire label or sidewall.

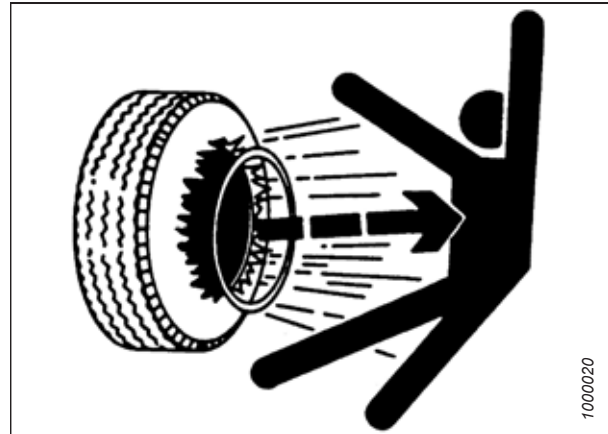


Figure 4.240: Inflation Warning

Table 4.5 Tire Pressure

Year	Tire	Size	Pressure
2006 and earlier	Goodyear Wrangler RT/S	205–75 R15	276 kPa (40 psi)
2007–2009	Carlisle and Titan	ST205/75 R15	448 kPa (65 psi)
2009 and later	DICO	ST205/75 R15	Load range D: 448 kPa (65 psi)
2009 and later	DICO	ST205/75 R15	Load range E: 552 kPa (80 psi)

4.12 Maintenance Requirements

Regular maintenance is the best insurance against early wear and untimely breakdowns.

Periodic maintenance requirements are organized according to service intervals.

When servicing the machine, refer to the appropriate section in this chapter and use only the fluids and lubricants specified in Recommended Fluids and Lubricants on the inside back cover.

Log hours of operation, use the maintenance record, and keep copies of your maintenance records (refer to [4.12.2 Maintenance Schedule, page 241](#)).



CAUTION

Carefully follow safety messages. Refer to [4.1 Preparing Machine for Servicing, page 113](#) and [1 Safety, page 1](#).

4.12.1 Break-in Inspection

Break-in inspections involve checking belts, fluids, and performing general machine inspections for loose hardware or other areas of concern. Break-in inspections ensure that all components can operate for an extended period without requiring service or replacement.

Inspection Interval	Item	Refer to
5 hours	Check for loose hardware. Tighten to required torque.	7.2 Torque Specifications, page 268
5 hours	Check knife drive belts tension. Periodically check for first 50 hours.	<ul style="list-style-type: none"> • Tensioning Timed Knife Drive Belts, page 160 • Tensioning Untimed Knife Drive Belts, page 157
10 hours	Check knife drive box mounting bolts.	Checking Mounting Bolts, page 173
50 hours	Change knife drive box lubricant.	Changing Oil in Knife Drive Box, page 179

4.12.2 Maintenance Schedule

Maintenance requirements are organized according to service intervals.

If a service interval specifies more than one timeframe, for example, "100 hours or annually", service the machine at whichever interval is reached first.

IMPORTANT:

Service the machine more often if operating under adverse conditions (severe dust, extra heavy loads, etc.).

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Interval	Service
First use	4.12.1 Break-in Inspection, page 241
100 hours or annually ³	<ul style="list-style-type: none"> • Check the wobble box mounting bolts • Check the wobble box lubricant level • Check the knife drive belt tension • Check the torque on the stabilizer/transport wheels (if installed) • Check the reel tine to cutterbar clearance • Check the reel drive chain tension • Grease the reel drive chain • Lubricate the hydraulic couplers
End of season	3.22 Storing the Header, page 111
10 hours or daily ⁴	<ul style="list-style-type: none"> • Check hydraulic hoses and lines for leaks • Check tire pressure of stabilizer/transport wheels (if installed) • Check knife sections, guards, and hold-downs • Oil knife (except in sandy conditions)
25 hours	<ul style="list-style-type: none"> • Grease the knife head
50 hours	<ul style="list-style-type: none"> • Grease the knife drive shaft bearings (double-knife headers only) • Grease the draper roller bearings • Change the knife drive box lubricant (first 50 hours only) • Grease all upper cross auger grease points
250 hours or annually ³	<ul style="list-style-type: none"> • Grease the transport axle pivot bushings (if installed) • Grease the double-reel U-joint (double-reel headers only)
500 hours or annually ³	<ul style="list-style-type: none"> • Grease the stabilizer/transport wheel hub bearings (if installed) • Grease the reel shaft bearings.
1000 hours or 3 years	<ul style="list-style-type: none"> • Change the knife drive box lubricant

3. It is recommended that annual maintenance be done prior to the start of the operating season.

4. Whichever occurs first.

4.12.3 Maintenance Record

Log hours of operation, use the maintenance record, and keep copies of your maintenance records.

Maintenance Record	Action:	✓ - Check	🔧 - Lubricate	▲ - Change
Hour Meter Reading				
Date				
Serviced by				
First Use, refer to 4.12.1 Break-in Inspection, page 241				
End of Season, refer to 3.22 Storing the Header, page 111				
10 Hours or Daily⁵				
✓ Hydraulic hoses and lines ⁶				
✓ Knife sections, guards, and hold-downs				
✓ Tire pressure				
🔧 Knife (except in sandy conditions)				
25 Hours				
🔧 Knifehead(s)				
50 Hours				
🔧 Draper roller bearings				
🔧 Knife drive shaft bearings (double-knife headers)				
🔧 Knife drive box oil - first 50 hours only				
🔧 All upper cross auger (UCA) grease points				
100 Hours or Annually				
✓ Reel drive chain tension				
✓ Reel tine/cutterbar clearance				
✓ Knife drive belt tension				
✓ Wheel bolt torque				
✓ Knife drive box lubricant level				
✓ Knife drive box mounting bolts				
250 Hours or Annually				
🔧 Reel drive U-joint				
🔧 Transport axle pivot bushings				

5. Whichever occurs first.

6. A record of daily maintenance is not required, but can be kept at the Owner's/Operator's discretion.

MAINTENANCE AND SERVICING

Maintenance Record	Action:	✓ - Check	🔧 - Lubricate	▲ - Change
500 Hours or Annually				
🔧	Reel shaft bearings			
🔧	Stabilizer/slow speed transport wheel bearings			
1000 Hours or 3 Years				
▲	Knife drive box lubricant			

4.12.4 Checking Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury.
- Keep your hands and body away from pinholes and nozzles which can eject fluids under high pressure.
- Relieve pressure before disconnecting hydraulic lines, and tighten all connections before applying pressure.
- If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury, or gangrene may result.



Figure 4.241: Hydraulic Pressure Hazard

- Use a piece of cardboard or paper to search for leaks.

IMPORTANT:

Keep hydraulic coupler tips and connectors clean. The introduction of dust, dirt, water, or foreign material into a hydraulic system is the major cause of damage. Do **NOT** attempt to service hydraulic systems in the field.



Figure 4.242: Testing for Hydraulic Leaks

Chapter 5: Options and Attachments

The following options and attachments are available for use with your header. See your MacDon Dealer for availability and ordering information.

5.1 Reel Kits

5.1.1 Lodged Crop Reel Finger Kit

The steel fingers provided in the Lodged Crop Reel Finger kit attach to the ends of every other tine tube and help to clear material in heavy, hard-to-cut crops such as lodged rice.

Each kit contains three fingers for the cam end of the reel and three fingers for the tail end. Hardware and installation instructions are included in the kit.

Two kits are required to modify each bar of a 6-bat reel.

MD #B4831



Figure 5.1: Lodged Crop Finger

5.1.2 Reel Endshield Kit

The steel shields provided in the Reel Endshield kit attach to the ends of the reels and help to clear material in heavy, hard-to-cut crops.

Hardware and installation instructions are included in the kit.

See your MacDon Dealer for more information.



Figure 5.2: Reel Endshields

5.1.3 Hydraulic Reel Fore-Aft Positioner

The Hydraulic Reel Fore-Aft Positioner allows the Operator to control the reel fore-aft position from the windrower cab.

This option is available only for headers that were not factory-equipped with the hydraulic reel fore-aft option.

Installation and adjustment instructions are included with the kit.

- Single-reel headers: MD #B5205
- Double-reel headers: MD #B5206

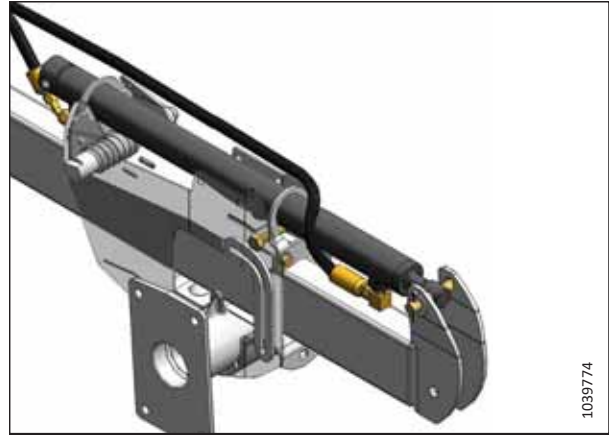


Figure 5.3: Hydraulic Reel Fore-Aft Positioner

5.2 Cutterbar Kits

The cutterbar is located on the front of the header. It supports the knife and guards which is used to cut the crop.

5.2.1 Cutterbar Wearplate

Cutterbar wearplates are recommended for cutting on the ground when the soil is adhering to the steel.

Installation instructions are included in the kit.

Order one of the following bundles according to your header size:

- 4.6 m (15 ft.) – MD #B4864
- 6.1 m (20 ft.) – MD #B4865
- 7.6 m (25 ft.) – MD #B4838
- 9.1 m (30 ft.) – MD #B4839
- 10.7 m (35 ft.) – MD #B4840
- 12.2 m (40 ft.) – MD #B4841



Figure 5.4: Cutterbar Wearplates

5.2.2 Knifehead Shield

Knifehead shields attach to the endsheets and reduce the knifehead opening to prevent cut crop (particularly severely lodged crop) from accumulating over the knifehead and damaging the knife drive box and endsheet.

It is recommended that the shield(s) be installed when harvesting severely lodged crop or in any crop conditions where the heads tend to accumulate over the knifehead.

Installation instructions are included in the kit.

Order the following bundles according to your header size:

- 7.6 m (25 ft.) and smaller – MD #125853
- 9.1 m (30 ft.) and larger – MD #125538

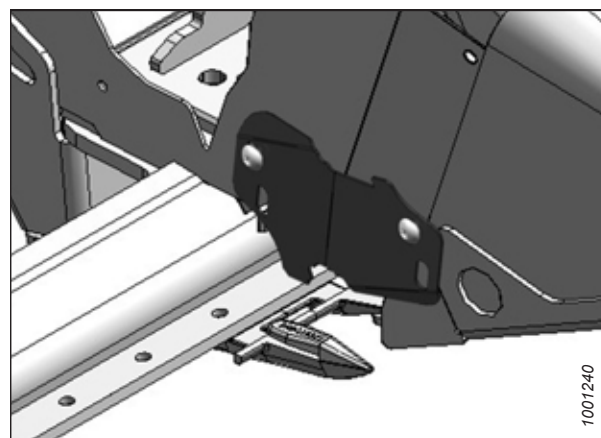


Figure 5.5: Knifehead Shield

5.2.3 Stub Guard Conversion Kit

Stub guards, complete with top guides and adjuster shoes, are designed to cut tough crops.

This kit is available for 4.6, 6.1, and 7.6 m (15, 20, and 25 ft.) D60 Draper Headers. Installation and adjustment instructions are included in the kit.

Order one of the following bundles according to your header size:

- 4.6 m (15 ft.) – MD #B5009
- 6.1 m (20 ft.) – MD #B5010

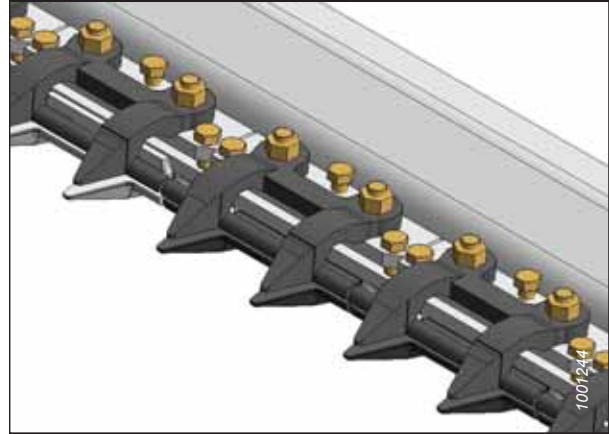


Figure 5.6: Stub Guards

5.2.4 Vertical Knife Mounts

The vertical knife mounts allow the installation of vertically oriented knives onto both ends of the header.

The vertical knives themselves are not sold by MacDon and must be purchased from a separate supplier.

Installation and adjustment instructions are included in the bundle.

Order the following bundles according to left or right side:

- Left side: MD #B4842
- Right side: MD #B4843

NOTE:

The Left Vertical Knife Mount kit can only be installed if installing both sides.

NOTE:

If mounting onto multiple headers, you will also require the auxiliary vertical knife plumbing kit MD #B5406.

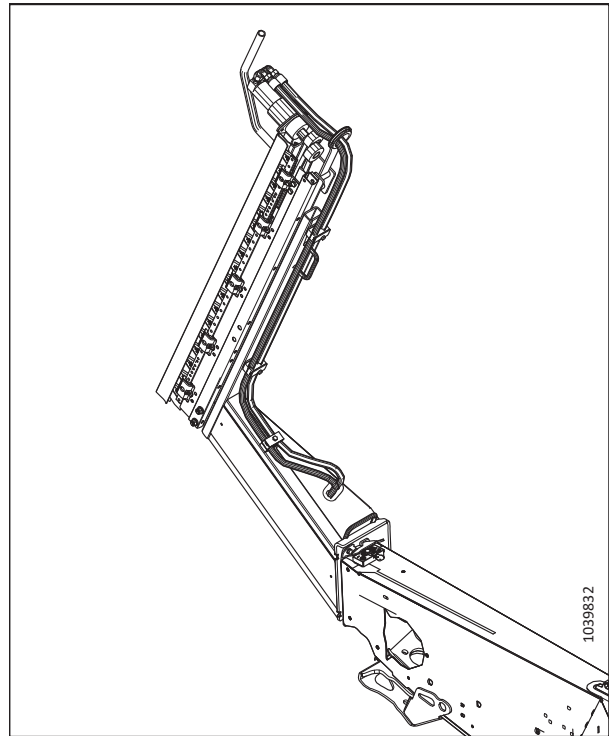


Figure 5.7: Vertical Knife Mount

5.2.5 Adjustable Skid Shoes with Poly Covers

Adjustable skid shoes with poly covers are recommended for cutting on the ground.

Installation and adjustment instructions are included in the kits.

- Outboard skid shoes, model years 2006 and older – MD #B4836
- Outboard skid shoes, model years 2007 and later – MD #B4963
- Inboard skid shoes – MD #B4837

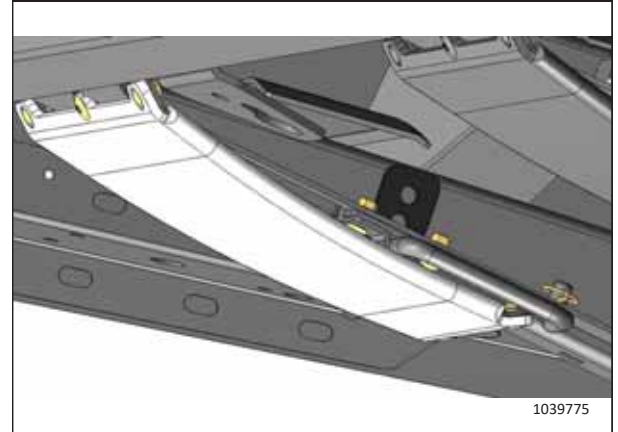


Figure 5.8: Adjustable Skid Shoe with Poly Cover

5.3 Header Kits

Header options add features or enhancements to the header frame rather than a specific system or function.

5.3.1 Stabilizer Wheels

Stabilizer wheels help to stabilize the header in field conditions that would otherwise cause the header to bounce, resulting in uneven cutting heights.

Installation and adjustment instructions are included in the kit.

This kit is available as an attachment for use with 9.1, 10.7, and 12.2 m (30, 35, and 40 ft.) headers.

MD #C1986

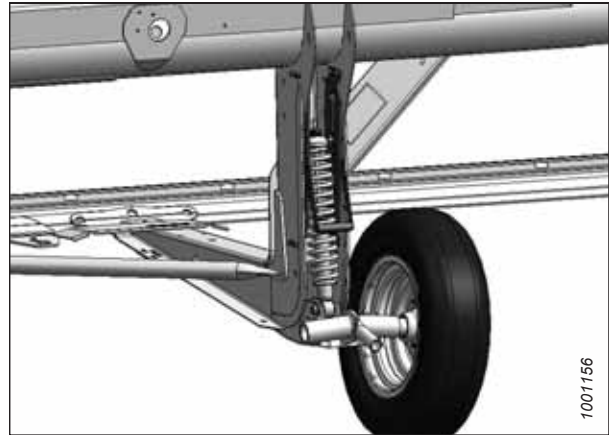


Figure 5.9: Stabilizer Wheel

5.3.2 Stabilizer / Slow Speed Transport Wheels

Stabilizer/slow speed transport wheels help to stabilize the header in field conditions that would otherwise cause the header to bounce, resulting in uneven cutting heights.

This system is similar to the Stabilizer Wheel option. For more information about that option, refer to [5.3.1 Stabilizer Wheels, page 250](#).

Stabilizer/slow speed transport wheels are used to convert the header into transport mode for slow-speed towing behind a properly configured windrower (or agricultural tractor). A tow pole and installation instructions are included in the kit.

This option is available for use with 9.1, 10.7, and 12.2 m (30, 35, and 40 ft.) headers.

MD #C1988 (Europe) and MD #C1983 (everywhere else)



Figure 5.10: Stabilizer/Transport Wheels

5.4 Crop Delivery Kits

Optional crop delivery kits can optimize header performance for specific crops or conditions.

5.4.1 Rice Divider Rods

Rice divider rods attach to the left and right crop dividers and divide tall and tangled rice crops in a similar manner to standard crop divider rods performing in standing crops. Installation instructions are included in the kit.

MD #B5609



Figure 5.11: Rice Divider Rod

5.4.2 Double Draper Drive Kit

The Double Draper Drive (DDD) kit provides power to four draper rollers instead of the usual two in order to minimize draper slipping when using the side delivery feature in heavy forage crops.

Installation instructions are included with the kit.

This kit is available for 7.6–12.2 m (25–40 ft.) D60 headers.

MD #B5409

5.4.3 Double Windrow Attachment

The Double Windrow Attachment (DWA) can be attached to an M Series Self-Propelled Windrower to enable double-windrowing with a hay conditioner.

The DWA⁷ lays up to 18.3 m (60 ft.) of crop in a single windrow which is ideal for large forage harvesters. It is designed to mount only on SP windrowers equipped with an HC10 Conditioner⁸.



Figure 5.12: Double Windrow Attachment (DWA)

5.4.4 Draper Extension Kit

The draper extension kit increases the inboard length of each deck up to 250 mm (10 in.), which narrows the header opening and decreases windrow width when cutting light/thin crops.

The kit includes roller support extensions, a draper repair kit, all necessary hardware, and installation instructions.

MD #B5407⁹

5.4.5 Swath Forming Rods (Center Delivery)

Swath forming rods form windrows so the heads are in the center and protected from shatter. Swath forming rods are mainly used for grass seed cutting applications.

Installation and adjustment instructions are included with the kit.

MD #B4803



Figure 5.13: Swath Forming Rods

-
- 7. This option is not compatible with the M105 SP Windrower.
 - 8. This option is not for use with the M205 or M105 SP Windrower.
 - 9. Not for use with Double Draper Drive (DDD).

5.4.6 HC10 Hay Conditioner

When paired with a windrower and a draper header, the HC10 hay conditioner lays uniform, fluffy windrows. Conditioning or crimping the cut hay allows the release of moisture resulting in faster drying times and earlier processing.

A parts list and installation and operating instructions are included with the kit.

MD #C1982

NOTE:

Not for use on D50 Draper Headers or M205 SP Windrowers.

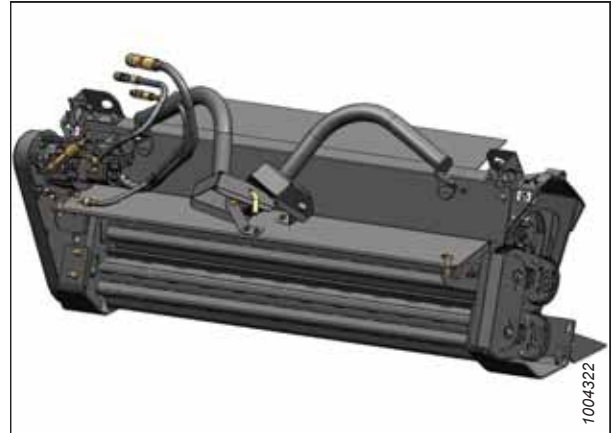


Figure 5.14: Hay Conditioner

5.4.7 Hydraulic Deck Shift Package

This system allows shifting of the decks from the operator's console when double-windrowing.

Installation and adjustment instructions are included with the kit.

Available on 7.6–12.2 m (25–40 ft.) D60 Draper Headers.

MD #B5201

5.4.8 Upper Cross Auger

The upper cross auger (UCA) attaches in front of the backtube and improves crop feeding into the center of the header in heavy crop conditions. It is ideal for high-volume harvesting of forages, oats, canola, mustard, and other tall, bushy, hard-to-feed crops.

Installation instructions are included with the kit.

Order from the following bundles according to your header size:

- 4.6 m (15 ft.) – MD #B6280
- 6.1 m (20 ft.) – MD #B6281
- 7.6 m (25 ft.) – MD #B6461
- 9.1 m (30 ft.) – MD #B9011
- 10.7 m (35 ft.) – MD #B9010
- 12.2 m (40 ft.) – MD #B9009

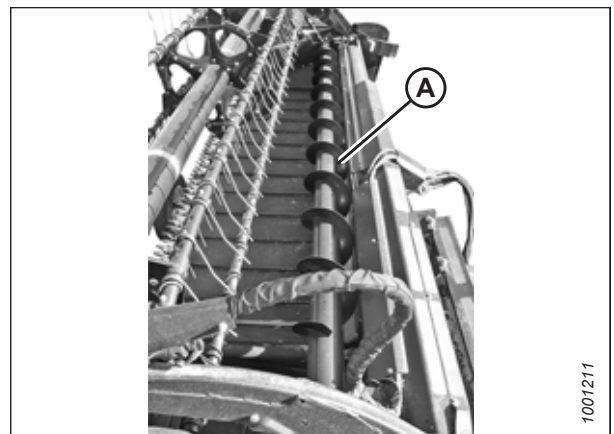


Figure 5.15: Upper Cross Auger with Beater Bars

OPTIONS AND ATTACHMENTS

NOTE:

Newer UCA kits do not include or use beater bars; they use bolt-on flighting instead.

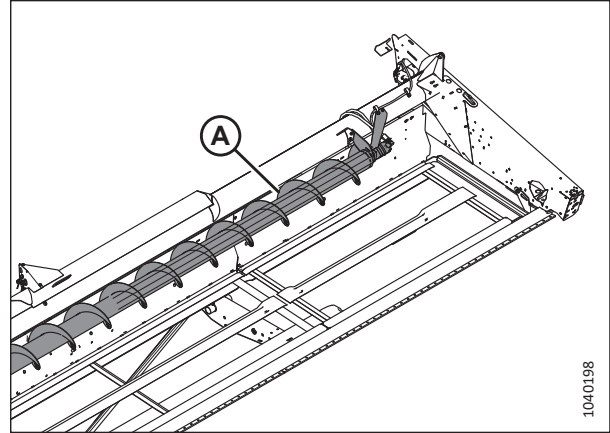


Figure 5.16: Upper Cross Auger with Bolt-On Flighting

Chapter 6: Troubleshooting

Troubleshooting tables are provided to help you diagnose and solve any problems you may have with the header.

6.1 Crop Loss at Cutterbar

Use the following tables to determine the cause of crop loss at the cutterbar and the recommended solution.

Problem	Solution	Refer to
Symptom: Does Not Pick Up Down Crop		
Cutterbar too high	Lower cutterbar	3.12.1 Cutting Height, page 43
Header angle too low	Increase header angle	Controlling Header Angle, page 49
Reel too high	Lower reel	3.12.8 Reel Height, page 54
Reel too far back	Move reel forward	3.12.9 Reel Fore-Aft Position, page 55
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	<ul style="list-style-type: none"> 3.12.4 Reel Speed, page 49 3.12.5 Ground Speed, page 50
Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	3.12.10 Reel Tine Pitch, page 63
Reel fingers not lifting crop sufficiently	Install lifter guards	See your MacDon Dealer
Symptom: Heads Shattering or Breaking Off		
Reel speed too fast	Reduce reel speed	3.12.4 Reel Speed, page 49
Reel too low	Raise reel	3.12.8 Reel Height, page 54
Ground speed too fast	Reduce ground speed	3.12.5 Ground Speed, page 50
Crop too ripe	Operate at night when humidity is higher	—
Symptom: Cut Grain Falling Ahead of Cutterbar		
Ground speed too slow	Increase ground speed	3.12.5 Ground Speed, page 50
Reel speed too slow	Increase reel speed	3.12.4 Reel Speed, page 49
Reel too high	Lower reel	3.12.8 Reel Height, page 54
Cutterbar too high	Lower cutterbar	3.12.1 Cutting Height, page 43
Reel too far forward	Move reel back	3.12.9 Reel Fore-Aft Position, page 55
Cutting at speeds over 10 km/h (6 mph) with high torque (10-tooth) reel drive sprocket	Replace with standard torque (19-tooth) reel drive sprocket	<ul style="list-style-type: none"> Replacing Reel Drive Sprocket, page 215 See your MacDon Dealer
Worn or broken knife components	Replace knife components	4.7 Cutterbar, page 140
Symptom: Strips of Uncut Material		
Crowding uncut crop	Allow enough room for crop to be fed to cutterbar	—
Broken knife sections	Replace broken sections	4.7.1 Replacing Knife Section, page 140
Symptom: Excessive Bouncing at Normal Field Speed		
Float set too light	Adjust header float	3.12.2 Header Float, page 48
Symptom: Divider Rod Running Down Standing Crop		
Divider rods too long	Remove divider rods	3.12.12 Crop Divider Rods, page 73
Symptom: Bushy or Tangled Crop Flows over Divider Rod, Builds Up on Endsheets		

TROUBLESHOOTING

Problem	Solution	Refer to
Divider rods providing insufficient separation	Install long divider rods or floating dividers	3.12.12 Crop Divider Rods, page 73
Symptom: Crop Not Being Cut at Ends		
Reel not frowning or not centered in header	Adjust reel frown or reel horizontal position	<ul style="list-style-type: none"> • 3.12.9 Reel Fore-Aft Position, page 55 • 4.10.2 Reel Frown, page 200
Knife hold-downs not adjusted properly	Adjust hold-downs so knife works freely, but still keeps sections from lifting off guards	Checking and Adjusting Knife Hold-Downs, page 151
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	4.7 Cutterbar, page 140
Header is not level	Level header	3.18 Leveling Header, page 90
Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	<ul style="list-style-type: none"> • 3.12.9 Reel Fore-Aft Position, page 55 • 3.12.10 Reel Tine Pitch, page 63
Divider runs down thick crop at ends, preventing proper feeding due to material bridging the knife guards	Replace three or four end guards with stub guards	<ul style="list-style-type: none"> • 4.7.7 Knife Guards, page 145 • See your MacDon Dealer
Symptom: Material Accumulating in Gap between Cutout in Endsheets and Knifehead		
Crop heads leaning away from knifehead opening in endsheet	Add knifehead shield(s), except in damp/sticky soils	3.17 Knifehead Shield, page 88

6.2 Cutting Action and Knife Components

Use the following tables to determine the cause of the cutting action and knife component problems and the recommended repair procedure.

Problem	Solution	Refer to
Symptom: Ragged or Uneven Cutting of Crop		
Knife hold-downs not adjusted properly	Adjust hold-downs	<i>Checking and Adjusting Knife Hold-Downs, page 151</i>
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	<i>4.7 Cutterbar, page 140</i>
Knife is not operating at recommended speed	Check engine speed of windrower	Refer to your windrower operator's manual
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	<ul style="list-style-type: none"> • <i>3.12.5 Ground Speed, page 50</i> • <i>3.12.4 Reel Speed, page 49</i>
Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	<ul style="list-style-type: none"> • <i>3.12.9 Reel Fore-Aft Position, page 55</i> • <i>3.12.10 Reel Tine Pitch, page 63</i>
Cutterbar too high	Lower cutting height	<i>3.12.1 Cutting Height, page 43</i>
Header angle too flat	Steepen header angle	<i>Controlling Header Angle, page 49</i>
Bent knife, causing binding of cutting parts	Straighten a bent knife and align guards	<i>4.7.7 Knife Guards, page 145</i>
Cutting edge of guards not close enough, or parallel to knife sections	Align guards	<i>4.7.7 Knife Guards, page 145</i>
Tangled / tough to cut crop	Install stub guards	<ul style="list-style-type: none"> • <i>4.7.7 Knife Guards, page 145</i> • See your MacDon Dealer
Reel too far back	Move reel forward	<i>3.12.9 Reel Fore-Aft Position, page 55</i>
Loose knife drive belt	Adjust knife drive belt tension	<ul style="list-style-type: none"> • <i>Tensioning Untimed Knife Drive Belts, page 157</i> • <i>Tensioning Timed Knife Drive Belts, page 160</i>
Symptom: Knife Plugging		
Reel too high or too far forward	Lower reel or move reel rearward	<ul style="list-style-type: none"> • <i>3.12.8 Reel Height, page 54</i> • <i>3.12.9 Reel Fore-Aft Position, page 55</i>
Ground speed too slow	Increase ground speed	<i>3.12.5 Ground Speed, page 50</i>
Loose knife drive belt	Adjust drive belt tension	<ul style="list-style-type: none"> • <i>Tensioning Untimed Knife Drive Belts, page 157</i> • <i>Tensioning Timed Knife Drive Belts, page 160</i>
Improper knife hold-down adjustment	Adjust hold-down	<i>Checking and Adjusting Knife Hold-Downs, page 151</i>
Dull or broken knife sections	Replace knife section	<i>4.7.1 Replacing Knife Section, page 140</i>

TROUBLESHOOTING

Problem	Solution	Refer to
Bent or broken guards	Align or replace guards	4.7.7 Knife Guards, page 145
Reel fingers not lifting crop properly ahead of knife	Adjust reel position / finger pitch	<ul style="list-style-type: none"> • 3.12.9 Reel Fore-Aft Position, page 55 • 3.12.10 Reel Tine Pitch, page 63
Steel pick-up fingers contacting knife	Increase reel clearance to cutterbar, or adjust frown	<ul style="list-style-type: none"> • 4.10.1 Reel Clearance to Cutterbar, page 197 • 4.10.2 Reel Frown, page 200
Float too heavy	Adjust springs for lighter float	3.12.2 Header Float, page 48
Mud or dirt build up on cutterbar	Raise cutterbar by lowering skid shoes	Cutting on Ground, page 46
Mud or dirt build up on cutterbar	Install cut-out sections	See your MacDon Dealer
Mud or dirt build up on cutterbar	Flatten header angle	Controlling Header Angle, page 49
Knife is not operating at recommended speed	Check engine speed of windrower	Refer to your windrower's operator's manual
Symptom: Excessive Header Vibration		
Knife hold-downs not adjusted properly	Adjust hold-downs	Checking and Adjusting Knife Hold-Downs, page 151
Knives on double-knife drive not timed	Adjust knife timing	Adjusting Double-Knife Timing, page 170
Knife not operating at recommended speed	Check engine speed of windrower	Refer to your windrower's operator's manual
Excessive knife wear	Replace knife	<ul style="list-style-type: none"> • 4.7.2 Removing Knife, page 141 • 4.7.5 Installing Knife, page 143
Loose or worn knifehead pin or drive arm	Tighten or replace parts	<ul style="list-style-type: none"> • 4.7.3 Removing Knifehead Bearing, page 142 • 4.8.2 Knife Drive Box, page 172
Bent cutterbar	Straighten cutterbar	See your MacDon Dealer
Symptom: Knife Back Breakage		
Bent or broken guard	Straighten or replace guard	4.7.7 Knife Guards, page 145
Worn knifehead pin	Replace knifehead pin	4.7.3 Removing Knifehead Bearing, page 142
Dull knife	Replace knife	<ul style="list-style-type: none"> • 4.7.2 Removing Knife, page 141 • 4.7.5 Installing Knife, page 143
Symptom: Excessive Breakage of Knife Sections or Guards		
Knife hold-downs not adjusted properly	Adjust hold-downs	Checking and Adjusting Knife Hold-Downs, page 151
Cutterbar operating too low in stony conditions	Raise cutterbar using skid shoes	Cutting on Ground, page 46
Float is set too heavy	Adjust for lighter float	3.12.2 Header Float, page 48
Bent or broken guard	Straighten or replace guard	4.7.7 Knife Guards, page 145
Header angle too steep	Flatten header angle	Controlling Header Angle, page 49

6.3 Reel Delivery

Use the following tables to determine the cause of reel delivery problems and the recommended repair procedure.

Problem	Solution	Refer to
Symptom: Reel Not Releasing Material in Normal Standing Crop		
Reel speed too fast	Reduce reel speed	3.12.4 Reel Speed, page 49
Reel too low	Raise reel	3.12.8 Reel Height, page 54
Reel tines too aggressive	Reduce cam setting	3.12.10 Reel Tine Pitch, page 63
Reel too far back	Move reel forward	3.12.9 Reel Fore-Aft Position, page 55
Symptom: Reel Not Releasing Material in Lodged and Standing Crop (Reel Fully Lowered)		
Reel tines too aggressive for standing crop	Reduce cam setting (1 or 2)	3.12.10 Reel Tine Pitch, page 63
Symptom: Wrapping on Reel End		
Reel tines too aggressive	Reduce cam setting	3.12.10 Reel Tine Pitch, page 63
Reel too low	Raise reel	3.12.8 Reel Height, page 54
Reel speed too fast	Reduce reel speed	3.12.4 Reel Speed, page 49
Crop conditions	Install optional endshields	See your MacDon Dealer
Reel not centered in header	Center reel in header	4.10.3 Centering Reel, page 201
Symptom: Reel Releases Crop too Quickly		
Reel tines not aggressive enough	Increase cam setting	3.12.10 Reel Tine Pitch, page 63
Reel too far forward	Move reel back	3.12.9 Reel Fore-Aft Position, page 55
Symptom: Reel Will Not Lift		
Reel lift couplers are incompatible or defective	Change quick coupler	—
Symptom: Reel Will Not Turn		
Control set at 0	Activate reel speed control	3.12.4 Reel Speed, page 49
Quick couplers not properly connected	Connect couplers	3.3.1 Attaching Header to Windrower, page 25
Reel drive chain disconnected	Connect reel drive chain	Replacing Drive Chain on Single Reel, page 207 or Replacing Drive Chain on Double Reel, page 209
Symptom: Reel Motion Uneven under no Load		
Excessive slack in reel drive chain	Tighten reel drive chain	Adjusting Reel Drive Chain Tension, page 206
Symptom: Reel Motion is Uneven or Stalls in Heavy Crops		
Reel speed too fast	Reduce reel speed	3.12.4 Reel Speed, page 49
Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	3.12.10 Reel Tine Pitch, page 63
Reel too low	Raise reel	3.12.8 Reel Height, page 54
Relief valve on windrower has low relief pressure setting	Increase relief pressure to manufacturer's recommendations	Refer to the windrower operator's manual
Low oil reservoir level on windrower (sometimes more than one reservoir)	Fill to proper level	Refer to the windrower operator's manual
Relief valve malfunction	Replace relief valve	Refer to the windrower operator's manual

TROUBLESHOOTING

Problem	Solution	Refer to
Cutting tough crops with standard torque (19-tooth) reel drive sprocket	Replace with high torque (10-tooth) or 14-tooth reel drive sprocket	<i>Optional Reel Drive Sprockets – D60, page 50</i>
Symptom: Plastic Fingers Cut at Tip		
Insufficient reel to cutterbar clearance	Increase clearance	<i>4.10.1 Reel Clearance to Cutterbar, page 197</i>
Symptom: Plastic Fingers Bent Rearward at Tip		
Reel digging into ground with reel speed slower than ground speed	Raise header	<i>3.12.1 Cutting Height, page 43</i>
Reel digging into ground with reel speed slower than ground speed	Decrease header tilt	<i>Controlling Header Angle, page 49</i>
Reel digging into ground with reel speed slower than ground speed	Move reel aft	<i>3.12.9 Reel Fore-Aft Position, page 55</i>
Symptom: Plastic Fingers Bent Forward at Tip (Opposite of Above)		
Reel digging into ground with reel speed faster than ground speed	Raise header	<i>3.12.1 Cutting Height, page 43</i>
Reel digging into ground with reel speed faster than ground speed	Decrease header tilt	<i>Controlling Header Angle, page 49</i>
Reel digging into ground with reel speed faster than ground speed	Move reel aft	<i>3.12.9 Reel Fore-Aft Position, page 55</i>
Symptom: Plastic Fingers Bent Close to Tine Tube		
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Correct plugging/cutting issues	<i>3.19 Unplugging Cutterbar, page 91</i>
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Stop reel before plugging becomes excessive	—

6.4 Header and Drapers

Use the following tables to determine the header and draper problems and the recommended solutions.

Problem	Solution	Refer to
Symptom: Insufficient Header Lift		
Low relief pressure	Increase relief pressure	See your MacDon Dealer
Symptom: Insufficient Draper Speed		
Speed control set too low	Increase control setting	3.12.6 Draper Speed, page 51
Relief pressure too low	Increase relief pressure to recommended setting	See your MacDon Dealer
Windrower header drive too slow	Adjust to correct speed for windrower model	Refer to windrower operator's manual
Worn out gear pump	Replace gear pump	See your MacDon Dealer
Pressure compensator (V7) set too low	Adjust to increase setting	Refer to windrower operator's manual
Symptom: Draper Will Not Move		
Drapers are loose	Tighten drapers	4.9.1 Adjusting Draper Tension, page 181
Drive or idler roller wrapped with material	Loosen draper and clean rollers	4.9.1 Adjusting Draper Tension, page 181
Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	4.9.1 Adjusting Draper Tension, page 181
Roller bearing seized	Replace roller bearing	4.9.7 Draper Roller Maintenance, page 189
Low hydraulic oil	Fill windrower reservoir to full level	See your MacDon Dealer
Incorrect relief setting at flow control valve	Adjust relief setting	See your MacDon Dealer
Symptom: Draper Stalling		
Material not feeding evenly off knife	Lower reel	3.12.8 Reel Height, page 54
Material not feeding evenly off knife	Install stub guards	<ul style="list-style-type: none"> • 5.2.3 Stub Guard Conversion Kit, page 248 • 4.7.7 Knife Guards, page 145 • See your MacDon Dealer
Symptom: Hesitation in Flow of Bulky Crop		
Header angle too low	Increase header angle	Controlling Header Angle, page 49
Material overload on drapers	Increase side draper speed	3.12.6 Draper Speed, page 51
Material overload on drapers	Install upper cross auger	5.4.8 Upper Cross Auger, page 253
Material overload on drapers	Add flighting extensions	See your MacDon Dealer
Symptom: Drapers Back Feed		
Drapers running too slow in heavy crop	Increase draper speed	3.12.6 Draper Speed, page 51
Symptom: Crop is Thrown Across Opening and under Opposite Side Draper		
Drapers running too fast in light crop	Reduce draper speed	3.12.6 Draper Speed, page 51
Symptom: Material Accumulates inside or under Front Edge of Draper		
Deck height improperly adjusted	Adjust deck height	4.9.8 Adjusting Deck Height, page 195

TROUBLESHOOTING

Problem	Solution	Refer to
Symptom: Material Wrapping at Upper Cross Auger Beater Bars NOTE: Some newer upper cross augers do not have beater bars.		
Crop conditions do not require beater bars	Remove beater bars	3.20.1 Removing Beater Bars, page 92
Symptom: Material Accumulating on End Deflectors and Releasing in Bunches		
End deflectors too wide	For headers with manual deck shift only, trim deflector or replace with narrow deflector (MD #172381)	3.19 Unplugging Cutterbar, page 91

6.5 Cutting Edible Beans

Use the following tables to determine the cause of any cutting edible bean problems and the recommended solutions.

Problem	Solution	Refer to
Symptom: Plants Being Stripped and Complete or Partial Plants Left Behind		
Header off ground	Lower header to ground and run on skid shoes and/or cutterbar	Cutting on Ground, page 46
Float set too light—rides on high spots and does not lower soon enough	Set float as follows: <ul style="list-style-type: none"> Dry ground: 445-667 N (100–150 lbf) Wet ground: 222–445 N (50–100 lbf) 	3.12.2 Header Float, page 48
Reel too high	Fully retract reel cylinders	3.12.8 Reel Height, page 54
Reel too high with cylinders fully retracted	Adjust reel height	3.12.8 Reel Height, page 54
Finger pitch not aggressive enough	Adjust finger pitch	3.12.10 Reel Tine Pitch, page 63
Reel too far aft	Move reel forward until the fingertips skim the soil surface with header on the ground and the center-link properly adjusted	3.12.9 Reel Fore-Aft Position, page 55
Header angle too shallow	Lengthen center-link	Controlling Header Angle, page 49
Header angle too shallow	If cutting on ground, header angle can be increased by fully retracting lift cylinders	Controlling Header Angle, page 49
Reel too slow	Adjust reel speed to be marginally faster than ground speed	3.12.4 Reel Speed, page 49
Ground speed too fast	Lower ground speed	3.12.5 Ground Speed, page 50
Skid shoes too low	Raise skid shoes to highest setting	Cutting on Ground, page 46
Dirt packs on bottom of cutterbar and raises cutterbar off the ground	Install plastic wear strips on bottom of cutterbar and skid shoes	See your MacDon Dealer
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar and raises cutterbar off the ground	Ground too wet. Allow soil to dry	—
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar and raises cutterbar off the ground	Manually clean the bottom of cutterbar when accumulation gets unacceptable	—
Plastic wear strip for cutterbar has been installed over top of steel wearplates	Remove steel cutterbar wearplates when installing the plastic wear strips for cutterbar	—
Header not level	Level header	3.18 Leveling Header, page 90
Worn/damaged knife sections	Replace sections or complete knife	4.7 Cutterbar, page 140
Parts of vines get caught in pointed guard tip. (Occurs more in row-cropped beans that are hilled from cultivating)	Install stub guard kit	5.2.3 Stub Guard Conversion Kit, page 248

TROUBLESHOOTING

Problem	Solution	Refer to
Symptom: Excessive Losses at Dividers		
Divider rod running down crop and shattering pods	Remove divider rods	3.12.12 Crop Divider Rods, page 73
Vines and plants build up on endsheet	Install divider rods	3.12.12 Crop Divider Rods, page 73
Plant Vines Pinched between Top of Draper and Cutterbar		
Cutterbar has filled up with trash with draper to cutterbar gap properly adjusted	Raise header fully at each end of field, or as required and shift decks back and forth to help clean out cutterbar	—
Shifting of decks with header raised does not clean out cutterbar debris	Manually remove debris from cutterbar cavity to prevent damage to drapers	—
Symptom: Crop Accumulating at Guards and Not Moving Rearward onto Drapers		
Reel finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	3.12.10 Reel Tine Pitch, page 63
Reel too high	Lower reel	3.12.8 Reel Height, page 54
Minimum reel clearance to cutterbar setting too high	Readjust reel minimum height with cylinders fully retracted	Adjusting Reel Clearance, page 199
Reel too far forward	Reposition reel	3.12.9 Reel Fore-Aft Position, page 55
Symptom: Reel Shattering Pods		
Reel too far forward	Reposition reel	3.12.9 Reel Fore-Aft Position, page 55
Reel speed too high	Reduce reel speed	3.12.4 Reel Speed, page 49
Bean pods are too dry	Cut at night with heavy dew once pods have softened	—
Finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	3.12.10 Reel Tine Pitch, page 63
Symptom: Cutterbar Guards Breaking		
Float insufficient	Increase float	3.12.2 Header Float, page 48
Excessive number of rocks in field	Consider installing optional stub guards Note: Experiment with a few guards on a section of cutterbar to compare the performance of the two different styles of guards	<ul style="list-style-type: none"> • 4.7.7 Knife Guards, page 145 • 5.2.3 Stub Guard Conversion Kit, page 248
Symptom: Cutterbar Pushing Too Much Trash and Dirt		
Header too heavy	Readjust float to make header lighter	3.12.2 Header Float, page 48
Header angle too steep	Decrease header angle with lift cylinders	3.12.3 Header Angle, page 48
Header angle too steep	Shorten the center-link	3.12.3 Header Angle, page 48
Regular guards push dirt and plug up with trash or plug up with trash and then push dirt	Install stub guard kit	5.2.3 Stub Guard Conversion Kit, page 248
Insufficient support for header	Install center skid shoes on header	Cutting on Ground, page 46
Symptom: Cutterbar Fills Up with Dirt		
Excessive gap between top of front of draper and cutterbar	Adjust front deck supports to obtain proper clearance between cutterbar and draper	4.9.8 Adjusting Deck Height, page 195

TROUBLESHOOTING

Problem	Solution	Refer to
Excessive gap between top of front of draper and cutterbar	Raise header fully at each end of field or as required and shift decks back and forth to help clean out cutterbar	—
Symptom: Reel Carries Over Odd Plants in Same Location		
Reel steel fingers bent and hook plants from crop flow on drapers	Straighten steel fingers	—
Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Raise reel	3.12.8 Reel Height, page 54
Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Adjust reel fore and aft location to move fingers out of the ground	3.12.9 Reel Fore-Aft Position, page 55
Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers	Adjust reel fore and aft location to move fingers out of the ground	3.12.9 Reel Fore-Aft Position, page 55
Symptom: Cutterbar Pushing Too Much Dirt in Certain Locations for Length of Field		
Tire tracks or row crop ridges	Cut at angle to ridges or crop rows to allow knife and guards to clean out better	—
Rolling land along length of field	Cut at 90° angle to undulations, provided knife floats across without digging in	—
Symptom: Reel Carries Over Excessive Amounts of Plants or Wads		
Excessive accumulation of crop on drapers (up to height of reel center tube)	Increase draper speed	3.12.6 Draper Speed, page 51
Finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	3.12.10 Reel Tine Pitch, page 63
Symptom: Reel Wraps Up with Crop		
Reel too low	Raise reel	3.12.8 Reel Height, page 54
Symptom: Reel Ends Wrap Up with Crop		
Uncut crop interfering on reel ends	Add reel endshields	Refer to the header parts catalog

6.6 Windrow Formation

Use the following tables to determine the cause of any windrow formation problems and the recommended solutions.

Problem	Solution	Refer to
Symptom: Heads on Ground and Scattered		
Draper speed too slow	Increase draper speed	3.12.6 Draper Speed, page 51
Draper angle too flat	Increase header angle	Controlling Header Angle, page 49
Ground speed too slow	Increase ground speed	3.12.5 Ground Speed, page 50
Crop too ripe	Cut material before too mature	—
Symptom: Hollow in Center		
Draper speed too slow	Increase draper speed	3.12.6 Draper Speed, page 51
Delivery opening too wide	Decrease delivery opening width	3.13 Delivery Opening, page 75
Symptom: All Heads in Center		
Draper speed too fast or header angle too steep	Reduce draper speed and/or decrease header angle	<ul style="list-style-type: none"> • 3.12.6 Draper Speed, page 51 • 3.12.3 Header Angle, page 48
Ground speed too fast	Reduce ground speed	3.12.5 Ground Speed, page 50
Crop too green	Allow time to mature	—
Symptom: All Heads To One Side		
Crop leaning to one side and reel too slow	Increase reel speed to orient crop parallel to draper slats and/or increase finger pitch aggressiveness	<ul style="list-style-type: none"> • 3.12.4 Reel Speed, page 49 • 3.12.10 Reel Tine Pitch, page 63
Symptom: Uneven Windrow (Any Crop Condition)		
Reel too low	Raise reel	3.12.8 Reel Height, page 54
Ground speed too fast for drapers, causing heads to fan out and crop to leave drapers unevenly	Reduce ground speed or increase draper speed	<ul style="list-style-type: none"> • 3.12.5 Ground Speed, page 50 • 3.12.6 Draper Speed, page 51
Reel speed too fast	Reduce reel speed	3.12.4 Reel Speed, page 49

Chapter 7: Reference

This chapter provides quick access to frequently needed information or numbers (for example, units of measurement or torque values).

7.1 Conversion Chart

Both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement are used in this manual. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

Table 7.1 Conversion Chart

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	$\times 2.4710 =$	acre	acres
Flow	liters per minute	L/min	$\times 0.2642 =$	US gallons per minute	gpm
Force	Newton	N	$\times 0.2248 =$	pound force	lbf
Length	millimeter	mm	$\times 0.0394 =$	inch	in.
Length	meter	m	$\times 3.2808 =$	foot	ft.
Power	kilowatt	kW	$\times 1.341 =$	horsepower	hp
Pressure	kilopascal	kPa	$\times 0.145 =$	pounds per square inch	psi
Pressure	megapascal	MPa	$\times 145.038 =$	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	$\times 14.5038 =$	pounds per square inch	psi
Torque	Newton meter	Nm	$\times 0.7376 =$	pound feet or foot pounds	lbf-ft
Torque	Newton meter	Nm	$\times 8.8507 =$	pound inches or inch pounds	lbf-in
Temperature	degrees Celsius	°C	$(^{\circ}\text{C} \times 1.8) + 32 =$	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	$\times 3.2808 =$	feet per minute	ft/min
Velocity	meters per second	m/s	$\times 3.2808 =$	feet per second	ft/s
Velocity	kilometers per hour	km/h	$\times 0.6214 =$	miles per hour	mph
Volume	liter	L	$\times 0.2642 =$	US gallon	US gal
Volume	milliliter	mL	$\times 0.0338 =$	ounce	oz.
Volume	cubic centimeter	cm ³ or cc	$\times 0.061 =$	cubic inch	in. ³
Weight	kilogram	kg	$\times 2.2046 =$	pound	lb.

7.2 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Refer to the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

7.2.1 Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 7.2 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651

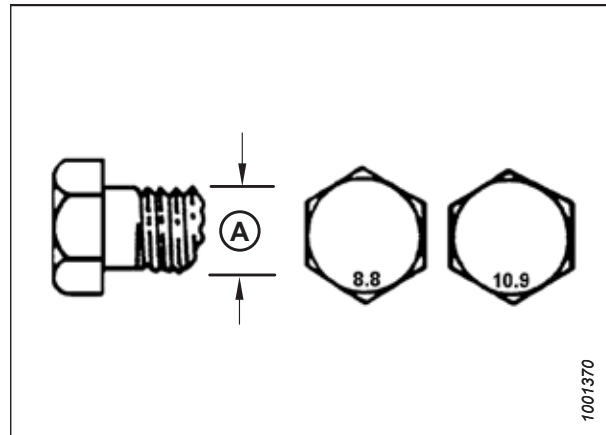


Figure 7.1: Bolt Grades

REFERENCE

Table 7.3 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

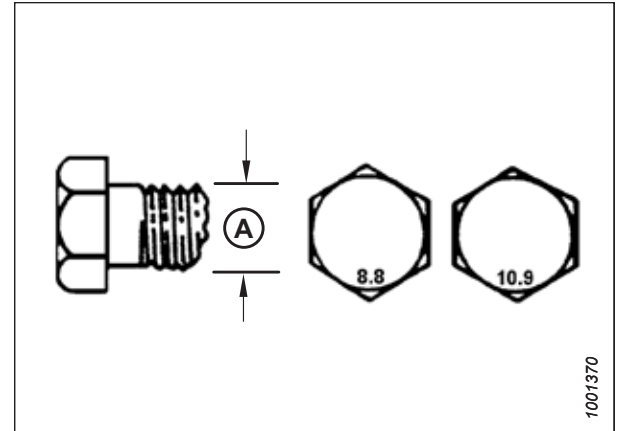


Figure 7.2: Bolt Grades

Table 7.4 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

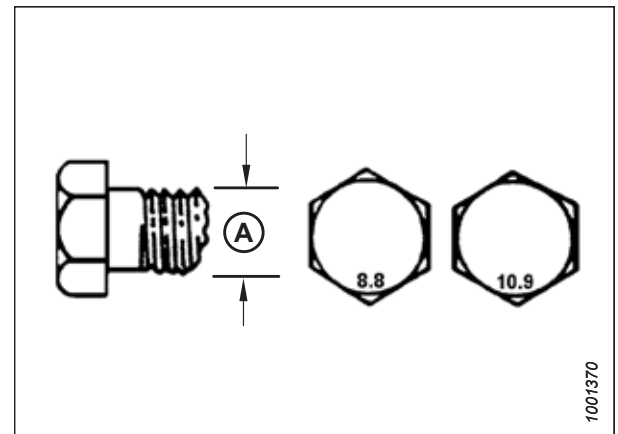


Figure 7.3: Bolt Grades

REFERENCE

Table 7.5 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

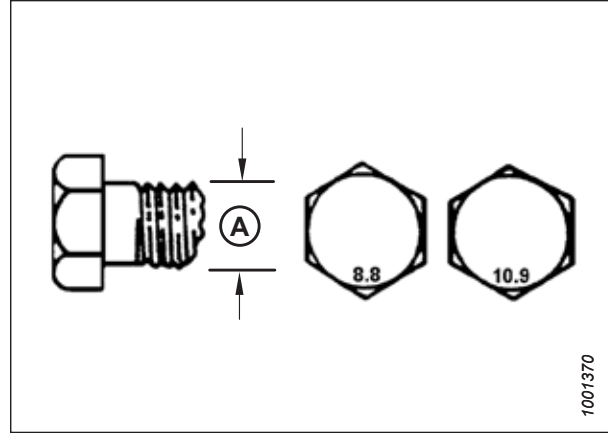


Figure 7.4: Bolt Grades

7.2.2 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 7.6 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf-ft	Nm	lbf-ft
M3	–	–	–	1
M4	–	–	4	2.6
M5	–	–	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	–	–	–	–
M16	–	–	–	–

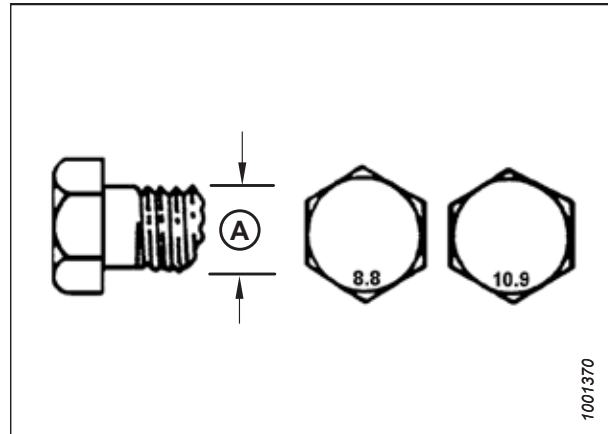


Figure 7.5: Bolt Grades

7.2.3 O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

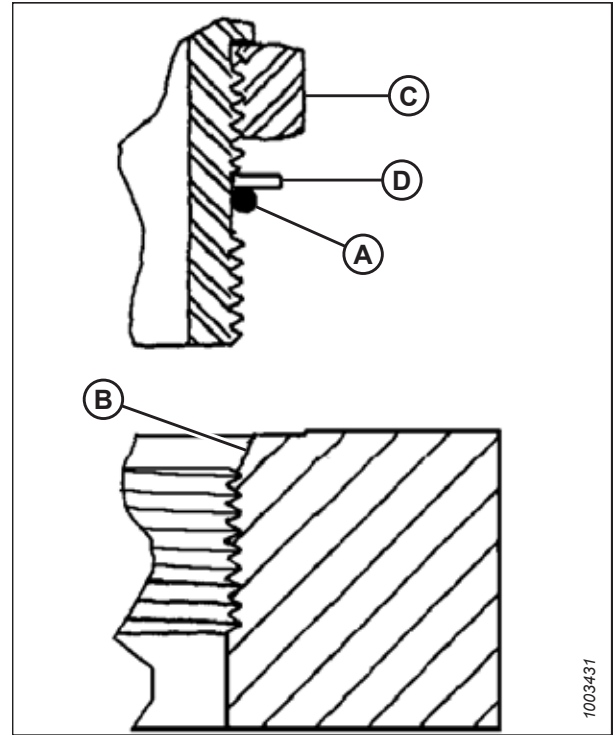


Figure 7.6: Hydraulic Fitting

5. Install fitting (B) into the port until backup washer (D) and O-ring (A) contact part face (E).
6. Position the angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten it to the torque value indicated in the table. Use two wrenches, one on fitting (B) and the other on lock nut (C).
8. Verify the final condition of the fitting.

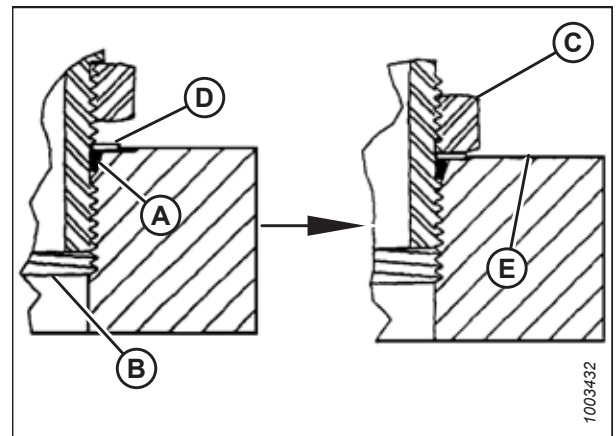


Figure 7.7: Hydraulic Fitting

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ¹⁰	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115

10. Torque values shown are based on lubricated connections as in reassembly.

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value ¹¹	
		Nm	lbf·ft (*lbf·in)
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1 1/16–12	120–132	88–97
-14	1 3/8–12	153–168	113–124
-16	1 5/16–12	176–193	130–142
-20	1 5/8–12	221–243	163–179
-24	1 7/8–12	270–298	199–220
-32	2 1/2–12	332–365	245–269

7.2.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 7.8, [page 272](#).
6. Verify the final condition of the fitting.

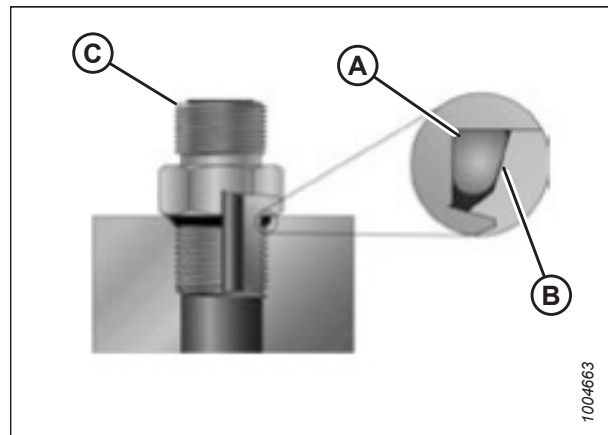


Figure 7.8: Hydraulic Fitting

Table 7.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ¹¹	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37

11. Torque values shown are based on lubricated connections as in reassembly.

Table 7.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value ¹²	
		Nm	lbf-ft (*lbf-in)
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

7.2.5 O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Torque values are shown in the Table 7.9, page 274.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.



Figure 7.9: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table 7.9, page 274.

NOTE:

If applicable, hold the hex flange on fitting body (E) to prevent the rotation of the fitting body and the hose when tightening fitting nut (D).

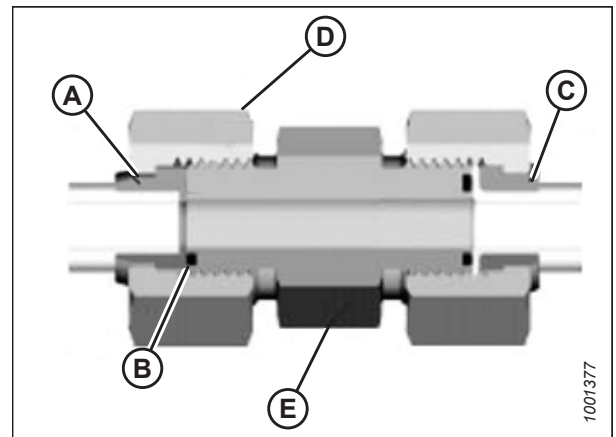


Figure 7.10: Hydraulic Fitting

12. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

6. Use three wrenches when assembling unions or joining two hoses together.
7. Verify the final condition of the fitting.

Table 7.9 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ¹³	
			Nm	lbf-ft
-3	Note ¹⁴	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note ¹⁴	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note ¹⁴	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

7.2.6 Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 7.10, page 275. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

NOTE:

The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

13. Torque values and angles shown are based on lubricated connection as in reassembly.

14. O-ring face seal type end not defined for this tube size.

REFERENCE

Table 7.10 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8-27	2-3	12-18
1/4-18	2-3	12-18
3/8-18	2-3	12-18
1/2-14	2-3	12-18
3/4-14	1.5-2.5	12-18
1-11 1/2	1.5-2.5	9-15
1 1/4-11 1/2	1.5-2.5	9-15
1 1/2-11 1/2	1.5-2.5	9-15
2-11 1/2	1.5-2.5	9-15

7.3 Unloading and Assembly

Refer to the instructions for your specific header for unloading, assembly, and setup procedures that are included with your shipment. The instruction part numbers are shown in the following table:

Shipping Destination	Header Description	MacDon Instruction Part Number
North America	D50 and D60 Draper Header for Self-Propelled Windrowers	MD #169007
Export (anywhere other than North America)	D50 and D60 Draper Header for Self-Propelled Windrowers	MD #169261

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Recommended Fluids and Lubricants

Ensure your machine operates at top efficiency by using clean fluids and lubricants only.

- Use clean containers to handle all fluids and lubricants.
- Store fluids and lubricants in an area protected from dust, moisture, and other contaminants.

Lubricant	Specification	Description	Use	Capacities
Grease	SAE multi-purpose	High temperature extreme pressure (EP2) performance with 1% max. molybdenum disulphide (NLGI grade 2) Lithium base	As required unless otherwise specified	—
Gear lubricant	SAE 85W-140	API service class GL-5	Knife drive box	2.2 liters (2.3 quarts)

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